



ADDENDUM NO. 2

June 8, 2016

NCC Vocational Technical School District

Renovations to the Howard High School of Technology – Bid Package 'B'

Wilmington, Delaware 19801

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NOTICE: Attach this addendum to the project manual for this project. It modifies and becomes a part of the contract documents. Work or materials not specifically mentioned herein are to be described in the main body of the specifications and as shown on the drawings. Bidders shall acknowledge receipt of this addendum on the space provided on the Bid Form. Failure to do so may subject the bidder to disqualification.

Whenever this Addendum modifies a portion of the Project Manual added information is shown as **Bold** and deleted information is shown as ~~striketrough~~.

The contract documents for the above referenced project, dated May 2, 2016 are amended as follows:

GENERAL CLARIFICATIONS:

The bid due date has been extended to Tuesday, June 21, 2016. Bids will be received at the NCC Vocational Technical School District 1417 Newport Road, Wilmington, Delaware 19804 until 2:00 PM local time.

All Contractors please review the following information as it pertains to your areas of work:

1. Contract HHS-19 Mechanical and Plumbing: This contractor shall evacuate, cut and cap all mechanical and plumbing equipment, piping, etc. scheduled to be demolished.
2. Contract HHS-20 Electrical and IT Infrastructure: This contractor shall safe off, cut and cap all electrical equipment, conduits etc. scheduled to be demolished
3. Contract HHS-21 Fire Protection: This contractor shall drain, evacuate, cut and cap all fire protection equipment scheduled to be demolished.
4. The following contractors are pre-qualified bidders for mechanical and electrical in Bid Package B:
 - Superior Electric
 - Nickle Electric
 - Worth and Company
 - Merit Mechanical
 - I.D. Griffith
 - Ralph Degli Obizzi & Sons
5. Contract HHS-17 Conveying Systems has been added to this bid package

QUESTIONS AND ANSWERS:

Q1. Reference drawing I-001, Finish Schedule Annex. The finish schedule indicates terrazzo





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- base is required at stairs A1, A2, & A3, however details on drawing A-455 indicate the stair stringers are to be painted. Please confirm there is no precast epoxy terrazzo stringers required at the stairs.
- A1. Precast epoxy terrazzo base is required at stair landings for stairs A1, A2 & A3.
- Q2. What wood trim is scheduled to be new at closet trim detail A1/A-471.
- A2. All trim is new custom trim to match existing.
- Q3. Is all wood trim including chalk trays in details A2/A-471 & A4/A-471 to be supplied as new?
- A3. All wood trim and chalk trays at marker board assemblies is to be provided as new.
- Q4. Confirm that all trim and cabinetry is new.
- A4. All trim and cabinetry is to be new unless noted otherwise.
- Q5. What is the detail for the sides of the chalkboards?
- A5. All trim at chalkboards is to match existing.
- Q6. Should quarry tile base or the Schluter cove accessory be used at quarry tile floor locations?
- A6. Quarry tile base should be used at all quarry tile floor locations.
- Q7. Are we to assume that any room where tile is specified that all walls get that finish and not just the ones with elevations.
- A7. In rooms that are listed to have a ceramic tile wainscot on the finish schedule, reference I-001, provide wainscot on all walls.
- Q8. How should the transition from tile wainscot to wood floor be treated.
- A8. Provide Schluter accessory at transition from tile wainscot to wood floor.
- Q9. Who owns saw cutting block walls for duct penetrations?
- A9. Saw cutting of walls is the responsibility of the mechanical contract.
- Q10. When will the list of alternatives be added to division 28000? PDF page 1360, section 2.1 A, B, & C
- A10. Included in this addendum.
- Q11. Section 271500-2 PDF page 1292 section E part 1 is the reference to "Two" cat6 cables per camera location accurate?
- A11. Yes, this is correct. Provide TWO CAT6 cables for each security camera location (2nd cable is for future camera and/or Wi-Fi antenna)
- Q12. Will divisions 27000 and 2800 go through the electrical prime? How do I obtain a list of those that requested documents?
- A12. A list of electrical bidders can be obtained by contacting EDiS, Jackie McKee at jmckee@ediscompany.com





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- Q13. The Specifications section 27 15 00 "Voice Data Video Systems" section is labeled "Currently Being Revised". When will the final version of this section be provided?
- A13. The originally issued spec section 271500 for bid documents. Delete words "Currently being revised" from the table of contents for 27 15 00 "Voice Data Video Systems" section
- Q14. We would like to request that Johnson Controls FX by Modern Controls be added as a customer/district approved building automation system service provider/integrator. Modern Controls has extensive experience executing projects for New Castle County Vo-tech School District as a preferred BAS vendor.
- A14. Yes, this is acceptable. Modern Controls is an acceptable installer for Johnson Controls FX.
- Q15. Please confirm that all backboxes and raceways indicated and defined on all technology drawings (T-000 - T-401) will be provided by Contract HHS-20 "Electrical & IT Infrastructure".
- A15. Contract HHS-20 will provide all back boxes, raceways and pull strings as indicated on the T series drawings.
- Q16. Drawing sheet T-000 defines an icon and description for wall mounted "12" w deep basket type cable tray". The remainder of the drawings only define 24" w Cable/Ladder tray in the MDF and IDF closets. Please confirm the MDF/IDF's are the only locations that require cable/ladder tray.
- A16. Confirmed. Provide 24" wide ladder tray in each telecom room (MDF/IDF) per bid documents.
- Q17. The Technology specifications require painted backboards in each MDF/IDF. Will this backboard be provided by another package, or should the board and installation be included in the HHS-23 Technology package?
- A17. Contract HHS-23 Technology will furnish and install painted back boards as required.
- Q18. Specification section 28 31 11 "Fire Alarm System" is listed in the Technology specification sections. Please confirm that this section is the responsibility of Contract HHS-20 Electrical and IT Infrastructure.
- A18. Contract HHS-20 is responsible for the complete fire alarm system; any interconnection to the Technology package will be the responsibility of Contract HHS-23 Technology.
- Q19. Technology Sheet T-305 defines 41 existing IP cameras, 15 existing analog cameras (upgraded in alternate C-07), and 11 new cameras as part of alternate C-06. The bid form currently does not indicate any alternates. Should this note be removed?
- A19. Delete note on sheet T-305 "TYPICAL ACCESS CONTROL RISER DIAGRAM" referring to Bid Alternate for cameras.





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- Q20. The Technology drawings depict some cameras with no subscript, some with a subscript of "new", and some with a subscript of "EX". Are all cameras depicted to be new? Are any existing cameras being re-used?
- A20. All cameras shall be new. Existing cameras shall be removed and turned over to the Owner.
- Q21. Technology drawing T-000 defines and IC with they E subscript as "connect to public address system". What is intended by this note? This device is depicted on sheet T-104.
- A21. Provide public address intercom "[IC]" call station. This call station will be used to call the main office from each elevator lobby to comply with IBC code requirements.
- Q22. Technology drawing T-101 defines an IC near ELM01 – what is the purpose of this IC?
- A22. Provide public address intercom "[IC]" call station. This call station will be used to call the main office from each elevator lobby to comply with IBC code requirements.
- Q23. Technology drawing T-303 depicts pedestals – are the pedestals to be included as part of the HHS-23 Technology package?
- A23. Contract HHS-23 Technology will provide the vehicle card reader pedestals in their contract.
- Q24. Technology drawing T-301 defines equipment that will be provided by the owner. The document camera is undefined. Please confirm the document camera would also be provided by the owner with the remainder of the classroom technology.
- A24. Confirmed. The contractor does not provide the document camera.
- Q25. Technology drawing T-102 defines a "box for Wi-Fi" near the bottom of vertical column line #24 – what is the intent of this "box". What is required to be provided by the HHS-23 Technology Package?
- A25. Contract HHS-23 Technology will provide the WIFI antenna enclosure.
- Q26. Technology drawing T-104 defines a "NEMA 3R Box on wall for roof" what is the intent of this "box". What is required to be provided by the HHS-23 Technology Package?
- A26. Contract HHS-23 Technology will provide the antenna enclosure on drawing T-104.
- Q27. SHEET T-305 – Access Control Diagram Detail contains information not related to this project.
- A27. Refer to revised SHEET T-305 – Access Control Diagram Detail with unrelated information deleted.

MODIFICATIONS TO SPECIFICATIONS:

1. Section 01370 – BIM Coordination, ADD the following attached documents to this Bid Package:
 - Section 01370 BIM Coordination





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- AIA Document E203-2013 Building Information Modeling and Digital Data Exhibit
 - AIA Document G202-2013 Project Building Information Modeling Protocol Form
2. Section 011100 – Summary of Work
 - a. Contract HHS-19 Mechanical and Plumbing ADD the following:
 71. This contractor shall evacuate, cut and cap all mechanical and plumbing equipment, piping, etc. scheduled to be demolished.
 - b. Contract HHS-20 Electrical and IT Infrastructure ADD the following:
 39. This contractor shall safe off, cut and cap all electrical equipment, conduits etc. scheduled to be demolished
 - c. Contract HHS-21 Fire Protection ADD the following:
 20. This contractor shall drain, evacuate, cut and cap all fire protection equipment scheduled to be demolished.
 - d. Contract HHS-25 Conveying Equipment ADD to this section.
 3. Section 004100 Bid Forms and Attachments, DELETE this section in its entirety and REPLACE with attached revised section.
 4. Section 012200 Unit Prices, DELETE this section in its entirety and REPLACE with attached revised section.
 5. Section 012300 Alternates, DELETE this section in its entirety and REPLACE with attached revised section.
 6. Section 01 9113 General Commissioning Requirements ADD this section.
 7. Section 01 9115 Exterior Enclosure Commissioning ADD this section.
 8. Section 08 7110 Hardware Sets ADD this section.
 9. Section 08 7100 Door Hardware (for Reference) ADD this section.
 10. Section 14 2010 Passenger Elevators ADD this section.
 11. Section 230900 “Instrumentation & Controls of HVAC & Plumbing Systems”;
Paragraph 1.01; Subparagraph E.
ADD: Johnson Controls FX as installed by Modern Controls as an acceptable manufacturer
 12. Section 28 1000 Access Control System REPLACE this section in its entirety with attached Section 28 1300 Access Control & Database Management System.
 - a. NOTE: Base Bid shall be any combination of approved electronic locksets (by Salto or Allegion) and approved software (by SoftwareHouse, Honeywell or S2).
 - i. The Owner recognizes that all features described in the Section 28 1300 may not be available in all combinations of locksets/software. Bidder/s shall





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provide a detailed list of differences between proposed system and features listed in Section 28 1300 at Construction Manger's descoping review.

13. Section 28 1300 Security & Database Management System ADD this section.
14. Section 28 3112-Public Safety-First Responder Radio Amplification System
 - a. REPLACE All instances of "Baltimore County" with "City of Wilmington"

MODIFICATIONS TO DRAWINGS:

1. Sheet E-112 – FLOOR PLAN – LOWER LEVEL (ANNEXES) - LIGHTING
 - a. ADD Type F1 Fixture to Elevator Machine Room, with line voltage switch for control, connected to ELGB-5.
2. Drawings G-213 through G-217, G230-231. (Access Control Door Openings) ADD to this bid package.
3. Drawings G002, G003, G-111, G112, S-001, S-101, S-102, S-113, A-010, A-101, A-102, A-104, A-107, A-108, A-109, A-113, A-114, A-116, A-124, A-458, A-459, A-530, I-001, I-112, I-114, ADD to this bid package for Conveying Equipment.
4. Drawing T-000 Symbols, Legends and Abbreviations – Telecom ADD to this bid package.
5. Drawing T-305 Detail – Telecom ADD to this bid package.
6. Drawing T-401 Risers – Telecom ADD to this bid package.

End of Addendum No. 2



Contract No. HHS-19 Mechanical and Plumbing

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

Contact Name: _____ E-Mail Address: _____

Delaware Business License No.: _____ Taxpayer ID No.: _____

(Other License Nos.): _____

(A copy of Bidder's Delaware Business License must be attached to this form.)

Phone No.: () _____ - _____ Fax No.: () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____ (\$ _____)

ALTERNATES

N/A

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

Alternate No. 1: Provide the additional cost associated with utilizing Modern Controls to install Johnson controls for the ATC system. If Modern Controls is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 2: Provide the additional cost associated with utilizing Cleaver Brooks boilers. If Cleaver Brooks is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 3: Provide lightning protection system in accordance with Division 26 specifications.

Add/Deduct _____ (\$ _____)

Alternate No. 4: Provide a fully integrated system with Salto locksets, utilizing SoftwareHouse CCure 9000 as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 5: Provide a fully integrated system with Salto locksets, utilizing Honeywell as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 6: Provide a fully integrated system with Allegion locksets, utilizing S2 as the integration software.

Add/Deduct _____ (\$ _____)

UNIT PRICES

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

Unit Price No. 1: Data Drop: Provide a Cat 6 data jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 2: Telephone Drop: Provide a Cat 6 telephone jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 3: Interior Security Camera: Provide Interior Security camera rough in. Include two runs 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 4: Exterior Security Camera: Provide Exterior Security camera rough in. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 5: Security Motion Detector: Provide Dual Technology Motion Detector complete with testing and programming. Including 100 feet of alarm cabling. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 6: Unit Price No. 6: Remove unusable spoils and import select fill backfilling operations/per cubic yard.

Unit Price No. 7: Remove unusable spoils and import clean stone fill for backfilling operations/per cubic yard.

Unit Price No. 8: Provide a unit price for trench rock Removal per cubic yard.

Unit Price No. 9: 120 volt, 20 ampere NEMA 5-20R duplex receptacle, back box, cover plate and 50 feet of 2#12 + #12GW-3/4" c.

Unit Price No. 10: Exit Sign. Provide exit sign and all associated supports, wiring and conduit.

Unit Price No. 11: Exit Light. Provide exit light and all associated supports, wiring, controls and conduit.

Unit Price No. 12: Fire alarm strobe and interlock with fire alarm system. Provide 110 cd wall mounted strobe, with cabling in surface raceway to ceiling and 50 linear feet of fire rated MC cable. Provide all programming ad testing.

Unit Price No. 13: Exterior doors (hardwired)

Unit Price No. 14: Interior rated doors (hardwired)

Unit Price No 15: Interior doors (WiFi/wireless)

NOTE: The difference in price between Add and Deduct in the above Unit Prices should not exceed fifteen percent (15%).

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for ninety (90) days the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS
Subcontractor List

Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.**

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax payer ID # or Delaware Business license #</u>
1. HVAC	_____	_____	_____
2. Plumbing	_____	_____	_____
3. Insulation	_____	_____	_____

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract No.: HHS-19 Mechanical and Plumbing have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE
(TYPED): _____

AUTHORIZED REPRESENTATIVE
(SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20__.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ of _____ in the County of _____ and State of _____ as Principal, and _____ of _____ in the County of _____ and State of _____ as Surety, legally authorized to do business in the State of Delaware ("State"), are held and firmly unto the New Castle County Vocational Technical School District in the sum of _____ Dollars (\$ _____), or percent not to exceed _____ Dollars (\$ _____) of amount of bid on Contract No. _____ to be paid to the New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical School District for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden Principal who has submitted to the New Castle County Vocational Technical School District a certain proposal to enter into this contract for the furnishing of certain material and/or services within the State, shall be awarded this Contract, and if said Principal shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the New Castle County Vocational Technical School District this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this day of _____ in the year of our Lord two thousand and _____ (20__).

SEALED, AND DELIVERED IN THE PRESENCE OF

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

Witness _____

Name of Surety

Title

CONSENT OF SURETY

DATE _____

To:

Gentlemen:

We, the _____

(Surety Company's Address)

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

(Contractor)

(Address)

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20_____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

SECTION 002113-2 - PREQUALIFICATION

Please note that all subcontractor categories do not require prequalification in order to participate in the bidding process.

Bidders for Contract HHS-19 Mechanical and Plumbing must be prequalified on both an annual and supplemental basis and have been assigned a MAXIMUM CONTRACT DOLLAR VALUE of \$3,250,000 (three million two hundred fifty thousand dollars) or greater classified as either a mechanical/plumbing trade may submit bids on this project. However, certain other conditions as they relate to Maximum Contract Dollar Value may apply.

General contractors must submit applications for annual and supplemental prequalification, for this project, by June 7, 2016. Only those listed contractors prequalified both on an annual and supplemental basis will be allowed to submit bids. Those currently prequalified on an annual basis need only submit their supplemental application.

For information on annual or supplemental prequalification procedures, or to apply for Annual Prequalification, visit the Division of Facilities Management website at <http://dfm.delaware.gov/> or call (302) 739-5644.

Upon completion of the review of the prequalification information submitted by the contractor or subcontractor, a decision will be made to either approve or deny the prequalification. All contractors or subcontractors seeking prequalification will be notified of the decision, in writing, within five days of such determination.

A copy of the Application for Contractor/Subcontractor Supplemental Prequalification follows this section. You must be prequalified under general prequalification in order for the supplemental prequalification to be valid. An applicant may submit applications for both general and supplemental prequalification at the same time (note different addresses below).

Mail completed general prequalification applications to:

Division of Facilities Management
540 S. DuPont Highway, Suite 1
Dover, DE 19901

Mail completed supplemental prequalification applications to:

EDiS Company
ATTN: Kevin Lucas
Project: Renovations to Howard High School of Technology
110 S. Poplar St., Suite 400
Wilmington, DE 19801

Any contractor or subcontractor who holds a valid prequalification classification shall report any material changes which could adversely affect the prequalification to the Department within ten days of the material change. This notification should come in the form of a letter on the contractor's or subcontractor's letterhead and be signed by an officer of the organization.

New Castle County Vocational Technical School District
Major Capital Improvement Program

Application for Contractor/Subcontractor Supplemental Prequalification

Project: Renovations to Howard High School of Technology

General Information:

Submitted by: _____

Address: _____

Principal Office Location if other than that noted above: _____

Phone Number: _____

Fax Number: _____

E-Mail Address: _____

Website Address: _____

Delaware Business License Number: _____

Federal E.I. Number: _____

Experience Modification Rating (EMR): _____

Have there been any material changes in your organization since you last submitted an application for general prequalification? (Changes would include things such as: change in organization name, leadership, claims/suits, suspensions/debarments, bankruptcy filings, change in bonding company or maximum bonding capacity)

No _____ Yes _____ (If yes, please explain in detail below)

This qualification statement must be signed by an officer/owner of the company certifying that all information provided is true and correct.

By: _____
(Printed Name)

(Title)

(Authorized Signature)

Date: _____

Contract No. HHS-20 Electrical and IT Infrastructure

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

Contact Name: _____ E-Mail Address: _____

Delaware Business License No.: _____ Taxpayer ID No.: _____

(Other License Nos.): _____

(A copy of Bidder's Delaware Business License must be attached to this form.)

Phone No.: () _____ - _____ Fax No.: () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____ (\$ _____)

ALTERNATES

N/A

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

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Add/Deduct _____ (\$ _____)

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Add/Deduct _____ (\$ _____)

Alternate No. 5: Provide a fully integrated system with Salto locksets, utilizing Honeywell as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 6: Provide a fully integrated system with Allegion locksets, utilizing S2 as the integration software.

Add/Deduct _____ (\$ _____)

UNIT PRICES

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

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Unit Price No. 2: Telephone Drop: Provide a Cat 6 telephone jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

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Unit Price No. 6: Unit Price No. 6: Remove unusable spoils and import select fill backfilling operations/per cubic yard.

Unit Price No. 7: Remove unusable spoils and import clean stone fill for backfilling operations/per cubic yard.

Unit Price No. 8: Provide a unit price for trench rock Removal per cubic yard.

Unit Price No. 9: 120 volt, 20 ampere NEMA 5-20R duplex receptacle, back box, cover plate and 50 feet of 2#12 + #12GW-3/4" c.

Unit Price No. 10: Exit Sign. Provide exit sign and all associated supports, wiring and conduit.

Unit Price No. 11: Exit Light. Provide exit light and all associated supports, wiring, controls and conduit.

Unit Price No. 12: Fire alarm strobe and interlock with fire alarm system. Provide 110 cd wall mounted strobe, with cabling in surface raceway to ceiling and 50 linear feet of fire rated MC cable. Provide all programming ad testing.

Unit Price No. 13: Exterior doors (hardwired)

Unit Price No. 14: Interior rated doors (hardwired)

Unit Price No 15: Interior doors (WiFi/wireless)

NOTE: The difference in price between Add and Deduct in the above Unit Prices should not exceed fifteen percent (15%).

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for ninety (90) days the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

Subcontractor List

Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.**

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax payer ID # or Delaware Business license #</u>
1. Electrical	_____	_____	_____
2. Fire Alarm	_____	_____	_____
3.	_____	_____	_____

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract No.: HHS-20 Electrical and IT Infrastructure have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE
(TYPED): _____

AUTHORIZED REPRESENTATIVE
(SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20__.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ of _____ in the County of _____ and State of _____ as Principal, and _____ of _____ in the County of _____ and State of _____ as Surety, legally authorized to do business in the State of Delaware ("State"), are held and firmly unto the New Castle County Vocational Technical School District in the sum of _____ Dollars (\$ _____), or percent not to exceed _____ Dollars (\$ _____) of amount of bid on Contract No. _____ to be paid to the New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical School District for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden Principal who has submitted to the New Castle County Vocational Technical School District a certain proposal to enter into this contract for the furnishing of certain material and/or services within the State, shall be awarded this Contract, and if said Principal shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the New Castle County Vocational Technical School District this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this day of _____ in the year of our Lord two thousand and _____ (20__).

SEALED, AND DELIVERED IN THE PRESENCE OF

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

Witness _____

Name of Surety

Title

CONSENT OF SURETY

DATE _____

To:

Gentlemen:

We, the _____

(Surety Company's Address)

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

(Contractor)

(Address)

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20_____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

SECTION 002113-2 - PREQUALIFICATION

Please note that all subcontractor categories do not require prequalification in order to participate in the bidding process.

Bidders for Contract HHS-20 Electrical and IT Infrastructure must be prequalified on both an annual and supplemental basis and have been assigned a MAXIMUM CONTRACT DOLLAR VALUE of \$2,500,000 (two million five hundred thousand dollars) or greater classified as either a electrical trade may submit bids on this project. However, certain other conditions as they relate to Maximum Contract Dollar Value may apply. Please see the full text of the Prequalification Regulations on our website at <http://dfm.delaware.gov/>.

General contractors must submit applications for annual and supplemental prequalification, for this project, by April 15, 2016. Only those listed contractors prequalified both on an annual and supplemental basis will be allowed to submit bids. Those currently prequalified on an annual basis need only submit their supplemental application.

For information on annual or supplemental prequalification procedures, or to apply for Annual Prequalification, visit the Division of Facilities Management website at <http://dfm.delaware.gov/> or call (302) 739-5644.

Upon completion of the review of the prequalification information submitted by the contractor or subcontractor, a decision will be made to either approve or deny the prequalification. All contractors or subcontractors seeking prequalification will be notified of the decision, in writing, within five days of such determination. Notice of the determination of this supplemental prequalification shall be made by no less than 14 calendar days before the close of the project bid. Any contractor or subcontractor denied supplemental prequalification may request, in writing, a review of such decision with the Superintendent. This request must occur within five working days of the contractor's or subcontractor's receipt of the notice of denial.

A copy of the Application for Contractor/Subcontractor Supplemental Prequalification follows this section. You must be prequalified under general prequalification in order for the supplemental prequalification to be valid. An applicant may submit applications for both general and supplemental prequalification at the same time (note different addresses below).

Mail completed general prequalification applications to:

Division of Facilities Management
540 S. DuPont Highway, Suite 1
Dover, DE 19901

Mail completed supplemental prequalification applications to:

EDiS Company
ATTN: Kevin Lucas
Project: Renovations to Howard High School of Technology
110 S. Poplar St., Suite 400
Wilmington, DE 19801

Any contractor or subcontractor who holds a valid prequalification classification shall report any material changes which could adversely affect the prequalification to the Department within ten days of the material change. This notification should come in the form of a letter on the contractor's or subcontractor's letterhead and be signed by an officer of the organization.

New Castle County Vocational Technical School District
Major Capital Improvement Program

Application for Contractor/Subcontractor Supplemental Prequalification

Project: Renovations to Howard High School of Technology

General Information:

Submitted by: _____

Address: _____

Principal Office Location if other than that noted above: _____

Phone Number: _____

Fax Number: _____

E-Mail Address: _____

Website Address: _____

Delaware Business License Number: _____

Federal E.I. Number: _____

Experience Modification Rating (EMR): _____

Have there been any material changes in your organization since you last submitted an application for general prequalification? (Changes would include things such as: change in organization name, leadership, claims/suits, suspensions/debarments, bankruptcy filings, change in bonding company or maximum bonding capacity)

No _____ Yes _____ (If yes, please explain in detail below)

This qualification statement must be signed by an officer/owner of the company certifying that all information provided is true and correct.

By: _____
(Printed Name)

(Title)

(Authorized Signature)

Date: _____

Contract No. HHS-21 Fire Protection

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

Contact Name: _____ E-Mail Address: _____

Delaware Business License No.: _____ Taxpayer ID No.: _____

(Other License Nos.): _____

(A copy of Bidder's Delaware Business License must be attached to this form.)

Phone No.: () _____ - _____ Fax No.: () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____ (\$ _____)

ALTERNATES

N/A

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

Alternate No. 1: Provide the additional cost associated with utilizing Modern Controls to install Johnson controls for the ATC system. If Modern Controls is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 2: Provide the additional cost associated with utilizing Cleaver Brooks boilers. If Cleaver Brooks is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 3: Provide lightning protection system in accordance with Division 26 specifications.

Add/Deduct _____ (\$ _____)

Alternate No. 4: Provide a fully integrated system with Salto locksets, utilizing SoftwareHouse CCure 9000 as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 5: Provide a fully integrated system with Salto locksets, utilizing Honeywell as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 6: Provide a fully integrated system with Allegion locksets, utilizing S2 as the integration software.

Add/Deduct _____ (\$ _____)

UNIT PRICES

N/A
Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

Unit Price No. 1: Data Drop: Provide a Cat 6 data jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 2: Telephone Drop: Provide a Cat 6 telephone jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 3: Interior Security Camera: Provide Interior Security camera rough in. Include two runs 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 4: Exterior Security Camera: Provide Exterior Security camera rough in. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 5: Security Motion Detector: Provide Dual Technology Motion Detector complete with testing and programming. Including 100 feet of alarm cabling. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 6: Unit Price No. 6: Remove unusable spoils and import select fill backfilling operations/per cubic yard.

Unit Price No. 7: Remove unusable spoils and import clean stone fill for backfilling operations/per cubic yard.

Unit Price No. 8: Provide a unit price for trench rock Removal per cubic yard.

Unit Price No. 9: 120 volt, 20 ampere NEMA 5-20R duplex receptacle, back box, cover plate and 50 feet of 2#12 + #12GW-3/4" c.

Unit Price No. 10: Exit Sign. Provide exit sign and all associated supports, wiring and conduit.

Unit Price No. 11: Exit Light. Provide exit light and all associated supports, wiring, controls and conduit.

Unit Price No. 12: Fire alarm strobe and interlock with fire alarm system. Provide 110 cd wall mounted strobe, with cabling in surface raceway to ceiling and 50 linear feet of fire rated MC cable. Provide all programming and testing.

Unit Price No. 13: Exterior doors (hardwired)

Unit Price No. 14: Interior rated doors (hardwired)

Unit Price No 15: Interior doors (WiFi/wireless)

NOTE: The difference in price between Add and Deduct in the above Unit Prices should not exceed fifteen percent (15%).

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for ninety (90) days the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

- Subcontractor List
- Non-Collusion Statement

Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.**

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax payer ID # or Delaware Business license #</u>
1. Sprinkler	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract No.: HHS-21 Fire Protection have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE
(TYPED): _____

AUTHORIZED REPRESENTATIVE
(SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20__.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ of _____ in the County of _____ and State of _____ as Principal, and _____ of _____ in the County of _____ and State of _____ as Surety, legally authorized to do business in the State of Delaware ("State"), are held and firmly unto the New Castle County Vocational Technical School District in the sum of _____ Dollars (\$ _____), or percent not to exceed _____ Dollars (\$ _____) of amount of bid on Contract No. _____ to be paid to the New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical School District for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden Principal who has submitted to the New Castle County Vocational Technical School District a certain proposal to enter into this contract for the furnishing of certain material and/or services within the State, shall be awarded this Contract, and if said Principal shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the New Castle County Vocational Technical School District this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this day of _____ in the year of our Lord two thousand and _____ (20__).

SEALED, AND DELIVERED IN THE PRESENCE OF

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

Witness _____

Name of Surety

Title

CONSENT OF SURETY

DATE _____

To:

Gentlemen:

We, the _____

(Surety Company's Address)

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

(Contractor)

(Address)

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20_____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

Contract No. HHS-22 Testing, Adjusting and Balancing

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

Contact Name: _____ E-Mail Address: _____

Delaware Business License No.: _____ Taxpayer ID No.: _____

(Other License Nos.): _____

(A copy of Bidder's Delaware Business License must be attached to this form.)

Phone No.: () _____ - _____ Fax No.: () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____ (\$ _____)

ALTERNATES

N/A
Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

Alternate No. 1: Provide the additional cost associated with utilizing Modern Controls to install Johnson controls for the ATC system. If Modern Controls is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 2: Provide the additional cost associated with utilizing Cleaver Brooks boilers. If Cleaver Brooks is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 3: Provide lightning protection system in accordance with Division 26 specifications.

Add/Deduct _____ (\$ _____)

Alternate No. 4: Provide a fully integrated system with Salto locksets, utilizing SoftwareHouse CCure 9000 as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 5: Provide a fully integrated system with Salto locksets, utilizing Honeywell as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 6: Provide a fully integrated system with Allegion locksets, utilizing S2 as the integration software.

Add/Deduct _____ (\$ _____)

UNIT PRICES

N/A

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

Unit Price No. 1: Data Drop: Provide a Cat 6 data jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 2: Telephone Drop: Provide a Cat 6 telephone jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 3: Interior Security Camera: Provide Interior Security camera rough in. Include two runs 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and

terminations.

Unit Price No. 4: Exterior Security Camera: Provide Exterior Security camera rough in. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 5: Security Motion Detector: Provide Dual Technology Motion Detector complete with testing and programming. Including 100 feet of alarm cabling. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 6: Unit Price No. 6: Remove unusable spoils and import select fill backfilling operations/per cubic yard.

Unit Price No. 7: Remove unusable spoils and import clean stone fill for backfilling operations/per cubic yard.

Unit Price No. 8: Provide a unit price for trench rock Removal per cubic yard.

Unit Price No. 9: 120 volt, 20 ampere NEMA 5-20R duplex receptacle, back box, cover plate and 50 feet of 2#12 + #12GW-3/4" c.

Unit Price No. 10: Exit Sign. Provide exit sign and all associated supports, wiring and conduit.

Unit Price No. 11: Exit Light. Provide exit light and all associated supports, wiring, controls and conduit.

Unit Price No. 12: Fire alarm strobe and interlock with fire alarm system. Provide 110 cd wall mounted strobe, with cabling in surface raceway to ceiling and 50 linear feet of fire rated MC cable. Provide all programming and testing.

Unit Price No. 13: Exterior doors (hardwired)

Unit Price No. 14: Interior rated doors (hardwired)

Unit Price No 15: Interior doors (WiFi/wireless) _____

NOTE: The difference in price between Add and Deduct in the above Unit Prices should not exceed fifteen percent (15%).

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for ninety (90) days the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)

Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.**

<u>Subcontractor</u> <u>Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax payer ID #</u> <u>or Delaware Business license #</u>
1. TAB Contractor	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract No.: HHS-22 Testing, Adjusting and Balancing have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE
(TYPED): _____

AUTHORIZED REPRESENTATIVE
(SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20__.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ of _____ in the County of _____ and State of _____ as Principal, and _____ of _____ in the County of _____ and State of _____ as Surety, legally authorized to do business in the State of Delaware ("State"), are held and firmly unto the New Castle County Vocational Technical School District in the sum of _____ Dollars (\$ _____), or percent not to exceed _____ Dollars (\$ _____) of amount of bid on Contract No. _____ to be paid to the New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical School District for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden Principal who has submitted to the New Castle County Vocational Technical School District a certain proposal to enter into this contract for the furnishing of certain material and/or services within the State, shall be awarded this Contract, and if said Principal shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the New Castle County Vocational Technical School District this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this day of _____ in the year of our Lord two thousand and _____ (20__).

SEALED, AND DELIVERED IN THE PRESENCE OF

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

Witness _____

Name of Surety

Title

CONSENT OF SURETY

DATE _____

To:

Gentlemen:

We, the _____

(Surety Company's Address)

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

(Contractor)

(Address)

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20_____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

Contract No. HHS-23 Technology

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

Contact Name: _____ E-Mail Address: _____

Delaware Business License No.: _____ Taxpayer ID No.: _____

(Other License Nos.): _____

(A copy of Bidder's Delaware Business License must be attached to this form.)

Phone No.: () _____ - _____ Fax No.: () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____ (\$ _____)

ALTERNATES

N/A
Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

Alternate No. 1: Provide the additional cost associated with utilizing Modern Controls to install Johnson controls for the ATC system. If Modern Controls is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 2: Provide the additional cost associated with utilizing Cleaver Brooks boilers. If Cleaver Brooks is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 3: Provide lightning protection system in accordance with Division 26 specifications.

Add/Deduct _____ (\$ _____)

Alternate No. 4: Provide a fully integrated system with Salto locksets, utilizing SoftwareHouse CCure 9000 as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 5: Provide a fully integrated system with Salto locksets, utilizing Honeywell as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 6: Provide a fully integrated system with Allegion locksets, utilizing S2 as the integration software.

Add/Deduct _____ (\$ _____)

UNIT PRICES

Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

Unit Price No. 1: Data Drop: Provide a Cat 6 data jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 2: Telephone Drop: Provide a Cat 6 telephone jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 3: Interior Security Camera: Provide Interior Security camera rough in. Include two runs 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 4: Exterior Security Camera: Provide Exterior

Security camera rough in. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 5: Security Motion Detector: Provide Dual Technology Motion Detector complete with testing and programming. Including 100 feet of alarm cabling. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 6: Remove unusable spoils and import select fill backfilling operations/per cubic yard.

Unit Price No. 7: Remove unusable spoils and import clean stone fill for backfilling operations/per cubic yard.

Unit Price No. 8: Provide a unit price for trench rock Removal per cubic yard.

Unit Price No. 9: 120 volt, 20 ampere NEMA 5-20R duplex receptacle, back box, cover plate and 50 feet of 2#12 + #12GW-3/4" c.

Unit Price No. 10: Exit Sign. Provide exit sign and all associated supports, wiring and conduit.

Unit Price No. 11: Exit Light. Provide exit light and all associated supports, wiring, controls and conduit.

Unit Price No. 12: Fire alarm strobe and interlock with fire alarm system. Provide 110 cd wall mounted strobe, with cabling in surface raceway to ceiling and 50 linear feet of fire rated MC cable. Provide all programming and testing.

Unit Price No. 13: Exterior doors (hardwired)

Unit Price No. 14: Interior rated doors (hardwired)

Unit Price No. 15: Interior doors (WiFi/wireless)

NOTE: The difference in price between Add and Deduct in the above Unit Prices should not exceed fifteen percent (15%).

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for ninety (90) days the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

- Subcontractor List
- Non-Collusion Statement

Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.**

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax payer ID # or Delaware Business license #</u>
1. Voice, Data, Video System:	_____	_____	_____
2. Integrated Telecom System:	_____	_____	_____
3. Access Controls:	_____	_____	_____
4. Intrusion Detection:	_____	_____	_____
5. Video Security Surveillance:	_____	_____	_____

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract No.: HHS-23 Technology have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE
(TYPED): _____

AUTHORIZED REPRESENTATIVE
(SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20__.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ of _____ in the County of _____ and State of _____ as Principal, and _____ of _____ in the County of _____ and State of _____ as Surety, legally authorized to do business in the State of Delaware ("State"), are held and firmly unto the New Castle County Vocational Technical School District in the sum of _____ Dollars (\$ _____), or percent not to exceed _____ Dollars (\$ _____) of amount of bid on Contract No. _____ to be paid to the New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical School District for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden Principal who has submitted to the New Castle County Vocational Technical School District a certain proposal to enter into this contract for the furnishing of certain material and/or services within the State, shall be awarded this Contract, and if said Principal shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the New Castle County Vocational Technical School District this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this day of _____ in the year of our Lord two thousand and _____ (20__).

SEALED, AND DELIVERED IN THE PRESENCE OF

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

Witness _____

Name of Surety

Title

CONSENT OF SURETY

DATE _____

To:

Gentlemen:

We, the _____

(Surety Company's Address)

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

(Contractor)

(Address)

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20_____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

Contract No. HHS-24 Automatic Temperature Controls

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

Contact Name: _____ E-Mail Address: _____

Delaware Business License No.: _____ Taxpayer ID No.: _____

(Other License Nos.): _____

(A copy of Bidder's Delaware Business License must be attached to this form.)

Phone No.: () _____ - _____ Fax No.: () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____ (\$ _____)

ALTERNATES

N/A

Alternate prices conform to applicable project specification section. Refer to specifications for a complete description of the following Alternates. An "ADD" or "DEDUCT" amount is indicated by the crossed out part that does not apply.

Alternate No. 1: Provide the additional cost associated with utilizing Modern Controls to install Johnson controls for the ATC system. If Modern Controls is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 2: Provide the additional cost associated with utilizing Cleaver Brooks boilers. If Cleaver Brooks is the apparent low bidder than the alternate value shall be \$0.

Add/Deduct _____ (\$ _____)

Alternate No. 3: Provide lightning protection system in accordance with Division 26 specifications.

Add/Deduct _____ (\$ _____)

Alternate No. 4: Provide a fully integrated system with Salto locksets, utilizing SoftwareHouse CCure 9000 as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 5: Provide a fully integrated system with Salto locksets, utilizing Honeywell as the integration software

Add/Deduct _____ (\$ _____)

Alternate No. 6: Provide a fully integrated system with Allegion locksets, utilizing S2 as the integration software.

Add/Deduct _____ (\$ _____)

UNIT PRICES

N/A
Unit prices conform to applicable project specification section. Refer to the specifications for a complete description of the following Unit Prices:

Unit Price No. 1: Data Drop: Provide a Cat 6 data jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 2: Telephone Drop: Provide a Cat 6 telephone jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 3: Interior Security Camera: Provide Interior Security camera rough in. Include two runs 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 4: Exterior Security Camera: Provide Exterior Security camera rough in. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 5: Security Motion Detector: Provide Dual Technology Motion Detector complete with testing and programming. Including 100 feet of alarm cabling. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.

Unit Price No. 6: Unit Price No. 6: Remove unusable spoils and import select fill backfilling operations/per cubic yard.

Unit Price No. 7: Remove unusable spoils and import clean stone fill for backfilling operations/per cubic yard.

Unit Price No. 8: Provide a unit price for trench rock Removal per cubic yard.

Unit Price No. 9: 120 volt, 20 ampere NEMA 5-20R duplex receptacle, back box, cover plate and 50 feet of 2#12 + #12GW-3/4" c.

Unit Price No. 10: Exit Sign. Provide exit sign and all associated supports, wiring and conduit.

Unit Price No. 11: Exit Light. Provide exit light and all associated supports, wiring, controls and conduit.

Unit Price No. 12: Fire alarm strobe and interlock with fire alarm system. Provide 110 cd wall mounted strobe, with cabling in surface raceway to ceiling and 50 linear feet of fire rated MC cable. Provide all programming and testing.

Unit Price No. 13: Exterior doors (hardwired)

Unit Price No. 14: Interior rated doors (hardwired)

Unit Price No 15: Interior doors (WiFi/wireless)

NOTE: The difference in price between Add and Deduct in the above Unit Prices should not exceed fifteen percent (15%).

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for ninety (90) days the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

- Subcontractor List
- Non-Collusion Statement
- Bid Bond
- Consent of Surety
- Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
- Delaware Business License
- (Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.**

<u>Subcontractor</u> <u>Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax payer ID #</u> <u>or Delaware Business license #</u>
1. ATC Contractor	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract No.: HHS-24 Automatic Temperature Controls have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE
(TYPED): _____

AUTHORIZED REPRESENTATIVE
(SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20__.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ of _____ in the County of _____ and State of _____ as Principal, and _____ of _____ in the County of _____ and State of _____ as Surety, legally authorized to do business in the State of Delaware ("State"), are held and firmly unto the New Castle County Vocational Technical School District in the sum of _____ Dollars (\$_____), or percent not to exceed _____ Dollars (\$_____) of amount of bid on Contract No. _____ to be paid to the New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical School District for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden Principal who has submitted to the New Castle County Vocational Technical School District a certain proposal to enter into this contract for the furnishing of certain material and/or services within the State, shall be awarded this Contract, and if said Principal shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the New Castle County Vocational Technical School District this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this day of _____ in the year of our Lord two thousand and _____ (20__).

SEALED, AND DELIVERED IN THE PRESENCE OF

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

Witness _____

Name of Surety

Title

CONSENT OF SURETY

DATE _____

To:

Gentlemen:

We, the _____

(Surety Company's Address)

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

(Contractor)

(Address)

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20_____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

Contract No. HHS-25 Conveying Equipment

BID FORM

For Bids Due: _____

To: NCC Vocational Technical School District
1417 Newport Road
Wilmington, DE 19804

Name of Bidder: _____

Bidder Address: _____

Contact Name: _____ E-Mail Address: _____

Delaware Business License No.: _____ Taxpayer ID No.: _____

(Other License Nos.): _____

(A copy of Bidder's Delaware Business License must be attached to this form.)

Phone No.: () _____ - _____ Fax No.: () _____ - _____

The undersigned, representing that he has read and understands the Bidding Documents and that this bid is made in accordance therewith, that he has visited the site and has familiarized himself with the local conditions under which the Work is to be performed, and that his bid is based upon the materials, systems and equipment described in the Bidding Documents without exception, hereby proposes and agrees to provide all labor, materials, plant, equipment, supplies, transport and other facilities required to execute the work described by the aforesaid documents for the lump sum itemized below:

\$ _____ (\$ _____)

ALTERNATES

N/A

UNIT PRICES

N/A

NOTE: The difference in price between Add and Deduct in the above Unit Prices should not exceed fifteen percent (10%).

I/We acknowledge Addendums numbered _____ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for ninety (90) days the date of opening of bids, and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid (if required).

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By _____ Trading as _____
(Individual's / General Partner's / Corporate Name)

(State of Corporation)

Business Address: _____

Witness: _____ By: _____
(SEAL) (Authorized Signature)

(Title)
Date: _____

ATTACHMENTS

Subcontractor List
Non-Collusion Statement
Bid Bond
Consent of Surety
Affidavit of Employee Drug Testing Program (1 per contractor/subcontractor)
Delaware Business License
(Others as Required by Project Manuals)

SUBCONTRACTOR LIST

In accordance with Title 29, Chapter 6962 (d)(10)b Delaware Code, the following sub-contractor listing must accompany the bid submittal. The name and address of the sub-contractor must be listed for each category where the bidder intends to use a sub-contractor to perform that category of work. In order to provide full disclosure and acceptance of the bid by the Owner, **it is required that bidders list themselves as being the sub-contractor for all categories where he/she is qualified and intends to perform such work.**

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City & State)</u>	<u>Subcontractors tax payer ID # or Delaware Business license #</u>
1. Elevator	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____

NON-COLLUSION STATEMENT

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date _____.

All the terms and conditions of Contract No.: HHS-25 Conveying Equipment have been thoroughly examined and are understood.

NAME OF BIDDER: _____

AUTHORIZED REPRESENTATIVE
(TYPED): _____

AUTHORIZED REPRESENTATIVE
(SIGNATURE): _____

TITLE: _____

ADDRESS OF BIDDER: _____

PHONE NUMBER: _____

Sworn to and Subscribed before me this _____ day of _____ 20__.

My Commission expires _____. NOTARY PUBLIC _____.

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____ of _____ in the County of _____ and State of _____ as Principal, and _____ of _____ in the County of _____ and State of _____ as Surety, legally authorized to do business in the State of Delaware ("State"), are held and firmly unto the New Castle County Vocational Technical School District in the sum of _____ Dollars (\$ _____), or percent not to exceed _____ Dollars (\$ _____) of amount of bid on Contract No. _____ to be paid to the New Castle County Vocational Technical School District for the use and benefit of the New Castle County Vocational Technical School District for which payment well and truly to be made, we do bind ourselves, our and each of our heirs, executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden Principal who has submitted to the New Castle County Vocational Technical School District a certain proposal to enter into this contract for the furnishing of certain material and/or services within the State, shall be awarded this Contract, and if said Principal shall well and truly enter into and execute this Contract as may be required by the terms of this Contract and approved by the New Castle County Vocational Technical School District this Contract to be entered into within twenty days after the date of official notice of the award thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and remain in full force and virtue.

Sealed with _____ seal and dated this day of _____ in the year of our Lord two thousand and _____ (20__).

SEALED, AND DELIVERED IN THE PRESENCE OF

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

Witness _____

Name of Surety

Title

CONSENT OF SURETY

DATE _____

To:

Gentlemen:

We, the _____

(Surety Company's Address)

a Surety Company authorized to do business in the State of Delaware hereby agrees that if

(Contractor)

(Address)

is awarded the Contract No. _____

We will write the required Performance and/or Labor and Material Bond required by Paragraph 9 of the Instructions to Bidders.

(Surety Company)

By _____
(Attorney-in-Fact)

AFFIDAVIT
OF
EMPLOYEE DRUG TESTING PROGRAM

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite that complies with this regulation:

Contractor/Subcontractor Name: _____

Contractor/Subcontractor Address: _____

Authorized Representative (typed or printed): _____

Authorized Representative (signature): _____

Title: _____

Sworn to and Subscribed before me this _____ day of _____ 20_____.

My Commission expires _____ . NOTARY PUBLIC _____ .

THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.

END OF SECTION

CONTRACT NO. HHS – 25 – CONVEYING EQUIPMENT

A. Work included in this contract consists of, but is not necessarily limited to, all labor, materials and equipment for:

- Technical Specification Sections:

Division 0	Bidding and Contract Requirements
Division 1	General Requirements
Division 2	Existing Conditions
Section 01 9113	General Commissioning Requirements
Section 01 9115	Exterior Enclosure Commissioning
Section 14 2010	Passenger Elevators

This contract also includes, but is not necessarily limited to, all labor, materials and equipment for the following:

1. Provide all elevators, cabs, hoistway doors complete.
2. This Contractor shall cooperate with the Construction Manager in laying out the core dimensions and sill elevations.
3. The elevator installation to be phased: Phase I will provide all elevators. Phase I installation must be limited to the lower level of the main building and the annex. Phase II will include installation of elevator at main building. This work will start June 2017.
4. Grouting of all elevator sill angles will be the responsibility of the Concrete Contractor.
5. This Contractor to furnish and install all rough wiring necessary for the installation of emergency telephones. All communication devices will be furnished and installed by the Owner.
6. Electric service and disconnect switch for the elevators are the responsibility of the Electrical Contractor. All other control wiring, as specified, will be the responsibility of this Contractor.
7. Provide temporary protection and railings at hoist ways after installation has started.
8. Provide central control panel as required.
9. Grouting of all elevator sill angles will be the responsibility of the Concrete Contractor.
10. This Contractor to furnish and install all rough wiring necessary for the installation of emergency telephones. All communication devices will be furnished and installed by the Owner.

11. Electric service and disconnect switch for the elevator are the responsibility of the Electrical Contractor. All other control wiring as specified, will be the responsibility of this Contractor.
12. This Contractor to submit for approval layout and excavation information for the elevator jack holes. The Construction Manager will supply all necessary bench marks.
13. This Contractor will be responsible for dewatering in order to complete installation of the jackholes.
14. This Contractor will be responsible for drilling the jackholes through unclassified material. Excavated material shall be disposed of by this Contractor.
15. Include the cost and warranty to allow temporary use of the elevators for four (4) months during the construction, operator to be included.
16. Provide jack hole sleeve where indicated on the drawing.
17. This contractor shall furnish and install all elevators for Phase I and Phase II of this project.
18. The work will be phased from June of 2016 to July of 2017; include any cost associated with this Phasing in your base bid.
19. This contractor shall include all permit applications, fees and inspection required by the City of Wilmington and the Fire marshal's office.
20. Coordination with the contractors for the elevator shafts is required.
21. This contractor will include a \$25,000 allowance for additional work to be directed by the Construction manager.

SECTION 012200 - UNIT PRICES

1. GENERAL PROVISIONS

- A. The general provision of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.
- B. Refer to provisions in AIA Document A232 – 2009 EDITION, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, CONSTRUCTION MANAGER AS ADVISOR EDITION, for requirements in addition to those specified in Division 1.
- C. For work being constructed under separate prime contract, provisions of this Section apply to each contract being bid.

2. BASE BID

- A. The Base Bid shall consist of all work shown or specified in the Contract Documents, exclusive of any Additive Unit Prices specified herein.
- B. The Base Bid shall include all work in any Subtractive Unit Prices specified herein.

3. UNIT PRICES

- A. State in the Bid Form the amount to be added to (or subtracted from) the Base Bid per unit of measurement for each Unit Price specified. State this amount to include all overhead and profit. No surcharge in addition to the Unit Price listed will be permitted.
- B. See Section 002113, INSTRUCTIONS TO BIDDERS for related information.
- C. For description of Unit Prices requested, refer to the specification. The method of stating the Unit Prices is described in the Bid Form.
- D. Where both add and deduct unit prices are requested, there shall not be more that a 10% variation between the two.

4. APPLICATION OF UNIT PRICES

- A. Unit prices stated in the Bid Form will apply from the time the Bid is submitted until Contract completion.

5. MEASUREMENT OF QUANTITIES

- A. Quantities shall be determined by field measurement by contractor personnel and as verified by the Construction Manager.
- B. At the Contractor's option, and at his expense, measurement may be made by a

registered surveyor.

6. LIST AND DESCRIPTION OF UNIT PRICES

- A. Unit Price No. 1: Data Drop: Provide a Cat 6 data jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.
- B. Unit Price No. 2: Telephone Drop: Provide a Cat 6 telephone jack complete with testing and termination. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.
- C. Unit Price No. 3: Interior Security Camera: Provide Interior Security camera rough in. Include two runs 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.
- D. Unit Price No. 4: Exterior Security Camera: Provide Exterior Security camera rough in. Include 300 feet of Cat 6 plenum cable. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.
- E. Unit Price No. 5: Security Motion Detector: Provide Dual Technology Motion Detector complete with testing and programming. Including 100 feet of alarm cabling. Complete with outlet, coverplate, backbox, conduit installed concealed, labeling, testing and terminations.
- F. Unit Price No. 6: Remove unusable spoils and import select fill backfilling operations/per cubic yard.
- G. Unit Price No. 7: Remove unusable spoils and import clean stone fill for backfilling operations/per cubic yard.
- H. Unit Price No. 8: Provide a unit price for trench rock removal/per cubic yard.
- I. **Unit Price No. 9: 120 volt, 20 ampere NEMA 5-20R duplex receptacle, back box, cover plate and 50 feet of 2#12 + #12GW-3/4" c.**
- J. **Unit Price No. 10: Exit Sign. Provide exit sign and all associated supports, wiring and conduit.**
- K. **Unit Price No. 11: Exit Light. Provide exit light and all associated supports, wiring, controls and conduit.**
- L. **Unit Price No. 12: Fire alarm strobe and interlock with fire alarm system. Provide 110 cd wall mounted strobe, with cabling in surface raceway to ceiling and 50 linear feet of fire rated MC cable. Provide all programming ad testing.**
- M. **Unit Price No. 14: Exterior doors (hardwired)**

N. Unit Price No. 13: Interior rated doors (hardwired)

O. Unit Price No 14: Interior doors (WiFi/wireless)

END OF SECTION

SECTION 012300 - ALTERNATES

1. GENERAL PROVISIONS

A. The general provisions of the Contract, including the Conditions of the Contract (General, Supplementary and other conditions, if any) and Division 1 as appropriate, apply to the Work specified in this Section.

B. Refer to provisions in AIA Document A232 – 2009 Edition, GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, CONSTRUCTION MANAGER AS ADVISOR EDITION, for requirements in addition to those specified in Division 1.

C. For work being constructed under separate prime contracts, provisions of this Section apply to each contract being bid.

2. BASE BID

A. The Base Bid shall consist of all work shown or specified in the Contract Documents, exclusive of any Additive Alternates specified herein.

B. The Base Bid shall include all work in any Subtractive Alternates specified herein.

3. ALTERNATES

A. State in the Bid Form the amount to be added to the Base Bid for each Alternate specified.

B. See Section 002113 - INSTRUCTIONS TO BIDDERS for related information.

C. The description of Alternates contained herein is in summary form. Detailed requirements for materials and execution shall be as specified in other sections and as shown on drawings.

Alternate No 1: Provide the additional cost associated with utilizing Modern Controls to install Johnson controls for the ATC system. If Modern Controls is the apparent low bidder than the alternate value shall be \$0.

Alternate No 2: Provide the additional cost associated with utilizing Cleaver Brooks boilers. If Cleaver Brooks is the apparent low bidder than the alternate value shall be \$0.

Alternate No. 3: Provide lightning protection system in accordance with Division 26 specifications.

Alternate No. 4: Provide a fully integrated system with Salto locksets, utilizing

SoftwareHouse CCure 9000 as the integration software

Alternate No. 5: Provide a fully integrated system with Salto locksets, utilizing Honeywell as the integration software

Alternate No. 6: Provide a fully integrated system with Allegion locksets, utilizing S2 as the integration software.

END OF SECTION

SECTION 01370
BIM COORDINATION
Modified by Chris Donahue 5/16/2015

1. DEFINITIONS

- 1.1. **Base Structural Model** – the structural steel mill order drawing file showing all structural elements. This model is not necessarily fully detailed with all connections.
- 1.2. **Base Architectural Model** – a combination of the Base Structural Model and key architectural elements. This model is to be used by all coordination participants as the background file in which to develop their work. No information within this model will be changed through the coordination process. It is for reference only.
- 1.3. **Base Composite Model** – this model includes all trade drawing files within the Base Architectural Model as a representation of the completed systems. This model is used to run the intermediate clash reports and is considered a work in progress.
- 1.4. **Final Coordination Model** – this model shows all trades’ systems fully coordinated within the Base Architectural Model. All clashes have been resolved. No further coordination is required. The work shown within this model represents the upcoming installations of each system.
- 1.5. **Completed Coordination Model** – this model is the close-out submittal to the Owner and includes the information within the Final Coordination Model as well as any project updates that have taken place during installations such as RFI responses, as-built conditions, etc.
- 1.6. **Building Information Model** - A Building Information Model(s) is a digital representation of the physical and functional characteristics of the Project and is referred to in this document as the “Model(s),” which term may be used herein to describe a Model Element, a single Model or multiple Models used in the aggregate. “Building Information Modeling” means the process and technology used to create the Model.
- 1.7. **Level of Development** - The Level(s) of Development (LOD) describes the level of completeness to which a Model Element is developed.
- 1.8. **Model Element** - A Model Element is a portion of the Building Information Model representing a component, system or assembly within a building or building site. Model Elements are represented by the Construction Specifications Institute (CSI) UniFormat™ classification system in the Model Element Table in Exhibit 1 - Article 3.
- 1.9. **Model Element Author** - The Model Element Author is the party responsible for developing the content of a specific Model Element to the LOD required for a particular phase of the Project. Model Element Authors are identified in the Model Element Table in Exhibit 1 - Article 3.
- 1.10. **Model User** - The Model User refers to any individual or entity authorized to use the Model on the Project for analysis, estimating, or scheduling.

2. COORDINATION DRAWING PROCESS – GENERAL REQUIREMENTS.

- 2.1. The coordination model shall be derived from the design base composite model which shall be in a (Program File Format – Ex: Revit 2014) format and utilized by all coordination participants. The A/E is to provide this base composite model as needed at each plan deliverable for coordination efforts. This

model will be utilized to establish field installation sequence, resolve trade coordination issues prior to installation, and to make the most efficient use of installation space without sacrificing system performance for mechanical, electrical, structural and architectural systems. (Program File Format – Ex: NAVISWORKS or IFC) design review software will be used to document, identify and resolve interferences between all trades.

- 2.2. Communication is a critical element to the success of this coordination process. All project team members must be in constant communication to keep the process moving forward according to the sign-off schedule (5.1). Constant collaboration is expected of all team participants and each participant should be proactive in identifying and resolving design, engineering, and model interferences.
- 2.3. EDiS Company will facilitate and lead the 3D coordination modeling process. It is the responsibility of all coordination participants to resolve discrepancies pertaining to their own model. All trades shall be responsible for collisions/clashes/coordination issues involving their respective trade(s) and proposed work. Coordinated work takes precedence over field routed systems.
- 2.4. Coordination meetings will occur weekly starting TBD. Selected coordination team members are required to generate a clash-free model inclusive of all systems. The following participants are required to attend the weekly coordination meetings:

Bid Package A:

Contract HHS-05	Structural and Miscellaneous Steel
Contract HHS-07	Metal Framing, Drywall, Plaster
Contract HHS-08	Acoustical Ceilings and Panels
Contract HHS-17	Conveying Equipment

Bid Package B:

Contract HHS-19	Mechanical & Plumbing
Contract HHS-20	Electrical and IT Infrastructure
Contract HHS-21	Fire Protection
Contract HHS-22	Testing, Adjusting and Balancing
Contract HHS-23	Technology
Contract HHS-24	ATC

- 2.5. A mandatory coordination kick-off meeting for all participants will review; team collaboration, the execution process, the coordination schedule, establishing zones per system, use of the coordinated elements during construction, project specific information and requirements, and model/document standards.
- 2.6. DELETE
- 2.7. Section 5 of this document will provide the coordination schedule per level/zone.
- 2.8. Coordination meetings will be held at Virtual Goto Meeting to review the model's progress per the schedule and process indicated.
- 2.9. Utility corridors and above ceiling space for each trade, will be established by the group at the beginning of the process. These zones will be adjusted through the coordination process to meet installation requirements and feasibility.
- 2.10. All participants are required to identify the submittals required for accurate detailing of the coordination model (such as equipment, light fixtures, etc.) and to obtain final approval so the information can be incorporated into the modeling process.

- 2.11. The 3D coordination modeling process does not replace the standard submittal process and will not be considered as a submittal. Exceptions: N/A
- 2.12. The coordination meeting:
 - 2.12.1. The purpose is to review and resolve items on the current clash report in conjunction with the project coordination schedule. The meetings will focus on clashes that cannot be resolved by internal collaboration. EDiS Company will facilitate the meeting and will make final decisions on clash resolution that are the least impact to the project as a whole. COORDINATION MEETINGS WILL NOT BE USED TO RESOLVE INDIVIDUAL MODELER'S/ENGINEER'S/ARCHITECTURE'S/SUBCONTRACTOR'S WORK. If a Subcontractor does not post a clash-free system of its own work or that only contains a very limited number of clashes internally (Example: Fire Sprinkler Clashing with Fire Sprinkler), that Subcontractor will be considered unprepared for the meeting and will be responsible for any delays to the project schedule and any associated costs due to that delay which shall be determined by EDiS Company.
 - 2.12.2. Each team participant will review the clash report prior to the subsequent coordination meeting in order to clean up any clashes that can be made without review by all participants.
 - 2.12.3. All project participants are expected to be prepared for the meeting with new drawing work of the next area to be coordinated per the coordination schedule and any drawing changes based on the published clash report. Each participant will have available any shop model, submittals or other materials required to solve identified or potential conflicts.
 - 2.12.4. The coordination schedule will be maintained and all identified conflicts addressed and resolved per the construction schedule. The coordination schedule may change as a result of design and/or model changes requested and made by the Owner, Architect or Engineer. In addition, the coordination schedule assumes selection of equipment is made within the time frame of the construction schedule as needed so it is incorporated into the coordination efforts without delay.
 - 2.12.5. All agreed upon corrections to identified clashes determined by the team at the Coordination Meeting are to be updated and resolved prior to the next meeting.
- 2.13. When an area of the model is fully coordinated and clash-free, each participant agrees:
 - 2.13.1. That each trades work is fully coordinated and will be installed per the signed off area as reflected in the coordination model. Sign off drawings from each trade are turned over in PDF form with projects title block. EDiS Company will include legend and title block for trade PDF file.
 - 2.13.2. All trades to provide Total Coordination drawings at the time of sign off. TCD's are drawings which include all trades sign off models. Models are submitted for turn over to EDiS Company. The purpose for TCD's is to provide coordinated building models for jobsite coordination. Models from subcontractors to include all but not limited to: item elevations, product type and all equipment tags.
 - 2.13.3. During the installation of each trade's work, EDiS Company will refer to the signed off report and the 3D model to resolve any conflicts. Each installation firm agrees to install all work per the signed off drawings/model, without deviation. If a deviation, during installation, takes place without prior approval from all detailing parties, it will be the responsibility of the installing contractor to tear out the work and install it as shown on the signed off

drawings/coordination model. The cost of this work will be evaluated when the issues arise; however, the party responsible for the conflict will be responsible for the cost of the fix, including the additional detailing time of all parties involved.

- 2.13.4. The model is not considered to be the final coordination model until the BIM Coordinator, EDiS Company's Project Manager, A/E, and Owner has approved all clash free systems and routings and documents are signed off by all parties (contractors).
- 2.14. Should a conflict arise during installation that was missed during the coordination process, and not a result of deviating from the signed off area, the coordination team will work together to find a solution that is optimal for all trades and the project.
- 2.15. The final coordination model shall be kept up to date by all participants during construction to include as-built information and any other pertinent data that is essential to the project. The data will be submitted electronically in Revit, AutoCAD, NWC, PDF format. Items to be included are:
 - 2.15.1. RFI responses.
 - 2.15.2. Design change orders or designs that are in addition to the original contract documents.
 - 2.15.3. Equipment will be tagged with all (Owner required) identification information within the model (ex. Equipment schedule information and O&M Manuals). This identification information will be the same and correspond to all other close-out documentation. This close-out documentation including O&M manuals, maintenance information, etc. will be included in PDF form.
 - 2.15.4. EDiS will provide a location for the subcontractor to submit the required documentation at a later time. EDiS will generate the completed coordination model based on these documents for turn-over to the owner.
 - 2.15.5. Tekla or Navisworks will be utilized to link PDF closeout documents, select RFI's, select Images, etc., to the closeout model. Subcontractors need to provide closeout documents in the format requested by EDiS for the closeout model as well as adding smart data to other model type files as determined necessary by EDiS within the time frame ABHA dictates. For example, if Revit files are needed to produce the closeout model, EDiS may direct subcontractor to set up certain Revit views for the exporting of files which make up the as-built models. ABHA may also request that the subcontractor create viewpoints for their equipment in as-built model.
- 2.16. Data for coordination will be available on the Box.com, to be referenced by the other participants. Models and drawing files will never be tampered with by non-owners of the file. If a mistake occurs and a drawing is inadvertently modified, the responsible party is required to alert the project team. (See attachment)
- 2.17. The Owner's commissioning agent can attend the coordination meeting to review the detailing effort for commissioning related items.
- 2.18. All trades will provide Level of Development (LOD) (400) models for weekly coordination meeting.

3. REQUIREMENTS OF THE LEAD COORDINATOR

- 3.1. The Lead Coordinator will be EDiS Company.
- 3.2. Identification of a common insertion point for all drawing files. (Utilize Revit Models origin)

- 3.3. A/E to provide Lead Coordinator model exports to 2D/3D CAD of each trade component as needed to coordination. Origins to be maintained in exports.
- 3.4. Using the A/E's files, the Lead Coordinator will utilize & maintain the base architectural model.
 - 3.4.1. The base architectural model is a combination of the base structural model and other architectural elements. These architectural elements will include all elevated 3D architectural elements including, but not limited to, all walls that extend to the deck, fire and smoke walls, soffits and associated framing, ceiling planes, and finish floor planes.
 - 3.4.2. This model will consist of cleaned-up floor plans void of any excessive notations, leaders, bubbles, marks, grid lines, etc. that are not required for detailing development and that may potentially cause a conflict in the base composite model.
 - 3.4.3. In the event of changes to the A/E's contract documents, the A/E must revise the base architectural model/MEP/structural models and distributed to all coordination participants. This will require subcontractor participation as need by A/E to complete the revised models for directive. Revision work will be directed by Owner through an executed change order.
 - 3.4.4. The base architectural models will be distributed and maintained by ABHA and EDiS Company.
- 3.5. Collation of all trades' detailing models as posted to the project's web-based posting site into a Base Composite Model thru the use of Navisworks.
 - 3.5.1. Establish a standard two inch (2") soft tolerance within the clash detection software. This tolerance will result in a reported clash for any elements drawn closer than two inches (2") to one another.
 - 3.5.2. Assess and include most current clash files including the generation of a clash reports and distribution to all project participants per the coordination schedule.
 - 3.5.3. Collect final as-built files from all trades and generate a Final Coordination Model to submit to CM as part of the close-out requirements.
 - 3.5.4. Coordination meeting minutes shall be kept by EDiS Company Lead Coordinator or EDiS' Project Manager showing issues and resolution dates.
4. REQUIREMENTS OF THE STRUCTURAL STEEL Subcontractor
 - 4.1. Obtain from the A/E Structural Revit files to be used in the generation of the base structural model.
 - 4.2. The structural subcontractor will develop and provide the base structural model within the time frame dictated by EDiS and provide structural model updates to ensure the coordination team is coordinating the MEP/FP to the most up-to-date structural model.
 - 4.3. All structural framing members in the final sizes and locations (typically referred to as a "mill order" or "procurement" model) will be shown in the model as 3D objects with surfaces. At the discretion of the lead coordinator, this model may be void of all hardware and secondary structural steel but should include the major components: primary steel, metal decking, slab on metal decking, and gusset plates.
 - 4.4. The structural insertion/datum point must match the architectural insertion/datum location. No detailing work shall take place until the insertion points of the architectural and structural models match.
 - 4.5. The steel subcontractor is responsible for resolving their own modeling issues (i.e.: steel not to scale, missing key structural components, missing surface data, and model showing as wire frame data, model

exported to proper file format, etc.). The steel subcontractor is responsible to provide a steel design model in a usable format for all coordination participants to reference as the base structural model.

- 4.6. A FINAL 3D steel model and 2D shop drawings shall be submitted to the structural engineer of record, and used for field erection. It must be completed and submitted in accordance to the BIM schedule. This model shall consist of:
 - 4.6.1. All primary and secondary steel including metal deck, slab on metal deck, actual gusset plate sizes, connection details, edge of slab details (pour stop), brick relief angles, embeds, anchor bolts, and other miscellaneous metals. Curtain Wall embeds modeled by others.
 - 4.6.2. Submit final approved files to Lead Coordinator for insertion into the coordinated model, and to the design team in the form of shop drawings and/or (Navisworks compatible model).

5. DETAILING REQUIREMENTS OF ALL PARTICIPANTS

5.1. File sharing information:

- 5.1.1. The in-progress (Coordination Software – Ex: IFC/NWC/Cad) naming convention will be: project-trade-level. Example: Project Designation -MechPipe-1, Project Designation -HVAC-1, Project Designation -Fire Protection-1, Project Designation -Elec-1, Project Designation -Plumbing-1. Project Designation -TeleCom-1 or AV-1, Project Designation -Pneumatic Tube-1, etc. Additional designations may be added based on project specific scope and deliverable requirements and/or deemed as a critical component to the coordination process.
- 5.1.2. Each model posted by the contractor shall contain sub-layers for the purpose of system identification and isolation during the clash detection process. Example: **HVAC-1** shall contain sub-layers for Supply, Return, Exhaust, Fire Smoke-Dampers, VAV clearance, AC Door Access, Fan Coil Units, FCU Access, Equipment, Equipment Pads, Equipment Clearances, and Hangers (designated per system). **MechPipe-1** shall contain sub-layers Hydronic Pipe Supply, Hydronic Pipe Return, Chilled Pipe Supply, Chilled Pipe Return, Shutoff Access, Equipment, Equipment Pads, Equipment Clearances, and Hangers. **Plumbing-1** shall contain sub-layers Domestic Water Supply, Domestic Water Return, (with additional layer designations for hot and cold), Gas, Med-Gas, Shutoff Access (designated per system), Sanitary, Vent, Roof Drain, Rain Conductors, Equipment, Equipment Pads, Equipment Clearances, and Hangers (designated per system). **Elec-1** shall contain sub-layers for Lights, Light Clearance, Conduit, (with additional layer designation for power and data), Cable Tray, Cable Tray Access Clearance, Pull Boxes, Pull Box Access Clearance, J-Boxes, Elec. Panels, Elec. Panel Access Clearance, Elec. Troughs, Elec. Trough Access Clearance, Equipment, Equipment Clearances, Equipment Pads, and Hangers. **Fire Protection1** shall contain sub-layers Mains, Branches, Shutoff Access, and Hangers. **Pneumatic Tube-1** shall contain sub-layers Equipment, Equipment Access, and Hangers. Additional sub layers may be added based on project specific scope and deliverable requirements and/or deemed as a critical component to the coordination process.
- 5.1.3. Clash detection files will be posted to **BuildingBlok.com** before **12:00 PM**, on **Wednesday and Friday** by each of the trades. The lead coordinator will also post updated coordination models as needed. The lead coordinator will maintain the master coordination files. The weekly coordination model will be name abbreviated Project Name-Floor-Coordination Model-Month-Day-Year.

All coordination participants will maintain a current control copy of their own drawing files outside of the project's web-based posting site. Control drawings are to include all previously posted files.

- 5.2. Trade Colors in the Coordination environment:
 - 5.2.1. Duct Supply – Dark Green, Duct Return- Light Blue - Duct Exhaust –Light Green, Mech Pipe- Orange, Pressure lines/Gas – Tan, Sanitary/Vent – Brown, Rain Conductors/Roof Drains – Maroon, Domestic Water- Blue, Fire – Red, Pneumatic – Purple, Electrical – Yellow, All Base Architectural Elements (walls, soffits, ceiling & floor planes, etc.) will assume Arch model color scheme saved in the export or Lead Coordinator will modify select color scheme in the coordination model. Steel – Dark Grey, Any hangers and equipment (that is fed per the designated system) will assume the same color of that system it is associated with. Additional color schemes may be added based on project specific scope and deliverable requirements and/or deemed as a critical component to the coordination process.
- 5.3. When posting drawing files for coordination:
 - 5.3.1. Posted subcontractor coordination files of each trades system should be clash-free with in their respective data. To clarify; trades should refrain from posting data that shows their systems clashing with itself.
 - 5.3.2. When coordination of an area is completed there should not be any unresolved clashes remaining.
 - 5.3.3. These files should be void of any text, dimensions or any other notations.
- 5.4. Each coordination participant is required to submit three (3) complete sets of installation drawings as well as electronic PDF's prior to any work being installed in the field. If A/E spec requires more or less than that will govern over this document. These complete drawings are to be fully dimensioned and notated. Items to be noted in the final, fully coordinated drawing paper and electronic files of each system include:
 - 5.4.1. Bottom and top elevations of duct, pipe, conduit racks, cable trays etc. must be indicated (where applicable).
 - 5.4.2. Dimensions shall be shown from the gridlines to the centerline of each element drawn (round duct, pipe, cable tray, etc.) and from finished floor.
 - 5.4.3. Height to top of light housing assembly must be indicated.
 - 5.4.4. Labeling of all equipment.
- 5.5. During the coordination drawing effort, priority will be given to those systems that have the least flexibility. The following list is a descending order of the system priority and shall be used as a general guideline. Throughout the coordination drawing effort, adjustments and deviations to this list can be made with the approval of EDiS Company. (0' - 6") clear above the ceiling shall be maintained for access and construction of the ceiling, whenever possible. Required maintenance and/or code access spaces and set-backs take precedence over all systems.
 - 5.5.1. Gravity Pipe
 - 5.5.2. Plumbing Vent
 - 5.5.3. Ductwork and appurtenances
 - 5.5.4. Cable tray

- 5.5.5. Recessed light fixtures
 - 5.5.6. Fire protection piping and fixtures
 - 5.5.7. Electrical conduit over (3/4") in diameter
 - 5.5.8. Pneumatic tube and other record or material conveying systems
 - 5.5.9. HVAC piping
 - 5.5.10. Plumbing, supply and medical gas piping
 - 5.5.11. Electrical conduit smaller than 3/4" in diameter
 - 5.5.12. Above ceiling miscellaneous metal supports
 - 5.5.13. Provide all copper tube routes (racks) for mechanical systems, including valves, clearance zones and hangers.
- 5.6. Items to be included in the detailed drawing progress include:
- 5.6.1. All systems must be fully detailed and shown as individual elements including ductwork, all piping 3/4" and larger, pneumatic tubing, exterior wall connections, any piping that is smaller than 1/2" that is racked or banked, etc.
 - 5.6.2. Ductwork is to include size, layout and routing of all metal and flex ductwork, re-heat coils, terminal units, filters registers, grilles, diffusers, and similar features; provide notation for diffuser boot sizes and heights and any other special features
 - 5.6.3. All valves, dampers and VAV's or heat pumps will note any items requiring access for service and maintenance as well as access doors in inaccessible ceilings.
 - 5.6.4. All piping valves, boxes, supports, etc. are to be fully detailed
 - 5.6.5. Sprinkler head locations shall be shown on ceiling plans.
 - 5.6.6. All electrical conduits two inches (2") or more in diameter are to be modeled and shown in addition to smaller diameter conduit that is racked or banked.
 - 5.6.7. Electrical items such as hangers, supports, electrical fixtures, lights, speakers, detectors, sensors, cable trays, raceways, sleeves, pull boxes, and access space claims, etc. must be shown.
 - 5.6.8. If an element is not shown, under the lead coordinators approval, it will be assumed to be field routed and to not interfere with the other elements that are shown or within code clearances. Contractors who field route their elements are responsible to ensure their installation will be feasible and void of creating a clash in the field. Coordinated items take precedence over field routing.
 - 5.6.9. All major hangers and supports (including sway bracing, equipment bracing, hangers, etc.), penetrations, openings must be shown for all systems. Sharing of supports with other systems is discouraged, but can be accomplished with prior owner and/or field inspector approval.
 - 5.6.10. All insulation must be shown with appropriate thicknesses. All insulation & clearance zones will be modeled or accounted for during the clash detection process.
 - 5.6.11. Fire spray: If required by your building type, establish a safe thickness from all structural objects with which to run your clashes. Assume fire spray will be two inches (2") thick.
 - 5.6.12. Engineered stud framing must be modeled for king studs and doors.

- 5.6.13. Code clearances and maintenance access clearances must be shown and maintained; these include, but are not limited to access to VAVs, air handling units, egresses around pumps and tanks, smoke FDs, electrical panels, pneumatic tube transfer units, cable tray access, pull boxes, valve access, etc.
- 5.6.14. All trades must coordinate and detail their systems with the intent of installing each system at the optimal elevation above ceiling, taking into consideration, access to equipment for maintenance, repairs, connections, filters and removal while eliminating or minimizing the impact to surrounding components.
- 5.7. Established Clash Files are to be incorporated to ensure proper coordination. List of those files to be provided by the Lead Coordinator.
- 5.8. Refer to Appendix B – Soft Clash Requirements for additional soft-clash requirements.

6. SCHEDULE OF DRAWING COMPLETION AND SIGN-OFF

- 6.1. The participants should plan on the coordination process taking three (3) months. The coordination schedule is as follows:

This table will be populated at the BIM Coordination Kick-off Meeting. OR Schedule to be developed as part of the master construction schedule development (see Section 00230).

Zone	Floor	Coordination Meeting	Sign-Off Date

- 6.2. At the completion of each floor, the team will determine the specific "priority walls" that will be constructed full-height ahead of other interior partitions and MEP installations.

6.3. 3D MEP/FP Coordination Team

6.3.1. The goal of the coordination team will be to integrate the architectural, structural, mechanical, electrical, fire protection, and project specific elements into a collaborative 3D model to identify and resolve issues pertaining to MEP/FP systems and to ensure succinct and expedited field installations of these systems following the release of each zone/floor after clash free conditions are met. (Filled out at BIM Coordination Kick-off Meeting)

BIM Coordinator	EDiS Company
Main Contact	Chris Donahue
Phone Number	302-421-2963
Email Address	cdonahue@ediscompany.com
	EDiS Coordination Team

Main Contact	Hugo DeLaRosa
Phone Number	800-995-3347 x701
Email Address	hdelarosa@ediscompany.com
Project Manager	EDiS Company
Main Contact	Kevin Lucas
Phone Number	302-421-2893
Email Address	klucas@ediscompany.com
Project Engineer	EDiS Company
Main Contact	Samara Hamilton
Phone Number	302-421-2965
Email Address	shamilton@ediscompany.com
Project Superintendent	EDiS Company
Main Contact	Mark Nordquist
Phone Number	302-218-4676
Email Address	mnordquist@ediscompany.com
HVAC	TBD
Main Contact	
Phone Number	
Email Address	
Main Contact	
Phone Number	
Email Address	
Electrical	TBD
Main Contact	
Phone Number	
Email Address	
Concrete	TBD
Main Contact	
Phone Number	
Email Address	
Plumbing and Piping	TBD
Main Contact	
Phone Number	
Email Address	
Architectural	ABHA Architects
Main Contact	Chandra Nilekani

Phone Number	302-658-6426
Email Address	cnilekani@abha.com
MEP/FP Engineers	Gipe Associates
Main Contact	Adam Kegan
Phone Number	410-822-8688
Email Address	akegan@gipe.net
Structural Steel	TBD
Main Contact	
Phone Number	
Email Address	
Miscellaneous Steel	TBD
Main Contact	
Phone Number	
Email Address	

EXHIBIT 1

ARTICLE 1: GENERAL PROVISIONS

1.1 This document defines protocols, expected levels of development, and authorized uses of Building Information Models on this Project. It assigns specific responsibility for the development of each Model Element to a defined Level of Development at each Project phase. Where a provision in this Exhibit conflicts with a provision in the Agreement into which this Exhibit is incorporated, the provision in this Exhibit will prevail.

1.1.1 The parties agree to incorporate this Exhibit by reference into any other agreement for services or construction for the Project.

ARTICLE 2: LEVEL OF DEVELOPMENT (LOD)

2.1 The following LOD descriptions identify the specific content requirements and associated authorized uses for each Model Element at five progressively detailed levels of completeness. Each subsequent LOD builds on the previous level and includes all the characteristics of previous levels.

2.2 LOD 100

2.2.1 **Model Content Requirements.** Overall building massing indicative of area, height, volume, location, and orientation may be modeled in three dimensions or represented by other data.

2.2.2 Authorized Uses

2.2.2.1 **Analysis.** The Model may be analyzed based on volume, area and orientation by application of generalized performance criteria assigned to the representative Model Elements.

2.2.2.2 **Cost Estimating.** The Model may be used to develop a cost estimate based on current area, volume or similar conceptual estimating techniques (e.g., square feet of floor area, condominium unit, hospital bed, etc.).

2.2.2.3 **Schedule.** The Model may be used for project phasing and overall duration.

2.3 LOD 200

2.3.1 **Model Content Requirements.** Model Elements are modeled as generalized systems or assemblies with approximate quantities, size, shape, location, and orientation. Non-geometric information such as object name and quantities should be attached to Model Elements.

2.3.2 Authorized Uses

2.3.2.1 **Analysis.** The Model may be analyzed for performance of selected systems by application of generalized performance criteria assigned to the representative Model Elements.

2.3.2.2 **Cost Estimating.** The Model may be used to develop conceptual cost estimates based on the approximate data provided and conceptual estimating techniques (e.g., volume and quantity of elements or type of system selected).

2.3.2.3 **Schedule.** The Model may be used to show ordered, time-scaled appearance of major elements and systems.

2.4 LOD 300

2.4.1 Model Content Requirements. Model Elements are modeled as specific assemblies accurate in terms of quantity, size, shape, location, and orientation. Existing building elements are modeled as shown on building record drawings. Non-geometric information such as object description and object tags (door number, equipment number, etc) and quantities should be included with each object. Examples of the details required for systems modeled to LOD 300 include, but are not limited to:

- Site Utilities
- Masonry
- Steel decking
- Correct slopes for gravity piping for sanitary, storm or wet fire suppression systems.
- Piping materials specifically called out on documents included with model element attributes (generic manufacturer for system components are acceptable).
- Insulation around Pipe and Ducting.
- Duct dampers included with the duct system.
- Doors/Frames (hollow metal and storefront)
- Owner Furnished Fixtures, Equipment, etc. generically modeled as space claims by the Model Element Author (MEA).

2.4.2 Authorized Uses

2.4.2.1 Construction. Suitable for the generation of traditional construction documents. Contractors may utilize this model for coordination purposes and creation of shop drawings.

2.4.2.2 Analysis. The Model may be analyzed for performance of selected systems by application of specific performance criteria assigned to the representative Model Elements.

2.4.2.3 Schedule. The Model may be used to show ordered, time-scaled appearance of detailed elements and systems.

2.5 LOD 400

2.5.1 Model Content Requirements. Model Elements are modeled as specific assemblies that are accurate in terms of size, shape, location, quantity, and orientation with complete fabrication, assembly, and detailing information. Non-geometric information such as manufacturer name, model and installation should also be included with each object in addition to the information added in LOD 300. Examples of items and details required in LOD 400 models include, but are not limited to:

- Concrete
- Concrete reinforcing steel (in plank)
- Anchor bolts
- Structural steel
- Steel stairs, handrails
- Floor/roof penetration steel
- Significantly sized support hangers and stanchions for all systems
- Uni-Strut associated with system components if it is located in a tight overhead space (case by case basis)

- Architectural millwork/casework
- Metal panels and support steel
- Curtainwall system
- Steel stud framing including kickers and trusses at floor penetrations.
- Valve locations (clearance)
- Access panels (these should be modeled with the system they provide access to).
- Conduit racks or other substantially wide / bundled electrical routing. (these can be generically modeled, i.e. extruded boxes, space claims)
- Single conduit runs associated with any system (lighting, power, controls, etc) if needed to coordinate concrete coring.
- Kitchen equipment
- MEP/FP & Low Voltage Equipment
- MEP/FP & Low Voltage Systems
- Pull box locations and any extra space claims for their access.

2.5.2 Authorized Uses

- 2.5.2.1 **Construction.** Model Elements are virtual representations of the proposed element and are suitable for construction.
- 2.5.2.2 **Analysis.** The Model may be analyzed for performance of approved selected systems based on specific Model Elements.
- 2.5.2.3 **Schedule.** The Model may be used to show ordered, time-scaled appearance of detailed specific elements and systems including construction means and methods.

2.6 LOD 500

2.6.1 **Model Content Requirements.** Model Elements are modeled as constructed assemblies actual and accurate in terms of size, shape, location, quantity, and orientation. Non-geometric information should be updated with actual installed items.

2.6.2 Authorized Uses

- 2.6.2.1 **General Usage.** The Model may be utilized for maintaining, altering, and adding to the Project, but only to the extent consistent with any licenses granted in the Agreement or in a separate licensing agreement.
- 2.6.2.2 **Other Authorized Uses.** The Model will be a tool for accessing as-built information for facility management and maintenance purposes.

ARTICLE 3: MODEL ELEMENTS

3.1 Reliance on EDiS Company's Model Element Matrix

3.1.1 The EDiS Company Model Element Matrix at the end of this section identifies (1) the LOD required for each Model Element at the end of each Project phase, and (2) the Model Element Author responsible for developing the Model Element to the LOD identified. Each Model Element Author's content is intended to be shared with subsequent Model Element Authors and Model Users throughout the course of the Project.

- 3.1.2 It is understood that while the content of a specific Model Element may include data that exceeds the required LOD identified in the Model Element Table for a particular phase, Model Users and subsequent Model Element Authors may rely on the accuracy and completeness of a Model Element consistent only with the content required for a LOD identified in the Model Element Table.
- 3.1.3 Any use of, or reliance on, a Model Element inconsistent with the LOD indicated in the Model Element Table by subsequent Model Element Authors or Model Users shall be at their sole risk and without liability to the Model Element Author. To the fullest extent permitted by law, subsequent Model Element Authors and Model Users shall indemnify and defend the Model Element Author from and against all claims arising from or related to the subsequent Model Element Author's or Model User's modification to, or unauthorized use of, the Model Element Author's content.

3.2 Table Instructions

- 3.2.1 The Model Element Table at the end of this section indicates the LOD to which each Model Element Author (MEA) is required to develop the content of the Model Element at the conclusion of each phase of the Project. EDiS Company holds the rights of this table and all ownership right for edits are performed via EDiS Company.
- 3.3 EDiS Company's Model Element Matrix AIA Document G202-2013 (attached).



Document E203™ – 2013

Building Information Modeling and Digital Data Exhibit

This Exhibit dated the 20th day of May in the year 2016 is incorporated into the agreement (the "Agreement") between the Parties for the following Project:
(Name and location or address of the Project)

Renovations to Howard High School of Technology
401 East 12th Street
Wilmington, Delaware 19801

TABLE OF ARTICLES

- 1 GENERAL PROVISIONS
- 2 TRANSMISSION AND OWNERSHIP OF DIGITAL DATA
- 3 DIGITAL DATA PROTOCOLS
- 4 BUILDING INFORMATION MODELING PROTOCOLS
- 5 OTHER TERMS AND CONDITIONS

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 This Exhibit provides for the establishment of protocols for the development, use, transmission, and exchange of Digital Data for the Project. If Building Information Modeling will be utilized, this Exhibit also provides for the establishment of the protocols necessary to implement the use of Building Information Modeling on the Project, including protocols that establish the expected Level of Development for Model Elements at various milestones of the Project, and the associated Authorized Uses of the Building Information Models.

§ 1.2 The Parties agree to incorporate this Exhibit into their agreements with any other Project Participants that may develop or make use of Digital Data on the Project. Prior to transmitting or allowing access to Digital Data, a Party may require any Project Participant to provide reasonable evidence that it has incorporated this Exhibit into its agreement for the Project, and agreed to the most recent Project specific versions of AIA Document G201™–2013, Project Digital Data Protocol Form and AIA Document G202™–2013, Project Building Information Modeling Protocol Form.

§ 1.2.1 The Parties agree that each of the Project Participants utilizing Digital Data on the Project is an intended third party beneficiary of the Section 1.2 obligation to incorporate this Exhibit into agreements with other Project Participants, and any rights and defenses associated with the enforcement of that obligation. This Exhibit does not create any third-party beneficiary rights other than those expressly identified in this Section 1.2.1.

§ 1.3 Adjustments to the Agreement

§ 1.3.1 If a Party believes that protocols established pursuant to Sections 3.2 or 4.5, and memorialized in AIA Documents G201–2013 and G202–2013, will result in a change in the Party's scope of work or services warranting an adjustment in compensation, contract sum, schedule or contract time, the Party shall notify the other Party. Failure to provide notice as required in this Section 1.3 shall result in a Party's waiver of any claims for

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be incorporated into an agreement between the parties and used in conjunction with AIA Documents G201™–2013, Project Digital Data Protocol Form, and G202™–2013, Building Information Modeling Protocol Form. It is anticipated that other Project Participants will incorporate a project specific E203–2013 into their agreements, and that the Parties and other Project Participants will set forth the agreed-upon protocols in AIA Documents G201–2013 and G202–2013.

adjustments in compensation, contract sum, schedule or contract time as a result of the established protocols.

§ 1.3.2 Upon such notice, the Parties shall discuss and negotiate revisions to the protocols or discuss and negotiate any adjustments in compensation, contract sum, schedule or contract time in accordance with the terms of the Agreement.

§ 1.3.3 Notice required under this Section 1.3 shall be provided within thirty days of receipt of the protocols, unless otherwise indicated below:

(If the Parties require a notice period other than thirty days from receipt of the protocols, indicate the notice period below.)

§ 1.4 Definitions

§ 1.4.1 **Building Information Model.** A Building Information Model is a digital representation of the Project, or a portion of the Project, and is referred to in this Exhibit as the "Model," which term may be used herein to describe a Model Element, a single model or multiple models used in the aggregate, as well as other data sets identified in AIA Document G202–2013, Project Building Information Modeling Protocol Form.

§ 1.4.2 **Building Information Modeling.** Building Information Modeling or Modeling means the process used to create the Model.

§ 1.4.3 **Model Element.** A Model Element is a portion of the Model representing a component, system or assembly within a building or building site.

§ 1.4.4 **Level of Development.** The Level of Development (LOD) describes the minimum dimensional, spatial, quantitative, qualitative, and other data included in a Model Element to support the Authorized Uses associated with such LOD.

§ 1.4.5 **Authorized Uses.** The term "Authorized Uses" refers to the permitted uses of Digital Data authorized in the Digital Data and/or Building Information Modeling protocols established pursuant to the terms of this Exhibit.

§ 1.4.6 **Model Element Author.** The Model Element Author is the entity (or individual) responsible for managing and coordinating the development of a specific Model Element to the LOD required for an identified Project milestone, regardless of who is responsible for providing the content in the Model Element. Model Element Authors are to be identified in Section 3.3, Model Element Table, of AIA Document G202–2013.

§ 1.4.7 **Digital Data.** Digital Data is information, including communications, drawings, specifications and designs, created or stored for the Project in digital form. Unless otherwise stated, the term Digital Data includes the Model.

§ 1.4.8 **Confidential Digital Data.** Confidential Digital Data is Digital Data containing confidential or business proprietary information that the transmitting party designates and clearly marks as "confidential."

§ 1.4.9 **Written or In Writing.** In addition to any definition in the Agreement to which this Exhibit is attached, for purposes of this Exhibit and the Agreement, "written" or "in writing" shall mean any communication prepared and sent using a transmission method set forth in this Exhibit, or the protocols developed pursuant to this Exhibit, that permits the recipient to print the communication.

§ 1.4.10 **Written Notice.** In addition to any terms in the Agreement to which this Exhibit is attached, for purposes of this Exhibit and the Agreement, "written notice" shall be deemed to have been duly served if transmitted electronically to an address provided in this Exhibit or the Agreement using a transmission method set forth in this Exhibit that permits the recipient to print the communication.

§ 1.4.11 **Party and Parties.** The terms "Party" and "Parties" refer to the signing parties to the Agreement.

§ 1.4.12 **Project Participant.** A Project Participant is an entity (or individual) providing services, work, equipment or materials on the Project and includes the Parties.

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ARTICLE 2 TRANSMISSION AND OWNERSHIP OF DIGITAL DATA

§ 2.1 The transmission of Digital Data constitutes a warranty by the Party transmitting Digital Data to the Party receiving Digital Data that the transmitting Party is the copyright owner of the Digital Data, or otherwise has permission to transmit the Digital Data for its use on the Project in accordance with the Authorized Uses of Digital Data established pursuant to the terms of this Exhibit.

§ 2.2 If a Party transmits Confidential Digital Data, the transmission of such Confidential Digital Data constitutes a warranty to the Party receiving such Confidential Digital Data that the transmitting Party is authorized to transmit the Confidential Digital Data. If a Party receives Confidential Digital Data, the receiving Party shall keep the Confidential Digital Data strictly confidential and shall not disclose it to any other person or entity except as set forth in Section 2.2.1.

§ 2.2.1 The receiving Party may disclose Confidential Digital Data as required by law or court order, including a subpoena or other form of compulsory legal process issued by a court or governmental entity. The receiving Party may also disclose the Confidential Digital Data to its employees, consultants or contractors in order to perform services or work solely and exclusively for the Project, provided those employees, consultants and contractors are subject to the restrictions on the disclosure and use of Confidential Digital Data as set forth in this Exhibit.

§ 2.3 By transmitting Digital Data, the transmitting Party does not convey any ownership right in the Digital Data or in the software used to generate the Digital Data. Unless otherwise granted in a separate license, the receiving Party's right to use, modify, or further transmit Digital Data is specifically limited to designing, constructing, using, maintaining, altering and adding to the Project consistent with the terms of this Exhibit, and nothing contained in this Exhibit conveys any other right to use the Digital Data.

§ 2.4 Where a provision in this Article 2 conflicts with a provision in the Agreement into which this Exhibit is incorporated, the provision in this Article 2 shall prevail.

ARTICLE 3 DIGITAL DATA PROTOCOLS

§ 3.1 **Anticipated Types of Digital Data.** The anticipated types of Digital Data to be used on the Project are as follows: *(Indicate below the information on the Project that shall be created and shared in a digital format. If the Parties indicate that Building Information Modeling will be utilized on the Project, the Parties shall also complete Article 4.)*

Anticipated Digital Data	Applicability to the Project <i>(Indicate Applicable or Not Applicable)</i>	Location of Detailed Description <i>(Section 3.1.1 below or in an attachment to this exhibit and identified below)</i>
Project Agreements and Modifications	Applicable	
Project communications	Applicable	
Architect's pre-construction submittals	Applicable	
Contract Documents	Applicable	
Contractor's submittals	Applicable	
Subcontractor's submittals	Applicable	
Modifications	Applicable	
Project payment documents	Applicable	
Notices and claims	Applicable	
Building Information Modeling	Applicable	

§ 3.1.1 Insert a detailed description of the anticipated Digital Data identified in Section 3.1, if not further described in an attachment to this Exhibit.

See attached Exhibit

Init.

§ 3.2 As soon as practical following execution of the Agreement, the Parties shall further describe the uses of Digital Data, and establish necessary protocols governing the transmission and Authorized Uses of Digital Data, in consultation with the other Project Participants that are expected to utilize Digital Data on the Project.

§ 3.2.1 Unless another Project Participant is identified below, the Architect shall prepare and distribute to the other Project Participants Digital Data protocols for review, revision and approval.
(If a Project Participant other than the Architect shall be responsible for preparing draft and final Digital Data protocols, identify that Project Participant.)

EDiS Company

§ 3.2.2 The agreed upon Digital Data protocols shall be set forth in AIA Document G201–2013 and each Project Participant shall memorialize their agreement in writing to such Digital Data protocols.

§ 3.2.3 The Parties, together with the other Project Participants, shall review and, if necessary, revise the Digital Data protocols at appropriate intervals as required by the conditions of the Project.

§ 3.3 The Parties shall transmit, use, store and archive Digital Data in accordance with the Digital Data protocols set forth in the latest version of AIA Document G201–2013 agreed to by the Project Participants.

§ 3.4 Unauthorized Use

§ 3.4.1 Prior to Establishment of Digital Data Protocols

If a Party receives Digital Data prior to the agreement to, and documentation of, the Digital Data protocols in AIA Document G201–2013, that Party is not authorized to use or rely on the Digital Data. Any use of, or reliance on, such Digital Data is at that Party's sole risk and without liability to the other Party and its contractors, consultants, agents and employees.

§ 3.4.2 Following Establishment of Digital Data Protocols

Following agreement to, and documentation of, the Digital Data protocols in AIA Document G201–2013, if a Party uses Digital Data inconsistent with the Authorized Uses identified in the Digital Data protocols, that use shall be at the sole risk of the Party using the Digital Data.

§ 3.5 Digital Data Management

§ 3.5.1 Centralized electronic document management system use on the Project shall be:

(Check the appropriate box. If the Parties do not check one of the boxes below, the default selection shall be that the Parties will not utilize a centralized electronic document management system on the Project.)

[X] The Parties intend to use a centralized electronic document management system on the Project.

[] The Parties do not intend to use a centralized electronic document management system on the Project.

§ 3.5.2 If the Project Participants intend to utilize a centralized electronic document management system on the Project, the Project Participants identified in Section 3.5.3 shall be responsible for managing and maintaining such system. The Project Participants responsible for managing and maintaining the centralized electronic document management system shall facilitate the establishment of protocols for transmission, use, storage and archiving of the centralized Digital Data and assist the Project Participants identified in Section 3.2.1 above in preparing Digital Data protocols. Upon agreement to, and documentation of, the Digital Data protocols in AIA Document G201–2013, the Project Participants identified in Section 3.5.3 shall manage and maintain the centralized electronic document management system consistent with the management protocols set forth in the latest version of G201–2013 approved by the Project Participants.

§ 3.5.3 Unless responsibility is assigned to another Project Participant, the Architect shall be responsible for managing and maintaining the centralized electronic document management system. If the responsibility for management and maintenance will be assigned to another Project Participant at an identified Project milestone, indicate below the Project Participant who shall assume that responsibility, and the Project milestone.
(Identify the Project Participant responsible for management and maintenance only if the Parties intend to utilize a centralized electronic document management system on the Project.)

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Responsible Project Participant
 EDiS Company

Project Milestone
 Bid Package A & B, Closeout

ARTICLE 4 BUILDING INFORMATION MODELING PROTOCOLS

§ 4.1 If the Parties indicate in Section 3.1 that Building Information Modeling will be used on the Project, specify below the extent to which the Parties intend to utilize Building Information Modeling and identify the provisions of this Article 4 governing such use:

- [] The Parties shall utilize Building Information Modeling on the Project for the sole purpose of fulfilling the obligations set forth in the Agreement without an expectation that the Model will be relied upon by the other Project Participants. Unless otherwise agreed in writing, any use of, transmission of, or reliance on the Model is at the receiving Party's sole risk. The remaining sections of this Article 4 shall have no force or effect.
- [] The Parties shall develop, share, use and rely upon the Model in accordance with Sections 4.2 through 4.10 of this Exhibit.

§ 4.2 **Anticipated Building Information Modeling Scope.** Indicate below the portions of the Project for which Modeling will be used and the anticipated Project Participant responsible for that Modeling.

Project Portion for Modeling	Responsible Project Participant
Bid Package A:	
HHS-05	Structural and Miscellaneous Steel
HHS-07	Metal Framing, Drywall, Plaster
HHS-08	Acoustical Ceilings and Panels
HHS-17	Conveying Equipment
Bid Package B:	
HHS-19	Mechanical & Plumbing
HHS-20	Electrical and IT Infrastructure
HHS-21	Fire Protection
HHS-23	Technology
HHS-24	ATC

§ 4.3 **Anticipated Model Authorized Uses.** Indicate below the anticipated Authorized Uses of the Model for the Project, which Authorized Uses will be agreed upon by the Project Participants and further described for each LOD in AIA Document G202-2013.

§ 4.4 **Ancillary Modeling Activities.** Indicate additional Modeling activities agreed upon by the Parties, but not to be included in AIA Document G202-2013, if any.

(Describe any Modeling activities, such as renderings, animations, performance simulations, or other similar use, including the anticipated amount and scope of any such Modeling activities.)

All parties identified in contract scopes and AIA E203 4.2 are required to provide 3D modeled electronic document in Autocad, Navisworks and/or Revit to participate in Building Information Modeling construction coordination process.

§ 4.5 **Modeling Protocols.** As soon as practical following execution of the Agreement, the Parties shall, in consultation with the other Project Participants that are expected to utilize Building Information Modeling on the Project, further describe the Authorized Uses of the Model and establish necessary protocols governing the development of the Model utilizing AIA Document G202-2013.

§ 4.5.1 The Modeling protocols shall address the following:

- .1 Identification of the Model Element Authors;

Init.

- .2 Definition of the various LOD for the Model Elements and the associated Authorized Uses for each defined LOD;
- .3 Identification of the required LOD of each Model Element at each identified Project milestone;
- .4 Identification of the construction classification systems to be used on the Project;
- .5 The process by which Project Participants will exchange and share the Model at intervals not reflected in Section 3.3, Model Element Table, of AIA Document G202–2013;
- .6 The process by which the Project Participants will identify, coordinate and resolve changes to the Model;
- .7 Details regarding any anticipated as-designed or as-constructed Authorized Uses for the Model, if required on the Project;
- .8 Anticipated Authorized Uses for facilities management or otherwise, following completion of the Project; and
- .9 Other topics to be addressed by the Modeling protocols: *(Identify additional topics to be addressed by the Modeling Protocols.)*

§ 4.5.2 Unless responsibility is assigned to another Project Participant identified below, the Architect shall prepare and distribute Modeling protocols to the other Project Participants for review, revision and approval. *(If a Project Participant other than the Architect shall be responsible for preparing draft and final Modeling protocols, identify that Project Participant.)*

§ 4.5.3 The agreed upon Modeling protocols shall be set forth in AIA Document G202–2013 and each Project Participant shall memorialize their agreement in writing to such Modeling protocols.

§ 4.5.4 The Parties, together with the other Project Participants, shall review, and if necessary, revise the Modeling protocols at appropriate intervals as required by the conditions of the Project.

§ 4.6 The Parties shall develop, use and rely on the Model in accordance with the Modeling protocols set forth in the latest version of AIA Document G202–2013, which document shall be included in or attached to the Model in a manner clearly accessible to the Project Participants.

§ 4.7 Unauthorized Use

§ 4.7.1 Prior to Establishment of Modeling Protocols

If a Party receives any Model prior to the agreement to, and documentation of, the Modeling protocols in AIA Document G202–2013, that Party is not authorized to use, transmit, or rely on the Model. Any use, transmission or reliance is at that Party's sole risk and without liability to the other Party and its contractors, consultants, agents and employees.

§ 4.7.2 Following Establishment of Modeling Protocols

Following agreement to, and documentation of, the Modeling protocols in AIA Document G202–2013, if a Party uses or relies on the Model inconsistent with the Authorized Uses identified in the Modeling protocols, such use or reliance shall be at the sole risk of the Party using or relying on the Model. A Party may rely on the Model Element only to the extent consistent with the minimum data required for the identified LOD, even if the content of a specific Model Element includes data that exceeds the minimum data required for the identified LOD.

§ 4.8 Model Management

§ 4.8.1 The requirements for managing the Model include the duties set forth in this Section 4.8. Unless assigned to another Project Participant, the Architect shall manage the Model from the inception of the Project. If the responsibility for Model management will be assigned to another Project Participant, or change at an identified Project milestone, indicate below the identity of the Project Participant who will assume that responsibility, and the Project milestone.

Responsible Project Participant

Project Milestone

Init.

§ 4.8.2 Model Management Protocol Establishment. The Project Participant responsible for managing the Model, in consultation with the other Project Participants that are expected to utilize Building Information Modeling on the Project, shall facilitate the establishment and revision of Model management protocols, including the following:

- .1 Model origin point, coordinate system, precision, file formats and units
- .2 Model file storage location(s)
- .3 Processes for transferring and accessing Model files
- .4 Naming conventions
- .5 Processes for aggregating Model files from varying software platforms
- .6 Model access rights
- .7 Identification of design coordination and clash detection procedures.
- .8 Model security requirements
- .9 Other: *(Identify additional Model management protocols to be addressed.)*

§ 4.8.3 Ongoing Responsibilities. The Project Participant responsible for managing the Model shall do so consistent with the Model management protocols, which shall also include the following ongoing responsibilities:

- .1 Collect incoming Models:
 - .1 Coordinate submission and exchange of Models
 - .2 Create and maintain a log of Models received
 - .3 Review Model files for consistency with Sections 4.8.2.1 through 4.8.2.5
 - .4 Maintain a record copy of each Model file received
- .2 Aggregate Model files and make them available for Authorized Uses
- .3 Maintain Model Archives and backups consistent with the requirements of Section 4.8.4 below
- .4 Manage Model access rights
- .5 Other: *(Identify additional responsibilities.)*

§ 4.8.4 Model Archives. The individual or entity responsible for Model management as set forth in this Section 4.8 shall compile a Model Archive at the end of each Project milestone and shall preserve it without alteration as a record of Model completion as of that Project milestone.

§ 4.8.4.1 Additional Model Archive requirements, if any, are as follows:

§ 4.8.4.2 The procedures for storing and preserving the Model(s) upon final completion of the Project are as follows:

§ 4.9 Post-Construction Model. The services associated with providing a Model for post-construction use shall only be required if specifically designated in the table below as a Party's responsibility.

(Designate below any anticipated post-construction Model and related requirements, the Project Participant responsible for creating or adapting the Model to achieve such uses, and the location of a detailed description of the anticipated scope of services to create or adapt the Model as necessary to achieve such uses.)

Post-Construction Model	Applicability to Project <i>(Applicable or Not Applicable)</i>	Responsible Project Participant	Location of Detailed Description of Requirements and Services <i>(Section 4.10 below or in an attachment to this exhibit and identified below)</i>
§ 4.9.1 Remodeling	Not Applicable		
§ 4.9.2 Wayfinding and Mapping	Not Applicable		
§ 4.9.3 Asset/FF & E Management	Not Applicable	EDiS Company	
§ 4.9.4 Energy Management			
§ 4.9.5 Space Management			

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§ 4.9.6 Maintenance Management			

§ 4.10 Insert a detailed description of the requirements for each Post-Construction Model identified in Section 4.9 and the anticipated services necessary to create each Post-Construction Model, if not further described in an attachment to this Exhibit.

ARTICLE 5 OTHER TERMS AND CONDITIONS

Other terms and conditions related to the transmission and use of Digital Data are as follows:

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Document G202™ – 2013

Project Building Information Modeling Protocol Form

(Row deleted)

PROJECT:

Renovations to Howard High School of Technology
401 East 12th Street
Wilmington, Delaware 19801

PROTOCOL VERSION NUMBER: 1

DATE: May 19, 2016

PREPARED BY: Chris Donahue/Jackie McKee

DISTRIBUTION TO

New Castle County Vocational Technical School District
1417 Newport Road
Wilmington, Delaware 19804

TABLE OF ARTICLES

- 1 GENERAL PROVISIONS
- 2 LEVEL OF DEVELOPMENT
- 3 MODEL ELEMENTS

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 For each Project Participant that has incorporated the Project specific AIA Document E203™–2013, Building Information Modeling and Digital Data Protocol Exhibit, dated May 2, 2016 , into its agreement for the Project, identify and provide the contact information for individuals responsible for implementation of the Modeling protocols. If, for any Project Participant, more than one individual will be responsible for implementation of the Modeling protocols, list each individual separately and describe the unique Modeling Role assigned to each individual.

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

This document is intended to be used in conjunction with a Project specific AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, which the Parties will incorporate into their agreement for the Project, and a Project specific AIA Document G201™–2013, Project Digital Data Protocol Form.

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Modeling Role	Project Participant	Individual Responsible	Contact Information
BIM Manager	EDiS BIM Services	Chris Donahue	EDiS Company 110 South Poplar Street, Suite 300 Wilmington, De 19801 302-421-2963 cdonahue@ediscompany.com

§ 1.2 This document establishes the Modeling protocols for the Project. For purposes of these protocols, the Model is comprised of the following information and other data sets:
 (Paragraph deleted)

§ 1.3 **Collaboration Protocols.** The Project Participants' protocols for the collaborative utilization of the Model, if any, including communications protocols, a collaboration meeting schedule and colocation requirements, are as follows:

§ 1.4 **Technical Requirements.** The technical requirements relating to the utilization of Building Information Modeling, including specific software and hardware requirements are as follows:

Revit, Navisworks, Bluebeam Autodesk fabrication

§ 1.5 **Training and Support.** –NOT USED

§ 1.6 **Model Standard.** The Model shall be developed in accordance with the following Model Standard, if any:

§ 1.7 **Model Management Protocols and Processes**

The following Model Management Protocols and Processes shall apply to the Project only if specifically designated in the table below as being applicable.

Model Management Protocols and Processes	Applicability to Project	Location of Detailed Description
§ 1.7.1 Model origin point, coordinate system, precision, file formats and units	Applicable	0, 0, 0
§ 1.7.2 Model file storage location(s)	Applicable	EDiS BIM Services & Newforma
§ 1.7.3 Processes for transferring and accessing Model files	Applicable	Drop Box & BuildingBlok
§ 1.7.4 Naming conventions	Applicable	EDiS Standard
§ 1.7.5 Processes for aggregating Model files from varying software platforms		Autodesk CAD MEP & Navisworks
§ 1.7.6 Model access rights	N/A	
§ 1.7.7 Design coordination and clash detection procedures.	Applicable	EDiS
§ 1.7.8 Model security requirements	Applicable	Confidential Between EDiS, ABHA & NCC Vo-Tech School District

§ 1.8 Insert a description of each Model Management Protocol and Process identified in Section 1.7, if not further described in an exhibit attached to this document:

See attached document.

§ 1.9 Terms in this document shall have the same meaning as those in AIA Document E203–2013.

ARTICLE 2 LEVEL OF DEVELOPMENT

§ 2.1 The Level of Development (LOD) descriptions, included in Section 2.2 through Section 2.6 below, identify the specific minimum content requirements and associated Authorized Uses for each Model Element at five progressively detailed levels of completeness. The Parties shall utilize the five LOD descriptions in completing the Model Element Table at Section 3.3.

§ 2.2 LOD 100 – NOT USED

§ 2.2.1 **Model Element Content Requirements.** The Model Element may be graphically represented in the Model with a symbol or other generic representation, but does not satisfy the requirements for LOD 200. Information related to the Model Element (i.e., cost per square foot, tonnage of HVAC, etc.) can be derived from other Model Elements.

§ 2.2.2 Authorized Uses

§ 2.2.2.1 **Analysis.** The Model Element may be analyzed based on volume, area and orientation by application of generalized performance criteria assigned to other Model Elements.

§ 2.2.2.2 **Cost Estimating.** The Model Element may be used to develop a cost estimate based on current area, volume or similar conceptual estimating techniques (e.g., square feet of floor area, condominium unit, hospital bed, etc.).

§ 2.2.2.3 **Schedule.** The Model Element may be used for Project phasing and determination of overall Project duration.

§ 2.2.2.4 **Other Authorized Uses.** Additional Authorized Uses of the Model Element developed to LOD 100, if any, are as follows:

§ 2.3 LOD 200 – NOT USED

§ 2.3.1 **Model Element Content Requirements.** The Model Element is graphically represented within the Model as a generic system, object, or assembly with approximate quantities, size, shape, location, and orientation. Non-graphic information may also be attached to the Model Element.

§ 2.3.2 Authorized Uses

§ 2.3.2.1 **Analysis.** The Model Element may be analyzed for performance of selected systems by application of generalized performance criteria assigned to the representative Model Elements.

§ 2.3.2.2 **Cost Estimating.** The Model Element may be used to develop cost estimates based on the approximate data provided and quantitative estimating techniques (e.g., volume and quantity of elements or type of system selected).

§ 2.3.2.3 **Schedule.** The Model Element may be used to show ordered, time-scaled appearance of major elements and systems.

§ 2.3.2.4 **Coordination.** The Model Element may be used for general coordination with other Model Elements in terms of its size, location and clearance to other Model Elements.

§ 2.3.2.5 **Other Authorized Uses.** Additional Authorized Uses of the Model Element developed to LOD 200, if any, are as follows:

§ 2.4 LOD 300 – Refer to Section 01370 – BIM Coordination (attached)

§ 2.4.1 **Model Element Content Requirements.** The Model Element is graphically represented within the Model as a specific system, object or assembly in terms of quantity, size, shape, location, and orientation. Non-graphic information may also be attached to the Model Element.

§ 2.4.2 Authorized Uses

§ 2.4.2.1 Analysis. The Model Element may be analyzed for performance of selected systems by application of specific performance criteria assigned to the representative Model Element.

§ 2.4.2.2 Cost Estimating. The Model Element may be used to develop cost estimates suitable for procurement based on the specific data provided.

§ 2.4.2.3 Schedule. The Model Element may be used to show ordered, time-scaled appearance of detailed elements and systems.

§ 2.4.2.4 Coordination. The Model Element may be used for specific coordination with other Model Elements in terms of its size, location and clearance to other Model Elements including general operation issues.

§ 2.4.2.5 Other Authorized Uses. Additional Authorized Uses of the Model Element developed to LOD 300, if any, are as follows:

§ 2.5 LOD 400

§ 2.5.1 Model Element Content Requirements. The Model Element is graphically represented within the Model as a specific system, object or assembly in terms of size, shape, location, quantity, and orientation with detailing, fabrication, assembly, and installation information. Non-graphic information may also be attached to the Model Element.

§ 2.5.2 Authorized Uses

§ 2.5.2.1 Analysis. The Model Element may be analyzed for performance of systems by application of actual performance criteria assigned to the Model Element.

§ 2.5.2.2 Cost Estimating. Costs are based on the actual cost of the Model Element at buyout.

§ 2.5.2.3 Schedule. The Model may be used to show ordered, time-scaled appearance of detailed specific elements and systems including construction means and methods.

§ 2.5.2.4 Coordination. The Model Element may be used for coordination with other Model Elements in terms of its size, location and clearance to other Model Elements, including fabrication, installation and detailed operation issues.

§ 2.5.2.5 Other Authorized Uses. Additional Authorized Uses of the Model Element developed to LOD 400, if any, are as follows:

§ 2.6 LOD 500 – NOT USED

§ 2.6.1 Model Element Content Requirements. The Model Element is a field verified representation in terms of size, shape, location, quantity, and orientation. Non-graphic information may also be attached to the Model Elements.

§ 2.6.2 Authorized Uses. Specific Authorized Uses of the Model Element developed to LOD 500, if any, are as follows:

ARTICLE 3 MODEL ELEMENTS

§ 3.1 Reliance on Model Elements

§ 3.1.1 At any particular Project milestone, a Project Participant may rely on the accuracy and completeness of a Model Element only to the extent consistent with the minimum data required for the Model Element's LOD for that Project milestone as identified below in the Model Element Table, even if the content of a specific Model Element includes data that exceeds the minimum data required for the identified LOD.

§ 3.1.2 Coordination and Model Refinement

Where conflicts are found in the Model, regardless of the phase of the Project or LOD, the Project Participant that identifies the conflict shall promptly notify the Model Element Authors and the Project Participant identified in AIA Document E203–2013 Section 4.8 as being responsible for Model management. Upon such notification, the Model Element Author(s) shall act promptly to evaluate, mitigate and resolve the conflict in accordance with the processes established in Section 1.7.7, if applicable.

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§ 3.2 Table Instructions

§ 3.2.1 The Model Element Table in Section 3.3 indicates the LOD to which each Model Element shall be developed at each identified Project milestone and the Model Element Author.

§ 3.2.2 Abbreviations for each Model Element Author to be used in the Model Element Table are as follows:

Abbreviation ABHA EDiS BP	Model Element Author (MEA) Anderson, Brown & Higley Architects EDiS Company Bid Package
---	---

§ 3.3 Model Element Table	Design Intent												Means & Methods Model - Phase I Bid Package A See Attachment for Scope Participant	Means & Methods Model - Phase II Bid Package B See Attachment for Scope Participant	Notes (See Sec 3.4)				
	Design Intent Model	Schematic Design			Design Development			Construction Documents											
Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
A SUBSTRUCTURE																			
A10 FOUNDATIONS																			
A1010 Standard Foundations																			
	100	ABHA					200	ABHA		300	ABHA		300	BPA HHS-03					
	A1010.10	Wall Foundations					200	ABHA		300	ABHA		300	BPA HHS-03					
	A1010.30	Column Foundations					200	ABHA		300	ABHA		300	BPA HHS-03					
	A1010.90	Standard Foundation Supplementary Components					200	ABHA		300	ABHA		300	BPA HHS-03					
A1020 Special Foundations - N/A																			
	A1020.10	Driven Piles																	
	A1020.15	Bored Piles																	
	A1020.20	Caissons																	
	A1020.30	Special Foundation Walls																	
	A1020.40	Foundation Anchors																	
	A1020.50	Underpinning																	

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§ 3.3 Model Element Table	Design Intent																		Notes (See Sec 3.4)
	Design Intent Model			Schematic Design			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			
Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
A1020.60 Raft Foundations																			
A1020.70 Pile Caps																			
A1020.80 Grade Beams																			
A20 SUBGRADE ENCLOSURES- N/A																			
A2010 Walls for Subgrade Enclosures																			
A2010.10 Subgrade Enclosure Wall Construction																			
A2010.20 Subgrade Enclosure Wall Interior Skin																			
A2010.90 Subgrade Enclosure Wall Supplementary Components																			
A40 SLABS-ON-GRADE																			
A4010 Standard Slabs-on-Grade- N/A																			
A4020 Structural Slabs-on-Grade- N/A																			
A4030 Slab Trenches- N/A																			
A4040 Pits and Bases- N/A																			
A4090 Slab-On-Grade Supplementary Components																			
A4090.10 Perimeter Insulation	100	ABHA				200	ABHA		300	ABHA		300	BPA HHS-03						
A4090.20 Vapor Retarder	100	ABHA				200	ABHA		300	ABHA		300	BPA HHS-03						
A4090.30 Waterproofing																			
A4090.50 Mud Slab																			
A4090.60 Subbase Layer																			
A60 WATER AND GAS MITIGATION																			
A6010 Building Subdrainage																			
A6010.10 Foundation Drainage	100	ABHA				200	ABHA		300	ABHA									
A6010.20 Underslab Drainage	100	ABHA				200	ABHA		300	ABHA									

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§ 3.3 Model Element Table	Design Intent												Means & Method Model						Notes (See Sec 3.4)
	Design Intent Model			Schematic Design			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			
Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
A6020 Off-Gassing Mitigation– N/A																			
A6020.10 Radon Mitigation																			
A6020.50 Methane Mitigation																			
A90 SUBSTRUCTURE RELATED ACTIVITIES																			
A9010 Substructure Excavation																			
A9010.10 Backfill and Compaction - SPCC	100	ABHA					200	ABHA		300	ABHA								
A9020 Construction Dewatering– N/A																			
A9030 Excavation Support– N/A																			
A9030.10 Anchor Tiebacks																			
A9030.20 Cofferdams																			
A9030.40 Cribbing and Walers																			
A9030.60 Ground Freezing																			
A9030.70 Slurry Walls																			
A9040 Soil Treatment – SPEC– N/A																			
B SHELL																			
B10 SUPERSTRUCTURE																			
B1010 Floor Construction																			
B1010.10 Floor Structural Frame	100	ABHA					200	ABHA		300	ABHA		400	BPA HHS-05					
B1010.20 Floor Decks, Slabs, and Toppings	100	ABHA					200	ABHA		300	ABHA		300	BPA HHS-03					
B1010.30 Balcony Floor Construction																			
B1010.40 Mezzanine Floor Construction - Reno	100	ABHA					200	ABHA		300	ABHA		300	BPA HHS-07					
B1010.50 Ramps	100	ABHA					200	ABHA		300	ABHA		300	BPA HHS-03, 07					
B1010.90 Floor Construction	100	ABHA					200	ABHA		300	ABHA		400	BPA HHS-05					

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§ 3.3 Model Element Table	Design Intent												Means & Methods Model						Notes (See Sec 3.4)
	Design Intent Model			Schematic Design			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			
Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
Supplementary Components																			
B1020 Roof Construction																			
B1020.10	Roof Structural Frame	100	ABHA				200	ABHA		300	ABHA								
B1020.20	Roof Decks, Slabs, and Sheathing	100	ABHA				200	ABHA		300	ABHA								
B1020.30	Canopy Construction	100	ABHA				200	ABHA		300	ABHA								
B1020.90	Roof Construction Supplementary Components	100	ABHA				200	ABHA		300	ABHA								
B1080 Stairs (Reno & New)																			
B1080.10	Stair Construction	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-05					
B1080.30	Stair Soffits	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-05					
B1080.50	Stair Railings	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-05					
B1080.60	Fire Escapes - Reno	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-05					
B1080.70	Metal Walkways																		
B1080.80	Ladders	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-05					
B20 EXTERIOR VERTICAL ENCLOSURES																			
B2010 Exterior Walls																			
B2010.10	Exterior Wall Veneer	100	ABHA				200	ABHA		300	ABHA								
B2010.20	Exterior Wall Construction	100	ABHA				200	ABHA		300	ABHA								
B2010.30	Exterior Wall Interior Skin	100	ABHA				200	ABHA		300	ABHA								
B2010.40	Fabricated Exterior Wall Assemblies	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-05					
B2010.50	Parapets	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-05					
B2010.60	Equipment Screens																		
B2010.80	Exterior Wall Supplementary Components																		
B2010.90	Exterior Wall Opening	100	ABHA				200	ABHA		300	ABHA								

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§ 3.3 Model Element Table	Design Intent												Means & Methods Model						Notes (See Sec 3.4)
	Design Intent Model			Schematic Design			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			
Model Elements Utilizing CSI-UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
Supplementary Components																			
B2020 Exterior Windows																			
B2020.10 Exterior Operating Windows	100	ABHA					200	ABHA		300	ABHA								
B2020.20 Exterior Fixed Windows	100	ABHA					200	ABHA		300	ABHA								
B2020.30 Exterior Window Wall																			
B2020.50 Exterior Special Function Windows	100	ABHA					200	ABHA		300	ABHA								
B2050 Exterior Doors and Grilles																			
B2050.10 Exterior Entrance Doors	100	ABHA					200	ABHA		300	ABHA								
B2050.20 Exterior Utility Doors	100	ABHA					200	ABHA		300	ABHA								
B2050.30 Exterior Oversize Doors	100	ABHA					200	ABHA		300	ABHA								
B2050.40 Exterior Special Function Doors	100	ABHA					200	ABHA		300	ABHA								
B2050.60 Exterior Grilles	100	ABHA					200	ABHA		300	ABHA								
B2050.70 Exterior Gates	100	ABHA					200	ABHA		300	ABHA								
B2050.90 Exterior Door Supplementary Components	100	ABHA					200	ABHA		300	ABHA								
B2070 Exterior Louvers and Vents																			
B2070.10 Exterior Louvers	100	ABHA					200	ABHA		300	ABHA								
B2070.50 Exterior Vents	100	ABHA					200	ABHA		300	ABHA								
B2080 Exterior Wall Appurtenances																			
B2080.10 Exterior Fixed Grilles and Screens	100	ABHA					200	ABHA		300	ABHA								
B2080.30 Exterior Opening Protection Devices	100	ABHA					200	ABHA		300	ABHA								
B2080.50 Exterior Balcony Walls and Railings	100	ABHA					200	ABHA		300	ABHA								
B2080.70 Exterior Fabrications	100	ABHA					200	ABHA		300	ABHA								

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§ 3.3 Model Element Table	Design Intent																		Notes (See Sec 3.4)
	Design Intent Model			Schematic Design			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			
	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
Model Elements Utilizing CSI-UniformFormat™																			
B2080.80	Bird Control Devices	100	ABHA				200	ABHA		300	ABHA								
B2090	Exterior Wall Specialties																		
B30	EXTERIOR HORIZONTAL ENCLOSURES																		
B3010	Roofing																		
B3010.10	Steep Slope Roofing	100	ABHA				200	ABHA		300	ABHA								
B3010.50	Low-Slope Roofing	100	ABHA				200	ABHA		300	ABHA								
B3010.70	Canopy Roofing	100	ABHA				200	ABHA		300	ABHA								
B3010.90	Roofing Supplementary Components	100	ABHA				200	ABHA		300	ABHA								
B3020	Roof Appurtenances																		
B3020.10	Roof Accessories	100	ABHA				200	ABHA		300	ABHA								
B3020.30	Roof Specialties	100	ABHA				200	ABHA		300	ABHA								
B3020.70	Rainwater Management	100	ABHA				200	ABHA		300	ABHA								
B3040	Traffic Bearing Horizontal Enclosures–N/A																		
B3040.10	Traffic Bearing Coatings																		
B3040.30	Horizontal Waterproofing Membrane																		
B3040.50	Wear Surfaces																		
B3040.90	Horizontal Enclosure Supplementary Components																		
B3060	Horizontal Openings																		
B3060.10	Roof Windows and Skylights	100	ABHA				200	ABHA		300	ABHA								
B3060.50	Vents and Hatches	100	ABHA				200	ABHA		300	ABHA				400		BPB HHS-19		
B3060.90	Horizontal Opening Supplementary Components	100	ABHA				200	ABHA		300	ABHA								
B3080	Overhead Exterior Enclosures																		

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Model Elements Utilizing CSI UniFormat™		LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes
B3080.10	Exterior Ceilings	100	ABHA				200	ABHA	300	ABHA									
B3080.20	Exterior Soffits	100	ABHA				200	ABHA	300	ABHA									
B3080.30	Exterior Bulkheads	100	ABHA				200	ABHA	300	ABHA									
C INTERIORS																			
C10 INTERIOR CONSTRUCTION																			
C1010 Interior Partitions - Replaster																			
C1010.10	Interior Fixed Partitions	100	ABHA				200	ABHA	300	ABHA	300	BPA HHS-06							
C1010.20	Interior Glazed Partitions	100	ABHA				200	ABHA	300	ABHA	300	BPA HHS-06							
C1010.40	Interior Demountable Partitions	100	ABHA				200	ABHA	300	ABHA	300	BPA HHS-06							
C1010.50	Interior Operable Partitions	100	ABHA				200	ABHA	300	ABHA	300	BPA HHS-06							
C1010.70	Interior Screens	100	ABHA				200	ABHA	300	ABHA	300	BPA HHS-06							
C1010.90	Interior Partition Supplementary Components	100	ABHA				200	ABHA	300	ABHA	300	BPA HHS-06							
C1020 Interior Windows																			
C1020.10	Interior Operating Windows	100	ABHA				200	ABHA	300	ABHA									
C1020.20	Interior Fixed Windows	100	ABHA				200	ABHA	300	ABHA									
C1020.50	Interior Special Function Windows	100	ABHA				200	ABHA	300	ABHA									
C1020.90	Interior Window Supplementary Components	100	ABHA				200	ABHA	300	ABHA									
C1030 Interior Doors																			
C1030.10	Interior Swinging Doors	100	ABHA				200	ABHA	300	ABHA									
C1030.20	Interior Entrance Doors	100	ABHA				200	ABHA	300	ABHA									
C1030.25	Interior Sliding Doors	100	ABHA				200	ABHA	300	ABHA									
C1030.30	Interior Folding Doors	100	ABHA				200	ABHA	300	ABHA									

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Model Elements Utilizing CSI UniFormat™		LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
C1030.40	Interior Coiling Doors	100	ABHA				200	ABHA		300	ABHA									
C1030.50	Interior Panel Doors	100	ABHA				200	ABHA		300	ABHA									
C1030.70	Interior Special Function Doors	100	ABHA				200	ABHA		300	ABHA									
C1030.80	Interior Access Doors and Panels	100	ABHA				200	ABHA		300	ABHA									
C1030.90	Interior Door Supplementary Components	100	ABHA				200	ABHA		300	ABHA									
C1040	Interior Grilles and Gates																			
C1040.10	Interior Grilles	100	ABHA				200	ABHA		300	ABHA						400	BPB HHS-19, 20, 21		
C1040.50	Interior Gates																			
C1060	Raised Floor Construction– N/A																			
C1060.10	Access Flooring																			
C1060.30	Platform/Stage Floors																			
C1070	Suspended Ceiling Construction																			
C1070.10	Acoustical Suspended Ceilings	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-08						
C1070.20	Suspended Plaster and Gypsum Board Ceilings	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-08						
C1070.50	Specialty Suspended Ceilings	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-08						
C1070.70	Special Function Suspended Ceilings	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-08						
C1070.90	Ceiling Suspension Components	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-08						
C1090	Interior Specialties																			
C1090.10	Interior Railings and Handrails	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-05						
C1090.15	Interior Louvers	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-05			400	BPB HHS-19, 20, 21		
C1090.20	Information Specialties	100	ABHA				200	ABHA		300	ABHA									

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
C1090.25 Compartments and Cubicles	100	ABHA					200	ABHA		300	ABHA								
C1090.30 Service Walls	100	ABHA					200	ABHA		300	ABHA								
C1090.35 Wall and Door Protection	100	ABHA					200	ABHA		300	ABHA								
C1090.40 Toilet, Bath, and Laundry Accessories	100	ABHA					200	ABHA		300	ABHA		400	BPA HHS-06					
C1090.45 Interior Gas Lighting	100	ABHA					200	ABHA		300	ABHA								
C1090.60 Safety Specialties																			
C1090.70 Storage Specialties																			
C1090.90 Other Interior Specialties																			
C20 INTERIOR FINISHES																			
C2010 Wall Finishes																			
C2010.10 Tile Wall Finish	100	ABHA					200	ABHA		300	ABHA								
C2010.20 Wall Paneling	100	ABHA					200	ABHA		300	ABHA								
C2010.30 Wall Coverings	100	ABHA					200	ABHA		300	ABHA								
C2010.35 Wall Carpeting	100	ABHA					200	ABHA		300	ABHA								
C2010.50 Stone Facing	100	ABHA					200	ABHA		300	ABHA								
C2010.60 Special Wall Surfacing	100	ABHA					200	ABHA		300	ABHA								
C2010.70 Wall Painting and Coating	100	ABHA					200	ABHA		300	ABHA								
C2010.80 Acoustical Wall Treatment	100	ABHA					200	ABHA		300	ABHA								
C2010.90 Wall Finish Supplementary Components	100	ABHA					200	ABHA		300	ABHA								
C2020 Interior Fabrications																			
C2030 Flooring																			
C2030.10 Flooring Treatment	100	ABHA					200	ABHA		300	ABHA								

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Model Elements Utilizing CSI:UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
C2030.20 Tile Flooring	100	ABHA					200	ABHA		300	ABHA								
C2030.30 Specialty Flooring	100	ABHA					200	ABHA		300	ABHA								
C2030.40 Masonry Flooring	100	ABHA					200	ABHA		300	ABHA								
C2030.45 Wood Flooring	100	ABHA					200	ABHA		300	ABHA								
C2030.50 Resilient Flooring	100	ABHA					200	ABHA		300	ABHA								
C2030.60 Terrazzo Flooring	100	ABHA					200	ABHA		300	ABHA								
C2030.70 Fluid-Applied Flooring	100	ABHA					200	ABHA		300	ABHA								
C2030.75 Carpeting	100	ABHA					200	ABHA		300	ABHA								
C2030.80 Athletic Flooring	100	ABHA					200	ABHA		300	ABHA								
C2030.85 Entrance Flooring	100	ABHA					200	ABHA		300	ABHA								
C2030.90 Flooring Supplementary Components	100	ABHA					200	ABHA		300	ABHA								
C2040 Stair Finishes																			
C2040.20 Tile Stair Finish	100	ABHA					200	ABHA		300	ABHA								
C2040.40 Masonry Stair Finish	100	ABHA					200	ABHA		300	ABHA								
C2040.45 Wood Stair Finish	100	ABHA					200	ABHA		300	ABHA								
C2040.50 Resilient Stair Finish	100	ABHA					200	ABHA		300	ABHA								
C2040.60 Terrazzo Stair Finish	100	ABHA					200	ABHA		300	ABHA								
C2040.75 Carpeted Stair Finish	100	ABHA					200	ABHA		300	ABHA								
C2050 Ceiling Finishes																			
C2050.10 Plaster and Gypsum Board Finish	100	ABHA					200	ABHA		300	ABHA								
C2050.20 Ceiling Paneling	100	ABHA					200	ABHA		300	ABHA		400	BPA HHS-08					
C2050.70 Ceiling Painting and Coating																			
C2050.80 Acoustical Ceiling Treatment	100	ABHA					200	ABHA		300	ABHA		400	BPA HHS-08					

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	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
Model Elements Utilizing CSI UniFormat™																			
C2050.90	Ceiling Finish Supplementary Components	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-08					
C2090	Interior Finish Schedules– N/A																		
D SERVICES																			
D10 CONVEYING																			
D1010 Vertical Conveying Systems																			
D1010.10	Elevators	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-17	400		BPB HHS-19, 21, 21		
D1010.20	Lifts	100	ABHA				200	ABHA		300	ABHA		400	BPA HHS-17	400		BPB HHS-19, 21, 21		
D1010.30	Escalators– N/A																		
D1010.50	Dumbwaiters– N/A																		
D1010.60	Moving Ramps– N/A																		
D1030 Horizontal Conveying– N/A																			
D1030.10	Moving Walks																		
D1030.30	Turntables																		
D1030.50	Passenger Loading Bridges																		
D1030.70	People Movers																		
D1050 Material Handling– N/A																			
D1050.10	Cranes																		
D1050.20	Hoists																		
D1050.30	Derricks																		
D1050.40	Conveyors																		
D1050.50	Baggage Handling Equipment																		
D1050.60	Chutes																		
D1050.70	Pneumatic Tube Systems																		
D1080	Operable Access Systems– N/A																		

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
D1080.10 Suspended Scaffolding																			
D1080.20 Rope Climbers																			
D1080.30 Elevating Platforms																			
D1080.40 Powered Scaffolding																			
D1080.50 Building Envelope Access																			
D20 PLUMBING																			
D2010 Domestic Water Distribution																			
D2010.10 Facility Potable-Water Storage Tanks	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2010.20 Domestic Water Equipment	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2010.40 Domestic Water Piping	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2010.60 Plumbing Fixtures	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2010.90 Domestic Water Distribution Supplementary Components	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2020 Sanitary Drainage																			
D2020.10 Sanitary Sewerage Equipment	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2020.30 Sanitary Sewerage Piping	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2020.90 Sanitary Drainage Supplementary Components	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2030 Building Support Plumbing Systems																			
D2030.10 Stormwater Drainage Equipment	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2030.20 Stormwater Drainage Piping	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2030.30 Facility Stormwater Drains	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2030.60 Gray Water Systems	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
D2030.90 Building Support Plumbing	100	ABHA				200	ABHA		300	ABHA						400			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
System Supplementary Components																			BPB HHS-19
D2050 General Service Compressed-Air																			
D2060 Process Support Plumbing Systems																			
D2060.10 Compressed-Air Systems	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19
D2060.20 Vacuum Systems	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19
D2060.30 Gas Systems	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19
D30 HEATING, VENTILATION, AND AIR CONDITIONING (HVAC)																			
D3010 Facility Fuel Systems																			
D3010.10 Fuel Piping	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19
D3010.30 Fuel Pumps	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19
D3010.50 Fuel Storage Tanks	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19
D3020 Heating Systems																			
D3020.10 Heat Generation	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19
D3020.70 Decentralized Heating Equipment	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19
D3020.90 Heating System Supplementary Components	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19
D3030 Cooling Systems																			
D3030.10 Central Cooling	100	ABHA					200	ABHA		300	ABHA					400			BPB HHS-19

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	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
Model Elements Utilizing CSI-UniFormat™																			
D3030.90	Cooling System Supplementary Components	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3050	Facility HVAC Distribution Systems																		
D3050.30	Facility Steam Distribution	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3050.50	HVAC Air Distribution	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3050.90	Facility Distribution Systems Supplementary Components	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3060	Ventilation																		
D3060.10	Supply Air	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3060.20	Return Air	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3060.30	Exhaust Air	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3060.40	Outside Air	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3060.60	Air-to-Air Energy Recovery	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3060.70	HVAC Air Cleaning	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D3060.90	Ventilation Supplementary Components	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-19	
D40	FIRE PROTECTION																		
D4010	Fire Suppression																		
D4010.10	Water-Based Fire-Suppression	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-21	
D4010.50	Fire-Extinguishing	100	ABHA				200	ABHA		300	ABHA					400		BPB HHS-21	
D4010.90	Fire Suppression Supplementary Components	100	ABHA				200	ABHA		300	ABHA					400			

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	Design Intent Model			Schematic Design			Design Development			Construction Documents											
Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes			
D4030 Fire Protection Specialties																			BPB HHS-21		
D4030.10 Fire Protection Cabinets	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-21	
D4030.30 Fire Extinguishers	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-21	
D4030.70 Fire Extinguisher Accessories	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-21	
D50 ELECTRICAL																					
D5010 Facility Power Generation																					
D5010.10 Packaged Generator Assemblies	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-20	If applicable
D5010.60 Power Filtering and Conditioning																					
D5010.70 Transfer Switches	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-20	
D5010.90 Facility Power Generation Supplementary Components	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-20	
D5020 Electrical Service and Distribution																					
D5020.10 Electrical Service	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-20	
D5020.30 Power Distribution	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-20	
D5020.70 Facility Grounding	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-20	
D5020.90 Electrical Service and Distribution Supplementary Components	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-20	
D5030 General Purpose Electrical Power																					
D5030.10 Branch Wiring System	100	ABHA					200	ABHA		300	ABHA								400	BPB HHS-20	

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§ 3.3 Model Element Table		Design Intent																	
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Model Elements Utilizing CSI UniFormat™		LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes
D5030.50	Wiring Devices	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
D5030.90	General Purpose Electrical Power Supplementary Components	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
D5040 Lighting																			
D5040.10	Lighting Control	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
D5040.20	Branch Wiring for Lighting	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
D5040.50	Lighting Fixtures	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
D5040.90	Lighting Supplementary Components	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
D5080 Miscellaneous Electrical Systems																			
D5080.10	Lightning Protection	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
D5080.70	Transient Voltage Suppression	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
D5080.90	Miscellaneous Electrical Systems Supplementary Components	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
D60 COMMUNICATIONS																			
D6010 Data Communications																			
D6010.10	Data Communications Network Equipment	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-23
D6010.20	Data Communications Hardware	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-23
D6010.30	Data Communications Peripheral Data Equipment	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-23
D6010.60	Data Communication Program and Integration Services	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-23

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	Design Intent Model	Schematic Design			Design Development			Construction Documents											
Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
D6020 Voice Communications																			
D6020.10 Voice Communications Switching and Routing Equipment	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-23	
D6020.20 Voice Communications Terminal Equipment	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-23	
D6030 Audio-Video Communication																			
D6030.10 Audio-Video Systems	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-23	
D6030.50 Electronic Digital Systems	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
D6090 Communications Supplementary Components																			
D6090.10 Supplementary Components	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20, 23	
D70 ELECTRONIC SAFETY AND SECURITY																			
D7010 Access Control and Intrusion Detection																			
D7010.10 Access Control																			
D7010.50 Intrusion Detection																			
D7030 Electronic Surveillance																			
D7030.10 Video Surveillance	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-24	
D7030.50 Electronic Personal Protection	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-24	

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	Design Intent Model			Schematic Design			Design Development			Construction Documents								
Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes
D7050 Detection and Alarm																		
D7050.10 Fire Detection and Alarm	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-21	
D7070 Electronic Monitoring and Control																		
D7070.10 Electronic Detention Monitoring and Control																		
D7090 Electronic Safety and Security Supplementary Components																		
D7090.10 Supplementary Components																		
D80 INTEGRATED AUTOMATION																		
D8010 Integrated Automation Facility Controls																		
D8010.10 Integrated Automation Control of Equipment	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-24	
D8010.20 Integrated Automation Control of Conveying Equipment	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-24	
D8010.30 Integrated Automation Control of Fire-Suppression Systems	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-24	
D8010.40 Integrated Automation Control of Plumbing Systems	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-24	
D8010.50 Integrated Automation Control of HVAC Systems	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-24	
D8010.60 Integrated Automation Control of Electrical Systems	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-24	

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
E EQUIPMENT AND FURNISHINGS																			
E10 EQUIPMENT																			
E1010 Vehicle and Pedestrian Equipment– N/A																			
E1010.10																			
E1010.30																			
E1010.50																			
E1010.70																			
E1030 Commercial Equipment																			
E1030.10																			
E1030.20																			
E1030.25																			
E1030.30	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
E1030.35	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	
E1030.40																			
E1030.50																			
E1030.55																			
E1030.60																			
E1030.70																			
E1030.75																			
E1030.80	100	ABHA				200	ABHA		300	ABHA						400		BPB HHS-19	

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Model Elements Utilizing CSI UniFormat™		LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes
E1040 Institutional Equipment																			
E1040.10	Educational and Scientific Equipment	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-19
E1040.20	Healthcare Equipment	100																	
E1040.40	Religious Equipment	100																	
E1040.60	Security Equipment	100	ABHA				200	ABHA			300	ABHA					400		BPB HHS-20
E1040.70	Detention Equipment																		
E1060 Residential Equipment– N/A																			
E1060.10	Residential Appliances																		
E1060.50	Retractable Stairs																		
E1060.70	Residential Ceiling Fans																		
E1070 Entertainment and Recreational Equipment																			
E1070.10	Theater and Stage Equipment	100	ABHA				200	ABHA			300	ABHA		400	BPA HHS-08				
E1070.20	Musical Equipment																		
E1070.50	Athletic Equipment																		
E1070.60	Recreational Equipment																		
E1090 Other Equipment																			
E1090.10	Solid Waste Handling Equipment																		
E1090.30	Agricultural Equipment	100	ABHA				200	ABHA			300	ABHA							
E1090.40	Horticultural Equipment	100	ABHA				200	ABHA			300	ABHA							
E1090.60	Decontamination Equipment	100																	
E20 FURNISHINGS																			
E2010 Fixed Furnishings																			
E2010.10	Fixed Art	100	ABHA				200	ABHA			300	ABHA							

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
E2010.20 Window Treatments	100	ABHA					200	ABHA		300	ABHA								
E2010.30 Casework	100	ABHA					200	ABHA		300	ABHA		400	BPA HHS-11					
E2010.70 Fixed Multiple Seating	100	ABHA					200	ABHA		300	ABHA								
E2010.90 Other Fixed Furnishings	100	ABHA					200	ABHA		300	ABHA								
E2050 Movable Furnishings																			
E2050.10 Movable Art	100	ABHA					200	ABHA		300	ABHA								
E2050.30 Furniture	100	ABHA					200	ABHA		300	ABHA								
E2050.40 Accessories	100	ABHA					200	ABHA		300	ABHA								
E2050.60 Movable Multiple Seating	100	ABHA					200	ABHA		300	ABHA								
E2050.90 Other Movable Furnishings	100	ABHA					200	ABHA		300	ABHA								
F SPECIAL CONSTRUCTION AND DEMOLITION																			
F10 SPECIAL CONSTRUCTION																			
F1010 Integrated Construction																			
F1010.10 Building Modules	100	ABHA					200	ABHA		300	ABHA								
F1010.50 Manufactured/Fabricated Rooms	100	ABHA					200	ABHA		300	ABHA								
F1010.70 Modular Mezzanines	100	ABHA					200	ABHA		300	ABHA								
F1020 Special Structures– N/A																			
F1020.10 Fabric Structures																			
F1020.20 Space Frames																			
F1020.30 Geodesic Structures																			
F1020.40 Manufacturer-Engineered Structures																			
F1020.60 Manufactured Canopies																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
F1020.65 Rammed Earth Construction																			
F1020.70 Towers																			
F1030 Special Function Construction																			
F1030.10 Sound and Vibration Control	100	ABHA					200	ABHA					300	ABHA					
F1030.30 Seismic Control	100	ABHA					200	ABHA					300	ABHA					
F1030.50 Radiation Protection																			
F1050 Special Facility Components																			
F1050.10 Pools																			
F1050.20 Interior Fountains																			
F1050.30 Interior Water Features																			
F1050.40 Aquariums																			
F1050.50 Amusement Park Structures and Equipment																			
F1050.60 Ice Rinks																			
F1050.70 Animal Containment																			
F1060 Athletic and Recreational Special Construction																			
F1060.10 Indoor Soccer Boards																			
F1060.20 Safety Netting																			
F1060.30 Arena Football Boards																			
F1060.40 Floor Sockets																			
F1060.50 Athletic and Recreational Court Walls																			
F1060.60 Demountable Athletic Surfaces																			
F1080 Special Instrumentation																			
F1080.10 Stress Instrumentation																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	EOD	MEA	Notes
F1080.20 Seismic Instrumentation																		
F1080.40 Meteorological Instrumentation																		
F1080.60 Earth Movement Monitoring																		
F20 FACILITY REMEDIATION																		
F2010 Hazardous Materials Remediation																		
F2010.10 Transportation and Disposal of Hazardous Materials																		
F2010.20 Asbestos Remediation																		
F2010.30 Lead Remediation																		
F2010.40 Polychlorinate Biphenyl Remediation																		
F2010.50 Mold Remediation																		
F30 DEMOLITION																		
F3010 Structure Demolition																		
F3010.10 Building Demolition	100	ABHA					200	ABHA		300	ABHA							
F3010.30 Tower Demolition	100	ABHA					200	ABHA		300	ABHA							
F3010.50 Bridge Demolition	100	ABHA					200	ABHA		300	ABHA							
F3010.70 Dam Demolition	100	ABHA					200	ABHA		300	ABHA							
F3030 Selective Demolition																		
F3030.10 Selective Building Demolition	100	ABHA					200	ABHA		300	ABHA							
F3030.30 Selective Interior Demolition	100	ABHA					200	ABHA		300	ABHA							
F3030.50 Selective Bridge Demolition	100	ABHA					200	ABHA		300	ABHA							
F3030.70 Selective Historic Demolition	100	ABHA					200	ABHA		300	ABHA							
F3050 Structure Moving																		
F3050.10 Structure Relocation	100	ABHA					200	ABHA		300	ABHA							

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
F3050.30 Structure Raising	100	ABHA					200	ABHA		300	ABHA								
G SITEWORK-- N/A																			
G10 SITE PREPARATION																			
G1010 Site Clearing																			
G1010.10																			
G1010.30																			
G1010.50																			
G1020 Site Elements Demolition																			
G1020.10																			
G1020.30																			
G1020.50																			
G1030 Site Element Relocations																			
G1030.10																			
G1050 Site Remediation																			
G1050.10																			
G1050.15																			
G1050.20																			
G1050.25																			
G1050.30																			
G1050.40																			
G1050.45																			
G1050.50																			

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	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
Model Elements Utilizing CSI UniFormat™																			
G1050.60	Contaminated Site Material Removal																		
G1050.80	Water Remediation																		
G1070	Site Earthwork																		
G1070.10	Grading																		
G1070.20	Excavation and Fill																		
G1070.30	Embankments																		
G1070.35	Erosion and Sedimentation Controls																		
G1070.40	Soil Stabilization																		
G1070.45	Rock Stabilization																		
G1070.50	Soil Reinforcement																		
G1070.55	Slope Protection																		
G1070.60	Gabions																		
G1070.65	Riprap																		
G1070.70	Wetlands																		
G1070.80	Earth Dams																		
G1070.90	Site Soil Treatment																		
G20	SITE IMPROVEMENTS – N/A																		
G2010	Roadways																		
G2010.10	Roadway Pavement																		
G2010.20	Roadway Curbs and Gutters																		
G2010.40	Roadway Appurtenances																		
G2010.70	Roadway Lighting																		
G2010.80	Vehicle Fare Collection																		

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
G2020 Parking Lots																			
G2020.10 Parking Lot Pavement																			
G2020.20 Parking Lot Curbs and Gutters																			
G2020.40 Parking Lot Appurtenances																			
G2020.70 Parking Lot Lighting																			
G2020.80 Exterior Parking Control Equipment																			
G2030 Pedestrian Plazas and Walkways																			
G2030.10 Pedestrian Pavement																			
G2030.20 Pedestrian Pavement Curbs and Gutters																			
G2030.30 Exterior Steps and Ramps																			
G2030.40 Pedestrian Pavement Appurtenances																			
G2030.70 Plaza and Walkway Lighting																			
G2030.80 Exterior Pedestrian Control Equipment																			
G2040 Airfields																			
G2040.10 Aviation Pavement																			
G2040.20 Aviation Pavement Curbs and Gutters																			
G2040.40 Aviation Pavement Appurtenances																			
G2040.70 Airfield Lighting																			
G2040.80 Airfield Signaling and Control Equipment																			
G2050 Athletic, Recreational, and Playfield Areas																			
G2050.10 Athletic Areas																			

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Bid Pack B June 8, 2016

§ 3.3 Model Element Table	Design Intent																		
	Design Intent Model			Schematic Design			Design Development			Construction Documents			Means & Methods Model – Phase I Bid Package A See Attachment for Scope Participant			Means & Methods Model – Phase II Bid Package B See Attachment for Scope Participant			Notes (See Sec 3.4)
	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
Model Elements Utilizing CSI UniFormat™																			
G2050.30	Recreational Areas																		
G2050.50	Playfield Areas																		
G2060	Site Development																		
G2060.10	Exterior Fountains																		
G2060.20	Fences and Gates																		
G2060.25	Site Furnishings																		
G2060.30	Exterior Signage																		
G2060.35	Flagpoles																		
G2060.40	Covers and Shelters																		
G2060.45	Exterior Gas Lighting																		
G2060.50	Site Equipment																		
G2060.60	Retaining Walls																		
G2060.70	Site Bridges																		
G2060.80	Site Screening Devices																		
G2060.85	Site Specialties																		
G2080	Landscaping																		
G2080.10	Planting Irrigation																		
G2080.20	Turf and Grasses																		
G2080.30	Plants																		
G2080.50	Planting Accessories																		
G2080.70	Landscape Lighting																		
G2080.80	Landscaping Activities																		
G30	LIQUID AND GAS SITE UTILITIES- N/A																		
G3010	Water Utilities																		

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
G3010.10 Site Domestic Water Distribution																			
G3010.30 Site Fire Protection Water Distribution																			
G3010.50 Site Irrigation Water Distribution																			
G3020 Sanitary Sewerage Utilities																			
G3020.10 Sanitary Sewerage Utility Connection																			
G3020.20 Sanitary Sewerage Piping																			
G3020.40 Utility Septic Tanks																			
G3020.50 Sanitary Sewerage Structures																			
G3020.60 Sanitary Sewerage Lagoons																			
G3030 Storm Drainage Utilities																			
G3030.10 Storm Drainage Utility Connection																			
G3030.20 Storm Drainage Piping	100	ABHA					200	ABHA		300	ABHA					400		BPB HHA-19	
G3030.30 Culverts																			
G3030.40 Site Storm Water Drains	100	ABHA					200	ABHA		300	ABHA					400		BPB HHA-19	
G3030.50 Storm Drainage Pumps																			
G3030.60 Site Subdrainage																			
G3030.70 Storm Drainage Ponds and Reservoirs																			
G3050 Site Energy Distribution																			
G3050.10 Site Hydronic Heating Distribution																			
G3050.20 Site Steam Energy Distribution																			
G3050.40 Site Hydronic Cooling Distribution																			

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
G3060 Site Fuel Distribution																			
G3060.10 Site Gas Distribution																			
G3060.20 Site Fuel-Oil Distribution																			
G3060.30 Site Gasoline Distribution																			
G3060.40 Site Diesel Fuel Distribution																			
G3060.60 Site Aviation Fuel Distribution																			
G3090 Liquid and Gas Site Utilities Supplementary Components																			
G3090.10 Supplementary Components																			
G40 ELECTRICAL SITE IMPROVEMENTS																			
G4010 Site Electric Distribution Systems																			
G4010.10 Electrical Utility Services	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4010.20 Electric Transmission and Distribution	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4010.30 Electrical Substations	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4010.40 Electrical Transformers	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4010.50 Electrical Switchgear and Protection Devices	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4010.70 Site Grounding	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4010.90 Electrical Distribution System Instrumentation and Controls	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4050 Site Lighting																			
G4050.10 Area Lighting	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4050.20 Flood Lighting	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4050.50 Building Illumination	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	
G4050.90 Exterior Lighting Supplementary Components	100	ABHA					200	ABHA		300	ABHA					400		BPB HHS-20	

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Model Elements Utilizing CSI UniFormat™	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	LOD	MEA	Notes	
G50 SITE COMMUNICATIONS																			
G5010 Site Communications Systems																			
G5010.10 Site Communications Structures	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-20		
G5010.30 Site Communications Distribution	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-20		
G5010.50 Wireless Communications Distribution	100	ABHA					200	ABHA		300	ABHA					400	BPB HHS-20		
G90 MISCELLANEOUS SITE CONSTRUCTION																			
G9010 Tunnels																			
G9010.10 Vehicular Tunnels																			
G9010.20 Pedestrian Tunnels																			
G9010.40 Service Tunnels																			
G9010.90 Tunnel Construction Related Activities																			

§ 3.4 Model Element Table Notes

Notes:

Identify all filter locations and covers.

Scope participant list is attached.

Model Element Table is an add on document to all bid packages noted above and relating to all contractors scope of work. The table identifies all bid package requirements to provide Building Information Models (BIM) during the BIM coordination process. In addition, refer to BIM protocol instruction to see LOD descriptions.

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Bid Pack B Addendum No. 2

June 8, 2016

NCC Vocational Technical School

Renovations to Howard High School of Technology

Project Building Information Modeling (BIM)

Scope Participant List

Bid Package A:

Contract HHS-01	Demolition
Contract HHS-02	Sitework/Utilities
Contract HHS-03	Concrete
Contract HHS-04	Masonry and Masonry Restoration
Contract HHS-05	Structural and Miscellaneous Steel
Contract HHS-06	Carpentry/Rough and Finish
Contract HHS-07	Metal Framing, Drywall, Plaster
Contract HHS-08	Acoustical Ceilings and Panels
Contract HHS-09	Terrazzo Flooring
Contract HHS-10	Flooring
Contract HHS-11	Laminate Casework and Millwork
Contract HHS-12	Roofing, Sheet Metal and Waterproofing
Contract HHS-13	Ceramic Tile
Contract HHS-14	Painting and Coatings
Contract HHS-15	Wood Flooring
Contract HHS-16	Window Treatments
Contract HHS-17	Conveying Equipment
Contract HHS-18	Aluminum Windows

Bid Package B:

Contract HHS-19	Mechanical & Plumbing
Contract HHS-20	Electrical and IT Infrastructure
Contract HHS-21	Fire Protection
Contract HHS-22	Testing, Adjusting and Balancing
Contract HHS-23	Technology
Contract HHS-24	ATC



**SECTION 01 9113
GENERAL COMMISSIONING REQUIREMENTS**

PART 1 GENERAL

1.01 SUMMARY

- A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
 - 1. Verify and document that functional performance is in accordance with the Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
 - 2. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
 - 3. Verify that the Owner's operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.
- B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Substantial Completion
- C. The Commissioning Authority is employed by Owner.

1.02 SCOPE OF COMMISSIONING

- A. The following are to be commissioned:
- B. Building envelope.
- C. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

1.03 RELATED REQUIREMENTS

- A. Section 01 7800 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.
- B. Section 04 0125 - Masonry Cleaning
- C. Section 04 0126 - Masonry Restoration
- D. Section 07 9200 - Joint Sealants

1.04 REFERENCE STANDARDS

- A. PEI (Samples) - Sample Forms for Prefunctional Checklists and Functional Performance Tests; Portland Energy Conservation, Inc.; located at <http://www.peci.org/library/mcpgs.htm>; current edition.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures; except:
 - 1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority, unless they require review by Architect; in that case, submit to Architect first.
 - 2. Submit one copy to the Commissioning Authority, not to be returned.
 - 3. Make commissioning submittals on time schedule specified by Construction Manager.
 - 4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of Prefunctional Checklists or Functional Test requirements; submit in editable electronic format, Microsoft Word 2010 preferred.

5. As soon as possible after submittals made to Architect are approved, submit copy of approved submittal to the Commissioning Authority.
- B. Manufacturers' Instructions: Submit copies of all manufacturer-provided instructions that are shipped with the material as soon as the material is delivered.
- C. Product Data: If submittals to Architect do not include the following, submit copies as soon as possible:
 1. Manufacturer's product data, cut sheets, and shop drawings.
 2. Manufacturer's installation instructions.
 3. Factory test reports.
 4. Warranty information, including details of Owner's responsibilities in regard to keeping warranties in force.
- D. Completed Prefunctional Checklists.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

- A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.
- B. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

PART 3 EXECUTION

3.01 COMMISSIONING PLAN

- A. Commissioning Authority will prepare the Commissioning Plan.
 1. Attend meetings called by the Commissioning Authority for purposes of completing the commissioning plan.
 2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.
- B. Contractor is responsible for compliance with the Commissioning Plan.
- C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.
- D. Commissioning Schedule:
 1. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
 2. Provide sufficient notice to Commissioning Authority for delivery of relevant Checklists and Functional Test procedures, to avoid delay.

3.02 DOCUMENTATION IDENTIFICATION SYSTEM

- A. Give each submitted form or report a unique identification; use the following scheme.
- B. Type of Document: Use the following prefixes:
 1. Functional Test Procedure: FTP-.
 2. Functional Test Report: FTR-.
- C. Component Number: Assign numbers sequentially, using 1, 2, or 3 digits as required to accommodate the number of units in the system.

- D. Test, Revision, or Submittal Number: Number each successive iteration sequentially, starting with 1.
- E. Example: PC-2320-001.2 would be the Prefunctional Checklist for equipment item 1 in the HVAC piping system, probably a pump; this is the second, revised submittal of this checklist.

3.03 STARTUP PLANS AND REPORTS

- A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.
- B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.
- C. Submit directly to the Commissioning Authority.

3.04 PREFUNCTIONAL CHECKLISTS

- A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
 - 1. No sampling of identical or near-identical items is allowed.
 - 2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
 - 3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
 - a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
 - b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
 - c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
 - d. Serial number of installed unit.
 - e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer's start-up checklist items and minor testing.
 - f. Sensor and actuator calibration information.
 - 4. Samples of Prefunctional Checklist forms that indicate anticipated level of detail can be found at <http://www.peci.org/library/mcpgs.htm>.
- B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Authority is not required unless otherwise specified.
 - 1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
 - 2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.

3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
 4. If any Checklist line item is not relevant, record reasons on the form.
 5. Contractor may independently perform startup inspections and/or tests, at his option.
 6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.
 7. Submit completed Checklists to Commissioning Authority within two days of completion.
- C. Commissioning Authority is responsible for furnishing the Prefunctional Checklists to Contractor.
1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so indicated in the Contract Documents.
 2. Provide all additional information requested by Commissioning Authority to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
 3. Commissioning Authority may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in the Contract Documents or not.
 4. When asked to review the proposed Checklists, do so in a timely manner.
- D. Commissioning Authority Witnessing: Required for:
1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
 2. A sampling of non-primary equipment, as allowed by the commissioning plan.
- E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
1. If difficulty in correction would delay progress, report deficiency to the Commissioning Authority immediately.

3.05 FUNCTIONAL TESTS

- A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.
- B. Contractor is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.
- C. Commissioning Authority is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.
- D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Authority will document the deficiency and the Contractor's stated intentions regarding correction.
 1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents or does not perform properly.
 2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Authority; the Commissioning Authority will reschedule the test and the Contractor shall re-test.
 3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after

notification of defect, including provision for testing sample installations prior to replacement of all items.

4. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing.
5. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Contractor shall bear the cost of the second and subsequent re-tests.

E. Functional Test Procedures:

1. Some test procedures are included in the Contract Documents; where Functional Test procedures are not included in the Contract Documents, test procedures will be determined by the Commissioning Authority with input by and coordination with Contractor.
2. Examples of Functional Testing:
 - a. Test for sealant adhesive and cohesive failure.
 - b. Test windows for resistance to water penetration.

3.06 TEST PROCEDURES - GENERAL

- A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
- B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.
- C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
 1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
 2. If frequent failures occur, resulting in more troubleshooting than testing, the Commissioning Authority may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.
- D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the "observation").

3.07 OPERATION AND MAINTENANCE MANUALS

- A. See Section 01 7800 - Closeout Submittals for additional requirements.
- B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.
- C. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.
- D. Commissioning Authority will add commissioning records to manuals after submission to Owner.

END OF SECTION

SECTION 01 9115
EXTERIOR ENCLOSURE COMMISSIONING

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes exterior enclosure commissioning procedures, including exterior enclosure, and roofing construction that protects climate-controlled interior spaces from unconditioned spaces and the exterior environment, as follows:
 - 1. Below-grade construction including foundations, basements, and slab-on-grade that functions as part of the exterior enclosure system but excluding structural systems and components.
 - 2. Superstructure floor and roof construction that functions as part of the exterior enclosure system.
 - 3. Exterior enclosure construction, above grade, including exterior opaque walls, windows, and doors including sheathing, framing, and insulation, and interior finish materials attached to the exterior wall.
 - 4. Roofing, including roofing system, roofing insulation, and skylights, hatches, and other roof openings.

1.02 RELATED SECTIONS:

- A. Division 01 Section "General Commissioning Requirements" for general requirements for commissioning including definitions, commissioning team membership, Owner's responsibilities, Contractor's responsibilities, and Commissioning Authority's responsibilities.
- B. Division 03 through 14 Sections for facility exterior enclosure commissioning requirements specific to the Work of each Section.

1.03 ALLOWANCES

- A. Commissioning testing and inspection costs are included in the Commissioning Testing Allowance in Division 01 Section "Allowances."

1.04 UNIT PRICE

- A. Commissioning Testing Allowance may be adjusted up or down by the "Commissioning Testing Man-Hour" unit prices in Division 01 Section "Unit Prices" when actual man hours are computed at the end of commissioning testing.

1.05 CONTRACTOR'S RESPONSIBILITIES

- A. Attend construction-phase coordination meetings.
- B. Provide schedule of field quality control tests and inspections required by the Contract Documents to Commissioning Authority.
 - 1. Update schedule biweekly throughout the construction period.
- C. Submit field quality control testing and inspection reports on exterior enclosure construction to the Commissioning Authority.
- D. Submit operation and maintenance data for systems, subsystems, and components to the Commissioning Authority.
- E. Participate in testing-procedures meetings.
- F. Participate in testing of installed systems, subsystems, and construction.
- G. Provide test data, inspection reports, and certificates to Commissioning Authority.
- H. Participate in maintenance orientation and inspection.

- I. Participate in operation and maintenance training sessions.
- J. Participate in final review at acceptance meeting.
- K. Provide input for final commissioning documentation.

1.06 COMMISSIONING AUTHORITY'S RESPONSIBILITIES

- A. Provide Project-specific construction checklists and commissioning process test procedures.
- B. Witness systems, assemblies, equipment, and component startup.
- C. Compile test data, inspection reports, and certificates and include them in the systems manual and commissioning process report.

1.07 COMMISSIONING DOCUMENTATION

- A. Provide the following information to Commissioning Authority for inclusion in the Commissioning Plan:
 - 1. Submittals, information for systems manuals, and other required documents and reports.
 - 2. Identification of installed exterior enclosure components, assemblies, systems, and equipment, including design changes that occurred during the construction phase.
 - 3. Certificate of completion, certifying that exterior enclosure assemblies, systems, equipment, and associated controls are complete and ready for testing.
 - 4. Test and inspection reports and certificates.
 - 5. Corrective action documents.

1.08 PRECONSTRUCTION TESTING

- A. Preconstruction Mockup Testing:
 - 1. Provide adhesion testing of sealant.
 - 2. Provide stain testing of sealant.
 - 3. Provide water penetration resistance testing of windows.
 - 4. Provide mortar pointing samples for brick work.

1.09 COMMISSIONING SUBMITTALS

- A. Submit commissioning submittals to Commissioning Authority. Submittals requiring Architect's action will be returned to Construction Manager, through Architect.

1.10 QUALITY ASSURANCE

- A. Quality Assurance and Control: Specific commissioning quality-assurance and-control requirements for individual construction activities are specified in the Sections that specify those activities. Specified commissioning tests, inspections, and related actions do not limit Contractor's other quality-assurance and-control procedures that facilitate compliance with the Contract Document requirements.
- B. Preconstruction Commissioning Conference: Commissioning Authority will schedule a preconstruction commissioning conference before construction of the exterior enclosure starts, at a time convenient to Owner, Construction Manager, Contractor, and Architect, but no later than 15 days after execution of the Agreement with the Contractor. Allow for the conference to be held at Project site or another convenient location. The Commissioning Authority will conduct the meeting to review commissioning responsibilities and personnel assignments.
 - 1. Attendees: Authorized representatives of Owner, Construction Manager, Commissioning Authority, Architect and consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to commissioning.

2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Commissioning plan
 - b. Tentative construction schedule.
 - c. Phasing.
 - d. Critical work sequencing and long-lead items.
 - e. Designation of key personnel and their duties.
 - f. Procedures for testing and inspecting.
 - g. Submittal procedures.
 - h. LEED requirements.
 - i. Preparation of Record Documents.
 - j. Owner's occupancy requirements.
 - k. Security.
3. Minutes: Record and distribute meeting minutes.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 VERIFICATION

- A. Certify that building exterior enclosure systems, subsystems, and construction have been completed according to the Contract Documents.
- B. Commissioning Authority will witness and document field quality-control tests and inspections.
- C. Verify that field quality control testing of building exterior enclosure has been completed and approved, that discrepancies have been corrected, and corrective work approved.
 1. Annotate checklist or data sheet when a deficiency is observed.
- D. Deferred Testing:
 1. If tests cannot be completed because of a deficiency outside the scope of the Building Exterior Enclosure, the deficiency shall be documented and reported to Owner. Deficiencies shall be resolved and corrected by Contractor and tests rescheduled.
 2. If the testing plan indicates specific seasonal testing, appropriate initial performance tests shall be completed and documented and additional tests scheduled.
- E. Testing Reports:
 1. Reports shall include measured data, data sheets, and a comprehensive summary describing the building exterior enclosure systems at the time of testing.
 2. Prepare a preliminary test report. Deficiencies will be evaluated by Architect to determine corrective action. Deficiencies shall be corrected and test repeated.

3.02 BUILDING ENVELOPE TEST FORMS

- A. Test forms follow this section.

END OF SECTION

SECTION 08 7110
DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY:

- A. Section Includes: Finish Hardware for door openings, except as otherwise specified herein.
 - 1. Door hardware for steel (hollow metal) doors.
 - 2. Door hardware for aluminum doors.
 - 3. Door hardware for wood doors.
 - 4. Door hardware for other doors indicated.
 - 5. Keyed cylinders as indicated.
- B. Related Sections:
 - 1. Division 6: Rough Carpentry.
 - 2. Division 8: Aluminum Doors and Frames
 - 3. Division 8: Hollow Metal Doors and Frames.
 - 4. Division 8: Wood Doors.
 - 5. Division 26 Electrical
 - 6. Division 28: Electronic Security
- C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
 - 1. Builders Hardware Manufacturing Association (BHMA)
 - 2. NFPA 101 Life Safety Code
 - 3. NFPA 80 -Fire Doors and Windows
 - 4. ANSI-A156.xx- Various Performance Standards for Finish Hardware
 - 5. UL10C - Positive Pressure Fire Test of Door Assemblies
 - 6. ANSI-A117.1 - Accessible and Usable Buildings and Facilities
 - 7. DHI /ANSI A115.IG - Installation Guide for Doors and Hardware
 - 8. ICC - International Building Code
- D. Intent of Hardware Groups
 - 1. Should items of hardware not definitely specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
 - 2. Where items of hardware aren't definitely or correctly specified, are required for completion of the Work, a written statement of such omission, error, or other discrepancy to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or, furnish such items in the type and quality established by this specification, and appropriate to the service intended.
- E. Allowances
 - 1. Refer to Division 1 for allowance amount and procedures.
- F. Alternates
 - 1. Refer to Division 1 for Alternates and procedures.

1.02 SUBSTITUTIONS:

- A. Comply with Division 1.

1.03 SUBMITTALS:

- A. Comply with Division 1.

- B. Special Submittal Requirements: Combine submittals of this Section with Sections listed below to ensure the "design intent" of the system/assembly is understood and can be reviewed together.
- C. Product Data: Manufacturer's specifications and technical data including the following:
 - 1. Detailed specification of construction and fabrication.
 - 2. Manufacturer's installation instructions.
 - 3. Wiring diagrams for each electric product specified. Coordinate voltage with electrical before submitting.
 - 4. Submit 6 copies of catalog cuts with hardware schedule.
 - 5. Provide ISO 9001-Quality Management and ISO 14001-Environmental Management for products listed in Materials Section 2.2
- D. Shop Drawings - Hardware Schedule: Submit complete reproducible copy of detailed hardware schedule in a vertical format.
 - 1. List groups and suffixes in proper sequence.
 - 2. Completely describe door and list architectural door number.
 - 3. Manufacturer, product name, and catalog number.
 - 4. Function, type, and style.
 - 5. Size and finish of each item.
 - 6. Mounting heights.
 - 7. Explanation of abbreviations and symbols used within schedule.
 - 8. Detailed wiring diagrams, specially developed for each opening, indicating all electric hardware, security equipment and access control equipment, and door and frame rough-ins required for specific opening.
- E. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
 - 1. Templates, wiring diagrams and "reviewed Hardware Schedule" of electrical terms to electrical for coordination and verification of voltages and locations.
- F. Samples:
 - 1. 1 sample of Lever and Rose/Escutcheon design, (pair).
 - 2. 3 samples of metal finishes
- G. Contract Closeout Submittals: Comply with Division 1 including specific requirements indicated.
 - 1. Operating and maintenance manuals: Submit 3 sets containing the following.
 - a. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 - 2. Copy of final hardware schedule, edited to reflect, "As installed".
 - 3. Copy of final keying schedule
 - 4. As installed "Wiring Diagrams" for each piece of hardware connected to power, both low voltage and 110 volts.
 - 5. One set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.04 QUALITY ASSURANCE

- A. Comply with Division 1.
 - 1. Statement of qualification for distributor and installers.
 - 2. Statement of compliance with regulatory requirements and single source responsibility.
 - 3. Distributor's Qualifications: Firm with 3 years' experience in the distribution of commercial hardware.
 - a. Distributor to employ full time Architectural Hardware Consultants (AHC) for the purpose of scheduling and coordinating hardware and establishing keying schedule.
 - b. Hardware Schedule shall be prepared and signed by an AHC.
 - 4. Installer's Qualifications: Firm with 3 years experienced in installation of similar hardware to that required for this Project, including specific requirements indicated.
 - 5. Regulatory Label Requirements: Provide testing agency label or stamp on hardware for labeled openings.
 - a. Provide UL listed hardware for labeled and 20 minute openings in conformance with requirements for class of opening scheduled.
 - b. Underwriters Laboratories requirements have precedence over this specification where conflict exists.
 - 6. Single Source Responsibility: Except where specified in hardware schedule, furnish products of only one manufacturer for each type of hardware.
- B. Review Project for extent of finish hardware required to complete the Work. Where there is a conflict between these Specifications and the existing hardware, notify the Architect in writing and furnish hardware in compliance with the Specification unless otherwise directed in writing by the Architect.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Comply with Division 1.
 - 1. Deliver products in original unopened packaging with legible manufacturer's identification.
 - 2. Package hardware to prevent damage during transit and storage.
 - 3. Mark hardware to correspond with "reviewed hardware schedule".
 - 4. Deliver hardware to door and frame manufacturer upon request.
- B. Storage and Protection: Comply with manufacturer's recommendations.

1.06 PROJECT CONDITIONS:

- A. Coordinate hardware with other work. Furnish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security and similar requirements indicated, as necessary for the proper installation and function, regardless of omissions or conflicts in the information on the Contract Documents.
- B. Review Shop Drawings for doors and entrances to confirm that adequate provisions will be made for the proper installation of hardware.

1.07 WARRANTY:

- A. Refer to Conditions of the Contract
- B. Manufacturer's Warranty:
 - 1. Closers: Ten years
 - 2. Exit Devices: Five Years
 - 3. Locksets Limited Lifetime
 - 4. Cylinders: Three years

5. All other Hardware: Two years.

1.08 OWNER'S INSTRUCTION:

- A. Instruct Owner's personnel in operation and maintenance of hardware units.

1.09 MAINTENANCE:

- A. Extra Service Materials: Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Division 1 Closeout Submittals Section.
 1. Special Tools: Provide special wrenches and tools applicable to each different or special hardware component.
 2. Maintenance Tools: Provide maintenance tools and accessories supplied by hardware component manufacturer.
 3. Delivery, Storage and Protection: Comply with Owner's requirements for delivery, storage and protection of extra service materials.
- B. Maintenance Service: Submit for Owner's consideration maintenance service agreement for electronic products installed.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents. Approval of manufacturers other than those listed shall be in accordance with Division 1.

	Manufacturer:	Approved:
1. Hinges	Stanley	Bommer, Hager
2. Continuous Hinges	Stanley	ABH, Bommer
3. Locksets	Best	Schlage L series, Sargent 8200 series
4. Cylinders	Best	
5. Exit Devices	Precision	Von Duprin, Detex
6. Closers	Stanley D-4550	LCN 4040, Norton 7500
7. Automatic Operators	Stanley D-4990	LCN 4640, Norton 6000
8. Push/Pull Plates	Trimco	Burns, Hiawatha, ABH
9. Protection Plates	Trimco	Burns, Hiawatha, ABH
10. Overhead Stops	ABH	Trimco, Dorma
11. Door Stops	Trimco	Burns, Hiawatha, ABH
12. Flush Bolts	Trimco	Burns, Hiawatha, ABH, DCI
13. Threshold & Gasketing	National Guard	Reese, DHSI

2.02 MATERIALS:

- A. Hinges:
 1. Template screw hole locations
 2. Minimum of 2 permanently lubricated non-detachable bearings
 3. Equip with easily seated, non-rising pins
 4. Sufficient size to allow 180-degree swing of door
 5. Furnish hinges with five knuckles and concealed bearings
 6. Provide hinge type as listed in schedule.
 7. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.

8. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
 9. UL10C listed for Fire rated doors.
- B. Geared Continuous Hinges:
1. Tested and approved by BHMA for ANSI A156.26-1996 Grade 1
 2. Anti-spinning through fastener
 3. UL10C listed for 3 hour Fire rating
 4. Non-handed
 5. Lifetime warranty
 6. Provide Fire Pins for 3-hour fire ratings
 7. Sufficient size to permit door to swing 180 degrees
- C. Mortise Type Locks and Latches:
1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra-Heavy Duty, Security Grade 2 and be UL10C.
 2. Furnish UL or recognized independent laboratory certified mechanical operational testing to 4 million cycles minimum.
 3. Provide 9001-Quality Management and 14001-Environmental Management.
 4. Fit ANSI A115.1 door preparation
 5. Functions and design as indicated in the hardware groups
 6. Solid, one-piece, 3/4-inch (19mm) throw, anti-friction latchbolt made of self-lubricating stainless steel
 7. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel
 8. Latchbolt and Deadbolt are to extend into the case a minimum of 3/8 inch (9.5mm) when fully extended
 9. Auxiliary deadlatch to be made of one piece stainless steel, permanently lubricated
 10. Provide sufficient curved strike lip to protect door trim
 11. Lever handles must be of forged or cast brass, bronze or stainless steel construction and conform to ANSI A117.1. Levers that contain a hollow cavity are not acceptable
 12. Lock shall have self-aligning, thru-bolted trim
 13. Levers to operate a roller bearing spindle hub mechanism
 14. Mortise cylinders of lock shall have a concealed internal setscrew for securing the cylinder to the lockset. The internal setscrew will be accessible only by removing the core, with the control key, from the cylinder body.
 15. Spindle to be designed to prevent forced entry from attacking of lever
 16. Provide locksets with 7-pin removable and interchangeable core cylinders
 17. Each lever to have independent spring mechanism controlling it
 18. Core face must be the same finish as the lockset.
- D. EL Series Electronic Locks:
1. Mechanical Lock Specification
 - a. Tested and approved by BHMA for ANSI A156.2, Series 4000, Grade 2, UL10C-90 Minutes, ADA
 - b. Fits ANSI A115.2 (160 &161) door preparation.
 - c. Locksets and cores to be of the same manufacturer to maintain complete lockset warranty
 - d. 2-3/4 inch (70 mm) backset
 - e. 1/2 inch (13 mm) throw latch bolt
 - f. Mechanical Warranty 2 years.

- g. Keyed lever removable only after core is removed, by authorized control key
 - h. Provide locksets with 7-pin removable “SFIC” interchangeable cores.
 - i. Case Material combination of zinc alloy and fire retardant ABS.
 - j. Classroom/Storeroom function -71 and “M” Summit design.
2. Electronic Lock Specification
- a. Users Up to 1000, for standalone recommend = 200 users.
 - b. Stand alone keyless entry upgradeable to wireless option.
 - c. Wireless entry, Industry standard 128-bit-based Security encryption
 - d. Audit Trail 500 Events for wireless communication only stored Locally
 - e. Credential Verification Time one second or less
 - f. Visual/Audible Interface Tri-Colored LED with field configurable Audible Indicator.
 - g. System Interface Stanley Wireless Gateway (Wireless Only)
 - h. Power supply 4 AA Batteries, Battery life up to 2 Years, depending on usage.
 - i. Certifications/Compliance FCC Part 15 B&C, RoHS
 - j. Reader Technology Proximity, 125 kHz.
 - k. 125 kHz Credential Compatibility Wiegand Proximity Cards
 - l. Wireless Communication Interface IEEE802.15.4 (2.4 GHz)
 - m. Communication Security AES 128-bit Encryption
 - n. Wireless Communication Protocol, Stanley Proprietary
 - o. Electronic warranty 1 year
- E. Exit Devices:
- 1. Exit devices to meet or exceed BHMA for ANSI 156.3, Grade 1.
 - 2. Exit devices to be tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
 - 3. Exit devices chassis to be investment cast steel, zinc dichromate.
 - 4. Exit devices to have stainless steel deadlocking $\frac{3}{4}$ ” through latch bolt.
 - 5. Exit devices to be equipped with sound dampening on touchbar.
 - 6. Non-fire rated exit devices to have cylinder dogging.
 - 7. Non-fire rated exit devices to have $\frac{1}{4}$ ” minimum turn hex key dogging.
 - 8. Touchpad to be “T” style constructed of architectural metal with matching metal end caps.
 - 9. Touchbar assembly on wide style exit devices to have a $\frac{1}{4}$ ” clearance to allow for vision frames.
 - 10. All exposed exit device components to be of architectural metals and “true” architectural finishes.
 - 11. Provide strikes as required by application.
 - 12. Fire exit hardware to conform to UL10C and UBC 7-2. UL tested for Accident Hazard.
 - 13. Exit device to be heavy investment cast stainless steel. The strike is to be black powder coated finish.
 - 14. Exit devices to have field reversible handing.
 - 15. Provide heavy duty vandal resistant lever trim with heavy duty investment cast stainless steel components and extra strength shock absorbing overload springs. Lever shall not require resetting. Lever design to match locksets and latchsets.
 - 16. Provide 9001-Quality Management and 14001-Environmental Management.
 - 17. Vertical Latch Assemblies to have gravity operation, no springs.
 - 18. Approved Manufacturers

- a. The following manufacturers will be approved contingent on meeting or exceeding the above performance criteria:
 - 1) Precision, Manufactured by Stanley Security Solutions
- F. Cylinders:
 1. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.
 2. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
 3. Coordinate and provide as required for related sections.
- G. Door Closers shall:
 1. Tested and approved by BHMA for ANSI 156.4, Grade 1
 2. UL10C certified
 3. Provide 9001-Quality Management and 14001-Environmental Management.
 4. Closer shall have extra-duty arms and knuckles
 5. Conform to ANSI 117.1
 6. Maximum 2 7/16 inch case projection with non-ferrous cover
 7. Separate adjusting valves for closing and latching speed, and backcheck
 8. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
 9. Full rack and pinion type closer with 1½" minimum bore
 10. Mount closers on non-public side of door, unless otherwise noted in specification
 11. Closers shall be non-handed, non-sized and multi-sized.
- H. Low Energy Operators shall:
 1. Conform to ANSI/BHMA A156.19 as a low energy power opening device.
 2. Be listed under UL228, UL325, UL10B, UL10C, UBC 7.2 and FCC listed.
 3. Shall be non-handed.
 4. Be rated for door panels weighing up to 350 lbs (160 kg).
 5. The manual door closer within the Low Energy Operator shall be adjusted to meet Americans with Disabilities Act (ADA) 5 lbs opening force.
 6. Operator shall be isolated from mounting plate with rubber mounts to mitigate the transmission of forces between the door and the operator.
 7. Shall have a position encoder to communicate with microprocessor.
 8. Incorporate a resettable powered operation counter that tracks both powered and non-powered cycling of the Operator.
 9. Incorporate the following adjustable settings:
 - a. Hold Open Timer, to 28 seconds
 - b. Open Speed
 - c. Backcheck Speed
 - d. Vestibule Sequence Timer
 10. Include DIP switch controls for:
 - a. On board diagnostics
 - b. Power close
 - c. Push and Go operation
 - d. Time delay logic for electrified hardware components
 11. Include terminals for auxiliary controls including:
 - a. Activation devices; provide two discrete inputs
 - b. Vestibule sequencing

12. Control switches including:
 - a. Day/Night open (illuminated)
 - b. Power On-Off
 13. Includes adhesive Low Energy Operator mounting templates.
 14. R-14 Aluminum Allow Materials
 15. For non-powered operation, the unit shall function as a standard door closer with adjustable spring force size 1 thru 6.
- I. Door Stops: Provide a dome floor or wall stop for every opening as listed in the hardware sets.
1. Wall stop and floor stop shall be wrought bronze, brass or stainless steel.
 2. Provide fastener suitable for wall construction.
 3. Coordinate reinforcement of walls where wall stop is specified.
 4. Provide dome stops where wall stops are not practical. Provide spacers or carpet riser for floor conditions encountered
- J. Over Head Stops: Provide a Surface mounted or concealed overhead when a floor or wall stop cannot be used or when listed in the hardware set.
1. Concealed overhead stops shall be heavy duty stainless steel.
 2. Surface overhead stops shall be heavy duty stainless steel.
- K. Push Plates: Provide with four beveled edges ANSI J301, .050 thickness, size as indicated in hardware set. Furnish oval-head countersunk screws to match finish.
- L. Pulls with plates: Provide with four beveled edges ANSI J301, .050 thickness Plates with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.
- M. Kickplates: Provide with four beveled edges ANSI J102, 6 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
- N. Mop plates: Provide with four beveled edges ANSI J103, 6 inches high by width less 1 inch on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
- O. Door Bolts: Flush bolts for wood or metal doors.
1. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 25 for hollow metal label doors.
 2. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 27 at wood label doors.
 3. Manual flush bolts, Certified ANSI/BHMA 156.16 at openings where allowed local authority.
 4. Provide Dust Proof Strike, Certified ANSI/BHMA 156.16 at doors with flush bolts without thresholds.
 5. Box shall include a key lock.
- P. Power Transfer: Power transfer device shall be a steel housing and flexible tube. Secure and inconspicuous channel is to bring power from the frame to the door.
1. Precision EPT-12C
 2. Tube shall contain 12 Wire bundle with Stanley Quick Connect Connectors one 4 wire connector consisting of two 18AWG wires and 2 24AWG wires and one 8 wire connector with 8 24AWG wires.
- Q. Electric Door Strike: Certified by ANSI/BHMA 156.31, Grade 1. and listed for Burglary Protection ANSI/ UL1034 Grade 1.
1. For General use provide fail-secure electric strike and with fire-rated device.

2. Listed UL10C for Fire Door assemblies
 3. Latchbolt monitor switch option when specified in hardware sets.
 4. Provide the electric strike in the appropriate model that will accept a 5/8" or 3/4" latchbolt.
- R. Door Position Switch: Provide door position switch for door status monitoring as indicated in hardware sets.
1. At all fired rated doors the door and frames, position switch preparation will be provided by the door and frame manufacturer or by an authorized label service agent.
- S. Magnetic Door Holders: Provide magnetic door holders with Tri-Voltage that can be wired 12VDC, 24V AC/DC or 120V AC
1. Wall magnetic door holders shall be Surface mounted.
 2. Armature shall be thru-bolted and can be provided with any projection required.
 3. Models will be available in US28, sprayed finishes and US32D.
 4. Floor mounted shall be provided for a single door or double door hold open application.
- T. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.
- U. Weatherstripping: Provide at head and jambs only those units where resilient or flexible seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.
1. Weatherstrip shall be resilient seal of (Neoprene, Polyurethane, Silicone)
 2. UL10C Positive Pressure rated seal set when required.
- V. Door Bottoms/Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.
1. Door seal shall be resilient seal of (Neoprene, Polyurethane, Silicone)
 2. UL10C Positive Pressure rated seal set when required.
- W. Thresholds: Thresholds shall be aluminum beveled type with maximum height of 1/2" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.
- X. Provide one wall mounted Telkee, Lund or MMF series key cabinet complete with hooks, index and tags to accommodate 50% expansion. Must have a Best lock with removable core PATD. Coordinate mounting location with architect.
- Y. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

2.03 FINISH:

- A. Designations used in Schedule of Finish Hardware - 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products
- B. Powder coat door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

2.04 KEYS AND KEYING:

- A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system.

Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.

- B. Cylinders, removable and interchangeable core system: Best CORMAX™ Patented 7-pin.
- C. Permanent keys and cores: Stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."
- D. Transmit Grand Masterkeys, Masterkeys and other Security keys to Owner by Registered Mail, return receipt requested.
- E. Furnish keys in the following quantities:
 - 1. 1 each Grand Masterkeys
 - 2. 4 each Masterkeys
 - 3. 2 each Change keys each keyed core
 - 4. 15 each Construction masterkeys
 - 5. 2 each Control keys
- F. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Hardware Supplier. Construction cores and keys remain the property of the Hardware Supplier.
- G. Keying Schedule: Arrange for a keying meeting, and programming meeting with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Architect.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
 - 1. Do not proceed until unsatisfactory conditions have been corrected.

3.02 HARDWARE LOCATIONS:

- A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.
 - 1. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).
 - 2. Recommended locations for Architectural Hardware for flush wood doors (DHI).
 - 3. WDMA Industry Standard I.S.-1A-04, Industry Standard for Architectural wood flush doors.

3.03 INSTALLATION:

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Conform to local governing agency security ordinance.
- C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.

1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.
- D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

3.04 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

- A. Contractor/Installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.
 1. Check and adjust closers to ensure proper operation.
 2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
 - a. Verify levers are free from binding.
 - b. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.
 3. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

3.05 SCHEDULE OF FINISH HARDWARE:

Manufacturer List

<u>Code</u>	<u>Name</u>
AB	ABH Manufacturing Inc.
BE	Best Access Systems
BY	By Others
NG	National Guard
PR	Precision
SD	Stanley Door Closers
SE	Security Door Controls
SR	Stanley
TR	Trimco

Option List

<u>Code</u>	<u>Description</u>
N	S/Steel Components (1000/7000//9000)
22	LENGTH CODE-1 3/8"
BT	BALL TIP HINGES
C4	CAM-STANDARD CAM
CD	CYLINDER DOGGING
FL	Fire Exit Hardware
M5	GALVANIZED STEEL CHAIN
3RO	Prefix option for 2000 Apex Series
B4E	BEVELED 4 EDGES - KICK PLATES
CSK	COUNTER SINKING
LBR	LESS BOTTOM ROD
MLR	MOTORIZED LATCH RETRACTION
VIN	Visual Indicator
VIT	Visual Indicator Thumb-Turn
R705	STRAIGHT CYLINDER RING - 5/16"

R706	STRAIGHT CYLINDER RING - 3/8"
7/8"LTC	7/8" Lip-To-Center Strike
1/4-20-2" COMBO	1/4-20 X COMBO MS/ANCHOR (SS)

Finish List

<u>Code</u>	<u>Description</u>
313	Dark Bronze Duranodic
600	Primed for Painting
612	Satin Bronze, Clear Coated
613	Oxidized Satin Bronze, Oil Rubbed
626	Satin Chromium Plated
630	Satin Stainless Steel
691	Light Bronze Painted
US10	Dull Bronze
US10	Dull Bronze, Oxidized and Oil Rubbed
US32D	Stainless Steel, Dull

END OF SECTION

**SECTION 08 7111
HARDWARE SETS**

SET #1

DOORS: CA001B

6 Hinges	BT CB199 6 x 6 NRP	US10	ST
2 Power Transfer	EPT 12C		PR
1 Removable Mullion	KR822	600	PR
1 Rim Cylinder (Mullion)	12E-72 PATD R706	612	BE
1 Exit Device	3RO C MLR TDS 2103	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE
1 Mortise Cylinder (Dogging)	1E-74 PATD C4 R705	612	BE
2 Classic Pull Plate	51	612	TR
2 Door Closer	CLD-4550 HCS	691	SD
2 Kick Plate	KO050 6" X 1" LDW B4E CSK	612	TR
1 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Exit Device	3RO TDS 2101 CD	612	PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Set Weatherseals	By Door Manufacturer		BY
1 Mullion Seal	5100 S		NA
1 Door Sweep	By Door Manufacturer		BY
1 Threshold	By Door Manufacturer		BY

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #2

Doors: CA001A

6 Hinges	BT CB199 6 x 6 NRP	US10	ST
2 Power Transfer	EPT-12C		PR
1 Removable Mullion	KR822	600	PR
1 Rim Cylinder (Mullion)	12E-72 PATD R706	612	BE
1 Exit Device	3RO TDS 2101 CD	612	PR
1 Exit Device	3RO C MLR TDS 2103	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE
2 Classic Pull Plate	51	612	TR
1 Low Energy Operator	CLD-4990 X PS490	313	SD
1 Actuator/Transmitter Package	CL4976		SD

2	Surface Mounting Box	CL4638		SD
1	Door Closer	CLD-4550 HCS	691	SD
2	Kick Plate	KO050 6" X 1" LDW B4E CSK	612	TR
1	Card Reader	By Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-6E		ST
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req'd		ST
1	Mullion Seal	5100 S		NA
1	Set Weatherseals	By Door Manufacturer		BY
1	Door Sweep	By Door Manufacturer		BY
1	Threshold	By Door Manufacturer		BY

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device. Push button switches are activated by card reader . Card reader is used to activate/deactivate auto operator.

SET #3

Doors: CA004

3	Hinges	BT CB199 6 x 6 NRP	US10	ST
1	Power Transfer	EPT-12C		PR
1	Exit Device	3RO C MLR TDS 2103	612	PR
1	Rim Cylinder	12E-72 PATD	612	BE
1	Classic Pull Plate	51	612	TR
1	Low Energy Operator	CLD-4990 X PS490	313	SD
1	Actuator/Transmitter Package	CL4976		SD
2	Surface Mounting Box	CL4638		SD
1	Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1	Card Reader	By Security Contractor		BY
1	Power Supply	RPSMLR2		PR
1	Wire Harness	WH-6E		ST
1	Wire Harness	WH-192P		ST
1	Wire Harness	WH-XXP Length as req'd		ST
1	Set Weatherseals	By Door Manufacturer		BY
1	Door Sweep	By Door Manufacturer		BY
1	Threshold	By Door Manufacturer		BY

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device. Push button switches are activated by card reader . Card reader is used to activate/deactivate auto operator.

SET #4

Doors: A007B, A009B, A010B, STA003B

3 Hinges	BT CB199 6 x 6 NRP	US10	ST
1 Power Transfer	EPT-12C		PR
1 Exit Device	3RO C MLR TDS 2103	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE
1 Classic Pull Plate	51	612	TR
1 Door Closer	CLD-4550 CS	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Set Weatherseals	By Door Manufacturer		BY
1 Door Sweep	By Door Manufacturer		BY
1 Threshold	By Door Manufacturer		BY

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #5

Doors: CA003

6 Hinges	BT CB199 6 x 6 NRP	US10	ST
1 Power Transfer	EPT-12C		PR
2 Flush Bolt	3917-12	612	TR
1 Dustproof Strike	3911	612	TR
1 Electro-mech Lock	45HW-7WEU14H PATD 7/8"LTC C	612	BE
1 Overhead Holder	N 1010 A Series	US10	AB
1 Door Closer	CLD-4550 CS	691	SD
2 Kick Plate	KO050 6" X 1" LDW B4E CSK	612	TR
2 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Set Weatherseals	By Door Manufacturer		BY
2 Door Sweep	By Door Manufacturer		BY
1 Threshold	By Door Manufacturer		BY

NOTE: Card Reader both inside and outside.

SET #6

Doors: STA002A

6 Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
2 Power Transfer	EPT-12C		PR
1 Exit Device	3RO FL TDS 2202 X 4902D LBR	612	PR
1 Exit Device	3RO FL C MLR TDS 2203 X 4903D LBR	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE
2 Door Closer	CLD-4550 EDA	691	SD
2 Kick Plate	KO050 6" X 1" LDW B4E CSK	613	TR
2 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Astragal Set	9675 DKB @ FACE OF EACH LEAF		NA
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #7

Doors: STA002B

3 Hinges	BT CB168 4 1/2 X 4 1/2	US10	
ST			
1 Exit Device	3RO FL 2114 X 4914D	612	
PR			
1 Door Closer	CLD-4550 EDA	691	
SD			
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	
TR			
1 Wall Bumper	1270CX / 1211 AS REQ'D	612	
TR			
1 Smoke Seal	5020C @ HEAD & JAMBS		
NA			

SET #8

Doors: STA003A, STA102, STA103, STA203

3 Hinges	BT CB168 4 1/2 X 4 1/2 NRP		
US10	ST		
1 Power Transfer			
EPT-12C			
	PR		
1 Exit Device	3RO C FL MLR TDS 2103 X 4903D	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE

1 Door Closer	CLD-4550 EDA	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #9

Doors: A103C

3 Hinges	BT CB168 5 X 4 1/2 NRP	US10	ST
1 Power Transfer	EPT-12C		PR
1 Exit Device	3RO C FL MLR TDS 2103 X 4903D	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE
1 Door Closer	CLD-4550 EDA	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #10

Doors: A012, A021, A104, A011

3 Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
1 Wireless Lockset	By Security Contractor		BY
1 Cylinder	12E-72 PATD /1E-74 PATD as req'd	612	BE
1 Door Closer	CLD-4550 EDA	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Card Reader	By Security Contractor		BY
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #11

Doors: A023, A027, A029, A031A, A106, A110

3 Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
1 Wireless Lockset	By Security Contractor		BY
1 Door Closer	CLD-4550 EDA	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #12

Doors: A007C, A009C, A010C

1 Cylinder	12E-72 PATD/1E-74 PATD as req'd	612	BE
1 Padlock	21B-722L PATD M5	626	BE

NOTE: Balance of hardware by door supplier.

SET #13

Doors: A014, A016, M036B

NOTE: Cased opening no hardware required.

SET #14

Doors: A112, A114

3 Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
1 Wireless Lockset	By Security Contractor		BY
1 Door Closer	CLD-4550 EDA	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #15

Doors: A116

3 Hinges	BT CB179 4 1/2 X 4 1/2	US10	ST
1 Wireless Lockset	By Security Contractor		BY
1 Door Closer	CLD-4550 EDA	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #16

Doors: A001, A107

6 Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
2 Flush Bolt	3917-12	612	TR
1 Dustproof Strike	3911	612	TR
1 Wireless Lockset	By Security Contractor		BY
1 Door Closer	CLD-4550 EDA	691	SD
2 Kick Plate	KO050 6" X 1" LDW B4E CSK	612	TR
2 Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
2 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Smoke Seal	5020C @ HEAD & JAMBS		NA
1 Astragal	139 SP X 2525 C		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #17

Doors: A003

3 Hinges	BT CB179 4 1/2 X 4 1/2 NRP	US10	ST
1 Wireless Lockset	By Security Contractor		BY
1 Door Closer	CLD-4550 CS	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #18

Doors: A005

6 Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
2 Power Transfer	EPT-12C		PR
1 Exit Device	3RO C MLR TDS 2203 X 4903D LBR	612	PR
1 Exit Device	3RO TDS 2201 X 4901 LBR	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE
2 Door Closer	CLD-4550 EDA	691	SD
2 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
2 Wall Bumper		1270CX / 1211	
AS REQ'D		612	TR
1 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		
	ST		
1 Wire Harness	WH-XXP Length as req'd		ST

1 Smoke Seal	5020C @ HEAD & JAMBS	NA
1 Astragal Set	9675 DKB @ FACE OF EACH LEAF	NA
NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.		

SET #19

Doors: A007A, A009A, A010A, A101A		
6 Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10 ST
2 Flush Bolt	3917-12	612 TR
1 Dustproof Strike TR	3911	612
1 Wireless Lockset BY	By Security Contractor	
2 Kick Plate TR	KO050 6" X 1" LDW B4E CSK	612
2 Mop Plate TR	KM050 6" X 1" LDW B4E CSK	612
2 Overhead Holder AB	N 1010 A Series	US10
1 Smoke Seal NA	5020C @ HEAD & JAMBS	
1 Astragal Set	9675 DKB @ FACE OF EACH LEAF	NA

SET #20

Doors: A018, A020		
3 Hinges US10	BT CB168 4 1/2 X 4 1/2	ST
1 Wireless Lockset BY	By Security Contractor	
1 Electric Strike	ES5 B LBM/LCM	612 BE
1 Low Energy Operator	CLD-4990 X PS490	313 SD
1 Actuator/Transmitter Package	CL4976	SD
2 Surface Mounting Box	CL4638	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612 TR
1 Mop Plate	KM050 6" X 1" LDW B4E CSK	612 TR
1 Wall Bumper	1270CX / 1211 AS REQ'D	612 TR
1 Card Reader	By Security Contractor	BY
1 Smoke Seal	5020C @ HEAD & JAMBS	NA

NOTE: Operational description: Wireless lockset is locked/unlocked via card or key. Card reader activates auto operator and HC push switches both inside and outside of classroom. When auto operator is activated, HC push switches will release electric strike-slight delay-activate auto operator.

SET #21

Doors: A019A, A019B, A025A, A025B, A102A, A102B, A108A, A108B

3 Hinges	BT CB168 4 1/2 X 4 1/2	US10	ST
1 Wireless Lockset	By Security Contractor		BY
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1 Overhead Holder	N 1010 A Series	US10	AB
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

SET #22

Doors: STA001B

3 Hinges	BT CB199 5 X 4 1/2 NRP	US10	ST
1 Power Transfer	EPT-12C		PR
1 Exit Device	3RO C MLR TDS 2103	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE
1 Classic Pull Plate	51	612	TR
1 Door Closer	CLD-4550 CS	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Saddle Threshold	425 DKB 1/4-20-2" COMBO	AL	NA
1 Weatherstrip	700 ESDKB @ HEAD & JAMBS		NA
1 Door Sweep	200 NDDKB		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #23

Doors: STA001A

6 Hinges	BT CB168 4 1/2 X 4 1/2	US10	ST
1 Exit Device	3RO FL 2214 X 4914D LBR	612	PR
1 Exit Device	3RO FL 2201 X 4901 LBR	612	PR
2 Door Closer	CLD-4550 EDA	691	SD
2 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
2 Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
2 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Smoke Seal	5020C @ HEAD & JAMBS		NA
1 Astragal Set	9675 DKB @ FACE OF EACH LEAF		NA

SET #24

Doors: STA101

6 Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
2 Power Transfer	EPT-12C		PR
1 Exit Device	3RO FL TDS 2202 X 4902D LBR	612	PR
1 Exit Device	3RO C FL MLR TDS 2203 X 4903D LBR	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE
1 Door Closer	CLD-4550 CS	691	SD
1 Door Closer	CLD-4550 EDA	691	SD
2 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
2 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Power Supply	RPSMLR2		PR
1 Card Reader	By Security Contractor		BY
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Astragal Set	9675 DKB @ FACE OF EACH LEAF		NA
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

SET #25

Doors: A101B

6 Hinges	BT CB199 4 1/2 X 4 1/2 NRP	US10	
ST			
1 Power Transfer	EPT-12C		
PR			
1 Dustproof Strike	3911	612	
TR			
2 Flush Bolt	3917-12	612	
TR			
1 Electro-mech Lock	45HW-7WEU14H PATD 7/8"LTC C	612	
BE			
1 Door Closer	CLD-4550 CS	691	
SD			
2 Kick Plate	KO050 6" X 1" LDW B4E CSK	612	
TR			
1 Overhead Holder	N 1010 A Series		
US10	AB		
1 Card Reader	By Security Contractor		
BY			

1 Power Supply PR	RPSMLR2		
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Saddle Threshold	425 DKB 1/4-20-2" COMBO	AL	NA
1 Weatherstrip	700 ESDKB @ HEAD & JAMBS		NA
1 Door Sweep	200 NDDKB		NA
1 Astragal	148 NDKB		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via lockset.

SET #26

Doors: A103A, A103B

3 Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
1 Wireless Lockset	By Security Contractor		BY
1 Overhead Holder	N 1010 A Series	US10	AB
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Mop Plate	KM050 6" X 1" LDW B4E CSK	612	TR
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

SET #27

Doors: A201

6 Hinges	BT CB199 4 1/2 X 4 1/2 NRP	US10	ST
1 Power Transfer	EPT-12C		PR
2 Flush Bolt	3917-12	612	TR
1 Dustproof Strike	3911	612	TR
1 Electro-mech Lock	45HW-7WEU14H PATD 7/8"LTC C	612	BE
1 Door Closer	CLD-4550 CS	691	SD
1 Overhead Stop	N 1020 Series	US10	AB
2 Kick Plate	KO050 6" X 1" LDW B4E CSK	612	TR
2 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Saddle Threshold	425 DKB 1/4-20-2" COMBO	AL	NA
1 Weatherstrip	700 ESDKB @ HEAD & JAMBS	NA	
2 Door Sweep	200 NDDKB		NA
1 Astragal	139 SP X 2525 C		NA

NOTE: Card Reader both inside and outside.

SET #28

Doors: 034A, 036A

3 Hinges	BT CB179 4 1/2 X 4 1/2	US10	ST
1 Wireless Lockset	By Security Contractor		BY
1 Door Closer	CLD-4551 REG	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

SET #29

Doors: 045

3 Hinges	BT CB168 4 1/2 X 4 1/2 NRP	US10	ST
1 Power Transfer	EPT-12C		PR
1 Exit Device	3RO C FL MLR TDS 2103 X 4903D	612	PR
1 Rim Cylinder	12E-72 PATD	612	BE
1 Door Closer	CLD-4550 EDA	691	SD
1 Kick Plate	KO050 6" X 2" LDW B4E CSK	612	TR
1 Wall Bumper	1270CX / 1211 AS REQ'D	612	TR
1 Card Reader	By Security Contractor		BY
1 Power Supply	RPSMLR2		PR
1 Wire Harness	WH-6E		ST
1 Wire Harness	WH-192P		ST
1 Wire Harness	WH-XXP Length as req'd		ST
1 Smoke Seal	5020C @ HEAD & JAMBS		NA

NOTE: Access via Card Reader or mechanical key. Egress at all times via bar of exit device.

OPENING LIST

<u>Opening</u>	<u>Hdw Set</u>
M045	29
M034A	28
M036A	28
A001	16
A003	17
A005	18
A012	10
A014	13
A016	13
A018	20
A020	20

A021	10
A023	11
A027	11
A029	11
A104	10
A106	11
A017	16
A110	11
A112	14
A114	14
A116	15
A201	27
A007A	19
A007B	4
A007C	12
A009A	19
A009B	4
A009C	12
A010A	19
A010B	4
A010C	12
A019A	21
A019B	21
A025A	21
A025B	21
A031A	11
A101A	19
A101B	25
A102A	21
A102B	21
A103A	26
A103B	26
A103C	9
A108A	21
A108B	21
CA003	5
CA004	3
CA001A	2

CA001B	1
STA101	24
STA102	8
STA103	8
STA203	8
STA001A	23
STA001B	22
STA002A	6
STA002B	7
STA003A	8
STA003B	4
A011	10

END OF SECTION

SECTION 14 2100
PASSENGER ELEVATORS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies electric traction elevators and hydraulic elevators .
- B. Work Required:
 - 1. The work required under this section consists of all labor, materials and services required for the complete installation (including operational verification) of all the equipment required for the elevator(s) as herein specified.
 - 2. All work shall be performed in a first class, safe and workmanlike manner.
 - 3. In all cases where a device or part of the equipment is herein referred to in the singular, it is intended that such reference shall apply to as many of such devices or parts as are required to make complete installation.
- C. Related Work
 - 1. Division 01 - Construction Facilities and Temporary Controls: protection of floor openings and personnel barriers; temporary power and lighting.
 - 2. Division 31 - Earthwork: excavation for elevator pit.
 - 3. Section 03 3000 - Cast-In-Place Concrete: elevator pit, and elevator machine foundation.
 - 4. Section 04 2000 - Unit Masonry: masonry hoistway enclosure, building-in and grouting hoistway doorframes, and grouting of sills.
 - 5. Section 05 5000 - Metal Fabrications: pit ladder and supports for entrances, rails and hoisting beam at top of elevator hoistway.
 - 6. Section 07 1300 - Sheet Waterproofing: waterproofing of elevator pit.
 - 7. Division 23 - Heating, Ventilating, and Air Conditioning: ventilation and temperature control of elevator equipment areas.
 - 8. Division 26 - Electrical:
 - a. Main disconnects for each elevator.
 - b. Electrical power for elevator installation and testing.
 - c. Disconnecting device to elevator equipment prior to activation of sprinkler system.
 - d. The installation of dedicated GFCI receptacles in the pit and overhead.
 - e. Lighting in controller area, machine area and pit.
 - f. Wiring for telephone service to controller.
 - g. Emergency (Standby) Power Supply Systems: emergency generator for elevator operation.
 - h. Fire Alarm Systems: The installation of fire and smoke detectors at required locations and interconnecting devices; fire alarm signal lines to contacts in the machine area.
 - i. Telephone Systems: ADAAG-required emergency communications equipment.
- D. Applicable Codes: Comply with applicable building and elevator codes at the project site, including but not limited to the following:
 - 1. ANSI A117.1, Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped People.
 - 2. ANSI/NFPA 70, National Electrical Code.
 - 3. ANSI/NFPA 80, Fire Doors and Windows.
 - 4. ASME/ANSI A17.7, Safety Code for Elevators and Escalators.
 - 5. ANSI/UL 10B, Fire Tests of Door Assemblies.

6. Local Building Codes

1.02 SYSTEM DESCRIPTION: ELEVATOR ELM 01

- A. Equipment Description: Gen2® gearless traction elevator with Machine Room-less application.
- B. Equipment Control: Elevonic® Control System.
- C. Quantity of Elevators: 1
- D. Elevator Stop Designations:
 - 1. Elevator No. 1: LL, 1, 2, Roof
- E. Stops (maximum): 4
- F. Openings: In line.
- G. Travel: 54 feet
- H. Rated Capacity: 4500 lb.
- I. Rated Speed: 200 fpm
- J. Platform Size: 5' 9-1/2" W x 7' 11-9/16" D
- K. Clear Inside Dimensions: 5' 8-5/16" W x 7' 11" D
- L. Cab Height: 9' 7"
- M. Clear height under suspended ceiling: 8' 11-3/4" (2813mm)
- N. Entrance Type and Width:
 - 1. Two-Speed Doors 4' 0" (1219 mm).
- O. Entrance Height: 7' 0" (2134 mm)
- P. Main Power Supply: 480 Volts + or - 5% of normal, three-Phase, with a separate equipment grounding conductor.
- Q. Car Lighting Power Supply: 120 Volts, Single-phase, 15 Amp, 60 Hz.
- R. Machine Location: Inside the hoistway at the top Signal Fixtures: Manufacturer's standard.
- S. Controller Location: Controller(s) shall be located adjacent to the hoistway at the top landing in a controller space
- T. Performance:
 - 1. Car Speed: + 3 % of contract speed under any loading condition or direction of travel.
 - 2. Car Capacity: Safely lower, stop and hold up to 125% of rated load. (code required).
- U. Ride Quality:
 - 1. Vertical Vibration (maximum): 12 - 17 milli-g
 - 2. Horizontal Vibration (maximum): 10 - 15 milli-g
 - 3. Vertical Jerk (maximum): 4.6 ± 1.0 ft./ sec³ (1.4 ± 0.3 m/ sec³)
 - 4. Acceleration/Deceleration (maximum): 2.6 ± .33 ft./ sec² (0.8 ± 0.13 m/ sec²)
 - 5. In Car Noise: 50 - 55 dB(A)
 - 6. Stopping Accuracy: ± 0.2 in. (± 5 mm)
 - 7. Re-leveling Distance: ± 0.4 in. (± 10 mm)
- V. Operation:
 - 1. Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.
- W. Operating Features - Standard
 - 1. Full Collective Operation

2. Anti-nuisance.
3. Fan and Light Protection.
4. Load Weighing Bypass.
5. Independent Service.
6. Full Collective Operation.
7. Firefighters' Service Phase I and Phase II
8. Top of Car Inspection.
9. Car to Lobby Operation.
10. Car Secure Access.
11. Provision for Card Reader in Car (Card Reader provided and Installed by others).
12. Automatic Standby Power Operation with Manual Override.

X. Door Control Features:

1. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
2. Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.
3. Primary door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening.
4. Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

Y. Provide equipment according to seismic zone: Refer to Structural Drawings.

1.03 SYSTEM DESCRIPTION: ELEVATOR ELA 01

- A. Equipment Description: Holeless Hydraulic elevator with Machine-Room Less application
- B. Equipment Control: Elevonic® Control System.
- C. Quantity of Elevators: 1
- D. Elevator Stop Designations: LL, 1
- E. Stops : 2
- F. Openings: In line.
- G. Travel: 13'-6".
- H. Rated Capacity: 4500 lb.
- I. Rated Speed: 125 fpm.
- J. Platform Size: 5'-6 3/4" W x 8'-8" D
- K. Clear Inside Dimensions: 5'-5 9/16" W x 7'-10 15/16" D
- L. Cab Height: 9'-9"
- M. Clear Cab Height: 9'-4 3/8" with 5/16" floor recess and dropped 6 LED ceiling or perimeter lit ceiling.
- N. Entrance Type and Width:
 1. Two Speed Door 4' 0" (1219 mm) .
- O. Entrance Height: 7' 0" (2134 mm)
- P. Main Power Supply: 480 - Volts, 3-Phase, 60Hz + or - 5% of normal, three-Phase, with a separate equipment grounding conductor.
- Q. Car Lighting Power Supply: 120 Volts, Single-phase, 15 Amp, 60 Hz.

- R. Machine and Controller Location: No machine-room required, tank and controller in hoistway pit.
- S. Signal Fixtures: Manufacturer's standard with stainless steel metal button targets.
- T. Controller Location: Inside hoistway, accessible by a door in a side hoistway wall on the 1st or 2nd landing.
- U. Stopping Accuracy: $\pm 1/4"$ (6.4 mm) under any loading condition or direction of travel.
- V. Operation:
- W. Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.
- X. Operating Features - Standard
 - 1. Full Collective Operation
 - 2. Fan and Light Protection.
 - 3. Firefighters' Service Phase I and Phase II.
 - 4. Top of Car Inspection.
 - 5. Emergency Rescue Unit
 - 6. Automatic Standby Power Operation with Manual Override.
 - 7. Independent Service.
- Y. Door Control Features:
 - 1. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
 - 2. Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.
 - 3. Door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening.
 - 4. Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.
- Z. Provide equipment according to seismic zone: Refer to Structural Drawings.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each system proposed for use. Include the following:
 - 1. Signal and operating fixtures, operating panels and indicators.
 - 2. Cab design, dimensions and layout.
 - 3. Hoistway-door and frame details.
 - 4. Electrical characteristics and connection requirements.
 - 5. Expected heat dissipation of elevator equipment in hoistway (BTU).
 - 6. Color selection chart for Cab and Entrances.
- B. Shop Drawings: Submit approval layout drawings. Include the following:
 - 1. Car, guide rails, buffers and other components in hoistway.
 - 2. Maximum rail bracket spacing.
 - 3. Maximum loads imposed on guide rails requiring load transfer to building structure.
 - 4. Clearances and travel of car.
 - 5. Clear inside hoistway and pit dimensions.
 - 6. Location and sizes of access doors, hoistway entrances and frames.

- C. Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual.

1.05 QUALITY ASSURANCE

- A. Permits, Inspections and Certificates: The Elevator Contractor shall obtain and pay for necessary Municipal or State Inspection and permit as required by the elevator inspection authority, and make such tests as are called for by the regulations or such authorities. These tests shall be made in the presence of such authorities or their authorized representatives.
- B. Designer Qualifications: Design guide rails, brackets, anchors, and machine anchors under direct supervision of a Professional Structural Engineer experienced in design of work of this type and licensed in the State in which the Project is located.
- C. Perform structural steel design, fabrication, and installation in accordance with AISC 360, Specification for Structural Steel Buildings. Perform seismic design in accordance with applicable code.
- D. Perform welding of steel in accordance with AWS D1.1/D1.1M.
- E. Fabricate and install door and frame assemblies in accordance with NFPA 80.
- F. Perform electrical work in accordance with NFPA 70.
- G. Maintain one copy of each quality standard document on site.
- H. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- I. Installer Qualifications: Employees and supervisor on payroll of elevator equipment manufacturer.
- J. Products Requiring Fire Resistance Rating: Listed and classified by UL.
- K. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.06 WARRANTY

- A. The elevator contractor's warranty covers defective material and workmanship.
 - 1. The warranty period shall extend one (1) year from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator.
 - 2. The warranty excludes: ordinary wear and tear, improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. ThyssenKrupp Elevator: www.thyssenkruppelevator.com.
- B. Otis Elevator Co: www.otis.com.
- C. Schindler Elevator Corp: www.us.schindler.com.
- D. Substitutions: See Section 01 6000 - Product Requirements.
- E. All components to be manufactured by same entity.

2.02 ELEVATOR ELM 01:

- A. Provide machine room-less traction passenger elevators.
- B. Basis of Design: Gen2 manufactured by Otis Elevator Company.
- C. Specifically, the system shall consist of the following components:

1. Controller located entirely inside the hoistway. No extra machine room or control closet space required.
 2. An AC gearless machine using embedded permanent magnets mounted at the top of the hoistway.
 3. Polyurethane Coated-Steel Belts for elevator hoisting purposes.
 4. Regenerative drive that captures normally wasted energy and feeds clean power back into the building's power grid.
 5. LED lighting standard in ceiling lights and elevator fixtures.
 6. Sleep mode operation for LED ceiling lights and car fan.
- D. Approved Installer: Otis Elevator Company
- E. Controller Components:
1. Controller: A microcomputer based control system shall be provided to perform all of the functions of safe elevator operation. The system shall also perform car and group operational control.
 - a. All high voltage (110V or above) contact points inside the controller shall be protected from accidental contact when the controller doors are open.
 - b. Controller shall be separated into two distinct halves; Motor Drive side and Control side. High voltage motor power conductors shall be routed so as to be physically segregated from the rest of the controller.
 - c. Field conductor terminations points shall be segregated; high voltage (>30 volts DC and 110 VAC,) and low voltage (< 30 volts DC)
 - d. Controllers shall be designed and tested for Electromagnetic Interference (EMI) immunity according to the EN 12016 (May 1998): "EMC Product Family Standards for lifts, escalators, and passenger conveyors Part 2 - immunity"
 2. Drive: A Variable Voltage Variable Frequency AC drive system shall be provided. The drive shall be set up for regeneration of AC power back to the building grid.
- F. Machine and Governor:
1. Machine: AC gearless machine, with a synchronous permanent-magnet motor, dual solenoid service and emergency disc brakes, mounted at the top of the hoistway.
 2. Governor: The governor shall be a tension type car-mounted governor.
 3. Buffers, Car and Counterweight: Oil type buffers shall be used.
 4. Hoistway Operating Devices:
 - a. Emergency stop switch in the pit
 - b. Terminal stopping switches.
 5. Positioning System: Consists of an encoder, reader box, and door zone vanes.
 6. Guide Rails and Attachments: Guide rails shall be Tee-section steel rails with brackets and fasteners. Side counterweight arrangements shall have a dual-purpose bracket that combines both counterweight guide rails, and one of the car guide rails to building fastening.
 7. Coated-Steel Belts: Polyurethane coated belts with high-tensile-grade, zinc-plated steel cords and a flat profile on the running surface and the backside of the belt. All driving sheaves and deflector sheaves should have a crowned profile to ensure center tracking of the belts. A continuous 24/7 monitoring system using resistance based technology has to be installed to continuously monitor the integrity of the coated steel belts and provide advanced notice of belt wear.
 8. Governor Rope: Governor rope shall be steel and shall consist of at least eight strands wound about a sisal core center.

2.03 ELEVATOR ELA 01:

- A. Provide machine-roomless holeless hydraulic elevators. from Otis Elevator Company.
- B. Basis of Design: HydroFit manufactured by Otis Elevator Company.
- C. Specifically, the system shall consist of the following components:
 - 1. The entire hydraulic system and the controller shall be located inside the hoistway. No extra machine room or control closet space is required.
 - 2. Sleep mode operation for LED ceiling lights and car fan.
 - 3. LED lighting standard in ceiling lights and elevator fixtures.
- D. Approved Installer: Otis Elevator Company
- E. Machine Components:
 - 1. The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a low-pressure switch and a shut-off valve.
 - 2. The entire hydraulic system with hydraulic-fluid storage tank, power component and valves shall be located in the hoistway pit and be easily accessible for maintenance through an access door in the hoistway wall.
 - 3. A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three (3) phase overload device shall be provided to protect the motor against overloading.
 - a. The controller shall be located together with the hydraulic system in the hoistway pit and be easily accessible for maintenance through the same access door that is also used for the hydraulic system.
 - 4. A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
 - 5. Pressure Switch.
 - 6. Tank Heater.
 - 7. Low-oil control.
- F. Hoistway Components:
 - 1. Plunger(s) and Cylinder(s): Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.
 - 2. Car Guide Rails: Tee-section steel rails with brackets and fasteners.
 - 3. Polyurethane type buffers shall be used.
 - 4. Wiring: 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.

2.04 HOISTWAY ENTRANCES:

- A. Fascia: Galvanized sheet steel shall be provided at the front of the hoistway.
- B. Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of UL fire rated steel.
- C. Sills shall be extruded aluminum.
- D. Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.
- E. Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour
 - 1. Entrance Finish: paint
 - a. Color to be selected from the manufacturer's color chart.
- F. Entrance marking plates: Entrance jambs shall be marked with 4" x 4" (102 mm x 102 mm) plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.
- G. Sight Guards: sight guards will be furnished with all doors painted to match with painted doors.

2.05 EQUIPMENT: CAR COMPONENTS

- A. Car frame and Safety: A car frame fabricated from formed or structural steel members shall be provided with adequate bracing to support the platform and car enclosures. The car safety shall be integral to the car frame and shall be Type "B", flexible guide clamp type.
- B. Cab
 - 1. Premium Cab Options: Steel Shell Cab with raised laminate hang on panels.
 - a. Laminate to be selected from manufacturer's catalog of choices.
 - b. Brushed Stainless Steel finished base plate located at top and bottom
- C. Car Front Finish: Satin Stainless Steel.
- D. Car Door Finish: Satin Stainless Steel.
- E. Ceiling Type:
 - 1. LED Perimeter-lit ceiling Black (EW5).
- F. Emergency Car Lighting: An emergency power unit employing a 6-volt sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car in the event of building power failure.
- G. Fan: A one-speed 120 VAC fan will be mounted to the ceiling to facilitate in-car air circulation, meeting A17.1 code requirements.
 - 1. The fan shall be rubber mounted to prevent the transmission of structural vibration and will include a baffle to diffuse audible noise.
 - 2. A switch shall be provided in the car-operating panel to control the fan.
- H. Handrail: Handrails shall be provided on the side and rear walls of the car enclosure. Handrails shall be 3/8" x 2" (9.5 mm x 51 mm) flat tubular handrail with a Brushed Steel.
- I. Threshold: Extruded Aluminum.
- J. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
- K. Guides: Rubber roller guides shall be mounted on the top and the bottom of the car and counterweight. Car roller guides shall be 6-1/4" (160mm) at the top of the car, and 6-1/4" (160mm) at the bottom. The counterweight roller guides shall be 3" (76mm) at the top and the bottom.

- L. Platform: The car platform shall be constructed of metal. Load weighing device shall be mounted on the belts at the top of the hoistway.
- M. The LED ceiling lights and the fan should automatically shut off when the system is not in use and be powered back up after a passenger calls the elevator and pushes a hall button.

2.06 SIGNAL DEVICES AND FIXTURES

- A. Car Operating Panel: A car operating panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. The car operating panel shall have a satin stainless steel finish
 - 1. A car operating panel shall be furnished. It shall contain a bank of round stainless steel, mechanical LED illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served. All buttons to have raised numerals and Braille markings with:
- B. Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel.
- C. The car operating panel shall be equipped with the following features:
 - 1. Raised markings and Braille to the left hand side of each push-button.
 - 2. Car Position Indicator at the top of and integral to the car operating panel.
 - 3. Door open and door close buttons.
 - 4. Inspection key-switch.
 - 5. Elevator Data Plate marked with elevator capacity and car number.
 - 6. Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
 - 7. Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.
 - 8. In car stop switch (toggle or key unless local code prohibits use)
 - 9. Firefighter's hat
 - 10. Firefighter's Phase II Key-switch
 - 11. Call Cancel Button
- D. Car Position Indicator: A digital, LED car position indicator shall be integral to the car operating panel.
- E. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation.
 - 1. Integral Hall fixtures shall feature round stainless steel, mechanical buttons marked to correspond to the landings. Hall fixtures to be located in the entrance frame face or the wall. Buttons shall be in vertically mounted fixture. Fixture shall be Gold Satin finish.
 - 2. Button Options:
- F. Vandal-Resistant, Flush satin stainless steel button with blue LED illuminating center jewel.
- G. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.
- H. Card Reader Provision

PART 3 - EXECUTION

3.01 PREPARATION

- A. Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Installation of all elevator components except as specifically provided for elsewhere by others.
- B. Install system components. Connect equipment to building utilities.
- C. Provide conduit, boxes, wiring, and accessories.
- D. Mount machines on vibration and acoustic isolators, on bed plate and concrete pad. Place on structural supports and bearing plates. Securely fasten to building supports. Prevent lateral displacement.
- E. Accommodate equipment in space indicated.
- F. Install guide rails using threaded bolts with metal shims and lock washers under nuts. Compensate for expansion and contraction movement of guide rails.
- G. Accurately machine and align guide rails. Form smooth joints with machined splice plates.
- H. Bolt or weld brackets directly to structural steel hoistway framing.
- I. Field Welds: Chip and clean away oxidation and residue, wire brush; spot prime with two coats.
- J. Coordinate installation of hoistway wall construction.
- K. Install hoistway door sills, frames, and headers in hoistway walls. Grout sills in place. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.
- L. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
- M. Adjust equipment for smooth and quiet operation.

3.03 ERECTION TOLERANCES

- A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 .

3.04 FIELD QUALITY CONTROL

- A. Perform testing and inspection in accordance with requirements of Section 01 4000.
 - 1. Perform tests as required by ASME A17.2.
 - 2. Provide two weeks written notice of date and time of tests.
 - 3. Supply instruments and execute specific tests.

3.05 ADJUSTING

- A. Adjust for smooth acceleration and deceleration of car so not to cause passenger discomfort.
- B. Adjust automatic floor leveling feature at each floor to achieve 1/4 inch from flush.

3.06 CLEANING

- A. Remove protective coverings from finished surfaces.
- B. Clean surfaces and components ready for inspection.

3.07 PROTECTION

- A. Do not permit construction traffic within cab after cleaning.

- B. Protect installed products until project completion.
- C. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

3.08 MAINTENANCE

- A. Perform maintenance work using competent and qualified personnel under the supervision and in the direct employ of the elevator manufacturer or original installer.
- B. Provide service and maintenance of elevator system and components for one year from Date of Substantial Completion.
- C. Examine system components monthly. Clean, adjust, and lubricate equipment.
- D. Include systematic examination, adjustment, and lubrication of elevator equipment. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original equipment. Replace wire ropes when necessary to maintain the required factor of safety.
- E. Perform work without removing cars during peak traffic periods.
- F. Provide emergency call back service during working hours for this maintenance period.

3.09 DEMONSTRATION

- A. The elevator contractor shall make a final check of each elevator operation with the Owner or Owner's representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

END OF SECTION

SECTION 28 1300**ACCESS CONTROL & DATABASE MANAGEMENT SYSTEM****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Security and Database Management System (SMS) requirements:
 - 1. Monitor and control door access.
 - 2. Monitor alarm, camera, video, communication loss and temperature.
 - 3. Maintain a database of system activity including:
 - a. Personnel access control information.
 - b. System user passwords.
 - c. User role permissions.
 - 4. System shall be managed by Owner's selected client software, as listed in specifications
- B. Access control system equipment for:
 - 1. Supply and install electronic door hardware.
 - 2. Computer hardware.
 - 3. Monitoring equipment.
 - 4. Recording equipment.
 - 5. Managing electronic access control system.
 - 6. Managing data and functionality of integrated systems.
- C. Access control units and software.
 - 1. Operating Systems software and firmware.
 - 2. Application Software.
 - 3. Database Software.
- D. Access control point peripherals, including readers.
- E. Accessories.
- F. Project Requirements and Background: Owner will require planning and programming assistance to ensure that system design for Phase 1 can be implemented in the future on all campuses. Owner wishes to have full range of school lock-down options available.
 - 1. Background: Owner has 5 campuses. Howard is the first location for keyless access control. Access control for this project will be implemented in 2 phases.
 - 2. Phases at Howard Campus: Phase 1 - Annex Phase 2 - Main Building 1927. Future Phase 3 will include 1972 Building on this campus.
 - 3. Software will be installed in a District-owned Virtual Server.
 - 4. Bidder shall provide detailed server specification as it will be required that the proposed system run on District-provided virtual server hosts. The District shall be notified in a timely manner, of the amount of servers, the processor, memory, disk specifications and any other requirements. District will build the servers and provide temporary credentials to the integrator for use with installs, setup, software and licensing for the system.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware: Electrically operated door hardware, for interface with access control system.
 - 1. Includes door hardware with integral request to exit devices.
 - 2. Includes parking gates, for interface with access control system
- B. Division 26
- C. Division 27

D. Division 28

E. Division 1 -

1. Alternates: Provide bid alternates for the following:
 - a. Alternate No. 1 - Provide a fully integrated system with Salto locksets, utilizing SoftwareHouse CCure 9000 as the integration software
 - b. Alternate no. 2 - Provide a fully integrated system with Salto locksets, utilizing Honeywell as the integration software
 - c. Alternate No. 3 - Provide a fully integrated system with Allegion locksets, utilizing S2 as the integration software.
2. Unit Prices: Provide add/deduct unit prices for the following
 - a. Unit Price 1 - Exterior doors (hardwired)
 - b. Unit Price 2 - Interior rated doors (hardwired)
 - c. Unit Price 3 - Interior doors (WiFi/wireless)

F. Drawings

1. Drawings for Phase 1 (Annex) along with Door & Hardware schedule are available as part of BP A.
2. Architectural drawings for Access Control reference (Drawings G-213 through 217; G 230 -231 are issued with this bid package for door count, swing & location. Main Building floor plans (G- 213, 215,217,230) are for access control bidding purposes only. Main Building Door schedules will be provided after bid award.

G. Electronic lockset requirements

1. All exterior doors shall be hardwired.
2. Interior rated and egress doors shall be hardwired.
3. Interior room doors shall be WiFi/wireless.

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.
- B. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 101 - Life Safety Code; National Fire Protection Association; 2015.
- D. UL 294 - Access Control System Units; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Pre-programming Meetings

1. Review Owner requirements and propose options and alternates

B. Coordination:

1. Coordinate the work with other installers to provide suitable door hardware as required for both access control functionality and code compliance.
2. Coordinate the placement of readers with millwork, furniture, equipment, etc. installed under other sections or by others.
3. Coordinate the work with other installers to provide power for equipment at required locations.
4. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

C. Preinstallation Meetings:

1. Conduct meeting with facility representative and other related equipment manufacturers to discuss access control system interface requirements.
- D. Phase Completion meetings
 1. Upon completion of each Phase, work with Owner to confirm program requirements and update as required for future phases.
- E. Owner Training and Support
 1. Provide up to 3 days training for up to 7 Owner representatives.
 2. Provide hardware and software support for 3 years on integrated system; including option to add 3 additional years.

1.05 DEFINITIONS

- A. Controller: An intelligent peripheral control unit that uses a computer for controlling its operation. Where this term is presented with an initial capital letter, this definition applies.
- B. CPU: Central processing unit.
- C. Credential: Data assigned to an entity and used to identify that entity, also called a Token or ID Card
- D. CU: Control Unit, Control unit either stand alone or hardwired
- E. I/O: Input/Output.
- F. LAN: Local area network.
- G. LED: Light-emitting diode.
- H. Mantrap: A man-trap in physical security protocols refers to a space having two sets of interlocking doors such that the first set of doors must close before the second set opens.
- I. PC: Personal computer. This acronym applies to the workstations Computers, and file Servers Computers.
- J. USB: Universal Serial Bus - The most widely used hardware interface for attaching peripherals to a computer.
- K. SQL: Database engine, a Microsoft product
- L. WiFi: Wireless Communication (802.15.4 - ZigBee)
- M. RS-232: A TIA/EIA standard for asynchronous serial data communications between terminal devices. This standard defines a 25-pin connector and certain signal characteristics for interfacing computer equipment.
- N. RS-485: A TIA/EIA standard for multi-point communications.
- O. TCP/IP: Transport Control Protocol/Internet protocol incorporated into Microsoft Windows.
- P. Smart Card: ID Token or Credential that can retain or store data and information and transmit the data upon request. (read & write of data)
- Q. Contactless Smart Card: ID Token or Credential that can retain or store data and information and transmit the data without contact with a reading device (read & write of data).
- R. NFC: Near Field Communication
- S. RFID: Radio Frequency Identification Device
- T. Black List: A list of invalid tokens/cards stored in the door unit
- U. UPS: Uninterruptible Power Supply
- V. WAN: Wide area network.

- W. LAN: Local area network
- X. POE: Power Over Ethernet
- Y. PIN: Personal Identification Number
- Z. MTBF: Mean Time Between Failures
- AA. Wiegand: Patented magnetic principle that uses specially treated wires embedded in the credential card.
- AB. Windows: Operating System by Microsoft Corporation
- AC. Workstation: A PC with software that is configured for specific limited security system functions.
- AD. API: Application Programming Interface
- AE. EAC: Electronic Access Control
- AF. SHIP: Salto Host Interface Protocol
- AG. SALLIS: Salto wireless interface
- AH. SVN: Salto Virtual Network

1.06 SYSTEM DESCRIPTION

A. Summary:

1. The Physical Access Control System has two primary component areas, door control hardware and the management application software.
2. The system shall provide for a combination of wireless (wire-free) and online (hardwired) wall readers to secure perimeter doors as well as battery powered electronic locks to secure all interior doors, all produced and supported by the same manufacturer.
 - a. Owner may choose to utilize off-line option if available
3. The system shall be centrally managed by one single database/software and one single credential system for all doors in the System.
4. NOTE: System description is based on SALTO.
 - a. For pre-approved products by ALLEGION and its software partners, the full suite of features shall be available to the Owner. Owner understands that options available may differ slightly from the system description herein.
 - b. Bidder shall provide information regarding differences from features listed below, at a descoping meeting.

B. Token, Credentials, and RFID Contact-less Smart Card Features and Technical Requirements

1. Secured RFID Contactless Smart Cards
 - a. Contactless smart card technology provides high-speed, reliable communications with data integrity.
 - b. Ensures high security with mutual authentication, encrypted data transfer.
2. Read/write capability is mandatory; any system that does not use a two way encrypted Smart Card (RFID) communication format will be considered Unacceptable by the Owner.
3. Multi-application cards: have to be capable of storing information for future applications and integration.

C. RFID Contact-less Smart Card Technology supported:

1. Compatible with a wide range of Smart Card (RFID) Technologies, operating on the industry standard frequency of 13.56MHz

2. To meet the owners needs, the read & write credentials may be any one of the following type products:
 - a. HID iClass: Memory capacity: 32K bit with 2 application area configurations. HID-iClass credential shall have a minimum of 16 kb, 32kb preferred, of available memory and allow the possibility for use with multiple vendors across multiple applications.
 - b. MIFARE: 4k Bytes
 - c. DESFire: 4k Bytes
 - d. Desfire EVI: 4K Bytes
 - e. NFC: Near Field Communication at 13.56 MHz
 3. Access profile for the individual user, encoded on to the card, shall be encrypted and in such a format as to negate the potential for cloning.
 4. Standard 16 kb, 32kb preferred memory on each credential shall be secured with a unique set of Keys- A&B for the Electronic Access Control (EAC) system and to enable, as and when required, the collection and transfer of information pertaining to audit trails, lost and stolen cards etc via a data on card functionality
 5. Tokens or credentials shall be available in multiple form factors. They are, but not limited to: Standard ID card format, printable ID card format, key fob format, wrist watch format, rubber wrist band format.
- D. Features and technical requirements:
1. Online CU (Control Unit) and wall readers will be manufactured and supported by the same manufacturer of the Electronic door locks and System Software. The following is a minimum list of features, that the online unit must contain:
 - a. Provide real time door access monitoring
 - 1) with the on-line hot-spots, if available.
 - b. Continue operating and store historical data (audit trail) in the event of a network or server failure. System door Units will provide a Minimum of 1000 transactions.
 - c. Ethernet connectivity of all on-line devices via IP4 or IP6 addressing, either hardwired WiFi Connection (802.15.4).
 - d. Provide automatic card updating to all Contactless Smart Cards regardless of brand.
 - e. Provide the ability to Support 2 Readers and 2 locking devices with on board auxiliary programmable on-board outputs (relays).
 - f. Provide for up to 16 Auxiliary output boards with a total of not less then 128 outputs available for end-user programming.
 - g. Provide the flexibility for either online wireless (or offline battery operated locks, if available) allowing for the 2 types of system integrated into the same facility.
- E. Battery Powered Wireless Networked Locks:
1. RFID Keycard operated: unlocking by means of contact-less smart carriers, which most include the following formats; card, key-fob, wrist watch, RFID stickers and wrist band. All devices will perform at the same level.
 2. The EAC Locking Unit shall have typical access control features and be able to mimic traditional door hardware functions. The following is a minimum of the required door operational features:
 - a. Standard
 - b. Office
 - c. Automatic Changes
 - d. Automatic Opening
 - e. Automatic Opening Plus Office

- f. Automatic Opening Plus Toggle
 - g. Key Card Plus Pin Number (Keypad)
 - h. Pin Number Only (Keypad)
 - i. Timed Key Card Plus Pin Number (Keypad)
 - j. Timed Pin Number (Keypad)
 - k. Timed Office
 - l. Timed Toggle
 - m. Toggle Only
 - n. Emergency Lockdown (AMOK Crisis)
 - o. Anti Passback - Soft/Timed
3. Internal door lock audit trail memory shall be at minimum, 1,000 transactions. This shall include valid, invalid attempts, request to exit, door status, door ajar and mechanical override key used.
 4. Automatic Unlocking, all locks shall be able to be programmed to remain unlocked during certain hours and days, automatically changing to a locked down mode outside of these times i.e.- go into office, card only, card plus PIN mode, etc. Each lock shall have a minimum of 8 different automatic locking and unlock schedules. This feature shall be able to be manipulated by day of the week and by system holidays for each door lock.
 5. Automatic Locking (lockdown mode), all locks shall be able to lock down from the inside in an emergency. While the lock is in lockdown mode, one designated token will be able to enter the locked down door unit. Once the unit is returned to normal programming mode, it will operate as previously programmed. Activation and resetting of the lockdown mode (AMOK) shall be done with a card holders token. This privilege will be given to the desired card holder on a person by person basis. Blanket lockdown setting or lockdown by a lock thumb turn will be unacceptable.
 6. Lost cards shall be able to be deleted from the system without waiting for card expiration or having to visit the locks with a handheld programmer.
 7. Water resistance application lock units, must be an option for outdoor and wet environments.
 8. Batteries:
 - a. Battery life benchmarked to 48,000 Operations or 2.5- 3.0 years.
 - b. Shall be powered by standard off the shelf batteries (AAA).
 - c. Proprietary batteries or proprietary battery packs are not acceptable.
 9. Low battery warning shall be at minimum via visual LEDs and should also automatically report through the system software. This will happen without the need to visiting the door lock with a programming device. For wireless lock units, they will also report via a link through the RFID Cards through a hotspot for direct communications back to the software to report current battery status.
 10. Shall automatically adjust for daylight saving time. This feature will be flexible enough to provide changeable dates from year to year. This feature shall not require a visit to the lock with a programming device.
 11. A door lockset shall be deemed to include all of the components necessary for the EAC to function as per manufacturer's specification; namely UL approved and listed internal and external lock parts. The following locking hardware types shall be available:
 - a. UL Listed, ANSI Grade 1 American Mortise Lock
 - b. UL Listed, ANSI Grade 1 American Mortise Lock, with deadbolt
 - c. UL Listed, ANSI Grade 1 Glass Door Lock
 - d. UL Listed, ANSI Grade 1 American Cylindrical Lock

- e. UL Listed, ANSI Grade 2 American Cylindrical Lock
 - f. UL Listed Locker Lock, Pad Lock
 - g. UL Listed, ANSI Grade 1 Exit Device
 - h. UL Listed, European Mortise Lock
 - i. Mortise Cylinder (Salto GEO)
 - j. Rim Cylinder (Salto GEO)
 - k. Keypad and Card Lock- XS4
12. External and internal lever handles shall comply with ADA requirements and specifications, and shall also be available with antibacterial Salto BioCote® finishes.
 13. The length of time that is allowed to open the door after a valid credential is presented shall be variable and managed by the software, allowing for users with physical disabilities additional time when needed to access their quarters.
 14. At all times the internal lever shall be free to operate and retract all latches and deadbolts, allowing free egress by way of a single action.
 15. A mechanical master key override shall be provided where necessary and shall operate in conjunction with the lever clutching mechanism, rather than directly on the door latch. Operation of the key override will be recorded in the lock unit audit trail memory to provide increased security and to track key usage. A standard American mortise cylinder shall provide the key override function.
- F. Off-line Reader and Battery Powered SVN Lock Operations
1. The smart card will transfer data to/from both off-line locksets to the on-line hot-spots. Tokens may be card, wrist watch or band, key fob formats. All formats shall have the same system performance.
 2. A door lockset shall be deemed to include all of the components necessary for the EAC to function as per manufacturer's specification; namely UL approved and listed internal and external lock parts. The following locking hardware types shall be available:
 - a. UL Listed, ANSI Grade 1 American Mortise Lock
 - b. UL Listed, ANSI Grade 1 American Mortise Lock, with deadbolt
 - c. UL Listed, ANSI Grade 1 Glass Door Lock
 - d. UL Listed, ANSI Grade 1 American Cylindrical Lock
 - e. UL Listed, ANSI Grade 2 American Cylindrical Lock
 - f. UL Listed Locker Lock, Pad Lock
 - g. UL Listed, European Mortise Lock
 - h. UL Listed, ANSI Grade 1 Exit Device
 - i. Mortise Cylinder (Salto GEO)
 - j. Rim Cylinder (Salto GEO)
 - k. Keypad and Card Units (XS4)
 - l. Cam Lock- GxCL (Salto GEO)
 - m. Heavy Duty Deadbolt- GxB3 (Salto GEO)
 - n. Locker 9000 (XS4)
 3. Retrofit Locks, wherever possible and as needed, the manufacturer will have an option to reuse existing locks that are in good working order and can support the new Salto trim and controls.
 4. External & Internal Lever handles shall comply with ADA requirements and specifications. Lever and trim shall also be available with antibacterial finishes. Traditional door hardware finishes and a choice of lever styles to as closely as possible match existing door hardware.

5. At all times the internal lever shall be free to operate and retract all latches and deadbolts, allowing free egress by way of a single action.
6. A mechanical key override shall be provided where necessary and shall operate in conjunction with the lever clutching mechanism, rather than directly on the door latch. To provide increased security the key operation will leave an audit in the lock memory that the mechanical key was used to open the door. This shall be available on mortise or cylindrical type locks.
7. The unit shall initially be delivered with 3 standard alkaline AA batteries, sufficient for up to 48,000 transactions or approximately 2.5 - 3.0 years operational life. No proprietary or rechargeable battery packs shall be accepted.
8. Low battery status shall be, by default, recorded on the user's credential and transferred to the management system when the credential is used at an on-line wall reader or update point (Hotspot). No handheld Device will be needed to retrieve battery status.
9. In the event of a battery failure, the door shall be able to be opened with a small portable handheld device in conjunction with a valid credential (smart card or token).
10. Networked and non-networked locks of all hardware styles shall always allow free egress if the batteries fail.
11. An audit trail of the last 1,000 events (including failed attempts at access by unauthorized key holders) shall be stored on the networked lock's memory for collection using the portable handheld device at anytime and without requiring access to the inside component of the door lock.
12. The networked lock shall hold its designation, the zones that it belongs to, operational configuration, audit trail and "black list" of cancelled keys in non-volatile memory.
13. Current date and time shall be synchronized with the server on a [Time] basis, and/or when collecting audit trails with the portable handheld device or replacing batteries.
14. The networked lock shall incorporate such measures as hardened high resistance steel drill plates, floating axes and steel ball bearings to prevent unauthorized access or tampering by physical means.
15. The external lever mechanism shall incorporate a clutching system to minimize the potential for vandal damage by allowing free travel up and down until a valid credential is presented for the door to be opened.
16. The length of time allowed to open the door after a valid credential is presented shall be variable and managed by the software, allowing for users with physical disabilities additional time when needed to access their quarters.
17. When the lever returns to the zero position, no matter the time elapsed since the valid credential was presented, the clutch shall automatically disengage, limiting the potential for an unauthorized person to enter after the authorized entry.
18. Internal covers may be secured with tamper resistant screws to restrict access to authorized personnel only.
19. Where appropriate the internal clock of the networked lock shall be programmed to allow for the start and finish of Daylight Saving Time.
20. In an office, meeting room or services environment (where applicable) the networked lock shall be able to either automatically or manually be set into "free passage" mode by authorized key holders, reverting to standard operating mode at a prescribed time.
21. In the event a user key is lost, an authorized operator shall be able to cancel and re-issue a new key for the User. Information regarding cancelled keys shall be transmitted to all off line doors via the "black list", placed on credentials when passing through an on-line "hotspot" or by visiting the doors with the portable programming device.

22. When the system is being operated using the hotel functionality, if a room key is reported lost or stolen (or the key holder is AWOL), simply presenting a “Guest cancel key” shall cancel access for that key without providing access to the room.
23. The EAC Locking Unit shall have typical access control features and be able to mimic traditional door hardware functions. The following is a Minimum of the required door operational features:
 - a. Standard
 - b. Office
 - c. Automatic Changes
 - d. Automatic Opening
 - e. Automatic Opening Plus Office
 - f. Automatic Opening Plus Toggle
 - g. Key Card Plus Pin Number (Keypad)
 - h. Pin Number Only (Keypad)
 - i. Timed Key Card Plus Pin Number (Keypad)
 - j. Timed Pin Number (Keypad)
 - k. Timed Office
 - l. Timed Toggle
 - m. Toggle Only
 - n. Emergency Lockdown (AMOK Crisis)
 - o. Anti Passback - Soft/Timed

G. HOT SPOT - Wall Reader Operations

1. A Wall Reader Device includes support for one (1) or two (2) wall readers. These readers may be; Mifare, Pico Pass, Iclass and NFC. Reader Plus PIN will also be available if needed. The Unit will control access and egress, where applicable, secured to the wall with a vandal resistant frame and tamper-proof fixings; plus a Control Unit (CU) housed with 12V DC power supply, ready for connection to 110V AC outlet. Additionally the power supply shall be prepared to interface with the local fire alarm system to cut power to the door locks, if required, and have connections for 12V DC battery back-up supply (provided by others).
2. Shall be ISO 15.93 and FCC Part 15 compliant.
3. The Wall reader Control Unit set shall have the capability to operate both as an off-line stand-alone door controller or, be easily upgraded with additional (not replacement) hardware to function as an integrated part of the on-line EAC system.
4. Connection between the Wall Reader and Control Unit shall be via UTP CAT5 cable.
5. If required for security or logistical reasons the CU shall be able to be placed up to 100 metres or 328 feet remotely from the wall reader(s).
6. The CU shall hold its designation, the zones that it belongs to, operational configuration, audit trail and “black list” of cancelled keys in non-volatile memory.
7. The on-line CU shall connect directly to the EAC application and be capable of making changes to the individual user access profile when a credential is presented. At the same time the CU shall pass the “black list” of recent cancelled cards on to the key and upload any stored “on key” audits of attempts to access doors and “low battery warnings” from the stand-alone locks.
8. The EAC system shall synchronize the server clock with the on-line CU approximately every 30 seconds.
9. The (off-line and on-line) CU shall be capable of integrating with the elevator management system to control access to individual floors for individual users. Connection

to the CU shall be via RS485 serial BUS to Extension Relay Boards (ERB) consisting of 8 NO/NC 12VDC dry contact switches. The EAC system shall allow for up to 16 ERB to be connected in series to each control unit.

10. For the Off-line reader the date and time shall synchronize with the hand held programming unit any time an audit is retrieved.

1.07 SYSTEM OPERATIONAL PERFORMANCE FEATURES

A. Basic System Performance requirements:

1. Shall provide central management of user rights, access policies, and credentialing.
2. The application shall be capable of implementing access policies through the assignment of entry permission based on door groupings and time schedules.
3. The system shall allow for schedules to be applied at doors, governing their remaining open or locked condition.
4. The application shall permit flexible assignment of user rights and privileges.
5. The application shall allow for creation and editing of cardholder credentials, including system wide card formats.
6. The application shall provide views of events and alarms throughout the installation and shall be capable of triggering hardware and communicative actions, based on system configuration.
7. The application shall be capable of generating standard and custom reports, and provide a detailed and complete log of all system events, as defined by the system operator.

B. System Software Features:

1. The system shall incorporate 128 bit AES encrypted data.
2. Supported operating systems shall be Microsoft Windows XP SP3, Vista, and Windows 7.
3. The database engine shall be SQL 2003, 2008, 2012 or SQL Express.
4. The system shall have an operating temperature of 0°C to 50°C, ambient, a storage temperature of -40°C to +85°C, ambient, a relative humidity ability of 0% to 95% (non-condensing) at 50°C, and a MTBF of > 100,000 hours.
5. The system-radiated emissions shall be compliant with FCC Part 15, Class A, and EN55022 specifications.
6. The system must be capable of managing 4 million users, 64,000 doors, 256 calendars, 1024 zones, and 256 time zones, 1024 time periods, both with 8 intervals each.
7. Integration with other software systems through dynamic database synchronization; Microsoft SQL Server is recommended.
8. Able to store all historical data on the system server without having to individually use a handheld device to download audit trail data from individual locks.
9. System capable of being expanded throughout the site. Each area (department) shall be able to manage their own doors and users without a chance of accidentally interfering with other areas (departments).
10. Capable of dynamic master-keying: each credential can change access privileges transparently “on the fly” without the need to visit the access control administrator to reprogram keycards and without the need to reprogram the electronic locks with a handheld programmer.
11. No predefined profiles are necessary to issue keycards. Each and every keycard can be individually enabled to access any combination of doors.
12. Lost keycard cancellation: “blacklist”. Contactless smart cards shall be capable of conveying lists of cancelled keys to avoid having to reprogram locks with a handheld device each time a keycard is lost.

13. No WI-FI or Radio infrastructure shall be required.
14. The locks shall have built-in anti-passback functionality. The EAC locks shall have the ability to prevent card holders from reentering without presenting their token to the out reader. This feature shall be incorporated in both On Line/Wireless, or in the off-line EAC lock units.

C. System Software:

1. Develop, install, program and test software and databases for the complete and proper operation of systems involved. Assign software license to Owner. The following is required of the EAC Software:
 - a. The software shall be supplied ready to support any number and configuration of off-line and on-line stand-alone locks and wall readers, with the capacity to manage multiple or single sites including up to 64,000 doors and individual users.
 - b. A Portable Programming Device (PPD) for transferring information to and from the database for all off-line locks and wall readers shall also be included.
 - c. 1024 Time Periods that determine the time intervals at which a lock shall operate in a special mode, timed office mode, automatic opening mode etc.
 - d. 256 Time Zones that determine the interval of time in which a user has access to a particular door or zone
 - e. 256 Calendars, for user access or used by the electronic locks when they operate in a timed mode.
 - f. 1024+ Zones to group doors into sets making programming user access simpler and more efficient.
 - g. User Groups shall enable the system manager to group users according to their privileges of access.
 - h. Operator Groups shall be defined hierarchically and be password protected to allow only authorized staff to make amendments to sections of the database for which they have responsibility.
 - i. Allow multiple simultaneous access, which allows multiple authorized operators to make dynamic changes to the database at any one time.
 - j. Must have a proven API for interfacing with existing and well established traditional access control systems.
 - k. Must have a proven API for interfacing with third party access control panels.
 - l. Must have a maps feature that will allow indicate to the operator where a system produced alarm is located.
 - m. Shall support an "Out of Site" feature which shall work in conjunction with IN and OUT hot spot readers to disable user access when leaving a facility and enabling user access when entering it.
 - n. Shall support a "Limited User Access" feature which can be set to allow a maximum number of users assigned to a door.
 - o. Shall support a "Limited User Occupancy" monitor which can be set to disallow access after the desired number is reached.
 - p. Shall support setting encryption type for Desfire cards.
 - q. Shall incorporate auto assignment when using Legic Prime cards.
 - r. Shall incorporate an activation date and time setting for user cards.
 - s. Shall allow multiple operator groups to be created with software features able to be individually allowed or denied to the group.
 - t. Shall feature a Department tab, allowing departments to share users and also add external (users not in a group) access to the department.

- u. Shall permit specifying Wiegand codes in decimal, hexadecimal, or binary formats, and bit order.
- D. On line Hotspot for Virtual Network
 1. The system Virtual Network (SVN) shall provide the capacity to combine the efficiencies of on-line access control with the (cost) advantages of off-line hardware, using data on card functionality.
 2. With SVN is enabled all on-line readers shall update access protocols on valid staff and user keys when they are presented to a desktop updater or on-line wall reader can also be used at a security entry check point to update any changes to the users access rights as they enter and leave during the day.
 3. If a cardholder has been cancelled an on-line wall reader or elevator reader shall remove all access privileges from the card and shall deny access to anyone presenting the invalid card.
 4. The current list of cancelled cards is placed onto every card when it is presented to an on-line reader (hot-spot), and the updated card shall then transfer that list to the off-line readers each time they are used, allowing for the upgraded list to be transmitted throughout the facilities by the users as they go about accessing doors.
 5. Data on card functionality shall also allow for the collection of audit trails and low battery warnings from staff and user cards.
- E. Emergency
 1. In the event of an emergency the System Manager has the ability to either lock down or unlock all or some doors/locks connected via the Salto Wireless Network. These doors shall then remain locked or unlocked until the emergency is designated as over by the System Security Manager.
- F. CCTV Invalid Card Interface
 1. If an invalid card is presented to an on-line reader an entry is placed immediately in the audit trail and the control unit can trigger a CCTV camera or an alarm (local or remote). This operation can be modified at anytime by changing the dipswitch configuration in the control unit.

1.08 ACTION SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 1. Include plan views indicating locations of system components and proposed size, type, and routing of conduits and/or cables.
 2. Include elevations and details of proposed equipment arrangements.
 3. Include system interconnection schematic diagrams.
 4. Include requirements for interface with other systems.
 - a. Network IP and or MAC addresses of field device.
 5. Include wiring diagrams for power and signal wiring.
- C. Product Data: Provide manufacturer's standard catalog pages and data sheets for each system component. Include ratings, configurations, dimensions, finishes, service condition requirements, and installed features.
- D. Design Data: Standby battery/UPS calculations.
 1. Provide heat load calculations for all hardware.

1.09 INFORMATIONAL SUBMITTALS

- A. Certify that proposed system design and components meet or exceed Owner's stated requirements during Programming meeting/s.
- B. Evidence of qualifications for installer.
- C. Evidence of qualifications for maintenance contractor (if different entity from installer).
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
- E. Manufacturer's detailed field testing procedures.
- F. Field quality control test reports.
 - 1. The final test report shall indicate that every device was tested successfully in a system test.
- G. Maintenance contracts.

1.10 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of system components and installed wiring arrangements and routing.
- B. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.
 - 1. Include contact information for entity that will be providing contract maintenance and trouble call-back service.
- C. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.
- D. Software: One copy of software not resident in read-only memory.
 - 1. Operating system, database and application software, including installation, system configuration backup and recovery data on CD or DVD media.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Deliver blank credentials to Owner as directed.

1.11 QUALITY ASSURANCE

- A. Comply with the following:
 - 1. NFPA 70
 - 2. NFPA 101 (Life Safety Code).
 - 3. The requirements of the local authorities having jurisdiction.
 - 4. Applicable TIA/EIA standards.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Software integration between the SMS and other integrated system components shall be tested and certified for interoperability by the manufacturers of each system.
- D. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- E. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience with access control systems of similar size, type,

and complexity and providing contract maintenance service as a regular part of their business; authorized manufacturer's representative.

1. Contract maintenance office located within 100 miles of project site.

F. Maintenance Contractor Qualifications: Same entity as installer.

G. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.12 DELIVERY, STORAGE, AND HANDLING

A. Ordering: The manufacturer's ordering instructions and lead-time requirements shall be followed to avoid installation delays.

B. Delivery, storage, and handling of the Access control hardware shall be in accordance with the manufacturer's recommendations.

C. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

D. Store products in manufacturer's unopened packaging, keep dry and protect from damage until ready for installation.

1. The Physical Access Control System shall be stored and protected from exposure to harmful weather conditions and at the environmental conditions recommended by the manufacturer.

1.13 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.14 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. All equipment and systems will be warranted by the Contractor for a period of two (2) years commencing with the filing date of the Notice of Completion after Phase 2, provided the system has been inspected and signed off by the Manufacturer and at the conclusion of satisfactory acceptance of the entire system by the Owner.

C. The period of occupancy of Phase 1 shall also be covered by this warranty.

D. The warranty will cover all costs for Warranty Service, including parts.

E. The contract for service will cover the period starting with the first expected activation of each system for installation and test and will continue for an initial period of two years. A partial-year extension will be acquired to cover the period to the end of the two-year guarantee and will be handled such that a smooth transition to a Customer maintenance agreement can be achieved with no lapse in coverage.

F. Service response will be within 2 hours of the initial request for service; the response may be by phone or remote VPN access into system. This service should be provided during the warranty period at no added cost. This service shall be provided 24 hours per day, 7 days per week, and inclusive of all holidays.

G. Service requests will be reported via phone call to a designated service number provided by Security Contractor, or via a service web site or e-mail account as designated by the security contractor.

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Basis of Design: Salto SVN/SHIP/SALLIS compliant Systems.
Salto Systems, Inc.
 - 1. Finish - Antique Brass
- B. Pre-Approved: Allegion NDE with Engage Technology
 - 1. Finish - Satin Bronze
- C. Pre-Approved Software for system
 - 1. CCure 9000
 - 2. Honeywell Access Control
 - 3. S2
- D. Substitutions: See Section 01 6000 - Product Requirements.
- E. Products other than basis of design are subject to compliance with specified requirements and prior approval of Engineer. By using products other than basis of design, Contractor accepts responsibility for costs associated with any necessary modifications to related work, including any design fees.
- F. Source Limitations: Where possible, furnish system components and accessories produced by a single manufacturer and obtained from a single supplier. Basis of Design: Salto
 - 1. Module include
 - a. Card Readers Units with and without Keypad
 - b. Door Locks SVN and Wireless Versions
 - c. Control Units Relay and Expansion Boards
 - d. UPS Network for Lock
 - e. Power Reader Switches
 - f. Card Encoders or Enrollment Reader
 - g. Portable Programmer Devices

2.02 ACCESS CONTROL SYSTEM REQUIREMENTS

- A. Provide new access control system consisting of all required equipment, conduit (if not provided under other contracts), boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the functional intent indicated.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
 - 1. Access Control Units and Readers: Listed and labeled as complying with UL 294.

2.03 ACCESS CONTROL UNITS AND SOFTWARE

- A. Provide access control units and associated software compatible with readers to be connected.

2.04 ACCESS CONTROL POINT PERIPHERALS

- A. Provide devices compatible with control units.
- B. Provide devices suitable for operation under the service conditions at the installed location.
- C. Provide readers compatible with credentials to be used.
- D. Reader Color: To be selected by Architect from manufacturer's available standard colors.
- E. Door Locking Devices (Electric Strikes and Magnetic Locks): Comply with Section 08 7100.

2.05 ACCESSORIES

- A. Provide components as indicated or as required for connection of access control system to devices and other systems indicated.
- B. Unless otherwise indicated, credentials to be provided by Contractor.
 - 1. Provide credentials compatible with readers and control units/software to be used.
- C. Provide cables as indicated or as required for connections between system components.
- D. Provide accessory racks/cabinets as indicated or as required for equipment mounting.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify the dimensions that are shown on the drawings with field measurements.
- B. Verify that ratings and configurations of the network and infrastructure components are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive system components.
- D. Verify space allocations, installation tolerance, hazards to safe system operation and other conditions affecting installation are in compliance with system requirements.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to system.
- F. Verify rough-in for LAN, WAN and IP network before device installation.
- G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install access control system in accordance with NECA 1 (general workmanship).
- B. Comply with SIA CP-01 Control Panel Standard.
- C. Comply with ANSI/TIA-606-B Labelling Standard.
- D. Install products in accordance with manufacturer's instructions.
- E. Provide grounding and bonding in accordance with Division 26.
 - 1. Comply with IEEE 1100, "Power and Grounding Sensitive Electronic Equipment."
 - 2. Ground cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.
 - 3. Bond shields and drain conductors to ground at only one point in each circuit.
 - 4. Signal Ground:
 - a. Terminal: Locate in each equipment room and wiring closet; isolate from power system and equipment grounding.
 - b. Bus: Mount on wall of main equipment room with standoff insulators.
 - c. Backbone Cable: Extend from signal ground bus to signal ground terminal in each equipment room and wiring closet.
- F. Identify system wiring and components in accordance with Division 26.
 - 1. Cabling:
 - a. Comply with NECA 1, "Good Workmanship in Electrical Contracting."
 - b. Install cables and wiring according to requirements in Division 28.
 - c. Access control system wiring color to be distinct and specific to the system.
Contractor to coordinate cable colors with all other vendors to ensure color is not duplicated.

- d. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use NRTL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.
 - e. Install LAN cables using techniques, practices, and methods that are consistent with Category 5E rating of components and that ensure Category 5E performance of completed and linked signal paths, end to end.
 - f. Install cables without damaging conductors, shield, or jacket.
 - g. Boxes and enclosures containing security system components or cabling, and which are easily accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building will not be considered to be accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public will be covered with a suitable cover plate and secured with tamperproof screws.
 - h. Install end-of-line resistors at the field device location and not at the controller or panel location.
2. Cable Application:
 - a. Comply with EIA/TIA-569, "Commercial Building Standard for Telecommunications Pathways and Spaces."
 - b. Cable application requirements are minimum requirements and will be exceeded if recommended or required by manufacturer of system hardware.
 - c. RS-232 Cabling: Install at a maximum distance of 50 feet (15 m).
 - d. RS-485 Cabling: Install at a maximum distance of 4000 feet (1220 m).
 3. Configuration:
 - a. The configuration of the Physical Access Control System shall be accomplished in accordance with the overall network plan with regard to the following:
 - 1) Network addressing
 - 2) User access
 - 3) Network security

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Provide services of a manufacturer's authorized representative to observe installation and assist in inspection and testing. Include manufacturer's detailed testing procedures and field reports with submittals.
- C. Prepare and start system in accordance with manufacturer's instructions.
- D. Factory Commissioning: Provide on-site inspection by manufacturer's personnel to test and assess system programming, functionality and performance.
- E. Program system parameters according to requirements of Owner.
- F. Testing Agency: Engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
 1. Test for proper interface with other systems.
 2. Perform the following field tests and inspections and prepare test reports:
 - a. LAN Cable Procedures: Inspect for physical damage and test each conductor signal path for continuity and shorts. Use Class 2, bidirectional, Category 6 tester. Test for faulty connectors, splices, and terminations. Test according to TIA/EIA-568-1, "Commercial Building Telecommunications Cabling Standards - Part 1 General

Requirements." Link performance for UTP cables must comply with minimum criteria in TIA/EIA-568-B.

- b. Test each circuit and component of each system. Tests will include, but are not limited to, measurements of power supply output under maximum load, signal loop resistance, and leakage to ground where applicable. System components with battery backup will be operated on battery power for a period of not less than 10 percent of the calculated battery operating time. Provide special equipment and software if testing requires special or dedicated equipment.
 - c. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance from each end of all pairs installed. Remove temporary connections when tests have been satisfactorily completed.
- G. Correct defective work, adjust for proper operation, and retest until entire system complies with contract documents.
- H. The Physical Access Control System shall be tested in accordance with the following:
1. The Contractor shall conduct a complete inspection and test of all installed Physical Access Control System equipment. This process includes testing and verifying operation with connected equipment and network infrastructure.
 2. The Contractor shall provide staff to test all devices and all operational features of the system for witness by the Owner's representative and the Authority having jurisdiction if need be.
 3. The Owner's representative, prior to acceptance, shall witness all testing.
- I. Submit detailed reports indicating inspection and testing results and corrective actions taken.

3.04 STARTUP SERVICE

- A. Prepare and start system in accordance with manufacturer's instructions.
- B. Engage a factory-authorized service representative to supervise and assist with startup service. Complete installation and startup checks according to approved procedures that were developed in the Preparation article and with manufacturer's written instructions. Engage a factory-authorized service representative to supervise and assist with startup service.
 1. Enroll and prepare badges and access cards for Owner's operators, management, and security personnel.

3.05 ADJUSTING

- A. Provide on-site assistance in adjusting system to suit actual occupied conditions.
- B. Provide up to two visits to project site.
- C. Tasks include, but are not limited to the following:
 1. Check cable connections.
 2. Check proper operation of card readers, intrusion sensors, integrated systems and database configuration. Verify SMS configuration and adjust as required.
 3. Recommend changes to SMS configuration and settings to improve operation.
 4. Provide written report of adjustments and recommendations.

3.06 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.07 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

- B. Demonstration: Demonstrate proper operation of system to Owner, and correct deficiencies or make adjustments as directed.
 - 1. The Contractor shall demonstrate the functionality of the Physical Access Control System upon completion of installation, documenting the result of all tests and providing these results to the Owner.
- C. Training: Train Owner's personnel on operation, adjustment, and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of one day of training for up to 7 Owner's staff.
 - 3. Instructor: Manufacturer's authorized representative.
 - 4. Location: At project site.
 - 5. Provide separate training modules for the following:
 - a. Computer system administration personnel to manage and repair the LAN and databases and to update and maintain software.
 - b. Operators who prepare and input credentials, monitor the SMS and enroll personnel.
 - c. Security personnel.
 - d. Hardware maintenance personnel.
 - e. Facility management.
 - 6. Video tape training sessions. Provide on DVD or other media as requested by Owner for future reference and training.

3.08 PROTECTION

- A. Protect installed system components from subsequent construction operations.

3.09 MAINTENANCE

- A.
- B. Provide to Owner, a proposal as an alternate to the base bid, a separate maintenance contract for the service and maintenance of access control system for two years from date of Substantial Completion; Include a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.
- C. Provide one year of trouble call-back service upon notification by Owner:
 - 1. Include allowance for one call-back service call per month during normal working hours at no extra cost to Owner.
 - 2. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.

END OF SECTION

SECTION 28 1300**SECURITY & DATABASE MANAGEMENT SYSTEM****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Security and Database Management System (SMS) requirements:
 - 1. Monitor and control door access.
 - 2. Monitor alarm, camera, video, communication loss and temperature.
 - 3. Maintain a database of system activity including:
 - a. Personnel access control information.
 - b. System user passwords.
 - c. User role permissions.
 - 4. System shall be controlled from a web browser without software installation or client licenses.
- B. Access control system equipment for:
 - 1. Electronic door hardware.
 - 2. Computer hardware.
 - 3. Monitoring equipment.
 - 4. Recording equipment.
 - 5. Managing electronic access control system.
 - 6. Managing data and functionality of integrated systems.
- C. Access control units and software.
 - 1. Operating Systems software and firmware.
 - 2. Application Software.
 - 3. Database Software.
- D. Access control point peripherals, including readers.
- E. Accessories.
- F. Project Requirements and Background: Owner will require planning and programming assistance to ensure that system design for Phase 1 can be implemented in the future on all campuses. Owner wishes to have full range of school lock-down options available.
 - 1. Background: Owner has 5 campuses. Howard is the first location for keyless access control. Access control for this project will be implemented in 2 phases.
 - 2. Phases at Howard Campus: Phase 1 - Annex Phase 2 - Main Building 1927. Future Phase 3 will include 1972 Building on this campus.
 - 3. Software will be installed in a District-owned Virtual Server.
 - 4. Bidder shall provide detailed server specification as it will be required that the proposed system run on district provided virtual server hosts. The District shall be notified in timely manner, of the amount of servers, the processor, memory, disk specifications and any other requirements. District will build the servers will be built and provide temporary credentials to the integrator for use with installs, setup, software and licensing for the system.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware: Electrically operated door hardware, for interface with access control system.
 - 1. Includes door hardware with integral request to exit devices.
 - 2. Includes parking gates, for interface with access control system

- B. Division 26
- C. Division 27
- D. Division 28
- E. Division 1 - Alternates: Provide bid alternates for the following:
 - 1. Alternate No. 1 - Provide a fully integrated system with Salto locksets, utilizing SoftwareHouse CCure 9000 as the integration software
 - 2. Alternate no. 2 - Provide a fully integrated system with Salto locksets, utilizing Honeywell ProWatch as the integration software

1.03 REFERENCE STANDARDS

- A. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.
- B. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 101 - Life Safety Code; National Fire Protection Association; 2015.
- D. UL 294 - Access Control System Units; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Pre-programming Meetings
 - 1. Review Owner requirements and propose options and alternates
- B. Coordination:
 - 1. Coordinate the work with other installers to provide suitable door hardware as required for both access control functionality and code compliance.
 - 2. Coordinate the placement of readers with millwork, furniture, equipment, etc. installed under other sections or by others.
 - 3. Coordinate the work with other installers to provide power for equipment at required locations.
 - 4. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
- C. Preinstallation Meetings:
 - 1. Conduct meeting with facility representative and other related equipment manufacturers to discuss access control system interface requirements.
- D. Phase Completion meetings
 - 1. Upon completion of each Phase, work with Owner to confirm program requirements and update as required for future phases.
- E. Owner Training and Support
 - 1. Provide up to 3 days training for up to 7 Owner representatives.
 - 2. Provide hardware and software support for 3 years on integrated system; including option to add 3 additional years.

1.05 DEFINITIONS

- A. Controller: An intelligent peripheral control unit that uses a computer for controlling its operation. Where this term is presented with an initial capital letter, this definition applies.
- B. CPU: Central processing unit.

- C. Credential: Data assigned to an entity and used to identify that entity, also called a Token or ID Card
- D. CU: Control Unit, Control unit either stand alone or hardwired
- E. I/O: Input/Output.
- F. LAN: Local area network.
- G. LED: Light-emitting diode.
- H. Mantrap: A man-trap in physical security protocols refers to a space having two sets of interlocking doors such that the first set of doors must close before the second set opens.
- I. PC: Personal computer. This acronym applies to the workstations Computers, and file Servers Computers.
- J. USB: Universal Serial Bus - The most widely used hardware interface for attaching peripherals to a computer.
- K. SQL: Database engine, a Microsoft product
- L. WiFi: Wireless Communication (802.15.4 - ZigBee)
- M. RS-232: A TIA/EIA standard for asynchronous serial data communications between terminal devices. This standard defines a 25-pin connector and certain signal characteristics for interfacing computer equipment.
- N. RS-485: A TIA/EIA standard for multi-point communications.
- O. TCP/IP: Transport Control Protocol/Internet protocol incorporated into Microsoft Windows.
- P. Smart Card: ID Token or Credential that can retain or store data and information and transmit the data upon request. (read & write of data)
- Q. Contactless Smart Card: ID Token or Credential that can retain or store data and information and transmit the data without contact with a reading device (read & write of data).
- R. NFC: Near Field Communication
- S. RFID: Radio Frequency Identification Device
- T. Black List: A list of invalid tokens/cards stored in the door unit
- U. UPS: Uninterruptible Power Supply
- V. WAN: Wide area network.
- W. LAN: Local area network
- X. POE: Power Over Ethernet
- Y. PIN: Personal Identification Number
- Z. MTBF: Mean Time Between Failures
- AA. Wiegand: Patented magnetic principle that uses specially treated wires embedded in the credential card.
- AB. Windows: Operating System by Microsoft Corporation
- AC. Workstation: A PC with software that is configured for specific limited security system functions.
- AD. API: Application Programming Interface
- AE. EAC: Electronic Access Control
- AF. SHIP: Salto Host Interface Protocol

AG. SALLIS: Salto wireless interface

AH. SVN: Salto Virtual Network

1.06 SYSTEM DESCRIPTION

A. Summary:

1. The Physical Access Control System has two primary component areas, door control hardware and the management application software.
2. The system shall provide for a combination of wireless (wire-free) and online (hardwired) wall readers to secure perimeter doors as well as battery powered electronic locks to secure all interior doors, all produced in the USA and supported by the same manufacturer.
3. The system shall be centrally managed by one single database/software and one single credential system for all doors in the System.

B. Token, Credentials, and RFID Contact-less Smart Card Features and Technical Requirements

1. Secured RFID Contactless Smart Cards
 - a. Contactless smart card technology provides high-speed, reliable communications with data integrity.
 - b. Ensures high security with mutual authentication, encrypted data transfer.
2. Read/write capability is mandatory; any system that does not use a two way encrypted Smart Card (RFID) communication format will be considered Unacceptable by the Owner.
3. Multi-application cards: have to be capable of storing information for future applications and integration.

C. RFID Contact-less Smart Card Technology supported:

1. Compatible with a wide range of Smart Card (RFID) Technologies, operating on the industry standard frequency of 13.56MHz
2. To meet the owners needs, the read & write credentials may be any one of the following type products:
 - a. HID iClass: Memory capacity: 32K bit with 2 application area configurations. HID-iClass credential shall have a minimum of 16 kb, 32kb preferred, of available memory and allow the possibility for use with multiple vendors across multiple applications.
 - b. MIFARE: 4k Bytes
 - c. DESFire: 4k Bytes
 - d. Desfire EVI: 4K Bytes
 - e. Sony FeliCa: 4K Bytes
 - f. Legic: 4K Bytes
 - g. Pico Pass: 4k Bytes
 - h. NFC: Near Field Communication at 13.56 MHz
3. Access profile for the individual user, encoded on to the card, shall be encrypted and in such a format as to negate the potential for cloning.
4. Standard 16 kb, 32kb preferred memory on each credential shall be secured with a unique set of Keys- A&B for the Electronic Access Control (EAC) system and to enable, as and when required, the collection and transfer of information pertaining to audit trails, lost and stolen cards etc via a data on card functionality
5. Tokens or credentials we be available in multiple form factors. They are but not limited to: Standard ID card format, printable ID card format, key fob format, wrist watch format, rubber wrist band format.

D. Features and technical requirements:

1. Online CU (Control Unit) and wall readers will be manufactured and supported by the same manufacturer of the Electronic door locks and System Software. The following is a minimum list of features, that the online unit must contain:
 - a. Provide real time door access monitoring with the on-line hot-spots.
 - b. Continue operating and store historical data (audit trail) in the event of a network or server failure. System door Units will provide a Minimum of 1000 transactions.
 - c. Ethernet connectivity of all on-line devices via IP4 or IP6 addressing, either hardwired or through a Salto ZigBee 16 Channel WiFi Connection (802.15.4).
 - d. Provide automatic card updating to all Contactless Smart Cards regardless of brand.
 - e. Provide the ability to Support 2 Readers and 2 locking devices with on board auxiliary programmable on-board outputs (relays).
 - f. Provide for up to 16 Auxiliary output boards with a total of not less than 128 outputs available for end-user programming.
 - g. Provide the flexibility for either online wireless or offline battery operated locks, allowing for the 2 types of system integrated into the same facility.

E. Battery Powered Wireless Networked Locks:

1. RFID Keycard operated: unlocking by means of contact-less smart carriers, which most include the following formats; card, key-fob, wrist watch, RFID stickers and wrist band. All devices will perform at the same level.
2. The EAC Locking Unit shall have typical access control features and be able to mimic traditional door hardware functions. The following is a minimum of the required door operational features:
 - a. Standard
 - b. Office
 - c. Automatic Changes
 - d. Automatic Opening
 - e. Automatic Opening Plus Office
 - f. Automatic Opening Plus Toggle
 - g. Key Card Plus Pin Number (Keypad)
 - h. Pin Number Only (Keypad)
 - i. Timed Key Card Plus Pin Number (Keypad)
 - j. Timed Pin Number (Keypad)
 - k. Timed Office
 - l. Timed Toggle
 - m. Toggle Only
 - n. Emergency Lockdown (AMOK Crisis)
 - o. Anti Passback - Soft/Timed
3. Internal door lock audit trail memory shall be at minimum, 1,000 transactions. This shall include valid, invalid attempts, request to exit, door status, door ajar and mechanical override key used.
4. Automatic Unlocking, all locks shall be able to be programmed to remain unlocked during certain hours and days, automatically changing to a locked down mode outside of these times i.e.- go into office, card only, card plus PIN mode, etc. Each lock shall have a minimum of 8 different automatic locking and unlock schedules. This feature shall be able to be manipulated by day of the week and by system holidays for each door lock.
5. Automatic Locking (lockdown mode), all locks shall be able to lock down from the inside in an emergency. While the lock is in lockdown mode, one designated token will be able

to enter the locked down door unit. Once the unit is returned to normal programming mode, it will operate as previously programmed. Activation and resetting of the lockdown mode (AMOK) shall be done with a card holders token. This privilege will be given to the desired card holder on a person by person basis. Blanket lockdown setting or lockdown by a lock thumb turn will be unacceptable.

6. Lost cards shall be able to be deleted from the system without waiting for card expiration or having to visit the locks with a handheld programmer.
7. Water resistance application lock units, must be an option for outdoor and wet environments.
8. Batteries:
 - a. Battery life benchmarked to 48,000 Operations or 2.5- 3.0 years.
 - b. Shall be powered by standard off the shelf batteries (AAA).
 - c. Proprietary batteries or proprietary battery packs are not acceptable.
9. Low battery warning shall be at minimum via visual LEDs and should also automatically report through the system software. This will happen without the need to visiting the door lock with a programming device. For wireless lock units, they will also report via a link through the RFID Cards through a hotspot for direct communications back to the software to report current battery status.
10. Shall automatically adjust for daylight saving time. This feature will be flexible enough to provide changeable dates from year to year. This feature shall not require a visit to the lock with a programming device.
11. A door lockset shall be deemed to include all of the components necessary for the EAC to function as per manufacturer's specification; namely UL approved and listed internal and external lock parts. The following locking hardware types shall be available:
 - a. UL Listed, ANSI Grade 1 American Mortise Lock
 - b. UL Listed, ANSI Grade 1 American Mortise Lock, with deadbolt
 - c. UL Listed, ANSI Grade 1 Glass Door Lock
 - d. UL Listed, ANSI Grade 1 American Cylindrical Lock
 - e. UL Listed, ANSI Grade 2 American Cylindrical Lock
 - f. UL Listed Locker Lock, Pad Lock
 - g. UL Listed, ANSI Grade 1 Exit Device
 - h. UL Listed, European Mortise Lock
 - i. Mortise Cylinder (Salto GEO)
 - j. Rim Cylinder (Salto GEO)
 - k. Keypad and Card Lock- XS4
12. External and internal lever handles shall comply with ADA requirements and specifications, and shall also be available with antibacterial Salto BioCote® finishes.
13. The length of time that is allowed to open the door after a valid credential is presented shall be variable and managed by the software, allowing for users with physical disabilities additional time when needed to access their quarters.
14. At all times the internal lever shall be free to operate and retract all latches and deadbolts, allowing free egress by way of a single action.
15. A mechanical master key override shall be provided where necessary and shall operate in conjunction with the lever clutching mechanism, rather than directly on the door latch. Operation of the key override will be recorded in the lock unit audit trail memory to provide increased security and to track key usage. A standard American mortise cylinder shall provide the key override function.

F. Off-line Reader and Battery Powered SVN Lock Operations

1. The smart card will transfer data to/from both off-line locksets to the on-line hot-spots. Tokens may be card, wrist watch or band, key fob formats. All formats shall have the same system performance.
2. A door lockset shall be deemed to include all of the components necessary for the EAC to function as per manufacturer's specification; namely UL approved and listed internal and external lock parts. The following locking hardware types shall be available:
 - a. UL Listed, ANSI Grade 1 American Mortise Lock
 - b. UL Listed, ANSI Grade 1 American Mortise Lock, with deadbolt
 - c. UL Listed, ANSI Grade 1 Glass Door Lock
 - d. UL Listed, ANSI Grade 1 American Cylindrical Lock
 - e. UL Listed, ANSI Grade 2 American Cylindrical Lock
 - f. UL Listed Locker Lock, Pad Lock
 - g. UL Listed, European Mortise Lock
 - h. UL Listed, ANSI Grade 1 Exit Device
 - i. Mortise Cylinder (Salto GEO)
 - j. Rim Cylinder (Salto GEO)
 - k. Keypad and Card Units (XS4)
 - l. Cam Lock- GxCL (Salto GEO)
 - m. Heavy Duty Deadbolt- GxB3 (Salto GEO)
 - n. Locker 9000 (XS4)
3. Retrofit Locks, wherever possible and as needed, the manufacturer will have a option to reuse existing locks that are in good working order and can support the new Salto trim and controls.
4. External & Internal Lever handles shall comply with ADA requirements and specifications. Lever and trim shall also be available with antibacterial finishes. Traditional door hardware finishes and a choice of lever styles to as closely as possible match existing door hardware.
5. At all times the internal lever shall be free to operate and retract all latches and deadbolts, allowing free egress by way of a single action.
6. A mechanical key override shall be provided where necessary and shall operate in conjunction with the lever clutching mechanism, rather than directly on the door latch. To provide increased security the key operation will leave an audit in the lock memory that the mechanical key was used to open the door. This shall be available on mortise or cylindrical type locks.
7. The unit shall initially be delivered with 3 standard alkaline AA batteries, sufficient for up to 48,000 transactions or approximately 2.5 - 3.0 years operational life. No proprietary or rechargeable battery packs shall be accepted.
8. Low battery status shall be, by default, recorded on the user's credential and transferred to the management system when the credential is used at an on-line wall reader or update point (Hotspot). No handheld Device will be needed to retrieve battery status.
9. In the event of a battery failure, the door shall be able to be opened with a small portable handheld device in conjunction with a valid credential (smart card or token).
10. Networked and non-networked locks of all hardware styles shall always allow free egress if the batteries fail.
11. An audit trail of the last 1,000 events (including failed attempts at access by unauthorized key holders) shall be stored on the networked lock's memory for collection using the portable handheld device at anytime and without requiring access to the inside component of the door lock.

12. The networked lock shall hold its designation, the zones that it belongs to, operational configuration, audit trail and “black list” of cancelled keys in non-volatile memory.
13. Current date and time shall be synchronized with the server on a [Time] basis, and/or when collecting audit trails with the portable handheld device or replacing batteries.
14. The networked lock shall incorporate such measures as hardened high resistance steel drill plates, floating axes and steel ball bearings to prevent unauthorized access or tampering by physical means.
15. The external lever mechanism shall incorporate a clutching system to minimize the potential for vandal damage by allowing free travel up and down until a valid credential is presented for the door to be opened.
16. The length of time allowed to open the door after a valid credential is presented shall be variable and managed by the software, allowing for users with physical disabilities additional time when needed to access their quarters.
17. When the lever returns to the zero position, no matter the time elapsed since the valid credential was presented, the clutch shall automatically disengage, limiting the potential for an unauthorized person to enter after the authorized entry.
18. Internal covers may be secured with tamper resistant screws to restrict access to authorized personnel only.
19. Where appropriate the internal clock of the networked lock shall be programmed to allow for the start and finish of Daylight Saving Time.
20. In an office, meeting room or services environment (where applicable) the networked lock shall be able to either automatically or manually be set into “free passage” mode by authorized key holders, reverting to standard operating mode at a prescribed time.
21. In the event a user key is lost, an authorized operator shall be able to cancel and re-issue a new key for the User. Information regarding cancelled keys shall be transmitted to all off line doors via the “black list”, placed on credentials when passing through an on-line “hotspot” or by visiting the doors with the portable programming device.
22. When the system is being operated using the hotel functionality, if a room key is reported lost or stolen (or the key holder is AWOL), simply presenting a “Guest cancel key” shall cancel access for that key without providing access to the room.
23. The EAC Locking Unit shall have typical access control features and be able to mimic traditional door hardware functions. The following is a Minimum of the required door operational features:
 - a. Standard
 - b. Office
 - c. Automatic Changes
 - d. Automatic Opening
 - e. Automatic Opening Plus Office
 - f. Automatic Opening Plus Toggle
 - g. Key Card Plus Pin Number (Keypad)
 - h. Pin Number Only (Keypad)
 - i. Timed Key Card Plus Pin Number (Keypad)
 - j. Timed Pin Number (Keypad)
 - k. Timed Office
 - l. Timed Toggle
 - m. Toggle Only
 - n. Emergency Lockdown (AMOK Crisis)
 - o. Anti Passback - Soft/Timed

G. HOT SPOT - Wall Reader Operations

1. A Wall Reader Device includes support for one (1) or two (2) wall readers. These readers may be; Mifare, Pico Pass, Iclass and NFC. Reader Plus PIN will also be available if needed. The Unit will controlled access and egress, where applicable, secured to the wall with a vandal resistant frame and tamper-proof fixings; plus a Control Unit (CU) housed with 12V DC power supply, ready for connection to 110V AC outlet. Additionally the power supply shall be prepared to interface with the local fire alarm system to cut power to the door locks, if required, and have connections for 12V DC battery back-up supply (provided by others).
2. Shall be ISO 15.93 and FCC Part 15 compliant.
3. The Wall reader Control Unit set shall have the capability to operate both as an off-line stand-alone door controller or, be easily upgraded with additional (not replacement) hardware to function as an integrated part of the on-line EAC system.
4. Connection between the Wall Reader and Control Unit shall be via UTP CAT5 cable.
5. If required for security or logistical reasons the CU shall be able to be placed up to 100 metres or 328 feet remotely from the wall reader(s).
6. The CU shall hold its designation, the zones that it belongs to, operational configuration, audit trail and "black list" of cancelled keys in non-volatile memory.
7. The on-line CU shall connect directly to the EAC application and be capable of making changes to the individual user access profile when a credential is presented. At the same time the CU shall pass the "black list" of recent cancelled cards on to the key and upload any stored "on key" audits of attempts to access doors and "low battery warnings" from the stand-alone locks.
8. The EAC system shall synchronize the server clock with the on-line CU approximately every 30 seconds.
9. The (off-line and on-line) CU shall be capable of integrating with the elevator management system to control access to individual floors for individual users. Connection to the CU shall be via RS485 serial BUS to Extension Relay Boards (ERB) consisting of 8 NO/NC 12VDC dry contact switches. The EAC system shall allow for up to 16 ERB to be connected in series to each control unit.
10. For the Off-line reader the date and time shall synchronize with the hand held programming unit any time an audit is retrieved.

1.07 SYSTEM OPERATIONAL PREFORMANCE FEATURES**A. Basic System Performance requirements:**

1. Shall provide central management of user rights, access policies, and credentialing.
2. The application shall be capable of implementing access policies through the assignment of entry permission based on door groupings and time schedules.
3. The system shall allow for schedules to be applied at doors, governing their remaining open or locked condition.
4. The application shall permit flexible assignment of user rights and privileges.
5. The application shall allow for creation and editing of cardholder credentials, including system wide card formats.
6. The application shall provide views of events and alarms throughout the installation and shall be capable of triggering hardware and communicative actions, based on system configuration.
7. The application shall be capable of generating standard and custom reports, and provide a detailed and complete log of all system events, as defined by the system operator.

B. System Software Features:

1. The system shall incorporate 128 bit AES encrypted data.
 2. Supported operating systems shall be Microsoft Windows XP SP3, Vista, and Windows 7.
 3. The database engine shall be SQL 2003, 2008, 2012 or SQL Express.
 4. The system shall have an operating temperature of 0°C to 50°C, ambient, a storage temperature of -40°C to +85°C, ambient, a relative humidity ability of 0% to 95% (non-condensing) at 50°C, and a MTBF of > 100,000 hours.
 5. The system-radiated emissions shall be compliant with FCC Part 15, Class A, and EN55022 specifications.
 6. The system must be capable of managing 4 million users, 64,000 doors, 256 calendars, 1024 zones, and 256 time zones, 1024 time periods, both with 8 intervals each.
 7. Integration with other software systems through dynamic database synchronization; Microsoft SQL Server is recommended.
 8. Able to store all historical data on the system server without having to individually use a handheld device to download audit trail data from individual locks.
 9. System capable of being expanded throughout the site. Each area (department) shall be able to manage their own doors and users without a chance of accidentally interfering with other areas (departments).
 10. Capable of dynamic master-keying: each credential can change access privileges transparently “on the fly” without the need to visit the access control administrator to reprogram keycards and without the need to reprogram the electronic locks with a handheld programmer.
 11. No predefined profiles are necessary to issue keycards. Each and every keycard can be individually enabled to access any combination of doors.
 12. Lost keycard cancellation: “blacklist”. Contactless smart cards shall be capable of conveying lists of cancelled keys to avoid having to reprogram locks with a handheld device each time a keycard is lost.
 13. No WI-FI or Radio infrastructure shall be required.
 14. The locks shall have built-in anti- passback functionality. The EAC locks shall have the ability to prevent card holders from reentering without presenting their token to the out reader. This feature shall be incorporated in both On Line/Wireless, or in the off-line EAC lock units.
- C. System Software:
1. Develop, install, program and test software and databases for the complete and proper operation of systems involved. Assign software license to Owner. The following is required of the EAC Software:
 - a. The software shall be supplied ready to support any number and configuration of off-line and on-line stand-alone locks and wall readers, with the capacity to manage multiple or single sites including up to 64,000 doors and individual users.
 - b. A Portable Programming Device (PPD) for transferring information to and from the database for all off-line locks and wall readers shall also be included.
 - c. 1024 Time Periods that determine the time intervals at which a lock shall operate in a special mode, timed office mode, automatic opening mode etc.
 - d. 256 Time Zones that determine the interval of time in which a user has access to a particular door or zone
 - e. 256 Calendars, for user access or used by the electronic locks when they operate in a timed mode.

- f. 1024+ Zones to group doors into sets making programming user access simpler and more efficient.
 - g. User Groups shall enable the system manager to group users according to their privileges of access.
 - h. Operator Groups shall be defined hierarchically and be password protected to allow only authorized staff to make amendments to sections of the database for which they have responsibility.
 - i. Allow multiple simultaneous access, which allows multiple authorized operators to make dynamic changes to the database at any one time.
 - j. Must have a proven API for interfacing with existing and well established traditional access control systems.
 - k. Must have a proven API for interfacing with third party access control panels.
 - l. Must have a maps feature that will allow indicate to the operator where a system produced alarm is located.
 - m. Shall support an "Out of Site" feature which shall work in conjunction with IN and OUT hot spot readers to disable user access when leaving a facility and enabling user access when entering it.
 - n. Shall support a "Limited User Access" feature which can be set to allow a maximum number of users assigned to a door.
 - o. Shall support a "Limited User Occupancy" monitor which can be set to disallow access after the desired number is reached.
 - p. Shall support setting encryption type for Desfire cards.
 - q. Shall incorporate auto assignment when using Legic Prime cards.
 - r. Shall incorporate an activation date and time setting for user cards.
 - s. Shall allow multiple operator groups to be created with software features able to be individually allowed or denied to the group.
 - t. Shall feature a Department tab, allowing departments to share users and also add external (users not in a group) access to the department.
 - u. Shall permit specifying Wiegand codes in decimal, hexadecimal, or binary formats, and bit order.
- D. On line Hotspot for Virtual Network
- 1. The system Virtual Network (SVN) shall provide the capacity to combine the efficiencies of on-line access control with the (cost) advantages of off-line hardware, using data on card functionality.
 - 2. With SVN is enabled all on-line readers shall update access protocols on valid staff and user keys when they are presented to a desktop updater or on-line wall reader can also be used at a security entry check point to update any changes to the users access rights as they enter and leave during the day.
 - 3. If a cardholder has been cancelled an on-line wall reader or elevator reader shall remove all access privileges from the card and shall deny access to anyone presenting the invalid card.
 - 4. The current list of cancelled cards is placed onto every card when it is presented to an on-line reader (hot-spot), and the updated card shall then transfer that list to the off-line readers each time they are used, allowing for the upgraded list to be transmitted throughout the facilities by the users as they go about accessing doors.
 - 5. Data on card functionality shall also allow for the collection of audit trails and low battery warnings from staff and user cards.
- E. Emergency

1. In the event of an emergency the System Manager has the ability to either lock down or unlock all or some doors/locks connected via the Salto Wireless Network. These doors shall then remain locked or unlocked until the emergency is designated as over by the System Security Manager.

F. CCTV Invalid Card Interface

1. If an invalid card is presented to an on-line reader an entry is placed immediately in the audit trail and the control unit can trigger a CCTV camera or an alarm (local or remote). This operation can be modified at anytime by changing the dipswitch configuration in the control unit.

1.08 ACTION SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 1. Include plan views indicating locations of system components and proposed size, type, and routing of conduits and/or cables.
 2. Include elevations and details of proposed equipment arrangements.
 3. Include system interconnection schematic diagrams.
 4. Include requirements for interface with other systems.
 - a. Network IP and or MAC addresses of field device.
 5. Include wiring diagrams for power and signal wiring.
- C. Product Data: Provide manufacturer's standard catalog pages and data sheets for each system component. Include ratings, configurations, dimensions, finishes, service condition requirements, and installed features.
- D. Design Data: Standby battery/UPS calculations.
 1. Provide heat load calculations for all hardware.

1.09 INFORMATIONAL SUBMITTALS

- A. Certify that proposed system design and components meet or exceed Owner's stated requirements during Programming meeting/s.
- B. Evidence of qualifications for installer.
- C. Evidence of qualifications for maintenance contractor (if different entity from installer).
- D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
- E. Manufacturer's detailed field testing procedures.
- F. Field quality control test reports.
 1. The final test report shall indicate that every device was tested successfully in a system test.
- G. Maintenance contracts.

1.10 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record actual locations of system components and installed wiring arrangements and routing.
- B. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.

1. Include contact information for entity that will be providing contract maintenance and trouble call-back service.
- C. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.
- D. Software: One copy of software not resident in read-only memory.
 1. Operating system, database and application software, including installation, system configuration backup and recovery data on CD or DVD media.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 1. See Section 01 6000 - Product Requirements, for additional provisions.
 2. Deliver blank credentials to Owner as directed.

1.11 QUALITY ASSURANCE

- A. Comply with the following:
 1. NFPA 70
 2. NFPA 101 (Life Safety Code).
 3. The requirements of the local authorities having jurisdiction.
 4. Applicable TIA/EIA standards.
- B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Software integration between the SMS and other integrated system components shall be tested and certified for interoperability by the manufacturers of each system.
- D. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- E. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience with access control systems of similar size, type, and complexity and providing contract maintenance service as a regular part of their business; authorized manufacturer's representative.
 1. Contract maintenance office located within 100 miles of project site.
- F. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.12 DELIVERY, STORAGE, AND HANDLING

- A. Ordering: The manufacturer's ordering instructions and lead-time requirements shall be followed to avoid installation delays.
- B. Delivery, storage, and handling of the Access control hardware shall be in accordance with the manufacturer's recommendations.
- C. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
- D. Store products in manufacturer's unopened packaging, keep dry and protect from damage until ready for installation.
 1. The Physical Access Control System shall be stored and protected from exposure to harmful weather conditions and at the environmental conditions recommended by the manufacturer.

1.13 FIELD CONDITIONS

- A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.14 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. All equipment and systems will be warranted by the Contractor for a period of two (2) years commencing with the filing date of the Notice of Completion after Phase 2, provided the system has been inspected and signed off by the Manufacturer and at the conclusion of satisfactory acceptance of the entire system by the Owner.
- C. The period of occupancy of Phase 1 shall also be covered by this warranty.
- D. The warranty will cover all costs for Warranty Service, including parts.
- E. The contract for service will cover the period starting with the first expected activation of each system for installation and test and will continue for an initial period of two years. A partial-year extension will be acquired to cover the period to the end of the two-year guarantee and will be handled such that a smooth transition to a Customer maintenance agreement can be achieved with no lapse in coverage.
- F. Service response will be within 2 hours of the initial request for service; the response may be by phone or remote VPN access into system. This service should be provided during the warranty period at no added cost. This will be a 24 hour per day, 7 days per week, and inclusive of all holidays.
- G. Service requests will be reported via phone call to a designated service number provided by Security Contractor, or via a service web site or e-mail account as designated by the security contractor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Security and Database Management System - Basis of Design: Salto SVN/SHIP/SALLIS compliant Systems.
Salto Systems, Inc.
3073 McCall Drive, Suite 1, Atlanta, GA 30340
866-GO SALTO (866-467 2586)
Email: info@Salto.us <mailto:info@Salto.us>, Internet: www.Salto.us
<http://www.Salto.us>
- B. Source Limitations: Where possible, furnish system components and accessories produced by a single manufacturer and obtained from a single supplier. Basis of Design: Salto
 - 1. Module include
 - a. Card Readers Units with and without Keypad
 - b. Door Locks SVN and Wireless Versions
 - c. Control Units Relay and Expansion Boards
 - d. UPS Network for Lock
 - e. Power Reader Switches
 - f. Card Encoders or Enrollment Reader
 - g. Portable Programmer Devices

2.02 ACCESS CONTROL SYSTEM REQUIREMENTS

- A. Provide new access control system consisting of all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the functional intent indicated.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.

1. Access Control Units and Readers: Listed and labeled as complying with UL 294.

2.03 ACCESS CONTROL UNITS AND SOFTWARE

- A. Provide access control units and associated software compatible with readers to be connected.

2.04 ACCESS CONTROL POINT PERIPHERALS

- A. Provide devices compatible with control units.
- B. Provide devices suitable for operation under the service conditions at the installed location.
- C. Provide readers compatible with credentials to be used.
- D. Reader Color: To be selected by Architect from manufacturer's available standard colors.
- E. Door Locking Devices (Electric Strikes and Magnetic Locks): Comply with Section 08 7100.

2.05 ACCESSORIES

- A. Provide components as indicated or as required for connection of access control system to devices and other systems indicated.
- B. Unless otherwise indicated, credentials to be provided by Contractor.
 1. Provide credentials compatible with readers and control units/software to be used.
- C. Provide cables as indicated or as required for connections between system components.
- D. Provide accessory racks/cabinets as indicated or as required for equipment mounting.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify the dimensions that are shown on the drawings with field measurements.
- B. Verify that ratings and configurations of the network and infrastructure components are consistent with the indicated requirements.
- C. Verify that mounting surfaces are ready to receive system components.
- D. Verify space allocations, installation tolerance, hazards to safe system operation and other conditions affecting installation are in compliance with system requirements.
- E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to system.
- F. Verify rough-in for LAN, WAN and IP network before device installation.
- G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

- A. Install access control system in accordance with NECA 1 (general workmanship).
- B. Comply with SIA CP-01 Control Panel Standard.
- C. Comply with ANSI/TIA-606-B Labelling Standard.
- D. Install products in accordance with manufacturer's instructions.
- E. Provide grounding and bonding in accordance with Division 26.
 1. Comply with IEEE 1100, "Power and Grounding Sensitive Electronic Equipment."
 2. Ground cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.
 3. Bond shields and drain conductors to ground at only one point in each circuit.
 4. Signal Ground:

- a. Terminal: Locate in each equipment room and wiring closet; isolate from power system and equipment grounding.
 - b. Bus: Mount on wall of main equipment room with standoff insulators.
 - c. Backbone Cable: Extend from signal ground bus to signal ground terminal in each equipment room and wiring closet.
- F. Identify system wiring and components in accordance with Division 26.
1. Cabling:
 - a. Comply with NECA 1, "Good Workmanship in Electrical Contracting."
 - b. Install cables and wiring according to requirements in Division 28.
 - c. Access control system wiring color to be distinct and specific to the system. Contractor to coordinate cable colors with all other vendors to ensure color is not duplicated.
 - d. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use NRTL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.
 - e. Install LAN cables using techniques, practices, and methods that are consistent with Category 5E rating of components and that ensure Category 5E performance of completed and linked signal paths, end to end.
 - f. Install cables without damaging conductors, shield, or jacket.
 - g. Boxes and enclosures containing security system components or cabling, and which are easily accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building will not be considered to be accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public will be covered with a suitable cover plate and secured with tamperproof screws.
 - h. Install end-of-line resistors at the field device location and not at the controller or panel location.
 2. Cable Application:
 - a. Comply with EIA/TIA-569, "Commercial Building Standard for Telecommunications Pathways and Spaces."
 - b. Cable application requirements are minimum requirements and will be exceeded if recommended or required by manufacturer of system hardware.
 - c. RS-232 Cabling: Install at a maximum distance of 50 feet (15 m).
 - d. RS-485 Cabling: Install at a maximum distance of 4000 feet (1220 m).
 3. Configuration:
 - a. The configuration of the Physical Access Control System shall be accomplished in accordance with the overall network plan with regard to the following:
 - 1) Network addressing
 - 2) User access
 - 3) Network security

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Provide services of a manufacturer's authorized representative to observe installation and assist in inspection and testing. Include manufacturer's detailed testing procedures and field reports with submittals.

- C. Prepare and start system in accordance with manufacturer's instructions.
- D. Factory Commissioning: Provide on-site inspection by manufacturer's personnel to test and assess system programming, functionality and performance.
- E. Program system parameters according to requirements of Owner.
- F. Testing Agency: Engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
 - 1. Test for proper interface with other systems.
 - 2. Perform the following field tests and inspections and prepare test reports:
 - a. LAN Cable Procedures: Inspect for physical damage and test each conductor signal path for continuity and shorts. Use Class 2, bidirectional, Category 6 tester. Test for faulty connectors, splices, and terminations. Test according to TIA/EIA-568-1, "Commercial Building Telecommunications Cabling Standards - Part 1 General Requirements." Link performance for UTP cables must comply with minimum criteria in TIA/EIA-568-B.
 - b. Test each circuit and component of each system. Tests will include, but are not limited to, measurements of power supply output under maximum load, signal loop resistance, and leakage to ground where applicable. System components with battery backup will be operated on battery power for a period of not less than 10 percent of the calculated battery operating time. Provide special equipment and software if testing requires special or dedicated equipment.
 - c. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance from each end of all pairs installed. Remove temporary connections when tests have been satisfactorily completed.
- G. Correct defective work, adjust for proper operation, and retest until entire system complies with contract documents.
- H. The Physical Access Control System shall be tested in accordance with the following:
 - 1. The Contractor shall conduct a complete inspection and test of all installed Physical Access Control System equipment. This process includes testing and verifying operation with connected equipment and network infrastructure.
 - 2. The Contractor shall provide staff to test all devices and all operational features of the system for witness by the Owner's representative and the Authority having jurisdiction if need be.
 - 3. The Owner's representative, prior to acceptance, shall witness all testing.
- I. Submit detailed reports indicating inspection and testing results and corrective actions taken.

3.04 STARTUP SERVICE

- A. Prepare and start system in accordance with manufacturer's instructions.
- B. Engage a factory-authorized service representative to supervise and assist with startup service. Complete installation and startup checks according to approved procedures that were developed in the Preparation article and with manufacturer's written instructions. Engage a factory-authorized service representative to supervise and assist with startup service.
 - 1. Enroll and prepare badges and access cards for Owner's operators, management, and security personnel.

3.05 ADJUSTING

- A. Provide on-site assistance in adjusting system to suit actual occupied conditions.

- B. Provide up to two visits to project site.
- C. Tasks include, but are not limited to the following:
 - 1. Check cable connections.
 - 2. Check proper operation of card readers, intrusion sensors, integrated systems and database configuration. Verify SMS configuration and adjust as required.
 - 3. Recommend changes to SMS configuration and settings to improve operation.
 - 4. Provide written report of adjustments and recommendations.

3.06 CLEANING

- A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.07 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Demonstration: Demonstrate proper operation of system to Owner, and correct deficiencies or make adjustments as directed.
 - 1. The Contractor shall demonstrate the functionality of the Physical Access Control System upon completion of installation, documenting the result of all tests and providing these results to the Owner.
- C. Training: Train Owner's personnel on operation, adjustment, and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of one day of training for up to 7 Owner's staff.
 - 3. Instructor: Manufacturer's authorized representative.
 - 4. Location: At project site.
 - 5. Provide separate training modules for the following:
 - a. Computer system administration personnel to manage and repair the LAN and databases and to update and maintain software.
 - b. Operators who prepare and input credentials, monitor the SMS and enroll personnel.
 - c. Security personnel.
 - d. Hardware maintenance personnel.
 - e. Facility management.
 - 6. Video tape training sessions. Provide on DVD or other media as requested by Owner for future reference and training.

3.08 PROTECTION

- A. Protect installed system components from subsequent construction operations.

3.09 MAINTENANCE

- A.
- B. Provide to Owner, a proposal as an alternate to the base bid, a separate maintenance contract for the service and maintenance of access control system for two years from date of Substantial Completion; Include a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.
- C. Provide one year of trouble call-back service upon notification by Owner:
 - 1. Include allowance for one call-back service call per month during normal working hours at no extra cost to Owner.

2. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.

END OF SECTION