ADDENDUM NO. 2

BREWSTER CENTRAL SCHOOL DISTRICT
BREWSTER HIGH SCHOOL
SECURITY VESTIBULE, SYNTHETIC FIELD AND RELATED WORK

The attention of Bidders submitting proposals for work on the Security Vestibule, Synthetic Field and Related Work at Brewster High School is called to the following Addendum to the Contract Forms and Specifications.

The items set forth herein, whether of omission, addition, substitution or clarification are to be included in and form a part of the proposal submitted. This Addendum is hereby included in and made a part of the Contract Documents, dated April 23, 2024, whether or not attached thereto. All requirements of the original project specifications and drawings shall remain in force except as amended by this addendum.

This Addendum contains changes to the requirements of the Contract Documents. Such changes shall be incorporated into the contract Documents and shall apply to the work with the same meaning and force as if they had been included in the original documents. Wherever or any portion of a drawing, the remainder of the paragraph or drawing affected shall remain in force.

The conditions of the Specifications shall govern all work described in this Addendum. Wherever the conditions of work and the quality or quantity of materials or workmanship are not fully described in this Addendum, the conditions of work, etc., described by the Specifications or drawings for similar items of work shall apply to the work described in this Addendum.

FULLER AND D'ANGELO, P.C..
ARCHITECTS AND PLANNERS
45 KNOLLWOOD ROAD
ELMSFORD, NEW YORK 10523

DATE: May 3, 2024

This Addendum consists of four (4) pages plus Sketches SK-1, SK-2, SK-3, specification sections 00 4150 Bid Form – Elevator Contractor, 00 4401 Qualifications of Bidders, 00 4150 Bid Form – Elevator Contractor, 01 2100 Allowances, 08 7100 Door Hardware, 27 0500 Common Work Results for Communications, 27 0528 Pathways for Communications Systems, and 27 5116 Public Address Systems.

THE FOLLOWING ARE MODIFICATIONS, CLARIFICATIONS, DELETIONS OR ADDITIONS TO THE SPECIFICATIONS:

TOC – TABLE OF CONTENTS
08 7110 **DELETE** in its entirety.
31 5000 **DELETE** in its entirety.
ADD 32 1823 RESILIENT SURFACING

SECTION 00 4100 – BID FORM CONSTRUCTION CONTRACTOR
00 4100-2, 1.5.A.1 **DELETE** "…AIA 201-2017…".

SECTION 00 4401 – QUALIFICATIONS OF BIDDERS
00 4401 **DELETE** in its entirety and **ADD** revised specification section attached to this addendum.

SECTION 00 4150 – BID FORM – ELEVATOR CONTRACTOR
00 4150 **DELETE** in its entirety and **ADD** revised Bid Form attached to this addendum.

SECTION 00 5200 – FORM OF AGREEMENT
00 5200-1, 1.2.B REVISE "AIA Document A101-2017.." to read "AIA Document A132-2019..".

SECTION 01 1000 – SUMMARY OF CONTRACTS
01 1000-6, 1.11 **ADD** "

C. The existing building work areas will be available to the Contractor(s) as follows:
   1. Award of Contract thru June 26, 2024:
      a. 3:30 PM thru 10:30 PM Monday thru Friday .
   2. June 27, 2024 through August 31, 2024:
      a. 7:00 AM thru 3:30 PM Monday thru Friday
   3. September 1, 2024 through June 27, 2025
      a. 3:30pm thru 10:30pm Monday thru Friday only when programs and school occupancy are not disrupted and with the approval of the Owner.

D. The existing site areas will be available to the Contractor(s) as follows:
   1. June 27, 2024 thru August 18, 2025

01 1000-8, 1.16.A.f **REVISE** "31 5000" to read "31 4260".

SECTION 01 1010 – MILESTONE SCHEDULE
01 1010-2, 3.1.B **DELETE** in its entirety and ADD "B. Refer to attached Milestone Schedule for dates.".

SECTION 01 2000 – PRICE AND PAYMENT PROCEDURES
01 2000-1, 1.3.C **DELETE** in its entirety.

SECTION 01 2100 – ALLOWANCES
01 2100 **DELETE** in its entirety and **ADD** revised specification section attached to this addendum.

SECTION 01 5500 – VEHICULAR ACCESS AND PARKING
01 5500-1, 1.3.E **DELETE** in its entirety.

SECTION 06 1000 – ROUGH CARPENTRY
06 1000-1, 1.3.C **DELETE** in its entirety and **ADD** "C. Section 12 2113 – Horizontal louver blinds".
06 1000-1, 1.3.D **DELETE** in its entirety.

SECTION 07 0150 – REHABILITATION OF MODIFIED BITUMINOUS ROOFING
07 0150-1, 1.1.C **DELETE** in its entirety.

SECTION 07 1113 – BITUMINOUS DAMPPROOFING
07 1113-2, 2.9 **ADD** "B. Drainage Panel: ¼" inch (6mm) thick formed plastic, hollowed sandwich.
   1. Product: MiraDrain 2000 Aggregate free drainage system manufactured by Carlisle.

SECTION 08 1116 – ALUMINUM DOORS AND ALUMINUM FRAMES
08 1116-7, 2.9.C **DELETE** in its entirety.

SECTION 08 7110 – FINISH HARDWARE

08 7110 **DELETE** in its entirety and **ADD** specification section attached to this addendum.

SECTION 09 9123 – INTERIOR PAINTING
09 9123-2, 2.1.B.2 **REVISE** "School standard colors to match rooms." to read "For colors, see Finish Schedule on drawings.".

SECTION 12 2113 – HORIZONTAL LOUVER BLINDS
12 2113-1, 1.3 C&D **DELETE** in its entirety.

SECTION 12 3200 – PLASTIC LAMINATED CASEWORK
12 3200-5, 2.2.C **DELETE** in its entirety.
12 3200-6, 2.3 **ADD** "K. Counter support brackets.
1. Hebgo Bracket, 330lb capacity, by HAFELE.".

SECTION 31 2319 – DEWATERING
REVISE any reference to "City of Yonkers or Town of Southeast" to read "Project Engineer and BCSD".

SECTION 31 5000 – EXCAVATION SUPPORT AND PROTECTION
DELETE in its entirety.

SECTION 32 1822 – SYNTHETIC GRASS SURFACING
32 1822-8, 2.03.C.1 **REVISE** "3/4" Gravel Base Aggregate" to read "3/4" Gravel Base Aggregate (5" depth).".
32 1822-8, 2.03.C.1 **REVISE** "1/4" Finish Stone Layer" to read "1/4" Finish Stone Layer (1" depth).".

THE FOLLOWING ARE MODIFICATIONS, CLARIFICATIONS, DELETIONS OR ADDITIONS TO THE DRAWINGS:

BHS C401 – GRADING AND UTILITIES PLAN
ADD note "All excess cut material shall remain on campus on the northern end of the wastewater treatment access drive. No excess cut will be exported from the campus.".

BHS C402 – GRADING AND UTILITIES PLAN
ADD note "All excess cut material shall remain on campus on the northern end of the wastewater treatment access drive. No excess cut will be exported from the campus.".

BHS C403 – GRADING AND UTILITIES PLAN
ADD note "All excess cut material shall remain on campus on the northern end of the wastewater treatment access drive. No excess cut will be exported from the campus.".

BHS C404 – GRADING AND UTILITIES PLAN
ADD note "All excess cut material shall remain on campus on the northern end of the wastewater treatment access drive. No excess cut will be exported from the campus.".

BHS C701 – DETAILS
Concrete Curb Detail **ADD** note "Where there is a concrete walk adjacent to a concrete curb, refer to detail as indicated on Sketch Sk-1 attached to this addendum.
Synthetic Turf Detail, **REVISE** crushed stone base depth as shown on Sketch SK-2 attached to this addendum.

BHS C707 – ATHLETIC FIELD, TRACK AND PARKING AT BREWSTER HIGH SCHOOL DETAILS

Athletic Field Drainage Detail, **REVISE** crushed stone base depth as shown on Sketch SK-3 attached to this addendum.

BHS A600 – COLUMN DETAILS
Detail 3 **REVISE** note "Knox Box" to read "High-security key lock box, model Knoxbox 3200 recess mount. Color: Dark Bronze.".

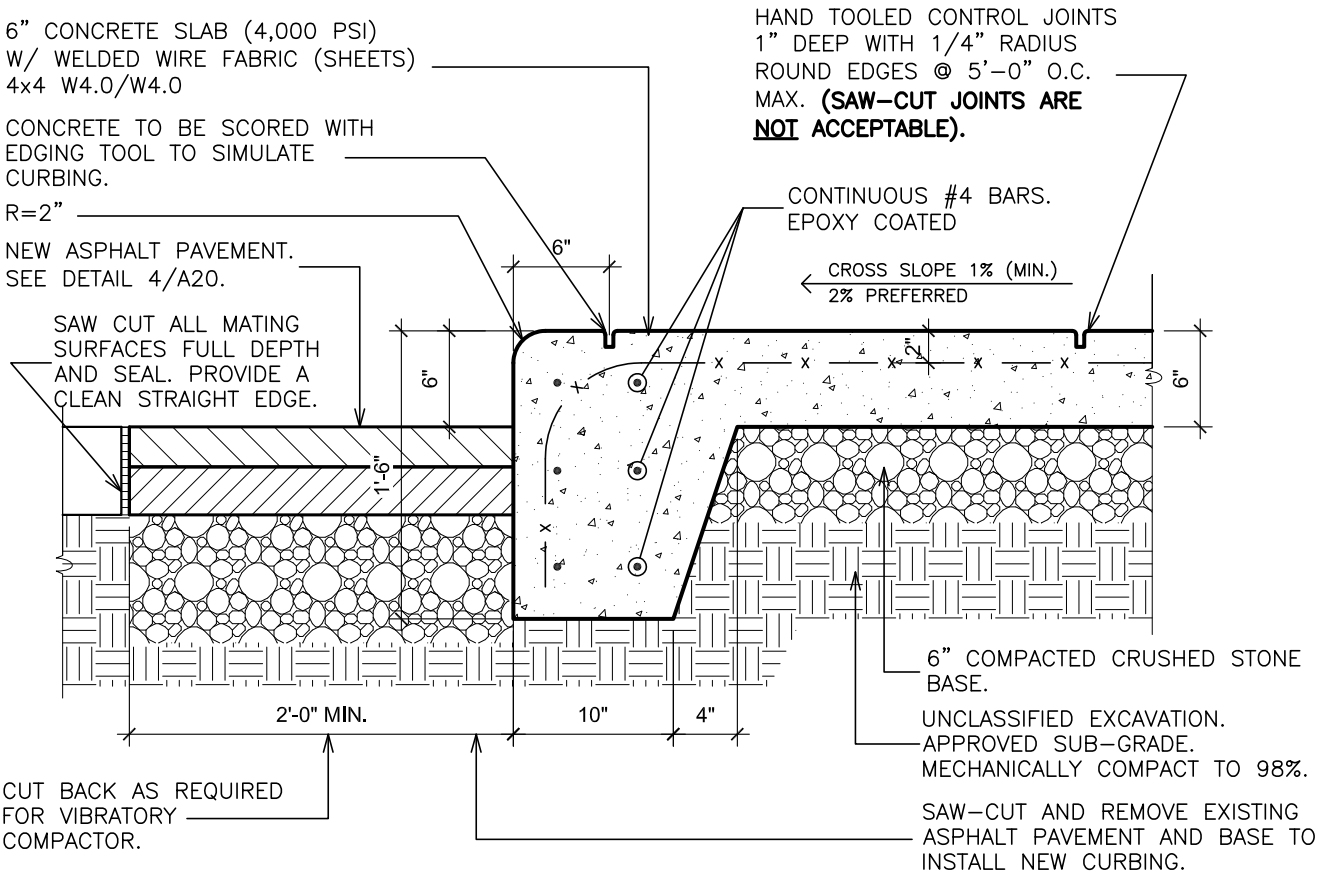
BHS SEC-1 – SECURITY DRAWINGS & DETAILS
Floor Plan, **ADD** note "Wire and connect Knoxbox to building security system.".

END OF ADDENDUM

The following attachments are being provided for informational purposes:
Pre-Bid walkthrough Minutes of Meeting and Sign-in Sheet.

Bidder RFI Responses (In the event of a discrepancy between these responses and the contract documents, the contract documents shall prevail unless modified by addendum.)

Bid RFI-#001 dated 4/29/2024 (1 page).
Bid RFI-#002 dated 4/30/2024 (1 page).
Bid RFI-#003 dated 5/1/2024 (2 pages).
Bid RFI-#004 dated 5/3/2024 (1 page).



NOTES:
1. EXPANSION JOINTS @ 20'-0" O.C. MAX. TO EXTEND THRU CURB.
2. ALL REINFORCING TO BE EPOXY COATED.

MONOLITHIC CURB / SIDEWALK

SCALE: N.T.S. (STRAIGHT & RADIUSED)

S.E.D. CONTROL NUMBER: 48-06-01-06-0-004-018

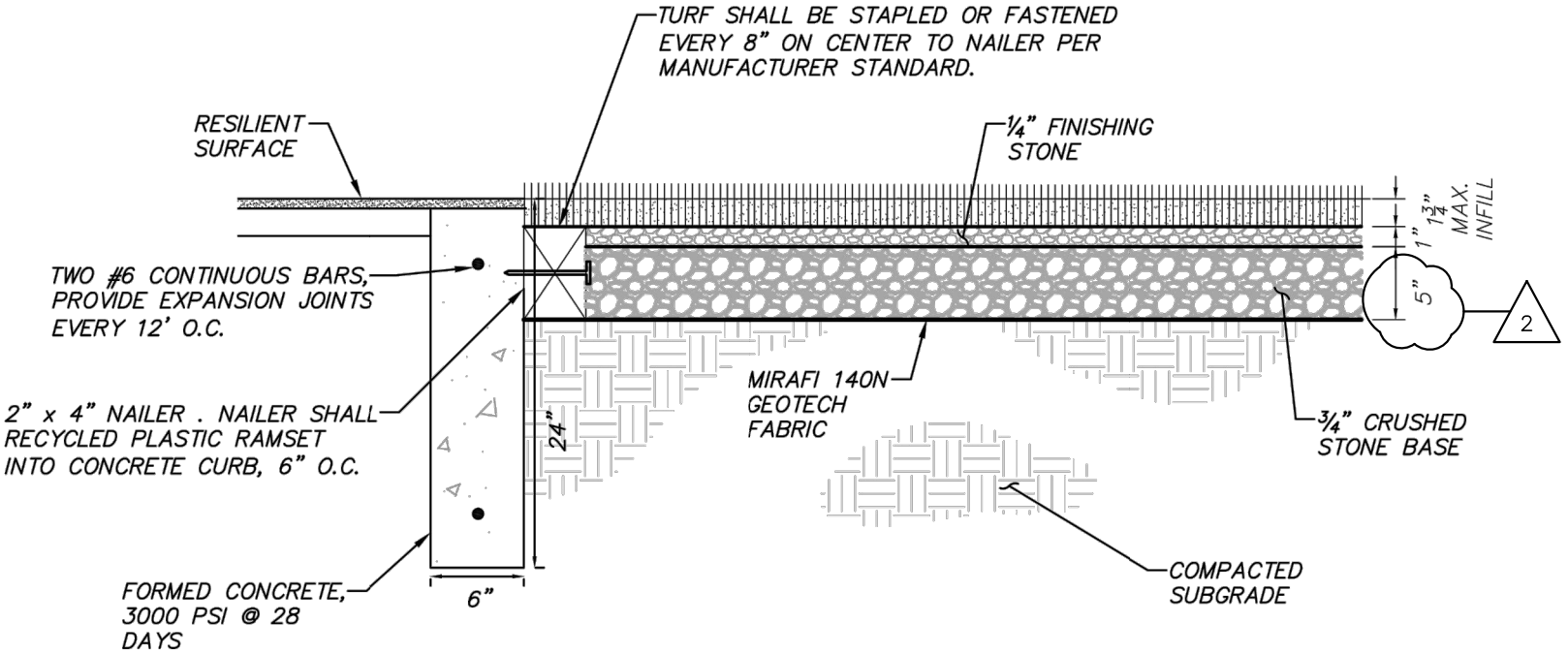
FULLER D'ANGELO P.C.
ARCHITECTS PLANNERS
48 KNOLLWOOD ROAD ELMSFORD NEW YORK 10523
TEL 914.592.4444 FAX 914.592.1717
WWW.FULLERDANGELO.COM

NOTE:
ALL INFORMATION ON ORIGINAL CONTRACT DOCUMENT SHALL PERTAIN UNLESS SPECIFICALLY CHANGED BY THIS DRAWING.

JOB NAME:
BREWSTER CENTRAL SCHOOL DISTRICT
BREWSTER HIGH SCHOOL
SECURITY VESTIBULE, SYNTHETIC FIELD & RELATED WORK
50 FOGGINTOWN ROAD BREWSTER, NY 10509

DRAWING TITLE:
SITE DETAILS
{REF: C701}

05-03-2024	BID ADDENDUM #2
DATE	ISSUED TO
SCALE:	AS NOTED
FILE NO. 23505.01	DRAWING NO. SK-1



NOTES:

1. TURF NAILER SHALL BE 2" X 4", 100% HIGH DENSITY POLYETHYLENE AND LOW DENSITY RECYCLED POLYETHYLENE WITH FIBERGLASS REINFORCEMENT, SEE SPEC. SECTION 02543. TAP–CON OR RAMSET NAILER TO CONC. CURB OR SURFACE EVERY 24" ON CENTER. TURF SHALL BE STAPLED OF FASTENED EVERY 8" ON CENTER TO NAILER PER MANUFACTURER STANDARDS.

2. AT EXPANSION JOINTS, PROVIDE TWO #6 BARS 24" LONG, ONE END GREASE AND IN SLEEVE.

SYNTHETIC TURF DETAIL

(N.T.S.)

S.E.D. CONTROL NUMBER: 48-06-01-06-0-004-018

JOB NAME:
BREWSTER CENTRAL SCHOOL DISTRICT
BREWSTER HIGH SCHOOL
SECURITY VESTIBULE, SYNTHETIC FIELD & RELATED WORK
50 FOGGINTOWN ROAD BREWSTER, NY 10509

DRAWING TITLE:
SITE DETAIL
{REF: C701}

05-03-2024	BID ADDENDUM #2
DATE	ISSUED TO
SCALE:	AS NOTED
FILE NO.	23505.01
DRAWING NO.	SK-2

NOTE:
ALL INFORMATION ON ORIGINAL CONTRACT DOCUMENT SHALL PERTAIN UNLESS SPECIFICALLY CHANGED BY THIS DRAWING.

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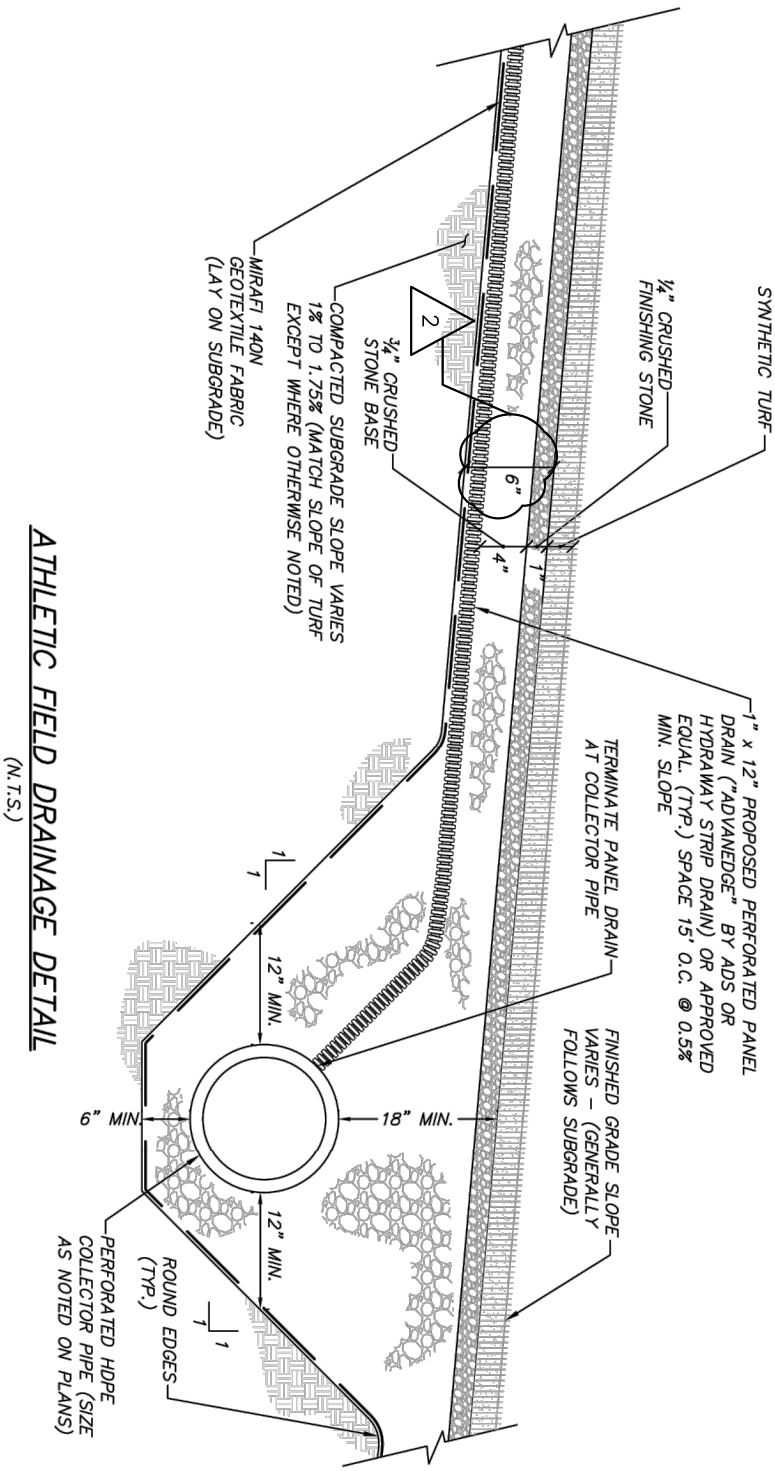

ATHLETIC FIELD DRAINAGE DETAIL

(N.T.S.)

S.E.D. CONTROL NUMBER: 48-06-01-06-0-004-018

FULLER D'ANGELO P.C.
ARCHITECTS PLANNERS
48 KNOLLWOOD ROAD ELMSFORD NEW YORK 10523
TEL 914.592.4444 FAX 914.592.1717
WWW.FULLERDANGELO.COM

NOTE:
ALL INFORMATION ON ORIGINAL CONTRACT DOCUMENT SHALL PERTAIN UNLESS SPECIFICALLY CHANGED BY THIS DRAWING.

JOB NAME:
BREWSTER CENTRAL SCHOOL DISTRICT
BREWSTER HIGH SCHOOL
SECURITY VESTIBULE, SYNTHETIC FIELD & RELATED WORK
50 FOGGINTOWN ROAD BREWSTER, NY 10509

DRAWING TITLE:
SITE DETAIL
{REF: C707}

05-03-2024	BID ADDENDUM #2
DATE	ISSUED TO
SCALE:	AS NOTED
FILE NO. 23505.01	DRAWING NO. SK-3

SECTION 00 4150
BID FORM - ELEVATOR CONTRACTOR

THE PROJECT AND THE PARTIES

TO:

Brewster Central School District

30 Farm To Market Road

Brewster, NY 10509

FOR:

BHS Security Vestibule, Synthetic Field & Related Work

50 Foggintown Road:

Brewster, New York 10509

Project Number: 23505.01

DATE: _____ (Bidder to enter date)

SUBMITTED BY: _____

Bidder's Full Name _____

Address_____

City, State, Zip_____

1.1 OFFER

A. Having examined the Place of The Work and all matters referred to in the Bidding Requirements and the Contract Documents prepared by Architect for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform Contract #6 Elevator Modification Work at BHS for the Sum of:

1.

a. BASE BID

a) The Base Bid of this Proposal for all work required by the Contract Documents for Contract #6 Elevator:

_____
_____($_____) DOLLARS

b. TOTAL ALLOWANCES

a) The Total Allowance as indicated in Section 01 2100 - Allowances is as follows:
_____ ($_____) DOLLARS

(Add to Base Bid amount)

c. **TOTAL BASE BID**

a) The Total Base Bid of this Proposal for all work required by the Contract Documents for Contract #6 Elevator at BHS and Related Work is as follows:

_____
_____ $_____), DOLLARS

(The Total Base Bid is the sum of 1.2.a.a and 1.2 b.a)

B. The undersigned further understands and agrees that he is to furnish and provide all the necessary material, machinery, plant, implements, tools, labor, services, skill and other items of whatever nature required, and to do and perform all the work necessary under the Contract, to complete the work in accordance with the drawings and specifications and any addenda thereto, and to accept in full compensation therefore the amount of the Total Bid stated, modified by such additive- or deductive alternatives, if any as are accepted by the Owner.

C. We have included the required security Bid Bond as required by the Instruction to Bidders.

D. All applicable federal taxes are included and New York taxes are included in the Bid Sum.

E. All Allowances described in Section 01 2100 - Allowances are included in the Bid Sum.

1.2 ALTERNATES

A. The Alternates for this Proposal required by the Contract Documents are listed in Section 01 2300.

B. Alternate No. EL - 1:

1. The Contractor shall state the amount to be ADDED TO the Base Bid to provide, furnish and install all labor, equipment and material required to [provide Service Contract in accordance with specifications and shown on drawings.] Work shall include all associated electrical installations.

_____
_____($_____), DOLLARS

1.3 ACCEPTANCE

A. This offer shall be open to acceptance and is irrevocable for forty-five (45) days from the bid closing date.

B. If this bid is accepted by Brewster Central School District within the time period stated above, we will:

1. Execute the Agreement within seven days of receipt of Notice of Award.
2. Furnish the required bonds within seven days of receipt of Notice of Award.

C. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Brewster Central School District by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

1.4 REJECTION OF BIDS

A. The undersigned agrees that the Owner shall have the right to accept or reject any or all bids

1.5 CONTRACT TIME

A. If this Bid is accepted, we will:

1. Complete all the work covered by this Proposal with a commencement date of NO EARLIER THAN Award of Contract by Owner. Work shall be phased as indicated in 01 1010 Milestone Schedule. Failure to complete each phase of work by dates indicated will result in liquidated damages as stated in the General Conditions.

1.6 CHANGES TO THE WORK

A. Refer to General Conditions.

1.7 ADDENDA

A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

1. Addendum # _____ Dated _____.
2. Addendum # _____ Dated _____.
3. Addendum # _____ Dated _____.
4. Addendum # _____ Dated _____.
5. Addendum # _____ Dated _____.

1.8 BID FORM SUPPLEMENTS

A. The following information is included with bid submission:

1. Refer to Section 00 4301 - Bid Form Supplements Cover Sheet.

1.9 NON-COLLUSIVE BIDDING CERTIFICATION

A. By submission of this bid or proposal:

1. The undersigned bidder and the person or persons signing on behalf of the bidder, and should this bid be a joint bid, each party thereto, certifies as to its own organization, under penalty of perjury, that to the best of knowledge and belief:
   a. The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor.
   b. Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor.
   c. No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.

1.10 BIDDER'S FURTHER AFFIRMATION AND DECLARATION

A. The above name bidder and should this bid be a joint bid each party thereto, further affirm and declares:
   1. That said bidder is of lawful age and the only one interested in this bid; and that no other person, firm or corporation, except those herein above named, has any interest in this bid or in the contract proposed to be entered into.
   2. That this bid is made without any understanding, agreement or connection with any other person, firm, or corporation making a bid for the same work, and is in all respects fair and without collusion or fraud.
   3. That said bidder is not in arrears to the Brewster Central School District upon debt or contract, and is not a defaulter, as surety or otherwise upon any obligation to the said Brewster Central School District
   4. That no member of the Brewster Central School District or any officer or employee of the Brewster Central School District or person whose salary is payable in whole or in part from the said school district treasury, or the spouse of any foregoing is or shall be or become interested, directly or indirectly, as a contracting party, partner, stockholder, surety or otherwise, in this bid, or in the performance of the Contract, or in the supplies, materials or equipment and work or labor to which it relates, or in any portion of the profits thereof.
   5. That he/she has carefully examined the site of the work and that, from his/her own investigations, he/she has satisfied him/herself as to the nature and location of the work, and character, quality and quantity of materials, and all difficulties likely to be encountered, the kind and extent of equipment and other facilities needed for the performance of the work, the general and local conditions, and all other items which may, in any way, affect the work or its performance.
   6. That if a corporation, this bid or proposal containing the Non-Collusive Binding Certification and the foregoing Affirmation and Declaration has been authorized by the Board of Directors of such Corporation, which authorization includes the signing and submission of this bid or proposal and the inclusion therein of the said Certificate of Non-Collusion and Affirmation and Declaration as the Act and Deed of the Corporation.

1.11 BID FORM SIGNATURE(S)

The Corporate Seal of

(Bidder - print the full name of your firm)

was hereunto affixed in the presence of:

_____

(Authorized signing officer, Title)

(Seal)

_____

If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

Subscribed and sworn before me this day of____ 20_____

Notary Public: _____

My Commission Expire: _____

END OF BID FORM

SECTION 00 4401
QUALIFICATION OF BIDDERS

1.1 REQUIREMENTS

A. The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

B. With the submittal of the Bid Proposal Form, **the bidder shall attach this Qualification of Bidders** and shall answer all the questions and provide all information requested herein. Failure to answer these questions or provide information requested in full may be cause for rejection of the bidder's proposal. If more space is needed, attach additional sheets with reference to subject paragraph.

C. The Owner reserves the right to consider, but not limited to, the bidder's financial responsibility, integrity, experience and reputation in the construction industry, as well as the specific qualifications listed below and elsewhere in this document in considering bids and awarding the contract. Brewster Central School District reserves the right to waive any informalities if, at its discretion the interest of the Brewster Central School District will be better served.

D. To demonstrate qualification for performing the Work of this Contract, bidders may be requested to submit written evidence of financial position and current commitments, license to perform work in the State NY .

E. To be considered qualified, in addition to the items listed in the Contractor's Qualification Statement, bidder must demonstrate to the Owner's satisfaction that:

1. A Principal of the corporation, partnership, sole proprietorship of the entity in whose name the bid is submitted has no less than the previous ten (10) years performing or coordinating the Work which they are bidding on.

F. The bidder is not currently involved in bankruptcy proceedings.

G. The bidder is capable of and intends to perform the work with its own employees in accordance with Article 5.2.5 of the General Conditions.

1. The bidder is capable of and intends to perform the work with its own employees in accordance with the following:
   a. Not withstanding any other provisions of the Contract Documents, Contractor shall perform at least twenty-five (25)% of the field work by its own employees.
   b. Not withstanding any other provisions of the Contract Documents of the field work by its own employees Contractors for HVAC and Electrical shall perform at least seventy-five (75)% of the field work by its own employees.
   c. For the purpose of the preceding paragraph, any part of the work performed by supervisory personnel (persons above level of foreman) or by the office personnel and such items as bonds, certificates, shop drawings and similar items shall not be considered part of the percentage of work required to be performed by the Contractor's employees.

H. Each subcontractor must have a minimum of five (5) years experience in the work and/or applicable trade.

I. The bidder will perform the work with sufficient personnel as required to comply with the schedule.

J. Field Superintendent must have at least five (5) years experience as a working field superintendent and must speak English or have a translator available at all times at no cost to the Owner.

K. Each Company (Bidder) shall have successfully completed three (3) public school construction or other public work projects within the last five (5) years substantially similar in scope, size, complexity and dollar value to the work of this project.

L. Each Company (Bidder) shall furnish, on the attached form, the three (3) three public school or public works projects it has performed during the most recent five (5) years including, but not limited to, the name and address of the project, the name of the awarding entity/owner, the name of the awarding

entity's/owner's representative, construction manager and architect, current telephone numbers where each can be reached, the description of the project, general scope of the contractor's work, contract price, dates of performance, whether the contract was terminated for cause or convenience, whether the contract was completed on time and whether liquidated damages were assessed against the contractor, and if so, to any items above provide a written explanation.

1. The Owner's Representative and Architect reserves the right to require additional information it deems appropriate concerning the history of the contractor's performance of each such contract.

M. The final determination of whether the contractor possesses the requisite experience rests in the sole discretion of the Owner.

1.2 QUESTIONAIRE:

A. **All information must be typewritten. Handwritten information will be rejected.**

Submitted to: Brewster Central School District

Address: 30 Farm To Market Road

City/Town: Brewster, NY 10509

Submitted By: _____

Tele #: _____ E-mail: _____

Corporation _____Partnership _____ Individual_____

Address:_____

Principal Office:_____

Other: _____

Project: BHS Security Vestibule, Synthetic Fields & Related Work

Facility: Brewster High School

1.3 ORGANIZATION

A. **All information must be typewritten. Handwritten information will be rejected.**

B. How many years has your organization been in business as a Contractor? _____

1. How many years has your organization been in business under its present business name? _____
2. Under what other or former names has your organization operated?

_____

_____

C. What is the firm's bonding range?

Single:_____ Aggregate: _____

D. If your organization is a corporation, answer the following:

1. Date of Incorporation: _____
   a. State of Incorporation: _____
   b. President's Name:_____
   c. Vice-president's name(s): _____
   d. Secretary's name: _____
   e. Treasurer's name: _____

E. If your organization is a partnership, answer the following:

1. Date of organization:_____
   a. Type of partnership (if applicable):_____ _____
   b. Name(s) of general partner(s): _____

_____

F. If your organization is individually owned, answer the following:

1. Date of organization:_____
2. Name of owner: _____

G. If the form of your organization is other than those listed above, describe it and name the principals:

_____

_____

1.4 OWNERSHIP, MANAGEMENT, AFFILIATION

A. Identify each person who is or has been ,within the past five years, an owner of 5.0% or more of the firm's shares, one of the five largest shareholders, a director, an officer, a partner or the proprietor, or a managerial employee.

First Name: _____MI___Last Name_____DOB_____

% Owned: __ Director: Yes__ No__ Officer: Yes__ No__ Title _____artner: Yes__ No____

First Name: _____MI____Last Name_____DOB_____

% Owned: __ Director: Yes__ No__ Officer: Yes__ No__ Title _____Partner: Yes__ No_____

First Name: _____MI____Last Name_____DOB_____

% Owned: __ Director: Yes__ No__ Officer: Yes__ No__ Title _____Partner: Yes__ No____

B. Has the firm or any firm listed in response to questions above defaulted or been terminated and its surety called upon to complete, any contract awarded within the past five years Yes ___ No ___ If yes, give date(s), agency (ies)/owner(s), project(s), contract numbers, and describe including the result:

_____

_____

C. List below any projects performed by the bidder in the past five (5) years on which any of the following events occurred:

1. Were any extension of time were requested by the contractor, Yes__ No __and were such requests granted? Yes__ No __
2. Was litigation and/or arbitration commenced by either the Owner or the bidder as a result of the work of the project performed by the bidder? Yes __ No __
3. Were any liens filed on the project by subcontractors or material suppliers of the bidder? Yes__ No __
4. Did the bidder make any claims for extra work on the project, and did said claim result in a change order? Yes__ No ___
5. If Yes:

Project Name/Address_____

Type of Event_____

Name & Phone # of Owner: _____

Contact Person at Owner: _____

D. For all contracts within the past five years: (a) List all liens or claims over $25,000 filed against the firm and remaining undischarged or unsatisfied for more than 90 days; and (b) list and describe all liquidated damages assessed: _____

_____

1.5 FINANCIAL INFORMATION

A. Submit firm's most recent annual financial statement and Dun and Bradstreet Report..

1.6 OTHER INFORMATION

A. Within the past five years has the firm, any affiliate, any predecessor company or entity or any person identified in questions number 1.1 through 1.2 above been the subject of any of the following: (Respond

to each question and describe in detail the circumstances of each affirmative answer: (Attach additional pages if necessary).

1. A judgment of conviction for any business-related conduct constituting a crime under state or federal law No__ Yes__
2. A criminal investigation or indictment for any business-related conduct constituting a crime under state or federal law? No__ Yes__
3. A grant of immunity for any business-related conduct constituting a crime under state and federal law? No__ Yes__
4. A federal or state suspension or debarment? No__ Yes__
5. A rejection of any bid for lack of qualifications, responsibility or because of the submission of an informal, non-responsive or incomplete bid? No__ Yes__
6. A denial or revocation of prequalification? No__ Yes__
7. A voluntary exclusion from bidding/contracting agreement? No__ Yes__
8. Any administrative proceeding or civil action seeking specific performance or restitution in connection with any public works contract except any disputed work proceeding? No__ Yes__
9. An OSHA Citation and Notification of Penalty containing a violation classified as serious? No__ Yes__
10. An OSHA Citation or Notification of Penalty containing a violation classified as willful? No__ Yes__
11. A prevailing wage or supplement payment violation? No__ Yes__
12. A State Labor Law violation deemed willful? No__ Yes__
13. Any other federal or state Citations, Notices, violation orders, pending administrative hearings or proceedings or determinations of a violation of any labor law or regulation? No__ Yes__
14. Any criminal investigation, felony indictment or conviction concerning formation of or any business association with, an allegedly false or fraudulent women's, minority or disadvantaged business enterprise? No__ Yes_
15. Any denial, desertification, revocation or forfeiture of Women's Business Enterprise, Minority Business Enterprise or Disadvantaged Business Enterprise status? No__ Yes_
16. Rejection of a low bid on a State contract for failure to meet statutory affirmative action M/WBE requirements? No__ Yes_
17. A consent order with the NYS Department of Environmental Conservation or a federal, state or local government enforcement determination involving a violation of federal or state environmental laws? No__ Yes_
18. Any bankruptcy proceeding? No__ Yes__
19. Any suspension or revocation of any business or professional license? No__ Yes_
20. Any citations, notices, violation orders, pending administrative hearings or proceedings or determinations for violation of hearings or proceedings or determinations for violation of:
    a. Federal, state or local health laws, rules or regulations? No__ Yes_
    b. Federal, state or local environmental laws, rules and regulations? No__ Yes_
    c. Unemployment insurance or workers compensation coverage or claim requirements. No__ Yes_
    d. ERISA (Employee Retirement Income Security Act) No__ Yes_
    e. Federal, state or local human rights laws. No__ Yes_
    f. Federal, state or local labor laws. No__ Yes__
    g. Federal or state security laws. No__ Yes_
    h. Withdrawal or an agreement to withdraw a bid submitted to a public owner or a request by a public owner to withdraw a bid? No__ Yes_

B. During the five year period preceding the submissions of this bid, has the bidder been named as a party in any lawsuit in an action involving a claim for personal injury or wrongful death arising from performance

of work related to any project in which it has been engaged? If the answer to this question is yes, list all such lawsuits, the index number associated with said suit and the status of the lawsuit at the time of the submission of this bid. No__ Yes_

C. During the five year period preceding the submission of this bid, has the bidder been the subject of proceedings before the Department of Labor for alleged violations of the Labor Law as it relates to the payment of prevailing wages and/or supplemental payment requirements? If the answer to this question is yes, please list each such instance of the commencement of a Department of Labor proceeding, for which project such proceeding was commenced, and the status of the proceeding at the time of the submission of this bid. No__ Yes_

D. During the five year period preceding the bidder's submission of this bid, has the bidder been the subject of proceedings involving allegations that it violated the Worker's Compensation Law including but not limited to the failure to provide proof of worker's compensation or disability coverage and/or any lapses thereof. If the answer to this question is yes, list such instance of violation and the status of the claimed violation at the time of disposition of this bid. No__Yes __

E. Has the bidder, its officers, directors, owner and/or managerial employees been convicted of a crime or been the subject of a criminal indictment during the five years preceding the submission of this bid? If the answer to this question is yes, list the name of the individual convicted or indicted the charge against the individual and the date of submission of the charge. No__Yes__

F. During the five year period preceding the bidder's submission of this bid, has the bidder been charged with and/or found guilty of any violations of federal, state, or municipal environmental and/or health laws, codes, rules and/or regulations. If the answer to this question is yes, list the nature of the charge against the bidder, the date of the charge, and the status of the charge at the time of the submission of this bid. No__ Yes_

G. Has the bidder ever defaulted or had its surety called upon to complete any contract awarded within the past five years. If the answer to this question is yes, list the projects, the dates and the nature of the termination (convenience, suspension, for cause). No__ Yes_

H. Has any officer or partner of the bidder's organization ever defaulted or had its surety called upon to complete any contract awarded within the past five years or been an officer or partner of some other organization that has been terminated from a project by an owner? If yes, state: No__ Yes__

I. Name of Individual(s) _____ Name of Organization(s) Reason(s)

_____

_____

1.7 LICENSING

A. List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration of license numbers, if applicable.

_____

_____

B. List jurisdictions in which your organization's partnership or trade name is filed:

_____

_____

C. Has any director, officer, owner or managerial employee had any professional license suspended or revoked? If the answer is yes, list the name of the individual, the professional license he/she formally had, whether the license was revoked or suspended and the date of the revocation or suspension. No__ Yes__

1.8 EXPERIENCE

A. List the categories of work that your organization will perform with its own forces:

_____

_____

B. Claims and Suits. (If the answer of any of the questions below is yes, please attach details.)

1. Have you or has any director, officer, owner or managerial employee ever failed to complete any work awarded to them? If yes, list the project(s) the date(s) and the reason(s) for the failure to complete. No____ Yes___
2. Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers? No____ Yes_____
3. Has your organization filed or been party to any law suits or requested arbitration proceedings with regard to construction contracts within the last five years? No____ Yes____
4. Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.) No____ Yes____

C. On a separate sheet, list all construction projects presently your organization has in progress or completed, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

D. State total worth of work in progress and under contract:

_____

E. On a separate sheet, list all projects, not listed above, that your organization has completed or in progress in the past five years, giving the name of the project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

F. State average annual amount of construction work performed during the past five years: _____

_____

G. On a separate sheet, list the construction experience and present commitment of the key individuals of your organization.

1.9 APPRENTICE PROGRAM

A. Has the Firm have in place apprenticeship agreements appropriate for the type and scope of work to be performed, that have been registered with, and approved by, the Commissioner of the New York State Department of Labor pursuant to the requirements found in Article 23 of the Labor Law. No__ Yes_

1.10 REFERENCES

A. Trade reference: _____

B. Bank references: _____

C. Surety: _____

1. Name of present bonding company: _____
2. Name and address of agent: _____
3. Name or previous bonding company: _____

1.11 CERTIFICATION

A. The undersigned recognizes that this questionnaire is submitted for the purpose of the Brewster Central School District awarding a contract or approving a subcontract; acknowledges that the Brewster Central School District may in its discretion, by means which it may choose, determine the truth and accuracy of all statements made herein; acknowledge that intentional submission of false or misleading information may constitute a felony under Penal Law §210.40 or a misdemeanor under Penal Law §210.35 or §210.45, and may also be punishable by a fine of up to $10,000.00 or imprisonment of up to five years under 18 U.S.C. §1001; and states that the information submitted in this questionnaire any attached pages is true, accurate and complete.

Dated at this day of _____

Name of Organization: _____

By: _____Title_____

being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading. Subscribed and sworn before me this day of:_____

Notary Public: _____My Commission Expire: _____

See Project Information Form attached.

PROJECT NAME: _____

Company work was performed under: _____

Who was Co. Principal in charge: _____

Location: _____

Cost of the Contract: _____ Final Cost of the Work: _____

Description of the Work:

_____

_____

_____

Owner's Name:

_____

Owners Contact: Name _____ Phone_____ E-Mail _____

CM Name(If Applicable: _____

CM Contact: Name _____ Phone_____E-Mail_____

Architect Firm: _____

Architect Contact: _____PhoneE_____ E-Mail_____

PROJECT NAME: _____

Company work was performed under: _____

Who was Co. Principal in charge: _____

Location: _____

Cost of the Contract: _____ **Final Cost of the Work:** _____

Description of the Work:

_____

_____

_____

Owner's Name:

_____

Owners Contact: Name _____ **Phone**_____ **E-Mail** _____

CM Name(If Applicable: _____

CM Contact: Name _____ **Phone**_____**E-Mail**_____

Architect Firm: _____

Architect Contact: _____**PhoneE**_____ **E-Mail**_____

PROJECT NAME: _____

Company work was performed under: _____

Who was Co. Principal in charge: _____

Location: _____

Cost of the Contract: _____ **Final Cost of the Work:** _____

Description of the Work:

_____

_____

_____

Owner's Name:

_____

Owners Contact: Name _____ **Phone**_____ **E-Mail** _____

CM Name(If Applicable: _____

CM Contact: Name _____ **Phone**_____**E-Mail**_____

Architect Firm: _____

Architect Contact: _____**PhoneE**_____ **E-Mail**_____

END OF SECTION

SECTION 01 2100
ALLOWANCES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Contingency Allowances

B. Commissioning Allowance

1.3 RELATED REQUIREMENTS

A. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

1.4 CONTINGENCY ALLOWANCES

A. Contingency Allowances includes Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit and will be included in the Change Order(s) authorizing expenditure of funds from this Contingency Allowance.

B. Funds will be drawn from the Contingency Allowances only by Change Order.

C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

D. Contingency Allowances included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work and overhead and profit.

E. Contingency Allowances is an amount proposed by bidders, included on the Bid Form, as a cost per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if **additional work is required and not indicated or can be inferred by the Contract Documents** or requested to be added or deleted from the base bid. Contingency allowances listed on the Bid Form are to be included in the Total Bid Proposal.

F. Quantities indicated are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

G. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

1. Assist by providing necessary equipment, workers, and survey personnel as required.

H. Payment for Work governed by Contingency allowances will be made on the basis of the actual measurements and quantities of Work which is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit sum/price.

I. Payment will not be made for any of the following:

1. **Work performed prior to measurement and establishing quantities approved by Owner or Architect.**
2. Products wasted or disposed of in a manner that is not acceptable.
3. Products determined as unacceptable before or after placement.
4. Products placed beyond the lines and levels of the required Work.
5. Loading, hauling, and disposing of rejected products.

1.5 ALLOWANCES SCHEDULE

A. COMMISSIONING ALLOWANCE - **HVAC Contract # 3**

1. (HVAC -1) Costs Included in the Commissioning Allowances: Cost of an Commissioning Agent selected by the Owner to perform commissioning of the RTU, FANS and BMS as directed by the LFG Engineers.
   a. TOTAL COMMISSIONING ALLOWANCE .
      TWENTY THOUSAND_____ ($ 20,000.00) DOLLARS
      (INSERT ON HVAC BID FORM)

B. CONTIGENCY ALLOWANCES **- GC Contract #1**

1. GC-1 Asbestos Pipe Fitting Abatement:
   a. Description: Removal of additional asbestos containing pipe insulation fittings and installation of new insulation fittings in areas already under containment and not specifically indicated with bid documents.
      Unit of Measurement: Each
      Quantity: Ten: (10) fittings .
      Ten: (10) fittings @_____ per fittings:
      _____ ($_____) DOLLARS
2. GC- 2 Asbestos Pipe Insulation Abatement:
   a. Description: Removal of additional asbestos contain pipe insulation and installation of new insulation in areas already under containment and not specifically indicated in bid documents.
      Unit of Measurement: Linear Feet
      Quantity: Twenty: (20) linear feet .
      Twenty: (20) linear feet @_____ per linear feet:
      _____ ($_____) DOLLARS
3. GC- 3 Small Containment Area:
   a. Description: Construct and remove, at completion of work, a small containment area in accordance with Asbestos Abatement Removal specifications at areas not specifically identified in bid documents and removal and reinsulation of five (5) fittings and ten (10) lineal feet of asbestos containing piping insulation.
      Unit of Measurement: Each
      Quantity: One.
      One containment area @_____ :
      _____ ($_____) DOLLARS

TOTAL CONTINGENCY ALLOWANCE - **CONTRACT #1 (INSERT ON GC BID FORM)**
_____ ($_____) DOLLARS

C. CONTINGENCY ALLOWANCES - **SC Contract #5**

1. SC- 1Removal of Trench Rock:
   a. Description: Removal of trench rock off site and backfill resultant void.
      Unit of Measurement: Cubic Yard
      Quantity: ten cubic yards of trench rock including backfilling.
      Ten cubic yards @_$_____ per each yard:
      _____ ($_____) DOLLARS
2. SC-2 Removal of Mass Rock:
   a. Description: Removal of mass rock, backfill resultant void and disposed off site.
      Unit of Measurement: Cubic Yard
      Quantity: Ten cubic yards of mass rock including backfilling.
      Ten cubic yards @_$_____ per each yard:

_____ ($_____) DOLLARS

3. SC- 3 New Engineered Fill:
   a. Description: Provide new engineered fill.
      Unit of Measurement: Cubic Yard
      Quantity: One hundred cubic yards
      one hundred cubic yards @_$_____ per each yard:
      _____ ($_____) DOLLARS

4. SC- 4 Removal and replacement of asphalt roadway:
   a. Description: Remove existing pavement and install new asphalt roadway pavement assembly.
      Unit of Measurement: square feet
      Quantity: five hundred square feet
      five hundred square feet @ $_____ per square foot:
      _____ ($_____) DOLLARS

5. SC - 5 Removal and replacement of asphalt sidewalk pavement assembly.
   a. Removal of existing pavement and install new asphalt sidewalk pavement assembly.
      Unit of Measure: Square feet
      Quantity: Five hundred square feet

   Five hundred square feet @_____ per square foot :
   _____ (_____) DOLLARS

6. SC-6 Removal and replacement of concrete sidewalk
   a. Description: Remove existing concrete pavement and install new concrete sidewalk pavement assembly.
      Unit of Measure: Square Feet
      Quantity: Five hundred square feet @ _____ per square foot:
      _____($_____) DOLLARS

7. SC-7 Removal of existing curb and install new concrete curb.
   a. Description: Removal of existing curb and install new concrete curb assembly.
      Unit of Measure: Linear foot
      Quantity: Seventy five lineal feet @ _____per lineal foot:

   _____
   _____($_____) DOLLARS

TOTAL CONTINGENCY ALLOWANCES **CONTRACT #5 - (INSERT ON SC BID FORM)**

_____
_____ ( ) DOLLARS

8. CONTINGENCY ALLOWANCE - ELEVATOR **Contract # 6**
   a. (EL-1) Costs Included in the Allowance: Cost of refurbishing the elevator car enclosure and related items as described in specification 14 2020, par. 2.30.
      a) TOTAL ALLOWANCE CONTRACT #6:
         TWENTY THOUSAND_____ ($ 20,000.00) DOLLARS
         (INSERT ON ELEVATOR BID FORM)

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for hollow metal, and other doors.

B. Hardware for fire-rated doors.

C. Electrically operated and controlled hardware.

1.02 RELATED REQUIREMENTS

A. Section 079200 - Joint Sealants: Sealants for setting exterior door thresholds.

B. Section 081113 - Hollow Metal Doors and Frames.

C. Section 101400 - Signage: Additional signage requirements.

D. Section 281000 - Access Control: Electronic access control devices.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

B. BHMA A156.1 - Standard for Butts and Hinges 2021.

C. BHMA A156.2 - Bored and Preassembled Locks and Latches 2017.

D. BHMA A156.3 - Exit Devices 2020.

E. BHMA A156.7 - Template Hinge Dimensions 2016.

F. BHMA A156.18 - Materials and Finishes 2020.

G. BHMA A156.22 - Standard for Gasketing 2021.

H. BHMA A156.25 - Electrified Locking Devices 2018.

I. BHMA A156.26 - Standard for Continuous Hinges 2021.

J. BHMA A156.28 - Standard for Recommended Practices for Mechanical Keying Systems 2018.

K. BHMA A156.115 - Hardware Preparation In Steel Doors And Steel Frames 2016.

L. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

M. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

N. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

O. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.

P. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

Q. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.

R. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.

S. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

T. UL 294 - Access Control System Units Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Sequence installation to ensure facility services connections are achieved in an orderly and expeditious manner.

C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by affected installers and the following:
   A. Architect.
   B. Installer's Architectural Hardware Consultant (AHC).
   C. Hardware Installer.
   D. Owner's Security Consultant.

D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

E. Keying Requirements Meeting:
   A. Schedule meeting at project site prior to Contractor occupancy.
   B. Attendance Required:
      a. Contractor.
      b. Owner.
      c. Construction Manager.
      d. Installer's Architectural Hardware Consultant (AHC).
      e. Door Hardware Installer.
      f. Owner's Security Consultant.
   C. Agenda:
      a. Establish keying requirements.
      b. Verify locksets and locking hardware are functionally correct for project requirements.
      c. Verify that keying and programming complies with project requirements.
      d. Establish keying submittal schedule and update requirements.
   D. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
      a. Access control requirements.
      b. Key control system requirements.
      c. Schematic diagram of preliminary key system.
      d. Flow of traffic and extent of security required.
   E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.
   F. Deliver established keying requirements to manufacturers.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

C. Shop Drawings - Door Hardware Schedule: A detailed listing that includes each item of hardware to be installed on each door.
   A. Prepared by or under supervision of Architectural Hardware Consultant.
   B. List groups and suffixes in proper sequence.
   C. Include complete description for each door listed.
   D. Include manufacturers and product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
   E. Include account of abbreviations and symbols used in schedule.

D. Shop Drawings - Electrified Door Hardware: Include diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:

A. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
B. Elevations: Include front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
C. Diagrams: Include point-to-point wiring diagrams that show each device in door opening system with related colored wire connections to each device.

E. Samples for Verification (If requested by Architect):
A. Submit minimum size of 2 by 4 inch (51 by 102 mm) for sheet samples, and minimum length of 4 inch (102 mm) for other products.
B. Submit one (1) sample of hinge, latchset, lockset, and closer illustrating style, color, and finish.
C. Architect will return full-size samples to Contractor.
D. Include product description with samples.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

G. Manufacturer's qualification statement.

H. Installer's qualification statement.

I. Supplier's qualification statement.

J. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
A. Include manufacturer's parts lists and templates.
B. Bitting List: List of combinations as furnished.

K. Keying Schedule:
A. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.

L. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

M. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.

N. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
A. See Section 016000 - Product Requirements, for additional provisions.
B. Lock Cylinders: Ten for each master keyed group.
C. Tools: One set of each special wrench or tool applicable for each different or special hardware component, whether supplied by hardware component manufacturer or not.

1.06 QUALITY ASSURANCE

A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.

D. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC) or similar to assist in work of this section.

E. 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.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.08 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide manufacturer warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.
   A. Closers: Limited Lifetime.
   B. Exit Devices: Five years, minimum.
   C. Locksets and Cylinders: Five years, minimum.
   D. Other Hardware: One year minimum.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Verification of existing conditions: Examine doors, frames, related items and conditions under which Work is to be performed such that specified hardware will accommodate these conditions.

C. Provide individual items of single type, of same model, and by same manufacturer unless otherwise specified.

D. Locks: Provide a lock for each door, unless it's indicated that lock is not required.
   A. Lock Function: Provide lock and latch function numbers and descriptions of manufacturer's Series. As indicated in hardware sets.
      a. Provide an office lockset for swinging doors for which a lock function is not indicated.
   B. Trim: Provide lever handle or pull trim on outside of each lock, unless otherwise indicated.
   C. Strikes:
      a. Finish: To match lock or latch.
      b. Curved-Lip Strikes: Provide as standard, with extended lip to protect frame, unless otherwise indicated.
      c. Extra-Long-Lip Strikes: Provide for locks used on frames with applied wood casing trim.
      d. Aluminum-Frame Strike Box: Provide strike box fabricated for use with aluminum framing.
      e. Center Strike At Pairs of Doors: 7/8 inch (22.2 mm) lip.

E. Closers:
   A. Provide door closer on each exterior door, unless otherwise indicated.
   B. Provide door closer on each fire-rated and smoke-rated door.
   C. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.

F. Thresholds:
   A. Interior Applications: Provide when specified at interior doors for transition between two different floor types, and over building expansion joints, unless otherwise indicated.
   B. Exterior Applications: Provide at each exterior door, unless otherwise indicated.

G. Smoke and Draft Control Seals:
   A. Provide gasketing for smoke and draft control doors (Indicated as "S" on Drawings) that complies with local codes, requirements of assemblies tested in accordance with UL 1784.
   B. Provide frame-applied intumescent gasketing on wood doors that are labeled as smoke and draft control doors (Indicated as "S" on Drawings), unless otherwise indicated.
   C. See Section 08 1416 for wood door to frame sealing system applied by door manufacturer.

H. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.

I. See Section 28 10 00 for additional access control system requirements.

J. Fasteners:

A. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
   a. Aluminum fasteners are not permitted.
   b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.

B. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
   a. Self-drilling (Tek) type screws are not permitted.

C. Provide stainless steel machine screws and lead expansion shields for concrete and masonry substrates.

D. Provide wall grip inserts for hollow wall construction.

E. Provide spacers or sex bolts with sleeves for through bolting of hollow metal doors and frames.

F. Fire-Resistance-Rated Applications: Comply with NFPA 80.
   a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
   b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

G. Concealed Fasteners: Do not use through or sex bolt type fasteners on door panel sides indicated as concealed fastener locations, unless otherwise indicated or required per manufacturer's testing requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Provide door hardware products that comply with the following requirements:

A. Applicable provisions of federal, state, and local codes.
   a. ICC (IBC).
   b. NFPA 101.

B. Accessibility: ADA Standards and ICC A117.1.

C. Fire-Resistance-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.

D. Hardware on Fire-Resistance-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), testing firm acceptable to authorities having jurisdiction, or as suitable for application indicated.

E. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
   a. Air Leakage Rate: Tested in accordance with UL 1784, with air leakage rate not to exceed 3.0 cfm/sf (0.01524 cu m/sec/sq m) of door opening at 0.10 inch (24.9 Pa) of water for both ambient and elevated temperature tests.
      1) When required for acceptance by authorities having jurisdiction for code-mandated applications, test without an artificial bottom seal.

F. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.

G. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

2.03 CONTINUOUS HINGES

A. Manufacturers:

A. BEST; dormakaba Group: www.bestaccess.com

B. Properties:

A. Continuous Hinges: As applicable to each item specified.
   a. Geared Continuous Hinges: As applicable to each item specified.
      1) Non-handed.
      2) Anti-spinning through-fastener.
      3) UL 10C listed for fire-resistance-rated doors.
         (a) Metal Door Installation: Rated up to 90 minutes.
         (b) Wood Door Installation: Rated up to 60 minutes.
      4) Sufficient size to permit door to swing 180 degrees

C. Grades:
   A. Continuous Hinges: Comply with BHMA A156.26, Grade 1.

D. Material: Base metal as indicated for each item by BHMA material and finish designation.

E. Types:
   A. Continuous: Provide as specified.

F. Quantities:
   A. Continuous Hinges: One per door leaf.

G. Products:
   A. Continuous Hinges:
      a. Aluminum geared hinges.

2.04 EXIT DEVICES

A. Manufacturers:
   A. BEST, dormakaba Group: www.bestaccess.com

B. Properties:
   A. Actuation: Touchbar
   B. Chassis:
      a. Construction: Investment heavy-duty cast steel, zinc dichromate plated.
      b. Compatibility: Standard Stile.
   C. Touchpads: 'T" style metal touchpads and rail assemblies with matching chassis covers end caps.
   D. Latch Bolts: Stainless steel deadlocking with 3/4 inch projection using latch bolt.
   E. Lever Design: Match project standard lockset trims.
   F. Cylinder: Include where cylinder dogging or locking trim is indicated.
   G. Strike as recommended by manufacturer for application indicated.
   H. Sound dampening on touch bar.
   I. Dogging:
      a. Non-Fire-Resistance-Rated Devices: Hex key dogging.
      b. Fire-Resistance-Rated Devices: Manual dogging not permitted.
   J. Touch bar assembly on wide style exit devices to have a 1/4 inch clearance to allow for vision frames.
   K. Handing: Field-reversible.
   L. Fasteners on Back Side of Device Channel: Concealed - exposed fasteners not allowed.
      a. Provide through-bolts.

C. Options:
   A. Electrified Devices:
      a. Latchbolt Retraction: Continuous-duty solenoid latchbolt retraction.
   B. Delayed Egress Devices: Manufacturer's standard for the application.
   C. Battery operated alarm function. Provide WH495 unit for Remote Arming/Disarming, as indicated in Door Hardware Schedule.
   D. Remote powered alarm 12 VDC. Provide WH495 unit for Remote Arming/Disarming or External Activation.

E. Internally mounted switch used to signal other components.
F. Internally mounted switch that monitors the position of the latchbolt.
   a. Comply with weather-resistance performance specified for Weatherized devices.
G. MLR: Motorized latch retraction.
H. Exit Device Intruder Function Visual Indicator in conjunction with the ANSI "10" Function,
   a. Directional Indicator:
      1) Actuation: By a rim cylinder equipped with a keyed core or thumb-turn.
      2) Embossed into the active case cover.
   b. Large status window integrated into the housing of the exit device, with directional pointers to indicated key turn direction to lock and unlock outside lever trim.
   c. Use bright reflective materials capable of being seen in low light condition.
   d. Labels or stickers are not permitted.
   e. Impact resistant lens cover.
   f. A quarter turn (90 degrees) of key or thumb turn to lock down or unlock.
   g. Locked status indicated by a red indicator with an image of a locked padlock appearing under lens cover.
   h. Unlocked status indicated by a green indicator with an image of an unlocked padlock appearing under lens cover.
I. Furnish less bottom rod (LBR) at scheduled locations to eliminate use of floor mounted strikes.
J. Vandal-Resistant Trim: Heavy-duty lever trim with heavy-duty investment-cast stainless steel components and extra strength shock absorbing overload springs.
   a. Not requiring resetting.
   b. Lever design to match locksets and latchsets.
K. Electrified Device Voltage: 24 VAC.

D. Grades: Complying with BHMA A156.3, Grade 1.
   A. Provide exit devices 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.

E. Standards Compliance:
   A. UL Listed for Panic and Fire for Class II Circuitry.
   B. Provide UL (DIR) listed exit device assemblies for fire-resistance-rated doors.
   C. Comply with UL 10C.

F. Code Compliance: As required by authorities having jurisdiction in the State in which the Project is located.

G. Products:
   A. 2000.

2.05 REMOVABLE MULLIONS

A. Manufacturers:
   A. BEST, dormakaba Group: www.bestaccess.com

B. Properties:
   A. Rectangular shape 3 inches (76 mm) by 2 inches (51 mm) tubes with minimum 1/8 inch (3.2 mm) wall thickness.
   B. Furnished by the same manufacturer as exit devices.
   C. Pre-drilled holes for installation of exit device strikes.
   D. Spacers: Provide as required for proper installation, based on frame profile and dimensions.

C. Grades: Complying with BHMA A156.3.

D. Materials: Manufacturer's standard for items specified.
   A. Top and Bottom Brackets: Investment-cast steel.

E. Options:
   A. Furnish Keyed Removable "KR" feature and corresponding cylinders as specified.

a. Mullions capable of being installed without physical key present.
b. Physical key required to operate.

B. Furnish electrified mullion as specified.

F. Applications: As indicated on drawings and in Door Hardware Schedule.
A. Fire-Resistance-Rated Openings: Mullions with UL Listed Labels and mullion stabilizers.

G. Products:
822 Series.

2.06 LOCK CYLINDERS

A. Manufacturers:
A. BEST, dormakaba Group: www.bestaccess.com
B. Substitutions: Not permitted.

B. Properties:
A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
a. Provide cylinders from same manufacturer as locking device.
b. Provide cams and/or tailpieces as required for locking devices.
c. Provide cylinders with appropriate format conventional cores where indicated.

C. Grades:
A. Standard Security Cylinders: Comply with BHMA A156.5.

D. Material:
A. Manufacturer's standard corrosion-resistant brass alloy.

E. Types: Refer to existing standards.

F. Applications: At locations indicated in hardware sets, and as follows
A. As required for items with locking devices provided by other sections, including at elevator controls and cabinets.
a. When provisions for lock cylinders are referenced elsewhere in the Project Manual to this Section, provide compatible type of lock cylinder, keyed to building keying system, unless otherwise indicated.

2.07 CYLINDRICAL LOCKS

A. Manufacturers:
A. BEST, dormakaba Group: www.bestaccess.com/#sle.
B. Substitutions: Not permitted.

B. Properties:
A. UL listed for use on single or pairs of doors with fire-resistance-rating up to 3 hours and latchbolt throw of 1/2 inch (12.7 mm).
B. Mechanical Locks:
a. Fitting modified ANSI A115.2 door preparation.
b. Door Thickness Fit: 1-3/8 inches (35 mm) to 2-1/4 inches (57 mm) thick doors.
c. Construction: Hub, side plate, shrouded rose, locking pin to be a one-piece casting with a shrouded locking lug.
1) Through-bolted anti-rotational studs.
2) Lock chassis constructed of steel, stainless steel and zinc components for superior strength and corrosion resistance.
d. Cast stainless steel latch retractor with roller bearings for exceptionally smooth operation and superior strength and durability.
e. Bored Hole: 2-1/8 inch (54 mm) diameter.
f. Backset: 2-3/4 inches (70 mm) unless otherwise indicated.
g. Latch: Single piece tail-piece construction.
1) Latchbolt Throw: 1/2 inch (12.7 mm), minimum.

h. Cylinders:
1) Cylinder Core Types: Locks capable of supporting manufacturers' cores, as applicable.
(a) Small format interchangeable.
i. Lever Trim:
1) Style: See Door Hardware Schedule.
2) Functionality: Allow the lever handle to move up to 45 degrees from horizontal position prior to engaging the latchbolt assembly.
3) Strength: Locksets outside locked lever designed to withstand minimum1,400 inch-lbs (158.2 Nm) of torque. In excess of that, a replaceable part will shear. Key from outside and/or inside lever will still operate lockset.
4) Independent spring mechanism for each lever.
(a) Contain lever springs in the main lock hub.
5) Outside Lever Sleeve: Seamless one-piece construction.
6) Keyed Levers: Removable only after core is removed by authorized control key.
7) Abrasive Lever Handles: Include a special abrasive strip on back of the hand grasp portion of lever.
8) Tactile Lever Handles: Machine grooves into the back of the hand grasp portion of the lever.

C. Electrified Locks: Same properties as standard locks, and as follows:
a. Voltage: 24 VAC.
b. Function: Electrically locked (Fail Safe) or unlocked (Fail Secure), as indicated for each lock in Door Hardware Schedule.
c. Temperature Control Module (TCM).
d. Internal request-to-exit feature.

C. Finishes: See Door Hardware Schedule.
A. Core Faces: Match finish of lockset.

D. Grades: Comply with BHMA A156.2, Grade 1, Series 4000, Operational Grade 1, Extra Heavy Duty.
A. Durability: Passing 50 Million cycle tests verified by third party testing agency.

E. Material: Manufacturer's standard for specified lock.
A. Critical Latch and Chassis Components: Brass or corrosion-resistance treated steel.
B. Outside Lever Sleeve: Hardened steel alloy.

F. Options:
A. Regulatory Compliance: As required by authorities having jurisdiction the State in which the Project is located.

G. Products: Cylindrical locks, including mechanical and electrified types.
A. 9K (Grade 1).

2.08 CLOSERS

A. Manufacturers:
A. dormakaba commercial, dormakaba Group: www.dormakaba.com/us-en

B. Properties:
A. Surface Mounted Closers: Manufacturer's standard.
a. Maximum Projection from Face of Door: 2-7/16 inches
b. Mechanism: Separate tamper-resistant adjusting valves for closing and latching speeds.
c. Pinion: Stainless steel.
d. Hydraulic Fluid: All-weather type.
e. Arm Assembly: Standard for product specified.
1) Include hold-open, integral stop, or spring-loaded stop feature, as specified in Door Hardware Schedule.
2) Parallel arm to be a heavy-duty rigid arm.
f. Covers:

1) Type: Standard for product selected.
(a) Full.
2) Material: Metal.
3) Finish: Painted.

C. Grades:
A. Closers: Comply with BHMA A156.4, Grade 1.
a. Underwriters Laboratories Compliance:
1) Product Listing: UL (DIR) and ULC for use on fire-resistance-rated doors.
(a) UL 228 - Door Closers-Holders, With or Without Integral Smoke Detectors.
(b) CAN/ULC S-133 - Standard Method Of Tests For Door Closers Intended For Use With Swinging Doors.
b. Testing Standards Compliance: Meeting requirements of UL 10C for positive pressure.

D. Code Compliance: As required by authorities having jurisdiction in the State in which the Project is located.

E. Products:
A. Surface Mounted:
a. 8900

2.09 KEYS AND CORES

A. Manufacturers:
A. BEST, dormakaba Group: www.bestaccess.com
B. Substitutions: Not permitted.

B. Properties: Complying with guidelines of BHMA A156.28.
A. Provide small format interchangeable core into existing system.
B. Keying Schedule: Arrange for a keying meeting, with Architect, Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying complies with project requirements.
C. Keying: Existing Master key system.
D. Include construction keying and control keying with removable core cylinders.
E. Do not make brass construction cores and construction control and operating keys a part of Owner's permanent keying system, nor furnish in the same keyway (or key section) as Owner, permanent keying system.
F. Key to existing keying system.
G. For estimate, supply keys in following quantities:
a. Great Grand Master Keys: 1 each.
b. Grand Master Keys: 1 each.
c. Master Keys: 4 each.
d. Construction Master Keys: 6 each.
e. Construction Keys: 15 each.
f. Construction Control Keys: 2 each.
g. Control Keys if New System: 2 each.
h. Extra Cylinder Cores: 2 each.
i. Change Keys: 2 each for each keyed core.
H. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
I. Deliver keys with identifying tags to Owner by security shipment direct from manufacturer.
J. Permanent Keys and Cores: Stamped with applicable key marking for identification. Do not include actual key cuts within visual key control marks or codes. Stamp permanent keys "Do Not Duplicate."
K. Include installation of permanent cores and return construction cores to hardware supplier. Construction cores and keys to remain property of hardware supplier.

C. Products:
A. Existing Best System.

2.10 OVERHEAD STOPS AND HOLDERS

A. Manufacturers:
A. dormakaba; dormakaba Group
B. Architectural Builders Hardware Mfg

B. Properties:
A. Stop Settings: Degrees opening as required

C. Sizes: Manufacturer's standard for the application.

D. Grades: As applicable to item specified.
A. Comply with BHMA A156.8, Grade 1.

E. Types:
A. Concealed.

F. Products:
A. Concealed Overhead Stops and Holders:
a. ABH: 1020SL Series

2.11 FINISHES

A. Finishes: Identified in Hardware Sets.

B. Finishes: Provide door hardware of same finish, unless otherwise indicated.
A. Finish: 630; satin stainless steel, with stainless steel 3000 series base material (former US equivalent 32D), 652; satin chromium plated over nickel, with steel base material (former US equivalent 26D), and 689; aluminum painted, with any base material (former US equivalent US28); BHMA A156.18.
B. Exceptions:
a. Where base material metal is specified to be different, provide finish that is an equivalent appearance in accordance with BHMA A156.18.
b. Hinges for Fire-Rated Doors: Steel base material with painted finish, in compliance with NFPA 80.
c. Door Closer Covers and Arms: Color as selected by Architect from manufacturer's standard colors unless otherwise indicated.
d. Aluminum Surface Trim and Gasket Housings: Anodized to match door panel finish, not other hardware, unless otherwise indicated.
e. Hardware for Aluminum Storefront Doors: Finished to match door panel finish, except at hand contact surfaces provide stainless steel with satin finish, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

B. Correct all defects prior to proceeding with installation.

C. Verify that electric power is available to power operated devices and of correct characteristics.

3.02 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Install hardware using the manufacturer's fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

C. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.

D. Install hardware for smoke and draft control doors in accordance with NFPA 105.

E. Use templates provided by hardware item manufacturer.

F. Do not install surface mounted items until application of finishes to substrate are fully completed.

G. Wash down masonry walls and complete painting or staining of doors and frames.

H. Complete finish flooring prior to installation of thresholds.

I. Door Hardware Mounting Heights: Match existing height as required.

J. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

K. Include in installation for existing doors and frames any necessary field modification and field preparation of doors and frames for new hardware. Provide necessary fillers, reinforcements, and fasteners for mounting new hardware and to cover existing door and frame preparations.

L. Hardware Installer shall coordinate with Security contractor to route cable to connect electrified locks, panic hardware, and fire exit hardware to power transfers or electric hinges at the time these items are installed so as to avoid disassembly and reinstallation of hardware.

M. Make all connections required for proper operation between the power supply and the electro-mechanical hardware. Provide the proper size conductors as specified in the manufacture's technical documentation

3.03 PROTECTION

A. Protect finished Work under provisions of Section 017000 - Execution and Closeout Requirements.

B. Do not permit adjacent work to damage hardware or finish.

3.04 HARDWARE SETS

A. See door schedule in drawings for hardware set assignments.

B. The hardware sets represent the product design intent and direction of the owner and architect. They should not be considered a detailed hardware schedule. Detailed or omitted items not included in the following hardware set(s) should be scheduled and submitted with the appropriate additional hardware required for proper application and functionality.

C. Manufacturer's Abbreviations:

1. BE BEST
2. PR Precision
3. RC RCI
4. DM Dormakaba
5. NA National Guard Products
6. AB ABH Manufacturing
7. TR Trimco

Hardware Sets

Set #100

Doors: 100

1	Continuous Hinge	661HD SO	AL	BE
1	Storeroom Lockset	9K3-7D15D L/C S3B TL/O	626	BE
1	SFIC	Owner Standard	626	BE
1	Closer	8916 SPA DA	689	DM
1	Overhead Stop	N1020SL Series	630	AB
1	Kick Plate	KO050 10" x 2" LDW x CSK B4E	630	TR

1	Gasketing	161SA @ Head & Jambs		NA
1	Auto Door Bottom	320S		NA
1	Threshold	Per Detail	AL	NA

Set #101

Doors: 200

1	Continuous Hinge	661HD SO	AL	BE
1	Intruder Lockset	9K3-7IN15D L/C S3B	626	BE
1	SFIC	Owner Standard	626	BE
1	Closer	8916 SPA	689	DM
1	Overhead Stop	N1020SL Series	630	AB
1	Kick Plate	KO050 10" x 2" LDW x CSK B4E	630	TR
1	Gasketing	161SA @ Head & Jambs		NA
1	Threshold	Per Detail	AL	NA

Set #102

Doors: 201

1	Continuous Hinge	661HD SO	AL	BE
1	Exit Device	FL 2103 x C03 SNB	630	PR
1	Rim Cylinder	12E-72 L/C	626	BE
2	SFIC	Owner Standard	626	BE
1	Electric Strike	9500 x 2005M3 FSE	630	HS
1	Closer	8916 S-DS SN	689	DM
1	Seals	By Alum. Storefront Mfg.		
1	Threshold	Per Detail	AL	NA
1	Key Switch	KS801 L1	628	DM
1	Mortise Cylinder	1E-74 L/C	626	BE
1	Remote Switch	By Security Provider		
1	Position Switch	By Security Provider		
1	Card Reader	By Security Provider		
1	Junction Box	By Electrical		
1	Wiring & Riser Diagrams	Coordinate w/ Related Trades		

NOTE: Key switch or remote switch for momentary or maintain access as required.
NOTE: Integrate power to electric strike through fire alarm.
NOTE: Card reader to release electric strike when door is locked.
NOTE: Coordinate all hardware as required for fire ratings.
NOTE: Coordinate additional requirements with electrical and security provider.
NOTE: Sequence unlocking with adjacent entrance door.

Set #103

Doors: 206

1	Continuous Hinge	661HD SO	AL	BE
1	Exit Device	2103 x C03 SNB	630	PR
1	Rim Cylinder	12E-72 L/C	626	BE
1	SFIC	Owner Standard	626	BE
1	Electric Strike	9500 x 2005M3	630	HS
1	Closer	8916 SPA SN	689	DM
1	Overhead Stop	N1020SL Series		
	US32D	AB		
1	Seals	By Alum. Storefront Mfg.		
1	Door Sweep	C697A		NA
1	Threshold	Per Detail	AL	NA
1	Position Switch	By Security Provider	BLK	RC
1	Card Reader	By Security Provider		

1	Junction Box	By Electrical
1	Wiring & Riser Diagrams	Coordinate w/ Related Trades

NOTE: Card reader to release electric strike when door is locked.
NOTE: Coordinate additional requirements with electrical and security provider.
NOTE: Sequence unlocking with adjacent vestibule door.

Set #104

Doors: 202

2	Continuous Hinge	661HD SO	AL	BE
1	Removable Mullion	KR FL 822 MCS KMC	689	PR
1	Exit Device	FL 2102 CD SNB	630	PR
1	Exit Device	FL 2102 CD SNB	630	PR
3	Rim Cylinder	12E-72 L/C	626	BE
3	SFIC	Owner Standard	626	BE
2	Closer	8916 SPA SN	689	DM
2	Overhead Stop	N1020SL Series		
	US32D	AB		
1	Mullion Seal	5100 N		NA
1	Seals	By Alum. Storefront Mfg. (verify)		
1	Threshold	Per Detail	AL	NA
1	Mortise Cylinder	1E-74 L/C	626	BE
2	Position Switch	By Security Provider	BLK	RC

NOTE: Coordinate additional requirements with electrical and security provider.
NOTE: Coordinate all hardware as required for fire ratings.

Set #105

Doors: 205

2	Continuous Hinge	661HD SO	AL	BE
1	Removable Mullion	KR822 MCS KMC	689	PR
1	Exit Device	2102 CD SNB	630	PR
1	Exit Device	2102 CD SNB	630	PR
3	Rim Cylinder	12E-72 L/C	626	BE
3	SFIC	Owner Standard	626	BE
2	Closer	8916 SPA SN	689	DM
2	Overhead Stop	N1020SL Series		
	US32D	AB		
1	Mullion Seal	5100 N		NA
2	Seals	By Alum. Storefront Mfg.		
2	Door Sweep	C697A		NA
1	Threshold	Per Detail	AL	NA
2	Position Switch	By Security Provider	BLK	RC

NOTE: Coordinate additional requirements with electrical and security provider.

Set #106

Doors: 204

2	Continuous Hinge	661HD SO	AL	BE
1	Mullion	822 MCS	689	PR
1	Exit Device	2102 CD SNB	630	PR
1	Exit Device	2102 CD x C03 SNB	630	PR

2	Rim Cylinder	12E-72 L/C	626	BE
2	SFIC	Owner Standard	626	BE
1	Electric Strike	9500 x 2005M3	630	HS
2	Closer	8916 SPA SN	689	DM
2	Overhead Stop	N1020SL Series		
	US32D	AB		
1	Mullion Seal	5100 S (as required)		NA
2	Seals	By Alum. Storefront Mfg.		
2	Door Sweep	C697A		NA
1	Threshold	Per Detail	AL	NA
2	Position Switch	By Security Provider	BLK	RC
1	Card Reader	By Security Provider		
1	Junction Box	By Electrical		
1	Wiring & Riser Diagrams	Coordinate w/ Related Trades		

NOTE: Card reader to release electric strike when door is locked.
NOTE: Coordinate additional requirements with electrical and security provider.

Set #107

Doors: 203

2	Continuous Hinge	661HD SO	AL	BE
1	Mullion	FL 822 MCS		
1	Exit Device	FL 2102 CD SNB	630	PR
1	Exit Device	FL 2102 CD x C03 SNB	630	PR
2	Rim Cylinder	12E-72 L/C	626	BE
3	SFIC	Owner Standard	626	BE
1	Electric Strike	9500 x 2005M3 FSE	630	HS
2	Closer	8916 S-DS SN	689	DM
1	Mullion Seal	5100 N (as required)		NA
1	Seals	By Alum. Storefront Mfg.		
1	Threshold	Per Detail	AL	NA
2	Position Switch	By Security Provider	BLK	RC
1	Junction Box	By Electrical		
1	Wiring & Riser Diagrams	Coordinate w/ Related Trades		

NOTE: Card reader to release electric strike when door is locked.
NOTE: Coordinate additional requirements with electrical and security provider.
NOTE: Integrate power to electric strike through fire alarm.
NOTE: Coordinate all hardware as required for fire ratings.

END OF SECTION

SECTION 27 0500
COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section is intended to describe the basic materials and installation methods for electrical work; it applies in general to all Sections under DIVISION 27. All materials and equipment specified and/or shown on Drawings are new unless noted otherwise.

B. All new materials, equipment and systems shall be listed and labeled by a licensed nationally recognized testing laboratory as defined by OSHA and used for the specific purpose, environment or application for which it was tested and approved. No field modifications and/or noncompliant installation whatsoever shall be made to any materials, equipment and systems that would violate the listing and labeling.

C. This section includes the following:
   1. Communications equipment coordination and installation.
   2. Sleeves for raceways and cables.
   3. Sleeve seals.
   4. Grout.
   5. Fire-Rated Cable Pathways
   6. Common communications installation requirements.

1.3 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

F. EPDM: Ethylene-propylene-diene terpolymer rubber.

G. NBR: Acrylonitrile-butadiene rubber.

1.4 REFERENCES

A. Provide work in accordance with all applicable international, state and local, codes, rules, regulations, and standards, including but not limited to, requirements of the following:
   1. Underwriters' Laboratories, Inc. (UL).
   2. National Electrical Manufacturer's Association (NEMA).
   3. National Electrical Contractors Association (NECA)
   4. The Institute of Electrical and Electronics Engineers, Inc. (IEEE)
   5. Applicable NFPA Codes and Standards
   6. American National Standards Institute (ANSI)

7. Code of Federal Regulations (CFR)
8. Building Industry Consulting Service International (BICSI) Telecommunications Distribution Methods Manual, Latest Edition
9. Telecommunication Industries Association/Electronic Industries Alliance / (TIA/EIA)

B. The following standards are referenced to establish a base level of quality and conformance with industry standards. These specifications and the contract drawings shall take precedence over any document listed below.
1. Lucent Systimax PDS, Fiber Installation Manual

C. Conflicts
1. Nothing stated or shown in Specifications or on Drawings is intended to conflict with the above standards and regulations. Should Contractor find any apparent conflict, it shall be his responsibility to notify Architect before any of the work in question is performed or material purchased.

1.5 SUBMITTALS

A. Provide Product List of factory fabricated items, in accordance with Section 016000 “Product Requirements”, including name of proposed manufacturer, for all products specified in various sections of Division 27.

B. Provide submittals in accordance with Section 013300 “Submittal Procedures” in sufficient detail to verify full compliance with the requirements of the Contract Documents.

C. Product Data: Provide for each type of factory-fabricated product indicated.

D. Submit testing reports.

1.6 WARRANTY AND CONTRACT CLOSEOUT

A. Comply with warranty and contract closeout requirements specified in Division 01, GENERAL REQUIREMENTS.

B. Provide Special Warranties and/or warranty service in accordance with Section 016000 “Product Requirements” where specified in the various sections of Division 27 and as indicated below.
1. Warranty - Communications cabling systems shall be guaranteed in writing against defects in workmanship and defective materials for a period of one (1) year after acceptance by the Owner. During this time, communications cabling systems shall be kept in proper operating condition at no additional cost to the Owner.
2. Service - Provide one (1) year service contract on all communications cabling system components and equipment. Contract shall be based on 8 hours service and preventative maintenance per month.
3. All associated hardware and labor shall have a manufacturer and/or supplier's warranty for a minimum period of fifteen (15) years from the date of acceptance by the Owner. This warranty must guarantee channel and link performance parameters that meet or exceed those specified in EIA/TIA 568-B.2-1 and offer an assurance for any application that is designed to operate on Category 6 UTP cable. This is to include the replacement of any defective components provided as part of this project at no cost to the Owner for either parts or labor.
   a. Provide manufacturer’s certificates of supervision and startup service as specified in the various sections of Division 27.
   b. Upon completion of work and tests, and at a time mutually agreed to by Contractor, Architect and Owner, operate all systems installed, in all parts, at Contractor's expense for sufficient length of time to demonstrate the mode of operation and definitely determine whether systems as a whole are in first class working condition. Defects and malfunctions that may develop during this period of operation shall be immediately corrected by Contractor at his own expense, and systems placed in first class working condition before being finally turned over to Owner.

c. Include information for all products specified in the operation and maintenance manual.

d. Provide electrical certificate(s) from electrical inspection agency - see Article titled "Inspections".

e. Provide manufacturer's certification and warranty of system operation - see Article titled "Tests".

1.7 QUALITY ASSURANCE

A. The specifications for certain products and alternative materials may appear in more than one section of Division 27. Work of Division 27 shall be coordinated for all sections of Division 27 to assure that where two or more items of any given product are furnished under Division 27 that they are of the same manufacturer and type and that alternative materials is consistent throughout the work of Division 27.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle all material and equipment in accordance with manufacturer's instructions and recommendations. Such instructions and recommendations are hereby made part of these specifications.

B. Deliver products and equipment properly labeled and tagged. Maintain products in original shipping containers and store in a dry area until ready for installation.

C. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.9 INSPECTIONS

A. Before starting any Work under this Contract, file for inspection with the agency approved by the AHJ. Upon completion of the work, furnish electrical certificates from said agency for all electrical equipment and systems installed or furnished and installed as part of the work.

B. Communications equipment or systems that are modified in the field shall be reinspected. Furnish a new electrical certificate covering such modifications.

1.10 COORDINATION

A. The communications systems are indicated on the Communications Drawings. Certain pertinent information and details required by the communications work appear on the Architectural, Structural and Mechanical Drawings. Become familiar with all drawings and incorporate all pertinent requirements

B. Drawings are diagrammatic and indicate general arrangement of systems and requirements of the Communications work. Do not scale the drawings to obtain dimensional requirements. Exact locations of equipment must be coordinated and obtained prior to starting the work.

C. Coordinate arrangement, mounting, and support of communications equipment:

1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
3. To allow right of way for piping and conduit installed at required slope.
4. So connecting pathways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
    a. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.
    b. Coordinate location of access panels and doors for communications items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."
    c. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping."."

1.11 EQUIPMENT LOCATIONS

A. Locations are subject to changes in order to avoid obstacles in building construction. Verify all dimensions and conditions at site. Check layout for sizes and clearances, so that the apparatus and material may be installed and operated satisfactorily in space provided. Install equipment and raceways to preserve headroom and to keep openings and passageways clear.

B. Install equipment, boxes and outlets in accessible locations. Obtain final locations of all outlets and equipment from details on drawings and from Architect. Examine drawings of other trades and avoid interferences with their work.

C. In case of conflict in location of flush outlets, architectural details shall take precedence.

D. Install conduit to avoid mechanical and/or structural obstructions, minimizing crossovers.

E. Install all exposed conduits parallel or perpendicular to building lines.

F. Provide minimum of 6 inches clearance between communications work and electrical work, flues, steam pipes and other heat sources.

G. Mounting heights of outlets and equipment shall be as indicated on "Mounting Height" Schedule, or as specified herein.

H. Verify all door swings before installing switch boxes. In case of conflict between drawings, Architectural details shall take precedence.

I. Architect reserves the right to change, without additional cost, location of any communications outlet, provided such changed location is not more than 10 feet, and is ordered changed before said work is completely "roughed in".

J. Locations of communications equipment and connections to all other equipment are approximately correct, and are subject to such modifications as are required at time of installation, in order to meet field conditions or the dimensions of equipment actually being supplied.

K. No changes are to be made in the original design without written approval by Architect.

PART 2 - PRODUCTS

2.1 SLEEVES FOR PATHWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

C. Sleeves for Rectangular Openings: Galvanized sheet steel.
   1. Minimum Metal Thickness:
      a. For sleeve cross-section rectangle perimeter less than 50 inches (1270 mm) and no side more than 16 inches (400 mm), thickness shall be 0.052 inch (1.3 mm).
      b. For sleeve cross-section rectangle perimeter equal to, or more than, 50 inches (1270 mm) and 1 or more sides equal to, or more than, 16 inches (400 mm), thickness shall be 0.138 inch (3.5 mm).

2.2 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and pathway or cable.
   1. Manufacturers: Subject to compliance with requirements,
   2. Basis-of-Design Product: Subject to compliance with requirements, provide product name or designation or comparable product by one of the following:
      a. Advance Products & Systems, Inc.
      b. Calpico, Inc.
      c. Metraflex Co.

d. Pipeline Seal and Insulator, Inc.
   a) Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of pathway or cable.

2.3 FIRE-RATED CABLE PATHWAY

2.4 All telecommunications cable bundles shall utilize an enclosed fire-rated pathway device wherever said cables penetrate rated walls. The fire-rated pathway shall contain a built-in fire sealing system sufficient to maintain the hourly fire rating of the barrier being penetrated. The self-contained sealing system shall automatically adjust to the installed cable loading and shall permit cables to be installed, removed, or retrofitted without the need to remove or reinstall firestop materials. The pathway shall be UL Classified and/or FM Systems Approved and tested to the requirements of ASTM E814 (UL1479).

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following]:

B. Basis-of-Design Product: Subject to compliance with requirements, provide product name or designation or comparable product by one of the following:
   1. STI, Inc., EZ-Path
   2. Wiremold

C. Cable pathway shall have an orange finish color and dimensions of 3 inches wide by 3 inches high by
   1. 10.5 inches long.

D. Multiple cable pathways shall be installed in rated partitions utilizing manufacturer's recommended wall plate.

E. Cable pathway shall meet or exceed rating of partition where pathway is installed. Refer to architectural drawings for rating of partitions.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR COMMUNICATIONS INSTALLATION

A. General
   1. Comply with NECA 1.
   2. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
   3. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
   4. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both communications equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
   5. Right of Way: Give to piping systems installed at a required slope.
   6. Furnish, deliver, erect, connect and finish in every detail, all materials, equipment and accessories required for the Work. Select and arrange to fit properly into the building spaces.
   7. Perform all work in accordance with the drawings, specifications, including manufacturer's installation instructions, all applicable codes and NECA's Standard of Installation guidelines.
   8. Include in the Work and in the bid proposal minor details not shown or specified, but manifestly necessary for the proper installation and operation of the various systems, as if specified or shown.
   9. Position and install all material and equipment to permit proper access and in such a manner that maintenance, adjustment, calibration, inspection, repair and replacement of the material and equipment can be accomplished with minimum effort and cost.
   10. Perform the installation, wiring, cleaning, testing, calibration and startup of all material and equipment in accordance with the manufacturers' instructions and recommendations. Such instructions and recommendations are hereby made a part of these Specifications.

11. If any departures from Contract Documents are deemed necessary, submit details of such departures and the reasons there for to Architect for approval.
12. Pull and junction boxes shall be located and sized by electrical contractor in accordance with NEC, EIA/TIA, utility company requirements and Owner standards, unless otherwise noted on the drawings.

B. Layout and Coordination

1. Lay out all work from approved building and property lines and benchmarks. Verify and be responsible for the correctness of all measurements in connection with work. Any change made in major overall dimensions as shown which affect the physical size, shape, or location of any part of the Work, whether due to field check or changes due to the use of equipment of a manufacturer other than that used as the basis of design shall not cause any interference with other work.
2. Examine the drawings of other trades and initiate cooperation and coordination of the Work with the work of other trades to insure that the Work can be installed properly as designed and planned without interference with other work or delay. Furnish all necessary templates, patterns, measurements, etc., for installing work and for the purpose of making adjoining work conform; furnish setting plans and shop details to other trades as required.
3. Investigate the structural and finish conditions affecting the Work. Offsets, bends or other items required by the Work may not be shown due to the small scale of the drawings; provide such offsets, bends or other items as required to meet structural or finish conditions.
4. Coordinate and be responsible for the required clearances of the Work in shafts, chases, double partitions and suspended ceilings. Coordinate and cooperate with the trades responsible for constructing such spaces, together with other trades sharing such spaces, and advise other trades of the requirements of the Work. Immediately submit for review space requirements that exceed those shown.
5. Install material and equipment as high as possible; at minimum, to clear the top of all doors, windows and other structural openings. Maintain maximum headroom and space conditions in every case. Where headroom or space conditions appear inadequate, notify the Architect before proceeding with the installation.
6. Install conduit, fittings, etc., to provide not less than 1/2 inch between their finished covering and the structure or adjacent work of any kind.
7. Communications equipment shall not interfere in any way with other material or equipment and shall be provided with adequate working space; see the National Electrical Code working space requirements.
8. Make reasonable modifications in the layout of the Work, as directed, to provide proper clearances or accessibility, or to prevent conflict with the work of other trades, at no increase in the Contract sum.
9. Cooperate fully with the Contractor for General Construction in regard to location of electrical equipment and work progress schedules. Notify him of all flush panelboard locations so that wall of proper thickness is provided.
10. Prepare large scale composite working drawings, including such section views and details as are necessary to clearly show how the Work is to be installed in relation to the work of other trades. Issue such drawings to the other trades for coordination of their work. Where such drawings show deviations from the Contract Drawings or conflict with other trades, detail and submit such deviation or conflicts to the Architect for review.
11. Locate wall switches at strike side of doors and at height indicated on "Mounting Height" schedule. Review all door swings with Contractor for General Construction prior to rough-in.
12. Locate receptacles at heights indicated in "Mounting Height" schedule. Mount receptacles vertically, ground pole at top. In special areas such as kitchens, laboratories, utility areas, coordinate locations with counters, benches and casework.

C. If work is installed before coordinating with all other trades and Owner's work, or so as to cause interference with the work of other trades, or so as not to provide proper access for maintenance or repair, make necessary changes in work to correct the condition at no cost to the Owner.
   1. Excavation, Trenching, Backfilling
      a. Mass excavation to required basic construction elevations will be performed under Division 31, EARTHWORK.
      b. Provide all other excavation, trenching and backfilling including shoring, sheeting, pumping, grading, barricading and other related work necessary for installation of electrical work.
      c. Perform work in accordance with the requirements of Division 31, EARTHWORK.

D. Cutting and Patching
   1. Except where specified otherwise in Division 27, provide cutting, patching and refinishing work in accord with the requirements of Division 01, GENERAL REQUIREMENTS.
   2. Horizontal chases shall not be cut into existing walls or partitions without approval of Architect.
   .

E. Painting
   1. Except where specified otherwise in Division 27, general painting will be provided under Division 09, FINISHES.

F. Touch up or paint out damage done to items having a factory applied finish, and which are installed under Division 27, utilizing materials and methods specified in Division 09. FINISHES.

G. Foundations
   1. Provide concrete foundations required for the work specified under Division 27, unless specifically noted otherwise. Be responsible for preparing foundation drawings and setting foundation anchor bolts in time so as not to delay the work. Concrete foundations shall be of the types detailed or as specified.
   2. Reinforce concrete foundations to suit the loads placed on them; foundations shall be in strict accordance with the equipment manufacturers' recommendations. Concrete materials and methods shall be as specified in Division 03, CONCRETE.
   3. Unless otherwise indicated, concrete equipment pads shall be provided under all switchgear, motor control centers, substations, etc., and shall extend a minimum 4 inches above the finished floor, at least 4 inches beyond the equipment base in all directions, shall have the top edges and vertical corners chamfered and shall have the same surface finish as the adjacent and surrounding floor.
   4. Securely anchor concrete foundations to the floor slab with steel dowels. When so indicated or where required, concrete foundations or concrete footings for structural steel supports for equipment too heavy to be placed in the floor slab shall be extended not less than 12 inches below the underside of the floor slab, except where bearing rock is encountered at a lesser depth. In such cases, after inspection and approval, concrete foundations may be set on bearing rock.
   5. Furnish and set, with proper templates, anchor bolts and inserts required for the proper attachment of the equipment to the concrete foundations. Anchor bolts shall be of the size and number required by the equipment or as recommended by the equipment manufacturer and shall be in accordance with the requirements detailed or specified. Anchor bolts shall also be compatible with vibration isolation requirements specified for the equipment.
   6. Set equipment anchor bolts in pipe sleeves at least two sizes larger than the anchor bolt. Length of pipe sleeve shall be the same as the imbedded length of the anchor bolt. After the equipment is set in place and adjusted to its proper position, completely fill the annular space between the anchor bolt and the inside of the pipe sleeve for the full length of the pipe sleeve with Embeco, or equivalent, nonshrink cement grout.
   7. Grout any openings between the top of the concrete foundation and the base of the equipment using nonshrink cement grout.

8. Piles, pile caps and foundation beams for exterior underground duct banks and for equipment foundations will be furnished under the General Construction Divisions of the Specifications.

H. Access Doors and Panels
1. Access doors and panels shown on the Architectural Drawings will be provided under Division 05, METALS.
2. Furnish other access panels required under Division 27 for installation under the General Construction Sections.
3. Furnish access panels for access to concealed junction/pull boxes, cabinets, terminal boxes and other equipment where other means of access is not available. Access panels shall be adequate in size for the service requirements, and shall not have a clear opening of less than 16 inches x 16 inches. Final size and location of access panels shall be subject to approval of the Architect. Cooperate with other trades so that the equipment will be accessible through the access panels.
4. Access panels shall be of steel construction, prime coated; have front panel fitted flush with the frame, with concealed hinge and latches; and shall be Inryco/Milcor, Style DW, K or M, to suit the construction and location.

I. Sleeves[, Fire-stops] and Waterseals
1. Provide each raceway or cable passing through a masonry or concrete wall, floor or partition with a sleeve made from standard weight steel pipe with smooth edges, securely and neatly cemented in place. Provide each raceway or cable passing through a wood or metal partition with a sleeve made from No. 22 gauge galvanized sheet metal, securely fastened in place.

J. Set floor sleeves flush with floor surface in finished areas; 1 inch above the finished floor in kitchens, cafeterias and similar service areas, mechanical rooms, pipe chases, pipe spaces and other unfinished areas, unless otherwise indicated, and flush with the underside of slabs. Wall and partition sleeves shall be flush with each surface unless otherwise indicated or specified.

K. Sleeves shall be 2 pipe sizes larger than the conduit or cable size unless otherwise required by the sealing method selected by the Contractor for Division 07, THERMAL AND MOISTURE PROTECTION. Coordinate with the Contractor for that section to determine requirements for sleeves, clearances, etc. Remove sleeve if required by UL listing for system selected.

L. Place sleeves in concrete floor or wall forms before concrete is poured. Sleeves shall have integral waterstop flanges, where they are to receive either watertight or hydrostatic seals.

M. Insure proper location and alignment of all sleeves for electrical work before and during concrete placement.

N. Where sleeves penetrate exterior walls, fill and seal ends around conduits and/or cables with duct sealant compound equal to Solorite KN-1146, or Link Seal. Install seals in accordance with the manufacturer's recommendations to provide airtightness above ground and hydrostatic sealing below grade. Caulking or other type mastic is not acceptable.

3.2 PROTECTION OF WORK

A. Protect all conduit, fittings, cabinets, racks, cable trays and other equipment before and during installation and keep clean.

B. Protect factory finished equipment and devices with approved temporary protective material where these items are subject to accidental damage or abuse. Communications equipment shall be stored indoors or otherwise securely protected and kept free of condensation by adequate electric heat. Contractor shall remove all temporary protective material at the conclusion of the Work or as directed.

C. The Contractor shall assume full responsibility for the cost of repairing or replacing any damaged Work or material caused by employees working under this Division.

3.3 TESTS

A. This article shall not be construed as deleting other tests specifically outlined in other sections of this Specification.

B. All materials and documentation to be furnished under this specification shall be subject to inspections and tests. Equipment and systems shall not be accepted until all required inspections and tests have been made, demonstrating that the equipment and systems conform to the specifications, and that all required equipment, systems, and documentation have been provided. The Owner reserves the right to request additional tests at no extra cost on any work that the Owner determines not to be in accordance with this specification.

C. The Owner shall have access to inspect the supplier/installer's quality assurance (QA) standards, procedures, and records that are applicable to this project. Inspection shall not relieve the supplier/installer of the responsibility for providing material and equipment conforming to the requirements of this specification.

D. Notify the Owner in writing of the test schedule at least two (2) weeks in advance. The test schedule shall be coordinated to permit the Design Professional to attend.

E. Twisted-Pair Media Tests - All UTP cables will be tested with equipment that meets or exceeds the requirements of TIA/EIA 568-B2 Level 2e and certified to ensure that the level of performance has been met. The tester must be calibrated with the cable used in the project to ensure that the correct NVP is utilized. The installation contractor shall provide documented proof that each line of the horizontal distribution system is capable of handling the required data rates. The customer may test random cables to ensure that they meet the documented test results provided. The installation contractor is responsible for correcting or reinstalling all systems that fail to perform to specification. The following is a summation of the tests that should be performed on a UTP cabling plant, basic link configuration. If any test indicates a lower level of performance, the link must be either repaired or replaced. The test instruments must have all the necessary tests preprogrammed into their logic circuits and require no further programming by the operator. The results must be available on both print out and on disk. All test reports will be provided to the Owner for future reference. The basic link shall be tested to the specifications set in EIA/TIA 568-B.2-1, Category 6 requirements. The basic link test results shall exceed "worst case" specifications as documented in the above said standard. The tests included are:

1. End To End Connectivity
2. Cable Delay Skew
3. Cable Length Testing
4. Insertion Loss
5. Worst Pair-to-Pair NearEnd Crosstalk (NEXT) Loss
6. Power Sum Near End Crosstalk (PSNEXT) Loss
7. Worst Pair-to-Pair Equal Level Far-EndCrosstalk (ELFEXT)
8. Power Sum Equal Level Far-End Crosstalk (PSELFEXT)
9. Propagation Delay
10. Return Loss, Measured from Local End
11. Return Loss, Measured from Far End

F. Optical Fiber Media Tests - Perform verification tests and enter results on the approved test sheets for all optical fiber cables as follows:

1. Visually inspect each installed optical fiber termination connector with an illuminated microscope. Inspect for scratches, pits or chips and reterminate if any of these conditions exist.
2. Measure end-to-end loss of each terminated optical fiber at 1300 nm and 850 nm wavelengths for multimode and at 1310 nm and 1550nm wavelengths for single mode.
3. Measure each terminated fiber length and signature with an optical time domain reflectometer (OTDR) from each end of the cable. The supplier/installer shall test each reel of cable prior to installation.
4. Replace any cable if any fiber within that cable exhibits greater than 0.2 dB localized attenuation or any discontinuities.
5. Verify polarity of all dual connectors.

G. Verify shield ground for riser distribution cables.

H. Replace any defective cabling system component if any applicable parameters do not meet the EIA/TIA Category 6 EIA/TIA 568-B.2-1.

I. Final Acceptance - The communications cabling system will not be considered accepted by the Owner until the certified results of the foregoing tests have been accepted by the Owner. Beneficial use of the system by the Owner will not be considered as acceptance.

J. Test Equipment shall be as follows:

1. Tester must have the functionality to test cables complying with current and upcoming proposed standards. Test frequency range must extend to 300 MHz.
2. Measurements must include: Wiremap, Length, Insertion Loss, PSNEXT, ACR, PSACR, ELFEXT, PSELFEXT, Return Loss, Resistance.
3. Autotest must comply with TIA/ISO/IEC standards, automatic increment of circuit ID.
4. Unit must have a replaceable, rechargeable battery, Flash ROM for field updates, and storage of 1000 Autotests.
5. Unit must be capable of testing single and multi-mode fiber optic cable with a supplied adapter.
6. Test results must be uploaded into a cable management software package that supports AutoCAD diagrams.
7. Unit shall be supplied with a carrying case and all necessary adapters to test any cable configuration installed and single mode fiber optic cables.
8. Tester shall be a Microtest OMNI Scanner, or approved equal.

3.4 WORKMANSHIP

A. Communications equipment shall be installed in a neat and workmanlike manner in accordance with latest and best practices of the trade.

B. Only mechanics skilled in this type of Work shall be employed and utilized by Contractor for this Division in the execution of this Work.

3.5 REFINISHING

A. A. All surfaces of boxes, cabinets and equipment shall have suitable lacquer, enamel or plated finishes. Touch up any finishes marred during construction. Supports and other metal work not furnished with a protective coating, shall be given two coats of approved paint after completion of the work.

3.6 SLEEVE INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Communications penetrations occur when pathways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.

C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

E. Cut sleeves to length for mounting flush with both surfaces of wall.

F. Extend sleeves installed in floors [2 inches (50 mm)] <Insert dimension> above finished floor level.

G. Size pipe sleeves to provide [1/4-inch (6.4-mm)] <Insert dimension> annular clear space between sleeve and pathway or cable, unless indicated otherwise.

H. Seal space outside of sleeves with grout for penetrations of concrete and masonry

1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
   a. EDGEMONT SCHOOL DISTRICT FIRE ALARM, CLOCK & PA UPGRADES

a) COMMON WORK RESULTS FOR COMMUNICATIONS

I. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and pathway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants.".

J. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pathway and cable penetrations. Install sleeves and seal pathway and cable penetration sleeves with firestop materials. Fireproofing of conduit sleeves shall be installed upon completion of cable installation. Comply with requirements in Division 07 Section "Penetration Firestopping."

K. Roof-Penetration Sleeves: Seal penetration of individual pathways and cables with flexible boot-type flashing units applied in coordination with roofing work.

L. Aboveground, Exterior-Wall Penetrations: Seal penetrations using [steel] [cast-iron] pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

M. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between pathway or cable and sleeve for installing mechanical sleeve seals.

3.7 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for pathway or cable material and size. Position pathway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pathway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.8 FIRESTOPPING

A. A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for communications installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

3.9 CONTINUITY OF EXISTING SERVICES

A. A. Perform alterations and connections to existing facilities with a minimum of interruption. Where interruption is necessary, prepare a time schedule for same, coordinate with Architect, Owner and other sections, and obtain prior written clearance from Owner. Provide and place notices in affected areas, and on luminaires or equipment, etc., which will be temporarily out of use. Remove notices when interruption has been completed.

3.10 ALTERATIONS AND CONNECTIONS TO EXISTING FACILITIES

A. Make all necessary alterations to existing DIVISION 27 systems to permit connecting or extending these systems to new work and to permit existing systems to remain in use whether indicated or not. New materials used to alter existing systems shall match existing materials unless otherwise indicated. Record modifications for Owner's future use.

B. Make all necessary alterations to existing DIVISION 27 systems to permit the installation of new DIVISION 23 equipment, i.e. ductwork and piping, to permit connecting or extending these systems to new work and to permit existing systems to remain in use whether indicated or not. New materials used to alter existing systems shall match existing materials unless otherwise indicated. Record modifications for Owner's future use.

C. Where equipment, ductwork and piping is removed or disconnected under DIVISION 27, perform the work in such a manner that no damage is done to the structure or remaining portions of the systems.

D. Remove exposed conduit, hangers and supports made obsolete due to this modification.

E. Where existing concealed conduit is not to be reused, abandon same in place unless otherwise indicated or specified.

F. Unless otherwise specified, all materials and equipment removed or disconnected by Contractor which are not to be reused shall be turned over to the Owner for his future use.

G. Where excavation for new electrical work disturbs support of any existing underground services, materials, equipment and structures, provide new and suitable concrete supports as required. Review supports and supporting methods with Architect before beginning work.

3.11 COMMISSIONING

A. Commissioning will be provided as specified in Division 01 Section “Commissioning”. All contractors and subcontractors of the various sections of this specification shall cooperate and participate in the commissioning work in accordance with requirements of Division 01 Section “Commissioning”.

B. Ensure participation of major equipment manufacturers or their representatives.

C. Equipment and systems/subsystems installed under this section are expected to be in full compliance with the design intent by the commissioning phase. Notify the Commissioning Agent when any specific piece of equipment or specific system/subsystem is ready for commissioning. Be prepared to demonstrate system readiness.

D. Equipment or systems/subsystems having incomplete work or exhibiting problems related to noncompliance with the design intent shall require commissioning. The contractor for this section shall be fully responsible to make all necessary corrections to incomplete or non-complying work at their own expense and shall pay the Commissioning Agent per diem rate for recommissioning such incomplete or non-complying work.

3.12 OWNER TRAINING

A. Provide basic training to Owner's IT personnel as designated by the Owner.

B. Provide additional training seminar to include fiber optic cable installation and termination techniques.

C. Provide cabling, jacks, tools and other devices as required to provide a "hands-on" learning experience. Provide Owner with one set of tools including, but not limited to, impact tool with two (2) spare blades, shears, knife and tool pouch.

D. Training shall take place at a time to be specified by the Owner. Provide a minimum of [two] [ ] days of training time.

E. Provide facilities to videotape the training session for the Owner's future use and turn over videotape(s) to the Owner.

END OF SECTION

SECTION 27 0528
PATHWAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Metal conduits and fittings.
   2. Nonmetallic conduits and fittings.
   3. Optical-fiber-cable pathways and fittings.
   4. Metal wireways and auxiliary gutters.
   5. Nonmetallic wireways and auxiliary gutters.
   6. Metallic surface pathways.
   7. Nonmetallic surface pathways.
   8. Tele-power poles.
   9. Hooks.
   10. Boxes, enclosures, and cabinets.
   11. Polymer-concrete handholes and boxes for exterior underground cabling.
   12. Fiberglass handholes and boxes for exterior underground cabling.

1.3 DEFINITIONS

A. ARC: Aluminum rigid conduit.

B. GRC: Galvanized rigid conduit.

C. IMC: Intermediate metal conduit.

D. RTRC: Reinforced thermosetting resin conduit.

1.4 ACTION SUBMITTALS

A. Product data for the following:
   1. Surface pathways
   2. Wireways and fittings.
   3. Tele-power poles.
   4. Boxes, enclosures, and cabinets.
   5. Underground handholes and boxes.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Pathway routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
   1. Structural members in paths of pathway groups with common supports.
   2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.
   3. Underground ducts, piping, and structures in location of underground enclosures and handholes.

B. Qualification Data: For professional engineer.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. General Requirements for Metal Conduits and Fittings:

B. Listed and labeled as defined in NFPA 70, by a nationally recognized testing laboratory, and marked for intended location and application.

C. Comply with TIA-569-C.
   1. GRC: Comply with ANSI C80.1 and UL 6.
   2. ARC: Comply with ANSI C80.5 and UL 6A.
   3. IMC: Comply with ANSI C80.6 and UL 1242.
   4. PVC-Coated Steel Conduit: PVC-coated
      a. Comply with NEMA RN 1.
      b. Coating Thickness: 0.040 inch (1 mm), minimum.
   5. EMT: Comply with ANSI C80.3 and UL 797.
   6. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   7. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
   8. Fittings for EMT:
      a. Material: Steel
      b. Type: Set screw.
      c. Expansion Fittings: PVC or steel to match conduit type, complying with UL-467, rated for environmental conditions where installed, and including flexible external bonding jumper.
      d. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch (1 mm), with overlapping sleeves protecting threaded joints.
   9. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 NONMETALLIC CONDUITS AND FITTINGS

A. General Requirements for Nonmetallic Conduits and Fittings:
   1. Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
   2. Comply with TIA-569-C.

B. RNC: Type EPC-40-PVC complying with NEMA TC 2 and UL 651 unless otherwise indicated.

C. Rigid HDPE: Comply with UL 651A.

D. Continuous HDPE: Comply with UL 651A.

E. RTRC: Comply with UL 2515A and NEMA TC 14.
   1. Fittings: Comply with NEMA TC 3; match to conduit or tubing type and material.

F. Solvents and Adhesives: As recommended by conduit manufacturer.

2.3 OPTICAL-FIBER-CABLE PATHWAYS AND FITTINGS

A. Description: Comply with UL 2024; flexible-type pathway, approved for plenum installation unless otherwise indicated.
   1. Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
   2. Comply with TIA-569-C.

2.4 SURFACE METAL PATHWAYS

A. Galvanized steel with snap-on covers, complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.

B. Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

C. Comply with TIA-569-C.

2.5 SURFACE NONMETALLIC PATHWAYS:

A. Description: Two- or three-piece construction, complying with UL 5A, and manufactured of rigid PVC with texture and color selected by Architect from manufacturer's standard colors. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics.

B. Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.

C. Comply with TIA-569-C.

2.6 HOOKS

A. General Requirements for Hooks:
   1. Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and application.
   2. Comply with TIA-569-C.
   3. Stamped steel.
   4. J shape.
   5. Installed every 4’-0” to center

2.7 BOXES, ENCLOSURES, AND CABINETS

A. General Requirements for Boxes, Enclosures, and Cabinets:
   1. Comply with TIA-569-C.
   2. Boxes, enclosures, and cabinets installed in wet locations shall be listed and labeled as defined in NFPA 70, by an NRTL, and marked for use in wet locations.
   3. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
   4. Device Box Dimensions: 4 inches by 2-1/8 inches by 2-1/8 inches deep (100 mm by 60 mm by 60 mm deep.

B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.

D. Metal Floor Boxes:
   1. Material: sheet metal.
   2. Type: Fully adjustable.
   3. Shape: Rectangular.
   4. Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   5. Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

F. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

PART 3 - EXECUTION

3.1 PATHWAY APPLICATION

A. Indoors: Apply pathway products as specified below unless otherwise indicated:
   1. Exposed, Not Subject to Physical Damage: EMT.
   2. Exposed, Not Subject to Severe Physical Damage: EMT.
   3. Exposed and Subject to Severe Physical Damage: GRC. Pathway locations include the following:
      a. Loading dock.

b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
c. Mechanical rooms.
d. Gymnasiums

4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Damp or Wet Locations: GRC.
6. Pathways for Optical-Fiber or Communications Cable in Spaces Used for Environmental Air: Plenum-type
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 nonmetallic units in institutional and commercial kitchens and damp or wet locations.
8. Minimum Pathway Size: 3/4-inch (21-mm) trade size for copper and aluminum cables, and 1 inch (25 mm) for optical-fiber cables.
9. Pathway Fittings: Compatible with pathways and suitable for use and location.
10. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
11. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
12. EMT: Use set-screw fittings. Comply with NEMA FB 2.10.
13. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.
14. Install surface pathways only where indicated on Drawings.

3.2 INSTALLATION

A. Comply with the following standards for installation requirements except where requirements on Drawings or in this Section are stricter:
1. NECA 1.
2. NECA/BICSI 568.
3. TIA-569-C.
4. NECA 101
5. NECA 102.
6. NECA 105.
7. NECA 111.

B. Comply with NFPA 70 limitations for types of pathways allowed in specific occupancies and number of floors.

C. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation for penetrations through fire-rated walls, ceilings, and assemblies.

D. Comply with requirements in Section 270528.29 "Hangers and Supports for Communications Systems" for hangers and supports.

E. Comply with requirements in Section 270544 "Sleeves and Sleeve Seals for Communications Pathways and Cabling" for sleeves and sleeve seals for communications.

F. Keep pathways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal pathway runs above water and steam piping.

G. Complete pathway installation before starting conductor installation.

H. Arrange stub-ups so curved portions of bends are not visible above finished slab.

I. Install no more than the equivalent of two 90-degree bends in any pathway run. Support within 12 inches (300 mm) of changes in direction. Utilize long radius ells for all optical-fiber cables.

J. Conceal rigid conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

K. Stub-ups to Above Recessed Ceilings:
   1. Use EMT, IMC, or RMC for pathways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

L. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of pathway and fittings before making up joints. Follow compound manufacturer's written instructions.

M. Coat field-cut threads on PVC-coated pathway with a corrosion-preventing conductive compound prior to assembly.

N. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install insulated bushings on conduits terminated with locknuts.

O. Install pathways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus one additional quarter-turn.

P. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure, to assure a continuous ground path.

Q. Cut conduit perpendicular to the length. For conduits of 2-inch (50-mm) trade size and larger, use roll cutter or a guide to ensure cut is straight and perpendicular to the length.

R. Install pull wires in empty pathways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire. Secure pull wire, so it cannot fall into conduit. Cap pathways designated as spare alongside pathways in use.

S. Surface Pathways:
   1. Install surface pathway for surface telecommunications outlet boxes only where indicated on Drawings.
   2. Install surface pathway with a minimum 2-inch (50-mm) radius control at bend points.
   3. Secure surface pathway with screws or other anchor-type devices at intervals not exceeding 48 inches (1200 mm) and with no less than two supports per straight pathway section. Support surface pathway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

T. Pathways for Optical-Fiber and Communications Cable: Install pathways, metal and nonmetallic, rigid and flexible, as follows:
   1. 3/4-Inch (21-mm) Trade Size and Smaller: Install pathways in maximum lengths of 50 feet (15 m).
   2. 1-Inch (25-mm) Trade Size and Larger: Install pathways in maximum lengths of 75 feet (23 m).
   3. Install with a maximum of two 90-degree bends or equivalent for each length of pathway unless Drawings show stricter requirements. Separate lengths with pull or junction boxes or terminations at distribution frames or cabinets where necessary to comply with these requirements.

U. Install pathway-sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed pathways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install pathway-sealing fittings according to NFPA 70.

V. Install devices to seal pathway interiors at accessible locations. Locate seals, so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all pathways at the following points:
   1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
   2. Where an underground service pathway enters a building or structure.

3. Where otherwise required by NFPA 70.

W. Comply with manufacturer's written instructions for solvent welding PVC conduit and fittings.

3.3 Expansion-Joint Fittings:

A. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F (17 deg C), and that has straight-run length that exceeds 25 feet (7.6 m). Install in each run of aboveground RMC that is located where environmental temperature change may exceed 100 deg F (55 deg C), and that has straight-run length that exceeds 100 feet (30 m).

B. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.

C. Install expansion fittings at all locations where conduits cross building or structure expansion joints.

D. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

3.4 Cable Hooks:

A. Size to allow a minimum of 25 percent future capacity without exceeding design capacity limits.

B. Shall be supported by dedicated support wires. Do not use ceiling grid support wire or support rods.

C. Hook spacing shall allow no more than 6 inches (150 mm) of slack. The lowest point of the cables shall be no less than 6 inches (150 mm) adjacent to ceilings, mechanical ductwork and fittings, luminaires, power conduits, power and telecommunications outlets, and other electrical and communications equipment.

D. Space hooks no more than 4 feet (1.5 m) o.c.

E. Provide a hook at each change in direction.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR COMMUNICATIONS PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies.

3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.7 PROTECTION

A. Protect coatings, finishes, and cabinets from damage or deterioration.

B. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.

C. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 27 5116
PUBLIC ADDRESS SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Preamplifiers.
2. Power amplifiers.
3. Transfer to standby amplifier.
4. Microphones.
5. Volume limiter/compressors.
6. Control console.
7. Equipment cabinet.
8. Equipment rack.
9. Telephone paging adapters.
10. Tone generator.
11. Monitor panel.
12. Loudspeakers.
13. Noise-operated gain controllers.
14. Microphone and headphone outlets.
15. Battery backup power unit.
16. Conductors and cables.
17. Pathways.

1.3 DEFINITIONS

A. Channels: Separate parallel signal paths, from sources to loudspeakers or loudspeaker zones, with separate amplification and switching that permit selection between paths for speaker alternative program signals.

B. VU: Volume unit.

C. Zone: Separate group of loudspeakers and associated supply wiring that may be arranged for selective switching between different channels.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Power, signal, and control wiring.
1. Include plans, elevations, sections, and attachment details.
2. Include details of equipment assemblies. Indicate dimensions, weights, required clearances, method of field assembly, components, and location and size of each field connection.
3. Console layouts.
4. Control panels.
5. Rack arrangements.
6. Calculations: For sizing backup battery.
7. Wiring Diagrams: For power, signal, and control wiring.
a. Identify terminals to facilitate installation, operation, and maintenance.
b. Single-line diagram showing interconnection of components.

c. Cabling diagram showing cable routing.

C. Delegated-Design Submittal: For supports and seismic restraints for control consoles, equipment cabinets and racks, and components indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Detail fabrication and assembly of supports and seismic restraints for control consoles, equipment cabinets and racks, and components.

1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings are shown and coordinated with each other, using input from installers of the items involved.

B. Qualification Data: For Installer:

C. Seismic Qualification Certificates: For control consoles, equipment cabinets and racks, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation. Include qualification data for testing agency.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For public address systems to include in emergency, operation, and maintenance manuals.

B. In addition to items specified in Section 017700 "Closeout Procedures" and Section 017823 "Operation and Maintenance Data," include the following:

1. List of tools and replacement items recommended to be stored at Project for ready access. Include part and drawing numbers, current unit prices, and source of supply.
2. Operating instructions laminated and mounted adjacent to operating console location.
3. Training plan.

1.7 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. None required

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain public address system from single source from single manufacturer.

B. The manufacturer for the Paging System shall be tied to the Bogen Nyquist E7000 educational series

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Comply with NFPA 70.

2.2 FUNCTIONAL DESCRIPTION OF SYSTEM

A. System Functions:

1. Selectively connect any zone to any available signal channel.
2. Selectively control sound from microphone outlets and other inputs.

3. "All-call" feature shall connect the all-call sound signal simultaneously to all zones regardless of zone or channel switch settings.
4. Telephone paging adapter shall allow paging by dialing an extension from any local telephone instrument and speaking into the telephone.
5. Produce a program-signal tone that is amplified and sounded over all speakers, overriding signals currently being distributed.
6. Reproduce high-quality sound that is free of noise and distortion at all loudspeakers at all times during equipment operation including standby mode with inputs off; output free of nonuniform coverage of amplified sound.

2.3 SYSTEM DESCRIPTION

A. Compatibility of Components: Coordinate component features to form an integrated system. Match components and interconnections for optimum performance of specified functions.

B. Equipment: Comply with UL 813. Equipment shall be modular, using solid-state components, and fully rated for continuous duty unless otherwise indicated. Select equipment for normal operation on input power usually supplied at 110 to 130 V, 60 Hz.

C. Equipment Mounting: Where rack, cabinet, or console mounting is indicated, equipment shall be designed to mount in a 19-inch (483-mm) housing complying with EIA/ECA-310-E.

D. A.

E. Weather-Resistant Equipment: Listed and labeled by a qualified testing agency for duty outdoors or in damp locations.

2.4 PREAMPLIFIERS

A. Preamplifier: Separately mounted.

B. Preamplifier: Integral to power amplifier.

C. Output Power: Plus 4 dB above 1 mW at matched power-amplifier load.

D. Total Harmonic Distortion: Less than 1 percent.

E. Frequency Response: Within plus or minus 2 dB from 20 to 20,000 Hz.

F. Input Jacks: Minimum of three. One matched for low-impedance microphone; one USB port; and the other matchable to DVD or CD player, or radio tuner signals without external adapters.

G. Minimum Noise Level: Minus 55 dB below rated output.

H. Controls: On-off, input levels, and master gain.

2.5 POWER AMPLIFIERS

A. Mounting: Rack.

B. Output Power: 70-V balanced line. 80 percent of the sum of wattage settings of connected for each station and speaker connected in all-call mode of operation, plus a 25 percent allowance for future stations.

C. Total Harmonic Distortion: Less than 3 percent at rated power output from 50 to 12,000 Hz.

D. Minimum Signal-to-Noise Ratio: 80 dB, at rated output.

E. Frequency Response: Within plus or minus 3 dB from 20 to 12,000 Hz.

F. Output Regulation: Less than 2 dB from full to no load.

G. Controls: On-off, input levels, and low-cut filter.

H. Input Sensitivity: Matched to preamplifier and to provide full-rated output with sound-pressure level of less than 10 dynes/sq. cm impinging on speaker microphone or handset transmitter.

I. TRANSFER TO STANDBY AMPLIFIER

1. Monitoring Circuit and Sensing Relay: Detect reduction in output of power amplifier of 40 percent or more and, in such event, transfer load and signal automatically to standby amplifier.

2.6 MICROPHONES

A. Paging Microphone:
   1. Type: Dynamic, with omnidirectional polar characteristic.
   2. Impedance: 250 ohms.
   3. Frequency Response: Uniform, 50 to 15,000 Hz.
   4. Sensitivity: Minus 70 dB.
   5. Output Level: Minus 58 dB, minimum.
   6. Cable: Coordinate impedance with microphone impedance.
   7. Mounting: Desk stand with integral-locking, press-to-talk switch.

2.7 VOLUME LIMITER/COMPRESSOR

A. Minimum Performance Requirements:
   1. Frequency Response: 45 to 15,000 Hz, plus or minus 1 dB minimum.
   2. Reduction Ratio: Automatically vary compression ratio, and attack and release times for voice and music inputs.
      a. Compression Ratio Range: 3:1 to 10:1 minimum.
      b. Averaging Compressor Attack Time: Up to 500 milliseconds.
      c. Signal Fast Compression Attack Time: Less than 10 milliseconds.
      d. Release time: Up to 500 milliseconds.
   3. Distortion: 0.5 percent, maximum.
   4. Rated Output: Minimum of plus 14 dB.
   5. Inputs: Minimum of two inputs with variable front-panel gain controls and VU or decibel meter for input adjustment.
   6. Rack mounted.

2.8 CONTROL CONSOLE

A. Panel for Equipment and Controls: Rack mounted.

B. Controls:
   1. Switching devices to select signal sources for distribution channels.
   2. Program selector switch to select source for each program channel.
   3. Switching devices to select zones for paging.
   4. All-call selector switch.

C. Indicators: A visual annunciation for each distribution channel to indicate source being used.

D. Self-Contained Power and Control Unit: A single assembly of basic control, electronics, and power supply necessary to accomplish specified functions.

E. Spare Positions: 25 percent spare zone control and annunciation positions on console.

F. Microphone jack.

2.9 EQUIPMENT CABINET

A. Comply with EIA/ECA-310-E.

B. House amplifiers and auxiliary equipment at each location.

C. Cabinet Housing:
   1. Constructed of 0.0478-inch (1.2-mm) steel, minimum, with front- and rear-locking doors and standard EIA/ECA-310-E-compliant, 19-inch (483-mm) racks.
   2. Arranged for floor or wall mounting as indicated.
   3. Sized to house all equipment indicated, plus spare capacity.
   4. Include 20 percent minimum spare capacity for future equipment in addition to space required for DVD or CD player.

a. Power Provisions: A single switch in cabinet shall disconnect cabinet power distribution system and electrical outlets, which shall be uniformly spaced to accommodate ac-power cords for each item of equipment.

b. Ventilation: A low-noise fan for forced-air cabinet ventilation. Fan shall be equipped with a filtered input vent and shall be connected to operate from 105- to 130-V ac, 60 Hz; separately fused and switched; arranged to be powered when main cabinet power switch is on.

2.10 EQUIPMENT RACK

A. Racks: 19 inches (483 mm) standard, complying with EIA/ECA-310-E.

B. Power-Supply Connections: Compatible plugs and receptacles.

C. Enclosure Panels: Ventilated rear and sides and solid top. Use louvers in panels to ensure adequate ventilation.

D. Finish: Uniform, baked-enamel factory finish over rust-inhibiting primer.

E. Power-Control Panel: On front of equipment housing, with master power on-off switch and pilot light; and with cartridge fuse protection for rack equipment power.

F. Service Light: At top rear of rack with an adjacent control switch.

G. Vertical Plug Strip: Grounded receptacles, 12 inches (300 mm) o.c.; the full height of rack for public address system equipment use only.

H. Maintenance Receptacles: Duplex convenience outlets supplied independent of vertical plug strip and located in front and bottom rear of rack.

I. Spare Capacity: 20 percent in rack for future equipment.

J. TELEPHONE PAGING ADAPTER

1. Adapters shall accept voice signals from telephone extension dialing access and automatically provide amplifier input and program override for preselected zones.
   a. Minimum Frequency Response: Flat, 200 to 2500 Hz.
   b. Impedance Matching: Adapter matches telephone line to public address equipment input.
   c. Rack mounted.

2.11 TONE GENERATOR

A. Tone generator shall provide clock and program interface with public address system.

B. Signals: Minimum of seven distinct, audible signal types including wail, warble, high/low, alarm, repeating and single-stroke chimes, and tone.

C. Pitch Control: Chimes and tone.

D. Volume Control: All outputs.

E. Activation-Switch Network: Establishes priority and hierarchy of output signals produced by different activation setups.

F. Mounting: Rack

2.12 MONITOR PANEL

A. Monitor power amplifiers.

B. Components: VU or dB meter, speaker with volume control, and multiple-position rotary selector switch.

C. Selector Switch and Volume Control: Selective monitoring of output of each separate power amplifier via VU or dB meter and speaker.

D. Mounting: Rack

2.13 LOUDSPEAKERS

A. Cone-Type Loudspeakers:

1. Minimum Axial Sensitivity: 91 dB at 1 m, with 1-W input.
2. Frequency Response: Within plus or minus 3 dB from 50 to 15,000 Hz.
3. Size: 8 inches200 mm with 1-inch (25-mm) voice coil and minimum 5-oz. (140-g) ceramic magnet.
4. Rated Output Level: 25/70 W.
5. Minimum Dispersion Angle: 100 degrees.
6. Matching Transformer: Full-power rated with four taps. Maximum insertion loss of 0.5 dB.
7. Surface-Mounted Units: Ceiling, wall, or pendant mounted, as indicated, in steel back boxes, acoustically dampened. Front face of at least 0.0478-inch (1.2-mm) steel and whole assembly rust proofed and shop primed for field painting.
8. Flush-Ceiling-Mounted Units: In steel back boxes, acoustically dampened. Metal ceiling grille with white baked enamel.

B. Horn-Type Loudspeakers:
1. Type: Single-horn units, double-reentrant design, with minimum full-range power rating of 15 W.
2. Matching Transformer: Full-power rated with four standard taps. Maximum insertion loss of
3. 0.5 dB.
4. Frequency Response: Within plus or minus 3 dB from 250 to 12,000 Hz.
5. Dispersion Angle: 130 by 110 degrees.
6. Mounting: Integral bracket.
7. 1.
8. Units in Damp, Wet, or Outdoor Locations: Listed and labeled for environment in which they are located.
9. Units in Hazardous (Classified) Locations: Listed and labeled for environment in which they are located. Provide any accessories required to maintain listing.

2.14 NOISE-OPERATED GAIN CONTROLLER

A. Gain controller shall be designed to continuously sense space noise level and automatically adjust signal level to local speakers.

B. Frequency Response: 20 to 20,000 Hz, plus or minus 1 dB.

C. Level Adjustment Range: 30 dB minimum.

D. Maximum Distortion: 0.5 percent.

E. Control: Permits adjustment of sensing level of device.

2.15 OUTLETS

A. Volume Attenuator Station: Wall-plate-mounted autotransformer type with paging priority feature.
1. Wattage Rating: 10 W unless otherwise indicated.
2. Attenuation per Step: 3 dB, with positive off position.
3. Insertion Loss: 0.4 dB maximum.
4. Attenuation Bypass Relay: SPDT. Connected to operate and bypass attenuation when all-call, paging, program signal, or prerecorded message features are used. Relay returns to normal position at end of priority transmission.
5. Label: "PA Volume."

B. Microphone Outlet: Three-pole, polarized, locking-type, microphone receptacles in single-gang boxes. Equip wall outlets with brushed stainless-steel device plates. Equip floor outlets with gray tapered rubber or plastic cable nozzles and fixed outlet covers.

C. Headphone Outlet (for the Hearing Impaired): Microphone receptacles in single-gang boxes. Equip wall outlets with brushed stainless-steel device plates. Equip floor outlets with gray tapered rubber or plastic cable nozzles and fixed-outlet covers.

2.16 BATTERY BACKUP POWER UNIT

A. Unit shall be rack mounted, consisting of time-delay relay, sealed lead-calcium battery, battery charger, on-off switch, "normal" and "emergency" indicating lights, and adequate capacity to supply maximum equipment power requirements for one hour of continuous full operation.

B. Unit shall supply public address equipment with 12- to 15-V dc power automatically during an outage of normal 120-V ac power.

C. Battery shall be on float charge when not supplying system and able to transfer automatically to supply system after three to five seconds of continuous outage of normal power, as sensed by time-delay relay.

D. Unit shall automatically retransfer system to normal supply when normal power has been reestablished for three to five seconds continuously.

2.17 CONDUCTORS AND CABLES

A. Jacketed, twisted pair and twisted multipair, untinned solid copper.
   1. Insulation for Wire in Conduit: Thermoplastic, not less than 1/32 inch (0.8 mm) thick.
   2. Microphone Cables: Neoprene jacketed, not less than 2/64 inch (0.8 mm) thick, over shield with filled interstices. Shield No. 34 AWG, tinned, soft-copper strands formed into a braid or approved equivalent foil. Shielding coverage on conductors is not less than 60 percent.
   3. Plenum Cable: Listed and labeled for plenum installation.

2.18 PATHWAYS

A. Conduit and Boxes: Comply with Section 270528 "Pathways for Communications Systems Flexible metal conduit shall not be used.
   1. Outlet boxes shall be not less than 2 inches (50 mm) wide, 3 inches (75 mm) high, and 2-1/2 inches (64 mm) deep.

PART 3 - EXECUTION

3.1 WIRING METHODS

A. Wiring Method: Install cables in pathways and cable trays 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. Conceal pathway and cables except in unfinished spaces.
   1. Install plenum cable in environmental air spaces, including plenum ceilings.
   2. Comply with requirements for pathways and boxes specified in Section 270528 "Pathways for Communications Systems."
      a. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.
      b. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.2 INSTALLATION OF PATHWAYS

A. Comply with requirements in Section 270528 "Pathways for Communications Systems." for installation of conduits and wireways.

B. Install manufactured conduit sweeps and long-radius elbows whenever possible.

3.3 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Cable Installation Requirements:
   1. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at outlets and terminals.

2. Splices, Taps, and Terminations: Arrange on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Cables may not be spliced.
3. Secure and support cables at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
4. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.
5. Do not install bruised, kinked, scored, deformed, or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
6. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used.

C. Open-Cable Installation:
1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
2. Suspend speaker cable not in a wireway or pathway a minimum of 8 inches (200 mm) above ceiling by cable supports not more than 60 inches apart.
3. Cable shall not be run through structural members or be in contact with pipes, ducts, or other potentially damaging items.

D. Separation of Wires: Separate speaker-microphone, line-level, speaker-level, and power wiring runs. Install in separate pathways or, where exposed or in same enclosure, separate conductors at least 12 inches (300 mm) apart for speaker microphones and adjacent parallel power and telephone wiring. Separate other communication equipment conductors as recommended by equipment manufacturer.

3.4 INSTALLATION

A. Coordinate layout and installation of system components and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

B. Match input and output impedances and signal levels at signal interfaces. Provide matching networks where required.

C. Identification of Conductors and Cables: Color-code conductors and apply wire and cable marking tape to designate wires and cables so they identify media in coordination with system wiring diagrams.

D. Equipment Cabinets and Racks:
1. Group items of same function together, either vertically or side by side, and arrange controls symmetrically. Mount monitor panel above the amplifiers.
2. Arrange all inputs, outputs, interconnections, and test points so they are accessible at rear of rack for maintenance and testing, with each item removable from rack without disturbing other items or connections.
3. Blank Panels: Cover empty space in equipment racks so entire front of rack is occupied by panels.

E. Volume Limiter/Compressor: Equip each zone with a volume limiter/compressor. Install in central equipment cabinet. Arrange to provide a constant input to power amplifiers.

F. Wall-Mounted Outlets: Flush mounted.

G. Floor-Mounted Outlets: Conceal in floor and install cable nozzles through outlet covers. Secure outlet covers in place. Trim with carpet in carpeted areas.

H. Conductor Sizing: Unless otherwise indicated, size speaker circuit conductors from racks to loudspeaker outlets not smaller than No. 18 AWG and conductors from microphone receptacles to amplifiers not smaller than No. 22 AWG.

I. Weatherproof Equipment: For units that are mounted outdoors, in damp locations, or where exposed to weather, install consistent with requirements of weatherproof rating.

J. Speaker-Line Matching Transformer Connections: Make initial connections using tap settings indicated on Drawings.

K. Connect wiring according to Section 271500 "Communications Horizontal Cabling" and Section 280513 "Conductors and Cables for Electronic Safety and Security."

3.5 GROUNDING

A. Ground cable shields and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.

B. Signal Ground Terminal: Locate at main equipment cabinet. Isolate from power system and equipment grounding.

C. Install grounding electrodes as specified in Section 270526 "Grounding and Bonding for Communications Systems."

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

D. Tests and Inspections:
   1. Schedule tests with at least seven days' advance notice of test performance.
   2. After installing public address system and after electrical circuitry has been energized, test for compliance with requirements.

E. Operational Test: Perform tests that include originating program and page messages at microphone outlets, preamplifier program inputs, and other inputs. Verify proper routing and volume levels and that system is free of noise and distortion.

F. Signal-to-Noise Ratio Test: Measure signal-to-noise ratio of complete system at normal gain settings as follows:
   1. Disconnect microphone at connector or jack closest to it and replace it in the circuit with a signal generator using a 1000-Hz signal. Replace all other microphones at corresponding connectors with dummy loads, each equal in impedance to microphone it replaces. Measure signal-to-noise ratio.
   2. Repeat test for each separately controlled zone of loudspeakers.
   3. Minimum acceptance ratio is 50 dB.

G. Distortion Test: Measure distortion at normal gain settings and rated power. Feed signals at frequencies of 50, 200, 400, 1000, 3000, 8000, and 12,000 Hz into each preamplifier channel. For each frequency, measure distortion in the paging and all-call amplifier outputs. Maximum acceptable distortion at any frequency is 3 percent total harmonics.

H. Acoustic Coverage Test: Feed pink noise into system using octaves centered at 500 and 4000 Hz. Use sound-level meter with octave-band filters to measure level at five locations in each zone. For spaces with seated audiences, maximum permissible variation in level is plus or minus 2 dB. In addition, the levels between locations in same zone and between locations in adjacent zones must not vary more than plus or minus 3 dB.

I. Power Output Test: Measure electrical power output of each power amplifier at normal gain settings of 50, 1000, and 12,000 Hz. Maximum variation in power output at these frequencies must not exceed plus or minus 1 dB.

J. Signal Ground Test: Measure and report ground resistance at public address equipment signal ground. Comply with testing requirements specified in Section 270526 "Grounding and Bonding for Communications Systems."

K. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified. Prepare a list of final tap settings of paging speaker-line matching transformers.

L. Public address system will be considered defective if it does not pass tests and inspections.

M. Prepare test and inspection reports.

1. Include a record of final speaker-line matching transformer-tap settings and signal ground-resistance measurement certified by Installer.

3.7 ADJUSTING

A. On-Site Assistance: Engage a factory-authorized service representative to provide on-site assistance in adjusting sound levels, resetting transformer taps, and adjusting controls to meet occupancy conditions.

B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.8 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain the public address system and equipment. Refer to Section 017900 "Demonstration and Training."

END OF SECTION

FULLER AND D'ANGELO P.C. ARCHITECTS AND PLANNERS
45 KNOLLWOOD ROAD ELMSFORD, NEW YORK 10523
TEL: 914.592.4444 FAX: 914.592.1717

MINUTES OF MEETING - PRE BID

DATE: **MAY 1, 2024**
RE: **BREWSTER CENTRAL SCHOOL DISTRICT**
SECURITY VESTIBULE, SYNTHETIC FIELD & RELATED WORK
F&D PROJECT NO.: 23505.01

PRESENT: **SEE ATTACHED SIGN-IN SHEET**

AGENDA

1.1 INTRODUCTION:
- A. Owner's Representative: Victor Karlsson, Assistant Superintendent for Finance & Operations.
- B. Owner's Representative: Glen Freyer, Director of Facilities.
- C. Construction Manager: John Hansen, Triton Construction.
- D. Fuller and D'Angelo: William J. Means RA LEED AP, project manager.

1.2 BID DUE DATE:
- A. May 16th, 2024 - 11:00 A.M.
- B. Location: Brewster Central School District Office, Board Room, 30 Farm to Market Road, Brewster, NY 10509.

1.3 SUMMARY OF PROJECT:
- A. Six (6) Contracts
  1. General Construction
  2. Plumbing
  3. HVAC
  4. Electrical
  5. Site GC
  6. Elevator
- B. Scope Summary:
  1. New Synthetic Athletic Field, track and related work.
  2. New security vestibule addition and bridge repairs.
  3. Replace two (2) existing RTU's with new and related work.
  4. Existing elevator modernization.

1.4 ALLOWANCES:
- A. There are various Contingency Allowances – see specification section 01 2100.
- B. Allowances are to be included in Total Base Bid.
- C. If Allowances are not used, they will be returned to the Owner as a credit.
- D. Overhead + Profit for allowances is to be included in the Base Bid.

1.5 ALTERNATES:
- A. There are various Alternates – see specification section 01 2300.

1.6 BID FORMS:
- A. Bid Bond required **10%** of Bid.
- B. Be sure to acknowledge all Addenda and dates on Bid Form.
- C. Include all Bid Form Supplements with the Bid.

1.7 BIDDING REQUIREMENTS SECTION 00 2113:
1. RFI form included in documents. Please scan and email to williamm@fullerdangelo.com Last date F&D will respond will be **May 9th, 2024.**

1.8 GENERAL CONDITIONS:
- A. Tax Exempt Project.
- B. Performance Bond Requirement **100%** of contract. AIA 312 form – 2010 Edition.
- C. Insurance requirements **Article 11 General Conditions** Review with your Agent.
- D. Article 11 par 11.1.4.6 Umbrella policy $5,000,000/$10,000,000.
- E. OCP Policy required for this project if contract is over $250,000.00.

RE: PRE-BID MEETING – PACKAGE #1

1.9 USE OF PREMISE:

A. Building Availability: 3:30 pm to 10:30 pm, September 1st through June 26th Monday-Friday.
B. Building Availability: 7:00 am to 3:30 pm, June 27th through August 31st, Monday-Friday.
C. Weekend and Holiday work at the discretion of the Owner.
D. There will be no cost to the contractor for custodial overtime to maintain schedule.

1.10 WORK SEQUENCE:

A. Start Construction: June 27, 2024.
B. Completion date: See Milestone Schedule 01 1010.

1.11 PAYMENTS:

A. Prevailing Wage Rates apply.
B. Certified payrolls required as per DOL.

1.12 TEMPORARY FACILITIES:

A. Refer to Section 01 5000.
B. Temporary lights, Waste containers and Temporary Toilets.

1.13 QUALITY CONTROL:

A. F&D and consultants will perform intermittent inspections.
B. Owner's third-party inspector.

1.14 GENERAL DISCUSSION:

A. A Logistics Plan drawing will be issued in an upcoming addendum.
B. Owner's Fire Alarm Vendor is Alarm Specialists.
C. Existing PVC roof is under warranty.
D. The Security Vestibule addition excavation is by the GC.
E. Any pertinent RFI questions will be answered in addendum.
F. Addendums will be uploaded to RevPlans. Contractor to check website frequently.

At the conclusion of meeting, a walk-through of the existing building and site was conducted and Base Bid and Alternate work areas identified.

In the event of a discrepancy between these minutes and the contract documents the contract documents shall prevail.

It is assumed that these Minutes are a true summary of the meeting. Any corrections or omissions should be brought to the attention of the writer. If not, they will be considered substantially correct.

Submitted by: _____
William J. Means, RA, LEED AP

F:\00000.00\23505.00 Brewster Bond 2023\23505.01 Brewster HS Security Vestibule, New Synthetic Turf Field\6A Bidding\05 01 24 Pre-Bid Minutes of Meeting.doc

FULLER D'ANGELO P.C. ARCHITECTS PLANNERS

FULLER AND D'ANGELO P.C. ARCHITECTS AND PLANNERS

45 KNOLLWOOD ROAD
TEL: 914.592.4444

ELMSFORD, NEW YORK 10523
FAX: 914.592.1717

PROJECT NAME: BREWSTER CENTRAL SCHOOL DISTRICT
SECURITY VESTIBULE, SYNTHETIC FIELD & RELATED WORK

DATE OF MEETING: MAY 1, 2024 @ 9:00 AM

F&D PROJECT #: 23505.01

BID SIGN-IN SHEET

Name	Company Name	Office Phone	Fax	Cell Phone	E-mail address	Signature
Victor Karlsson	BCSD					
Glen Freyer	BCSD					[signature]
William Means	Fuller D'Angelo, P.C.	914.592.4444			williamm@fullerdangelo.com	[signature]
John Hansen	Triton Constr.					
Tom DeRosa	DeRosa Sons	914-341-1586		914-447-4814	Tom@DeRosaSons.com	[signature]
Adam DiValentino	Taconic Elevator	845-704-1365		845-559-8250	INFO@Taconicelevator.com	[signature]
John N.	Renu	732-360-0444		7323604444	Jneil@renu.com	[signature]
Vincent Buttafuoco	DSI			845-416-4833	vbuttafuoco@dsi.us	[signature]
Stephen Scherrer	Butler Cons Grp	845-863-7832		Same	Steve@butlerconstructiongroup.com	[signature]
Harley Toledo	SMC	(203)942-5076		Same	htoledo@southeastmech.com	[signature]
Anthony Marfitano	Bertussis	845-735-5588				[signature]
Zachary Girvalo	Pierotti Corp	914-233-9990		845-380-5302	zacharyg@pierotticorp.com	[signature]

FULLER D'ANGELO P.C. ARCHITECTS PLANNERS

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45 KNOLLWOOD ROAD
TEL: 914.592.4444

ELMSFORD, NEW YORK 10523
FAX: 914.592.1717

PROJECT NAME: BREWSTER CENTRAL SCHOOL DISTRICT
SECURITY VESTIBULE, SYNTHETIC FIELD & RELATED WORK
DATE OF MEETING: MAY 1, 2024 @ 9:00 AM
F&D PROJECT #: 23505.01

BID SIGN-IN SHEET

Name	Company Name	Office Phone	Fax	Cell Phone	E-mail address	Signature
Eric K. Pfohl	Key Construction			845-772-155	epfohl@landtekgroup.com	
Gerson Coreas	Landtek Group			631-747-3119	gcoreas@landtekgroup.com	
Glenn Markley	Markley Mech.	914-788-5536			contact@markleymechanical.com	

SECTION 00 2115
RFI FORM

CONTRACTOR'S REQUEST FOR INTERPRETATION NO. 1 **F&D RFI NO:** 001
(F&D USE)

NAME OF PROJECT: **BHS Security Vestibule, Synthetic Fields & Related Work**
NAME OF OWNER: **Brewster Central School District**
FACILITY: **Brewster High School**
DATE: 4/29/2024
A/E PROJECT NO: **23505.01**
ARCHITECT: **Architect**
45 Knollwood Road, Elmsford, NY 10523
Tel: 914-592-4444; Fax: 914-592-1717
William Means, RA **WilliamM@fullerdangelo.com**

Refer to Section 00 2113 Par 1.12 for additional requirements.

FROM (CO. NAME): Joe Lombardo Plumbing & Heating of Rockland, Inc.
CONTACT NAME: Joe Furtado
Tel: 845-357-6537 x2994 **E-mail:** joe@josephlombardo.com
SUBJECT: Fan Schedule Discreapancy
DISCIPLINE/TRADE:
DWG./SPEC. REFERENCE: Equipment schedule M300 list O.A. Intake Fan as Greenheck Fan
QUESTION: Model G-060-VG-D. A "G" Fan is a Direct Drive Roof Fan. Please correct and advise on correct Model.

___ **FIELD CONDITION**
___ **DRAWING/SPEC**
✔ **DISCREPANCY**
___ **OWNER CHANGE**
___ **CLARIFICATION**
___ **CONTRACTOR'S SUGGESTION (IF APPLICABLE):**

ANSWER

For SF-1, provide inline fan for the duty point indicated in schedule. Choices include Greenheck Model SQ-70-VG or equivalent.

ARCHITECT'S SIGNATURE: Richard A Siles **DATE:** 5-1-24

Note: review and any responses to this request for information by the architect/engineer is strictly for design intent only and does not constitute acknowledgement or acceptance of any cost or schedule implications unless specifically presented by the contractor. By submission of this request for information, the contractor assumes all responsibility in the absence of an approved change order or work directive.

RA
5/2/2024

SECTION 00 2115
RFI FORM

CONTRACTOR'S REQUEST FOR INTERPRETATION NO. 1 **F&D RFI NO:** 002
(F&D USE)

NAME OF PROJECT: **BHS Security Vestibule, Synthetic Fields & Related Work**
NAME OF OWNER: **Brewster Central School District**
FACILITY: **Brewster High School**
DATE: 4.30.24
A/E PROJECT NO: **23505.01**
ARCHITECT: **Architect**
45 Knollwood Road, Elmsford, NY 10523
Tel: 914-592-4444; Fax: 914-592-1717
William Means, RA **WilliamM@fullerdangelo.com**

Refer to Section 00 2113 Par 1.12 for additional requirements.

FROM (CO. NAME): Renu
CONTACT NAME: John Neal
Tel: 732-306-0459 **E-mail:** Jneal@rmny.com
SUBJECT: Site/GC Demo Vestibule Work
DISCIPLINE/TRADE: Demolition
DWG./SPEC. REFERENCE: BHS A110 - Note R4
QUESTION: Per Note R4, Remove, Save, Clean & Store Bricks & Plaques for Reinstalliation. However, the note is indicated at the "Site Removals by Site Contractor". Does this also include reinstall of bench? Please confirm if Note R4 should be included in either GC or Site Contract.

___ **FIELD CONDITION**
___ **DRAWING/SPEC**
___ **DISCREPANCY**
___ **OWNER CHANGE**
___ **CLARIFICATION**
___ **CONTRACTOR'S SUGGESTION (IF APPLICABLE):**

ANSWER
Site GC.

ARCHITECT'S SIGNATURE: MWL ML KA **DATE:** 5/2/2024

Note: review and any responses to this request for information by the architect/engineer is strictly for design intent only and does not constitute acknowledgement or acceptance of any cost or schedule implications unless specifically presented by the contractor. By submission of this request for information, the contractor assumes all responsibility in the absence of an approved change order or work directive.

SECTION 00 2115
RFI FORM

CONTRACTOR'S REQUEST FOR INTERPRETATION NO. ____ **F&D RFI NO: 003**
(F&D USE)

NAME OF PROJECT: **BHS Security Vestibule, Synthetic Fields & Related Work**
NAME OF OWNER: **Brewster Central School District**
FACILITY: **Brewster High School**
DATE: 5/1/24
A/E PROJECT NO: **23505.01**
ARCHITECT: **Architect**
45 Knollwood Road, Elmsford, NY 10523
Tel: 914-592-4444; Fax: 914-592-1717
William Means, RA **WilliamM@fullerdangelo.com**

Refer to Section 00 2113 Par 1.12 for additional requirements.

FROM (CO. NAME): Bertussi Contracting Inc
CONTACT NAME: S.Weber
Tel: 845-735-5588 **E-mail:** sweber@bertussis.com
SUBJECT: See attached
DISCIPLINE/TRADE: _____
DWG./SPEC. REFERENCE: _____
QUESTION: See attached

___**FIELD CONDITION**_____
___ **DRAWING/SPEC** _____
___ **DISCREPANCY**_____
___ **OWNER CHANGE**_____
___ **CLARIFICATION** _____
___ **CONTRACTOR'S SUGGESTION (IF APPLICABLE):** _____

ANSWER

ARCHITECT'S SIGNATURE: _____**DATE:**_____

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1. Are the structural bridge - expansion joint tar in the abatement spec page 020811 page 1 in the base bid or in the alternate? Please advise.
2. On drawing BHSS 102, is the work outside of the cartouche that show alternate 1 in the base bid? Please advise.
3. The language for alternate GC 1 is for the bridge repair, but it appears like some bridge repair work is in the base bid as it is outside the cartouche that shows GC Alternate. Please advise.
4. Detail 54/S102 is for a small wall. Is it in the base bid or Alt GC 1? Please advise.
5. Is the repair of the underside of the bridge in the base bid or Alt GC 1? Please advise.
6. Is the 50’ beam repair at the bridge on S102 in the base bid or alternate GC 1?
7. Are the steel guardrails at S102 in the base bid or in Alt GC 1? Please advise.

1. **Base Bid.**
2. **Base Bid.**
3. **Bridge abutment repairs is the Alternate GC-1.**
4. **Alternate GC-1.**
5. **Base Bid.**
6. **There is no 50' beam on the project.**
7. **Base Bid.**

5/2/2024

SECTION 00 2115
RFI FORM

CONTRACTOR'S REQUEST FOR INTERPRETATION NO. 2 **F&D RFI NO:** 004
(F&D USE)

NAME OF PROJECT: **BHS Security Vestibule, Synthetic Fields & Related Work**
NAME OF OWNER: **Brewster Central School District**
FACILITY: **Brewster High School**
DATE: 5/3/24
A/E PROJECT NO: **23505.01**
ARCHITECT: **Architect**
45 Knollwood Road, Elmsford, NY 10523
Tel: 914-592-4444; Fax: 914-592-1717
William Means, RA WilliamM@fullerdangelo.com

Refer to Section 00 2113 Par 1.12 for additional requirements.

FROM (CO. NAME): Renu Contracting
CONTACT NAME: John Neal
Tel: 732-306-0459 **E-mail:** jneal@rmny.com
SUBJECT: West & East Bridge Walls
DISCIPLINE/TRADE: Concrete
DWG./SPEC. REFERENCE: S-102
QUESTION: For the base bid work @ West & East Bridge, are the concrete walls, curbs & rails indicated to be removed & replaced with New? Are the only new concrete walls, curbs and rails part of the alternate? Are we only to repair existing? Can you provide elevations of the existing concrete walls?

___ **FIELD CONDITION**
___ **DRAWING/SPEC**
___ **DISCREPANCY**
___ **OWNER CHANGE**
___ **CLARIFICATION**
___ **CONTRACTOR'S SUGGESTION (IF APPLICABLE):**

ANSWER
1. As shown on details S1 & S2, the guardrail is to be replaced. The concrete walls and curbs to be repaired.
2. No. Section S4 is Base Bid work.
3. See drawings.
4. Not necessary.

ARCHITECT'S SIGNATURE: [signature] RA **DATE:** 5/3/2024

Note: review and any responses to this request for information by the architect/engineer is strictly for design intent only and does not constitute acknowledgement or acceptance of any cost or schedule implications unless specifically presented by the contractor. By submission of this request for information, the contractor assumes all responsibility in the absence of an approved change order or work directive.