Sampson Construction Co., Inc.
3730 South 14th Street
Lincoln, NE 68502
Phone: (402) 434-5450
FAX: (402) 434-5466

Bid Bulletin #2

PROJECT: Kearney High School, Kearney, Nebraska
Bid Package #3

DATE: October 8, 2014

This Bid Bulletin includes items 2-1 through 2-7. Each item shall be fully incorporated into the Bidding/Contract Documents and have the same force and effect as though originally included. Bidders shall acknowledge receipt of this Bid Bulletin on the bid form. Bidders MUST use the bid form that is included in Bid Bulletin #1 or risk disqualification.

Item 2-1 Reference Summary of Work 03O – Metal Panels: Delete reference to Section 089100-Louvers and add this section to Summary of Work 03YY-HVAC.

Item 2-2 Attached is a copy of Addendum #1 from Wilkins, Hinrichs, Stober Architects LLC dated October 7, 2014.

Item 2-3 Subcontractors need to verify their insurance meets the requirements for this project. The certificate of insurance must include additional insureds, a blanket waiver of subrogation for the general liability/workers compensation and $1,000,000 excess liability. Attached is a sample copy of the Acord Certificate of Liability Insurance.

Item 2-4 A performance and payment bond may be required for your scope of work and the dollar amount should be listed under the Alternates on the bid form, but not included in your base bid.

Item 2-5 Contractors must be registered with the State of Nebraska Department of Labor in order to work in Nebraska. If you are awarded a contract for your Summary of Work and you are not already registered with the State of Nebraska, visit http://www.dol.nebraska.gov/index.cfm to register your company.

Item 2-6 A pre-bid meeting will be held on Thursday, October 9, 2014 at the Kearney Public Schools Administration Building, Whittier Learning Resource Center, 2nd Floor Staff Development Conference Room, 310 West 24th Street, Kearney, NE 68847. There will be two meetings:

- Contractors bidding Divisions 2-13 will meet at 10:00 AM Central Time
- Contractors bidding Divisions 14-33 will meet at 2:00 PM Central Time

Item 2-7 Bids will be accepted until 2:00 PM Central Time at the Kearney Public Schools, Whittier Learning Resource Center, Office of Finance Director. Bids will be read aloud at 3:00 PM Central Time in the 2nd Floor Staff Development Conference Room.

Bids can be hand delivered or mailed to 310 West 24th Street, Kearney, NE 68847, submitted by FAX to (308) 698-8001 or by e-mail to kpsbid@sampson-construction.com. It is your responsibility to make sure these bids are received prior to 2:00 PM Central Time.

END OF BID BULLETIN #2

SAMPLE CERTIFICATE WHERE SAMPSON IS THE CONSTRUCTION MANAGER

ACORD®

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY) MM/DD/YYYY

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME: Agency contact name
Insurance Agency Name and Address Telephone and Fax Numbers	PHONE (A/C, No, Ext): FAX (A/C, No): Agent fax E-MAIL ADDRESS: Agent email PRODUCER CUSTOMER ID #:

INSURED	INSURER(S) AFFORDING COVERAGE	NAIC #
Subcontractor Name and address Telephone and Fax Numbers	INSURER A: Insurance Company A	
	INSURER B:	
	INSURER C:	
	INSURER D:	
	INSURER E:	
	INSURER F:	

COVERAGES **CERTIFICATE NUMBER:** **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	GENERAL LIABILITY							
	COMMERCIAL GENERAL LIABILITY	X	X		MM/DD/ YYYY	MM/DD/ YYYY	EACH OCCURRENCE	$ 1,000,000
	CLAIMS-MADE [X] OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
X	Owner AI						MED EXP (Any one person)	$
							PERSONAL & ADV INJURY	$ 1,000,000
							GENERAL AGGREGATE	$ 2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						PRODUCTS - COMP/OP AGG	$ 2,000,000
	POLICY [X] PRO-JECT [ ] LOC							$
A	AUTOMOBILE LIABILITY							
X	ANY AUTO			[Waived if sub-contractor does not use commercial vehicles]	MM/DD YYYY	MM/DD YYYY	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	ALL OWNED AUTOS						BODILY INJURY (Per person)	$ 500,000
	SCHEDULED AUTOS						BODILY INJURY (Per accident)	$ 500,000
X	HIRED AUTOS						PROPERTY DAMAGE (Per accident)	$ 1,000,000
X	NON-OWNED AUTOS							$
								$
A	UMBRELLA LIAB [ ] OCCUR			***see note***	MM/DD YYYY	MM/DD YYYY	EACH OCCURRENCE	$ 1,000,000
	EXCESS LIAB [ ] CLAIMS-MADE						AGGREGATE	$ 1,000,000
	DEDUCTIBLE							$
	RETENTION $							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y/N			[Waived if sub-contractor has no employees]	MM/DD YYYY	MM/DD YYYY	X WC STATU-TORY LIMITS [ ] OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [ ] N/A [X]						E.L. EACH ACCIDENT	$ 500,000
	(Mandatory in NH) If yes, describe under SPECIAL PROVISIONS below						E.L. DISEASE - EA EMPLOYEE	$ 500,000
							E.L. DISEASE - POLICY LIMIT	$ 500,000

Required

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

Sampson Construction Project #_____, job-site located at _____.

Excess policy (1) may be substituted with increases in General Liability "Each Occurrence" (2) to $2 million and "General Aggregate" (3) to $4 million

CERTIFICATE HOLDER	CANCELLATION
Sampson Construction Co., Inc. 3730 S. 14th Street Lincoln, NE 68502	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE

ADDENDUM #1

KEARNEY PUBLIC SCHOOLS
KEARNEY NEW HIGH SCHOOL
KEARNEY, NEBRASKA
1355

Wilkins Hinrichs Stober Architects, L.L.C.
2908 West 39th Street, Suite A
Kearney, Nebraska 68845
308-237-5787

Date Issued: October 7, 2014

Bid Date: October 23, 2014

TO: All Bid Holders of Record

Acknowledge receipt of this addendum by inserting its number in the space provided on the BID FORM. Failure to do so may subject Bidder to disqualification. This Addendum forms a part of the BIDDING DOCUMENTS and modifies them as follows.

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Addendum #1 - #1 **SPECIFICATION SECTION - 00 2113 - INSTRUCTIONS TO BIDDERS**

Bids will be accepted up until the hour of 2:00 PM Central Time at the Whittier Learning Resource Center, Office of Finance Director. The bids will be read aloud at 3:00 PM Central Time in the 2nd Floor Staff Development Conference Room. Bids can be submitted via email, fax or hard copy. Email address and fax number to be obtained from Sampson Construction Company.

Addendum #1 - #2 **SPECIFICATION SECTION - 00 2113 - INSTRUCTIONS TO BIDDERS**

Pre-Bid Conference: The conference will take place on 10/09/2014, and there will be two conferences, Spec Divisions 2-13 will be addressed at a 10:00 AM Central Time meeting and Divisions 14-33 will be addressed at 2:00 PM Central Time. The conferences will still take place in the Whittier Learning Resource Center (KPS Admin), 2nd Floor Staff Development Conference Room.

Addendum #1 - #3 **SPECIFICATION SECTION - 01 1000 - SUMMARY**

Under Work Sequence October 9, 2014: Replace time information with the following:
There will be two pre-bid conferences. Spec Divisions 2-13 will be addressed at a 10:00 AM Central Time meeting and Divisions 14-33 will be addressed at 2:00 PM Central Time.

Under Work Sequence add to Bid Date:
Bids will be accepted up until the hour of 2:00 PM Central Time, at the Whittier Learning Resource Center, Office of Finance Director, and they will be read aloud at 3:00 PM Central Time. The bids will be read aloud in the 2nd Floor Staff Development Conference Room. Bids can be submitted via email, fax or hard copy. Email address and fax number to be obtained from Sampson Construction Company.
Bid date remains Thursday October 23, 2014.

Addendum #1 - #4 **SPECIFICATION SECTION – 07 4213 – METAL WALL PANELS**

Paragraph 2.2.I: Add the following clarification note to the end of this paragraph: Closure pieces are to be metal, of the same material, thickness and finish as the wall panels. Corners are to be formed corners.

Addendum #1 - #5 **SPECIFICATION SECTION – 07 7200 – ROOF ACCESSORIES**
Subparagraph 2.1.B.3.a.i: Add the following subparagraph: "Babcock-Davis is an acceptable substitute manufacturer for the basis of design Bilco Company."

Addendum #1 - #6 **SPECIFICATION SECTION – 09 6400 – WOOD GYMNASIUM FLOORING**
Paragraph 2.2.A.4: Delete subparagraph "4". FSC Certified Lumber." in its entirety. FSC Certified Lumber is NOT required.

Addendum #1 - #7 **SPECIFICATION SECTION – 10 1101 – VISUAL DISPLAY BOARDS**
Paragraph 2.1.A.8: Add the following approved manufacturer: "8. AJW Architectural Products: www.ajw.com".

Addendum #1 - #8 **SPECIFICATION SECTION – 10 2113.19 – SOLID PLASTIC (HDPE) TOILET COMPARTMENTS**
Paragraph 2.1.A.9: Add the following approved manufacturer: "15. AJW Architectural Products: **www.ajw.com**".

Addendum #1 - #9 **SPECIFICATION SECTION – 10 2800 - TOILET, BATH AND LAUNDRY ACCESSORIES**
Paragraph 2.1.A.6: Add the following approved manufacturer: "AJW Architectural Products: www.ajw.com".

Addendum #1 - #10 **SPECIFICATION SECTION – 10 5100 – LOCKERS**
Paragraph 2.1.A.9: Add the following approved manufacturer: "8. AJW Architectural Products: **www.ajw.com**".

Addendum #1 - #11 **SPECIFICATION SECTION - 11 4000 - FOOD SERVICE EQUIPMENT**
Replace Section 11 4000 Food Service Equipment in its entirety with attached revised Specification Section 11 4000.

Addendum #1 - #12 **SPECIFICATION SECTION - 11 5330 - LABORATORY FUME HOODS**
Paragraph 2.1.B.7: Add the following approved manufacturer: "7. Labconco.".

Addendum #1 - #13 **SPECIFICATION SECTION - 11 6623 - GYMNASIUM EQUIPMENT**
Paragraph 2.1.B.5: Add the following approved manufacturer: "5. AALCO Manufacturing Company: www.aalcomfg.com".

Addendum #1 - #14 **SPECIFICATION SECTION – 12 3450 - LABORATORY CASEWORK**
Paragraph 2.1.B.8: Add the following approved manufacturer: "8. CiF Lab Solutions.".

Addendum #1 - #15 **SPECIFICATION SECTION – 12 3530 - EDUCATIONAL CASEWORK**
Paragraph 1.4.E.10: Delete references to "Mod-Ez" clips being unacceptable. "Mod-Ez" clips are acceptable.
Paragraph 2.1.B.4: Add the following approved manufacturer: "4. Case Systems".

Addendum #1 - #16 **SPECIFICATION SECTION – 12 3540 - MUSIC CASEWORK**
Paragraph 2.1.B: Delete the following manufacturers: "2. TIM Systems Design Corporation: www.tmisystems.com" and "3. Stevens Industries: www.stevensind.com".
Paragraph 2.1.B.4: Add the following approved manufacturer: "2. Wenger Corporation: www.wengercorp.com".

Addendum #1 - #17 **SPECIFICATION SECTION – 13 1500 - SWIMMING POOL**
Add "Acapulco Pools & Gall Construction of America" as a pre-qualified pool subcontractor.

Paragraph 1.1.B: Eliminate the listed Division Numbers referencing other Divisions for Earthwork, Mechanical, Plumbing and Electrical and substitute the following Division numbers:
"Plumbing – Division 22
HVAC – Division 23
Electrical – Division 26
Earthwork – Division 31
Utilities – Division 33".

Addendum #1 - #18 **SPECIFICATION SECTION - 26 3600 - TRANSFER SWITCHES**
Add Section in its entirety.

Addendum #1 - #19 **SPECIFICATION SECTION - 27 1500 - COMMUNICATIONS CABLING**
Add Section in its entirety.

Addendum #1 - #20 **SPECIFICATION SECTION – 27 4133 - MASTER ANTENNA TELEVISION SYSTEM**
Add Section in its entirety.

Addendum #1 - #21 **SPECIFICATION SECTION – 27 5123 - EDUCATIONAL INTERCOMMUNICATIONS AND PROGRAM SYSTEMS**
Add Section in its entirety.

Addendum #1 - #22 **SHEET 0.01 – SHEET INDEX – VOLUME I**
Add a reference to the following Drawing Sheet: "A11.13 – VERTICAL CIRCULATION DETAILS". This Drawing Sheet is and was included in the printed Drawing Sets.

Addendum #1 - #23 **SHEET 0.02 – SHEET INDEX – VOLUME II**
CLARIFICATION NOTE: PL100-PL510 Drawing Sheets were inadvertently listed in both the sheet index for VOLUME II and VOLUME III and should have only been listed and included with the VOLUME III drawings. If the drawing set that you received included those drawings in with VOLUME II, it is okay to leave them where they are at. Any addenda items pertaining to the PL drawing sheets are applicable to both occurrences of the PL drawing sheets if your drawing set includes them twice.

Addendum #1 - #24 **SHEET 0.02 – SHEET INDEX – VOLUME II**
Delete references to the following Drawing Sheets: "M3.1, M3.2 and P4.1".

Addendum #1 - #25 **SHEET 0.03 – SHEET INDEX – VOLUME III**
CLARIFICATION NOTE: PL100-PL510 Drawing Sheets were inadvertently listed in both the sheet index for VOLUME II and VOLUME III and should have only been listed and included with the VOLUME III drawings. If the drawing set that you received included those drawings in with VOLUME II, it is okay to leave them where they are at. Any addenda items pertaining to the PL drawing sheets are applicable to both occurrences of the PL drawing sheets if your drawing set includes them twice.

Addendum #1 - #26 **SHEET 0.03 – SHEET INDEX – VOLUME III**
Delete references to the following Drawing Sheets: "TR-13".

Addendum #1 - #27 **SHEET C 3.2 – GEOTHERMAL DISCHARGE PROFILE**
Add attached Sketch C3.2 for Geothermal Discharge Profile

Addendum #1 - #28 **SHEET C 3.3 – GEOTHERMAL DISCHARGE DETAIL**
Add attached Sketch C3.3 for Geothermal Discharge Detail.

Addendum #1 - #29 **SHEET C 4.7 – GEOTHERMAL DISCHARGE STRUCTURE (PLAN VIEW)**
Add attached Sketch C4.7 for Geothermal Discharge Structure.

Addendum #1 - #30 **SHEET C 4.8 – BOLLARDS AT ELECTRICAL TRANSFORMER (PLAN VIEW)**
Add attached Sketch C4.8 for Bollards at Electrical Transformer.

Addendum #1 - #31 **SHEET C 5.0 – BOLLARD DETAIL**
Add attached Sketch C5.0 for Bollard Detail.

Addendum #1 - #32 **SHEET A1.32 – PLAN DETAILS**
3/A1.32 PLAN DETAILS: Adjust the location of the return air grille by centering its location within the curved portion of the wall.

Addendum #1 - #33 **SHEET A7.02 – WALL SECTIONS – AREA B**
9/A7.02 TYP. METAL WALL PANEL HC FLOOR DETAIL: Revise detail to match detail 44/A8.10 as shown on Attachment A1-A8.10 to Addendum No. 1, dated October 7, 2014.

Addendum #1 - #34 **SHEET A7.08 – WALL SECTIONS – AREA H**
9/A7.08 SECTION DETAIL – STAGE – SPEAKER: At warming speaker box add the following note pointing to the face of the speaker box: “PAINTED STEEL GRILLE, TITUS 8F, 3/16” HOLES ON ¼” STAGGERED CENTERS, (TYP), OR APPROVED EQUAL”.

Addendum #1 - #35 **SHEET A8.6 – STOREFRONT ELEVATIONS**
4/A8.6 – STE-N1-1: Delete this elevation in its entirety and substitute a new elevation as shown on Attachment A1-A8.6 to Addendum No. 1, dated October 7, 2014.
5/A8.6 – STE-L1-1: Delete this elevation in its entirety and substitute a new elevation as shown on Attachment A1-A8.6 to Addendum No. 1, dated October 7, 2014.

Addendum #1 - #36 **SHEET A8.10 – DOOR AND WINDOW DETAILS**
Add Details 43 and 44/A8.10 as shown on Attachment A1-A8.10 to Addendum No. 1, dated October 7, 2014.

Addendum #1 - #37 **SHEET A9.00 – ROOM FINISH SCHEDULE, NOTES, MATERIALS LIST & SIGNAGE**
MATERIALS LIST: Under the ACOUSTICAL WALL PANEL MATERIAL add the following type: “AWP-7/4xCUSTOM LENGTHx2 ACOUSTICAL WALL ABSORBING PANEL/G&S ACOUSTICS/ACOUSTI-PANELS/FIBERGLASS CORE/SQUARE EDGES/FABRIC FB-1”.

Addendum #1 - #38 **SHEET A9.00 - ROOM FINISH SCHEDULE NOTES, MATERIALS LIST & SIGNAGE**
At the ROOM FINISH GENERAL NOTES, add the following note: "NO. 11 to read “Roller Shades to be installed on EXTERIOR WINDOWS ONLY.”

Addendum #1 - #39 **SHEET A9.03 - FINISH FLOOR PLAN – FIRST FLOOR – AREA AA & B**
At plan view 1/A9.03, at SCIENCE LAB/LECTURE B102, delete FUME HOOD note.

Addendum #1 - #40 **SHEET A9.04 - FINISH FLOOR PLAN – FIRST FLOOR – AREA C**
At the ROOM FINISH SCHEDULE, at STAIR C100 and TEACHING PLANNING CENTER OFFICE C106, delete RS.

Addendum #1 - #41 **SHEET A9.04 - FINISH FLOOR PLAN – FIRST FLOOR – AREA C**
At plan view 1/A9.04, at SCIENCE LAB/LECTURE C130, delete FUME HOOD note.

Addendum #1 - #42 **SHEET A9.05 - FINISH FLOOR PLAN – FIRST FLOOR – AREA D**
At plan view 1/A9.05, at SCIENCE LAB/LECTURE D110 & D111, delete FUME HOOD note.

Addendum #1 - #43 **SHEET A9.09 – FINISH FLOOR PLAN – FIRST FLOOR – AREA J**
ROOM FINISH SCHEDULE – FIRST FLOOR – AREA J: Add "RS" under the Column Heading "WINDOW COVERING" at the following Room Numbers: J118C, J119, J120, J121, J122, J123, J124, J125, and J126.

Addendum #1 - #44 **SHEET A9.10 - FINISH FLOOR PLAN – FIRST FLOOR – AREA K**
At the ROOM FINISH SCHEDULE, at GIRLS TOILET K114T and BOYS TOILET K115T, delete REMARK NO. 19.

Addendum #1 - #45 **SHEET A9.15 - FINISH FLOOR PLAN – SECOND FLOOR – AREA B**
At plan view 1/A9.15, at SCIENCE LAB/LECTURE B206, delete FUME HOOD note.

Addendum #1 - #46 **SHEET A9.16 - FINISH FLOOR PLAN – SECOND FLOOR – AREA C**
At the ROOM FINISH SCHEDULE, at STAIR C200ST and CORRIDOR C201C, delete RS.

Addendum #1 - #47 **SHEET A9.16 - FINISH FLOOR PLAN – SECOND FLOOR – AREA C**
At plan view 1/A9.16, at SCIENCE LAB/LECTURE C230, delete FUME HOOD note.

Addendum #1 - #48 **SHEET A9.58 – INTERIOR ELEVATIONS - PAC**
Delete this sheet in its entirety and substitute a new Sheet A9.58 as shown on the Attached Sheet A9.58, dated October 7, 2014.

Addendum #1 - #49 **SHEET E0.0 ELECTRICAL NOTES, SYMBOLS AND ABBREVIATIONS**
Modify Drawing as shown on Attachment Nos. E0.0-1 and E0.0-2.

Addendum #1 - #50 **SHEET E1.18 LIGHTING PLAN – SECOND FLOOR – AREA G**
G107 VOCAL: Delete Note "MH=13'-8" AFF" and substitute Note "MH=16'-0" AFF." Add Keyed Note No. 2 to room.
G117 BAND: Delete Note "MH=13'-8" AFF" and substitute Note "MH=16'-0" AFF."

Addendum #1 - #51 **SHEET E2.5 POWER PLAN – FIRST FLOOR – AREA E & F**
Modify drawing as shown on Attachment No. E2.5-1 to Addendum No. 1

Addendum #1 - #52 **SHEET E3.1 SPECIAL SYSTEMS PLAN – FIRST FLOOR – AREA A**
Modify drawing as shown on Attachments Nos. E3.1-1, E3.1-2 and E3.1-3.

Addendum #1 - #53 **SHEET E3.2 SPECIAL SYSTEMS PLAN – FIRST FLOOR – AREA AA & B**
AA103 INSTITUTE LAB: Remove "D" from clock and substitute "10'-0".

Addendum #1 - #54 **SHEET E3.3 SPECIAL SYSTEMS PLAN – FIRST FLOOR – AREA C**
C100 STAIR: Remove "D" from clock and substitute "10'-0".

Addendum #1 - #55 **SHEET E3.6 SPECIAL SYSTEMS PLAN – FIRST FLOOR – AREA G**
G106C CORRIDOR: Add one (1) double sided clock in center of corridor.

Addendum #1 - #56 **SHEET 3.8 SPECIAL SYSTEMS PLAN – FIRST FLOOR – AREA J**
J131 COMMONS/CAFETERIA: Remove "D" from clock on West wall and substitute "11'-0"
J131 COMMONS/CAFETERIA: Remove "D" from clock on East wall and substitute "10'-6"
J101C CORRIDOR: Add one (1) wall mounted clock as shown on Attachment E3.8-1.

Addendum #1 - #57 **SHEET E3.10 SPECIAL SYSTEMS PLAN – FIRST FLOOR – AREA L**

L109 MAIN COMPETITION GYMNASIUM: Remove “D” from two (2) clocks on East and West walls.

L109 MAIN COMPETITION GYMNASIUM: Remove two (2) clocks on North and South walls.

Addendum #1 - #58 **E3.11 SPECIAL SYSTEMS PLAN – FIRST FLOOR – AREA L**

M111 AUXILIARY GYM: Remove “D” from two (2) clocks and substitute “10’-6”

M104 WRESTLING ROOM: Remove “D” from one (1) clock and substitute “8’-2”

M103 WEIGHT ROOM: Remove “D” from one (1) wall mounted clock and substitute “DS” and “8’-2”

SECTION 11 4000

FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. RELATED SECTIONS

1. Tiling - Section 09 3000

2. High Performance Coating Systems - Trowel - Section 09 9610

3. Educational Casework - Section 12 3530

B. WORK BY OTHERS

1. OWNER'S EXISTING FOOD SERVICE EQUIPMENT, Items 158 through 231 shall be relocated as shown on the Drawings by the Food Service Equipment Subcontractor. Items 188, 191, 218, 219, 220, 221, 223 and 224 shall be disconnected (at the existing Kearney High School) and reconnected under Divisions 22, 23 and 26.

2. CONCRETE SLABS AND VAPOR BARRIER for walk-in coolers/freezer insulated slabs shall be furnished and installed under Division 3.

3. ROOF CURBS AND PENETRATION for Remote Refrigeration System (Item 15) shall be furnished and installed under Divisions 5 and 7.

4. WOOD BLOCKING in metal stud walls required for fastening wall mounted units, Items 73, 75, 76, 79, 90 and 215 shall be furnished and installed under Division 6.

5. QUARRY TILE FLOOR AND BASE in walk-in coolers and freezer shall be furnished and installed under Division 9.

6. PLUMBING MATERIALS, including traps, grease traps, stops, and shutoffs, shall be furnished and installed under Division 22.

7. DUCTWORK for Conveyor Oven Exhaust Hood (Item 68) shall be furnished and installed under Division 23.

8. VENTILATING EQUIPMENT, including hoods, ductwork, and fans, shall be furnished and installed under Division 23, unless specified otherwise herein.

9. ELECTRICAL DEVICES, including switches, current protection devices, circuit disconnects, motor starters and fittings shall be furnished and installed under Division 26, unless specified otherwise herein.

10. ROUGHING-IN AND CONNECTING, including material and labor for roughing-in to points shown on Mech. and Elect. Drawings and final connections from rough-in points to equipment items, shall be furnished under Divisions 22, 23 and 26, unless specified otherwise herein.

C. ALTERNATES

1. ALTERNATE NO. 12. Add Food Service Equipment Items 113, 114, and 117 through 153 as specified, under this Alternate.

2. ALTERNATE NO. 13. Add Food Service Equipment Item 154 as specified, under this Alternate.

3. ALTERNATE No. 14. Add Food Service Equipment Item 155 as specified, under this Alternate.

4. ALTERNATE No. 15. Add Food Service Equipment Items 156, 156A and 157 as specified, under this Alternate.

1.3 REFERENCES

A. NSF INTERNATIONAL. Construct equipment in compliance with the standards of the NSF International and in full compliance with Public Health Regulations of the City of Kearney and State of Nebraska. Each piece of equipment shall have the "seal of approval" label of the NSF International.

B. REGULATIONS AND STANDARDS. Construct equipment in compliance with the following applicable codes, regulations, and standards. In case of conflict between the following standards, the most stringent requirements shall govern:

American National Standards Institute (ANSI)
American Society of Mechanical Engineers (ASME)
American Society for Testing and Materials (ASTM)
National Electrical Code (NEC)
National Electrical Manufacturers Association (NEMA)
National Fire Protection Association (NFPA)
Underwriters Laboratories Inc. (UL)

1.4 SUBMITTALS

A. BIDDER QUALIFICATION STATEMENT. After the receipt of the Food Service Equipment Bids, the Architect / Food Facility Consultant may request the Low Bidder to submit a list of completed projects in which the cost of the Food Service Equipment totaled $500,000.00 or more. These projects should have been bid (not negotiated) within the past ten years. Project name, location and project representative contact information shall be included for each project.

B. SUBMIT SHOP DRAWINGS to the Architect-Engineer, within 45 days after award of Contract, in accord with the General Conditions and General Requirements. In addition to electronic files, submit two blue or black-line prints for review. Shop drawings include plans, elevations, and sections drawn at a minimum scale of 3/4 inch and 1-1/2 inches equal to 1 foot respectively. Shop drawings shall show complete details of each item of fabricated equipment; locations, heights, sizes, and capacities of mechanical and electrical rough-ins; special wall openings required where items of equipment extend through walls; and the location of wood blocking required for fastening wall mounted items as noted in Subparagraph 1.2B.4. Shop drawings for walk-in cooler/freezer shall include 3/8 inch scale plan locating all centerlines of treated wood blocking (thermal break) with respect to perimeter walls.

C. EQUIPMENT BOOKLET. Submit to the Architect-Engineer, within 45 days after award of Contract, electronic files of product data accompanied by a typewritten sheet listing item number, item description, quantity, manufacturer's name, model number, accessories, and pertinent notes relative to the item being furnished. In addition to electronic files, submit two sets of hardcopies bound in three ring binders.

D. PLASTIC LAMINATE SAMPLES. Submit a set of four 2" x 3" samples for each of the plastic laminates specified for dishtable conveyor, serving counters, tray counters, mobile silverware dispensers and mobile cashier counters.

E. SOLID SURFACE SAMPLES. Submit a set of four 2" x 2" color samples of both solid surfaces specified for serving counters, tray counters, mobile silverware dispensers, tray slides and mobile cashier counters.

F. TRAY SLIDE MOCK-UP. Submit 12 inch L x 14 inch D full size tray slide mock-up for Serving Counter, Item 98, at exposed end with countertop corner. Sample shall be constructed of specified color, and shall include integral raised ribs as detailed on Sheet FS3.6.

G DOOR PULL SAMPLE. Submit a set of four door pulls as specified for Items 2, 98, 99, 104, 108, 109 and 110.

H. ROUGH-IN VERIFICATION LETTER. Before the concrete floor slabs are poured in areas containing food service equipment, the Construction Manager shall submit, to the Architect-Engineer, a letter from the Food Service Equipment Subcontractor stating that he has visited the site and confirmed that the location and size of all mechanical and electrical rough-ins are installed as required for equipment specified herein.

I. CLOSEOUT DOCUMENTS. Submit to the Architect-Engineer three sets of dimensional prints, maintenance manuals, operating instructions, replacement parts, lists, serial numbers, and warranty and registry cards for each applicable item of equipment. Label and bind in hardback binder.

1.5 QUALITY ASSURANCE

A. REGULATORY REQUIREMENTS: Install equipment to comply with the following:

ASHRAE 15, "Safety Code for Mechanical Refrigeration."
NFPA 54, "National Fuel Gas Code."
NFPA 70, "National Electrical Code."
NFPA 96, "Ventilation Control and Fire Protection of Commercial Cooking Operations."

B. SEISMIC RESTRAINTS: Comply with SMACNA's "Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines," Appendix A, "Seismic Restraint Details," unless otherwise indicated.

C. QUALIFICATIONS OF FABRICATORS

1. PLANT, PERSONNEL AND FACILITIES. Fabricated equipment, such as counters, sinks, tables, etc., described in the following specifications other than by name and catalog numbers, shall be manufactured by an equipment fabricator who has the plant, personnel, and engineering facilities to properly design, detail, and manufacture high quality food service equipment. The fabricator is subject to the approval of the Architect-Engineer. All work in the above category shall be manufactured by one manufacturer, and shall be of standard unit assembly and uniform design and finish.

2. EXPERIENCE OF FABRICATOR. For the past ten years, the fabricator of this equipment shall be engaged in the manufacture or distribution of equipment, as required under the Contract, as his principal product.

D. QUALIFICATIONS OF INSTALLERS

1. EXPERIENCED PERSONNEL. A competent foreman or supervisor and qualified workmen shall be provided for installation of equipment and to counsel with other trades in regard to installation and connections.

E. PRE-APPROVED INSTALLERS

1. COOLER/FREEZER COMPARTMENTS, COOKING, CUSTOM FABRICATION, PREPARATION, SERVING, AND STORAGE EQUIPMENT shall be installed by one of the following:

Institutional Equipment, Inc.	Bolingbrook, IL	(630/771-0990)
North Country Installations	Coon Rapids, MN	(612/751-2462)
Russco Custom Fabrication Inc.	Kansas City, MO	(816/241-8787)
Sunflower Restaurant Supply	Salina, KS	(785/823-6394)

2. DISHWASHING EQUIPMENT shall be installed by Aerowerks Inc., Avtec Ind. or Caddy Corp. as specified in Paragraph 2.7 Itemized Specifications.

1.6 DELIVERY AND STORAGE

A. STORE AND PROTECT EQUIPMENT, when delivered, in a dry and ventilated space to prevent corrosion or other damage. Store materials a minimum of 6 inches above floor on blocking adequate to prevent warpage to equipment.

1.7 WARRANTIES

A. Unless stated otherwise herein, all warranties shall be for one year from the date of start-up and acceptance by the Owner. This shall include parts and labor.

B. Fill out all warranty forms and enclose copies in operations manuals.

1.8 SUBSTITUTIONS

A. SUBSTITUTIONS. To obtain approval to use unspecified products, Bidders shall submit written requests at least ten (10) days before the Bid date and hour. Requests received after this time will not be considered. Requests shall clearly describe the product for which approval is asked, including all data necessary to demonstrate acceptability. If the product is acceptable, the Architect-Engineer will approve in an Addendum issued to Prime Bidders of record.

PART 2 - PRODUCTS

2.1 MATERIALS AND GAUGES FOR FABRICATED ITEMS

A. STAINLESS STEEL shall be Type 304 stainless steel having a standard analysis of 18 percent chrome and 8 percent nickel. Give exposed surfaces a No. 4 or No. 180 grit finish. Where manufacturing process and welding disturb the original finish, carefully regrind stainless steel, polish, and restore to match balance of surface.

B. GALVANIZED IRON shall be tight coat galvanized, copper bearing steel, and shall be used in the largest possible sheets with as few joints as necessary. Unless specified otherwise, spray paint galvanized iron with gray hammerloid enamel.

C. GAUGES OF STAINLESS AND GALVANIZED STEEL shall be as follows:

14 gauge	Sinks, sink inserts and table tops
16 gauge	Legs, elevated shelves, cross rails and drawer fronts
18 gauge	Cabinet bodies, shelves, exterior faces of doors, and drawer bodies and partitions behind doors
20 gauge	Interior faces of doors

2.2 PLUMBING DEVICES

A. FAUCETS, VALVES, FITTINGS, AND SIMILAR ITEMS shall be furnished and installed by the Food Service Equipment Subcontractor as specified in the Itemized Specifications. Where lever handle drains are specified, they shall be 2 inch chrome-plated brass drains with stainless steel strainers and steel rod lever handles for opening and closing drains. Securely brace handle rods to sink bottoms. Fit sinks with tailpieces.

2.3 ELECTRICAL EQUIPMENT AND DEVICES

A. RECEPTACLES, SWITCHES, AND CONTROLS in fabricated equipment items shall be factory installed and of the proper type in accordance with the National Electrical Code. All devices shall be listed or recognized by Underwriters' Laboratories, Inc. Set controls, that are mounted on vertical surfaces of fabricated fixtures, into recessed die-stamped stainless steel cups or otherwise indent to prevent damage.

B. INTERNAL WIRING for fabricated equipment items shall be factory installed, with all items wired complete to a junction box within the fixture, or to devices as specified in the preceding paragraph, ready for final connections by the Electrical Subcontractor to building lines. Protect internal wiring in metal enclosures which meet the requirements of National Electrical Code. All receptacles shall be grounded type, listed by Underwriters' Laboratories and approved for use by the National Electrical Code.

2.4 FABRICATION

A. FABRICATED EQUIPMENT, such as counters, sinks, tables, etc. described in the following specifications other than by manufacturer and model, shall be manufactured by one of the following fabricators:

Institutional Equipment, Inc.	Bolingbrook, IL
MCM Stainless Fabricating Inc.	Hazel Park, MI
Russco Custom Fabrication Inc.	Kansas City, MO

B. WELDING. Welded parts shall be nonporous, free of imperfections, pits, cracks, or discoloration. Welds of galvanized metal shall be ground smooth, sandblasted, and sprayed with molten zinc at 1,200°F to a thickness of .004 inch. Thinning of welds is not acceptable. Grind and polish welds of stainless steel to the original finish.

C. FIELD JOINTS. Locate field joints for practical construction consistent with sizes convenient for shipping and accessibility into the building. Carefully shear field joints in tops so they are tightly butted and fully welded on the job, with welds ground and polished smooth, to match the balance of equipment.

D. PIPE STANDS AND FRAMES. Fabricate pipe stands and frames from stainless steel tubing. Legs shall be constructed from 1-5/8 inch diameter tubing and cross rails from 1-1/4 inch diameter tubing. Locate cross rails with centerlines 10 inches above floor. Anchor legs to closed gussets at the tops only. Provide cross rails at all pipe stands, except omit rear cross rails directly below all sink and disposer cone locations. Provide front cross rails at sink locations. Finish off pipe leg bottoms smoothly and overlap stems of feet resulting in a sanitary fitting preventing the accumulation of grease or other foreign matter.

E. FEET AT PIPE STANDS shall be sanitary die-stamped stainless steel, bullet shaped feet, fully enclosed, with slightly rounded bottoms. Fit the tops of these feet with male threaded stems to fit into the pipe legs and provide 1 inch of adjustment. Stems shall be extra long so threads are not exposed.

F. FEET AT CABINET TYPE FIXTURES shall be 6 inch high stamped, one-piece stainless steel feet not less than 3 inches in diameter at the top. The bottom adjusting member shall telescope into upper member, shall match adjuster at pipe stands, and shall provide a 1 inch adjustment. Stamp the upper part of feet in a neat design with flared inverted shoulders and weld to a stainless steel base plate which is anchored to channel braces below cabinet type fixtures.

G. TABLE TOPS shall be stainless steel with horizontal and vertical interior corners coved on 3/8 inch radius. Turn tops straight down 1-3/4 inches, with 1/2 inch 45 degree toe-in, except where adjacent to walls or other pieces of equipment. Turn wall side up 6 inches, back 1 inch at a 45 degree angle, and down 1/2 inch unless shown or specified otherwise. Weld shop seams and corners, grind smooth, and polish. Reinforce working tops on the underside with a framework of 1-1/2 inch x 1-1/2 inch x 1/8 inch galvanized angles. Place cross angle members at each pair of legs and additional cross angle members between legs on approximately 24 inch centers. Provide one angle runner, running lengthwise, on the tops up to 30 inches wide; two shall be provided on tops over 30 inches. Reinforce tops so there is not any noticeable deflection with reinforcements stud welded to underside of top. No rivets or bolts shall be used through the top. Sound deaden the top of bracing with mastic, at contact locations with the underside of tops.

H. ENCLOSED BASE CABINET BODIES shall be stainless steel. Partitions exposed because of open front or bases shall be of the same material as cabinet bodies. Partitions which are semi-exposed behind doors shall be of stainless steel. Reinforce bases at the top with a framework of 1-1/2 inch x 1-1/2 inch x 1/8 inch galvanized angles on approximately 24 inch centers. Reinforce the body with channels and gussets, where necessary. Round free corners of enclosed bodies on a 5/8 inch radius and fabricate corners square against walls and other fixtures.

.1 In the Case of Fixtures Fitting Against or Between Walls, set the bodies in 1 inch from the wall line, but extend the tops back to wall line. This permits adjustment to wall irregularities. Provide a vertical trim strip of the same material as the body at the end or rear of the fixture to close the gap between body and wall.

I. CABINET BODIES, which set on stainless steel channel bases, shall overhang bases to provide toe spaces with framework, and body material shall be turned under to overlap the bases without openings.

J. WALL CABINET BODIES shall be stainless steel, with tops sloped upward 4 inches from front to rear with all edges turned down 1-1/2 inches and fitted snugly over body. Partitions shall be as specified for base cabinet bodies. Enclose the bottom of wall cabinet body to form a flush surface.

K. SLIDING DOORS shall be of stainless steel, double pan construction, with 3/4 inch thick sound-deadening fiberglass between the two thicknesses of metal, and shall operate on top hung ball bearing rollers. Bottom edge of doors shall be square and fitted with a guide groove which rides in a stainless steel channel at the center point of doors. Fit doors with stops. Handles shall be die-stamped, recessed stainless steel.

L. DRAWERS. Die stamp drawer bodies from one piece of stainless steel, size as shown or specified. Top edges of drawer shall be flanged out 1/2 inch. Interior horizontal corners shall be rounded on a 1 inch radius. Drawer body shall set in channel frame so it can be removed for cleaning. Drawer face shall be stainless steel flat face, with formed handle. Weld drawer face to supporting channel frame, and fit with steel ball bearing rollers. Furnish built-in stops on each drawer. Enclose drawers on open base tables in 18 gauge housing to make vermin proof.

M. UNDERSHELVES in open base tables shall be solid stainless steel, made in removable sections with rolled down edges on sides overlapping pipe cross rails where they abut same. Turn down abutting sections of shelves 1 inch straight.

N. INTERIOR SHELVES in cabinet bodies shall be stainless steel, solid, nonremovable, with ends and backs turned up 1-1/2 inches and welded against the body of fixture. Turn down the front edge 1-1/2 inches and under 1/2 inch. Further brace shelves with longitudinal centered 1-1/2 inch x 1-1/2 inch x 1/8 inch angles.

O. ELEVATED SHELVES shall be of stainless steel with edges and brackets as per Itemized Specifications. Shelves attached to wall shall be supported by stainless steel gusset brackets.

P. SINKS shall be 37 inches high at top of front edge and 46 inches high at top of backsplash, with length and depth as shown or specified. Fabricate sink from stainless steel with backs, bottoms, and fronts formed from one continuous sheet with ends welded in place. Form partitions for multiple compartment sinks from double thickness stainless steel with the top of partition welded, ground, and polished. Top edges of sinks at front and ends, except where fitted with integral drainboards, shall have die-formed integral sanitary semi-roll rims. Cove vertical and horizontal corners to a 5/8 inch radius. Mount sinks on pipe stands. Unless shown or specified otherwise, sink backs and ends at walls or high fixtures shall have 12 inch high x 2 inch thick backsplashes, with tops turned back at a 45 degree angle and ends enclosed. Provide two faucet holes on 8 inch centers over the centerlines of partitions between compartments, 2-1/2 inches down from the top of the backsplash.

Q. SINK INSERTS shall be one-piece deep drawn stainless steel construction. Weld sinks integral with countertops with no lap between. Sizes are as shown or specified.

R. SINK DRAINBOARDS shall be of stainless steel and welded integral to sinks. Drainboards shall have 2 inch high rims with die-formed integral rolled edges to match sink edges. Cove horizontal and vertical corners to a 5/8 inch radius. Solder filleting of these corners is not accepted. Pitch drainboards to properly drain into sink. Unless shown or specified otherwise, drainboards shall have backsplashes at backs and ends against walls or high fixtures. Reinforce drainboards with stainless steel channel bracing. Sound deaden the top of bracing with mastic, at contact locations with the underside of drainboards. Backsplashes shall match backsplashes at sinks and be welded integral with splash of sink compartment with ends enclosed.

S. PIPE CHASES. Where the top arrangement of enclosed cabinets makes it necessary for supply and waste piping to pass through the base, enclose piping in suitable pipe chases. Where access to chases is required from the front of the fixture, provide chases with access panels formed in a pan shape and removable without tools. Access panels held in place with screws or latches are not permitted. Unless shown or specified otherwise, pipe chases at the ends of fixtures need not be enclosed; however, turn shelves up 3 inches at the edges of such chases. Omit cabinet bottom at locations behind access panel.

2.5 SOLID SURFACE FABRICATIONS

A. SOLID SURFACE shall be Corian Surfaces as manufactured by DuPont.

B. MATERIAL. Homogeneous filled acrylic; not coated, laminated or of composite construction; meeting ANSI Z124.3 and Z124.6, Type Six, and Fed. Spec. WW-P-541E/GEN.

1. Colors shall be as follows:

SS-1 Not used in Section 11 4000

SS-2 Graylite

SS-3 Natural Gray

2. Superficial damage to a depth of 0.010 inch shall be repairable by sanding and polishing.

C. CAFETERIA COUNTERTOPS. 1/2 inch thick Corian, adhesively joined with inconspicuous seams, edge details as shown on Sheets FS3.4, FS3.5 and FS3.6.

1. Make cutouts for drop-in Items 100, 102 and 144 furnished by the Food Service Equipment Subcontractor. In addition, cut openings for breath shield posts on Items 101 and 103.

2. Reinforce joints and cutouts as recommended by the surfacing manufacturer.

3. Provide Nomex Insulation between Corian and adjacent cold pans.

4. Provide Nomex Insulation between Corian and adjacent food warmers.

D. CAFETERIA TRAY SLIDES. Top constructed of 1/2 inch thick Corian. Edge details shall be constructed of 1/2 inch thick Corian as shown on Sheets FS3.5 and FS3.6.

E. JOINT ADHESIVE. Manufacturer's standard two-part adhesive kit to create inconspicuous, non-porous jointed, with chemical bond.

F. FABRICATION

1. FABRICATIONS shall be performed by a Certified Corian fabricator/installer. Submit the name of the fabricator/installer, for approval, to the Architect prior to submitting shop drawings.

2. FABRICATE COMPONENTS in shop to greatest extent practical to sizes and shapes shown, in accordance with approved shop drawings and DuPont requirements.

3. FORM JOINTS between components using manufacturer's standard joint adhesive. Joints shall be inconspicuous in appearance and without voids. Attach 2 inch wide reinforcing strip of Corian under each joint.

4. PROVIDE HOLES and cutouts for food service equipment and accessories as shown on the drawings.

5. ROUT AND FINISH component edges to a smooth, uniform finish. Rout all cutouts, then sand all edges smooth. Repair or reject defective or inaccurate work.

6. FINISH. All surfaces shall have uniform semigloss finish, with a gloss rating of 25-50.

7. COVE TRAY SLIDES. Fabricate 3/16 inch radius cove at intersection of Corian counters and tray slides. Form other radiuses as shown on the Drawings. Fabricate in shop and field as required.

G. ALLOWABLE TOLERANCES

1. Variation in component size: ± 1/16 inch

2. Location of openings: ± 1/8 inch from indicated location

2.6 WALK-IN COOLER/FREEZER INSULATION

A. EXTRUDED POLYSTYRENE INSULATION for floor construction for Items 13, 16, 17 and 18 shall be manufactured by one of the following manufacturers:

Certifoam 25 (two 2 inch thick layers)	DiversiFoam Products, Rockford, MN
Foamular 400 (two 2 inch thick layers)	Owens Corning, Toledo, OH
Square Edge (two 2 inch thick layers)	Dow Chemical, Midland, MI

Ship insulation to job site prior to walk-in cooler/freezer assembly as per Construction Manager's request.

2.7 ITEMIZED SPECIFICATIONS

ITEM 1 MOBILE SILVER SOAK SINK
Advance Tabco 9-FMS-20
26L x 34H x 26D
Finish: stainless steel
Twist Handle Lever Drain with Tailpiece
Corner Bumpers: 9-SS-2
Swivel Casters: 5 inch, two with brakes

ITEM 2 SOILED DISHTABLE WITH CONVEYOR
Aerowerks Inc., Avtec Conveyor Systems or Caddy Corp.
Construct unit as detailed on Sheet FS3.7.
Dishtable Top: 14 gauge stainless steel
Provide 2 inch W x 2-1/2 inch H flat (box) edge
Table surface to be 34 inches above floor.
Sound deaden the top of stainless steel bracing with mastic tape, at contact locations with the underside of top.
Construct length of unit, at enclosed ends, to prevent any space between unit and wall from exceeding 3/16 inch.
Conveyor Slat Belt: Gray, 26 feet L x 10 inches W (for 12 x 16 trays)
Provide continuous weld between flange of disposer reservoir (Item 4) and dishtable
Provide silverware magnet below trough.
Pre-Rinse Sink: 20L x 20W x 8H, with removable perforated basket and rack guides. Center sink 14-5/8 inches from front face of backsplash
Quick Drain: full length x 5W x 2D with 1-1/2 inch open drain, removable strainer basket, and stainless steel rods across top for slides
Four Wastes: 1-1/2 tailpiece
Provide one hinged and four removable closure panels, (3/4 inch plywood) covered with Wilsonart 4941K-18 Cosmic Strandz, vertical grade plastic laminate, as shown on Detail C, Sheet FS3.7. Plastic laminate to be installed with vertical grain.
Removable closure panels shall be provided with stainless steel "Z" clips.
Door Pull shall be Component Hardware Group P45-4000, satin chrome finish.
Watertight Control Panel with Line Disconnect
Manufacturer shall prewire anti-jam switch (at west end of conveyor) to control panel.
208 volt, single phase, 3/4 hp
Submit shop drawing of unit.
Unit shall be field installed by Aerowerks, Avtec or Caddy.
Factory Demonstration / Instruction
Submit sample of slat belt for approval.

ITEM 2A REMOVABLE TROUGH COVER (TWO REQUIRED)
Aerowerks Inc., Avtec Conveyor Systems or Caddy Corp.
20L x 10W
Tack weld clips to bottom of cover for positioning over trough.
Perforated surface for drainage.
Submit shop drawing of unit.

ITEM 3 SLIDING SECURITY DOOR
Aerowerks Inc., Avtec Conveyor Systems or Caddy Corp.
Door shall be 18 gauge stainless steel, double pan insulated (non-rated) construction.
Track shall be mounted on east wall of Room K117.
Latch mechanism shall be accessible from Room K117.
See Section 1, Sheet FS3.7, for wall opening height
Submit shop drawing of unit.
Unit shall be field installed by Aerowerks, Avtec or Caddy.

ITEM 4 TROUGHVEYOR DISPOSER
Salvajor Trough-veyor TVL-300
Left Hand Operation
NEMA 4 Control Panel: Pre-wired with Line Disconnect
Trough Diffuser
Gusher Head Assemblies: two, No. 988001
Automatic Water Blender
Solenoid Valves
Check Valves
Backflow Prevention Device
208 volt, 3 phase, 12.64 amps, motors (3 hp disposer, 3/4 hp pump and 1/6 hp separator)
Ship unit to Aerowerks, Avtec or Caddy for factory installation/welding of unit to Soiled Dishtable (Item 2).
Factory Demonstration / Instruction

ITEM 4A GUSHER HEAD ASSEMBLY (TWO REQUIRED)
Item furnished with Item 4 Troughveyor Disposer.

ITEM 5 SORTING RACK SHELF (TWO REQUIRED)
Eagle 606301
42L x 12H x 15-1/2D
Welded Tubular Construction
Mounting Height: bottom of rack 52 inches A.F.F.

ITEM 6 SPARE NUMBER

ITEM 7 PRE-RINSE ASSEMBLY
T and S Brass B-0113-01BY or Chicago Faucet 919
Wall Bracket
Brush Attachment: T and S Brass, BR-10
Yoke Connection

ITEM 8 CONVEYOR DISHWASHER
Hobart CLPS86e
Hot Water Sanitizing
Power Scrapper: upper and lower wash arms
Left to right Operation
Standard Chamber Height: 19-1/2 inches
Single Point Electrical Connection: for tank heat and motors
Vent Fan Control
Automatic Fill
Insulated Hinged Doors
Frame, Legs, and Feet: stainless steel
Bottom Panel: stainless steel, at front and ends
Splash Shields: stainless steel
Tank Heaters: electric immersion with thermostat and low water protection
Extended Hood: one, stainless steel, 4 inch x 16 inch vent connection and locking damper for entrance end.
Table Limit Switch: installed at right end of Clean Dishtable (Item 9).
Plastic Racks: nine PEG
three COM
three BUNPAN-RACK
Common Drain Connection
Maximum Final Rinse Flow: 132 gph
Energy Star Qualified
480 volt, 3 phase, motors (2 hp prewash, 2 hp wash, 2 hp power rinse and 1/6 hp drive) heaters (one @ 15 kw and one @ 10 kw)
Unit shall be field installed by Aerowerks, Avtec or Caddy.
Factory Demonstration / Instruction

ITEM 8A BLOWER DRYER
Hobart CLe all electric
Left to right Operation
Chamber: 33-1/4L
Blower: 2 hp
Electric Heat: 10 kw
Vent: stainless steel, 4 inch x 16 inch with locking damper
Drain: 1 inch
Install on right end of Item 8.
480 volt, 3 phase, 15.7 amps
Unit shall be field installed by Aerowerks, Avtec or Caddy.
Factory Demonstration / Instruction

ITEM 9 CLEAN DISHTABLE
Aerowerks, Inc., Avtec Conveyor Systems or Caddy Corp.
90L x 37H x 30D
Construct unit as detailed on Sheet FS3.7.
Dishtable Top: 14 gauge stainless steel
Provide 2 inch W x 2-1/2 inch H flat (box) edge
Table surface to be 34 inches above floor at left (dishwasher) end.
Sound deaden the top of stainless steel bracing with mastic tape, at contact locations with underside of top.
Legs: two pair
Removable Undershelf: 36L, right end
Provide mounting brackets and reinforcement at underside of dishtable for Booster Heater (Item 10).
Provide opening for table limit switch at right end, per Hobart's recommendation. Limit switch furnished with Item 8.
Submit shop drawing of unit.
Unit shall be field installed by Aerowerks, Avtec or Caddy.

ITEM 10 BOOSTER HEATER
Hatco C-18
Castone Tank
Brass Pressure Reducing Valve
Slide Mounting Brackets
Omit Legs
480 volt, 3 phase, 18 kw
Mount to underside of Clean Dishtable (Item 9).

ITEM 11 EQUIPMENT WASHER
T and S Brass B-2117
Vacuum Breaker
Soap Injector
Mounting height for supply connection shall be 47 inches A.F.F.

ITEM 12 INSECT LIGHT TRAP (TWO REQUIRED)
Gilbert 220 Guerrilla (800/643-0400)
29-1/8L x 13-3/4H x 7-3/4D
Wall Mounted
Finish: anodized aluminum
Interlock Switch
Warranty: 5 year
Cord and Plug
120 volt, single phase, .52 amps
Mounting Height: top of unit 96 inches A.F.F.

ITEM 13 WALK-IN DISTRIBUTION FREEZER

Thermo-Kool or American Panel
Single Compartment
NSF Listed
19 feet 3 inches W x 9 feet 3 inches H x 15 feet 5 inches D
Insulation: foamed-in-place urethane
Flat Bottom Wall Panel Construction
Panel Thickness: 5 inch ceiling panels
4 inch (R-32) wall panels
Panel Finish:
Exposed exterior: .040 stucco aluminum painted white
Unexposed exterior: stucco galvanized or acrylume
Interior walls: .040 stucco aluminum painted white
Interior ceiling: .040 stucco aluminum painted white
Ceiling Support: external self support steel channels, with load bearing angles above perimeter walls as required (no hanger rods). Exposed roof structure above Distribution Freezer (no horizontal closure panel above compartment).
Entrance Door: located as shown on Sheet FS3.1
42 inches x 80 inches, solid, furnished with 3 hinges. Door Handle shall be a Kason 27C.
Cylinder locks for Items 13, 16, 17 and 18 shall be keyed alike.
Provide backing inside door section for mounting Item 14.
Kick Plate: 1/8 inch thick aluminum (diamond tread) plate, 36H, mounted at interior and exterior of door plug.
Posi-Seal Door Closure
Vinyl Bumper: one, 2 inch diameter
Heated Door Threshold: stainless steel
Continuous Attachment Angle: Walk-in manufacturer shall furnish 1-1/2 x 1-1/2 inch stainless steel angle with low profile drive studs and screws for securing wall panels to floor. Fill voids, between wall panels and floor with pressure spray foam, prior to installing attachment angle.
Floor Construction: insulated concrete slab. Extruded polystyrene insulation for slab shall be furnished by walk-in manufacturer. See Paragraph 2.6A and details on Sheet FS3.2.
Refrigeration System: see Items 15 and 15D.
Digital Light / Temperature Monitor: one, Modularm 75LC or American Panel System 100, with separate connection contacts for remote monitoring system. Furnish and install a set of flush mounted magnetic light switch, MC-1F, at each door. Freezer shall operate at -10°F. Freezer High / Low Temperature Alarm shall be set at +10°F (high) and -20°F (low).
Provide two (2) additional wires within door section switch box to enable separate circuits for door heat tape and vaporproof ceiling lights.
LED Vaporproof Lights: seven (six ceiling mounted 48 inch L fixtures and one wall mounted globe), 120 volt
Heated Pressure Relief Port
Trim Strips: stucco aluminum painted white, at space between unit and wall
NSF Coved Base: 4 inch H stainless steel, at exposed exterior on south and east sides. Provide 90° mitred ends of base at southeast corner of compartment.
Stainless Steel Bumper Rails: 8H x 2D at exterior and interior walls as noted and detailed on Sheet FS3.1. See Detail A on Sheet FS3.2.

ITEM 14 HINGED VINYL DOOR

CCI Clear Vu Swinging Door SS-4280-LT Modified
Two Panels
Low Temperature Application
Clear Vinyl Thickness: .125 inch
Impact Panels: PAN 2336 (both sides)
Stainless Steel Hardware: ten year warranty
Standard Bracket Assembly
Verify freezer door opening size (width and height) before ordering.

ITEM 15 REMOTE REFRIGERATION SYSTEM

rdt (Refrigeration Design Technologies) ZS1-4 Eco-Smart (Project 16775)
120L x 30H x 40W
Outdoor, Air Cooled
Fused Disconnect
208 volt, 3 phase, 68.6 amps
Unit shall include the following scroll compressors for each of the respective systems:

Item 15A	ZS13KAE	1.8 hp	208 volt, 3 phase, 11.6 amps
Item 15B	ZS15KAE	2.0 hp	208 volt, 3 phase, 12.5 amps
Item 15C	ZF15K4E	5.0 hp	208 volt, 3 phase, 20.8 amps
Item 15D	ZF18K4E	6.0 hp	208 volt, 3 phase, 23.7 amps

All compressor systems shall be furnished with factory installed crankcase heaters and headpressure controls.
Low temperature system shall be furnished with factory installed suction line accumulator.
All evaporator coils shall be furnished with matching thermostats, solenoid valves, and expansion valves factory installed.
All evaporator coils shall be powered through building circuit breaker panel (house circuit).
All interconnecting refrigeration piping and insulation shall be furnished and installed by the Food Service Equipment Subcontractor. Install piping from north side of unit down through roof and into steel joist web space. Route piping to Items 15A, 15B, 15C and 15D horizontally through joist above bottom chord of joist and drop down vertically directly above connection point. All piping joints shall be brazed (not soldered), and pressure tested. Coordinate size and location of pipe penetration with Construction Manager.
All refrigeration piping shall be sized in accordance with requirements by rdt.
All refrigeration piping insulation routed inside building shall comply with ASTM E-84 (flame spread – 25/smoke density – 50).
Compressor Warranties: five year
Enclosure finish shall be pre-assembled stainless steel.
Install unit with the Air In-take located on north side and refrigeration piping exiting north side of unit.
Submit shop drawing of unit.

ITEM 15A EVAPORATOR COIL

rdt ADT-140
R-404A Refrigerant
Temperature control shall be set at 38°F
Off-Cycle Defrost Time Clock
Condensate Drain: provide 3/4 inch copper drain, routed through common wall partition and connect to cook's cooler condensate drain, as shown on Sheet FS3.1.
115 volt, single phase, 2.7 amps

ITEM 15B EVAPORATOR COIL

rdt ADT-180
R-404A Refrigerant
Temperature control shall be set at 35°F
Off-Cycle Defrost Time Clock
Condensate Drain: provide 3/4 inch copper drain, routed to floor sink in northeast corner of Room K127, as shown on Sheet FS3.1. Allow adequate slope for condensate drains from Items 15A and 15C. Extend drain through west cooler wall and concrete block wall at 8" A.F.F.
115 volt, single phase, 2.7 amps

ITEM 15C EVAPORATOR COIL

rdt LET-180
R-404A Refrigerant
Temperature control shall be set at -10°F
Eco-Smart Controller ("on demand" electric defrost) located in Item 15

Drain Line Heater
Condensate Drain: provide 3/4 inch copper drain, with heat tap and insulation, routed through common wall partition and connect to cook's cooler condensate drain as shown on Sheet FS3.1.
208 volt, single phase, 15.7 amps

ITEM 15D EVAPORATOR COIL
rdt LET-240
R-404A Refrigerant
Temperature control shall be set at -10°F
Eco-Smart Controller ("on demand" electric defrost) located in Item 15
Drain Line Heater
Condensate Drain: provide 3/4 inch copper drain, with heat tape and insulation, routed to floor sink in northwest corner of Room K125, as shown on Sheet FS3.1. Extend drain through wall panel 8" A.F.F.
208 volt, single phase, 23.5 amps

ITEM 16 WALK-IN COOK'S FREEZER
Thermo-Kool or American Panel
Three-Compartment, side by side
NSF Listed
28 feet 10 inches W x 9 feet 3 inches H x 19 feet 8-3/4 inches D
Inside Cook's Freezer Width: 8 feet 2 inches
Inside Cook's Cooler Width: 11 feet 2 inches
Inside Produce Cooler Width: 8 feet 2 inches
Insulation: foamed-in-place urethane
Flat Bottom Wall Panel Construction
Panel Thickness: 5 inch ceiling panels
4 inch (R-32) wall panels
Panel Finish:
Exposed exterior: .040 stucco aluminum painted white
Unexposed exterior: stucco galvanized or acrylume
Interior walls: .040 stucco aluminum painted white
Interior ceiling: .040 stucco aluminum painted white
Entrance Doors: located as shown on Sheet FS3.1
Freezer: 36 inches x 80 inches, solid, furnished with 3 hinges. Door handle shall be a Kason 27C.
Cook's Cooler: 42 inches x 80 inches, with view window (14 x 14), furnished with 3 hinges. Door handle shall be a Kason 27C.
Produce Cooler: 36 inches x 80 inches, with view window (14 x 14), furnished with 3 hinges. Door handle shall be a Kason 27C.
Cylinder locks for Items 13, 16, 17 and 18 shall be keyed alike.
Provide backing inside door section for mounting Items 19, 20 and 21.
Kick Plates: at coolers and freezer
1/8 inch thick aluminum (diamond tread) plate, 36H mounted at interior and exterior of door plug.
Posi-Seal Door Closures
Vinyl Bumper: two, 2 inch diameter, at Freezer and Cook's Cooler doors
Heated Door Thresholds: stainless steel (at coolers and freezer)
Continuous Attachment Angle: Walk-in manufacturer shall furnish 1-1/2 x 1-1/2 inch stainless steel angle with low profile drive studs and screws for securing wall panels to floor. Fill voids, between wall panels and floor with pressure spray foam, prior to installing attachment angle.
Floor Construction: insulated concrete slab. Extruded polystyrene insulation for slab shall be furnished by walk-in manufacturer. See Paragraph 2.6A and details on Sheet FS3.2.
Refrigeration Systems: see Items 15, 15A, 15B and 15C.
Digital Light / Temperature Monitors: three, Modularm 75LC or American Panel System 100, with separate connection contacts for remote monitoring system. Furnish and install a set of flush mounted magnetic light switch, MC-1F, at each door. Freezer shall operate at -10°F. Freezer High / Low Temperature Alarm shall be set at +10°F (high) and -20°F (low).
Provide two (2) additional wires within door section switch box to enable separate circuits for door heat tape and vaporproof ceiling lights.

LED Vaporproof Lights: thirteen (three and four ceiling mounted 48 inch L fixtures and one wall mounted globe in each cooler, as shown on Sheet FS1.1, and three ceiling mounted and one wall mounted in cook's freezer), 120 volt
Closure Panel: stucco aluminum painted white, above unit to extend from top of unit to 2 inches above 9 foot 4 inch ceiling. Brace panel with channel knee braces as required.
Heated Pressure Relief Port: at freezer
Trim Strips: stucco aluminum painted white, at space between unit and wall
Stainless Steel Bumper Rails: 8H x 2D at exterior and interior walls as noted on Sheet FS3.1. See Detail A on Sheet FS3.2.
Install east face of walk-in freezer to align with face of adjacent wall.

ITEM 17 WALK-IN COOK'S COOLER
Included with Item 16 above.

ITEM 18 WALK-IN PRODUCE COOLER
Included with Item 16 above.

ITEM 19 HINGED VINYL DOOR
CCI Clear Vu Swinging Door SS-3680-LT Modified
Two Panels
Low Temperature Application
Clear Vinyl Thickness: .125 inch
Impact Panels: PAN 2336 (both sides)
Stainless Steel Hardware: ten year warranty
Standard Bracket Assembly
Verify freezer door opening size (width and height) before ordering.

ITEM 20 HINGED VINYL DOOR
CCI Clear Vu Swinging Door SS-4280 Modified
Two Panels
Medium Temperature Application
Clear Vinyl Thickness: .125 inch
Impact Panels: PAN 2336 (both sides)
Stainless Steel Hardware: ten year warranty
Standard Bracket Assembly
Verify cooler door opening size (width and height) before ordering.

ITEM 21 HINGED VINYL DOOR
CCI Clear Vu Swinging Door SS-3680 Modified
Two Panels
Medium Temperature Application
Clear Vinyl Thickness: .125 inch
Impact Panels: PAN 2336 (both sides)
Stainless Steel Hardware: ten year warranty
Standard Bracket Assembly
Verify cooler door opening size (width and height) before ordering.

ITEM 22 SPARE NUMBER

ITEM 23 WORK TABLE
132L x 34H x 30D
Open Base
Legs: four pair
Two Drawers: 20W x 5D, one centered 27 inches from each end
Removable Undershelf: 48L, at each end
No Front Rail: at center 30 inch section (space for waste receptacle), rear rail only

ITEM 24 WALL SHELF
Advance Tabco WS-10-48 or Low Temp Industries WSF-40
48L x 8H x 10D
Edges rolled down at front with square closed ends.
Finish: stainless steel
Mounting Height: top of shelf 54 inches A.F.F.

ITEM 25 MANUAL TRAY SEALER
140 Packaging DC-ISP (770/597-0963)
21-1/2L x 11H x 9-1/2W
Programmable Heat Settings: preset in factory
Maximum Tray Size: 9-7/8L x 6-7/8W x 4H
Furnish the following seal pockets:
one SP-ISP-W101
one SP-ISP-275B
Demonstration Video
Cord and Plug
120 volt, single phase, 700 watts

ITEM 26 PREPARATION SINK
128L x 34H x 30D
Open Base
Left Counter Section: 42L, no front rail
Left Compartment: 20L x 6H x 20D
Right Compartment: 24L x 12H x 20D
Legs: four pair
One Drawer: 20W x 5D, with lock, centered 21 inches from right end
Removable Undershelf: 36L, located on right side of sinks
Faucet: T and S Brass B-1122 or Chicago Faucet 527-L9
One Waste: 2 inch brass with lever handle drain
Counter shall have a 3/8 inch inverted vee marine edge at front and right end.
Provide 2 inch thick backsplash to accommodate disposer vacuum breaker.
Provide hole for deck mounted Pre-Rinse Assembly (Item 28) behind right sink compartment.
Provide stainless steel mounting bracket for disposer switch (Item 27) at the left side of sink.
Provide white polyethylene portable cutting board (18W x 24D x 3/4T) and stainless steel holder slide angles mounted below drawer housing.

ITEM 27 DISPOSER
Salvajor 150-SA-6 1/2 or In-Sink-Erator SS-150-7
Sink Collar Adaptor Assembly with Stopper
Start/Stop Push Button Magnetic Switch with Line Disconnect: MSSLD7 or MSLV
Polished Housing (no paint)
208 volt, 3 phase, 1-1/2 hp

ITEM 28 PRE-RINSE ASSEMBLY
T and S Brass B-0113-01BY or Chicago Faucet 919
Wall Bracket
Yoke Connection

ITEM 29 KNIFE HOLDER
Edlund KR-699
12L x 12H x 2-5/8D
Protective Skirt
NSF Certified
Mounting Height: top of unit 54 inches A.F.F.

ITEM 30 WALL SHELF
Advance Tabco WS-10-36 or Low Temp Industries WSF-30
36L x 8H x 10D
Edges rolled down at front with square closed ends.
Finish: stainless steel
Mounting Height: top of shelf 54 inches A.F.F.

ITEM 31 WALL SHELF
Advance Tabco MS-18-24 or Channel MWS1824
24L x 12H x 18D
Mounting height: bottom of shelf 50 inches A.F.F.

ITEM 32 SPARE NUMBER

ITEM 33 REACH-IN REFRIGERATOR
Traulsen AHT232WUT-HHS or Continental DL2RE-SA-HD
Self-contained, front opening
Expansion Valve System
Doors: four hinged half height solid
Locks for Items 33 and 72 shall be keyed alike.
Swivel Casters: 6 inch, two with brakes
Wire Shelves: twelve
Exterior Digital Thermometer
Exterior Finish: stainless steel
Interior Finish: aluminum
Compressor Warranty: 5 year
Energy Star Qualified
115 volt, single phase
Items 33 and 72 shall be furnished by same manufacturer.

ITEM 34 PRODUCE WASHER
Power Soak Systems Produce Soak 50PSP84R4B1
84L x 35-1/2H x 30D
NSF approved
14 gauge stainless steel construction
Wash Tank: 36L, four bay with four washing baskets
Left Drainboard: 30L
Right Drainboard: 18L
On/Off Control: PS-50
One Faucet with Pre-Rinse Spray Assembly
One Waste: rear exit stainless ball valve drain
Wash Pump: 3/4 hp
Warranty: 3 year
Factory Demonstration / Instruction: 2 hours minimum
208 volt, single phase, 5.2 amps
Submit shop drawing of unit

ITEM 35 SPARE NUMBER

ITEM 36 SPARE NUMBER

ITEM 37 WALL MOUNTED UTENSIL RACK
Advance Tabco SW-24
24L x 12H x 12D
Finish: stainless steel
Pot Hooks: twelve
Mounting Height: top of unit 88 inches A.F.F.

ITEM 38 SINK WORK TABLE
96L x 34H x 30D
Enclosed Body
Legs: 6 inch, four pair
Sink: 16L x 12H x 20D, centered 14 inches from right end
Faucet: T and S Brass B-1122 or Chicago Faucet 527-L9
One Waste: basket strainer with 1-1/2 inch tailpiece
Three Drawers: 20W x 5D, stacked vertically at left end
Intermediate and Bottom Undershelves: 30L, open on middle section (no doors)
Access Panel: 31L, below sink

ITEM 39 HOT WATER DISPENSER
Hatco AWD-12
13-3/8L x 28-1/16H x 27-1/2D
Temperature Setting: 195° F
Tank: 12 gallon, stainless steel with manual drain
Legs: 4 inch
Inlet Tubing: 1/4 inch x 120 inches L
Rubber Drain Hose: 36 inches L
Cord and Plug: NEMA 6-30P (90° plug)
208 volt, single phase, 5 kw, 24 amps

ITEM 39A WATER FILTER ASSEMBLY
Hatco AWD-FILTER
for cold water only
Mount unit below countertop, behind access panel on Item 38

ITEM 40 SPARE NUMBER

ITEM 41 MOBILE PASS-THRU HOT CABINET
Winston Industries CVAP HA4522-PTW-HR-3 Modified
29-1/2W x 73-3/4H x 37-5/8D
Electronic Differential Control: located for visibility from Room K133 (Hot Prep) side
Radial Fan
Pass-Thru
Doors: two right hinged half height with windows on Room K133 (Hot Prep) side
two right hinged half height solid (no windows) on Room K135 (Staging) side
Solid Universal Angles: stainless steel, fourteen pair
Full Perimeter Bumper Guard
Swivel Plate Casters: 3 inch, two with brakes
120 volt, single phase, 2.32 kw
Factory Demonstration / Instruction

ITEM 42 SINK WORK TABLE
90L x 34H x 30D
Open Base
No Front Rail: at right 52 inch section (space for waste receptacle)
Legs: three pair
Sink: 16L x 12H x 20D, centered 14 inches from right end
Faucet: T and S Brass B-1122 or Chicago Faucet 527-L9
One Waste: 2 inch brass with lever handle drain
One Drawer: 20W x 5D, centered 19 inches from the left end
Removable Undershelf: 32L, at left end

ITEM 43 PASS-THRU SHELF
23-3/4L x 24D
Construct unit as detailed on Sheet FS1.2
Construct length of unit, to prevent any space between enclosed ends and wall, from exceeding 1/16 inch.

ITEM 44 WALL CABINET
54L x 28H x 15D
Intermediate Shelf
Sliding Doors: one pair
Slope Top
Mounting Height: bottom of cabinet 56 inches A.F.F.

ITEM 45 MOBILE HOT / PROOF CABINET
FWE PHU-12-L
32-3/4W x 69H x 34-1/4D
Insulated Construction
Universal Wire Slides: seventeen pair, stainless steel
Lexan Door
Drip Trough
Full Perimeter Bumper
Casters: all swivel, 5 inch, two with brakes
120 volt, single phase, 1.65 kw

ITEM 46 ROLL-IN / PASS-THRU FREEZER
Traulsen AIF132LUT-FHS Modified
Self-contained: roll-in (west side)
Expansion Valve System
Insulated Floor: stainless steel
Doors: one right hinged full height solid (roll-in) on Room K133 (Hot Prep) side
one left hinged solid (reach-in) on Room K135 (Staging) side
Locks
Clear Door Height: 66-5/16 inches on Room K133 (Hot Prep) side
Exterior Digital Thermometer, located on Room K133 (Hot Prep) side
Exterior Finish: stainless steel
Interior Finish: aluminum
Seal Plate: one, No. 17617359-00 for recessed installation, on Room K133 (Hot Prep) side
NSF Coved Base: 2-1/2 inches H stainless steel, on Room K135 (Staging) side
Trim Angles: stainless steel, 1-1/2 inches wide, at sides between unit and wall in Rooms K133 and K135.
Compressor Warranty: 5 year
Install unit in 3/4 inch floor recess as shown on Section 2, Sheet FS3.3, after porcelain tile has been installed on walls in opening.
Caulk between unit and perimeter of floor recess on east and west sides, before installing stainless steel seal plate and coved base, to prevent moisture penetration into floor depression.
115 volt, single phase, 1/2 hp
Submit shop drawing of unit.

ITEM 47 STAINLESS STEEL PIPE SHROUD
Construct vertical riser and horizontal pipe enclosure as detailed on Sheet FS1.2.
Coordinate horizontal enclosure configuration with Mechanical Subcontractor prior to fabrication.

ITEM 48 TWO COMPARTMENT CONVECTION STEAMER
Market Forge Eco-Tech Plus ETP-10G
Two Compartment
Twin Atmospheric Steam Generators
Self Contained Water Filter
60 Minute timer
Electric Ignition
Lower Water Cut-off
Total Concept Descaler: case of 4 gallons
Stainless Steel Pans: six Vollrath 92022, solid 12 x 20 x 2-1/2
Energy Star Qualified
Controls: 115 volt, single phase, 2 amps
Provide quick disconnect cold water connector: one Dormont W37BP2Q-36 (gray coating)
Unit to be used at 2,152 foot altitude
Natural Gas: 84,000 Btu
Provide quick disconnect double swivel gas connector: one Dormont 1675-BPQ-2SR-60 with restraining device (attached to wall)

ITEM 49 SEDIMENT PRE-FILTER SYSTEM
Selecto Scientific 02-231
Mounting Bracket
On/Off Ball Valve & Pressure Gauge
Mount top of wall bracket at 34 inches A.F.F. on side of 44 inch high concrete block wall for Item 50.

ITEM 49A WATER TREATMENT SYSTEM
Selecto Scientific SMF SteamerGuard Flash 4000
Mount top of wall bracket at 34 inches A.F.F. on side of 44 inch high concrete block wall for Item 50.
Coordinate connection of unit to Item 49, with Mechanical Subcontractor.

ITEM 50 COMBINATION OVEN / STEAMER
Rational Self Cooking Center WE102G with Care Control
Programmable Controls: 350 menu items
Seven Operating Modes
HACCP Data Memory: output via integral USB interface
USB Memory Stick
Automatic Cleaning System with Tablet Drawer
Automatic Vapor Quenching
Internal Backflow Prevention
Stainless Steel Stationary Stand: UGII No. 60.30.331
Stainless Steel Grid Shelves: ten (for 18 x 26 pans)
Combi Fry Baskets: four, 12 x 20
Core Temperature Probe
Double Glass Door: hinged inside pane for easy cleaning
Spray Nozzle and Retractable Hose
Halogen Lighting
100 Cleaner Tablets: one bucket
100 Care Tablets: one bucket
Warranty: two year
Installation Kit
Provide quick disconnect cold water connector: one Dormont W75BP2Q-60 (gray coating)
Factory Certified Installation
Factory Demonstration / Instruction: 4 hours minimum
Unit to be used at 2,152 foot altitude
Natural Gas: 168,000 Btu
Provide quick disconnect swivel gas connector: one, Dormont 1675-BPQ2-SR-36 with restraining device (attached to wall)
208 volt, single phase, .8 kw, 3.85 amps

ITEM 51 DOUBLE CONVECTION OVEN
Montague HX2-63 or Blodgett DFG-200 Double
Interior Depth: 27 inches (minimum)
Manual Dial Controls
Solid State Thermostat
Front, Top and Sides: stainless steel
Interior Finish: porcelain
Electric Ignition
Glass Doors
Flue Deflector: stainless steel
Back Panels: stainless steel
Swivel Casters: 5 inch, two with brakes
Rigid Gas Manifold: 3/4 inch with 3/4 inch Gas Pressure Regulator (factory furnished)
Two Speed Fan Motors: two @ 115 volt, single phase, 1/2 hp
Unit to be used at 2,152 foot altitude
Natural Gas
Provide quick disconnect double swivel gas connector: one, Dormont 1675-BPQ2-SR-60 with restraining device (attached to wall)

ITEM 52 QUICK DISCONNECT GAS HOSE
Dormont 1675-BPQ2-SR-48
Double Swivel, 48 inches L
Attach restraining device to 44 inch H wall.

ITEM 53 TROUGH DRAIN (TWO REQUIRED)
Duke SteelKor SFT-1830 Modified
30L x 6H x 18W
Trough finish: stainless steel
3 inch drain
Stainless Steel Tiger Grate: two section, TG-400 (1-1/4 x 4 inch c/c spacing)
Removable Sediment Basket: stainless steel
Trough drain shall be delivered to jobsite before high performance trowel floor installation.
Submit shop drawing of unit.

ITEM 54 TILTING KETTLE / 60 GALLON
Market Forge FT-60LEF
Capacity: 60 gallon
Manual Tilt
Quad-Leg
Maximum Rim Height: 39-1/2 inches
316 Stainless Steel Liner: 316
2 inch Tangent Draw-off Valve
Perforated Drain Strainer
Counter-balanced Hinged Cover
Etched Kettle Markings (10 gallon increments)
Tilting Kettle Accessory Kit: provide one Kit only to service both kettles
Fasten leg base plates to floor with stainless steel bolts to prevent corrosion of fasteners.
480 volt, 3 phase, 24 kw, 28.9 amps

ITEM 55 KETTLE FILLER / SPRAY STANCHION
T and S Brass B-0193
Stanchion: 4 inch diameter, chromium plate
Vacuum Breakers

ITEM 56 KETTLE STAND
Cleveland ST-28
Pull-out Drain Drawer with Splash Shield
Drain: 1-1/4 inch diameter
Fasten leg base plates to floor with stainless steel screws.

ITEM 57 COUNTERTOP KETTLE
Cleveland KET-12-TGB
Capacity: 12 gallon
Manual Tilt with gearbox
316 Stainless Steel Liner: 316
High Wattage: HW
Hot and Cold Water Faucet with Swing Spout
Faucet Bracket: FBKT
Lift-off Cover: CL12
Kettle Markings: KM (5 and 10 gallon)
Clean-up Brush: CB
480 volt, 3 phase, 16.3 kw, 19.6 amps

ITEM 58 WATER FILTER ASSEMBLY
3M Purification ICE120-S

ITEM 59 SINK WORK TABLE
96L x 34H x 30D
Open Base
No Front Rail: at right 54 inch section (space for waste receptacle)
Legs: three pair
Sink: 18L x 12H x 20D, centered 14 inches from right end
Faucet: T and S Brass B-1122 or Chicago Faucet 527-L9
One Waste: 2 inch brass with lever handle drain
One Drawer: 20W x 5D, centered 21 inches from the left end
Removable Undershelf: 36L, at left end

ITEM 60 ELECTRIC CAN OPENER
Edlund 270
Two Speed
NSF Certified
115 volt, single phase, 1.2 amps

ITEM 61 SPARE NUMBER

ITEM 62 FOUR COMPARTMENT SINK
192L x 37H x 31-1/2D
Left Compartment: 27L x 14H x 28D
Three Compartments, 24L x 11H x 28D
Left Drainboard: 48L, front rail only (no rear rail)
Right Drainboard: 45L, 1/2 inch slope down to sink
Removable Undershelf: 43L, below right drainboard
Legs: five pair
Omit front and rear rails below three compartments
Two Faucets: T and S Brass Big-Flo B-0290 modified with lever handles (001636-45 & 001637-45)
and 3/4 inch Street Elbows
Four Wastes: 2 inch brass with lever handle drain
Provide stainless steel mounting bracket below left drainboard for disposer switch (Item 63)
at left side of disposer

ITEM 63 DISPOSER
Salvajor 150-CA-18 or In-Sink-Erator SS-150-18C
18 inch cone
Start/Stop Push Button Magnetic Switch with Line Disconnect: MSSLD7 or MSLV
Polished Housing (no paint)
208 volt, 3 phase, 1-1/2 hp

ITEM 64 HOSE REEL SPRAY ASSEMBLY
T and S Brass B-7232-01 Reel-Kleen
Open Reel (no cover)
Wall Mount
B-0963 Vacuum Breaker
B-1025-1 Shut-off Valve (Mount 4 feet 2 inches above floor.)
Food Service Equipment Contractor shall provide a Symmons 7-102 mixing valve with integral check valves as manufactured by Symmons Industries (800/796-6667).
Center reel 7 feet 4 inches above floor.
All components shall be delivered to jobsite prior to construction of concrete block wall.

ITEM 65 WORK TABLE
66L x 34H x 30D
Open Base
Legs: two pair
One Drawer: 20W x 5D, with lock, centered horizontally
Removable Undershelf

ITEM 66 WALL SHELF
Advance Tabco WS-12-60 or Low Temp Industries WSF-52
60L x 10H x 12D
Edges rolled down at front with square closed ends.
Finish: stainless steel
Mounting Height: top of shelf 54 inches A.F.F.

ITEM 67 DOUBLE CONVEYOR OVEN
XLT Ovens 3240 Double Stack (316/943-2751)
78-1/4L x 67-3/4H x 62-3/8D
Cooking Chamber: 40 inches L
Conveyor Belt: 32 inches W
Adjustable Belt Speed
Right to Left Operation
Front Loading Door
Removable Crumb Tray
Product Stop: at left end of each conveyor
Stand: stainless steel, 20-7/8H, with casters
Gas Kit: 1-1/2 inch manifold with sediment trap, shut-off valves and two 60 inch L Dormont quick disconnect gas connectors, with restraining device (attached to wall).
Provide twelve Chicago Metallic No. 69, 18 x 26 x 1, 16 gauge aluminum sheet pans.
Cord and Plug: two, to be plugged into VFD Controller on Item 68
Unit to be used at 2,152 foot altitude.
Natural Gas: two @ 96,100 Btu (192,200 Btu total)
Factory Installation
Factory Start-up and Demonstration: 4 hours minimum (separate trip from installation date)
Food Service Equipment Subcontractor shall coordinate unit size/delivery time, for Items 67 & 68, with Construction Manager
120 volt, single phase, two @ 6 amps

ITEM 68 CONVEYOR OVEN EXHAUST HOOD
XLT Ovens H3C-3240-01145
96-5/8L x 48-3/8W
Double Stack Configuration
Exterior Finish: stainless steel, including shrouds
VFD Controller
Pre-piped Fire Suppression Piping (factory installed)
Hood Lights, 120 volt
Valance Enclosure: stainless steel, between top of exhaust hood and 9 foot 4 inch lay-in ceiling. Verify ceiling height with Construction Manager prior to fabrication.
Hanger Rods: four, stainless steel, furnished and installed by Food Service Equipment Subcontractor. Extend to steel angles mounted above bottom chord of steel joists. Provide vibration isolation washers between hanger rods and steel angles.
Coordinate exhaust hood mounting location (height and distance from cmu wall) with manufacturer.
Factory Start-up and Demonstration
208 volt, single phase (VFD Controller)
120 volt, single phase (Ovens and System Power)

ITEM 68A EXHAUST FAN / ROOF CURB
XLT Ovens HP-1046-VFD and HP-1047-VFD-F
Exhaust: 828 cfm @ 1 inch w.g.
Flat Roof Installation: confirm with Construction Manager
Ship roof curb to jobsite, prior to exhaust hood delivery, per Construction Manager's request.
208 volt, 3 phase, 10 amps (from VFD Controller)

ITEM 69 SPARE NUMBER

ITEM 70 WORK TABLE
66L x 34H x 30D
Open Base
Legs: two pair
No Front Rail: rear rail only

ITEM 71 SINK COUNTER
60L x 34H x 27D
Enclosed Body
Legs: 6 inch, 3 pair
Sink: 14L x 10H x 18D, centered 14 inches from right end
Faucet: T and S Brass B-1120 modified with B-2387 swivel gooseneck faucet
One Waste: basket strainer with 1-1/2 inch tailpiece
Three Drawers: 20W x 5D, stacked vertically at left end
Access Panel: 28-1/2L, below sink

ITEM 72 ROLL-IN REFRIGERATOR
Traulsen ARI132HUT-FHS or Continental DL1RI-SA-E
Self-contained: roll-in
Expansion Valve System
Insulated Floor: stainless steel
Door: one left hinged full height solid (72 inch minimum clear door height)
Locks for Items 33 and 72 shall be keyed alike.
Exterior Digital Thermometer
Exterior Finish: stainless steel
Interior Finish: aluminum
Threshold Ramp: stainless steel
Trim Angles: stainless steel, 1-1/2 inches wide, at sides between unit and wall at northeast and southwest corners.
Compressor Warranty: 5 year
115 volt, single phase

ITEM 73 WALL SHELF
44L x 10H x 16D
Finish: stainless steel
Front Edge turned down 1-1/4 inches with toe-in.
Back and both ends turned up 1-1/2 inches.
Solid Support Brackets: two
Construct length of unit, at enclosed ends, to prevent any space between unit and porcelain tile wall from exceeding 3/16 inch.
Mounting Height: top of shelf 54 inches A.F.F.

ITEM 74 WORK TABLE
Eagle Spec-Master UT2460SE or Advance Tabco Premium FSS-245
60L x 35H x 24D
Top: 14 gauge stainless steel, with 1-1/2 inch H rear turn-up
Legs, Gussets and Feet: stainless steel
Adjustable Undershelf: stainless steel

ITEM 75 TRAY COUNTER
Construct unit as detailed on Sheets FS3.4, FS3.5 and FS3.6.

ITEM 76 TRAY COUNTER
Construct unit as detailed on Sheets FS3.4, FS3.5 and FS3.6.

ITEM 77 TRAY SLIDE
137-3/8L x 33H x 12D
Construct unit as detailed on Sheet FS3.6.
Field verify opening length from face of porcelain tile to face of porcelain tile.
Field verify height of metal stud wall furnished by others, prior to fabrication of tray slide.

ITEM 78 TRAY SLIDE
181-3/8L x 33H x 12D
Construct unit as detailed on Sheet FS3.6.
Field verify opening length from face of porcelain tile to face of porcelain tile.
Field verify height of metal stud wall furnished by others, prior to fabrication of tray slide.

ITEM 79 TRAY COUNTER
Construct unit as detailed on Sheets FS3.4, FS3.5 and FS3.6.

ITEM 80 TRAY SLIDE
125-3/8L x 33H x 12D
Construct unit as detailed on Sheet FS3.6.
Field verify opening length from face of porcelain tile to face of porcelain tile.
Field verify height of metal stud wall furnished by others, prior to fabrication of tray slide.

ITEM 81 TRAY SLIDE
125-3/8L x 33H x 12D
Construct unit as detailed on Sheet FS3.6.
Field verify opening length from face of porcelain tile to face of porcelain tile.
Field verify height of metal stud wall furnished by others, prior to fabrication of tray slide.

ITEM 82 MOBILE REFRIGERATED DELI COUNTER
Low Temp Industries
66-3/8L x 34H x 32D
Tempest-Aire Cold Plan: 2 well, sloped
NSF7
Construct unit as shown on Drwg. 9910269 (K-1)
Provide undercounter reinforcement for English Breath Shield (Item 83) undercounter F-6 mounting
Drain Valve: 1 inch diameter with plastic hose, 36 inches L
Counter Latches
Swivel Casters: 4 inch, all with brakes
Removable Adaptor Bars: three, 20 inches L
Cord and Plug: NEMA 5-15P
120 volt, single phase, 1/3 hp, 7.6 amps
Submit shop drawing No. 9910269 (K1)

ITEM 83 BREATH SHIELD
English Mfg. Inc. Matrix TMA-120-2 Custom
39L(CL) x 22H (13 inch H clearance)
Frame: 1-1/2 inch diameter tubing
Finish: #4 brushed stainless steel
End Posts: two, with undercounter F-6 mounting on stainless steel countertop
Shields and Top: 3/8 inch clear tempered glass with polished edges and 1" radius corners
End Panels: two 1/4 inch clear tempered glass with polished edges
Submit shop drawing of unit
Ship unit to Low Temp Ind. for installation on Item 82.

ITEM 84 MOBILE REFRIGERATED DELI COUNTER
Low Temp Industries
66-3/8L x 34H x 32D
Tempest-Aire Cold Plan: 3 well, sloped
NSF7
Construct unit as shown on Drwg. 9910269 (K-2)
Provide undercounter reinforcement for English Breath Shield (Item 85) undercounter F-6 mounting
Drain Valve: 1 inch diameter with plastic hose, 36 inches L
Counter Latches
Swivel Casters: 4 inch, all with brakes
Removable Adaptor Bars: five, 20 inches L
Cord and Plug: NEMA 5-15P
120 volt, single phase, 1/3 hp, 7.6 amps
Submit shop drawing No. 9910269 (K2)

ITEM 85 BREATH SHIELD
English Mfg. Inc. Matrix TMA-120-2 Custom
52L(CL) x 22H (13 inch H clearance)
Frame: 1-1/2 inch diameter tubing
Finish: #4 brushed stainless steel
End Posts: two, with undercounter F-6 mounting on stainless steel countertop
Shields and Top: 3/8 inch clear tempered glass with polished edges and 1" radius corners
End Panels: two 1/4 inch clear tempered glass with polished edges
Submit shop drawing of unit
Ship unit to Low Temp Ind. for installation on Item 84.

ITEM 86 SWIVEL CASTER KIT (SIX REQUIRED)

Duke: 3 inch diameter wheels, four per set, with brakes (Jarvis and Jarvis No. 3-291-106-WB) to provide a 33-13/16 H Counter

Food Service Equipment Subcontractor shall remove 6 inch legs and Kickplates from existing Thurmaduke Serving Counters (Items 218, 219, 220, 221, 223 and 224), Redrill new holes in cabinet bottom plates as required and install new 3 inch diameter casters. Care should be taken when placing units on side, to protect cabinet body and breathguards.

ITEM 87 MOBILE UTILITY SERVING COUNTER

Duke Thurmaduke TST-32SS Modified
32L x 33-13/16H x 32D
Body Finish: stainless steel
Top: 16 gauge stainless steel
Serving Shelf: TS540-32 (18H x 13D) with adjustable tempered glass guard, stainless steel shelf and powdercoat (No. 217175 textured black) end stanchions.
Swivel Casters: 3 inch diameter, four, to match Item 86. Casters with brakes shall be located on operator side.
Body Latches: to match existing Items 218 and 219
Submit shop drawing of unit.

ITEM 88 MOBILE UTILITY SERVING COUNTER

Duke Thurmaduke TST-24SS Modified
24L x 33-13/16H x 32D
Body Finish: stainless steel
Top: 16 gauge stainless steel
Swivel Casters: 3 inch diameter, four, to match Item 86. Casters with brakes shall be located on operator side.
Body Latches: left (north) end only, to match existing Item 219.
Omit latches on south end.
Submit shop drawing of unit.

ITEM 89 WORK COUNTER

38-1/2L x 34H x 24D
Open Base
Legs: two pair
No Front Rail: rear rail only
Construct length of unit, to prevent any space between enclosed ends and porcelain tile wall from exceeding 3/16 inch.

ITEM 90 WALL SHELF

Advance Tabco WS-12-36 or Low Temp Industries WSF-32
36L x 10H x 12D
Edges rolled down at front with square closed ends.
Finish: stainless steel
Mounting Height: top of shelf 54 inches A.F.F.

ITEM 91 BLACK INSERT TRIM KIT (TWO REQUIRED)

APW No. 21789948 Black Insert: five
APW No. 21790305 Black Double Side Cover: two
Existing APW DMXD-48H (Item 222) includes all red horizontal inserts and side covers. Remove existing red side covers and red inserts for three front strips and two rear strips and replace with above black inserts and covers. Only existing red lower rear horizontal strip (with controls) to remain red, all other trim shall be black.

ITEM 92 SPARE NUMBER

ITEM 93 TRACK LIGHT SYSTEM
Hatco DL-775-STL (Wire-in Style)
Track Bar Length: one @ 10 feet L
Light Shade Assemblies: four
Shade Style: No. 775
Shade Finish: 120Grit Clear (Clear Brush Metal)
Mounting: Rigid Stem (STL Switch)
Stem and Track Color: White
Bulbs: three, Shat-R-Shield 50R20/FL, 50W Teflon coated incandescent flood lamp
* Unit Length: 30 inches H, field verify soffit height 8'-0" A.F.F.
120 volt, single phase, .2 kw
Locate track as shown on Detail D on Sheet FS3.3

ITEM 94 TRACK LIGHT SYSTEM
Hatco DL-775-STL (Wire-in Style)
Track Bar Length: one @ 12 feet L
Light Shade Assemblies: six
Shade Style: No. 775
Shade Finish: 120Grit Clear (Clear Brush Metal)
Mounting: Rigid Stem (STL Switch)
Stem and Track Color: White
Bulbs: six, Shat-R-Shield 250BR40/1, clear coated, 250W clear heat lamp (white light)
* Unit Length: 34 inches H, field verify soffit height 8'–0" A.F.F.
120 volt, single phase, 1.5 kw
Locate tracks as shown on Detail D on Sheet FS3.3.

ITEM 95 SPARE NUMBER

ITEM 96 TRACK LIGHT SYSTEM
Hatco DL-775-STL (Wire-in Style)
Track Bar Length: one @ 8 feet L
Light Shade Assemblies: four
Shade Style: No. 775
Shade Finish: 120Grit Clear (Clear Brush Metal)
Mounting: Rigid Stem (STL Switch)
Stem and Track Color: White
Bulbs: four, Shat-R-Shield 250BR40/1, clear coated, 250W clear heat lamp (white light)
* Unit Length: 34 inches H, field verify soffit height 8'-0" A.F.F.
120 volt, single phase, 1 kw
Locate tracks as shown on Detail D on Sheet FS3.3.

ITEM 97 SPARE NUMBER

ITEM 98 L – SHAPED SERVING COUNTER
Construct unit as detailed on Sheets FS3.4 and FS3.5.
Provide 4 x 4 inch junction box (for Items 101 and 103) and receptacle box (for Item 102), inside cabinet as shown on Sheet FS3.4.
Electrical Receptacle Box: mounted in endpanel at east end, for one G.F.I. NEMA 5-20R.
Cut openings for Items 100, 101, 102 and 103 in unit at fabricator's shop.
120 volt, single phase

ITEM 99 L - SHAPED SERVING COUNTER
Construct unit as detailed on Sheets FS3.4 and FS3.5.
Provide 4 x 4 inch junction box (for Items 101 and 103) and receptacle box (for Item 102), inside cabinet as shown on Sheet FS3.4.
Electrical Receptacle Box: mounted in endpanel at east end, for one G.F.I. NEMA 5-20R.
Cut openings for Items 100, 101, 102 and 103 in unit at fabricator's shop.
120 volt, single phase

ITEM 100 DROP-IN HOT WELLS (TWO REQUIRED)
Low Temp Ind. DI-EF-2D-H
30-1/2L x 7H x 26-3/4W
Two Sealed Wells: individual thermostat control with 3/4 inch manifold and drain valve.
Hugged Flange Edge with Gasket
Remote Control Panel: mounted in endpanel on south side of Item 98 and north side of Item 99.
Removable Adaptor Bars: two, 20 inches L
Cord and Plug: 6 foot NEMA 5-15P
120 volt, single phase, 1.32 kw
Ship units to custom fabricator for coordination of openings on Items 98 and 99.

ITEM 101 BREATH SHIELD WITH LIGHTS (TWO REQUIRED)
English Mfg. Ind. Matrix TMA-120-IS-2 Custom
37L (CL) x 22H
Frame: 1-1/2 inch diameter tubing
Finish: #4 brushed stainless steel
MBL Adjustable Brackets: for tilt-up angled glass panels
End Posts: two, with undercounter F-10 mounting, with s/s beveled flange, on solid surface countertop
Shields and Top: 3/8 inch clear tempered glass with 1 inch radius corners and polished edges
End Panels: two, TMA-120IS with 1/4 inch clear tempered glass
LED EC05 Light Fixture: 3500K, with anodized aluminum housing and EC-09 Connector.
Wiring routed down northwest end post. LED lamps shall be furnished with fixture.
Provide extra length lead wires to extend to junction box mounted on Items 98 and 99.
Toggle Switch furnished and installed by Electrical Subcontractor. Switch box furnished and installed by custom fabricator
120 volt, single phase
Submit shop drawing of unit.
Ship units to custom fabricator for coordination of openings on Items 98 and 99.

ITEM 102 DROP-IN REFRIGERATED PAN (TWO REQUIRED)
Low Temp Ind. Temp-est Aire DI-2063TA-H
68-7/8L x 25-3/4H x 26-3/4D
NSF 7
Well: 64L, installed with 3/4 inch drain located on west end.
Hugged Flange Edge with Gasket
Removable Adaptor Bars: six, 20 inches L
Cord and Plug: 6 foot, NEMA 5-15
Compressor Warranty: 5 year
120 volt, single phase, 1/3 hp
Ship units to custom fabricator for coordination of openings on Item 98 and 99.

ITEM 103 BREATH SHIELD WITH LIGHTS (TWO REQUIRED)
English Mfg. Ind. Matrix TMA-120-IS-3 Custom
78L (CL) x 22H (two equal sections)
Frame: 1-1/2 inch diameter tubing
Finish: #4 brushed stainless steel
MBL Adjustable Brackets: for tilt-up angled glass panels
End Posts: two, with undercounter F-10 mounting, with s/s beveled flange, on solid surface countertop
Cross Supports: two, with a support arm between them
Shields and Top: 3/8 inch clear tempered glass with 1 inch radius corners and polished edges
End Panels: two, TMA-120IS with 1/4 inch clear tempered glass
LED EC05 Light Fixture: 3500K, with anodized aluminum housing and EC-09 Connector.
Wiring routed down northwest end post. LED lamps shall be furnished with fixture.
Provide extra length lead wires to extend to junction box mounted on Items 98 and 99.
Toggle Switch furnished and installed by Electrical Subcontractor. Switch box furnished and installed by custom fabricator
120 volt, single phase
Submit shop drawing of unit.
Ship units to custom fabricator for coordination of openings on Items 98 and 99.

ITEM 104 MOBILE SILVERWARE DISPENSER (FIVE REQUIRED)
24L x 33H x 24W
Construct units as detailed on Sheet FS3-6
Submit shop drawing of unit.

ITEM 105 MOBILE MILK COOLER
True TMC-34-S-SS
Forced Air Refrigeration
Case Capacity: eight
Single Access
Cylinder Lock
Exterior: stainless steel
Interior: stainless steel (sides and floor)
Digital Thermometer
Swivel Casters: 4 inch, two with brakes
Compressor Warranty: 5 year
115 volt, single phase, 1/3 hp

ITEM 106 MOBILE MILK COOLER (THREE REQUIRED)
True TMC-49-S-DS-SS
Forced Air Refrigeration
Case Capacity: twelve
Dual Access
Cylinder Locks
Exterior: stainless steel
Interior: stainless steel (sides and floor)
Digital Thermometer
Swivel Casters: 4 inch, two with brakes
Compressor Warranty: 5 year
115 volt, single phase, 1/3 hp

ITEM 107 MOBILE STAND
Eagle Spec-Master UT3048SE or Advance Tabco Premium FSS-304
48L x 35H x 30D
Top: 14 gauge stainless steel, with 1-1/2 inch H rear turn-up
Legs and Gussets: stainless steel
Adjustable Undershelf: stainless steel
Casters: 5 inch, two with brakes

ITEM 108 MOBILE CASHIER COUNTER
Diamond Group – Modular Series DCC-58
Unit constructed identical to Item 109.
Submit shop drawing of unit.

ITEM 108A CASHIER COUNTERTOP
59-1/2L x 1-1/2H x 38-3/4W
Construct solid surface countertop as detailed on Sheet FS3.6.
East end of countertop shall align with east end of cabinet body.
Verify cabinet body length of Item 108.
Countertop is to be provided by same solid surface fabricator for Items 75, 76, 77, 78, 79, 80, 81, 98, 99, 104, 108A, 109A and 110A.

ITEM 109 MOBILE CASHIER COUNTER (THREE REQUIRED)
Diamond Group – Modular Series DCC-58
58L x 34H (32-1/2 inch H body) x 30D
Construct unit as per Diamond Group Drwg. No. 14-08070.
Omit 16 gauge stainless steel countertop: see Item 109A
Enclosed Cabinet Body: 32-1/2L, with one pair of hinged doors facing south. Doors shall be covered with plastic laminate.
Formed Vertical Corner Posts shall be stainless steel and closed off at rear side
Full Rear and Sidepanels: covered with plastic laminate veneer
Apron: 2 inches H, southwest side, covered with plastic laminate.
Bottom Undershelf: stainless steel, behind hinged doors
Omit Convenience Outlet
Cashier Drawer with lock (facing northwest)
Omit Counter Latches
Adjustable Swivel Casters: 5 inch, two with brakes
Door Pulls: Component Hardware Group P45-4000, satin chrome finish, mounted vertically
Plastic Laminate: Wilsonart 7935-07 Shaker Cherry, vertical grade
Submit sample of plastic laminate for approval.
Submit shop drawing of unit.

ITEM 109A CASHIER COUNTERTOP (THREE REQUIRED)
59-1/2L x 1-1/2H x 48-3/4W
Construct solid surface countertop as detailed on Sheet FS3.6.
East end of countertop shall align with east end of cabinet body.
Verify cabinet body length of Item 109.

ITEM 110 MOBILE CASHIER COUNTER
Diamond Group – Modular Series DCC-58 (1-800/363-5926)
58L x 34H (32-1/2 inch H body) x 30D
Construct unit as per Diamond Group Drwg. No. 14-08070.
Omit 16 gauge stainless steel countertop: see Item 110A
Enclosed Cabinet Body: 32-1/2L, with one pair of hinged doors facing north. Doors shall be covered with plastic laminate.
Formed Vertical Corner Posts shall be stainless steel and closed off at rear side
Full Rear and Sidepanels: covered with plastic laminate veneer
Apron: 2 inches H, northeast side, covered with plastic laminate.
Bottom Undershelf: stainless steel, behind hinged doors
Omit Convenience Outlet
Cashier Drawer with lock (facing east)
Omit Counter Latches
Adjustable Swivel Casters: 5 inch, two with brakes
Plastic Laminate: Same as Item 109
Submit shop drawing of unit.

ITEM 110A CASHIER COUNTERTOP
59-1/2L x 1-1/2H x 38-3/4W
Construct solid surface countertop as detailed on Sheet FS3.6.
East end of countertop shall align with east end of cabinet body.
Verify cabinet body length of Item 110.
Countertop is to be provided by same solid surface fabricator for Items 75, 76, 77, 78, 79, 80, 81, 98, 99, 104, 108A, 109A and 110A.

ITEM 111 SPARE NUMBER

ITEM 112 ROLL-OUT RECYCLE / TRASH ENCLOSURE – N.I.C.

ITEM 113 SOILED TRAY DOUBLE RACK (TWO REQUIRED) – ALTERNATE NO. 12
Sammons Equipment 9172-1820 (951/340-3419)
37L x 60-1/8H x 26-1/2D
Aluminum Construction
Tray Capacity: forty
Side Loaded (two trays per pair of slides)
Double Beaded "C" Channel Slides: ten pair per side @ 5-1/16 inches c/c
Solid Base
Swivel Casters: 5 inch, two with brakes
Corner Bumpers
for 12 x 16 trays (Carlisle 1612FG)
Submit shop drawing of unit

ITEM 114 WASTE RECEPTACLE – ALTERNATE NO. 12
Rubbermaid Slim Jim FG354060GRAY
11W x 30H x 22D
Capacity: 23 gallon
Venting Channels
Lid: Slim Jim Handle Top 2688-88
Color: Gray

ITEM 115 MOBILE RECYCLE BIN / 40 GALLON (THREE REQUIRED) – N.I.C.

ITEM 116 MOBILE WASTE RECEPTACLE / 44 GALLON (THREE REQUIRED) – N.I.C.

ITEM 117 MOBILE PAN RACK (THREE REQUIRED) – ALTERNATE NO. 12
InterMetro Industries Corporation MetroMax Q Open Grid System
60L x 68H x 24D
Shelves: MQ2460G, five
Uprights: MQ63UPE, four
Casters: two 5MX and two 5MBX
Donut Bumpers

ITEM 118 DISH RACK DOLLY – ALTERNATE NO. 12
Lakeside 447, Piper/Servolift 750 or Sammons Equipment 2085-2020
Platform: stainless steel
Corner Bumpers
Casters: 4 inch, all swivel

ITEM 119 UTENSIL CART – ALTERNATE NO. 12
InterMetro Industries Corporation Super Erecta Shelf MW708 or Eagle U3-2136S
Wire Shelves: three, 36 x 21
Handles: two
Finish: stainless steel
Donut Bumpers
Casters: 5 inch, all swivel

ITEM 120 SOILED LINEN RECEPTACLE – ALTERNATE NO. 12
Rubbermaid FG353600 WHT
Capacity: 40 gallon
Color: White
Lid: 3539
Dolly with Casters: 3530

ITEM 121 TWO TIER RACK (FOUR REQUIRED) – ALTERNATE NO. 12
New Age Industrial Corporation 1028 or Prairie View Industries SWB244872-2
72L x 48H x 24D
Bar Style: 1-1/2 inch x 1-1/2 inch tubing
Finish: aluminum
NSF Listed
Adjustable Feet

ITEM 122 DUNNAGE PLATFORM (THREE REQUIRED) – ALTERNATE NO. 12
New Age Industrial Corporation 2018 or Prairie View Industries SDR2048-8
48L x 8H x 20D
Finish: aluminum
NSF Listed
Welded Capped Feet

ITEM 123 THREE TIER RACK (TWO REQUIRED) – ALTERNATE NO. 12
New Age Industrial Corporation 1048 or Prairie View Industries SWB246072-3
72L x 60H x 24D
Bar Style: 1-1/2 inch x 1-1/2 inch tubing
Finish: aluminum
NSF Listed
Adjustable Feet

ITEM 124 WIRE SHELVING – ALTERNATE NO. 12
InterMetro Industries Corporation Super Erecta Shelf or Eaglebrite Shelving
60L x 74H x 24D
Wire Shelves: 2460BR or 2460Z, five
Uprights: 74P or P74Z, four
Finish: Brite
Items 124, 125, 126, 136, 137, 138, 139 and 140 shall be furnished by same manufacturer.

ITEM 125 WIRE SHELVING (TWO REQUIRED) – ALTERNATE NO. 12
InterMetro Industries Corporation Super Erecta Shelf or Eaglebrite Shelving
54L x 74H x 21D
Wire Shelves: 2154BR or 2154Z, five
Uprights: 74P or P74Z, two
"S" Hooks: ten
Finish: Brite

ITEM 126 WIRE SHELVING (THREE REQUIRED) – ALTERNATE NO. 12
InterMetro Industries Corporation Super Erecta Shelf or Eaglebrite Shelving
60L x 74H x 21D
Wire Shelves: 2160BR or 2160Z, five
Uprights: 74P or P74Z, four
Finish: Brite
Shelf construction shall include center truss.

ITEM 127 LOUVERED SHELVING (THIRTEEN REQUIRED) – ALTERNATE NO. 12
InterMetro Industries Corporation MetroMax Q Open Grid System
60L x 63H x 21D
Shelves: MQ2160G, four
Uprights: MQ63PE, four
Adjustable Nylon Feet

ITEM 128 TWO TIER RACK (THREE REQUIRED) – ALTERNATE NO. 12
New Age Industrial Corporation 1027 or Prairie View Industries SWB244860-2
60L x 48H x 24D
Bar Style: 1-1/2 inch x 1-1/2 inch tubing
Finish: aluminum
NSF Listed
Adjustable Feet

ITEM 129 UTILITY CART (TWO REQUIRED) – ALTERNATE NO. 12
Lakeside 543 or Sammons Equipment 2171-EC Modified (951/340-3419)
Shelves: two, 21 x 33
NSF Listed
Finish: stainless steel
Extended Perimeter Bumper
Casters: 5 inch, all swivel

ITEM 130 POLY BOX PREP CART – ALTERNATE NO. 12
Rubbermaid FG331600OWHT Max System
31-3/4L x 36-1/8H x 23-3/4W
Side Load
Cutting Board with Slot
Color: OWHT (off white)
Swivel Casters: 5 inches, two with brakes
Polycarbonate Food Boxes, three, 3300 clear, 26L x 9H x 18W
Lids: three, 3302

ITEM 131 MOBILE WASTE RECEPTACLE (FOUR REQUIRED) – ALTERNATE NO. 12
Rubbermaid Square Brute FG352600 Gray
Capacity: 28 gallon
Color: Gray
Lid: 3527
Dolly with Casters: 3530

ITEM 132 MOBILE DRYING RACK – ALTERNATE NO. 12
InterMetro Industries Corporation MetroMax Drying Rack PR48VX3
50L x 68H x 26D
Casters: 5 inch, two with brakes
Drying Racks: two intermediate stainless steel wire drop-ins and one cutting board/tray rack at bottom

ITEM 133 SHEET PAN DOLLY (TWO REQUIRED) – ALTERNATE NO. 12
Sammons Equipment 2086-1826 (951/340-3419)
26-1/2L x 8-7/8H x 18-1/2W
Single Stack
All Welded Construction
Frame and Gussets: 12 gauge stainless steel
Tubular Push Handle: stainless steel
Heavy Duty Swivel Casters: 5 inch
for 18 x 26 sheet pans

ITEM 134 PLATFORM TRUCK – ALTERNATE NO. 12
Prairie View Industries P20836T
36L x 20W
Crossbar Handle: one
Donut Plate Casters: 8 inch

ITEM 135 ROLL-IN UTILITY RACK (TWO REQUIRED) – ALTERNATE NO. 12
CresCor 273-65-12/1818 or Seco Select ORV-3-1818X
Welded Construction
Tray Slides: eighteen pair
Finish: aluminum
Perimeter Bumper
Swivel Casters: 5 inch, two with brakes
for 18 x 26 and 12 x 20 pans

ITEM 136 WIRE SHELVING – ALTERNATE NO. 12
InterMetro Industries Corporation Super Erecta Shelf or Eaglegard Shelving
60L x 74H x 18D
Wire Shelves: 1860NK3 or 1860E, six
Uprights: 74PK3 or P74E, four
Finish: Metroseal 3 or Eaglegard

ITEM 137 WIRE SHELVING – ALTERNATE NO. 12
InterMetro Industries Corporation Super Erecta Shelf or Eaglegard Shelving
54L x 74H x 18D
Wire Shelves: 1854NK3 or 1854E, six
Uprights: 74PK3 or P74E, four
Finish: Metroseal 3 or Eaglegard

ITEM 138 WIRE SHELVING – ALTERNATE NO. 12
InterMetro Industries Corporation Super Erecta Shelf or Eaglegard Shelving
54L x 74H x 21D
Wire Shelves: 2154NK3 or 2154E, six
Uprights: 74PK3 or P74E, four
Finish: Metroseal 3 or Eaglegard

ITEM 139 WIRE SHELVING – ALTERNATE NO. 12
InterMetro Industries Corporation Super Erecta Shelf or Eaglegard Shelving
60L x 74H x 21D
Wire Shelves: 2160NK3 or 2160E, six
Uprights: 74PK3 or P74E, four
Finish: Metroseal 3 or Eaglegard

ITEM 140 WIRE SHELVING – ALTERNATE NO. 12
InterMetro Industries Corporation Super Erecta Shelf or Eaglegard Shelving
36L x 74H x 24D
Wire Shelves: 2436NK3 or 2436E, six
Uprights: 74PK3 or P74E, four
Finish: Metroseal 3 or Eaglegard

ITEM 141 PLATE DOLLY (THREE REQUIRED) – ALTERNATE NO. 12
CresCor 501-D-EX
27-1/8L x 32H x 27-1/8 W
Adjustable hex Rods: twelve (adjust rod spacing to accommodate Item 153)
Perimeter Bumper
Vinyl Dust Cover
Swivel Casters: 5 inch, two with brakes

ITEM 142 SPARE NUMBER

ITEM 143 HOT TILE WELL INSERT (TWO REQUIRED) – ALTERNATE NO. 12
Hubert HotTiles No. 12048 (1-800/543-7374)
Full, 21-3/4L x 13-1/8W
Standard size tiles
Solid Color: black
Install two inserts on Item 143.

ITEM 144 SILVERWARE CYLINDER (SEVENTY-TWO REQUIRED) – ALTERNATE NO. 12
Vollrath Nylon Cylinders 52642

ITEM 145 SPARE NUMBER

ITEM 146 PORTABLE BELT BARRIER – ALTERNATE NO. 12
Hubert Pathways Public Guidance System
Brushed Stainless Pole Tubes: three, No. 20213 (2-1/2 inch diameter x 40H)
Flat Cast Iron Base with steel cover and protective rubber ring
Retractable Belt: Black
Locate poles as shown on Sheet FS1.1

ITEM 147 FULL SIZE PAN WITH LID (TWELVE REQUIRED) – ALTERNATE NO. 12
Vollrath Super Pan Low Temperature Plastic 8004420 or Cambro Camwear 14CW-110
20-7/8L x 12-13/16W x 4H
Color: black
Temperature range: -40° to 210°F
Flat Cover: 31100 or 10CWC-135
Color: clear
Locate in Room K119.

ITEM 148 HALF SIZE LONG PAN WITH LID (TWENTY-FOUR REQUIRED) – ALTERNATE NO. 12
Vollrath Super Pan Low Temperature Plastic 8054420 or Cambro Camwear 24LPCW-110
20-7/8L x 6-3/8W x 4H
Color: black
Temperature Range: -40° to 210°F
Flat Cover: 31500 or 20LPCWC-135
Color: clear
Locate in Room K119.

ITEM 149 HALF SIZE SHALLOW LONG PAN WITH LID (TWELVE REQUIRED) – ALTERNATE NO. 12
Vollrath Super Pan Low Temperature Plastic 8052420 or Cambro Camwear 22LPCW-110
20-7/8L x 6-3/8W x 2-1/2H
Color: black
Temperature Range: -40° to 210°F
Flat Cover: 31500 or 20LPCWC-135
Color: clear
Locate in Room K119.

ITEM 150 THIRD SIZE PAN WITH LID (TWELVE REQUIRED) – ALTERNATE NO. 12
Vollrath Super Pan Low Temperature Plastic 8034420 or Cambro Camwear 34CW-110
12-13/16L x 6-15/16W x 4H
Color: black
Temperature Range: -40° to 210°F
Flat Cover: 31300 or 30CWC-135
Color: clear
Locate in Room K119.

ITEM 151 SIXTH SIZE PAN WITH LID (SIX REQUIRED) – ALTERNATE NO. 12
Vollrath Super Pan Low Temperature Plastic 8066420 or Cambro Camwear 66CW-110
6-15/16L x 6-3/8W x 6H
Color: black
Temperature Range: -40° to 210°F
Flat Solid Cover: 31600 or 60CWC-135
Color: clear
Locate in Room K119.

ITEM 152 CAFETERIA TRAY (1080 REQUIRED) – ALTERNATE NO. 12
Carlisle Glasteel 1612FG
Size: 12 x 16-5/16 inches
Fiberglass with reinforced edges
Color: No. 002 Smoke Gray
Locate in Room K119.

ITEM 153 OVAL PLATE (1200 REQUIRED) – ALTERNATE NO. 12
Carlisle Dallas Ware Oval Platter 43563
Size: 9-1/4L x 6-1/4W
Color: No. 35 Café Blue
Locate in Room K119.

ITEM 154 REACH-IN BLAST CHILLER – ALTERNATE NO. 13
American Panel Hurrichill AP12BCF110-3
Self-contained, air cooled
32-1/4L x 74H x 36D
Food Capacity / Cycle: 110 lbs. (maximum)
Microprocessor Solid State Control with two (2) Food Probes
Chilling Modes: soft chilling, hard chilling, shock freezing and holding
Ultraviolet Sterilizing System
Automated Report Documentation Software Package
Label Printer: for food labels
Drain Pan
Left Hinged Door
Exterior Finish: stainless steel
Interior Finish: stainless steel
Refrigerant: R404A
Casters: 5 inch, two with brakes (omit legs)
Cord and Plug: NEMA L15-20P
Compressor Warranty: 5 year
208 volt, 3 phase, 1.5 hp, 10 amps
Factory Demonstration / Instruction: 2 hours (minimum)

ITEM 155 SOFT SERVE FREEZER – ALTERNATE NO. 14
Taylor Crown C713
25-7/16W x 60H x 36-3/16D
Twin Twist
Air Cooled
Standby Feature
Brush Cleaning Kit
Casters: two with brakes
Compressor Warranty: 5 year
208 volt, 3 phase, left @ 17 amps, right @ 15 amps

ITEM 156 SEDIMENT PRE-FILTER SYSTEM – ALTERNATE NO. 15
Selecto Scientific 02-231
Mounting Bracket
On/Off Ball Valve & Pressure Gauge
Mount top of wall bracket at 34 inches A.F.F. on side of 44 inch high concrete block wall for Item 157.

ITEM 156A WATER TREATMENT SYSTEM – ALTERNATE NO. 15
Selecto Scientific SMF SteamerGuard Flash 4000
Mount top of wall bracket at 34 inches A.F.F. on side of 44 inch high concrete block wall for Item 157.
Coordinate connection of unit to Item 156, with Mechanical Subcontractor.

ITEM 157 COMBINATION OVEN / STEAMER – ALTERNATE NO. 15
Rational Self Cooking Center WE102G with Care Control
Programmable Controls: 350 menu items
Seven Operating Modes
HACCP Data Memory: output via integral USB interface
USB Memory Stick
Automatic Cleaning System with Tablet Drawer
Automatic Vapor Quenching
Internal Backflow Prevention
Stainless Steel Stationary Stand: UGII No. 60.30.331
Stainless Steel Grid Shelves: ten (for 18 x 26 pans)
Combi Fry Baskets: four, 12 x 20
Core Temperature Probe
Double Glass Door: hinged inside pane for easy cleaning
Spray Nozzle and Retractable Hose
Halogen Lighting
100 Cleaner Tablets: one bucket
100 Care Tablets: one bucket
Warranty: two year
Installation Kit
Provide quick disconnect cold water connector: one Dormont W75BP2Q-60 (gray coating)
Factory Certified Installation
Factory Demonstration / Instruction: 4 hours minimum
Unit to be used at 2,152 foot altitude
Natural Gas: 168,000 Btu
Provide quick disconnect swivel gas connector: one, Dormont 1675-BPQ2-SR-36 with restraining device (attached to wall)
208 volt, single phase, .8 kw, 3.85 amps

ITEM 158 UTILITY CART – EXISTING
Existing Lakeside 444 3 tier unit, 35L x 21W, to be relocated by F.S.E. Subcontractor.

ITEM 159 UTILITY CART (FOUR REQUIRED) – EXISTING
Existing Commercial 3 tier units, 33L x 21W, with 'U' frame and two handles, to be relocated by F.S.E. Subcontractor.

ITEM 160 UTILITY CART (THREE REQUIRED) – EXISTING
Existing InterMetro 3 tier units, 27L x 17W, beige color, to be relocated by F.S.E. Subcontractor.

ITEM 161 WIRE SHELVING (FOUR REQUIRED) – EXISTING
Existing InterMetro 4 tier units, 60L x 74H x 24D, with Metroseal finish, to be relocated by F.S.E. Subcontractor.

ITEM 162 DUNNAGE PLATFORM (SEVEN REQUIRED) – EXISTING
Existing Faribo 36L x 12H x 24D units, blue color, to be relocated by F.S.E. Subcontractor.

ITEM 163 DUNNAGE PLATFORM (EIGHT REQUIRED) – EXISTING
Existing Faribo 30L x 12H x 24D units, black color, to be relocated by F.S.E. Subcontractor.

ITEM 164 DUNNAGE PLATFORM (FOUR REQUIRED) – EXISTING
Existing Faribo 46L x 12H x 24D units to be relocated by F.S.E. Subcontractor.

ITEM 165 LEDGE CART (TWO REQUIRED) – EXISTING
Existing InterMetro BC2636-2D-BU 2 tier units, 36L x 26W, blue color, to be relocated by F.S.E. Subcontractor.

ITEM 166 DUNNAGE PLATFORM (FOURTEEN REQUIRED) – EXISTING
Existing New Age 2019 units, 60L x 8H x 20D, to be relocated by F.S.E. Subcontractor.

ITEM 167 SPARE NUMBER

ITEM 168 SPARE NUMBER

ITEM 169 DUNNAGE PLATFORM (NINE REQUIRED) – EXISTING
Existing New Age 2017 units, 36L x 8H x 20D, to be relocated by F.S.E. Subcontractor.

ITEM 170 DUNNAGE PLATFORM – EXISTING
Existing New Age 2002 unit, 48L x 8H x 18D, to be relocated by F.S.E. Subcontractor.

ITEM 171 CAN RACK – EXISTING
Existing Always Can unit, 26-1/2L x 83H x 38-1/2D, to be relocated by F.S.E. Subcontractor.

ITEM 172 INGREDIENT BIN – EXISTING
Existing Rubbermaid unit, 13L x 29H x 30D, to be relocated by F.S.E. Subcontractor.

ITEM 173 MOBILE UTILITY RACK (TWO REQUIRED) – EXISTING
Existing 20-1/2L x 66H x 26-3/4D units, with 1/2W ledges at 1-1/2 inch center spacing and solid side panels, to be relocated by F.S.E. Subcontractor.

ITEM 174 DUNNAGE PLATFORM – EXISTING
Existing New Age 2016 unit, 60L x 8H x 24D, to be relocated by F.S.E. Subcontractor.

ITEM 175 MOBILE UTILITY RACK (THREE REQUIRED) – EXISTING
Existing 20-1/2L x 69H x 26D units, with 1-1/2W ledges at 3 inch center spacing, to be relocated by F.S.E. Subcontractor.

ITEM 176 MICROWAVE OVEN – EXISTING
Existing Sharp R-22GT unit to be relocated by F.S.E. Subcontractor.

ITEM 177 PORTABLE FRUIT SLICER – EXISTING
Existing unit to be relocated by F.S.E. Subcontractor.

ITEM 178 DIGITAL PORTION SCALE – EXISTING
Existing Taylor TE22 unit, 8L x 2H x 8D, to be relocated by F.S.E. Subcontractor.

ITEM 179 MIXER / 4 QUART – EXISTING
Existing Kitchen Aid unit to be relocated by F.S.E. Subcontractor.

ITEM 180 ELECTRIC CAN OPENER – EXISTING
Existing Edlund 203 unit to be relocated by F.S.E. Subcontractor.

ITEM 181 SLICER STAND – EXISTING
Existing Advance Tabco 24L x 33H x 36D unit, with marine edge, galvanized legs and undershelf, to be relocated by F.S.E. Subcontractor.

ITEM 182 SLICER – EXISTING
Existing Hobart 1712E unit to be relocated by F.S.E. Subcontractor.

ITEM 183 MOBILE MIXER STAND – EXISTING
Existing 27L x 27H x 32D unit, with undershelf and casters, to be relocated by F.S.E. Subcontractor.

ITEM 184 MIXER / 20 QUART – EXISTING
Existing Hobart A200T unit to be relocated by F.S.E. Subcontractor.

ITEM 185 MOBILE HOT / PROOF CABINET – EXISTING
Existing InterMetro C75-P4N unit, with wire angles and clear door (right hinged), to be relocated by F.S.E. Subcontractor.

ITEM 186 PORTION SCALE – EXISTING
Existing 7L x 9H x 7D unit to be relocated by F.S.E. Subcontractor.

ITEM 187 MOBILE UTILITY RACK – EXISTING
Existing New Age unit, 20-1/2L x 69H x 27D, with 1-1/2W ledges at 3 inch center spacing, to be relocated by F.S.E. Subcontractor.

ITEM 188 TILTING SKILLET / 40 GALLON – EXISTING
Existing Groen HFP/2-4 unit to be relocated by F.S.E. Subcontractor. Electrical and Mechanical Subcontractors to disconnect electrical and gas connections, before removal. Adjust bullet feet as required to level skillet in both directions.

ITEM 189 WORK TABLE – EXISTING
Existing Aero PTG-3072 unit, 72L x 35H x 30D, with two drawers and galvanized undershelf and legs, to be relocated by F.S.E. Subcontractor.

ITEM 190 WORK TABLE – EXISTING
Existing Aero PTG-3072 unit, 72L x 35H x 30D, with two drawers and galvanized undershelf and legs, to be relocated by F.S.E. Subcontractor.

ITEM 191 ICE MAKER W/ BIN – EXISTING
Existing Scotsman CO530SA-1C unit, with B-530S bin and black legs, to be relocated by F.S.E. Subcontractor. Electrical and Mechanical Subcontractors to disconnect electrical and water connections, before removal. After relocation, F.S.E. Subcontractor shall sanitize interior of bin before start-up.

ITEM 192 UTILITY CART – EXISTING
Existing Vollrath 3 tier unit, 24L x 32H x 16W, to be relocated by F.S.E. Subcontractor.

ITEM 193 INGREDIENT BIN (TWO REQUIRED) – EXISTING
Existing Rubbermaid units, 15L x 29H x 30D, to be relocated by F.S.E. Subcontractor.

ITEM 194 TWO TIER WALL SHELF – EXISTING
Existing InterMetro 2 tier wire unit, 36L x 21H x 12D, to be relocated by F.S.E. Subcontractor. Top of wire mounting bracket mounted 66 inches A.F.F., with bottom of wire mounting bracket mounted at 45 inches A.F.F.

ITEM 195 SPARE NUMBER

ITEM 196 MOBILE HOT CABINET (TWO REQUIRED) – EXISTING
Existing Cres-Cor 1301836D units, with non-insulated corrugated sides and solid door (right hinged), to be relocated by F.S.E. Subcontractor.

ITEM 197 UTILITY CART – EXISTING
Existing Vollrath 97106 3 tier unit, 33L x 21W, with 'U' shaped handles, to be relocated by F.S.E. Subcontractor.

ITEM 198 REACH-IN REFRIGERATOR – EXISTING
Existing True GDM-15 refrigerator, with Coca-Cola decals and right hinged door, to be relocated by F.S.E. Subcontractor.

ITEM 199 MOBILE UTILITY RACK – EXISTING
Existing Panco OUR-1820-3 unit, 21L x 69-1/4H x 26-1/2D, with 1-1/2W ledges at 3 inch center spacing, to be relocated by F.S.E. Subcontractor.

ITEM 200 SPARE NUMBER

ITEM 201 COOKIE OVEN – EXISTING
Existing Commercial Convection Oven OS-1 unit, Serial No. C0085415, to be relocated by F.S.E. Subcontractor.

ITEM 202 REACH-IN FREEZER – EXISTING
Existing True T-23F freezer, with bottom mount compressor, right hinged door, and stainless steel front and sides, to be relocated by F.S.E. Subcontractor.

ITEM 203 MOBILE HOT CABINET – EXISTING
Existing Vulcan VHFA18-1M3CN unit, with clear door (right hinged), to be relocated by F.S.E. Subcontractor.

ITEM 204 REACH-IN DISPLAY REFRIGERATOR – EXISTING
Existing True GDM-26 refrigerator, with Coca-Cola decals and right hinged door, to be relocated by F.S.E. Subcontractor.

ITEM 205 REACH-IN DISPLAY REFRIGERATOR – EXISTING
Existing True GDM-45 refrigerator, with Coca-Cola decals and sliding doors, to be relocated by F.S.E. Subcontractor.

ITEM 206 COUNTERTOP WIRE SHELVING – EXISTING
Existing 3 tier unit, 17-1/2L x 14-1/4H x 8-3/4D, with chrome finish, to be relocated by F.S.E. Subcontractor.

ITEM 207 COUNTERTOP WIRE SHELVING – EXISTING
Existing Hubert 3 tier unit, 17-1/2L x 18H x 5-1/2D, with chrome finish, to be relocated by F.S.E. Subcontractor.

ITEM 208 MOBILE FLAT SHELF MERCHANDISER (TWO REQUIRED) – EXISTING
Existing 5 tier units, 26L x 50H x 14D, with black finish, to be relocated by F.S.E. Subcontractor.

ITEM 209 COUNTERTOP WIRE SHELVING – EXISTING
Existing Hubert 3 tier unit, 17-1/2L x 18H x 12D, with black finish, to be relocated by F.S.E. Subcontractor.

ITEM 210 NACHO CHEESE DISPENSER (TWO REQUIRED) – EXISTING
Existing Gehl units, 9L x 24H x 17D, with white finish, to be relocated by F.S.E. Subcontractor.

ITEM 211 PRETZEL DISPLAY WARMER – EXISTING
Existing JJ Snack Foods 750 unit, 15L x 26-1/2H x 17D, to be relocated by F.S.E. Subcontractor.

ITEM 212 COUNTERTOP DISPLAY WARMER – EXISTING
Existing Vollrath FMA7048 unit, 47L x 24H x 19-1/4D, with sliding doors, to be relocated by F.S.E. Subcontractor.

ITEM 213 NACHO CHIP RACK – EXISTING
Existing Gehl wire unit, with white finish, to be relocated by F.S.E. Subcontractor.

ITEM 214 UTILITY CART – EXISTING
Existing InterMetro 3 tier unit, 30-1/2L x 34H x 20-1/2W, beige color, to be relocated by F.S.E. Subcontractor.

ITEM 215 WALL SHELF – EXISTING

Existing 83L x 8H x 10D unit, with no turn-up at rear and three mounting brackets, to be relocated by F.S.E. Subcontractor. Top of shelf mounted 55 inches A.F.F.

ITEM 216 SHEET PAN ADAPTOR PLATE (TWO REQUIRED) – EXISTING

Existing units to be provided by Owner.

ITEM 217 OPEN REFRIGERATED DISPLAY CASE – EXISTING

Existing Hussmann GSVM-5272 refrigerator, with lighted shelves and night curtain, to be relocated by F.S.E. Subcontractor.

ITEM 218 HOT SERVING COUNTER WITH LIGHT – EXISTING

Existing Duke Thermaduke DCTEHF60SSM unit, Serial No. 07053201, with three hot wells at right end, serving shelf TS-540-4FLM (Serial No. 07053202) and fluorescent lights, counter latches at operator's right end, tray slide, 6H legs and kickplate, to be relocated by F.S.E. Subcontractor. F.S.E. Subcontractor to remove existing tray slide, 6H legs and kickplate; redrill new holes in cabinet bottom plates as required, and install new 3 inch diameter casters (Item 86). Care should be taken when placing unit on side, to protect cabinet body and breathguard. Electrical Subcontractor to disconnect electrical connections, before removal. F.S.E. Subcontractor shall furnish and install 20 inch L plastic drain hose with clamp.

ITEM 219 HOT SERVING COUNTER WITH LIGHT – EXISTING

Existing Duke Thermaduke DCTEHF60SSM unit, Serial No. 07053196, with three hot wells at left end, serving shelf TS-540-4FLM (Serial No. 07053197) and fluorescent lights, counter latches at both ends, tray slide, 6H legs and kickplate, to be relocated by F.S.E. Subcontractor. F.S.E. Subcontractor to remove existing tray slide, 6H legs and kickplate; redrill new holes in cabinet bottom plates as required, and install new 3 inch diameter casters (Item 86). Care should be taken when placing unit on side, to protect cabinet body and breathguard. Electrical Subcontractor to disconnect electrical connections, before removal. F.S.E. Subcontractor shall furnish and install 20 inch L plastic drain hose with clamp.

ITEM 220 UTILITY SERVING COUNTER – EXISTING

Existing Duke Thermaduke DCTST-60SSM unit, with two receptacles (centered 20 inches from each end) in rear apron, no serving shelf, counter latches at operator's right end, tray slide, 6H legs and kickplate, to be relocated by F.S.E. Subcontractor. F.S.E. Subcontractor to remove existing tray slide, 6H legs and kickplate; redrill new holes in cabinet bottom plates as required, and install new 3 inch diameter casters (Item 86). Care should be taken when placing unit on side, to protect cabinet body. Electrical Subcontractor to disconnect electrical connections, before removal.

ITEM 221 UTILITY SERVING COUNTER – EXISTING

Existing Duke Thermaduke DCTST-60SSM unit, with two receptacles (centered 20 inches from each end) in rear apron, no serving shelf, counter latches at operator's left end, tray slide, 6H legs and kickplate, to be relocated by F.S.E. Subcontractor. F.S.E. Subcontractor to remove existing tray slide, 6H legs and kickplate; redrill new holes in cabinet bottom plates as required, and install new 3 inch diameter casters (Item 86). Care should be taken when placing unit on side, to protect cabinet body. Electrical Subcontractor to disconnect electrical connections, before removal.

ITEM 222 HORIZONTAL DISPLAY WARMER (TWO REQUIRED) – EXISTING

Existing APW DMXD-48H units, 48L x 27-1/2H x 28-1/2D, to be relocated by F.S.E. Subcontractor. F.S.E. Subcontractor to remove existing red side covers and red inserts for three front strips and two rear strips and replace with above black inserts (Item 91). Only existing red lower rear horizontal strip (with controls) to remain red, all other trim shall be black.

ITEM 223 UTILITY SERVING COUNTER WITH LIGHT & OVERHEAD WARMER – EXISTING

Existing Duke Thermaduke DCTST-60SSM unit, with duplex receptacle centered in rear apron, serving shelf TS-540-4HRILM and Hatco GRAL-48 foodwarmer/lights, counter latches at operator's right end, tray slide, 6H legs and kickplate, to be relocated by F.S.E. Subcontractor. F.S.E. Subcontractor to remove existing tray slide, 6H legs and kickplate; redrill new holes in cabinet bottom plates as required, and install new 3 inch diameter casters (Item 86). Care should be taken when placing unit on side, to protect cabinet body and breathguard. Electrical Subcontractor to disconnect electrical connections, before removal.

ITEM 224 UTILITY SERVING COUNTER WITH LIGHT & OVERHEAD WARMER– EXISTING
Existing Duke Thermaduke DCTST-60SSM unit, with duplex receptacle centered in rear apron, serving shelf TS-540-4HRILM and Hatco GRAL-48 foodwarmer/lights, counter latches at operator's left end, tray slide, 6H legs and kickplate, to be relocated by F.S.E. Subcontractor. F.S.E. Subcontractor to remove existing tray slide, 6H legs and kickplate; redrill new holes in cabinet bottom plates as required, and install new 3 inch diameter casters (Item 86). Care should be taken when placing unit on side, to protect cabinet body and breathguard. Electrical Subcontractor to disconnect electrical connections, before removal.

ITEM 225 PORTABLE FOOD WARMER (TWO REQUIRED) – EXISTING
Existing APW WS-4 units, 48L x 2-3/4H x 18D, to be relocated by F.S.E. Subcontractor.

ITEM 226 MOBILE HOT CABINET – EXISTING
Existing Cres-Cor H1381834C unit, with half height solid doors (right hinged), to be relocated by F.S.E. Subcontractor.

ITEM 227 WIRE SHELVING – EXISTING
Existing InterMetro Super Erecta 4 tier unit, 72L x 74H x 24D, with Metroseal finish, to be relocated by F.S.E. Subcontractor.

ITEM 228 SPARE NUMBER

ITEM 229 OPEN REFRIGERATED DISPLAY CASE – EXISTING
Existing Hussmann GSVM-5272 refrigerator, with lighted shelves and night curtain, to be relocated by F.S.E. Subcontractor.

ITEM 230 REACH-IN DISPLAY REFRIGERATOR – EXISTING
Existing True GDM-33 refrigerator, with cow print decals and sliding doors, to be relocated by F.S.E. Subcontractor.

ITEM 231 CONDIMENT CUP DISPENSER (TWO REQUIRED) – EXISTING
Existing San Jamar Gourmet units, 5L x 12H x 10D, to be relocated by F.S.E. Subcontractor.

ITEM 232 SPARE NUMBER

ITEM 233 SPARE NUMBER

ITEM 234 COUNTERTOP WIRE SHELVING – N.I.C.

ITEM 235 BREAD TRAY DOLLY (TWO REQUIRED) – N.I.C.

ITEM 236 CASH REGISTER – N.I.C.

ITEM 237 CONDIMENT PUMP (SEVEN REQUIRED) – N.I.C.

ITEM 238 KETCHUP PUMP (FOUR REQUIRED) – N.I.C.

ITEM 239 MOBILE FLAT SHELF MERCHANDISER (FOUR REQUIRED) – N.I.C.

ITEM 240 NAPKIN DISPENSER (EIGHT REQUIRED) – N.I.C.

ITEM 241 P.O.S. SYSTEM (FIVE REQUIRED) – N.I.C.

ITEM 242 ROLL-OUT RECYCLE / TRASH CONTAINER (TWO REQUIRED) – N.I.C.

PART 3 - EXECUTION

3.1 EXAMINATION

A. FIELD MEASUREMENTS. Verify dimensions before fabrication as required at all equipment locations. When checking measurements at jobsite, carefully examine existing conditions and report to the Construction Manager any work performed and planned which would prevent execution of this work. Notify the Construction Manager of such conditions in writing before proceeding.

B. MECHANICAL AND ELECTRICAL ROUGH-INS. Examine roughed-in mechanical and electrical services, and installation of floors, walls, columns and other conditions under which the work is to be installed. Notify the Construction Manager of unsatisfactory conditions for proper installation of food service equipment.

1. Visit the job site to check mechanical and electrical rough-ins, prior to the installation of concrete floor.

2. Cost to relocate or add utility lines due to the failure of the Equipment Subcontractor to indicate their proper location on the rough-in shop drawings, will be assumed by the Food Service Equipment Subcontractor.

C. THOROUGHLY REVIEW Architectural, Mechanical, and Electrical Drawings, and visit the project site as necessary to coordinate construction of all partitions prior to delivery of food service equipment.

3.2 PREPARATION

A. SCHEDULE TIME OF INSTALLATION to prevent damage to equipment by other trades.

B. PROTECT COUNTERTOPS, EXPOSED SURFACES, AND PLUMBING FIXTURES from damage during and after installation until project closeout.

C. NOTIFY THE CONSTRUCTION MANAGER, in writing, that the doors of walk-in cooler/freezer shall be propped, in the open position, during the floor curing process inside the respective compartment. Proper ventilation of compartment is required to prevent corrosion of the interior metal panels.

3.3 INSTALLATION

A. ASSEMBLE AND ERECT EQUIPMENT ITEMS in the locations shown on the Drawings. Set up items plumb and level, ready for final plumbing, electrical, and ventilating connections.

B. CAULK BETWEEN WALLS and all sinks, tables, and dishtables where backsplashes sit against walls. Caulking shall be CLEAR silicone, applied in a narrow smooth bead.

C. INSTALL CLOSURE PANELS AND TRIM STRIPS where required with matching metal.

D. INSTALL INTERCONNECTING REFRIGERATION PIPING and insulation required for the walk-in coolers/freezers. All piping insulation routed in ceiling plenum shall comply with ASTM E-84 (flame spread-25/smoke density-50).

E. TAG AND LABEL ALL KEYS with plastic identification note and deliver to the Owner.

3.4 CLEANING

A. REMOVE PROTECTIVE COVERING from equipment after completion of all major work by all trades in the food service areas. Thoroughly clean interior and exterior of equipment and service all parts, leaving all items free from defects and completely ready for operation.

B. KEEP WORKING AREA FREE FROM DEBRIS throughout the progress of the work, and remove all rubbish resulting from the installation of food service equipment from the premises.

3.5 TESTING AND DEMONSTRATING EQUIPMENT

A. DELAY START-UP of food service equipment until service lines have been tested, balanced, and adjusted for pressure, voltage and similar considerations; and until water and steam lines have been cleaned and treated for sanitation.

B. TEST EACH EQUIPMENT ITEM to demonstrate that it is operating properly, and that controls and safety devices are functioning. Repair or replace equipment which is found to be defective or operating with excessive noise or vibration.

C. FINAL TEST AND DEMONSTRATION OF EQUIPMENT shall be conducted by the Food Service Equipment Subcontractor in the presence of the Owner or his representative after all connections have been made. Qualified technicians shall instruct Owner personnel in proper function, adjustment methods, maintenance and care of each piece of equipment herein specified, to the complete satisfaction of the Owner. All cooking equipment shall be demonstrated by the respective manufacturer's representative.

D. SCHEDULE DEMONSTRATION OF EQUIPMENT with Owner. Provide written notice of demonstration date to the Construction Manager and Architect-Engineer, at a minimum of 7 days prior to the scheduled date.

E. SOLID SURFACE FABRICATOR/INSTALLER shall provide the Corian Commercial Care and Maintenance video, review maintenance procedures and the DuPont warranty with the head of maintenance upon completion of the project.

END OF SECTION 114000

SECTION 263600

TRANSFER SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes transfer switches rated 600 V and less, including the following:
   1. Automatic transfer switches.
   2. Remote annunciation systems.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.
   1. Include tables indicating actual values for short circuit current withstand ratings of transfer switches with each major manufacturer's circuit breakers.

B. Shop Drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.
   1. Single-Line Diagram: Show connections between transfer switch, bypass/isolation switch, power sources, and load; and show interlocking provisions for each combined transfer switch and bypass/isolation switch.

C. Qualification Data: For manufacturer and testing agency.

D. Field quality-control test reports.

E. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
   1. Features and operating sequences, both automatic and manual.
   2. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Maintain a service center capable of providing training, parts, and emergency maintenance repairs within a response period of less than eight hours from time of notification.

B. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
   1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

C. Source Limitations: Obtain automatic transfer switches, remote annunciators and remote annunciator and control panels through one source from a single manufacturer.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

E. Comply with NEMA ICS 1.

F. Comply with NFPA 70.

G. Comply with NFPA 110.

H. Comply with UL 1008 unless requirements of these Specifications are stricter.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Contactor Transfer Switches:
      a. Caterpillar; Engine Div.
      b. Generac Power Systems.
      c. Kohler Company; Generator Division.
      d. Onan/Cummins Power Generation; Industrial Business Group.

2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

A. Indicated Current Ratings: Apply as defined in UL 1008 for continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.

B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated, based on testing according to UL 1008.

C. Solid-State Controls: Repetitive accuracy of all settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.

D. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.

E. Electrical Operation: Accomplish by a nonfused, momentarily energized solenoid or electric-motor-operated mechanism, mechanically and electrically interlocked in both directions.

F. Switch Characteristics: Designed for continuous-duty repetitive transfer of full-rated current between active power sources.
   1. Switch Action: Double throw; mechanically held in both directions.
   2. Contacts: Silver composition or silver alloy for load-current switching. Conventional automatic transfer-switch units, rated 225 A and higher, shall have separate arcing contacts.

G. Neutral poles have the same ratings as the phase poles and are operated by a common mechanism.

H. Annunciation, Control, and Programming Interface Components: Devices at transfer switches for communicating with remote programming devices, annunciators, or annunciator and control panels shall have communication capability matched with remote device. Multiple transfer switches shall be connected to one (1) or more remote annunciators, to monitor and display all information of generators and transfer switches providing remote annunciation exactly as if connected to only one (1) transfer switch.

I. Factory Wiring: Train and bundle factory wiring and label, consistent with Shop Drawings, either by color-code or by numbered or lettered wire and cable tape markers at terminations. Color-coding and wire and cable tape markers are specified in Division 26 Section "Identification for Electrical Systems."
   1. Designated Terminals: Pressure type, suitable for types and sizes of field wiring indicated.
   2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
   3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.

J. Enclosures: General-purpose NEMA 250, Type 1, complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

2.3 AUTOMATIC TRANSFER SWITCHES

A. Comply with Level 1 equipment according to NFPA 110.

B. Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning, unless otherwise indicated.

C. Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.

D. Manual Switch Operation: Unloaded. Control circuit automatically disconnects from electrical operator during manual operation.

E. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.

F. Digital Communication Interface: Matched to capability of remote annunciator or annunciator and control panel.

G. Motor Disconnect and Timing Relay: Controls designate starters so they disconnect motors before transfer and reconnect them selectively at an adjustable time interval after transfer. Control connection to motor starters is through wiring external to automatic transfer switch. Time delay for reconnecting individual motor loads is adjustable between 1 and 60 seconds, and settings are as indicated. Relay contacts handling motor-control circuit inrush and seal currents are rated for actual currents to be encountered.

H. Automatic Transfer-Switch Features:
   1. Undervoltage Sensing for Each Phase of Normal Source: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 90 to 95 percent of nominal, and dropout voltage is adjustable from 70 to 90 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.
   2. Adjustable Time Delay: For override of normal-source voltage sensing to delay transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.
   3. Voltage/Frequency Lockout Relay: Prevent premature transfer to generator. Pickup voltage shall be adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency shall be adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.
   4. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes, and factory set for 10 minutes to automatically defeat delay on loss of voltage or sustained undervoltage of emergency source, provided normal supply has been restored.
   5. Test Switch: Simulate normal-source failure.
   6. Switch-Position Pilot Lights: Indicate source to which load is connected.
   7. Source-Available Indicating Lights: Supervise sources via transfer-switch normal- and emergency-source sensing circuits.
      a. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available."
      b. Emergency Power Supervision: Red light with nameplate engraved "Emergency Source Available."
   8. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each switch position, rated 10 A at 240-V ac.
   9. Transfer Override Switch: Overrides automatic retransfer control so automatic transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.
   10. Engine Starting Contacts: One isolated and normally closed, and one isolated and normally open; rated 10 A at 32-V dc minimum.
   11. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes, and factory set for five minutes. Contacts shall initiate shutdown at remote engine-generator controls after retransfer of load to normal source.
   12. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine generator and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable at 7, 14, 21, or 28 days. Running periods are fixed at 20 minutes. Factory settings are for 28-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:
      a. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.

2.4 REMOTE ANNUNCIATOR SYSTEM

A. Functional Description: Remote annunciator panel shall annunciate conditions for each indicated transfer switch discretely. Annunciation shall include the following:
   1. Sources available, as defined by actual pickup and dropout settings of transfer-switch controls.

2. Switch position.
3. Switch in test mode.
4. Failure of communication link.

B. Annunciator Panel: LED-lamp type with audible signal and silencing switch.

1. Indicating Lights: Grouped for each transfer switch monitored.
2. Label each group, indicating transfer switch it monitors, location of switch, and identity of load it serves.
3. Mounting: Flush, modular, steel cabinet, unless otherwise indicated.
4. Lamp Test: Push-to-test or lamp-test switch on front panel.

2.5 SOURCE QUALITY CONTROL

A. Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Annunciator and Control Panel Mounting: Flush in wall, unless otherwise indicated.

B. Identify components according to Division 26 Section "Identification for Electrical Systems."

C. Set field-adjustable intervals and delays, relays, and engine exerciser clock.

3.2 CONNECTIONS

A. Wiring to Remote Components: Match type and number of cables and conductors to control and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.

B. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

C. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

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

B. Perform tests and inspections and prepare test reports.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installation, including connections, and to assist in testing.
   2. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
   3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
   4. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.
      a. Check for electrical continuity of circuits and for short circuits.
      b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
      c. Verify that manual transfer warnings are properly placed.
      d. Perform manual transfer operation.
   5. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.
      a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
      b. Simulate loss of phase-to-ground voltage for each phase of normal source.
      c. Verify time-delay settings.
      d. Verify pickup and dropout voltages by data readout or inspection of control settings.
      e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.
      f. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for 1 pole deviating by more than 50 percent from other poles.
      g. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.
   6. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.
      a. Verify grounding connections and locations and ratings of sensors.

C. Testing Agency's Tests and Inspections:
   1. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
   2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
   3. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.
      a. Check for electrical continuity of circuits and for short circuits.
      b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
      c. Verify that manual transfer warnings are properly placed.
      d. Perform manual transfer operation.
   4. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.
      a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
      b. Simulate loss of phase-to-ground voltage for each phase of normal source.

c. Verify time-delay settings.
d. Verify pickup and dropout voltages by data readout or inspection of control settings.
e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.
f. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for 1 pole deviating by more than 50 percent from other poles.
g. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.

5. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.
   a. Verify grounding connections and locations and ratings of sensors.

D. Coordinate tests with tests of generator and run them concurrently.

E. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.

F. Remove and replace malfunctioning units and retest as specified above.

G. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switch. Remove all access panels so joints and connections are accessible to portable scanner.
1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.
2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
3. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.4 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment as specified below. Refer to Division 01 Section "Demonstration and Training."

B. Coordinate this training with that for generator equipment.

END OF SECTION 263600

SECTION 271500

COMMUNICATIONS CABLING

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. Telecommunications mounting elements.
2. Telecommunications equipment racks and cabinets.
3. Grounding.
4. UTP cabling.
5. Voice backbone cabling.
6. 50/125-micrometer, optical fiber cabling.
7. 9/125-micrometer, optical fiber cabling.
8. Horizontal coaxial cable.
9. Multiuser telecommunications outlet assemblies.
10. Cable connecting hardware, patch panels, and cross-connects.
11. Telecommunications outlet/connectors.
12. Cabling system identification products.
13. Cable management system.

B. Related Sections:
1. Division 27 Section “Common Work Results For Communications” for device outlets and sleeves for pathways.
2. Division 27 Section “Cable Trays for Communications Systems” for cable tray pathways.
3. Division 27 Section “Master Antenna Television System” for program source and broadband distribution components.

1.3 DEFINITIONS

A. BICSI: Building Industry Consulting Service International.

B. EMI: Electromagnetic interference.

C. IDC: Insulation displacement connector.

D. Cable Runway: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).

E. LAN: Local area network.

F. PVC: Polyvinyl chloride.

G. LEC: Local exchange carrier.

H. POT: Point of termination.

I. MM: Multimode fiber optic.

J. SM: Single-mode fiber optic.

K. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.

L. RCDD: Registered Communications Distribution Designer.

M. UTP: Unshielded twisted pair.

N. UPS: Uninterruptable power supply.

O. RU: Rack Unit (1.75 inches)

P. System Installer: The term “System Installer” shall refer to the person who is responsible for the installation and performance testing of the voice, data and video communications cabling work specified herein.

Q. CCTV: Closed-circuit television.

1.4 COMMUNICATIONS CABLING DESCRIPTION

A. Backbone cabling system shall provide interconnections between communications equipment rooms, main terminal space, and entrance facilities in the telecommunications cabling system structure. Cabling system consists of backbone cables, intermediate and main cross-connects, mechanical terminations, and patch cables or jumpers used for backbone-to-backbone cross-connection.

B. Backbone cabling cross-connects may be located in communications equipment rooms or at entrance facilities. Bridged taps and splitters shall not be used as part of backbone cabling.

C. Horizontal cable and its connecting hardware provide the means of transporting signals between the telecommunications outlet/connector and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.
   1. TIA-568-C requires that a minimum of two telecommunications outlet/connectors be installed for each work area.
   2. Bridged taps and splices shall not be installed in the horizontal cabling.
   3. Splitters shall not be installed as part of the optical fiber cabling.

D. The maximum allowable horizontal cable length is 295 feet (90 m). This maximum allowable length does not include an allowance for the length of 16 feet (4.9 m) to the workstation equipment. The maximum allowable length does not include an allowance for the length of 16 feet (4.9 m) in the horizontal cross-connect.

E. Communications cabling includes wire, cable, connecting devices, installation, and testing for wiring systems to be used as signal pathways for voice, high-speed data and video transmission. Voice and Data horizontal cabling rated Category 6A and Category 5e voice backbone cable, 850nm VCSEL source optimized 50 micron multimode fiber optic backbone cable designed for 10Gb out to 300 and 500 meters and 9 micron singlemode fiber optic cable. All UTP cable and connecting hardware are TIA compliant for the application served. All cabling shall be tested and certified, with UTP cabling provided with a minimum 15 year bandwidth warranty.

F. Telephones and the PBX system are not specified under this section.

G. Distribution of cable television service signals is not included in this section.

H. Broadband cable distribution system consisting of high resolution RG-6 horizontal coaxial cables and user interfaces are included in this section. Backbone coaxial cables, signal taps, splitters, RF amplifiers, signal equalizers, power supplies are not included in this Section.

I. Drawings indicating rack elevations are general in nature and may require modified horizontal capacity to meet project requirements.

1.5 PERFORMANCE REQUIREMENTS

A. General Performance: Backbone and horizontal cabling system shall comply with transmission standards in TIA-568-C.0, TIA-568-C.1 TIA-568-C.2 and TIA-568-C.3, when tested according to test procedures of this standard.

1.6 SUBMITTALS

A. Product Data: For each product or component, include data on features, ratings, and performance.

B. Include dimensioned plan and elevation views of each individual component. Show equipment assemblies, method of field assembly, workspace requirements, and access for cable connections.

C. Qualification Data: If requested, for installation team indicating compliance with Quality Assurance Article.

D. System Labeling Schedules: Electronic copy of labeling schedules, in software and format selected by Owner.

E. Material list: Complete list of materials showing quantity, brief description and manufacturer's part number as shown on specification sheets.

F. Specification sheets: Clearly identify provided product model and options. Part numbers shall match materials list. Include typical details, schematics and dimensions.

G. Provide information on all products, including:
1. Workstation outlets, jacks, jack assemblies and labeling.
2. UTP patch panels.
3. UTP patch cables.
4. UTP connecting and termination hardware.
5. UTP backbone cable.
6. UTP horizontal cable.
7. Wire management.
8. Fiber optic patch panels.
9. Fiber optic patch cables.
10. Fiber optic connecting and termination hardware.
11. Fiber optic backbone cable.
12. Innerduct.
13. Coaxial horizontal cable.
14. Horizontal coaxial cable terminations at user interfaces.
15. UPS.
16. Cable supports, D-rings and cable wraps.
17. Equipment racks.
18. Cable runway components and supports.
19. Grounding terminal components.
20. Cable test equipment.

H. Cable Administration Drawings: Submit as specified in Part 3. Administration drawings shall be installed within each telecommunications room prior to any Owner occupancy. Contractor shall temporarily post contract document detail sheets in each telecom equipment room for reference by the Owner.

I. Samples: If requested, for workstation outlets, jacks, jack assemblies, and faceplates for color selection and evaluation of technical features.

J. Warranty and Product Certificates: For each UTP type of cable, connector, and terminal equipment, signed by product manufacturer.

K. Field quality-control permanent link test reports for all copper and coaxial cables specified.

L. Submit a signed copy of delivery receipt for spare materials as specified in Extra Materials section below with quantity and line item listing of products. Differentiate products for station cables and patch cables.

M. Operation and Maintenance Manual: For communication cabling to include reviewed product data submittal and user manuals on all active electronic products.

N. Software Documentation:
1. Utilized version of tester software and portable document software reader software.
2. Data Backup: On compact disk, in original tester format and portable document format. Include summary listing of tests and cable detail sheets.
3. Labeling device address list in original software format and editable document version.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Communications cabling contractors listed below are approved to perform the work of this Section. Non-approved contractors or installers shall not be allowed.
1. Americomm, Lincoln, NE
   Contact: Trevor Kinnett, 402-214-5231, trevor@americom.biz
2. Commonwealth Communications, Omaha, NE
   Contact: Dave Krahmer, 402-331-1414, dkrahmer@commonwealthelectric.com
3. Electric Company of Omaha, Omaha, NE
   Contact: Bryan Shaw, 402-672-7116, bshaw@ecoo.com
4. Electronic Systems, Hastings, NE
   Contact: Bruce Moores, 402-463-0200, elecsys@kdsi.net
5. Kidwell Communications, Lincoln, NE
   Contact: John Wiechman, 402-898-4262, jwiechman@kidwell.us.com
6. Miller Electric, Omaha, NE
   Contact: Tom Parks, 402-341-6479, tom@millerelect.com
7. Prime Communications, Omaha, NE
   Contact: Brain Kenkel, 402-289-4126, bkenkel@primecominc.com
8. Computer Cable Connection, Omaha, NE
   Contact: Chris Kielian, 402-291-9500, ckielian@cccne.com
9. Lines of Communications, Inc., Omaha, NE
   Contact: Eric Roark, 402-333-2111, eric.roark@locomaha.com

B. Manufacturers: Cabling Installer shall have been a certified installer for specified manufacturer's warranty with connectivity equipment manufacturer for a minimum of 6 months prior to project bid date.

C. Testing Equipment: Contractor shall utilize and have prior training with test equipment specifically suited to and designed for link testing of the cabling and connecting hardware specified. Unless approved otherwise, Contractor shall utilize the following:
1. UTP testing Equipment:
   a. Fluke DTX1800 or DSX-5000 Series test sets.

2. Fiber optic test equipment for both LED and VCSEL sources from 850nm - 1300nm wavelengths for Gigabit applications:
    a. Fluke Encircled Flux Launch Controller multimode fiber test assemblies.
    b. Fluke singlemode fiber test assemblies.

D. 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.

E. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.

F. Grounding: Comply with ANSI-J-STD-607-A.

G. Comply with NECA 1.

H. Expansion Capability: Unless otherwise indicated, provide spare positions in cross-connect and patch panels, and terminal strips to accommodate 25 percent future increase in active workstations.

I. Product Warranties: All UTP structured cabling, equipment and connecting components shall be provided with a minimum fifteen (15) year Product and Applications Warranty including materials and installation cost for replacement of any warranted link failure within the warranty period. Warranty shall not be sub year renewable or require additional information or processing by the Owner for the entire warranty period.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Test cables upon receipt at Project site.
1. Test optical fiber cables while on reels. Use an optical time domain reflectometer to verify the cable length and locate cable defects, splices, and connector; including the loss value of each. Retain test data and include the record in maintenance data.
2. Test each pair of UTP cable for open and short circuits.

1.9 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install cables and connecting materials until wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Inspect cable pathways, including raceway stub-ups, sleeves and cable tray. Report any deficiencies to Architect/Engineer prior to installation of cable.

1.10 COORDINATION

A. Coordinate layout and installation of communications equipment with Owner's telecommunications and LAN equipment and service suppliers. Coordinate service entrance arrangement with local exchange carrier.
1. Meet jointly with telecommunications, LAN and cable television equipment suppliers, local exchange carrier representatives, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
2. Record agreements reached in meetings and distribute them to other participants.
3. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.

4. Adjust arrangements and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other communications, electronic safety and security, and related systems that share space in the equipment room.

B. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

C. Coordinate with other building trades during the progress of work to insure access and clearance requirements and to insure proper coordination with the building construction schedule.

D. Coordinate Voice and Data backbone cable lengths with installed pathways.

E. Coordinate phasing of work with the Construction Manager, Electrical Contractor and with the Summary of Work section to organize materials and resources to meet the scheduled completion dates indicated.

1.11 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. See submittals section for delivery requirements.
   1. Horizontal UTP Cable: Two (2) 1,000ft reel in unopened tote boxes. (1-White, 1-Blue)
   2. Telecommunications Outlet Assemblies: Ten (10) device plates with twenty (20) UTP jack assemblies of each type and color.
   3. Horizontal wire management: Two (2) 2-RU Units.
   4. UTP and fiber patch cables: As specified elsewhere.
   5. UTP workstation cables: As specified elsewhere.

PART 2 - PRODUCTS

2.1 GENERAL

A. Specific products listed within the specification are to be used as a standard for comparison for like products offered by approved manufacturers listed above. All features and specifications of products listed are applicable to like products whether the specification is listed or not. Listing of specific products within the specification is not to be construed as approval of manufacturer for complete product line.

2.2 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A. See Division 27 Section 270500 “Common Work Results for Communications” for additional cable pathway information.

B. Cable Support: NRTL labeled for support of Category 6A cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
   1. Support brackets with cable tie slots for fastening cable ties to brackets.
   2. Lacing bars, spools, J-hooks, and D-rings.
   3. Straps and other devices.

C. Cable Trays, Conduit and Boxes: Provided by Division 27 “Common Work Results for Communications” and “Cable Trays for Communications Systems.”

2.3 BACKBOARDS

A. Backboards: As shown on drawings, provide as required to mount cable runway and equipment. Plywood, fire-retardant treated, 3/4 by 48 by 96 inches (19 by 1220 by 2440 mm). Comply with requirements in Division 06 Section "Rough Carpentry" for plywood backing panels. Paint plywood with 2 coats of gray enamel.

2.4 UTP HORIZONTAL CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Panduit Corp.
   2. General Cable.
   3. Siemon Company (The).
   4. SYSTIMAX Solutions; a CommScope, Inc. brand.

B. Description: 100-ohm, 4-pair UTP, sweep tested to 500Mhz minimum, covered with a thermoplastic jacket. Provide in colors specified on Drawings.
   1. Comply with ICEA S-90-661 for mechanical properties.
   2. Comply with TIA/EIA-568-C for performance specifications.
   3. Comply with TIA/EIA-568-C, Category 6A.
   4. Cable outside diameter shall be less than or equal to .300 inch diameter.
   5. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70 for the following types:
      a. Communications, Plenum Rated: Type CMP, complying with NFPA 262.

2.5 UTP VOICE BACKBONE CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Belden CDT Inc.; Electronics Division.
   2. General Cable.
   3. Superior Essex Inc.
   4. SYSTIMAX Solutions; a CommScope, Inc. brand.

B. Description: 100-ohm, 4-pair UTP, covered with a thermoplastic jacket and be fully water blocked, in a FR Polyolefin jacket for underground applications.
   1. Comply with ICEA S-90-661 for mechanical properties.
   2. Comply with TIA/EIA-568-C for performance specifications.
   3. Comply with TIA/EIA-568-C Category 5e.
   4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444 and NFPA 70.

2.6 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Panduit Corp.
   2. Siemon Company (The).
   3. SYSTIMAX Solutions; a CommScope, Inc. brand.

B. General Requirements for Cable Connecting Hardware: Comply with TIA-568-C, IDC type, with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Connection Panel: Modular 48 port panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables. Provide jack panels with replaceable label and cover for each port. Standard patch panels will not be accepted.
   1. Number of Jacks per Field: One for each four-pair UTP cable indicated plus spares and blank positions adequate to suit specified expansion criteria.
   2. Install jacks in all unused ports of jack panels.

D. Voice Connecting Blocks: 66-style IDC for Category 5. Provide blocks for the number of cables terminated on the block. Integral with connector bodies, including plugs and jacks where indicated.

2.7 TELECOMMUNICATIONS OUTLET/CONNECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Panduit Corp.
   2. Siemon Company (The).
   3. SYSTIMAX Solutions; a CommScope, Inc. brand.

B. Jacks: 100-ohm, balanced, twisted-pair connector; four-pair, eight-position modular. Comply with TIA/EIA-568-C.

C. Workstation Outlets: Multi-port connector assemblies mounted in single faceplates.
   1. Plastic Faceplate: High-impact plastic, color as indicated.
   2. For use with snap-in jacks accommodating any combination of UTP, optical fiber, video computer graphic and coaxial work area connectors.
      a. Flush mounting jacks, positioning the cord at a 45-degree angle.
      b. Coaxial inserts shall be self-terminating type F.
   3. Legend: Snap-in, two clear-label identification covers and machine-printed paper inserts.
   4. Typical communications outlet: Single gang, four (4) – port.
   5. Dust Covers: Provide dust covers on all unused ports.

D. Wall Phone Outlet Assemblies: Complete mounting assembly including 302 brushed stainless coverplate, RJ-45 jack and wall phone mounting bracket and hardware.

E. Divided raceway outlets: Provide outlets with four (4) ports minimum and internal labeling windows complying with TIA 606, suitable for mounting within surface wireway assemblies. Provide “Open System Modules” for divided raceway specified to mate with manufacturer’s jacks. Coordinate adapters with divided raceway provided by Division 26.

F. Typical WAP or Video Projector outlet: Provide surface mounted outlet boxes as indicated on drawings.

G. Dust Covers: Provide dust covers on all unused ports.

2.8 PATCH AND WORKSTATION CABLES

A. Patch Cables: Factory-made by same manufacturer as horizontal cable, four-pair in lengths as indicated; terminated with eight-position modular plug at each end.
   1. Patch cables shall have bend-relief-compliant boots to ensure Category 6A performance. Patch cables shall have latch guards to protect against snagging.
   2. Provide patch cables as follows:
      a. Provide quantity equal to 100% of terminated horizontal data WAP cables installed.
         1) Cable lengths and colors to be provided in ratios as follows:
            a) 50% at 4ft, color Green.

b) 50% at 6ft, color Green.

b. Provide quantity equal to 100% of terminated horizontal data Video Projector cables installed.
   1) Cable lengths and colors to be provided in ratios as follows:
      a) 50% at 4ft, color Yellow.
      b) 50% at 6ft, color Yellow.

c. Provide quantity equal to 75% of the terminated horizontal data cables installed.
   1) Cable lengths and colors to be provided in ratios as follows:
      a) 30% at 4ft, color Blue.
      b) 40% at 6ft, color Blue.
      c) 10% at 8ft, color Blue.
      d) 20% at 15ft, color Blue.

B. Workstation Cables: Factory-made by same manufacturer as horizontal cable, four-pair in lengths as indicated; terminated with eight-position modular plug at each end.
   1. Workstation cables shall have bend-relief-compliant boots to ensure Category 6A performance. Patch cables shall have latch guards to protect against snagging.
   2. Provide workstation cables as follows:
      a. Provide quantity equal to 100% of terminated horizontal data WAP cables installed.
         1) Cable lengths and colors to be provided in ratios as follows:
            a) 50% at 4ft, color Green.
            b) 50% at 6ft, color Green.
      b. Provide quantity equal to 100% of terminated horizontal data Video Projector cables installed.
         1) Cable lengths and colors to be provided in ratios as follows:
            a) 100% at 4ft, color Yellow.
      c. Provide quantity equal to 90% of the terminated horizontal data cables installed.
         1) Cable lengths and colors to be provided in ratios as follows:
            a) 35% at 6ft, color Gray or White.
            b) 50% at 10ft, color Gray or White
            c) 15% at 15ft, color Gray or White.

2.9 OPTICAL FIBER CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Cable Assembly:
      a. Corning Cable Systems.
      b. OFS; a Furukawa Company.
      c. Optical Cable Corporation.
      d. Panduit.
      e. SYSTIMAX Solutions; a CommScope, Inc. brand.
   2. Optical Glass:
      a. OFS.
      b. Corning.

B. Description: Multimode, 50/125-micrometer, 24-fiber (unless otherwise specified), tight buffered, graded index, glass optical fiber cable. Cable shall support 10Gb Ethernet out to 300 and 550 meters.
   1. Comply with ICEA S-83-596 for mechanical properties.
   2. Comply with TIA/EIA-568-C for performance specifications.
   3. Comply with TIA/EIA-492AAAA-B for detailed specifications.
   4. Listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 444, UL 1651, and NFPA 70 for the following types:
      a. Indoor/Outdoor Plenum Rated: Type OFNP, complying with NFPA 262.
   5. Maximum Attenuation: 3.00 dB/km at 850 nm; 1.0 dB/km at 1300 nm.

6. Minimum Modal Bandwidth (EMB): 2000 MHz-km at 850 nm; 500 MHz-km at 1300 nm for 300 series and 4700 MHz-km at 850 nm for 550 series.

C. Singlemode Description: Factory fabricated sheathed and jacketed, low loss, glass type, fiber optic, 9 micron single mode loose tube, germanium doped core, silica cladding, operating at both 1310 nm through 1550 nm, indoor/outdoor rated. Cables shall be continuous without splices, with machine polished ends.
1. Strands per Cable: 12, unless otherwise indicated.
2. Dimensions: 8.2-micrometer nominal core diameter; 125-micrometer cladding diameter.
3. Zero Dispersion: Wavelength: 1313nm, Slope .086 ps/nm2xkm)
4. Refractive Index Difference: .36 percent.
5. Effective Group Index of Refraction: 1310nm: 1.4677, 1550nm: 1.4682.
6. Individual fiber Polarization Mode Dispersion (PMD): Less than or equal to .02 ps/km
7. Maximum Attenuation: Minus .35 dB/km at 1310 nm; minus .20 dB/km at 1550 nm.
8. Minimum Dispersion: Less than 18.0 ps/nm-km 1285 nm to 1550 nm.
9. Operating Temperature Range: Minus 60 to plus 85 deg C with less than or equal to .05dB/km loss.
10. Provide Corning SMF-28e series or approved equal.

D. Jacket:
1. Jacket Color: Aqua for 50/125-micrometer cable. Yellow for 9/125-micrometer cable.
2. Cable cordage jacket, fiber, unit, and group color shall be according to TIA/EIA-598-B.
3. Imprinted with fiber count, fiber type, and aggregate length at regular intervals not to exceed 40 inches (1000 mm).
4. Provide indoor/outdoor plenum rated and metallic sheathed, water blocked, OSP cable where indicated.

2.10 OPTICAL FIBER CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Corning Cable Systems.
2. Panduit.
3. Siemon Co. (The).
4. SYSTIMAX Solutions; a CommScope, Inc. brand.

B. Cross-Connects and Patch Panels: Modular panels housing multiple-numbered, duplex cable connectors. Two (2) rack unit mountable with modular array of interchangeable fiber termination units allowing the use of ST, SC or LC connecting devices within the frame. Unit shall include, fiber drums, front fiber trough, splice tray and plexi-glass front access panel.
1. Number of Connectors per Field: One for each fiber of cable or cables assigned to field by type, plus spares as indicated.

C. Patch Cables: Factory-made, dual-fiber 1.6 mm cables in lengths indicated.
1. Provide Multimode patch and equipment cables as follows:
a. Connectors: Patch panel connector - Duplex SC.
b. Provide quantity equal to 50% of the fiber strands terminated in each location.
c. Cable lengths to be provided in ratios as follows:
1) 20% at 3ft, color Aqua.
2) 60% at 6ft, color Aqua.
3) 20% at 15ft, color Aqua.

D. Provide Singlemode patch and equipment cables as follows:
a. Connectors: Patch panel connector - ST type.
b. Provide quantity equal to 10% of the fiber strands terminated in each location.
c. Cable lengths to be provided in ratios as follows:
1) 50% at 6ft, color Yellow.
2) 50% at 10ft, color Yellow.

E. Cable Connecting Hardware:
   1. Comply with Optical Fiber Connector Intermateability Standards (FOCIS) specifications of TIA/EIA-604-2, TIA/EIA-604-3-A, and TIA/EIA-604-12. Comply with TIA/EIA-568-C.
   2. Fusion spliced Type connectors. Insertion loss not more than 0.2 dB. Mechanical crimp type connectors shall not be accepted.
   3. Connectors shall be manufactured of zirconia ceramic material.

2.11 COAXIAL CABLE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Belden CDT Inc.; Electronics Division.
   2. CommScope, Inc.
   3. Extron Electronics.
   4. West Penn Wire.

B. Cable Characteristics: Broadband type, recommended by cable manufacturer specifically for broadband and serial digital data transmission applications. Coaxial cable and accessories shall have 75-ohm nominal impedance with a return loss of 20 dB maximum from 7 to 806 MHz.

C. RG-6/U: NFPA 70, Type CMP or CATVP, complying with NFPA 262.
   1. No. 18 AWG, solid, bare copper conductor.
   2. FFEP – Foam Fluorinated Ethylene Proplene insulation.
   3. Double shielded with 100 percent aluminum-foil shield and 95 percent tinned copper braid.
   4. Jacketed with LS PVC, black Low Smoke Polyvinyl Chloride.
   5. Suitable for installations in ambient temperatures ranging from minus 20 to plus 75 deg C.
   6. Provide Extron 22-164 series, Belden 1695A, West Penn 256350 or approved equal.

D. NFPA and UL compliance, listed and labeled by an NRTL acceptable to authorities having jurisdiction as complying with UL 1655 and with NFPA 70 "Radio and Television Equipment" and "Community Antenna Television and Radio Distribution" Articles. Types are as follows:
   1. CATV Plenum Rated: Type CATVP, complying with NFPA 262.

2.12 COAXIAL CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Digicon.
   2. Holland Electronics.
   3. Other approved manufacturer.

B. Coaxial-Cable Connectors: Type F, 75 ohms.
   1. Compression style with complete 360 degree conical crimp approved by the cable manufacturer for use on cable specified.
   2. Brass body with tin plating meeting SCTE IPS-SP-401 standards.
   3. Return Loss to be greater than 30dB from 5-1000Mhz.
   4. Cable holding force minimum 50 lbs.
   5. Insertion loss less than .3dB to 1000Mhz.
   6. Shielding effectiveness greater than 70dB to 1000Mhz.
   7. Hex or pinch type crimp connectors will not be accepted.

2.13 MOUNTING ELEMENTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Chatsworth Products, Inc.
   2. Panduit Corp.
   3. SYSTIMAX Solutions; a CommScope, Inc. brand.

B. Distribution Racks: Freestanding 2-post and 4-post modular-aluminum units capable of supporting 750 lbs and designed for telecommunications terminal support, with two-sided vertical front and rear accessible cable managements and top mounted cable runway mounting features.
   1. Approximate Module Dimensions: 84 inches high by 19 inches wide by 29 inches deep rail to rail for 4-post rack.
      a. 2-post: Provide CPI #55053-X03 or approved equal.
      b. 4-post: Provide CPI #50120-X03 or approved equal.
   2. Vertical wire management devices: Approximately 16 inches deep double sided, width as indicated, mounted either side of vertical rack frames. Provide with hinged removable front covers. Provide Panduit PatchRunner PRV series or approved equal.

C. Distribution Equipment Cabinet: Freestanding enclosed cabinet capable of supporting 3000 lbs and designed for telecommunications equipment support, with adjustable mounting rails, vertical accessible cable management, front and rear split perforated doors, side panels at both ends of utility cabinets, PDU mounting brackets and standard top accessible panel with cable access grommets aligned with vertical cable management. Doors have keyed locks.
   1. Approximate Dimensions: 84 inches high by 32 inches wide by 43 inches deep.
      a. Provide CPI model GF2-C-5 cabinet with accessories or approved equal.

D. Distribution Cable Cabinet: Freestanding enclosed cabinet capable of supporting 2500 lbs and designed for telecommunications cabling support, with two-sided vertical front and rear accessible cable management, front and rear split perforated doors, side panels at ends and standard top panel with cable access grommets aligned with vertical cable management. PDU mounting brackets and double latch keyed door locks.

   1. Approximate Dimensions: 84 inches high by 40 inches wide by 40 inches deep.

      a. Provide CPI model NF2-6-J-2-2-3-C-C-4 cabinet with accessories or approved equal.

E. Distribution Components:
   1. Horizontal wire management devices: Horizontal distribution channels on both front and rear. Provide slotted wall wiring Duct with removable cover matching vertical wire management. Provide one organizer on top and bottom of each patch panel and top and bottom of each Owner provided network switch.
      a. Provide Panduit model NM2 or approved equal.
   2. Rack Crossing Pathway: Four (4) RU pathway for cables with radius mounts.
      a. Provide Panduit model NM4 or approved equal.

F. Distribution Rings: Metal rings designed to wall mount and support cables, innerduct and systems specified.

G. Keyboard/Monitor Shelf: Provide integral front and rear mount unit with single sliding keyboard tray and mouse pad. Provide CPI #12495-719 or approved equal.

H. Equipment Shelf: Provide front and rear mounted heavy duty vented equipment shelf CPI #40117-719 or approved equal.

I. HD Equipment Shelf: Provide front and rear mounted heavy duty vented equipment shelf CPI #14072-719 or approved equal.

J. Patch Cable Storage: Provide six (6) cable storage hangers for storing patch cables. Each hanger shall consist of one (1) Suttle No. 66145 wire and cable hanger and two (2) Suttle No. A20B cable routing spools mounted either side of hanger. Mount three (3) in each communications room.

K. Cable straps: Straps used for strapping cable bundles shall be plenum rated where installed in plenums. Provide the following:
   1. Horizontal and Patch Cables: One (1) inch wide by 8 and 12 inches in length.
   2. Backbone Cables: 3/4-inch wide by 12 and 18 inches in length.

2.14 CABLE RUNWAY

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. CPI, Chatsworth Products, Inc.
   2. Panduit Corporation.
   3. SYSTIMAX Solutions; a CommScope, Inc. brand.

B. Materials: Tubular steel metal, suitable for indoors made of 3/8 inch" x 1-1/2-inch x 0.065 inch wall rectangular welded sections. Includes standard sections, 90 degree vertical sweeps, horizontal and vertical radius bends, cable drop-outs, mounting hardware, brackets and accessories. Color: Black.
   1. Runway: Nominally 12, 15 and 18 inches wide, and a rung spacing of 9 inches (228 mm). CPI # 11252-715 series or approved equal.
   2. Corner Radiuses: CPI # 11959 series or approved equal.
   3. Drop Outs: 12100-715 series or approved equal.

2.15 INNERDUCT

A. Nonmetallic corrugated flexible conduit for use in plenum, riser and general purpose applications per NEC Article 770 and 800, UL 2024 listed for standard and riser applications for optical communications raceways. Minimum diameter shall be one (1) inch.
   1. Provide Carlon - Plenum-guard, #CF4X1C Series or approved equal.

2.16 UNINTERRUPTIBLE POWER SUPPLY AND HORIZONTAL POWER DISTRIBUTION

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. APC.
   2. Liebert Corporation.

B. The UPS units shall be rack mounted within the systems cabinets and racks to protect the equipment as shown on drawing. Unit shall be rated at 2880 VA maximum configurable power with a half load run time of 10 minutes with internal battery and contain at least six (6) NEMA 5-20R outlets for equipment protection. Unit shall be capable of supporting one (1) external battery unit. Provide with NEMA L5-30P input connector.
   1. Provide APC Smart UPS SMT RM XL Series in quantities shown on drawings or approved equal.

C. Vertical Power Distribution Unit:
   1. Where noted on drawings, provide APC model AP8965 vertical power distribution components matching Owner's existing models.

D. Horizontal Power distribution strips: For each rack plug strip indicated, provide rack mounted power strip with integral surge suppression. Plug strips shall be switchless 19" units, with a minimum of ten (10) NEMA 5-15 outlets rear, two (2) NEMA 5-15 outlets front, one (1) NEMA 5-15 plug on 15ft cord, and a clamping voltage of 315V and a 420 joule, 13,000 amp energy rating.
   1. Provide Geist Manufacturing custom configured SPN124-15 or approved equal.

E. Networked Power Management strips: For each unit indicated, provide rack mounted power strip with integral surge suppression. Power strips shall be switchless 19" units, with a minimum of ten (8) NEMA 5-15 rear outlets, Unit shall include an amp meter, one (1) Ethernet connection, one (1) NEMA 5-15 plug on 15ft cord, and be capable of environmental monitoring. Surge Protection shall have a clamping voltage of 315V and a 420 joule, 13,000 amp energy rating. Unit shall be capable of being remotely monitored and switched for hardware restart.
   1. Provide Geist Manufacturing custom configured RCURN082-15D20ST5-0 or approved equal.

2.17 IDENTIFICATION PRODUCTS

A. Comply with TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Maintain an electronic software spreadsheet of workstation outlets, cable labels, and patch panel ports for use during construction and for Owner's operational use.

C. Cable Labels: Self-adhesive vinyl wrap around tape markers, machine printed self-laminating tape with alphanumeric cable designations applied to each end of each cable and to terminal equipment, patch panels, and distribution frames.

D. Equipment, Nameplates and Wall Fields Labels: Engraved black with white letter laminate plastic with identifying description of frames and wall fields served. Permanent industrial strength adhesive backed. Letters shall be minimum one (1) inch high.
   1. Communications Equipment racks and Enclosures.
   2. Backbone and Distribution wall fields.
   3. Raceways serving communications rooms.

2.18 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Factory test optical fiber cables on reels according to TIA-568-C.

C. Factory test UTP cables according to TIA-568-C.

D. Cable will be considered defective if it does not pass tests and inspections or produces marginal results.

PART 3 - EXECUTION

3.1 APPLICATION OF PRODUCT

A. Building Backbone Cable for Voice Service: Use UTP Category 5e cable rated for underground installation for runs between telecommunications rooms.

B. Building Backbone Fiber-Optic Cable: Use multimode 50 micron 300 meter and 550 meter, 10Gb, 850nm VCSEL optimized indoor/outdoor plenum rated fiber-optic cable as indicated for runs between telecommunications rooms.

C. Horizontal Cable for Voice Service: Use UTP Category 6A CMP rated cable for runs between telecommunications rooms and workstation outlets.

D. Horizontal Cable for Data Service: Use UTP Category 6A, CMP rated cable for runs between telecommunications rooms and workstation outlets. Colors as follows:
   1. Blue for designated voice terminations.
   2. Blue for wall terminations.
   3. Blue for wireless access devices.
   4. Blue for security devices.

E. Horizontal Cable for Video Service: Use RG-6/U CMP rated cable for runs between telecom rooms and workstation outlets. Color White.

F. Terminate fiber optic cable within rack mounted fiber enclosures where indicated.

G. Horizontal data cables terminated on segregated 48 port jack type connection panels.

H. Horizontal voice cables terminated on wall-mounted 66 blocks.

I. Provide workstation outlet faceplates in color gray with the following colored outlet jacks:
   1. Voice: Grey.
   2. Data: Black.
   3. Video (Coax): Grey.
   4. Wireless Access: Green.
   5. Projectors: Yellow.
   6. Security Devices: Red.

J. Provide jacks in colors matching above in connection panels.

3.2 ENTRANCE FACILITIES

A. Coordinate backbone cabling with the protectors and demarcation point provided by communications service provider and LEC.

3.3 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces where unenclosed wiring method may be used. Conceal raceway and cables except in unfinished spaces. Provide J-hook support attached to structure for cable support between raceways and cable trays.
   1. Install plenum cable in environmental air spaces, including plenum ceilings.
   2. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."
   3. 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 and support bars and distribution spools.

3.4 INSTALLATION OF PATHWAYS

A. Cable Runways: Comply with NEMA VE 2 and TIA/EIA-569-A-7.

B. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" and Division 27 Section “Common Work Results for Communications” for installation of raceways and cable supports.

C. Pathway Installation in Telecom Equipment Rooms:
   1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
   2. Secure conduits to backboard when entering room from overhead.
   3. Extend conduits 8 inches (203 mm) above finished floor.
   4. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.
   5. Install cable runway securely to walls and attach each rack to cable runway with two (2) extension mounting kits.

D. Backboards: Install backboards with 96-inch (2440-mm) dimension vertical. Butt adjacent sheets tightly, and form smooth gap-free corners and joints.

E. Wall penetrations for all communications cabling shall be sleeved with rated walls fire-stopped.

F. Install supports and J-hooks to create parallel and perpendicular pathways from outlets to cable tray. J-hooks shall be securely attached to building structure and aligned with cable pathway. Suspended J-hooks shall utilize threaded rod, no wire supports will be accepted.

3.5 INSTALLATION IN EQUIPMENT ROOMS

A. Coordinate installation of raceways, sleeves and other electrical devices with existing electrical contractor to provide a neat, orderly and finished installation.

B. Install equipment racks securely bolted to floors for mounting of all termination equipment, wire management, shelves and materials indicated.

C. Mount all cross connect fields, terminal strips, and other connecting hardware on racks, except as shown on Drawings.

D. Group connecting hardware for cables into separate logical fields.

E. Bundle cables in logical grouping and lace with cable wraps. Horizontal cables shall be bundled in groups not to exceed 25 cables.

F. Insure cable slack is properly bundled within cable runway above racks.

G. Provide conductors of adequate length. Include service slack loop of 12ft minimum in runway before dropping to rack. Train conductors to terminal points with no excess. Install cable runway fall-out and lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.

H. Install cable tray extensions and cable runways within equipment rooms. Install standard sweep corner brackets for horizontal transitions.

I. Install backbone cable diagram and cable administration drawings on wall.

J. Patch Cable Storage: Mount cable hangers where designated by Owner or shown on drawings.

K. Isolate cable runway from direct contact with electrical raceway and grounding. If center supports are installed, electrically isolate cable runway from support.

3.6 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:
1. Comply with TIA/EIA-568-C.
2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
5. Cables may not be spliced. 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.
6. Install lacing bars to support cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
7. Bundle, lace, and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
8. 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.
9. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
10. In the communications equipment room, install a 10-foot (3-m) long service loop on each end of cable.
11. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.
12. Maintain pull strings in all underground raceways after installation of communications cabling.
13. Install communications outlet assemblies in all communications rough-ins indicated. Provide blank outlet assemblies including dust covers for all unused ports.

C. UTP Cable Installation:
1. Comply with TIA/EIA-568-C.
2. Do not untwist UTP cables more than 1/4 inch (6 mm) from the point of termination to maintain cable geometry.
3. Within Cable trays, cable shall be separated from other cabling, bundled and tie wrapped with Velcro type ties to the tray every 12 feet. Cables shall exit out the top of cable trays and be supported within 24 inches of exiting cable tray.
4. Pull cables without exceeding cable manufacturer's recommended pulling tensions.
5. Pull cables simultaneously if more than one is being installed in same raceway.
6. Use pulling compound or lubricant if necessary. Use compounds that will not damage conductor or insulation.
7. Use pulling means, including fish tape, cable, rope, and basket-weave wire or cable grips, that will not damage media or raceway.
8. Provide minimum 3ft slack loop coiled and secured with cable wraps above accessible ceilings at each device location.
9. Make terminations only at indicated outlets, terminals, and cross-connect and patch panels.
10. For divided raceway and floorbox outlet assemblies, provide device assemblies and faceplate that mate to provide finished installation. Include mounting frames.
11. Terminate all horizontal voice and data cables per the TIA/EIA 568B wiring standard.

D. Optical Fiber Cable Installation:
1. Comply with TIA/EIA-568-C.
2. Cable may be terminated on connecting hardware that is rack or cabinet mounted.

E. Open-Cable Installation:
   1. Do not route cables through or over structural members, fasten J-hooks for cables to side or bottom of structural member.
   2. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
   3. Suspend UTP cable not in a wireway or pathway a minimum of 8 inches (200 mm) above ceilings by cable supports not more than 60 inches (1524 mm) apart.
   4. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.
   5. Install wiring in cable supports and cable runway. Insure cable is properly supported upon exiting cable runway and raceways. Securing shall be with hook and loop cable wraps (no vinyl or nylon straps).
   6. Install cable supports (J-hooks) between conduit stub-ups, sleeves for cable support to industry standard. Attach cable supports to structural elements. Do not attach supports to roof deck or other building systems. Install cable supports at intervals not to exceed 5 feet on center.
   7. Install cables within dedicated raceway sleeves for wall penetrations.
   8. Install cables parallel and perpendicular to surfaces or exposed structural members, and follow surface contours. Secure and support cables by J-hooks or similar fittings so designed and installed as not to damage the cables. Secure cable at intervals not exceeding 60 inches, not more than 6 inches (152 mm) from cabinets, boxes, or fittings and at intervals to prevent gaps or sagging in cable bundles.
   9. Group connecting hardware for cables into separate logical fields.

F. Group connecting hardware for cables into separate logical fields.

G. Do not use water-based cable pulling lubricants with PVC-jacketed cable.

H. Separation from EMI Sources:
   1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
   2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
      a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 5 inches (127 mm).
      b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 12 inches (300 mm).
      c. Electrical Equipment Rating More Than 5 kVA: A minimum of 24 inches (610 mm).
   3. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
      a. Electrical Equipment Rating Less Than 2 kVA: A minimum of 2-1/2 inches (64 mm).
      b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 6 inches (150 mm).
      c. Electrical Equipment Rating More Than 5 kVA: A minimum of 12 inches (300 mm).
   4. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
      a. Electrical Equipment Rating Less Than 2 kVA: No requirement.
      b. Electrical Equipment Rating between 2 and 5 kVA: A minimum of 3 inches (76 mm).
      c. Electrical Equipment Rating More Than 5 kVA: A minimum of 6 inches (150 mm).
   5. Separation between Communications Cables and Electrical Motors and Transformers, 5 kVA or HP and Larger: A minimum of 48 inches (1200 mm).
   6. Separation between Communications Cables and Fluorescent Fixtures: A minimum of 5 inches (127 mm).

I. Cover and protect installed jacks and terminations until construction dust and debris are no longer present.

J. Network communication cables shall not share raceways with fire alarm, video cables, intercom cables or cables from other building systems and equipment.

3.7 FIRESTOPPING

A. Comply with requirements in Division 07 Section "Penetration Firestopping."

B. Comply with TIA/EIA-569-A, Annex A, "Firestopping."

C. Comply with BICSI TDMM, "Firestopping Systems" Article.

D. Fill Void or Cavity Material - (Pillows): Maximum 9 inch long by 6 inch wide by 2- and 3-inch thick plastic covered pillows tightly packed to fill annular space between cable tray and periphery of openings. Pillows installed with 9 inch dimension projection through floor or wall and centered within the opening. Provide 3M - Fire Barrier Pillows FB 249 or equal.

E. Where pillows are not utilized, firestopping shall be a resilient and pliable material and shall remain pliable. Material shall be easily removable and capable of self-adhering for repairs and replacement without cracking or crumbling.

3.8 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems" for grounding conductors and connectors.

C. Comply with ANSI-J-STD-607-B.

D. Ground equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments. Connect #6 AWG minimum green copper conductor to local telecom ground bus (TGB).

E. Equipment Racks: Install #6 AWG uninsulated common bonding conductor in cable runway above racks and bond to telecom grounding bus. Bond each rack to common bonding conductor with compression tap connectors. Do not jumper between racks.

F. Bond each section of cable runway with #6 AWG conductor unless cable runway is UL Listed as a grounding conductor.

G. Ground Lugs: Two hole copper lugs sized for ground conductor used and terminated by irreversible connection. Use conductive anti-oxidation compound at mechanical connections.

H. Remove all paint and foreign matter from contact surfaces before bonding ground lugs.

3.9 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A.
   1. Administration Class: 2.

B. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 2 level of administration, including optional identification requirements of this standard.

C. Verify labeling with Owner.

D. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins, and destinations. Protect with clear plastic covers. Furnish an electronic copy of final comprehensive schedules for Project.

E. Cable Plant Drawings: Provide a computer generated drawing and post in prominent location in main equipment room. Show incoming and outgoing OSP, backbone cables and their designations, origins, and destinations. For each cable, list the manufacturer, part number, conductor size, pair count, type and cable rating. Show telecommunications closets, entrance pathways and spare conduits. Protect with finished rigid frame and clear plastic cover. Furnish an electronic copy of final drawings for Project, in software and format selected by Owner. No hand written identification will be accepted.

F. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications rooms, backbone pathways and cables, entrance pathways and cables, terminal hardware and positions, horizontal cables, work areas and workstation terminal positions, grounding buses and pathways, and equipment grounding conductors. Follow convention of TIA/EIA-606-A. Furnish electronic record of all drawings, in software and format selected by Owner. For each communications equipment room, show only horizontal devices served from this room. Drawing scale to be same as Architect/Engineers original scale.
   1. NOTE: Electronic CAD files are available from Architect-Engineer as stated in Division 1 Section "Electronic Drawings." Contractor shall pay specified fee for each Drawing sheet.

G. Cable and Wire Identification:
   1. Label each cable within 4 inches (100 mm) of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
   2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
   3. Label each terminal strip and screw terminal in each cabinet, rack, or panel.
      a. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with name and number of particular device as shown.
      b. Label each port, unit and field within distribution racks and frames.
   4. Identification within Connector Fields in Telecom Equipment Rooms: Label each connector and each discrete unit of cable-terminating and connecting hardware. Where similar jacks and plugs are used for both voice and data communication cabling, use a different color for jacks and plugs of each service.

H. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color but still complies with requirements in TIA/EIA-606-A.
   1. Cables use flexible vinyl or polyester that flex as cables are bent.

I. Workstation: Label cables within outlet boxes and within coverplate labeling window. Label as shown on Drawings.

J. Clean cable or surface to remove debris, wax and grease before applying label.

3.10 FIELD QUALITY CONTROL

A. All testing specified shall be performed after installation is complete, including installation of workstation outlets and patch panels.

B. Perform the following tests and Inspections:
   1. Visually inspect UTP and optical fiber cable jacket materials for NRTL certification markings. Inspect cabling terminations in communications equipment rooms for compliance with color-coding for pin assignments, and inspect cabling connections for compliance with TIA/EIA-568-C.
   2. Visually confirm Category 6A, marking of outlets, cover plates, outlet/connectors, and patch panels.
   3. Visually inspect cable placement, cable termination, grounding and bonding, equipment and patch cables, and labeling of all components.
   4. Test UTP backbone copper cabling for DC loop resistance, shorts, opens, intermittent faults, and polarity between conductors. Test operation of shorting bars in connection blocks. Test cables after termination but not cross-connection.
      a. Test instruments shall meet or exceed applicable requirements in TIA/EIA-568-C. Perform tests with a tester that complies with performance requirements in "Test Instruments (Normative)" Annex, complying with measurement accuracy specified in "Measurement Accuracy (Informative)" Annex. Use only test cables and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
   5. For cables other than Panduit MTX and General Perform TIA Category 6A Permanent Link alien crosstalk tests per test equipment manufacturer's written instructions. Test the three (3) longest cables in each 24 cable bundle. Notify Architect/Engineer 7 days prior to testing. Inaccurate tests, marginal results or test failures will require additional testing as directed by Architect/Engineer.
   6. Optical Fiber Cable Tests:
      a. Test instruments shall meet or exceed applicable requirements in TIA-568-C. Use only test cables and adapters that are qualified by test equipment manufacturer for channel or link test configuration.
      b. Link End-to-End Attenuation Tests:
         1) Horizontal and multimode backbone link measurements: Test at 850 or 1300 nm in 1 direction according to TIA/EIA-526-14-A, Method B, One Reference Jumper.
         2) Attenuation test results for backbone links shall be less than that calculated according to equation in TIA-568-C.
   7. UTP Performance Tests:
      a. Test for each outlet. Perform the following tests according to TIA-568-C:
         1) Wire map.
         2) Length (physical vs. electrical, and length requirements).
         3) Insertion loss.
         4) Near-end crosstalk (NEXT) loss.
         5) Power sum near-end crosstalk (PSNEXT) loss.
         6) Equal-level far-end crosstalk (ELFEXT).
         7) Power sum equal-level far-end crosstalk (PSELFEXT).
         8) Return loss.
         9) Propagation delay.
         10) Delay skew.
         11) Power sum alien near-end crosstalk (PSANEXT) with TIA Cat 6A Perm. Link test limit.
         12) Power sum alien attenuation to crosstalk ratio, far-end (PSAACR-F) with TIA Cat 6A Permanent Link test limit.
   8. Optical Fiber Cable Performance Tests: Perform optical fiber end-to-end link tests according to TIA-568-C:
      a. Test optical performance with specified tester at both 850nm and 1300nm with LED source using encircled flux launch controller adapters per manufactures recommended procedures.
      b. Submit graphed test results of each fiber optic strand tested.

C. Record test results.

D. Retest: Correct deficiencies identified by tests and observations and retest until requirements specified in Part 1 are met.

E. Document data for each measurement. Submit the field tests in electronic (original tester software format) and electronic portable document format (PDF). Submit compact disc with multiple PDF files, one file for each telecom equipment room. Each page shall contain one (1) 8.5 x 11 inch page showing the graphed test results for each cable installed. At the beginning of each room file, include a title sheet including all information for the location served. Following title sheet shall be a printed summary report that is formatted similar to Table 10.1 in BICSI TDMM.
   1. NOTE: Creation of PDF documents will require software capable of reading, manipulating and combining document pages.

F. End-to-end cabling will be considered defective if it does not pass tests and inspections or provides marginal results.

G. Prepare test and inspection reports.

3.11 DEMONSTRATION

A. Train Owner's maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new workstation outlets.

B. Demonstrate to owner, proper use and necessity of supporting patch cables in horizontal and vertical wire management systems provided.

C. Once Owner provided electronics are installed, install patch cable excess length within wire management systems for a neat and orderly installation.

END OF SECTION 271500

SECTION 274133

MASTER ANTENNA TELEVISION SYSTEM

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. MATV equipment using cable television service as the signal source.
   2. MATV head-end components.
   3. Distribution cable and components.

B. Related Sections:
   1. Section 271500 "Communications Cabling" for horizontal coaxial cables and connectors.

1.3 DEFINITIONS

A. Agile Receiver: A broadband receiver that can be tuned to any desired channel.

B. A/V: Audio/Visual.

C. Broadband: For the purposes of this Section, wide bandwidth equipment or systems that can carry signals occupying in the frequency range of 54 to 1002 MHz. A broadband communication system can simultaneously accommodate television, voice, data, and many other services.

D. Carrier: A pure-frequency signal that is modulated to carry information. In the process of modulation, the signal is spread out over a wider band. The carrier frequency is the center frequency on any television channel.

E. CATV: Community antenna television. A communication system that simultaneously distributes several different channels of broadcast programs and other information to customers via a coaxial cable.

F. CCTV: Closed-circuit television.

G. CEA: Consumer Electronics Association.

H. dBmV: Decibels relative to 1 mV across 75 ohms. Zero dBmV is defined as 1 mV across 75 ohms. dBmV = 20 log $10(V_1/V_2)$ where V_1 is the measurement of voltage at a point having identical impedance to V_2 (0.001 V across 75 ohms).

I. Headend: The control center of the MATV system, where incoming signals are amplified, converted, processed, and combined into a common cable along with any locally originated television signals, for transmission to user-interface points. It is also called the "central retransmission facility."

J. I/O: Input/Output.

K. MATV: Master antenna television. A small television antenna distribution system usually restricted to one or two buildings.

L. RF: Radio frequency.

M. User Interface: User interfaces are the terminal blocks to which the end user may connect coaxial cabling.

1.4 SYSTEM DESCRIPTION

A. System shall consist of cable television service and a coaxial cable distribution system.
   1. Headend equipment shall consist of receiving antennas, satellites, and associated signal distribution amplification and equalization.
   2. Distribution of cable television service signals and locally originated program materials, which includes coordinating with Owner's selected service provider and combining local channels for installation of cable to the service point ready for connection into the distribution system. Obtain signal levels and noise and distortion characteristics from service provider as the point of departure for system layout and final equipment selection.
   3. Cable distribution system consisting of coaxial cables, user interfaces, signal taps and splitters, RF amplifiers, signal equalizers, power supplies, and required hardware, complying with CEA-310-E and CEA-2032 and resulting in performance parameters specified in this Section. System shall be capable of distributing television channels according to CEA-542-B.
   4. Horizontal coaxial cables between communications equipment rooms and user interfaces shall be provided by Section 271500. Backbone coaxial cables shall be included in this Section.

B. Hardware Requirements: Use plug-in, modular, solid-state electronic components. Mount amplifiers and other powered equipment in standard rack provided by Section 271500.

1.5 PERFORMANCE REQUIREMENTS

A. Minimum acceptable performance of distribution system at all user-interface points shall be as follows:
   1. RF Video-Carrier Level: Between 3 and 15 dBmV.
   2. Relative Video-Carrier Level: Within 3 dB to adjacent channel.
   3. Carrier Level Stability, Short Term: Level shall not change more than 0.5 dB during a 60-minute period.
   4. Carrier Level Stability, Long Term: Level shall not change more than 2 dB during a 24-hour period.
   5. Channel Frequency Response: Across any 6-MHz channel in the 54- to 220-MHz frequency range, referenced to video; signal amplitude shall be plus or minus 1 dB, maximum.
   6. Carrier-to-Noise Ratio: 45 dB or more.
   7. RF Visual Signal-to-Noise Ratio: 43 dB or more.
   8. Signal Power Splitter and Isolation Tap Return Loss: 17 dB maximum.

9. Cable Connectors Attenuation: Less than 0.1 dB.
10. Cross Modulation: Less than minus 50 dB.
11. Carrier-to-Echo Ratio: More than 40 dB.
12. Composite Triple Beat: Less than minus 53 dB.
13. Second Order Beat: Less than minus 60 dB.
14. Terminal Isolation from Television to Television: 25 dB, minimum.
15. Terminal Isolation between Television and FM: 35 dB, minimum.
16. Hum Modulation: 2 percent, maximum.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For headend and distribution system. Include plans, elevations, sections, details, and attachments to other work.
1. Show fabrication and installation details for television equipment.
2. Wiring Diagrams: For power, signal, and control wiring. For UTP or fiber-optic cable, include cross connects, patch panels, and patch cords.

C. Design Calculations: Calculate signal attenuation budget and show calculated line and equipment losses for the system based on the functional block diagram, to show that proposed system layout can be expected to perform up to specification. Calculate signal strength from sources to headend input points for each antenna, satellite dish, and CATV grouping. Allowable losses between components and user interface shall be used to determine size and type of coaxial cable.

1.7 SUBMITTALS

A. Equipment List: Include each piece of equipment and include model number, manufacturer, serial number, location, and date of original installation. Insert testing record of each piece of adjustable equipment, listing name of person testing, date of test, and description of as-left set points.

B. Field quality-control reports.

1.8 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For headend and distribution system to include in emergency, operation, and maintenance manuals.

1.9 QUALITY ASSURANCE

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

1.10 PROJECT CONDITIONS

A. Environmental Limitations: System components shall be equipped and rated for the environments in which they are installed.

1.11 COORDINATION

A. Coordinate size and location of raceway system and provisions for electrical power to equipment specified in this Section.

B. Verify installed lengths of horizontal cables with Section 271500 and coordinate interconnection of horizontal cable with distribution system.

C. Coordinate Work of this Section with requirements of cable television service provider.

1.12 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, provide 12 months' full maintenance by skilled employees of MATV system Installer. Include quarterly adjusting as required for optimum system performance. Provide parts and supplies the same as those used in the manufacture and installation of original equipment.

PART 2 - PRODUCTS

2.1 SYSTEMS REQUIREMENTS

A. Components: Plug-in, modular, heavy-duty, industrial- or commercial-grade units.

B. Equipment: Silicon-based, solid-state, integrated circuit devices.

C. Power Supply Characteristics: Devices shall be within specified parameters for ac supply voltages within the range of 105 to 130 V.

D. Protect signal cables and connected components against transient-voltage surges by suppressors and absorbers designed specifically for that purpose. Comply with requirements in Section 264313 "Surge Protection for Low-Voltage Electrical Power Circuits."

E. Provide ac-powered equipment with integral surge suppressors complying with UL 1449.

F. RF and Video Impedance Matching: Signal-handling components, including connecting cable, shall have end-to-end impedance-matched signal paths. Match and balance devices used at connections where it is impossible to avoid impedance mismatch or mismatch of balanced circuits to unbalanced circuits.

2.2 MATV EQUIPMENT

A. Description: Signal-source components, signal-processing and amplifying equipment, distribution components, and interconnecting wiring. System shall receive, amplify, process, and distribute signals to outlets for receiving sets.

B. Identification of Signal Sources Distributed:
1. Match existing channels of CATV service provider. Provide headend receivers for selection of four (4) analog or digital cable television channels distributed on four (4) QAM discrete digital high definition channels. Modulators shall be agile and support QAM 256.

2. Provide two (2) separate HDMI inputs for connection to two (2) Owner provided servers distributed on two (2) discrete digital high definition channels. Modulators shall be agile and support QAM 256.
3. Provide distribution of CATV service to allow connection of local tuner receivers at each user interface.

C. MATV System Qualitative and Quantitative Performance Requirements: Reception quality of digital high definition color-television program transmissions at each system outlet from each service and source shall be equal to or superior than that obtained with performance checks specified in "Field Quality Control" Article, using standard, commercial, cable-ready, multiple A/V input color-television receivers.

2.3 MATV HEADEND COMPONENTS

A. Headend Equipment: Select equipment from available major commercial equipment manufacturers to meet the specifications of this Section.

B. Audio and Video Monitors: Rack mounted utilizing equipment mounting shelf. Provide Minimum 19 inch, color, ATSC/NTSC tuner, liquid crystal display (LCD) or LED television monitor with front panel speakers and controls.
1. Provide Samsung, LG or approved equal.
2. Verify TV width for rack mounting.
3. Provide one (1) monitor switchable between CATV input signal and local output channels.

2.4 DISTRIBUTION CABLE

A. Select distribution cable from available major commercial manufacturers with characteristics to meet the specifications of this Section.

B. Horizontal coaxial cables between communications equipment rooms and user interfaces shall be provided by Section 271500. Backbone coaxial cables shall be included in this Section.

2.5 DISTRIBUTION COMPONENTS

A. Signal Power Splitters and Isolation Taps: Metal-enclosed directional couplers with brass connector parts. Where installed in signal circuits used to supply cable-powered amplifiers, power throughput capacity shall exceed load by at least 25 percent.
1. Return Loss: 17 dB.
2. RFI Shielding: 100 dB.
3. Isolation: 25 dB.
4. I/O Impedance: 75 ohms.

B. Distribution System Amplifiers: Powered by coaxial cable system and equipped with surge protection device and external test points to allow convenient signal monitoring.

C. Cable System Power Supplies: Plug-in, modular construction, with surge, short-circuit, and overload protection.

D. Signal Traps: Packaged filters tuned to interference frequencies encountered in Project.

E. Attenuators: Passive, of fixed value, and used to balance signal levels.

F. Terminating Resistors: Enclosed units rated 0.5 W and matched for coaxial impedance.

G. User-Interface Device: Provided by Section 271500.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine walls, floors, roofs, equipment bases, and roof supports for suitable conditions where television equipment is to be installed.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. All distribution components shall be located within designated communications rooms.

B. Install signal line surge suppressors on coaxial cables entering headend equipment space and at antenna-mounted amplifiers.

3.3 ANTENNA AND HEADEND INSTALLATION

A. Mount headend equipment in electronic-equipment cabinets provided by Section 271500. Group related items in methodical sequence.

B. Arrange equipment to facilitate access for maintenance and to preserve headroom and passage space. Parts that require periodic service or maintenance shall be readily accessible. Headend components that require tuning adjustments shall be accessible from the front of equipment cabinets.

3.4 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

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

B. Tests and Inspections:
   1. Tests of distribution system shall include the horizontal cabling and user interface. Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements.
   2. Replace malfunctioning or damaged items.
   3. Retest until satisfactory performance and conditions are achieved.
   4. Prepare television equipment for acceptance and operational testing.
   5. Use an agile receiver and signal strength meter or spectrum analyzer for testing.

6. CATV Sources: Connect receiver to an agile demodulator or CATV set-top converter at CATV service entrance to the facility.
7. Test Schedule: Schedule tests after pretesting has successfully been completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.
8. Operational Tests: Perform tests of operational system to verify that system complies with Specifications. Include all modes of system operation. Test equipment for proper operation in all functional modes.
9. Distribution System Acceptance Tests:
    a. Field-Strength Instrument: Rated for minus 40-dBmV measuring sensitivity and a frequency range of 54 to 1002 MHz, minimum. Provide documentation of recent calibration against recognized standards.
    b. Signal Level and Picture Quality: Use a field-strength meter or spectrum analyzer, and a standard television receiver to measure signal levels and check picture quality at all user interfaces.
        1) Test the signal strength in dBmV at 55**,** 151, 547, and 750, 860 and 1002 MHz.
        2) Minimum acceptable signal level is 0 dBmV (1000 mV).
        3) Maximum acceptable signal level over the entire bandwidth is 15 dBmV.
        4) Television receiver shall show no evidence of cross-channel intermodulation, ghost images, or beat interference.
10. Signal-to-Noise-Ratio Test: Use a field-strength meter to make a sequence of measurements at the output of the last distribution amplifier or of another agreed-on location in system. With system operating at normal levels, tune meter to the picture carrier frequency of each of the designated channels in turn and record the level. With signal removed and input to corresponding headend amplifier terminated at 75 ohms, measure the level of noise at same tuning settings. With meter correction factor added to last readings, differences from first set must not be less than 45 dB.
11. Qualitative and Quantitative Performance Tests: Demonstrate reception quality of Digital color-television program transmissions at each user interface from each designated channel and source. Quality shall be equal to or superior than that obtained with performance checks specified below, using a standard, commercial, cable-ready, color-television receiver. Level and quality of signal at each outlet and from each service and source shall comply with the following Specifications when tested according to 47 CFR 76:
    a. RF video-carrier level.
    b. Relative video-carrier level.
    c. Carrier level stability, during 60-minute and 24-hour periods.
    d. Broadband frequency response.
    e. Channel frequency response.
    f. Carrier-to-noise ratio.
    g. RF visual signal-to-noise ratio.
    h. Antenna combiner insertion loss.
    i. Signal power splitter loss.
    j. Cable connector attenuation.
    k. Cross modulation.
    l. Carrier-to-echo ratio.
    m. Composite triple beat.
    n. Second order beat.
    o. Terminal isolation.
    p. Terminal isolation between television and FM.
    q. Hum modulation.

C. Headend and distribution system will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports.

E. Cap and terminate all unused connectors.

3.6 DEMONSTRATION

A. After Owner provide program source equipment and television receivers have been installed, train Owner's personnel to operate the MATV equipment.

END OF SECTION 274133

SECTION 275123

EDUCATIONAL INTERCOMMUNICATIONS AND PROGRAM 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: This Section includes a user-programmable, multi-channel, microprocessor-switched, centrally controlled voice intercommunication system with a synchronized clock, time tone generator, and interface to an Owner provided telephone system for operation from Owner provided telephone handsets. System Includes:
   1. Master stations.
   2. All-call amplifier.
   3. Intercommunication amplifier.
   4. Cone type loudspeakers.
   5. Low-Profile horn type loudspeakers.
   6. Cone type interior weather resistant loudspeakers.
   7. Volume Controls.
   8. Telephone system interface.
   9. Master Clock System.
   10. Digital Room Clocks.
   11. Conductors and cables.

B. This Section includes connection to a national time standard synchronized programmable master clock and interface to an Owner provided telephone system for communications and control. Integrate intercom system to Owner provided VOIP system.

C. System shall include three (3) master station desktop intercom interfaces. Locate one (1) in admin office, one (1) at the main intercom rack and one at the Principal's desk.

D. Circuit speakers by classroom and by groups for zone communications by classroom, small learning community, by corridor and by separate functional work space.

E. Master clock system is included in this Section, including digital corridor and room clocks including power supplies. Classroom analog clocks are not included in this contract.

F. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 26 Section "Grounding and Bonding for Electrical Systems."
   2. Division 26 Section "Raceway and Boxes for Electrical Systems."
   3. Division 27 Section "Common Work Results for Communications."
   4. Division 27 Section "Cable Trays for Communications Systems."

1.3 DEFINITIONS

A. GPS: Global Positioning System .

B. NIST: National Institute of Science and Technology.

C. PC: Personal computer.

D. CDMA: Code Division Multiple Access.

1.4 SYSTEM DESCRIPTION

A. General Intercom: Intercom system zone control processers and terminations shall be located in multiple telecommunications rooms within the building. Processors shall be networked via 50um multimode fiber optic provided by Division 27 “Communications Cabling.” Interconnects, media convertors, switches and interfaces from the Intercom System to dark fiber located within communications equipment rooms shall be provided by the Intercom Contractor. System shall include one (1) connection to the owners LAN for programming purposes only. Networked system shall function as one unit with complete system functionality. The intercom system shall not reside on the schools LAN. Dark fiber will be provided under Division 27. Intercom contractor shall supply all necessary network gear required for an operational system. Multiple units acting independently requiring individual access for operation or programming shall not be allowed.

B. System shall include all equipment necessary for a complete and functioning system including but not limited to speakers, backboxes, supports, CMP rated cable, amplifiers, processors and master control equipment.

C. Coordinate raceway, sleeves, boxes for wiring methods indicated with Division 27 Section “Common Work Results for Communications” and Division 26 Section “Raceway and Boxes for Electrical Systems.”

D. General: The clock system shall include a transmitter, a roof mounted GPS receiver, a CDMA receiver or network interface, indicating clocks, and all accessories for a complete and fully functional system.

E. An integrated, microprocessor-based system for originating and distributing time and time correction signals and interfacing to intercommunications system by others for initiation of synchronized scheduled tones. The system transmits time correction signals wirelessly from a master control unit to indicating battery-operated analog clocks. Master control unit is GPS, CDMA or network synchronized to a national time standard.

F. The wireless clock system shall continually synchronize clocks throughout the facility.

G. The system shall synchronize all clocks to each other. The system shall utilize GPS, CDMA or network connection technology to provide a National time standard synchronized time. The system shall be capable of both wireless and hard wire synchronization. Clocks shall automatically adjust for Daylight Savings Time.

H. Digital Clocks: Test clocks automatically for synchronization with master time control at least once every hour and automatically correct those not synchronized with the time reference unit. Automatically correct clocks immediately when power is restored after an outage of normal power to the master clock.

I. The system shall include an internal clock reference so that failure of the sync signal shall not cause the clocks to fail in indicating time. The system shall incorporate a “fail-safe” design so that failure of any component shall not cause failure of the system. Upon restoration of power or repair of failed component, the system shall resume normal operation without the need to reset the system or any component thereof.

1.5 SUBMITTALS

A. Product Data for each component, including detailed manufacturer's specifications. Provide complete materials list including quantities, manufacturer, model and description of each item.

B. Shop Drawings: For educational intercommunications and program systems. Include plans, elevations, sections, details, and attachments to other work.
   1. 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.

A. Shop Drawings: For Clock Systems: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes (including available colors) for each product indicated and describe features and operating sequences, both automatic and manual, for the following:
   1. Master Transmitter Unit.
   2. Accessory components.
   3. Receiver for NIST Synchronization.
   4. Antenna.
   5. Repeaters or Signal Boosters.
   6. Digital Clocks.

B. Drawings in 15” x 21” or larger format showing circuiting of speakers, speaker assembly type/model and identifying termination zone/card within main or remote equipment.

C. Qualification Data: If requested, for qualified installer per quality assurance article below.

D. Submit an owner signed copy of delivery receipt for materials as specified in Extra Materials section below with quantity, description and line item listing of products.

E. Field quality-control reports.

F. Operation and Maintenance Data: For educational intercommunications and program systems to include in operation and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:
   1. A record of final matching transformer-tap settings and signal ground-resistance measurement certified by Installer.
   2. A record of Owner's equipment-programming option decisions.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Testing Qualifications: Qualified personnel, with the experience and capability to conduct testing indicated.
   1. Testing Agency's Field Supervisor: Certified by NICET as Audio Systems Level II Technician.

C. Source Limitations: Obtain educational intercommunications and program systems from single source from single manufacturer for main processor and master station equipment.

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

E. Comply with NFPA 70.

1.7 COORDINATION

A. Coordinate layout and installation of ceiling-mounted speaker microphones 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.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Intercom Manufacturers: Subject to compliance with requirements, provide one of the following:
   1. Rauland-Borg Corporation, Telecenter VOIP.
   2. Bogen Quantum IP.
   3. Telecor, XL-IP.

2.2 FUNCTIONAL DESCRIPTION OF MICROPROCESSOR-SWITCHED SYSTEMS

A. Master Station:
   1. Communicating selectively with other masters, and speaker-microphone stations by dialing station's number on a 12-digit keypad or by access from telephone system.
   2. Communicating with individual stations in privacy.
   3. Communicating on a minimum of three voice channels with up to two simultaneous conversations between master stations and one conversation between a master station and a speaker-microphone station.
   4. Increasing the number of conversation channels by adding a module in central-control cabinet.
   5. Including up to three other station connections in a conference call.
   6. Accessing separate paging speakers or groups of paging speakers by dialing designated numbers on a 12-digit keypad or by access from telephone system.
   7. Overriding any conversation by a designated master station.
   8. Displaying selected station.
   9. Communicating simultaneously with all other stations by dialing a designated number on a 12-digit keypad or by access from telephone system.
   10. Automatically controlling gain to ensure constant intercom speech level.
   11. Controlling the simultaneous distribution of program material to various combinations of speaker-microphone stations or groups over two program channels by using keypad to control sources and distribute programs.
   12. Operating class-change signals to speakers by using keypad.

13. User-programmable features include the following:
    a. Station calling by room number.
    b. Room station call-in priority levels.
    c. Clock signal schedule functions.
    d. Schedule characteristics of audible signals.
    e. Call-in tone characteristic.
    f. Precedence among master stations as destinations for incoming calls from room stations.
    g. Grouping of rooms and speakers into zones for paging and program distribution purposes.
14. Paging: Separate paging speakers or groups of paging speakers are accessed from a master station by key presses or by Owner's telephone handsets. Separate paging zone provided for exterior speakers with local disconnect switch located in administration office.
15. System capabilities shall be expandable using modules to increase capacity by 50% beyond expansion listed.
16. Time signaling: Intercom system shall be synced to master clock system. Intercom time tones shall be distributed via intercom speakers throughout.
17. System features including time tone scheduling shall be modifiable via software. Time schedules shall be programmable by the Owner via software installed on Owner's designated computers. System programming shall be available from any connection on the Owner's network. System shall provide minimum 8 separate schedules with up to 256 events.

B. Speakers: Free of noise and distortion during operation and when in standby mode.

2.3 GENERAL REQUIREMENTS FOR EQUIPMENT AND MATERIALS

A. Coordinate features and select components to form an integrated system. Match components and interconnections for optimum performance of specified functions.

B. Expansion Capability: Increase number of stations in the future by 25 percent above those indicated without adding any internal or external components or main trunk cable conductors. Expansion capabilities shall be installed and include all components, licensing and connections.

C. Equipment: Modular type using solid-state components, 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. Comply with UL 813.

D. Weather-Resistant Equipment: Listed and labeled by an NRTL for duty outdoors or in damp locations.

2.4 MASTER STATION FOR MICROPROCESSOR-SWITCHED SYSTEMS

A. 12-Digit Keypad Selector: Transmits calls to other stations and initiates commands for programming and operation.

B. Volume Control: Regulates incoming-call volume.

C. Tone Annunciation: Momentary audible tone signal announces incoming calls.

D. Lamp Annunciation: Identifies calling stations and stations in use. Lamp remains on until call is answered.

E. Speaker Microphone: Transmits intercom voice signals when used via a voice-operated switch.
   1. Minimum Speaker Sensitivity: 91 dB at one meter, with 1-W input.

F. Link Button: To transfer calls.

G. Reset Control: Cancels call and resets system for next call.

H. Digital Display: 2 lines of 20-digit alphanumeric LCD readout minimum.

2.5 EQUIPMENT CABINET

A. General: EIA-310 compliant equipment racks housing all intercom equipment as follows:
   1. Rack: Provided by Section 271500.

2.6 ALL-CALL AMPLIFIER

A. Output Power: Provide capacity to equal at least 0.5 W for each classroom speaker, 1.0 W for each corridor or commons speaker and 7.5 W for each horn type speaker, root mean square (RMS), for each station and speaker connected in the all-call mode of operation, plus allowance for future station capacity indicated. Provide multiple amplifiers as required.

B. Comply with the following:
   1. Total Harmonic Distortion: Less than 2 percent at rated output power with load equivalent to quantity of stations connected in all-call mode of operation.
   2. Minimum Signal-to-Noise Ratio: 60 dB, at rated output.
   3. Frequency Response: Within plus or minus 2 dB from 50 to 12,000 Hz.
   4. Output Regulation: Maintains output level within 2 dB from full to no load.
   5. Input Sensitivity: Compatible with master stations and central equipment so amplifier delivers full-rated output with sound-pressure level of less than 10 dynes/sq. cm impinging on master stations, speaker microphones, or handset transmitters.
   6. Amplifier Protection: Prevents damage from shorted or open output.

C. Capacity shall include calculations for serving 20% more field devices.

2.7 INTERCOMMUNICATION AMPLIFIER

A. Minimum Output Power: 15 W; adequate for all functions.

B. Comply with the following:
   1. Total Harmonic Distortion: Less than 5 percent at rated output power with load equivalent to one station connected to output terminals.
   2. Minimum Signal-to-Noise Ratio: 50 dB, at rated output.
   3. Frequency Response: Within plus or minus 3 dB from 70 to 10,000 Hz.
   4. Output Regulation: Maintains output level within 2 dB from full to no load.
   5. Input Sensitivity: Matched to input circuit and to provide full-rated output with sound-pressure level of less than 10 dynes/sq. cm impinging on microphones in master stations, speaker microphones, or handset transmitters.
   6. Amplifier Protection: Prevents damage from shorted or open output.

2.8 LOUDSPEAKERS/SPEAKER MICROPHONES

A. Recessed Loudspeaker (Accessible Ceiling): Recessed speaker system for acoustical tile ceilings shall be suitable for ready placement in ceiling system and come complete with speaker, transformer, 12" x 24" grille, and backbox.
   1. Speaker: 8 inch, 8 ohm, 15 Watts RMS, dual-cone with 10 ounce ceramic magnet. Provide Lowell model 810T72 or equal.
      a. Transformer: Dual voltage, 70/25V, minimum of four taps, 0.25W to 5W.
      b. Dispersion Angle: 120 degrees at 2 kHz – 6 dB.
      c. Sensitivity: 95 dB Average SPL at 1W/1m.
      d. Frequency Response: 47 Hz – 20 kHz (±6 dB).
   2. Grille: Factory mounted 12 inch by 24 inch, fine perforated steel, white powder coat finish. Factory mounted built-in T-bar to support adjoining tile.
   3. Backbox: Factory mounted 4 inch deep galvanized steel with speaker terminations. Non-metallic backboxes shall not be accepted.
   4. Provide factory provided junction box mounted to backbox to house speaker pigtail connections.
   5. Provide Lowell model LT81072BB or approved equal.

B. Recessed Loudspeaker (Gypsum Ceiling): Recessed speaker system for gypsum board or other inaccessible ceilings shall be suitable for ready placement in ceiling system and come complete with speaker, transformer, baffle, backbox and supports.
   1. Speaker: 8 inch, 8 ohm, 15 Watts RMS, dual-cone with 10 ounce ceramic magnet.
      a. Minimum Axial Sensitivity: 91 dB at one meter, with 1-W input.
      b. Frequency Response: Within plus or minus 3 dB from 70 to 15,000 Hz.
      c. Minimum Dispersion Angle: 100 degrees.
      d. Line Transformer: Maximum insertion loss of 1.0 dB, power rating equal to speaker's, and at least four level taps.
   2. Enclosures: Steel housings or back boxes, acoustically dampened, with front face of at least 0.0478-inch (1.2-mm) steel and whole assembly rust proofed and factory primed; complete with mounting assembly and suitable for flush ceiling, with relief of back pressure.
   3. Baffle: Square style for flush speakers, minimum thickness of 0.032-inch (0.8-mm) steel with textured white finish. Provide aluminum in all locker rooms and areas subject to high humidity. Baffles shall be screw mounted. Torsion mounting shall not be acceptable.
   4. Provide Lowell Manufacturing speaker model 8C10MRA/CB84-SGVP for areas subject to high humidity.

C. Surface Loudspeaker: Surface speaker system for areas with exposed structure shall be suitable for ready mounting and come complete with speaker, transformer, baffle, and enclosure.
   1. Speaker: 8 inch, 8 ohm, 15 Watts RMS, dual-cone with 10 ounce ceramic magnet.
      a. Minimum Axial Sensitivity: 91 dB at one meter, with 1-W input.
      b. Frequency Response: Within plus or minus 3 dB from 70 to 15,000 Hz.
      c. Minimum Dispersion Angle: 100 degrees.
      d. Line Transformer: Maximum insertion loss of 1.0 dB, power rating equal to speaker's, and at least four level taps.
   2. Enclosures: Square style steel housing or back box made of 22 AWG steel minimum, acoustically dampened, and factory painted white finish; complete with mounting assembly and suitable for surface mounting.
   3. Baffle: For flush speakers, minimum thickness of 0.032-inch (0.8-mm) steel with textured white finish. Provide aluminum in all locker rooms and areas subject to high humidity. Baffles shall be screw mounted. Torsion mounting shall not be acceptable.
   4. Provide Lowell Manufacturing speaker model 8C10MRA/CB84-SGVP for areas subject to high humidity.

D. Horn-type loudspeakers: Speakers shall be all-metal, weatherproof construction; complete with speaker, transformer, baffle, low-profile enclosure and mounting hardware.
   1. Comply with the following:
      a. Frequency Response: Within plus or minus 6 dB from 740 to 7,400 Hz.
      b. Minimum Power Rating of Driver: 15 W, continuous.
      c. Minimum Dispersion Angle: 80 degrees.
      d. Line Transformer: Maximum insertion loss of 1.0 dB, power rating equal to speaker's, and at least four level taps.
   2. Enclosures: Four (4) inch maximum depth, Cast aluminum housings or back boxes, acoustically dampened; complete with mounting assembly and suitable for surface ceiling, flush ceiling, pendant or wall mounting; with relief of back pressure.
   3. Baffle: For flush speakers, minimum thickness of 0.032-inch (0.8-mm) aluminum with textured white finish. Provide vandal resistant baffles for gymnasiums, weight rooms and other rooms prone to abuse. Provide weather resistant components for exterior applications.
   4. Provide Lowell Mfg model LUH-15T or approved equal.

E. Surface Mounted Loudspeaker (Type S2): Surface speaker system for areas with exposed structure and wall mounting shall be suitable for ready mounting and come complete with speaker, transformer, baffle, enclosure and U shaped mounting bracket.
   1. Speaker: 5-1/4 inch, 8 ohm, 100 Watts RMS with 1 inch high frequency driver.
      a. Minimum Axial Sensitivity: 89 dB at one meter, with 1-W input.
      b. Frequency Response: Within plus or minus 3 dB from 85 to 15,000 Hz.
      c. Minimum Dispersion Angle: 90 degrees.
      d. Line Transformer: Maximum insertion loss of 1.0 dB, power rating equal to speaker's, and at least four level taps.
   2. Enclosures: Polypropylene injection molded enclosure with powder coated steel or aluminum grill. Color white.
   3. Provide Atlas Sound speaker model SM52T-WH where designated.

2.9 VOLUME CONTROLS

A. Flush wall-mounted auto-transformer type with brushed stainless faceplate with black control knob and indicating digits. Ten step attenuation plus open position. Insertion loss less than 0.5dB. Designed for use on both 25V and 70V lines.

2.10 TELEPHONE SYSTEM INTERFACE

A. Provide interface to Owner provided VOIP telephone system integration by zone. Phone system shall integrate without additional intercom system components.

2.11 INSTALLATION HARDWARE

A. Distribution J-Hooks, Rings and Caddys: Wall and ceiling mount devices designed to support cables, and systems specified.

B. Interconnection blocks wall mounted 66 style and designed to terminate cables and systems specified.

2.12 CONDUCTORS AND CABLES

A. Conductors: Jacketed, shielded, twisted pair and twisted multi-pair, tinned stranded copper. Sizes as recommended by system manufacturer, but no smaller than No. 20 AWG. Unshielded twisted pair cable shall not be acceptable.

B. Insulation: Thermoplastic, not less than 1/32 inch (0.8 mm) thick.

C. Plenum Cable: Listed and labeled for plenum installation.

2.13 RACEWAYS

A. Educational Intercommunication and Program System Raceways and Boxes: Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems."

B. 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.

C. Flexible metal conduit is prohibited.

2.14 MANUFACTURERS

A. Clock Systems Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. American Time & Signal Co.
   2. Primex Wireless, Inc.
   3. Sapling.
   4. Rauland.

2.15 MASTER TRANSMITTER UNIT

A. Unit consisting of transmitter with sync receiver and a surge suppressor/battery backup. The clock system shall transmit time continuously to all clocks in the system.
   1. Informational Display: Backlit LCD type.
   2. Frequency Range: As defined by the manufacturer.
   3. Transmission Power: As required for building coverage.
   4. Radio technology: narrowband FM.
   5. Number of channels: 16 selectable channels.
   6. Transition mode: one-way communication.
   7. Operating range: 32 degree F to 158 degrees F.
   8. Transmitter shall have the following functions:
      a. Time zone adjustment for all time zones in North America.
      b. Daylight Saving Time selection.
      c. 12-hour or 24-hour display.
      d. Time readout.
      e. AM and PM indicator if 12-hour time display is set.
      f. Day and date readout.
      g. Indicator for daylight savings or standard time.
      h. Master time sync reception indicator.
      i. Access levels with passcodes.
   9. Transmitter shall contain an internal clock such that failure of reception from the GPS will not disable the operation of the clocks.

10. Power supply input: 120-volt AC 50/60 Hz.
11. Surge Protector/Battery Backup: Provide lighting surge protector and battery backup for system.

2.16 RECEIVER FOR NIST SYNCRONIZATION

A. Provide one of the following receiver types for Master Transmitter synchronization to NIST time standard.

B. CDMA type unit with interior receiving antenna. Capable of syncing to time signal transmitted by area cell tower.

C. Network interface to TCP/IP network for synchronization to network server transmitted master signal.

2.17 CLOCKS

A. Digital Clock: Microprocessor-controlled unit complying with Class A device requirements in 47 CFR 15, with red LED digital time display of hours and minutes.
   1. Display Height: 2-inch (51-mm) and 4-inch (102-mm) Clock: Hour and minute numerals readable at 100 feet (30 m).
   2. Display Format: Selectable between 12-hour with "PM" LED display and 24-hour formats.
   3. Face Configuration: Single and Double face.
   4. Mounting: Ceiling mounted.
   5. Nominal Dimensions: 12 inches.
   6. External Finish: Standard manufactures colors.
   7. Crystal: Clear polycarbonate.
   8. Connections for Power and Correction:
      a. Wired synchronous connection to master clock for both operating power and correction. Wireless correction signal is acceptable if available from Manufacturer.
      b. Time-Base Backup: Internal capacitor shall back up internal time base to maintain timekeeping during outages of up to 12 hours' duration.
      c. Connection Provision for Secondary Indicating Clocks: Plug connector.

B. Equipment Cabinet: Rack provided by Division 27 “Communications Cabling.” Provide adapter to mount Master Transmitter Unit in standard EIA-310-D compliant rack:

2.18 EXTRA MATERIALS

A. In addition to the those indicated on the drawings, provide the following extra materials:
   1. Digital Clocks: Single sided, quantity two (2).
   2. Digital Clocks: Double sided, quantity two (2).

2.19 WIRE AND CABLE

A. Conductors: Insulated copper, with minimum sizes as recommended by the connected device manufacturer. Voltage drop for signal, control, and clock correction circuits shall not exceed 10 percent under peak load conditions.

B. 120 Volt AC and Class 1 Signal and Control Circuits: Stranded single conductors of size recommended by system manufacturer. Materials and installation requirements are specified in Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

C. Classes 2 and 3 Signal and Control Circuits: Single conductor or twisted-pair cable, unshielded, unless manufacturer recommends shielded cable.

D. Plenum Cable: Listed and labeled for use in air-handling spaces, plenums, and plenum ceilings.

PART 3 - EXECUTION

3.1 APPLICATION

A. Provide digital clocks with display height of 2-inches in corridors.

B. Provide digital clocks with display height of 4-inches in the following rooms:
1. J131 Commons/Cafeteria.
2. L109 Main Competition Gymnasium
3. M111 Auxiliary Gym
4. M104 Wrestling Room
5. M103 Weight Room
6. N105 Natatorium

3.2 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, counters, and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used.
1. Install plenum cable in environmental air spaces, including plenum ceilings.
2. Install all cabling within raceways in areas with exposed structure.
3. Install cabling within raceway in walls and other structures.
4. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."

B. Conceal raceway where possible.

C. Intercom wiring from speakers shall terminate on wall mounted 66 blocks with extension cables to rack mounted intercom unit.

D. 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.

3.3 INSTALLATION OF RACEWAYS

A. Comply with requirements in Division 26 Section "Raceway and Boxes for Electrical Systems" for installation of conduits and wireways.

3.4 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General 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 36 inches (914 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 telecommunication spaces with terminating hardware and interconnection equipment, clearly labeled for the purpose.
2. Install open cables parallel and perpendicular to structure, concealing cables in bundles within structure.
3. Cable shall not be run through structural members or be in contact with pipes, ducts, or other potentially damaging items that can affect the performance of the cable of the surfaces where it is installed.

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

3.5 INSTALLATION

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

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

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

D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

E. Install speaker circuits by groups for zone paging by classroom, grade level, by corridor and by separate functional work space.

F. Install surface mounted boxes level, plumb and secure to wall or ceiling.

G. Install wall mounted volume controls where indicated.

H. Connect intercom system, including all-call amplifiers to UPS supplied power receptacles.

I. Connect intercom system to master clock system for synchronization to national time standard.

J. Connect intercom system to owner's network and install bell schedule software on Owner's computers.

K. Connect intercom system to Owners VOIP telephone system. Install 1 pathway between intercom and telephone system. Program intercom zone numbering to match with Owners telephone extension numbering. Coordinate with Owner.

L. All Station cables at the wall field must be dressed neatly using Velcro & labeled according to the school dedicated room numbers not architectural plan numbers.

M. Label wall field punch blocks with the associated line card on the punch block.

N. Cables from intercom system to wall field must be labeled with the associated line card being used.

O. All field intercom jacks must be labeled according to system connection.

P. Locate Master Transmitter in existing intercom equipment rack in main communications room.

Q. Connect master clock output to intercom system for synchronization of program tones.

R. Install clocks in locations indicated and connect to power supplies located in communication or electrical rooms. Circuit power supply to spare 20A circuit breaker in nearest "L" panelboard.

S. Install wire guards on clocks in Gymnasiums, Weight, Fitness and Wrestling rooms.

3.6 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 each equipment cabinet. Isolate from power system and equipment grounding.

C. Connect intercom components to rack and bond rack to signal ground terminal with No. 6 AWG minimum green copper conductor.

D. Remove all paint and foreign matter from contact surfaces before bonding ground lugs.

3.7 IDENTIFICATION PRODUCTS

A. Comply with the following:
   1. Cable Labels: Self-adhesive vinyl or vinyl-cloth wraparound tape markers, machine printed self-laminating tape with alphanumeric cable designations applied to each end of each cable and to terminal equipment, raceways, ductbanks, cabinets and enclosures.
   2. Wall Fields descriptions: Engraved black with white letter laminate plastic with identifying description of wall fields served.

3.8 CLEANING

A. Prior to final acceptance, clean system components and protect from damage and deterioration.

3.9 SYSTEM PROGRAMMING

A. Programming: Fully brief Owner on available programming options. Record Owner's decisions and set up initial system program. Prepare a written record of decisions, implementation methodology, and final results.

3.10 FIELD QUALITY CONTROL

A. 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.

B. Tests and Inspections:
   1. Schedule tests with at least seven days' advance notice of test performance.
   2. After installing educational intercommunications and program systems and after electrical circuitry has been energized, test for compliance with requirements.
   3. Operational Test: Test originating station-to-station and all-call messages at each intercommunication station. Verify proper routing and volume levels and that system is free of noise and distortion. Test each available message path from each station on system.
   4. Frequency Response Test: Determine frequency response of two transmission paths, including all-call, by transmitting and recording audio tones. Minimum acceptable performance is within 3 dB from 150 to 2500 Hz.
   5. Signal-to-Noise Ratio Test: Measure signal-to-noise ratio of complete system at normal gain settings as follows:
      a. Disconnect speaker microphone and replace it in the circuit with a signal generator using a 1000-Hz signal. Measure signal-to-noise ratio at speakers.
      b. Repeat test for three speaker microphones, and one master station microphone.
      c. Minimum acceptable ratio is 45 dB.
   6. Distortion Test: Measure distortion at normal gain settings and rated power. Feed signals at frequencies of 150, 200, 400, 1000, and 2500 Hz into each intercom and all-call amplifier. For each frequency, measure distortion in the paging and all-call amplifier outputs. Maximum acceptable distortion at any frequency is 5 percent total harmonics.
   7. Signal Ground Test: Measure and report ground resistance at system signal ground. Comply with testing requirements in Division 26 Section "Grounding and Bonding for Electrical Systems."

C. 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 and independent room speaker-line matching transformers.

D. Educational intercommunications and program systems will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.11 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service and initial system programming.
   1. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements.
   2. Complete installation and startup checks according to manufacturer's written instructions.

3.12 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 three (3) requested visits to Project during other-than-normal occupancy hours for this purpose.

C. Assist with telephone system integration to insure interconnection and proper intercom system isolation and insure intercom system integrity. Provide up to two (2) 4-hour site visits for this purpose.

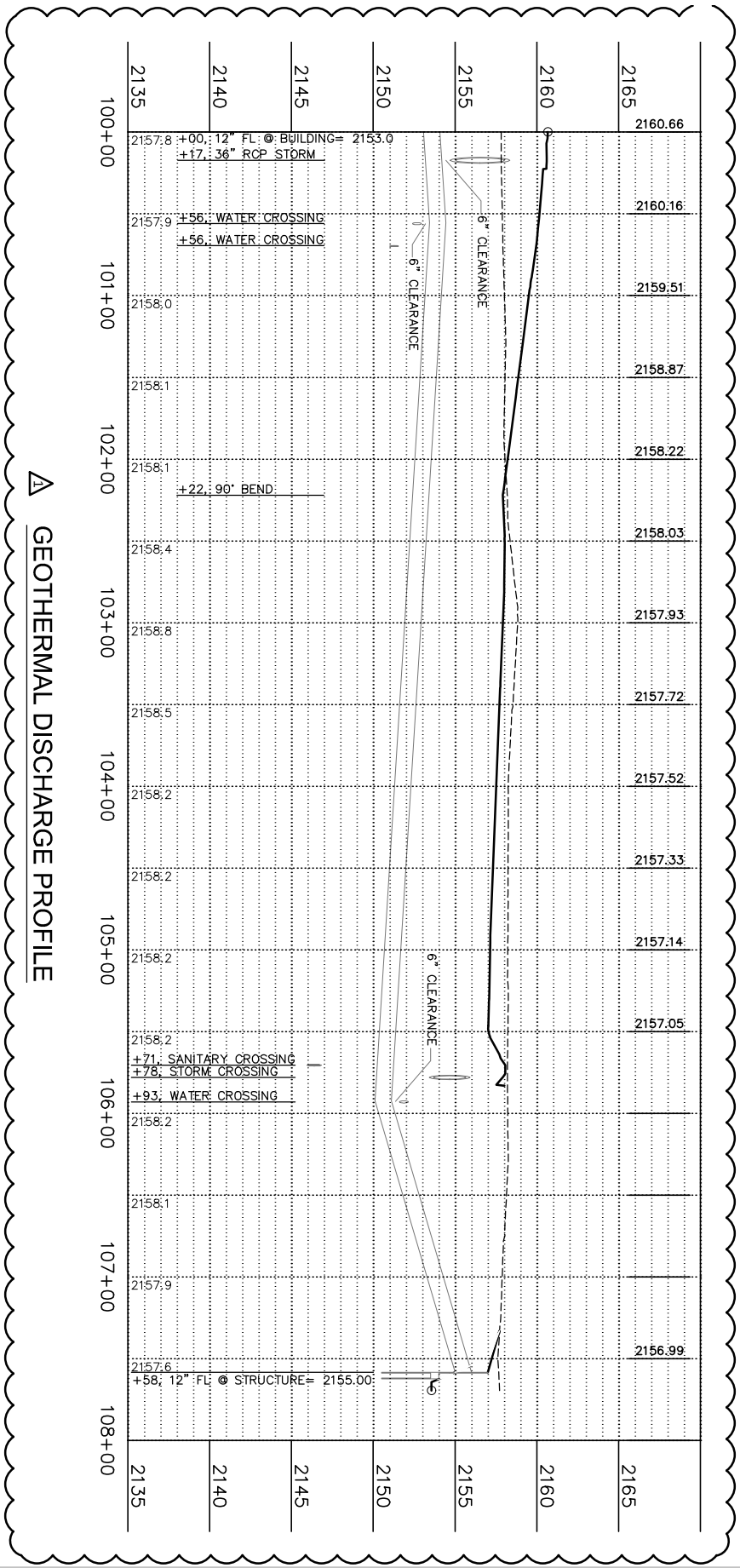
3.13 DEMONSTRATION

A. Training: Conduct a minimum of two (2) days' training of Owner's personnel in operation, preventive maintenance, and user-programming of the system as specified in Division 1 Section Project Closeout." Include both classroom training and hands-on experience. Include 2 sessions on bell schedule software programming.

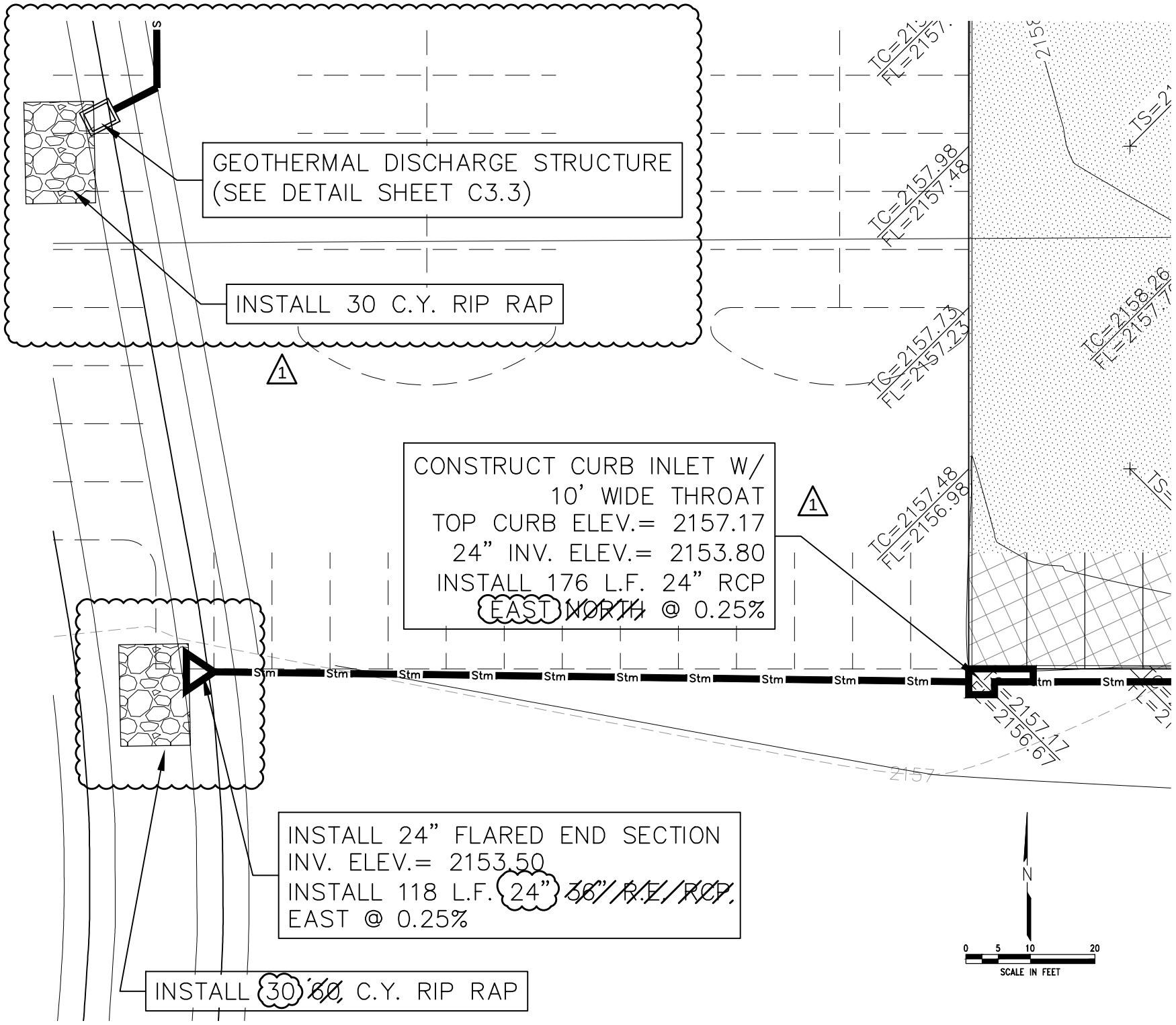
B. Schedule Owner training with at least 7 days' advance notice.

C. Provide a complete machine printed intercom directory.

END OF SECTION 275123



GEOTHERMAL DISCHARGE PROFILE



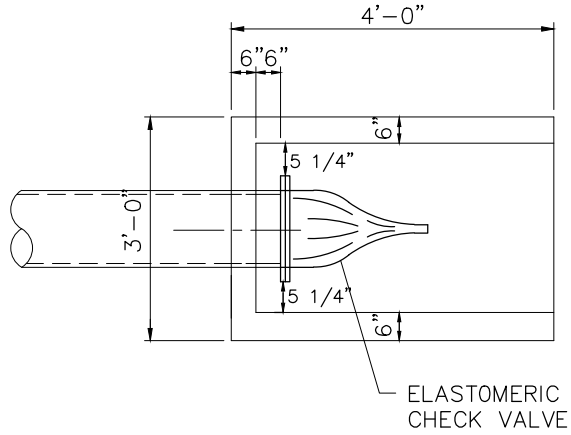
Addendum No. 1

C4.7

Project Number: 1355

Kearney Public Schools
New Kearney High School
October 7, 2014

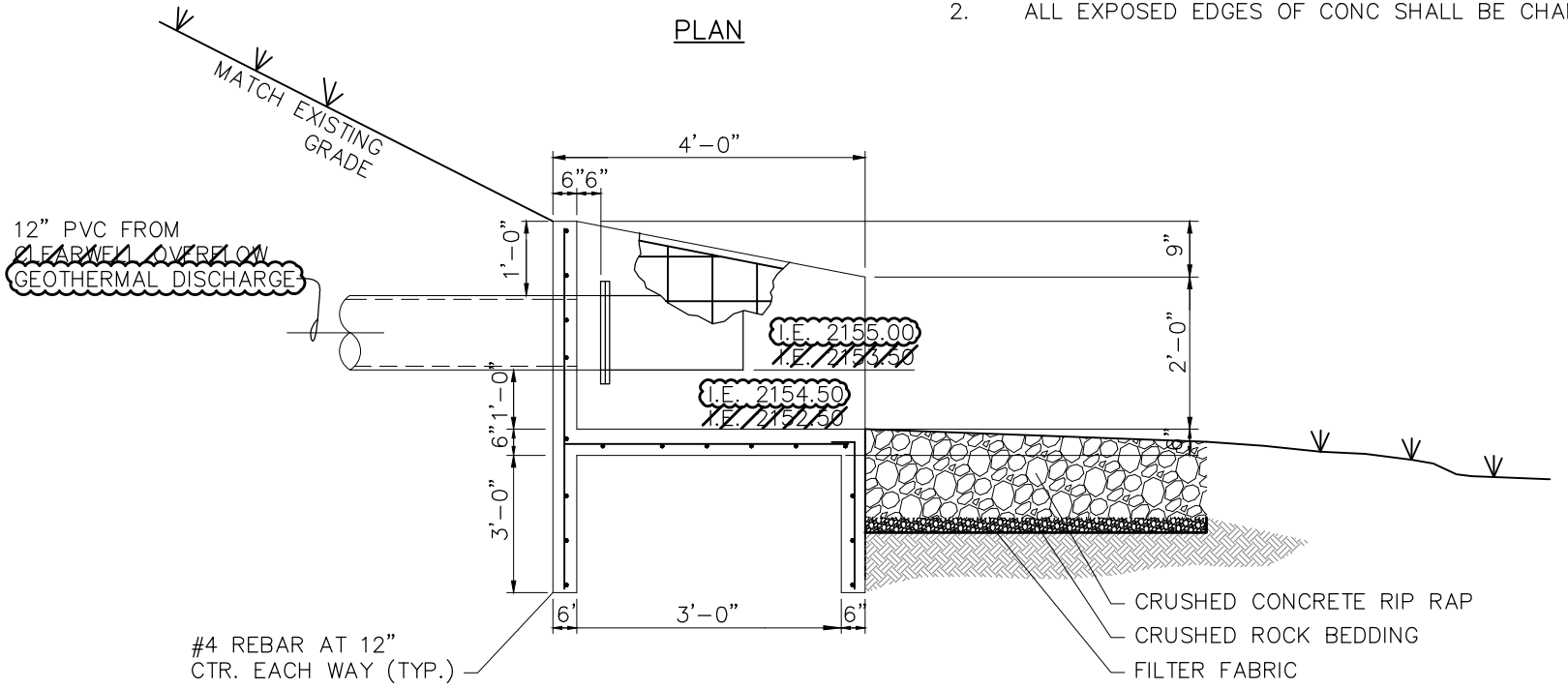
Wilkins Hinrichs Stober Architects, L.L.C.



PLAN

NOTES:

1. ALL REQUIRED CLEARING, GRUBBING, DEWATERING, EXCAVATION, SHEET PILING, BACKFILL AND FINAL GRADING SHALL BE INCLUDED IN CONSTRUCTION OF DISCHARGE STRUCTURE.
2. ALL EXPOSED EDGES OF CONC SHALL BE CHAMFERED 3/4".



SECTION

1 GEOTHERMAL DISCHARGE STRUCTURE

NO SCALE

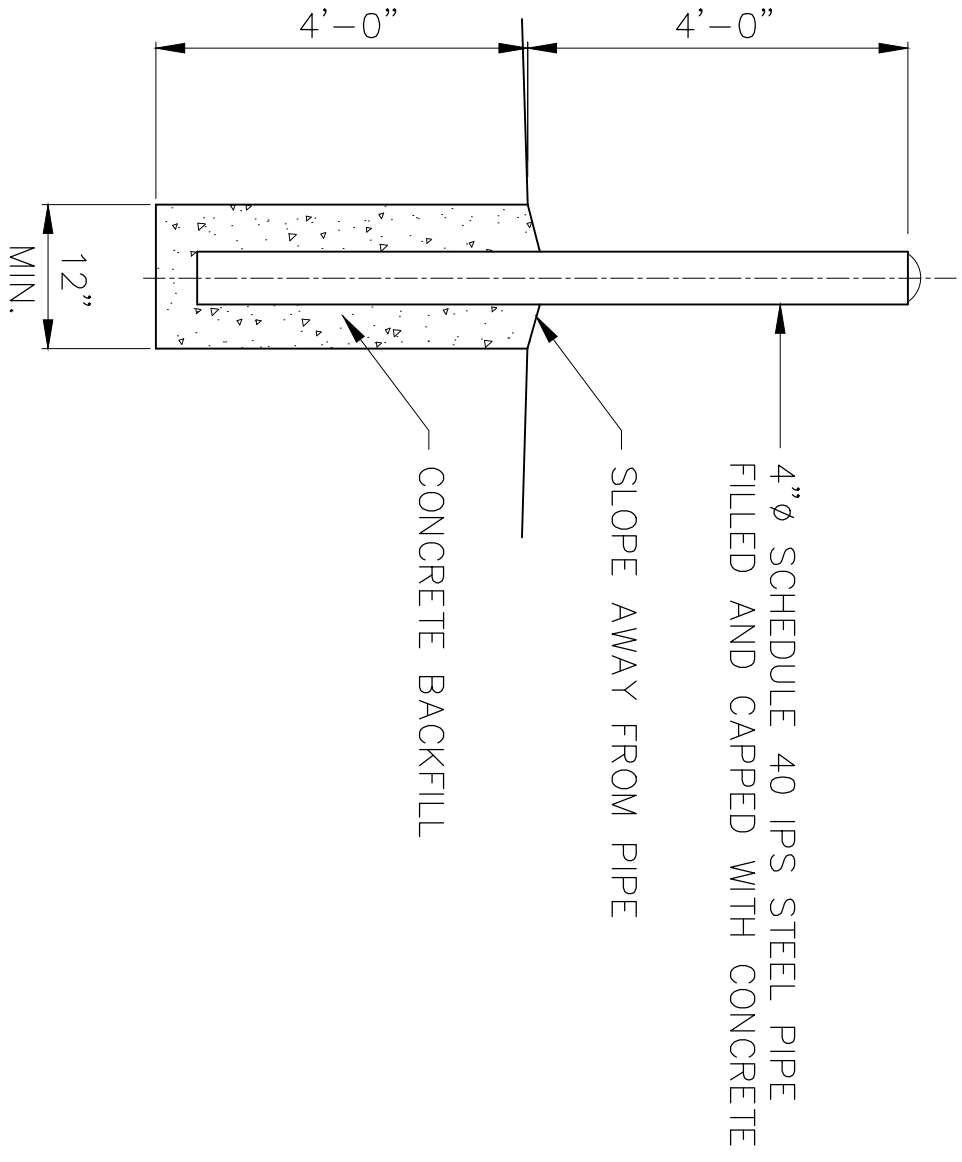
Addendum No. 1

C3.3

Project Number: 1355

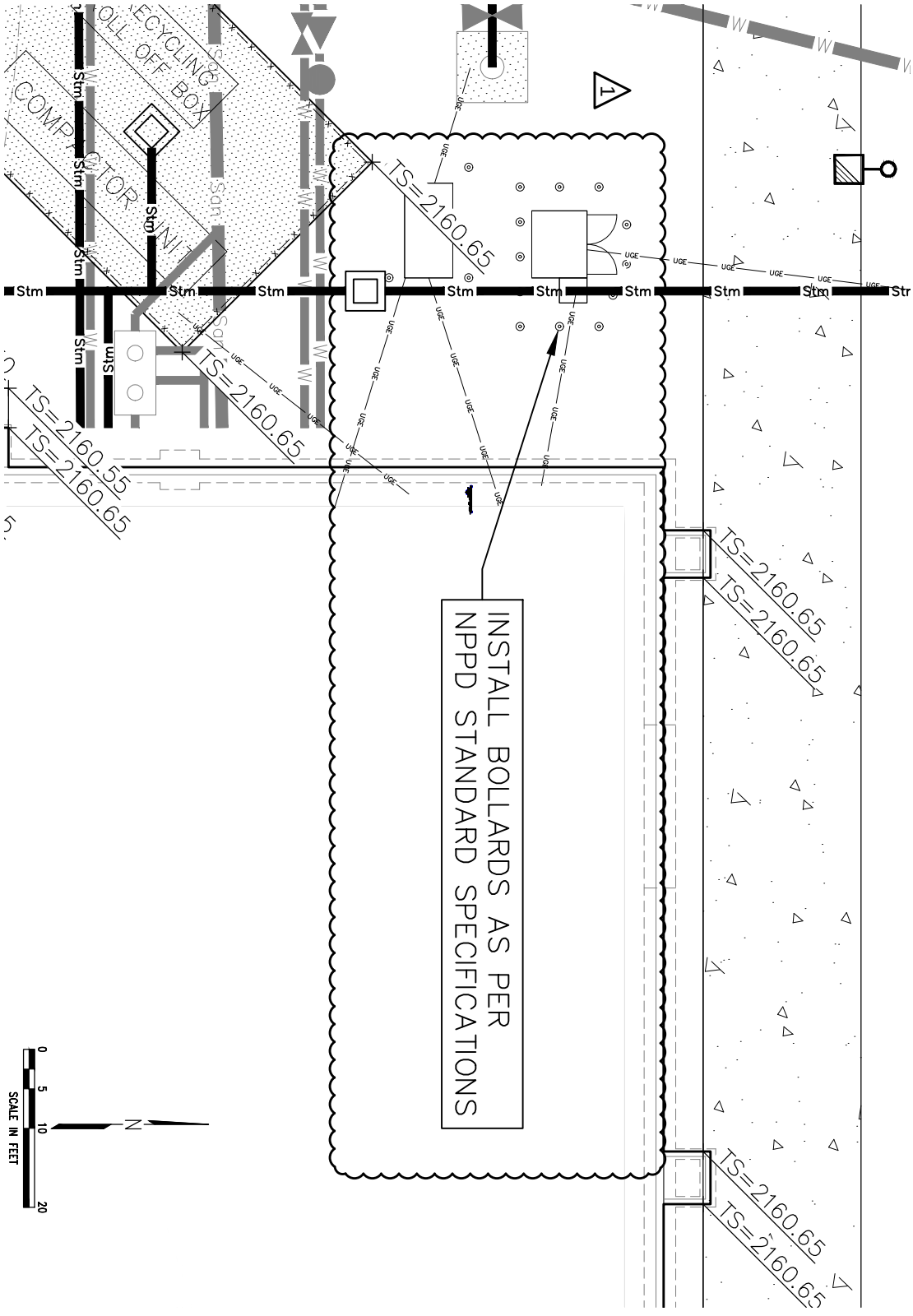
Kearney Public Schools
New Kearney High School
October 7, 2014

Wilkins Hinrichs Stober Architects, L.L.C.



1 BOLLARD DETAIL

NO SCALE


INSTALL BOLLARDS AS PER
NPPD STANDARD SPECIFICATIONS
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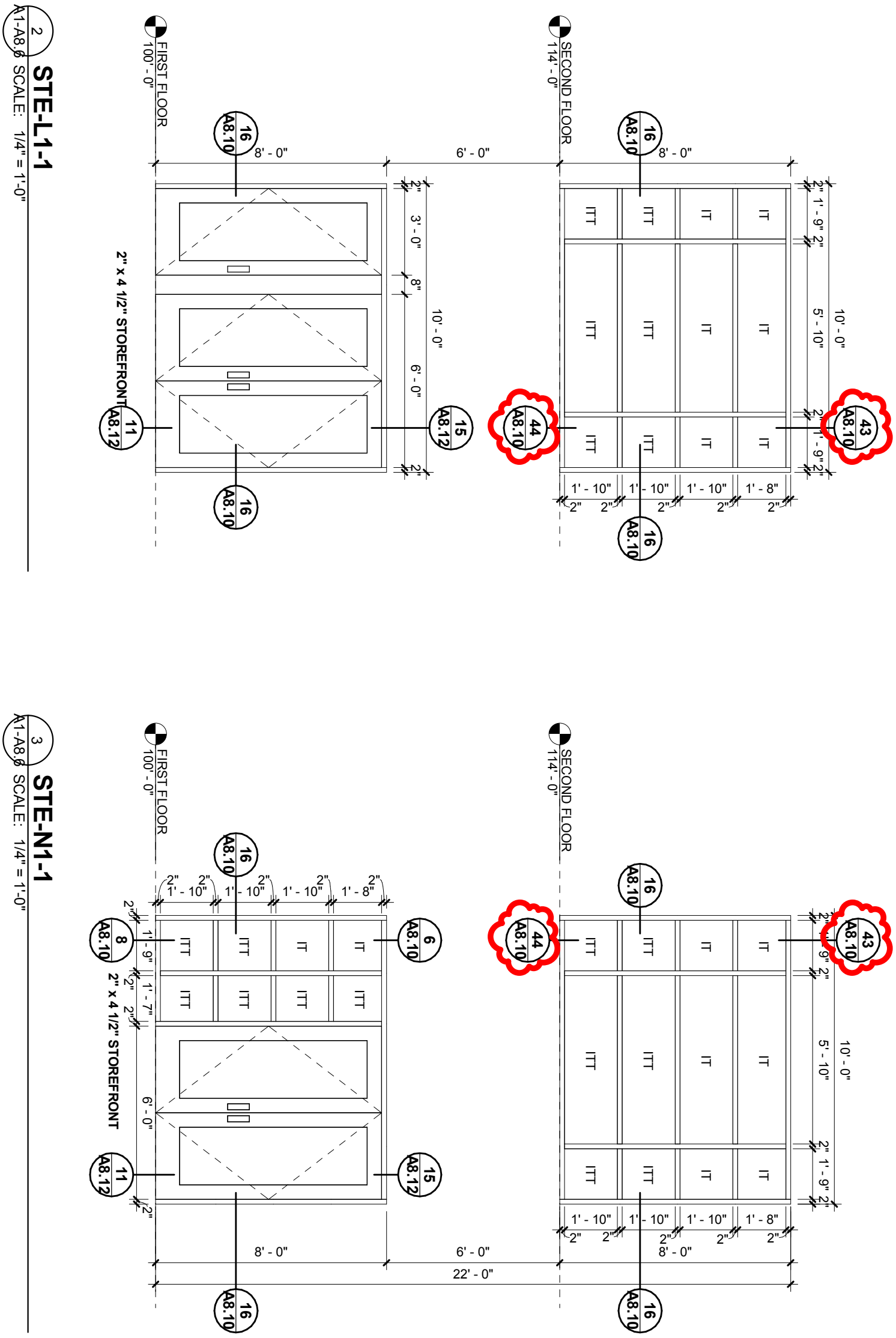
Stm
UGE
W
SCALE IN FEET
0
5
10
20
N

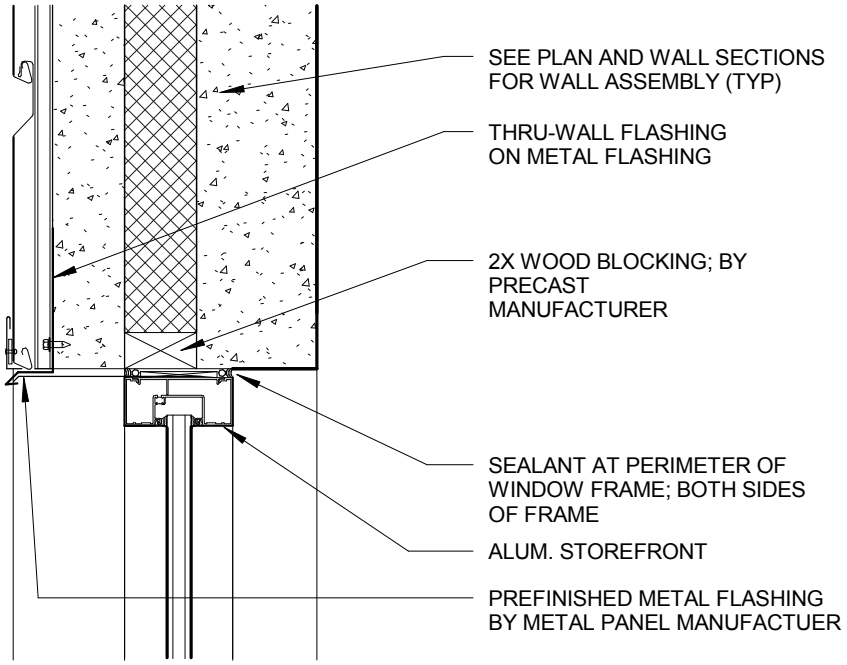


2 A1-A8.6 STE-L1-1

SCALE: 1/4" = 1'-0"

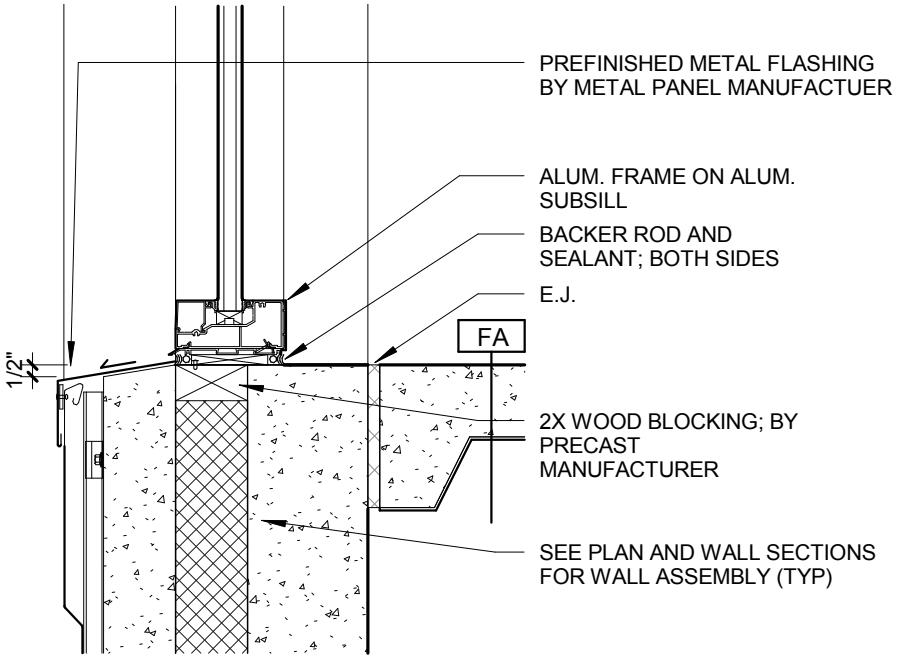
3 A1-A8.6 STE-N1-1

SCALE: 1/4" = 1'-0"



43 / A8.10 **HEAD DETAIL**

SCALE:1 1/2" = 1'-0"



44 / A8.10 **SILL DETAIL**

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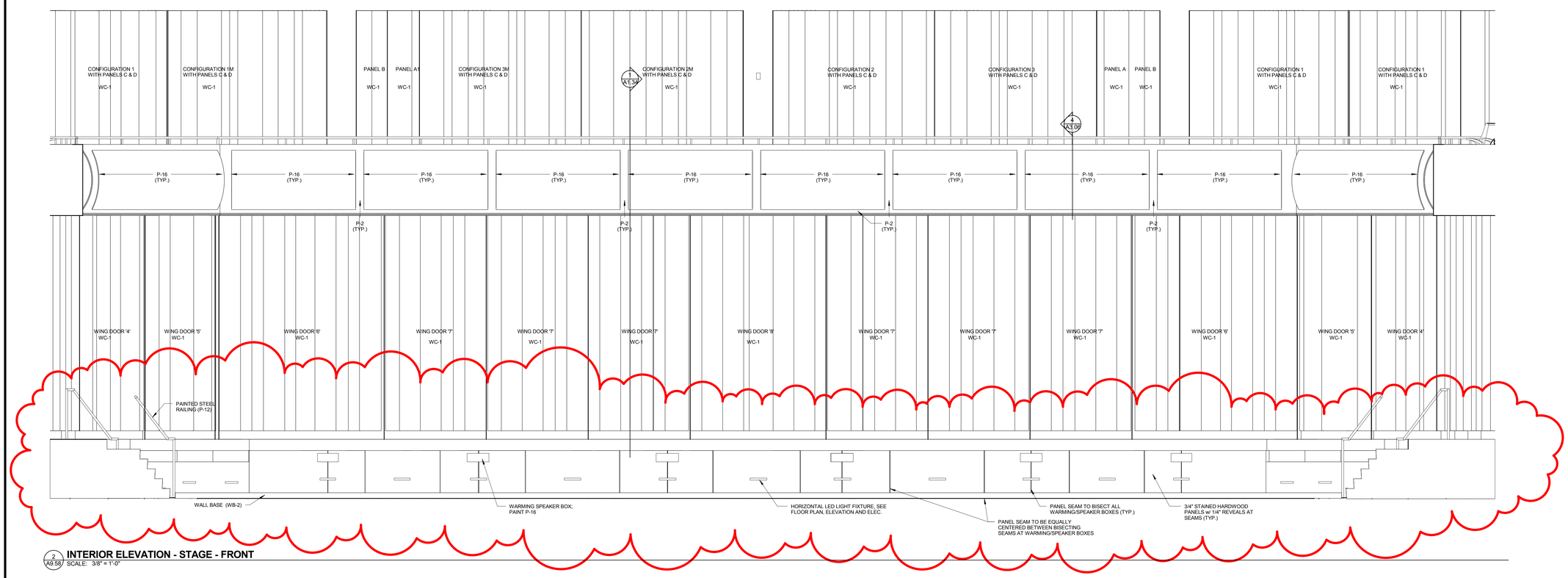
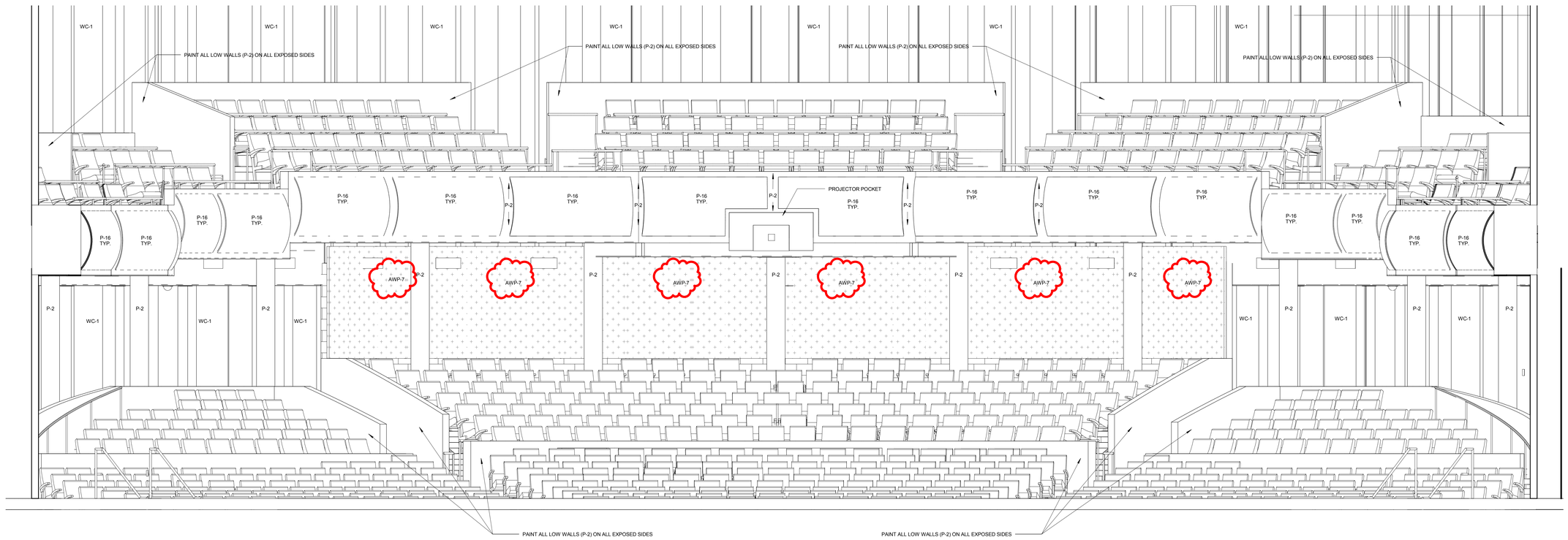


2 A9.58 **INTERIOR ELEVATION - STAGE - FRONT**
SCALE: 3/8" = 1'-0"



1 A9.58 **INTERIOR ELEVATION - PAC**
SCALE: 3/8" = 1'-0"

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DLR Group Project No.: 10-13113-00

Kearney Public Schools
New Kearney High School
Kearney, Nebraska

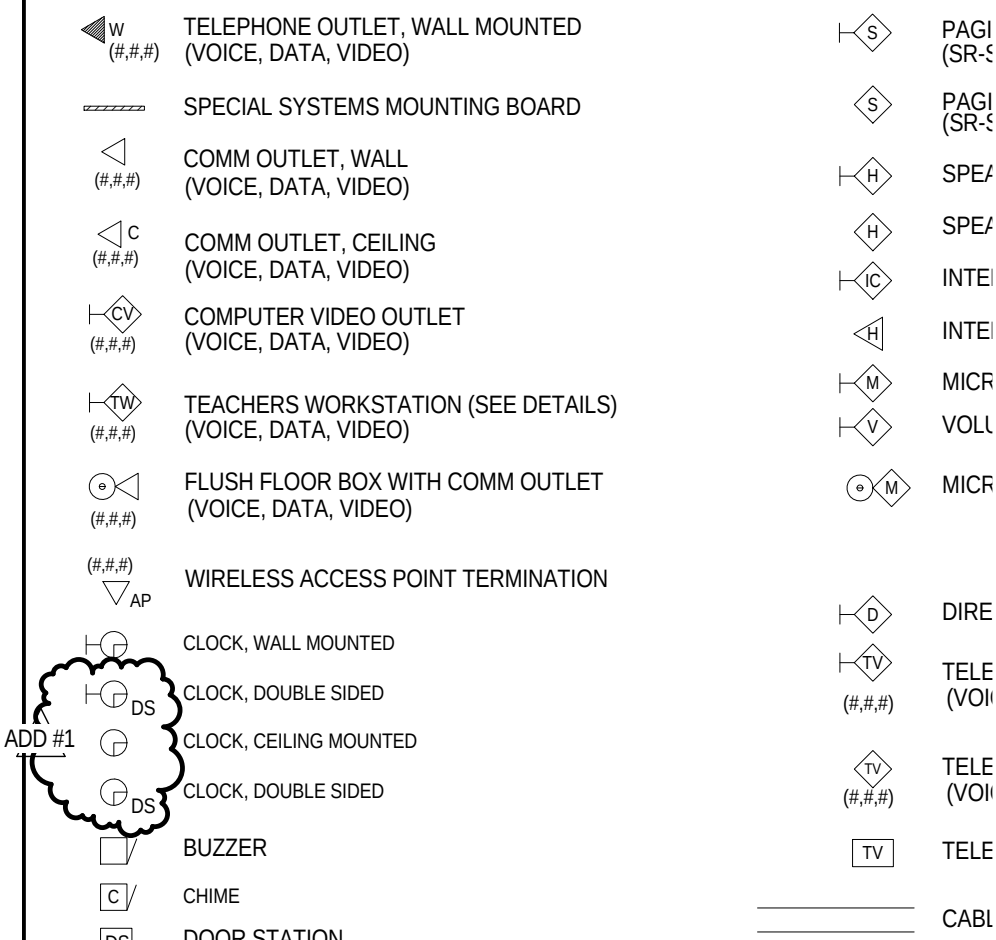
Revision/Issue	Date
Addendum No. 1	10/07/2014

Interior Elevations - PAC

Project Number: **1355**
Date: **September 30, 2014**

Sheet Number:
A9.58

COMMUNICATION SYSTEMS



Attachment No. E0.0-1
to ADDENDUM NO. 1
Dated: OCT 7, 2014

Wilkins Hinrichs Stober Architects, L.L.C.

DLR Group
Architecture Engineering Planning Interiors

DLR Project # 10-13113-00

Kearney Public Schools
New Kearney High School

Project Number: 1355

GENERAL POWER NOTES:

(TYPICAL ALL POWER SHEETS)

1. VERIFY OWNER'S PREFERENCE FOR PANEL DIRECTORIES. DIRECTORIES SHALL REFLECT OWNER'S NUMBERING SCHEME AND NOT THE ARCHITECTURAL NUMBERING SCHEME. OBTAIN REQUIRED INPUT FROM OWNER PRIOR TO FABRICATION OF TYPED PANEL DIRECTORIES.

2. PROVIDE MINIMUM OF 24-INCHES SEPARATION BETWEEN BOXES LOCATED BACK-TO-BACK AT ALL FIRE-RATED WALLS.

3. PROVIDE POWER FROM DESIGNATED 20/1P BREAKER IN NEAREST PANEL TO EACH SMOKE DAMPERS IN AREA. WIRE THROUGH FIRE ALARM SYSTEM RELAYS.

4. SEE SCHEDULE SHEETS FOR CONNECTIONS TO ALL MECHANICAL EQUIPMENT, INCLUDING DISCONNECTS & STARTERS PROVIDED BY DIVISION 26. COORDINATE MOUNTING OF DISCONNECTS AND STARTERS WITH SURROUNDING EQUIPMENT AND PROVIDE ADEQUATE CLEARANCES AS REQUIRED BY NEC.

5. SEE MECHANICAL AND PLUMBING DRAWINGS TO CONFIRM LOCATIONS OF ALL HVAC EQUIPMENT, WATER HEATERS, PUMPS, EXHAUST FANS, DAMPERS, THERMOSTATS, CONTROL DEVICES, CONTROL PANELS, ETC.

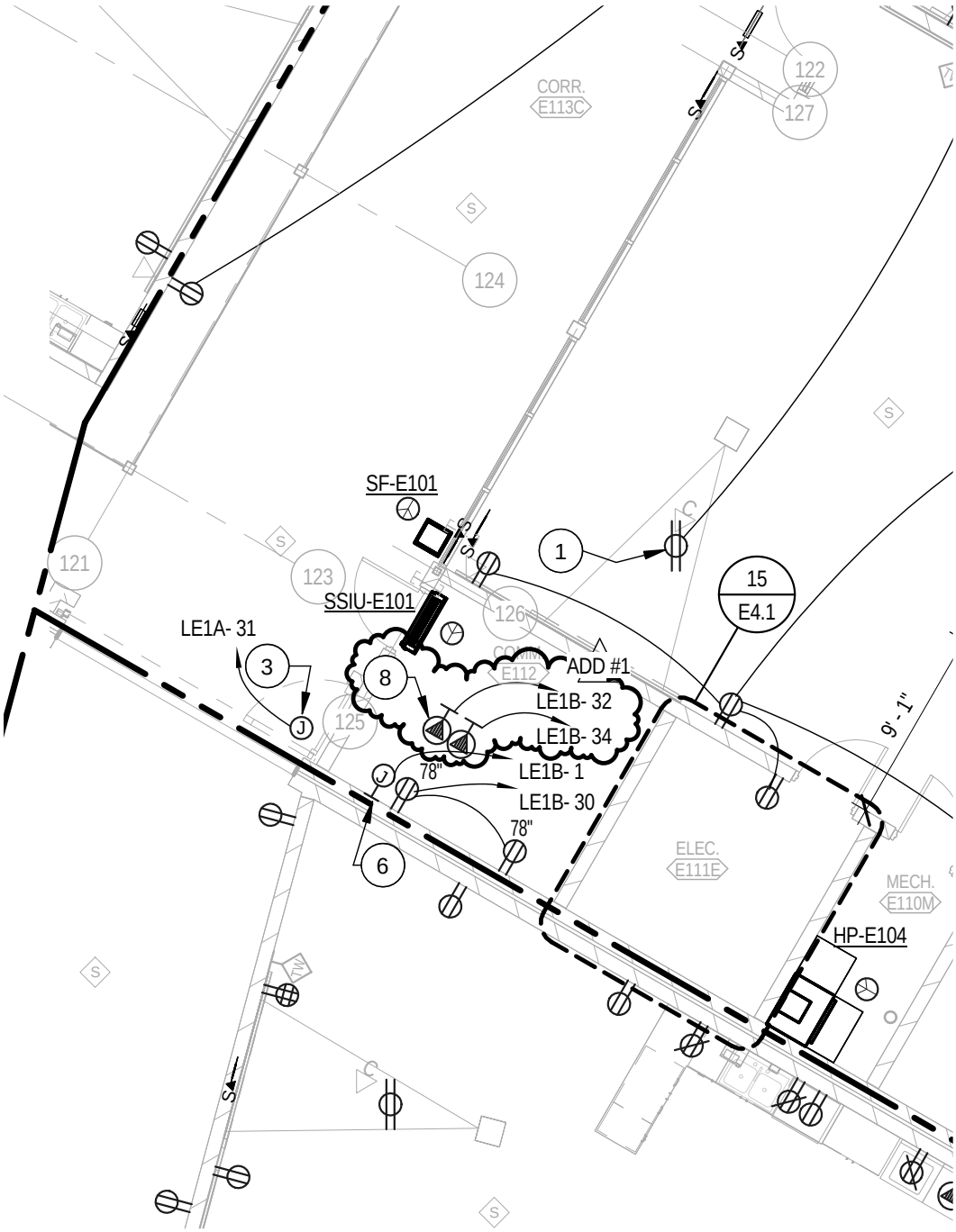
6. FLOORBOXES SHALL BE TYPE FB-1 UNLESS NOTED OTHERWISE.

7. SEE SHEET A4.04 FOR CONDUIT ROOF PENETRATION DETAIL.

ADD #1

8. PROVIDE POWER FROM SPARE 20/1P BREAKER IN NEAREST PANEL TO EACH PROGRAM CLOCK POWER SUPPLY. COORDINATE LOCATIONS WITH SECTION 275123.

Attachment No. E0.0-2
to ADDENDUM NO. 1
Dated: OCT 7, 2014



Attachment No. E2.5-1
to ADDENDUM NO. 1
Dated: OCT 7, 2014

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Architecture Engineering Planning Interiors

DLR Project # 10-13113-00

Kearney Public Schools
New Kearney High School

Project Number: 1355

KEYNOTES

KEY #	KEYNOTE TEXT
1	COORDINATE LOCATION OF RECEPTACLE WITH OWNER PROVIDED PROJECTOR PRIOR TO INSTALLATION. LOCATION MAY VARY BY ROOM. TYPICAL OF ALL CLASSROOMS.
2	RECEPTACLES SHALL BE TAMPER RESISTANT TYPE. TYPICAL IN THIS ROOM.
3	POWER FOR COILING DOOR OR FIRE/SMOKE SHUTTER. COORDINATE CONNECTION WITH REVIEWED SHOP DRAWING. CONNECT MOTOR AND CONTROL PANEL.
4	USE #10S, #10G FOR THIS CIRCUIT TO COMPENSATE FOR VOLTAGE DROP.
5	HAND DRYER PROVIDED BY SECTION 262726. SEE MOUNTING HEIGHT SCHEDULE ON SHEET E0.1. MOUNT ONE HAND DRYER IN EACH TOILET AT ADA HEIGHT. TYPICAL.
6	POWER FOR DOOR CONTROL PANEL. MOUNT ABOVE CEILING OR AT 9'-0" IN ROOMS WITH EXPOSED STRUCTURE.
7	AUTOMATIC DOOR OPERATOR FURNISHED BY DIVISION 8. CONNECT OPERATOR TO CIRCUIT INDICATED. PROVIDE OUTLET BOXES AND RACEWAYS FOR PUSH PADS EXCEPT ON GLASS WALLS.
8	NEMA L5-30 RECEPTACLE FOR UPS IN RACK. SEE SPECIAL SYSTEMS AND LARGE-SCALE PLAN. SEE DETAIL 21/E6.1 FOR MOUNTING.

ADD #1

Attachment No. E2.5-2
to ADDENDUM NO. 1
Dated: OCT 7, 2014

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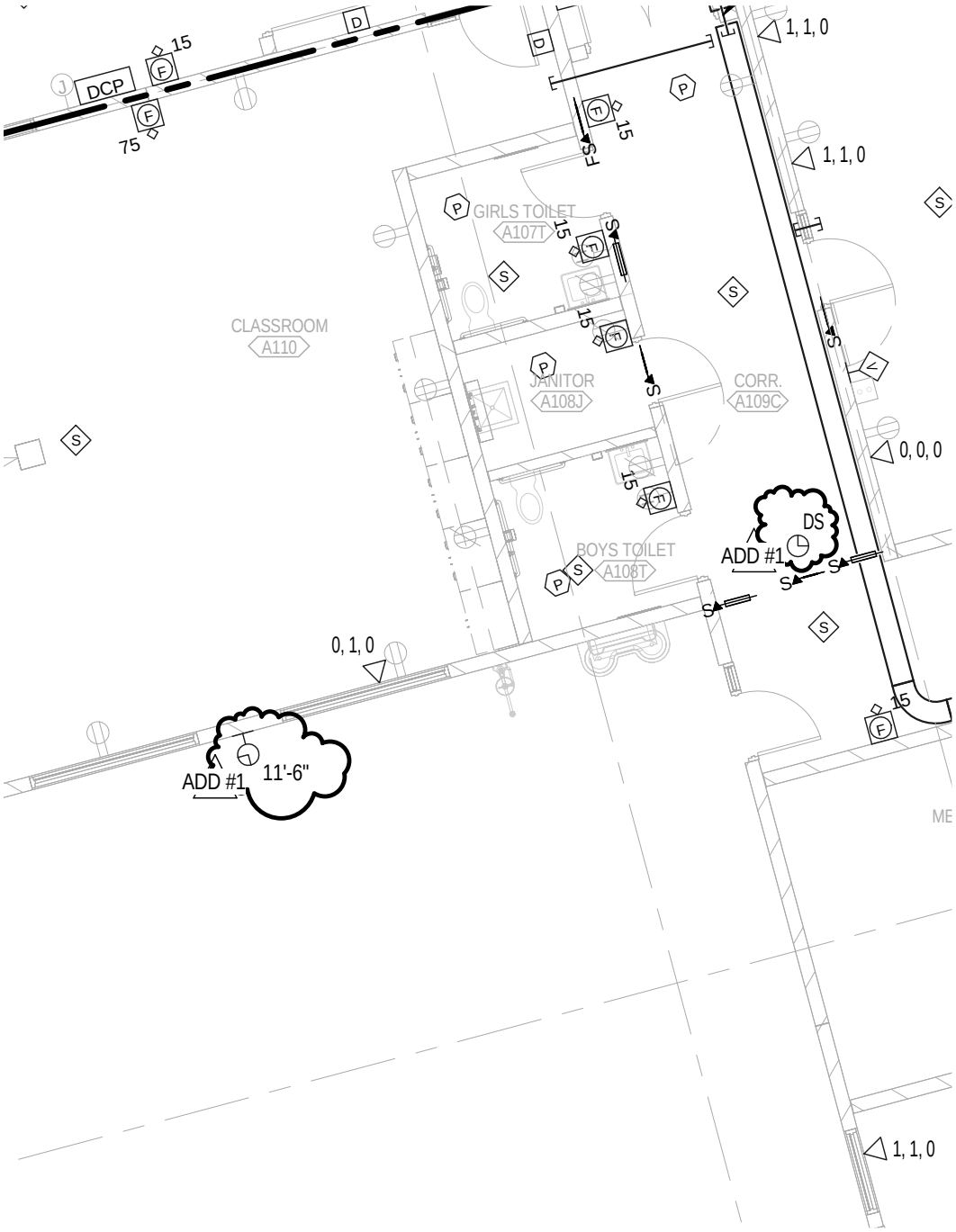

Attachment No. E3.1-1
to ADDENDUM NO. 1
Dated: OCT 7, 2014

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DLR Project # 10-13113-00

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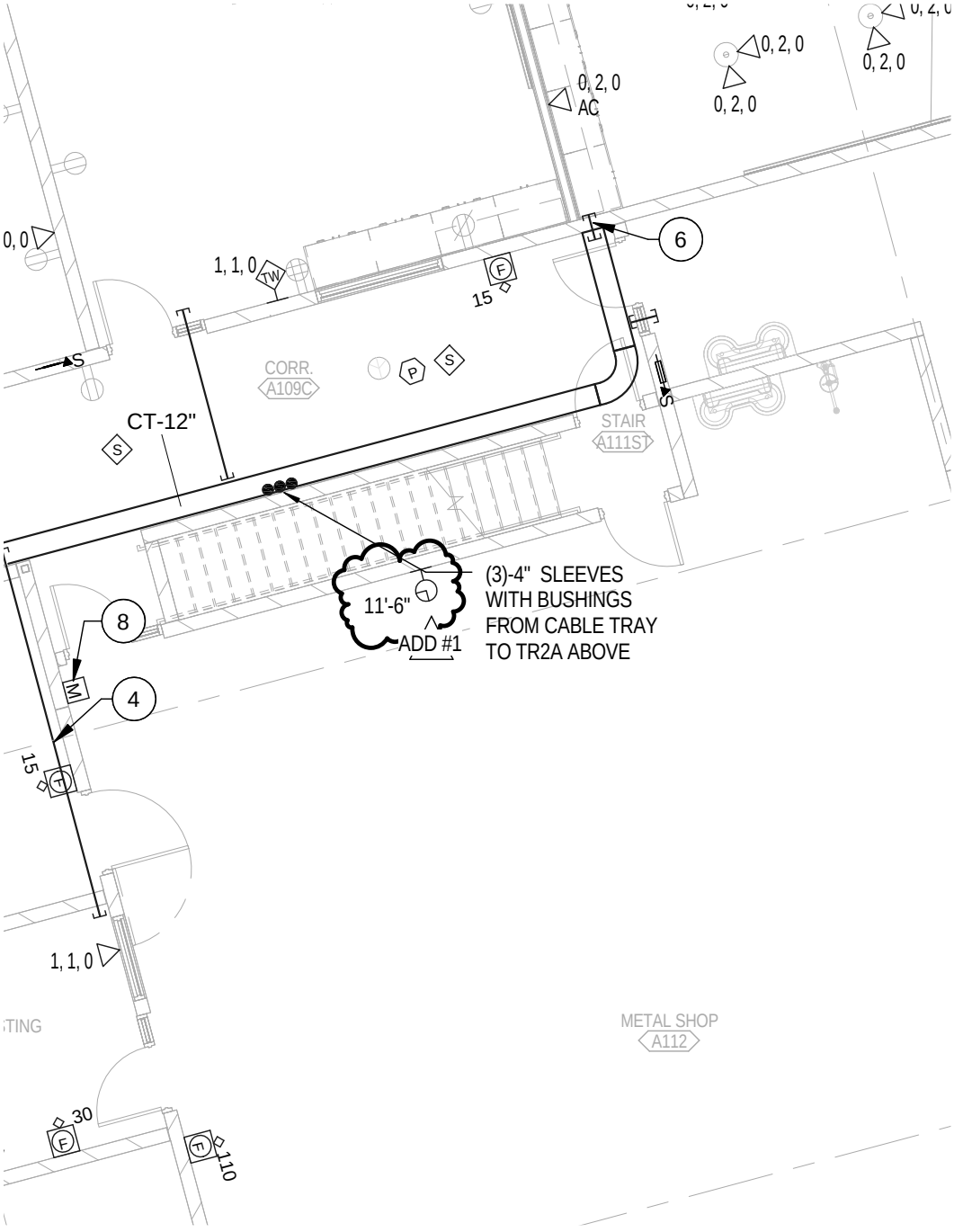

Attachment No. E3.1-2
to ADDENDUM NO. 1
Dated: OCT 7, 2014

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DLR Project # 10-13113-00

Kearney Public Schools
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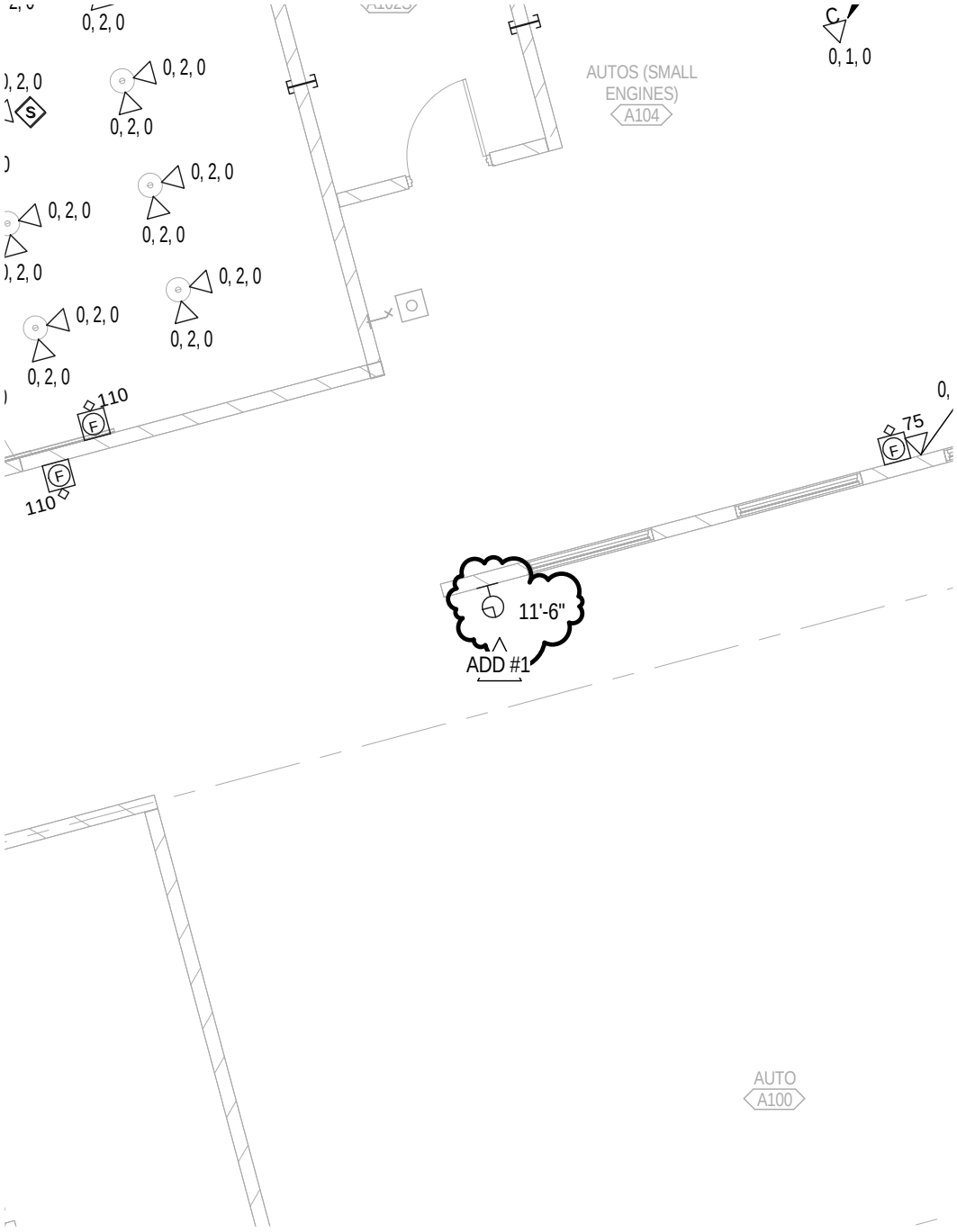

Attachment No. E3.1-3
to ADDENDUM NO. 1
Dated: OCT 7, 2014

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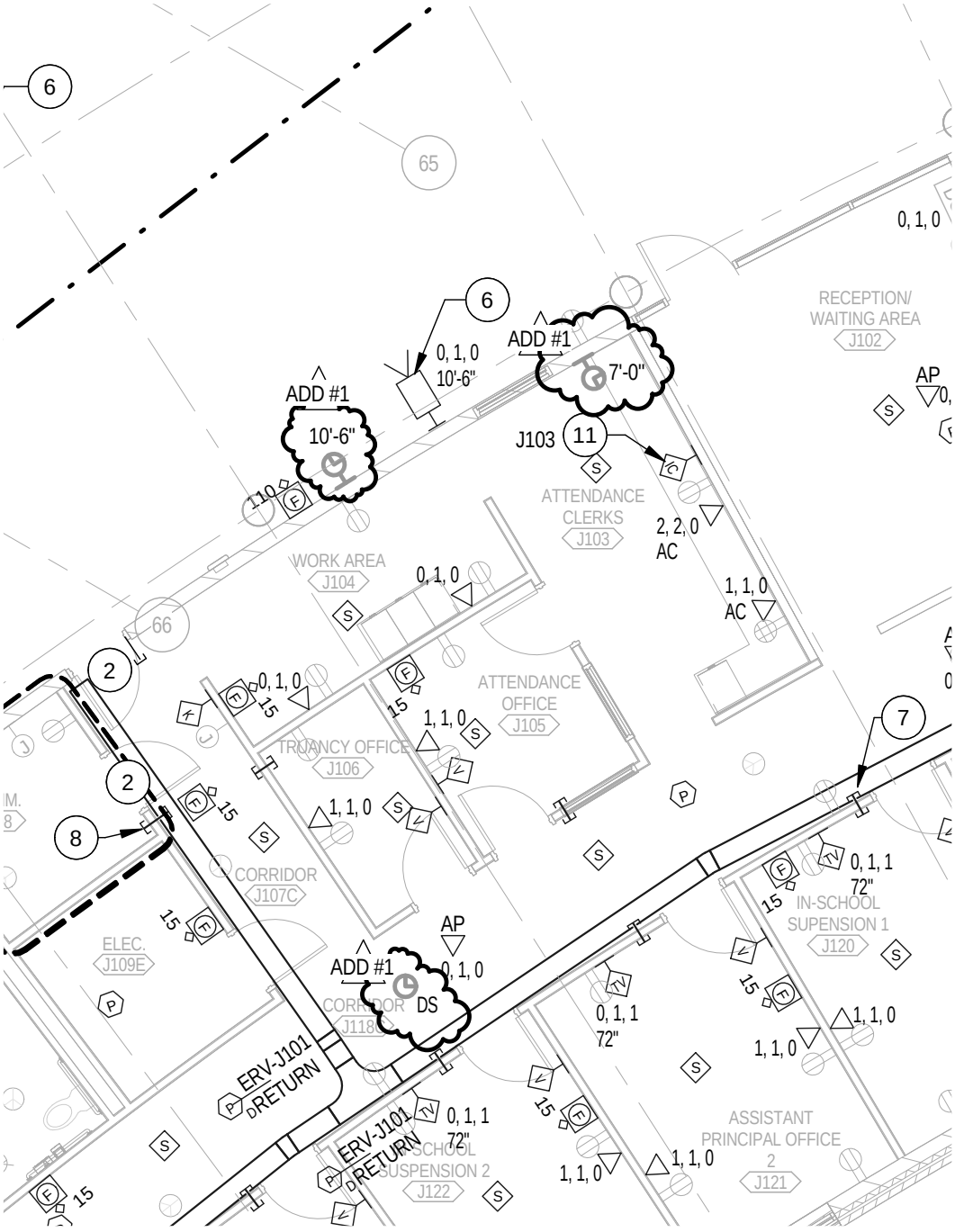
DLR Project # 10-13113-00

Kearney Public Schools
New Kearney High School

Project Number: 1355



Attachment No. 3.8-1
to ADDENDUM NO. 1
Dated: OCT 7, 2014

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DLR Project # 10-13113-00

Kearney Public Schools
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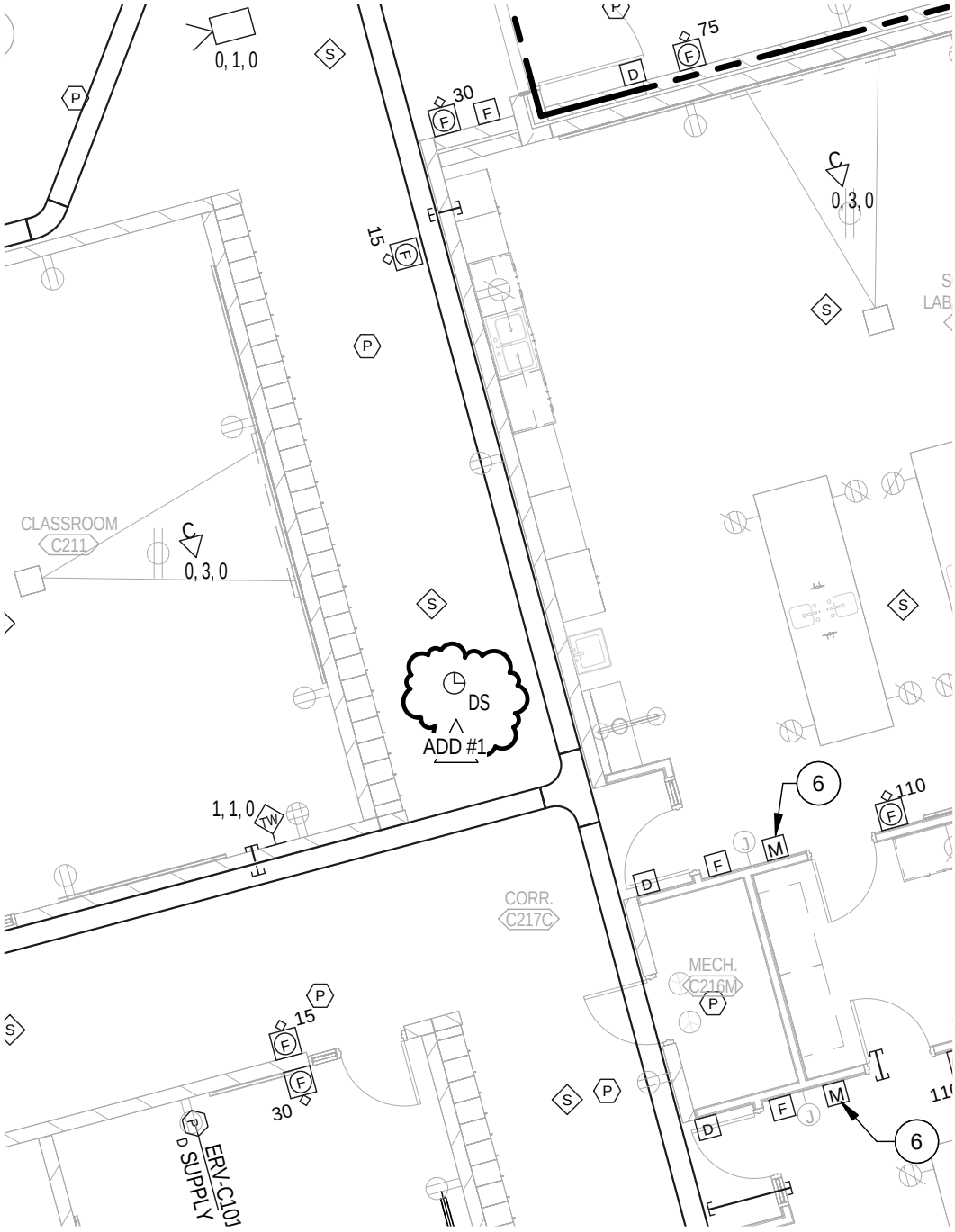
Project Number: 1355



Attachment No. E3.15-1
to ADDENDUM NO. 1
Dated: OCT 7, 2014

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Architecture Engineering Planning Interiors

DLR Project # 10-13113-00

Kearney Public Schools
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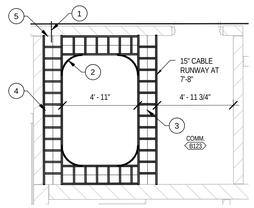
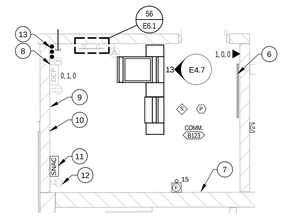
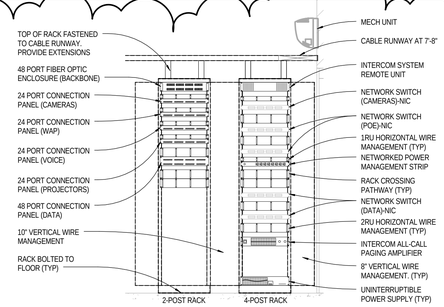
Project Number: 1355



11 E4.7 B123-TR1B CABLE RUNWAY
SCALE: 1/4" = 1'-0"

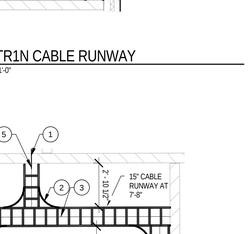


12 E4.7 B123-TR1B LARGE-SCALE
SCALE: 1/4" = 1'-0"

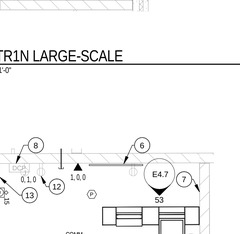


13 E4.7 TR1B RACK ELEVATION
SCALE: 1/2" = 1'-0"

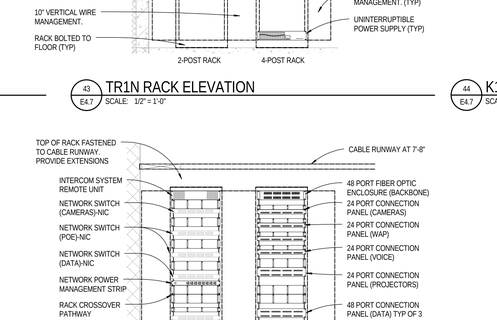
KEYNOTES	
KEY #	**KEYNOTE TEXT**
1	SLEEVES THROUGH WALL. STACK AND ALIGN WITH CABLE RUNWAY. TYPICAL.
2	PROVIDE RADIUS CORNER BRACKETS FOR ALL CABLE RUNWAY CORNERS. TYPICAL.
3	PROVIDE CABLE DROP-OUTS AT EACH VERTICAL CABLE MANAGEMENT.
4	PROVIDE CABLE DROP-OUTS 3'-0" ON CENTER AT WALL FIELD.
5	PROVIDE VERTICAL RUNWAY FOR SUPPORT OF CABLES UP TO SLEEVES. TYPICAL.
6	FRAMED CABLE ADMINISTRATION DRAWINGS WITH PLEXIGLASS COVER MOUNTED ON WALL.
7	PLYWOOD FROM 0'-4" TO 8'-4" ON ALL 4 WALLS.
8	DOOR CONTROL PANEL PROVIDED BY SECURITY CONTRACTOR.
9	WALL FIELD LOCATION FOR INTERCOM TERMINATIONS.
10	COAXIAL CABLE TERMINATIONS AND BROADBAND DISTRIBUTION ON WALL.
11	FIRE ALARM POWER SUPPLY PANEL LOCATION IF NEEDED.
12	ALL WALL-MOUNTED ELECTRICAL DEVICES FLUSH MOUNTED THIS ROOM.
13	CONDUITS FROM C110 HEADEND ROOM. SEE NOTE 7 UNDER GENERAL SPECIAL SYSTEMS NOTES.



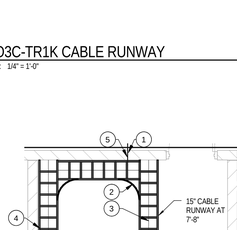
21 E4.7 E112-TR1E CABLE RUNWAY
SCALE: 1/4" = 1'-0"



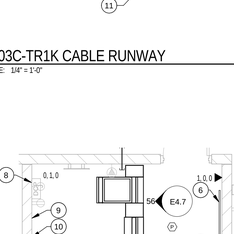
22 E4.7 E112-TR1E LARGE-SCALE
SCALE: 1/4" = 1'-0"



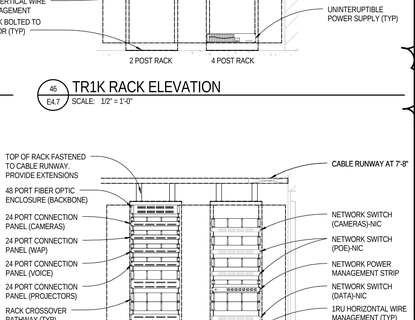
23 E4.7 TR1E RACK ELEVATION
SCALE: 1/2" = 1'-0"



24 E4.7 D125-TR1D CABLE RUNWAY
SCALE: 1/4" = 1'-0"



25 E4.7 D125-TR1D LARGE-SCALE
SCALE: 1/4" = 1'-0"



26 E4.7 TR1D RACK ELEVATION
SCALE: 1/2" = 1'-0"

31 E4.7 J108-TR1J CABLE RUNWAY
SCALE: 1/4" = 1'-0"

32 E4.7 J108-TR1J LARGE-SCALE
SCALE: 1/4" = 1'-0"

33 E4.7 TR1J RACK ELEVATION
SCALE: 1/2" = 1'-0"

34 E4.7 H107-TR1H CABLE RUNWAY
SCALE: 1/4" = 1'-0"

35 E4.7 H107-TR1H LARGE-SCALE
SCALE: 1/4" = 1'-0"

36 E4.7 TR1H RACK ELEVATION
SCALE: 1/2" = 1'-0"

41 E4.7 N106C-TR1N CABLE RUNWAY
SCALE: 1/4" = 1'-0"

42 E4.7 N106C-TR1N LARGE-SCALE
SCALE: 1/4" = 1'-0"

43 E4.7 TR1N RACK ELEVATION
SCALE: 1/2" = 1'-0"

44 E4.7 K103C-TR1K CABLE RUNWAY
SCALE: 1/4" = 1'-0"

45 E4.7 K103C-TR1K CABLE RUNWAY
SCALE: 1/4" = 1'-0"

46 E4.7 TR1K RACK ELEVATION
SCALE: 1/2" = 1'-0"

51 E4.7 A205-TR2A CABLE RUNWAY
SCALE: 1/4" = 1'-0"

52 E4.7 A205-TR2A LARGE-SCALE
SCALE: 1/4" = 1'-0"

53 E4.7 TR2A RACK ELEVATION
SCALE: 1/2" = 1'-0"

54 E4.7 B223-TR2B CABLE RUNWAY
SCALE: 1/4" = 1'-0"

55 E4.7 B223-TR2B LARGE-SCALE
SCALE: 1/4" = 1'-0"

56 E4.7 TR2B RACK ELEVATIONS
SCALE: 1/2" = 1'-0"

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Engineering
Planning
Interiors

DLR Group Project No: 10-13113-00

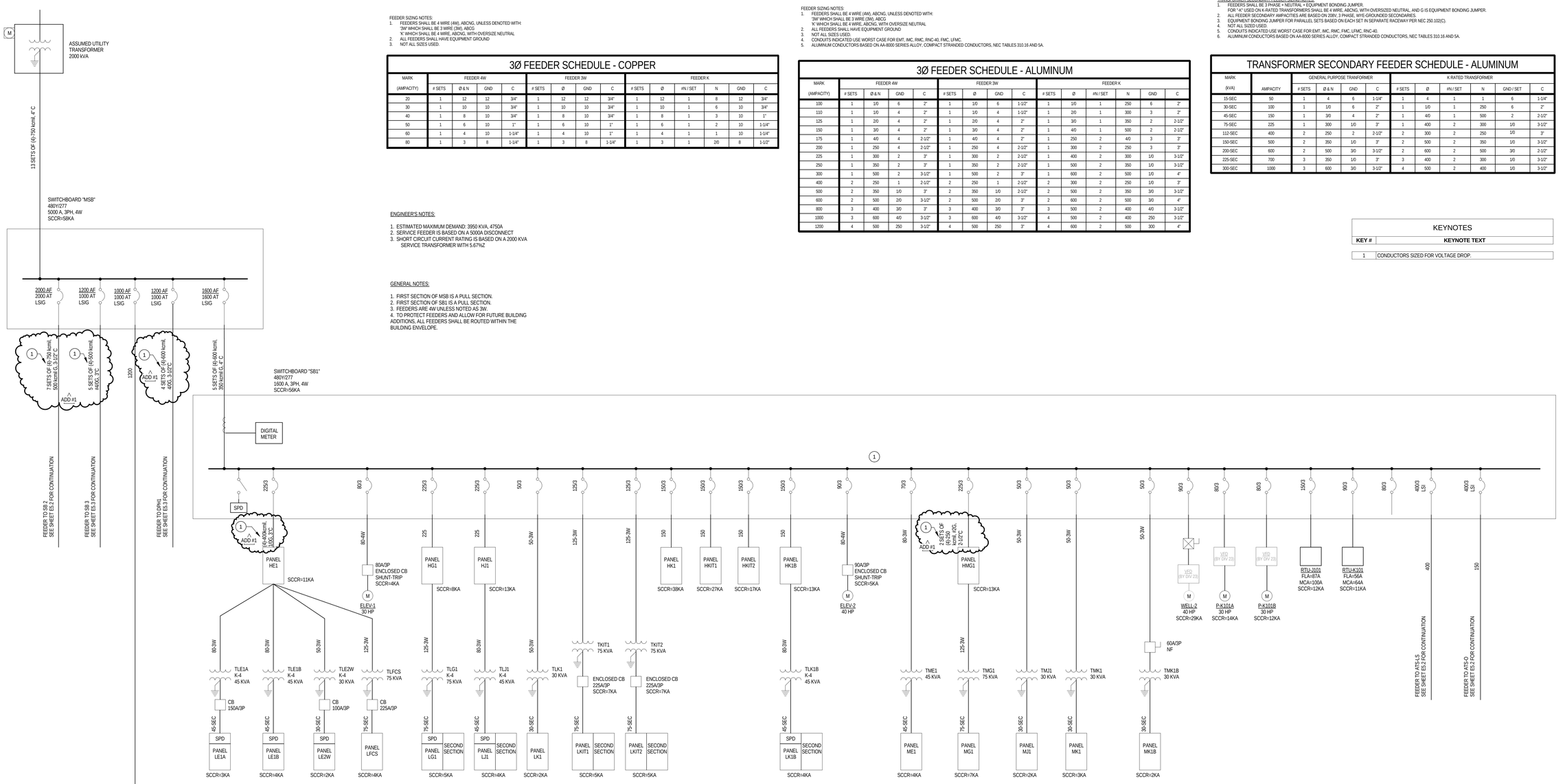
Kearney Public Schools
New Kearney High School
Kearney, Nebraska

Revision/Issue	Date
ADD #1 Addendum No. 1	10/7/2014

LARGE-SCALE SPECIAL SYSTEMS PLANS

ProjectNumber: 1355
Date: September 30, 2014

Sheet Number:
E4.7



FEEDER SIZING NOTES:
1. FEEDERS SHALL BE 4 WIRE (4W), ABCNG, UNLESS DENOTED WITH:
   '3W' WHICH SHALL BE 3 WIRE (3W), ABCG
   'K' WHICH SHALL BE 4 WIRE, ABCNG, WITH OVERSIZE NEUTRAL
2. ALL FEEDERS SHALL HAVE EQUIPMENT GROUND
3. NOT ALL SIZES USED.

3Ø FEEDER SCHEDULE - COPPER

MARK	FEEDER 4W				FEEDER 3W				FEEDER K					
(AMPACITY)	# SETS	Ø & N	GND	C	# SETS	Ø	GND	C	# SETS	Ø	#N / SET	N	GND	C
20	1	12	12	3/4"	1	12	12	3/4"	1	12	1	8	12	3/4"
30	1	10	10	3/4"	1	10	10	3/4"	1	10	1	6	10	3/4"
40	1	8	10	3/4"	1	8	10	3/4"	1	8	1	3	10	1"
50	1	6	10	1"	1	6	10	1"	1	6	1	2	10	1-1/4"
60	1	4	10	1-1/4"	1	4	10	1"	1	4	1	1	10	1-1/4"
80	1	3	8	1-1/4"	1	3	8	1-1/4"	1	3	1	2/0	8	1-1/2"

ENGINEER'S NOTES:

1. ESTIMATED MAXIMUM DEMAND: 3950 KVA, 4750A
2. SERVICE FEEDER IS BASED ON A 5000A DISCONNECT
3. SHORT CIRCUIT CURRENT RATING IS BASED ON A 2000 KVA SERVICE TRANSFORMER WITH 5.67%Z

GENERAL NOTES:

1. FIRST SECTION OF MSB IS A PULL SECTION.
2. FIRST SECTION OF SB1 IS A PULL SECTION.
3. FEEDERS ARE 4W UNLESS NOTED AS 3W.
4. TO PROTECT FEEDERS AND ALLOW FOR FUTURE BUILDING ADDITIONS, ALL FEEDERS SHALL BE ROUTED WITHIN THE BUILDING ENVELOPE.

FEEDER SIZING NOTES:
1. FEEDERS SHALL BE 4 WIRE (4W), ABCNG, UNLESS DENOTED WITH:
   '3W' WHICH SHALL BE 3 WIRE (3W), ABCG
   'K' WHICH SHALL BE 4 WIRE, ABCNG, WITH OVERSIZE NEUTRAL
2. ALL FEEDERS SHALL HAVE EQUIPMENT GROUND
3. NOT ALL SIZES USED.
4. CONDUITS INDICATED USE WORST CASE FOR EMT, IMC, RMC, RNC-40, FMC, LFMC.
5. ALUMINUM CONDUCTORS BASED ON AA-8000 SERIES ALLOY, COMPACT STRANDED CONDUCTORS, NEC TABLES 310.16 AND 5A.

3Ø FEEDER SCHEDULE - ALUMINUM

MARK	FEEDER 4W				FEEDER 3W				FEEDER K					
(AMPACITY)	# SETS	Ø & N	GND	C	# SETS	Ø	GND	C	# SETS	Ø	#N / SET	N	GND	C
100	1	1/0	6	2"	1	1/0	6	1-1/2"	1	1/0	1	250	6	2"
110	1	1/0	4	2"	1	1/0	4	1-1/2"	1	2/0	1	300	3	2"
125	1	2/0	4	2"	1	2/0	4	2"	1	3/0	1	350	2	2-1/2"
150	1	3/0	4	2"	1	3/0	4	2"	1	4/0	1	500	2	2-1/2"
175	1	4/0	4	2-1/2"	1	4/0	4	2"	1	250	2	4/0	3	3"
200	1	250	4	2-1/2"	1	250	4	2-1/2"	1	300	2	250	3	3"
225	1	300	2	3"	1	300	2	2-1/2"	1	400	2	300	1/0	3-1/2"
250	1	350	2	3"	1	350	2	2-1/2"	1	500	2	350	1/0	3-1/2"
300	1	500	2	3-1/2"	1	500	2	3"	1	600	2	500	1/0	4"
400	2	250	1	2-1/2"	2	250	1	2-1/2"	2	300	2	250	1/0	3"
500	2	350	1/0	3"	2	350	1/0	3-1/2"	2	500	2	350	3/0	3-1/2"
600	2	500	2/0	3-1/2"	2	500	2/0	3"	2	600	2	500	3/0	4"
800	3	400	3/0	3"	3	400	3/0	3"	3	500	2	400	4/0	3-1/2"
1000	3	600	4/0	3-1/2"	3	600	4/0	3-1/2"	4	500	2	400	250	3-1/2"
1200	4	500	250	3-1/2"	4	500	250	3"	4	600	2	500	300	4"

TRANSFORMER SECONDARY FEEDER SIZING NOTES:
1. FEEDERS SHALL BE 3 PHASE + NEUTRAL + EQUIPMENT BONDING JUMPER.
   FOR "K" USED ON K-RATED TRANSFORMERS SHALL BE 4 WIRE, ABCNG, WITH OVERSIZED NEUTRAL, AND G IS EQUIPMENT BONDING JUMPER.
2. ALL FEEDER SECONDARY AMPACITIES ARE BASED ON 208V, 3 PHASE, WYE-GROUNDED SECONDARIES.
3. EQUIPMENT BONDING JUMPER FOR PARALLEL SETS BASED ON EACH SET IN SEPARATE RACEWAY PER NEC 250.102(C).
4. NOT ALL SIZED USED.
5. CONDUITS INDICATED USE WORST CASE FOR EMT, IMC, RMC, FMC, LFMC, RNC-40.
6. ALUMINUM CONDUCTORS BASED ON AA-8000 SERIES ALLOY, COMPACT STRANDED CONDUCTORS, NEC TABLES 310.16 AND 5A.

TRANSFORMER SECONDARY FEEDER SCHEDULE - ALUMINUM

MARK		GENERAL PURPOSE TRANFORMER				K RATED TRANSFORMER							
(kVA)	AMPACITY	# SETS	Ø & N	GND	C	# SETS	Ø	#N / SET	N	GND / SET	C
15-SEC	50	1	4	6	1-1/4"	1	4	1	1	6	1-1/4"
30-SEC	100	1	1/0	6	2"	1	1/0	1	250	6	2"
45-SEC	150	1	3/0	4	2"	1	4/0	1	500	2	2-1/2"
75-SEC	225	1	300	1/0	3"	1	400	2	300	1/0	3-1/2"
112-SEC	400	2	250	2	2-1/2"	2	300	2	250	1/0	3"
150-SEC	500	2	350	1/0	3"	2	500	2	350	1/0	3-1/2"
200-SEC	600	2	500	3/0	3-1/2"	2	600	2	500	3/0	2-1/2"
225-SEC	700	3	350	1/0	3"	3	400	2	300	1/0	3-1/2"
300-SEC	1000	3	600	3/0	3-1/2"	4	500	2	400	1/0	3-1/2"

KEYNOTES

KEY #	KEYNOTE TEXT
1	CONDUCTORS SIZED FOR VOLTAGE DROP.

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DLR Group Project No: 10-13113-00

Kearney Public Schools
New Kearney High School
Kearney, Nebraska

Revision/Issue		Date
ADD #1	Addendum No. 1	10/7/2014

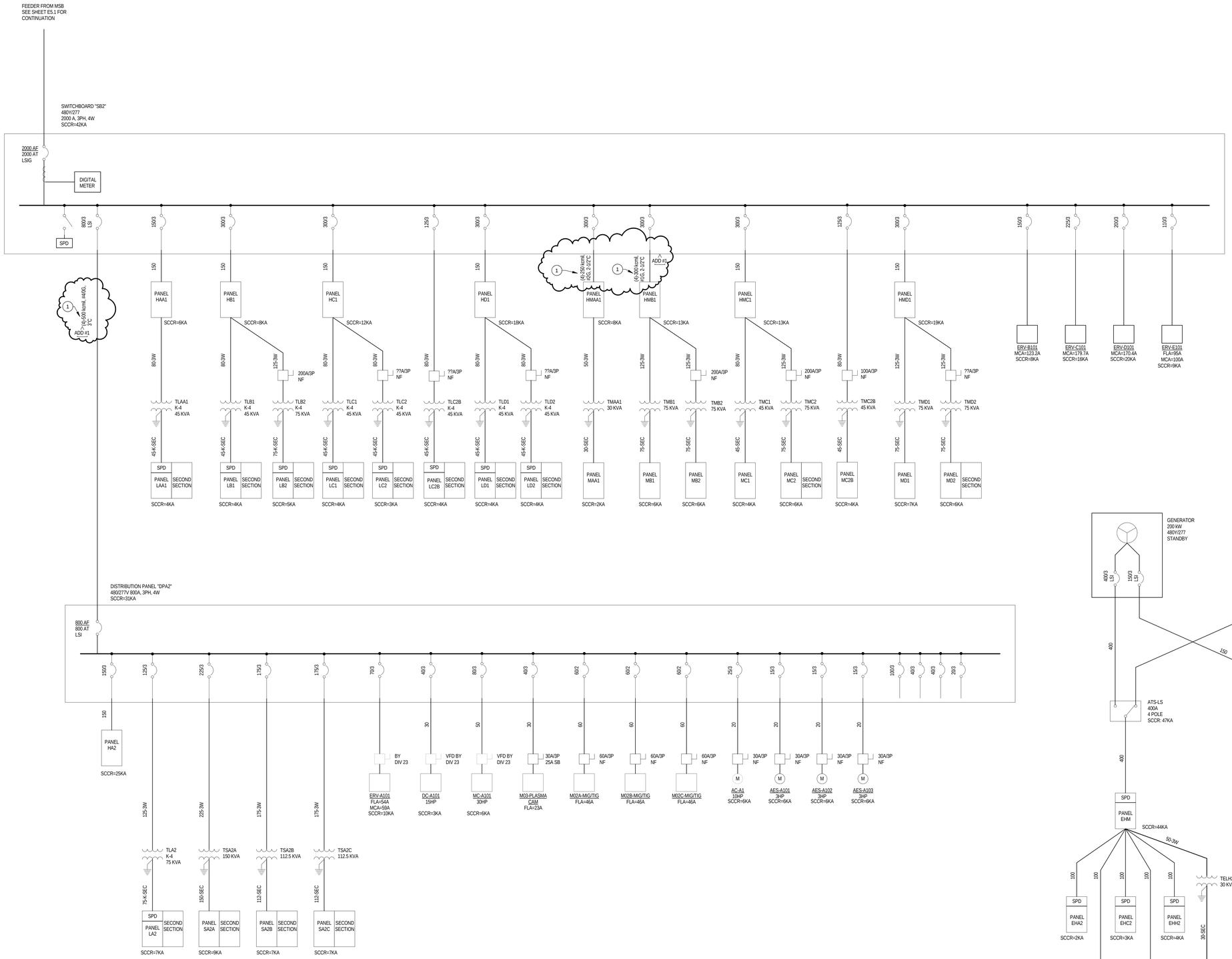
ELECTRICAL ONE-LINE DIAGRAM

ProjectNumber: **1355**
Date: **September 30, 2014**

Sheet Number:
E5.1

KEYNOTES

KEY #	KEYNOTE TEXT
1	CONDUCTORS SIZED FOR VOLTAGE DROP.



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Kearney Public Schools
New Kearney High School
Kearney, Nebraska

Revision/Issue		Date
ADD #1	Addendum No. 1	10/7/2014

ELECTRICAL ONE-LINE DIAGRAM

ProjectNumber: **1355**
Date: **September 30, 2014**

Sheet Number:

E5.2

C		POLES	BKR TRIP	CIRCUIT DESCRIPTION	CKT
		2	40 A	DRYER-F118 SPECIAL NEEDS	2
		--	--	--	4
440 VA	780 VA	2	15 A	HAND DRYER-F112T	6
		--	--	--	8
		2	15 A	HAND DRYER-F113T	10
080 VA	780 VA	--	--	--	12
		1	20 A	RECEPT-F114 TEEN NET, F110 COTS	14
		1	20 A	RECEPT-F111 SUPPLY, F109 EXAM	16
500 VA	360 VA	1	20 A	EWC-F205C CORRIDOR**	18
		1	20 A	RECEPT-COPIER F209	20
		1	20 A	RECEPT-F209 REGISTRAR	22
260 VA	200 VA	1	20 A	DCP-F213 RECORDS	24
		1	20 A	RECEPT-F211 TEAMMATES	26
		1	20 A	RECEPT-F215 CAREER CENTER	28
440 VA	360 VA	1	20 A	RECEPT-F112 COMM WALL	30
		1	30 A	UPS-COMM E112 #1	32
		1	30 A	UPS-COMM E112 #2 ADD #1	34
000 VA	1000 VA	1	20 A	SPARE	36
		1	20 A	SPARE	38
		1	20 A	SPARE	40
000 VA	1000 VA	1	20 A	SPARE	42
12200 VA					
102 A					

STIMATED DEMAND	PANEL TOTALS	
15500 VA		
13140 VA	**CONNECTED LOAD:**	43140 VA
450 VA	**ESTIMATED DEMAND:**	29090 VA
	CONNECTED CURRENT:	120 A
	EMD CURRENT:	81 A

Attachment No. E7.10-1
to ADDENDUM NO. 1
Dated: OCT 7, 2014

Wilkins Hinrichs Stober Architects, L.L.C.

DLR Group
Architecture Engineering Planning Interiors

DLR Project # 10-13113-00

Kearney Public Schools
New Kearney High School

Project Number: 1355