ADDENDUM
NO. 1

June 22, 2020

Zionsville New Elementary School
4400 S. 875 East
Zionsville, IN 46077

TO: ALL BIDDERS OF RECORD

This Addendum forms a part of and modifies the Bidding Requirements, Contract Forms, Contract Conditions, the Specifications and the Drawings dated June 5, 2020, by Fanning Howey Associates, Inc. Acknowledge receipt of the Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to disqualification.

This Addendum consists of Pages ADD 1-1 through ADD 1-3, Project Guideline Schedule, New Drawing Sheets: R-001, R-002 and R-003, and attached Fanning Howey Associates, Inc. Addendum No. 1, consisting of 5 pages and 23 items, New Drawing Sheets: A8.09, M5.07, M5.08, M5.09 and Revised Drawing Sheets: Index A, Index B, Survey Sheets 17, 18, 23, 24, 25, 26, 37, 38, G1.1, G2.1, G3.1, G4.4, SU3.2, SU6.1, L1.2, A0.01, A1.19, A5.02, A5.03, A5.04, A5.05, A5.08, A6S.01, A7.01, A7.02, A7.03, A7.04, A7.05, A7.11, A7S.01, A8.01, A8.02, A8.03, A8.04, A8.05, A8.07, A8.08, A8S.01, P2.1, P2.2, P2.3, P2.4, P2.5, P2.6, P2.7, P2.8, P2.9, P2.10, P3.1, P3.2, P4.1, P4.2, P4.3, P4.4, P4.5, P4.6, P4.7, M3.02, M3.05, M4.01, M4.02, M4.03, M5.04, M5.05, M5.06, M6.01, M6.02, M6.03, M6.04, E2.01, E2.02, E3.01, E3.02, E4.01, E4.02, E4.04, E4.06, E5.01, E5.02, E5.03, E5.04, E5.06, E5.07, E5.08, E6.02, E6.04, E8.01, E8.02, E8.03, E8.04, E8.05, T2.01, T3.01 and T3.02.

PROJECT MANUAL *(all locations)*

A. **REPLACE** ALL references to Specification Section "11 68 33 Athletic Field Equipment" in the Contract Documents with Specification Section "11 68 13 Playground Equipment and Structures."

B. **AMEND** ALL references to Facility Natural Gas Piping Specification Section "22 11 22" in the Contract Documents dated June 5, 2020 with Specification Section No. "23 11 23".

SPECIFICATION SECTION 00 20 00 – INFORMATION AVAILABLE TO BIDDERS

A. **INSERT** the following:
   J. Site Logistics Plan (R-001) is included within R Series Drawings within the Contract Documents. Site access shall be at the locations approved by the

Construction Manager. Contractors shall coordinate laydown areas, parking areas, trailer locations, and other site logistics with the Construction Manager. The Contractor shall not park, unload materials, or stage materials in "clearance areas" to allow for access/egress from site.

K. Pre-Bid Meeting is available through video and telephone conferencing:
Join Microsoft Teams Meeting *(hyperlinked for access to video conference)*
+1 317-762-3960 United States, Indianapolis (Toll)
Conference ID: 117 758 348#

L. Bid Opening is available through video and telephone conferencing:
Join Microsoft Teams Meeting *(hyperlinked for access to video conference)*
+1 317-762-3960 United States, Indianapolis (Toll)
Conference ID: 740 980 328#

SPECIFICATION SECTION 01 12 00 – MULTIPLE CONTRACT SUMMARY

A. **INSERT** Specification "Section 01 45 23.13 Concrete Floor Moisture Content and pH Testing" under Part 3, 3.03 Bid Categories, A. Bid Category No. 1 – General Trades".

B. **DELETE** Specification "Section 08 16 13 Fiberglass Doors" under Part 3, 3.03 Bid Categories, A. Bid Category No. 1 – General Trades".

C. **INSERT** Specification "Section 09 05 61.13 Moisture Vapor Emission Control" under Part 3, 3.03 Bid Categories, A. Bid Category No. 1 – General Trades".

D. **INSERT** Specification "Section 11 68 13 Playground Equipment and Structures`1" under Part 3, 3.03 Bid Categories, A. Bid Category No. 1 – General Trades".

E. **AMEND** Part 3, 3.03 Bid Categories, A. Bid Category No. 1 – General Trades", Bid Category No. 1 Clarifications, 19.:
   19. Section 10 11 00 framed or unframed visual display board **assemblies** shall be provided by the General Trades Contractor. Section 10 11 00 visual display **surfaces** shall be provided by the Painting Contractor.

F. **INSERT** the following clarifications under Part 3, 3.03 Bid Categories, A. Bid Category No. 1 – General Trades", Bid Category No. 1 Clarifications:
   26. Drainage course and aggregate base course under playground surfaces are responsibility of the General Trades Contractor.
   27. The General Trades Contractor shall provide landscaping improvements and furnishings including, but not limited to, planting preparation procedures, transplanting as noted, planting soils stabilization, turfs and grasses, mulch, brick dust, athletic field specialties, seeding, plants, and planting accessories such as edging, timbers, planters, tree grates, grids, and the like.

G. **AMEND** Part 3, 3.03 Bid Categories, C. Bid Category No. 3 – Masonry", Bid Category No. 3 Clarifications, 7.:
   7. Miscellaneous metal clips, anchors, supports, […]. This clarification is to address Work not specifically outlined in Division 4 Specifications, assigned to the

Masonry Contractor, or Division 5 Specifications, assigned to the Structural Steel Contractor.

H. **AMEND** Part 3, 3.03 Bid Categories, D. Bid Category No. 4 – Structural Steel", Bid Category No. 4 Clarifications, 6.:

6. Miscellaneous metal clips, anchors, supports, […]. This clarification is to address Work not specifically outlined in Division 4 Specifications, assigned to the Masonry Contractor, or Division 5 Specifications, assigned to the Structural Steel Contractor.

I. **INSERT** Specification "Section 08 16 13 Fiberglass Doors" under Part 3, 3.03 Bid Categories, G. Bid Category No. 7 – Window Systems, Glass & Glazing".

J. **AMEND** Part 3, 3.03 Bid Categories, J. Bid Category No. 10 – Painting & Wallcovering", Bid Category No. 10 Clarifications, 2.:

2. Section 10 11 00 framed or unframed visual display board **assemblies** shall be provided by the General Trades Contractor. Section 10 11 00 visual display **surfaces** shall be provided by the Painting Contractor.

K. **INSERT** the following clarification Part 3, 3.03 Bid Categories, J. Bid Category No. 10 – Painting & Wallcovering", Bid Category No. 10 Clarifications:

5. Unless otherwise noted, paint edges (vertical surfaces and 2" on t.o.c. surface) of equipment pads in mechanical rooms and mezzanines with high visibility yellow paint.

L. **AMEND** Part 3, 3.03 Bid Categories, N. Bid Category No. 14 – Mechanical: Plumbing & HVAC", Bid Category No. 14 Clarifications, 1., to include references to "SM" – "Sheetmetal Contractor" Work as indicated in the Contract documents to be part of this bid category.

M. **AMEND** Part 3, 3.03 Bid Categories, O. Bid Category No. 15 – Electrical, Communications, Safety & Security", Bid Category No. 15 Clarifications, 1., to include references to "TC" – "Technology Contractor" Work as indicated in the Contract documents to be part of this bid category.

SPECIFICATION SECTION 01 32 00 – SCHEDULES AND REPORTS

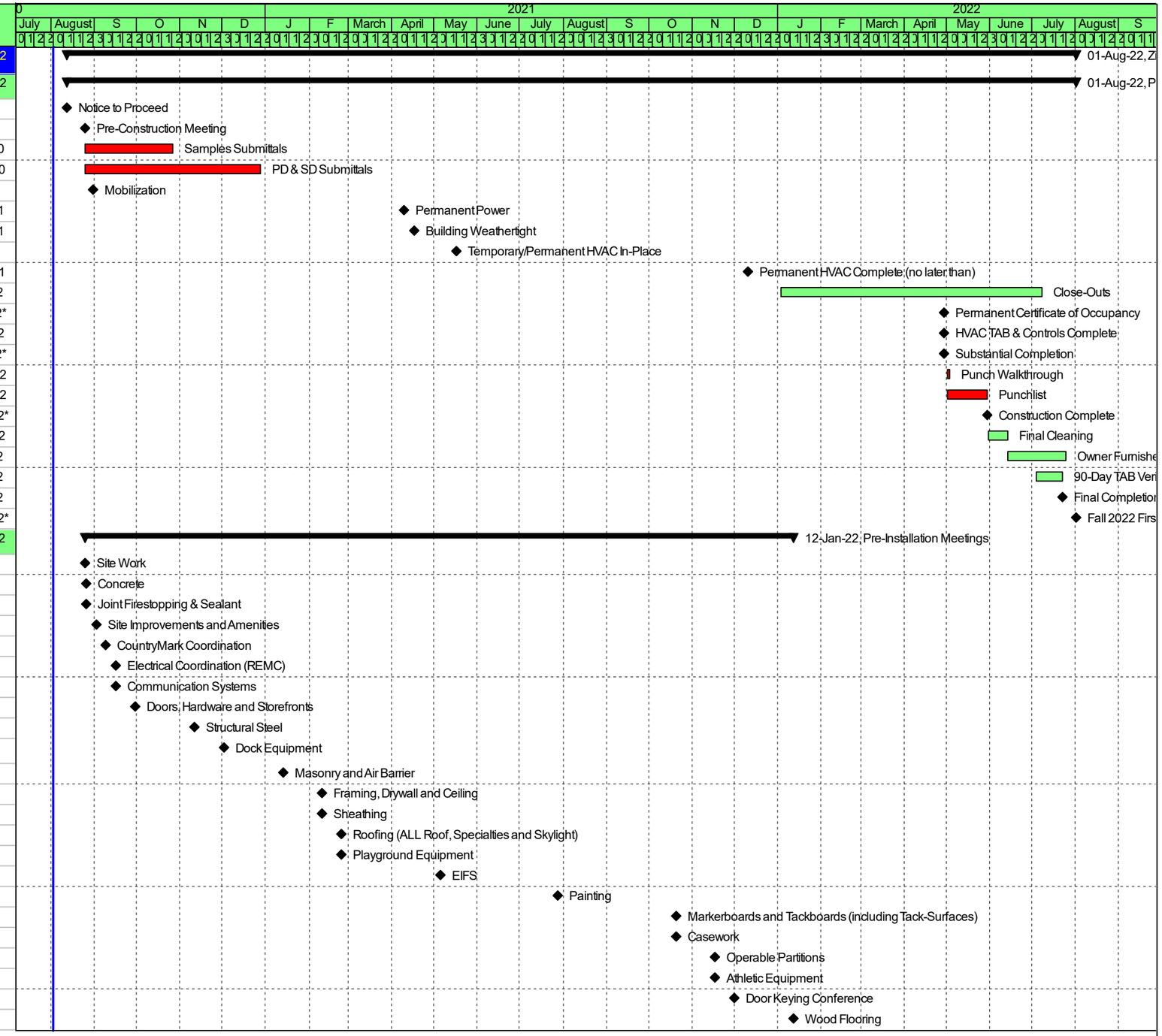
A. **INSERT** Guideline Schedule, Construction Site Phasing Plan, and Interior Buildout Plan within Part 1, 1.03 Guideline Schedule, A.:

3. Zionsville New Elementary School Project Guideline Schedule dated June 19, 2020 attached (3 pages).
4. Drawing R-002 Construction Site Phasing Plan dated June 12, 2020.
5. Drawing R-003 Interior Buildout Plan dated June 12, 2020.

B. **INSERT** "Building Weathertight" Project Milestone within Part 1, 1.03 Guideline Schedule, B., bullet list item:

- Building Weathertight: April 16, 2021, or earlier.

Activity ID	Activity Name	Original Duration	Start	Finish
Zionsville New Elementary School		514	12-Aug-20	01-Aug-22
Project Administration		514	12-Aug-20	01-Aug-22
A1010	Notice to Proceed	0	12-Aug-20*	
A1020	Pre-Construction Meeting	0	25-Aug-20*	
A1610	Samples Submittals	45	25-Aug-20	26-Oct-20
A1630	PD & SD Submittals	90	25-Aug-20	28-Dec-20
A1030	Mobilization	0	31-Aug-20*	
A1060	Permanent Power	0		09-Apr-21
A1040	Building Weathertight	0		16-Apr-21
A1050	Temporary/Permanent HVAC In-Place	0	17-May-21*	
A1650	Permanent HVAC Complete (no later than)	0		10-Dec-21
A1620	Close-Outs	135	03-Jan-22*	08-Jul-22
A1070	Permanent Certificate of Occupancy	0		29-Apr-22*
A1570	HVAC TAB & Controls Complete	0		29-Apr-22
A1660	Substantial Completion	0		29-Apr-22*
A1080	Punch Walkthrough	2	02-May-22	03-May-22
A1090	Punchlist	21	02-May-22	30-May-22
A1600	Construction Complete	0		30-May-22*
A1100	Final Cleaning	10	31-May-22	13-Jun-22
A1550	Owner Furnished FF&E / Technology	30	14-Jun-22	25-Jul-22
A1580	90-Day TAB Verification (Including Peak Summer Sea	15	04-Jul-22	22-Jul-22
A1110	Final Completion	0		22-Jul-22
A1590	Fall 2022 First Day of School	0		01-Aug-22*
Pre-Installation Meetings		361	25-Aug-20	12-Jan-22
A1930	Site Work	0	25-Aug-20	
A1700	Concrete	0	26-Aug-20	
A1770	Joint Firestopping & Sealant	0	26-Aug-20	
A1900	Site Improvements and Amenities	0	02-Sep-20	
A1690	CountryMark Coordination	0	09-Sep-20	
A1910	Electrical Coordination (REMC)	0	16-Sep-20	
A1920	Communication Systems	0	16-Sep-20	
A1780	Doors, Hardware and Storefronts	0	30-Sep-20	
A1720	Structural Steel	0	11-Nov-20	
A1860	Dock Equipment	0	02-Dec-20	
A1710	Masonry and Air Barrier	0	13-Jan-21	
A1730	Framing, Drywall and Ceiling	0	10-Feb-21	
A1740	Sheathing	0	10-Feb-21	
A1760	Roofing (ALL Roof, Specialties and Skylight)	0	24-Feb-21	
A1880	Playground Equipment	0	24-Feb-21	
A1750	EIFS	0	05-May-21	
A1830	Painting	0	28-Jul-21	
A1840	Markerboards and Tackboards (including Tack-Surfac	0	20-Oct-21	
A1890	Casework	0	20-Oct-21	
A1850	Operable Partitions	0	17-Nov-21	
A1870	Athletic Equipment	0	17-Nov-21	
A1790	Door Keying Conference	0	01-Dec-21	
A1800	Wood Flooring	0	12-Jan-22	



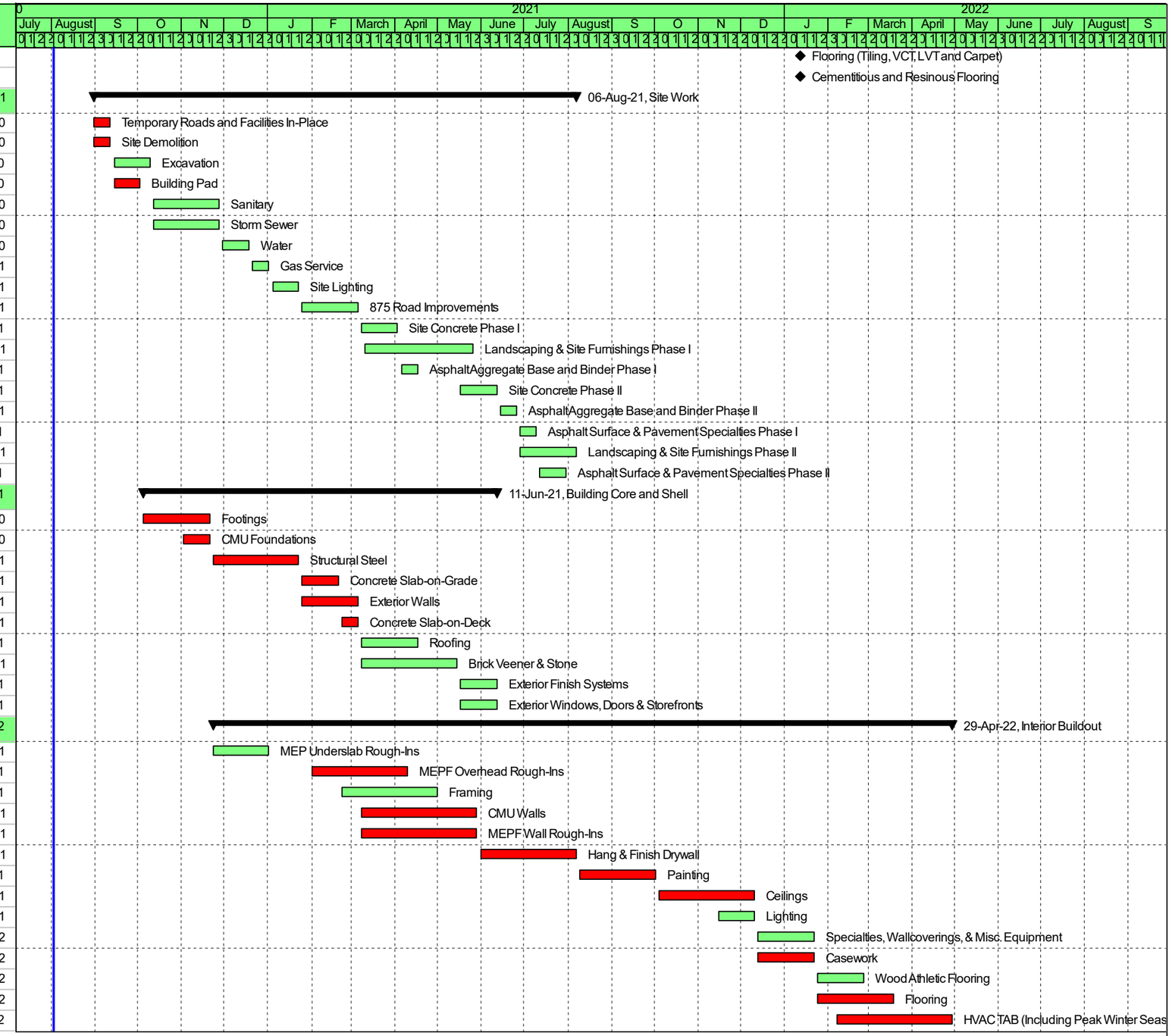
- Actual Work
- Remaining Work
- Critical Remaining Work
- Milestone
- Summary

Zionsville New Elementary School

Project Guideline Schedule 19-Jun-20

SKILLMAN

Activity ID	Activity Name	Original Duration	Start	Finish
A1810	Flooring (Tiling, VCT, LVT and Carpet)	0	12-Jan-22	
A1820	Cementitious and Resinous Flooring	0	12-Jan-22	
Site Work		245	31-Aug-20	06-Aug-21
A1120	Temporary Roads and Facilities In-Place	10	31-Aug-20	11-Sep-20
A1680	Site Demolition	10	31-Aug-20	11-Sep-20
A1130	Excavation	20	14-Sep-20	09-Oct-20
A1140	Building Pad	15	14-Sep-20	02-Oct-20
A1150	Sanitary	35	12-Oct-20	27-Nov-20
A1160	Storm Sewer	35	12-Oct-20	27-Nov-20
A1170	Water	15	30-Nov-20	18-Dec-20
A1370	Gas Service	10	21-Dec-20	01-Jan-21
A1180	Site Lighting	15	04-Jan-21	22-Jan-21
A1560	875 Road Improvements	30	25-Jan-21	05-Mar-21
A1190	Site Concrete Phase I	20	08-Mar-21	02-Apr-21
A1210	Landscaping & Site Furnishings Phase I	55	10-Mar-21*	25-May-21
A1200	AsphaltAggregate Base and Binder Phase I	10	05-Apr-21	16-Apr-21
A1230	Site Concrete Phase II	20	17-May-21	11-Jun-21
A1240	AsphaltAggregate Base and Binder Phase II	10	14-Jun-21	25-Jun-21
A1220	Asphalt Surface & Pavement Specialties Phase I	10	28-Jun-21	09-Jul-21
A1250	Landscaping & Site Furnishings Phase II	30	28-Jun-21*	06-Aug-21
A1260	Asphalt Surface & Pavement Specialties Phase II	15	12-Jul-21	30-Jul-21
Building Core and Shell		180	05-Oct-20	11-Jun-21
A1270	Footings	35	05-Oct-20	20-Nov-20
A1280	CMU Foundations	15	02-Nov-20	20-Nov-20
A1290	Structural Steel	45	23-Nov-20	22-Jan-21
A1300	Concrete Slab-on-Grade	20	25-Jan-21	19-Feb-21
A1310	Exterior Walls	30	25-Jan-21	05-Mar-21
A1320	Concrete Slab-on-Deck	10	22-Feb-21	05-Mar-21
A1330	Roofing	30	08-Mar-21	16-Apr-21
A1350	Brick Veener & Stone	50	08-Mar-21	14-May-21
A1340	Exterior Finish Systems	20	17-May-21	11-Jun-21
A1360	Exterior Windows, Doors & Storefronts	20	17-May-21	11-Jun-21
Interior Buildout		375	23-Nov-20	29-Apr-22
A1380	MEP Underslab Rough-Ins	30	23-Nov-20	01-Jan-21
A1390	MEPF Overhead Rough-Ins	50	01-Feb-21	09-Apr-21
A1400	Framing	50	22-Feb-21	30-Apr-21
A1410	CMU Walls	60	08-Mar-21	28-May-21
A1420	MEPF Wall Rough-Ins	60	08-Mar-21	28-May-21
A1430	Hang & Finish Drywall	50	31-May-21	06-Aug-21
A1440	Painting	40	09-Aug-21	01-Oct-21
A1450	Ceilings	50	04-Oct-21	10-Dec-21
A1520	Lighting	20	15-Nov-21	10-Dec-21
A1460	Specialties, Wallcoverings, & Misc. Equipment	30	13-Dec-21	21-Jan-22
A1470	Casework	30	13-Dec-21	21-Jan-22
A1480	Wood Athletic Flooring	25	24-Jan-22	25-Feb-22
A1490	Flooring	40	24-Jan-22	18-Mar-22
A1530	HVAC TAB (Including Peak Winter Season)	60	07-Feb-22	29-Apr-22



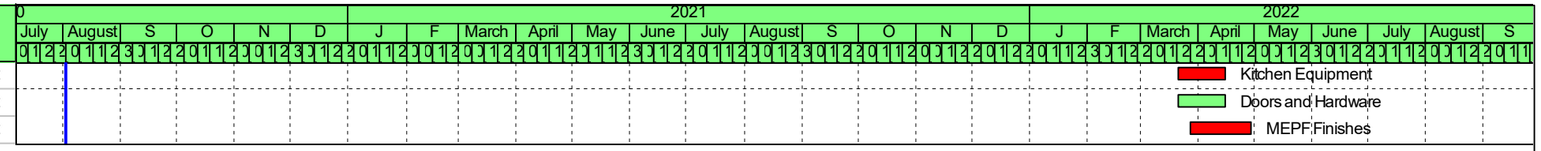
Actual Work
Remaining Work
Critical Remaining Work
Milestone
Summary

Zionsville New Elementary School

Project Guideline Schedule 19-Jun-20

SKILLMAN

Activity ID	Activity Name	Original Duration	Start	Finish
A1510	Kitchen Equipment	20	21-Mar-22	15-Apr-22
A1540	Doors and Hardware	20	21-Mar-22	15-Apr-22
A1500	MEPF Finishes	25	28-Mar-22	29-Apr-22



Actual Work
Remaining Work
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Zionsville New Elementary School

Project Guideline Schedule 19-Jun-20

SKILLMAN

A D D E N D U M N O. 1

New Zionsville Elementary School

Zionsville Community Schools
Zionsville, Indiana

Project No. 219124.00

Index of Contents

Addendum No. 1, 23 items, 5 pages
Revised Project Manual Sections 08 71 06 – Door Hardware Schedule, 11 40 00 Food Service Equipment, and 23 09 93 – HVAC Sequence of Operation
New Drawing Sheets: A8.09, M5.07, M5.08, M5.09,
Revised Drawing Sheets: Index A, Index B, Survey Sheets 17, 18, 23, 24, 25, 26, 37, 38, G1.1, G2.1, G3.1, G4.4, SU3.2, SU6.1, L1.2, A0.01, A1.19, A5.02, A5.03, A5.04, A5.05, A5.08, A6S.01, A7.01, A7.02, A7.03, A7.04, A7.05, A7.11, A7S.01, A8.01, A8.02, A8.03, A8.04, A8.05, A8.07, A8.08, A8S.01, P2.1, P2.2, P2.3, P2.4, P2.5, P2.6, P2.7, P2.8, P2.9, P2.10, P3.1, P3.2, P4.1, P4.2, P4.3, P4.4, P4.5, P4.6, P4.7, M3.02, M3.05, M4.01, M4.02, M4.03, M5.04, M5.05, M5.06, M6.01, M6.02, M6.03, M6.04, E2.01, E2.02, E3.01, E3.02, E4.01, E4.02, E4.04, E4.06, E5.01, E5.02, E5.03, E5.04, E5.06, E5.07, E5.08, E6.02, E6.04, E8.01, E8.02, E8.03, E8.04, E8.05, T2.01, T3.01and T3.02

Date: June 19, 2020

I hereby certify that this Addendum was prepared by me or under my direct supervision and that I am a duly registered Architect/Engineer under the Laws of the State of Indiana.

FANNING/HOWEY ASSOCIATES, INC.
ARCHITECTS/ENGINEERS/CONSULTANTS

Charles R. Tyler, AIA
Indiana Registration No. 4438

TO: ALL BIDDERS OF RECORD

ADDENDUM NO. 1 to Drawings and Project Manual, dated June 5, 2020, for New Zionsville Elementary School, for Zionsville Community Schools, 900 Mulberry Street, Zionsville, Indiana; as prepared by Fanning/Howey Associates, Inc., Indianapolis, Indiana.
This Addendum shall hereby be and become a part of the Contract Documents the same as if originally bound thereto.

The following clarifications, amendments, additions, revisions, changes, and modifications change the original Contract Documents only in the amount and to the extent hereinafter specified in this Addendum.

Each bidder shall acknowledge receipt of this Addendum in his proposal or bid.

NOTE: Bidders are responsible for becoming familiar with every item of this Addendum. (This includes miscellaneous items at the very end of this Addendum.)

RE: ALL BIDDERS

ITEM NO. 1. PROJECT MANUAL, TABLE OF CONTENTS

A. Book 2, Page 00 01 10-3, DIVISION 11: Add Section 11 68 13 – Playground Equipment and Structures.

B. Book 2, Page 00 01 10-3, DIVISION 12: Change title of Section 12 93 00 to "Site Improvements and Amenities".

ITEM NO. 2. REVISED PROJECT MANUAL SECTIONS

A. Sections 08 71 06 – Door Hardware Schedule, 11 40 00 Food Service Equipment, and 23 09 93 – HVAC Sequence of Operation dated 6/19/20, and is included with and hereby made a part of this Addendum.

ITEM NO. 3. PROJECT MANUAL, SECTION 06 20 23 – INTERIOR FINISH CARPENTRY

A. Add 1.2, A., 7., as follows:

"7. Wood Bench assembly."

B. Add 2.3, C., as follows:

"C. Wood Bench Assembly:
1. Wood slat bench components, Red Oak, Custom Grade.
   a. Conceal or provide matching plugs to conceal bench slat anchorage.
2. Bench Support Assembly:
   a. Steel plate, steel pipe/tube, and steel base plate.
   b. Steel pipe/tube shall be Schedule 40.
   c. Plates comply with ASTM A 36
   d. Anchors: Adhesive Anchor Bolts for Concrete, Refer to Division 05, Metal Fabrications.
   e. Finish: Factory Primer."

ITEM NO. 4. PROJECT MANUAL, SECTION 06 41 16 – PLASTIC-LAMINATE-FACED ARCHITECTURAL CABINETS

A. Article 1.2, A., 1: Add "and Wood-Veneer-Faced" between "faced" and "cabinets" at beginning of paragraph.

B. Add 1.6, C., 3., as follows:

"3. Veneer-faced panels products with stain or transparent finish, 8 by 10 inches for each species and cut."

C. Add 2.3, B., 4., as follows:

"4. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde."
a. Wood Species: As indicated on Drawings and List of Finishes."

D. Add 2.9, A., 3., a., as follows:

"a. Provide lumber edge for transparent finish matching wood species and cut on cabinet surfaces, where indicated."

E. Add Article 2.12 as follows:

"2.12. SHOP FINISHING WOOD PANELS AND TRIM.

A. Grade: Provide finishes of same grades as items to be finished.

B. General: Finish wood cabinets at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to end-grain surfaces.

D. Transparent Finish:
1. Finish System: AWI System 11 - Catalyzed polyurethane.
2. Staining: Match A/E's sample.
3. Wash Coat for Stained Finish: Apply wash-coat sealer to woodwork made from closed-grain wood before staining and finishing.
4. Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.
5. Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523."

ITEM NO. 5. <u>PROJECT MANUAL, SECTION 06 61 16 – SOLID SURFACE FABRICATIONS</u>

A. Add 1.2, A., 3., as follows:

"3. Wall cap."

B. Article 2.2, B., 5: Add "<u>and Wall Cap</u>:" after "Windowsills" at beginning of paragraph.

ITEM NO. 6. <u>PROJECT MANUAL, SECTION 08 43 13 – ALUMINUM-FRAMED STOREFRONTS</u>

A. Add 2.9, E., 2., as follows:

"2. Provide curved framing members as required by design configurations."

ITEM NO. 7. PROJECT MANUAL, SECTION 08 63 00 – METAL-FRAMED SKYLIGHTS

A. Add 2.7, D., 1., 2., and 3., as follows:

"1. Rafters and purlins shall be fabricated with aluminum in hollow rectangular sections in configuration required to provide required structural support of unit.
2. Provide rafter at ridge/hip supporting both sections of skylight with dual slope ridge cap. Connection to building structural steel at this location for addition support is acceptable.
3. Rafter and purlin depth and shape shall be the same."

ITEM NO. 8. PROJECT MANUAL, SECTION 08 80 00 - GLAZING

A. Article 2.8, B., 5: At beginning of paragraph within parentheses change terminology to "(Laminated Glazing/Security Glazing)".

B. Delete 2.8, C., 3., in its entirety.

ITEM NO. 9. PROJECT MANUAL, SECTION 10 11 00 – VISUAL DISPLAY UNITS

A. Article 2.5, B: Add "(MW-Markerwall)" after "Panel Assemblies" at beginning of paragraph.

ITEM NO. 10. PROJECT MANUAL, SECTION 11 61 43 – STAGE CURTAINS

A. Article 2.2, A: Delete "or chemically flame resistant by immersion treatment" from first sentence.

B. Replace 2.2, B., 1., a., as follows:

"a. Heavyweight: Fabric weighing not less than 20 ounces per linear yard. Velour fabrics shall be rated as inherently flameproof.
1) 26 ounce "Prestige" velour by KM Mills, Greenville, SC.
2) 22 ounce "Encore" velour by Milliken & Co., Spartanburg, SC.
3) 20 ounce "Crescent" velour by Rose Brand, Secaucus, NJ."
4) 22 ounce "Prism" velour by Krieger

C. Delete 2.2 C., in its entirety.

D. Replace 2.2, D., as follows:

"D. Woven Cotton Velour: Napped fabric 100 percent cotton; 54-inch minimum width.
1. Light Weight: Fabric weighing not less than 13 ounces per linear yard. Velour fabrics shall be rated as inherently flameproof.
a. 13.2 ounce "Plateau" velour by KM Mills, Greenville, SC.
b. 22 ounce "Encore" velour by Milliken & Co., Spartanburg, SC
c. 16 ounce "Volcano" velour by J.B. Martin, Quebec.
d. 14 ounce "Prism" by Krieger.
2. Colors: Refer to Division 09 Section "List of Finishes".
3. Location: Boarder and side curtains."

ITEM NO. 11. PROJECT MANUAL, SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

A. Delete 1.2, A., 2., in its entirety.

ITEM NO. 12. PROJECT MANUAL, SECTION 26 05 33 – CONDUITS AND BOXES FOR ELECTRICAL SYSTEMS

A. Change 2.1, F., 3., “Compression type”, to read, “Set screw type”.

ITEM NO. 13. PROJECT MANUAL, SECTION 26 22 00 – LOW-VOLTAGE TRANSFORMERS

A. Delete 1.2, A., 1., in its entirety.

B. Delete 1.2, A., 2., in its entirety.

ITEM NO. 14. PROJECT MANUAL, SECTION 26 24 13 - SWITCHBOARDS

A. Delete 2.2, B., in its entirety.

ITEM NO. 15. PROJECT MANUAL, SECTION 26 32 13 – ENGINE GENERATORS

A. Change 1.2, A., 1., “[Gas][Diesel]”, to read, “Gas”.

ITEM NO. 16. PROJECT MANUAL, SECTION 26 51 00 – INTERIOR LIGHTING

A. Delete 2.8, in its entirety.

ITEM NO. 17. PROJECT MANUAL, SECTION 28 31 11 – DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

A. Add 2.1, A., 6., as follows:

“6. SimplexGrinnell.

B. Change 2.11, B., “if Ethernet”, to read, “IP Ethernet”.

ITEM NO. 18. PROJECT MANUAL, SECTION 32 31 13 – CHAIN LINK FENCES AND GATES

A. Add Article 2.7 as follows:

“2.7 TRAFFIC CONTROL GATE

A. New traffic control gates as indicated on drawings.”

B. Add Article 2.8 as follows:

“2.8 MECHANICAL/ELECTRICAL YARD GATE AND PEDESTRIAN GATE

A. New mechanical/electrical yard/pedestrian gates as indicated on drawings.”

C. Add Article 2.9 as follows:

“2.9 PRIVACY SLATS

A. Tubular Polyethylene Slats: Minimum 0.023-inch-thick tubular polyethylene, manufactured for chain-link fences from virgin polyethylene with UV inhibitor, sized to fit mesh specified for direction indicated, with fins for increased privacy factor.

1. Color: As selected by Architect from manufacturer's full range”

D. Add Article 3.1, M as follows:

"M. Install traffic control gates in strict accordance with manufacturer's recommendations and as indicated."

E. Add Article 3.1, N as follows:

"N. Install mechanical/electrical yard gates and pedestrian in strict accordance with manufacturer's recommendations and as indicated."

F. Add Article 3.1, O as follows:

"O. Install privacy slats accordance with manufacturer's recommendations and as indicated."

ITEM NO. 19. ACCEPTABLE MANUFACTURERS

The following manufacturers are to be considered acceptable manufacturers (suppliers and fabricators) for the Sections of the Specifications listed. Listed manufacturers are required to bid on products equal in type and design, size, function, and quality to that originally specified. Final decision as to equality of products specified versus those proposed shall be made by the Architect.

Section 32 31 13 – Chain Link Fences and Gates
- Basteel Perimeter Systems, Frankfort, Indiana (Traffic Control Gate, Mechanical/Electrical yard Gates)

ITEM NO. 20. NEW DRAWING SHEETS

A. New Drawing Sheets No: A8.09, M5.07, M5.08, M5.09, dated 6/19/2020, are included with and hereby made a part of this Addendum.

ITEM NO. 21. REVISED DRAWING SHEETS

A. Drawing Sheets: Index A, Index B, Survey Sheets 17, 18, 23, 24, 25, 26, 37, 38, G1.1, G2.1, G3.1, G4.4, SU3.2, SU6.1, L1.2, A0.01, A1.19, A5.02, A5.03, A5.04, A5.05, A5.08, A6S.01, A7.01, A7.02, A7.03, A7.04, A7.05, A7.11, A7S.01, A8.01, A8.02, A8.03, A8.04, A8.05, A8.07, A8.08, A8S.01, P2.1, P2.2, P2.3, P2.4, P2.5, P2.6, P2.7, P2.8, P2.9, P2.10, P3.1, P3.2, P4.1, P4.2, P4.3, P4.4, P4.5, P4.6, P4.7, M3.02, M3.05, M4.01, M4.02, M4.03, M5.04, M5.05, M5.06, M6.01, M6.02, M6.03, M6.04, E2.01, E2.02, E3.01, E3.02, E4.01, E4.02, E4.04, E4.06, E5.01, E5.02, E5.03, E5.04, E5.06, E5.07, E5.08, E6.02, E6.04, E8.01, E8.02, E8.03, E8.04, E8.05, T2.01, T3.01and T3.02 have been revised, dated 6/19/20 and are included with and hereby made a part of this Addendum. These Drawings supersede the original documents.

ITEM NO. 22. DRAWING SHEET: G4.0

A. Delete Detail G-G4.0 in its entirety.

ITEM NO. 23. DRAWING SHEET: A6.02

A. Frame Elevation G: Add the following note to this elevation.

"Special insulating glass unit with laminated glass interior lite with translucent film"

END OF ADDENDUM

SECTION 08 71 06 – DOOR HARDWARE SCHEDULE

PART 1 - PRODUCTS

1.1 SCHEDULED DOOR HARDWARE

A. Refer to "PART 3 – EXECUTION" for required specification sections.

PART 2 -

1. OT - Other
2. MK - McKinney
3. PE - Pemko
4. RO - Rockwood
5. SA - SARGENT
6. DE - Detex Corporation
7. BE - dormakaba Best
8. RF - Rixson
9. NO - Norton
10. SU - Securitron

Hardware Sets

Set: 1.0

Doors: B124B, C109, D108, E118

2	Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE	
1	Keyed Removable Mullion (Alum)	L980A	US28	SA	
1	Rim Exit Device (NL, RX, ELR, CD)	16 43 55 56 8804 Less Pull (Cyl. Dogging)	US32D	SA	□
1	Rim Exit Device (EO, RX, CD)	16 43 55 8810 EO (Cyl. Dogging)	US32D	SA	□
2	SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA	
1	SFIC Rim Cylinder Housing	Tail as required	US32D	SA	
3	SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE	
1	Removable Mullion Cylinder Kit	70 980C1	US26D	SA	
2	Pull	RM3131-24 Mtg-Type 12HD	US32D	RO	
2	Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA	

2 Blade Stop Spacer Kit	581-1 or 2 (as required)	EN	SA	
2 Drop Plate	351D	EN	SA	
1 Threshold	2005AV ES14L		PE	
2 Sweep	3452AV		PE	
2 Door Wire Harness	QC-C**** (length / type as required)		MK	
2 ElectroLynx Harness	QC-C3000P		MK	
1 Card Reader	By Security Supplier			
1 Power Supply	AQD (Size and Options as required)		SU	
2 Door Position Switch	By Security Supplier		OT	
1 Wiring Diagram	Elevation and Point to Point as Specified		OT	

Notes: * Weatherstrip supplied with aluminum frame & door.
* Card Reader supplied by the owner.
* Coordinate all wiring & conduit with the electrical contractor.
* Door contacts monitor the position of the doors and reports status to the security system.
* Mode of Operation:
Day / Unsecure Mode: The exit device can be manually dogged down (push/pull mode). The door can be manually pulled or pushed open.

Night / Secure Mode: When the correct credential is presented to the card reader the exit device latch will release and door can be manually pulled open. Authorized mechanical key entry is allowed at all times. Manual egress is allowed at all times.

Set: 2.0

Doors: A101A, A102A, B101B, B128

2 Continuous Hinge	CFM_SLF-HD1 QC (# of Wires and Size as Required)		PE	
1 Keyed Removable Mullion (Alum)	L980A	US28	SA	
1 Rim Exit Device (NL, RX, ELR, CD)	16 43 55 56 8804 Less Pull (Cyl. Dogging)	US32D	SA	
1 Rim Exit Device (EO, RX, ELR, CD)	16 43 55 56 70 8810 EO (Cyl. Dogging)	US32D	SA	
3 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA	
1 SFIC Rim Cylinder Housing	Tail as required	US32D	SA	
4 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE	
1 Removable Mullion Cylinder Kit	70 980C1	US26D	SA	
2 Pull	RM3131-24 Mtg-Type 12HD	US32D	RO	
2 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA	
2 Blade Stop Spacer Kit	581-1 or 2 (as required)	EN	SA	

2 Drop Plate	351D	EN	SA	
2 Door Wire Harness	QC-C**** (length / type as required)		MK	☐
2 ElectroLynx Harness	QC-C3000P		MK	☐
1 Power Supply	AQD (Size and Options as required)		SU	☐
2 Door Position Switch	By Security Supplier		OT	
1 Wiring Diagram	Elevation and Point to Point as Specified		OT	

Notes: * Weatherstrip supplied with aluminum frame & door.
* Coordinate all wiring & conduit with the electrical contractor.
* Mode of Operation:
  * The Doors are normally closed and secure.
  * When programmed through the access control system the exit device latches can be electronically retract and held (doors will be Push/Pull) and can be manually opened.
  * Door position switch will monitor the doors open/closed status to the access control system.
  * Manual egress is allowed at all times. Request to Exit Switch in the exit device push bar will signal an authorized egress to the access control system.

Set: 3.0

Doors: A101B, A102B, B101A

2 Continuous Hinge	CFM_SLF-HD1 QC (# of Wires and Size as Required)		PE	☐
1 Keyed Removable Mullion (Alum)	L980A	US28	SA	
1 Rim Exit Device (NL, RX, ELR, CD)	16 43 55 56 8804 Less Pull (Cyl. Dogging)	US32D	SA	☐
1 Rim Exit Device (EO, RX, ELR, CD)	16 43 55 56 70 8810 EO (Cyl. Dogging)	US32D	SA	☐
3 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA	
1 SFIC Rim Cylinder Housing	Tail as required	US32D	SA	
4 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE	
2 Pull	RM3131-24 Mtg-Type 12HD	US32D	RO	
1 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA	
1 Blade Stop Spacer Kit	581-1 or 2 (as required)	EN	SA	
1 Drop Plate	351D	EN	SA	
1 Automatic Opener	60X1 D (Drop Plate as Required)	689	NO	☐
1 Threshold	2005AV ES14L		PE	
2 Sweep	3452AV		PE	
2 ElectroLynx Harness	QC-C3000P		MK	☐
1 Card Reader	By Security Supplier			
1 Keyswitch	MKAN2		SU	☐

2 Door Actuator Switch	505	NO	
1 Power Supply	AQD (Size and Options as required)	SU	
2 Door Position Switch	By Security Supplier	OT	
1 Wiring Diagram	Elevation and Point to Point as Specified	OT	

Notes: * Weatherstrip supplied with aluminum frame & door.
* Card Reader supplied by the owner.
* Coordinate all wiring & conduit with the electrical contractor.
* Mode of Operation:
  * When the key switch is "off" the exit device latch is secure and the exterior wall actuator is de-activated.
  * When the correct credential is presented to the card reader the exit device latch will retract and the exterior actuator will become activate. The door can be manually opened or the wall actuator can be pressed and the automatic operator will open the door.
  * When the key switch is "on" the exterior wall actuator is activated. The exit device latch will be electronically retracted and held (the door will be Push/Pull). The door can be manually opened or the wall actuator can be pressed to open the door.
  * The interior wall actuator can be pressed at any time and the automatic operator will open the door.
  * Door position switch will monitor the doors open/closed status to the access control system.
  * Manual egress is allowed at all times. Request to Exit Switch in the exit device push bar will signal an authorized egress to the access control system.

Set: 4.0

Doors: B112A

2 Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE
1 Keyed Removable Mullion (Steel)	L980S	PC	SA
2 Rim Exit Device (EO, CD)	16 43 8810 EO (Cyl. Dogging)	US32D	SA
3 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
3 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Removable Mullion Cylinder Kit	70 980C1	US26D	SA
1 Threshold	2005AV ES14L		PE
1 Rain Guard	346C		PE
1 Gasketing (Head and Jambs)	2891APK		PE
2 Sweep	3452AV		PE
2 Door Position Switch	By Security Supplier		OT

Notes: * Coordinate all wiring & conduit with the electrical contractor.
* Door contacts monitor the position of the doors and reports status to the security system.

Set: 5.0

Doors: A128B, E111A, E114A, E116A, E119A, E122A, E123A, E126A

1 Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE
1 Rim Exit Device (EO, CD)	16 43 8810 EO (Cyl. Dogging)	US32D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	TB 351 CPS (HW SPG STP Arm)	EN	SA
1 Threshold	2005AV ES14L		PE
1 Sweep	3452AV		PE
1 Door Position Switch	By Security Supplier		OT

Notes: * Exit Only, no exterior hardware or access.
* Weatherstrip supplied with aluminum frame & door.
* Coordinate all wiring & conduit with the electrical contractor.
* Door contacts monitor the position of the doors and reports status to the security system.

Set: 6.0

Not Used

Set: 7.0

Doors: B112C, B113A

1 Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE
1 Rim Exit Device (STRM, LD)	LD 43 70 8804 ETL (Less Dogging)	US32D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	TB 351 CPS (HW SPG STP Arm)	EN	SA
1 Threshold	2005AV ES14L		PE
1 Rain Guard	346C		PE
1 Gasketing (Head and Jambs)	2891APK		PE
1 Sweep	3452AV		PE
1 Door Position Switch	By Security Supplier		OT

Notes: * Coordinate all wiring & conduit with the electrical contractor.
* Door contacts monitor the position of the doors and reports status to the security system.

Set: 8.0

Doors: B108C, B108D

2	Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE
1	Keyed Removable Mullion (Steel)	L980S	PC	SA
2	Rim Exit Device (EO, CD)	16 43 8810 EO (Cyl. Dogging)	US32D	SA
2	SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
3	SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1	Removable Mullion Cylinder Kit	70 980C1	US26D	SA
2	Surface Closer	TB 351 CPS (HW SPG STP Arm)	EN	SA
1	Threshold	2005AV ES14L		PE
1	Rain Guard	346C		PE
1	Mullion Gasketing	5110BL		PE
2	Sweep	3452AV		PE
2	Astragal	305CN		PE
1	Door Position Switch	By Security Supplier		OT

Notes: * Exit Only, no exterior hardware or access.
* Weatherstrip supplied with aluminum frame & door.
* Coordinate all wiring & conduit with the electrical contractor.
* Door contacts monitor the position of the doors and reports status to the security system.

Set: 9.0

Doors: B102A

2	Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE	
2	Dummy Push Bar	8893	US32D	SA	
2	Pull	RM3131-24 Mtg-Type 12HD	US32D	RO	
2	Concealed Overhead Stop	1-X36	630	RF	
1	Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA	
1	Blade Stop Spacer Kit	581-1 or 2 (as required)	EN	SA	
1	Drop Plate	351D	EN	SA	
1	Automatic Opener	60X1 D (Drop Plate as Required)	689	NO	□
2	Door Actuator Switch	505		NO	□

Notes: * Coordinate all wiring & conduit with the electrical contractor.
* Mode of Operation:

* When either door switch actuator is pressed the automatic operator on the active leaf will open the door. The doors can be manually opened or the wall actuator can be pressed to open the door.

Set: 9.1

Doors: B102B

2 Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE
2 Dummy Push Bar	8893	US32D	SA
2 Pull	RM3131-24 Mtg-Type 12HD	US32D	RO
2 Concealed Overhead Stop	1-X36	630	RF
2 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA
2 Blade Stop Spacer Kit	581-1 or 2 (as required)	EN	SA
2 Drop Plate	351D	EN	SA

Set: 10.0

Doors: A104A, B103A, B103B

2 Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE
2 CVR Exit Device (CLRM, CD)	16 43 70 AD8413 ETL	US32D	SA
4 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
4 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
2 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA
2 Blade Stop Spacer Kit	581-1 or 2 (as required)	EN	SA
2 Drop Plate	351D	EN	SA

Notes: * Weatherstrip supplied with aluminum frame & door.

Set: 11.0

Doors: A119, B103D, B108A, B108B, C101, E102

2 Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE
2 SVR Exit Device (CLRM, CD)	16 43 70 NB8713 ETL (Cyl. Dogging)	US32D	SA
4 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
4 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
2 Surface Closer (Hold Open)	351 CPSH	EN	SA
2 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
2 Armor Plate	K1050 34" high X 2" LDW CSK BEV	US32D	RO
2 Silencer	608 / 609 (type as applicable)		RO

Set: 11.1

Doors: B124A

2 Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE
2 Surface Vert Rod Exit, Exit Only	43 NB8710 EO	US32D	SA
2 Surface Closer (Double Egress)	DA 351 (Arm as application requires)	EN	SA
2 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
2 Armor Plate	K1050 34" high X 2" LDW CSK BEV	US32D	RO
2 Silencer	608 / 609 (type as applicable)		RO

Set: 12.0

Doors: C108, D107, E117

6 Hinge, Full Mortise, Hvy Wt	T4A3786 (NRP and Size as required)	US26D	MK
1 Keyed Removable Mullion (Steel)	L980S	PC	SA
2 Rim Exit Device (PASS)	43 8815 ETL	US32D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Removable Mullion Cylinder Kit	70 980C1	US26D	SA
2 Surface Closer (Hold Open)	351 CPSH	EN	SA
2 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
1 Mullion Gasketing	5110BL		PE
2 Silencer	608 / 609 (type as applicable)		RO

Set: 13.0

Doors: B104

3 Hinge, Full Mortise, Hvy Wt	T4A3786 (NRP and Size as required)	US26D	MK
1 Rim Exit Device (PASS)	43 8815 ETL	US32D	SA
1 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 14.0

Doors: A136A, A136B, A137A, A137B, E106, E107

3 Hinge, Full Mortise, Hvy Wt	T4A3786 (NRP and Size as required)	US26D	MK
1 Rim Exit Device (CLRM-SEC, LD)	LD 43 70 8816 ETL (Less Dogging)	US32D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Rim Cylinder Housing	Tail as required	US32D	SA
2 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 UO (RA or P/A arm as required)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 15.0

Doors: A104B

1 Continuous Hinge	CFM_SLF-HD1 (Size as Required)		PE
1 Classroom Lock	8237 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Concealed Overhead Stop	1-X36	630	RF
1 Surface Closer	TB 351 CPS (HW SPG STP Arm)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO

Set: 16.0

Doors: B107A, B107B, B127

6 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Flush Bolt (self latching)	2805 / 2905 (top bolt only) (type as applicable)	US32D	RO
1 Storeroom Lock	8204 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
2 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA

2 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
2 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
1 Astragal	357SP		PE
2 Silencer	608 / 609 (type as applicable)		RO

Notes: * Outswing doors - Install astragal on pull side of the active leaf.
* Closer with stop on the active leaf only.
* Wall stop on inactive leaf.

Set: 17.0

Doors: A118, A140, A141, B110

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Storeroom Lock	8204 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 18.0

Doors: A129A, A138, B122, C130, D126, E138

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Storeroom Lock	8204 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 UO (RA or P/A arm as required)	EN	SA
2 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 18.1

Doors: B106, B112B, B121

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Storeroom Lock	8204 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA

1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 UO (RA or P/A arm as required)	EN	SA
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
1 Gasketing	S88D		PE

Set: 19.0

Doors: A112, A129B, A133, A135, B103C, C123, D119, E124, E133

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Storeroom Lock	8204 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA
2 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 19.1

Doors: A127, B111B, B113B, B126

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Storeroom Lock	8204 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Gasketing	S88D		PE

Set: 20.0

Doors: A105A, A106, A107, A108, B118A

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Office Lock	8205 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
2 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO

3 Silencer	608 / 609 (type as applicable)		RO

Set: 21.0

Doors: A125A, A126A, B109

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Office Lock	8205 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
1 Threshold	2005AP ES14L x P380		PE
1 Gasketing	S88D		PE
1 Door Bottom	4131CRL		PE

Set: 22.0

Doors: A110, A111A, A122, B123

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Office Lock	8205 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 UO (RA or P/A arm as required)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 23.0

Doors: A116B

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Office Lock	8205 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO

1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 24.0

Doors: A128A

6 Hinge, Full Mortise, Hvy Wt	T4A3786 (NRP and Size as required)	US26D	MK
2 SVR Exit Device (CLRM, CD)	16 43 70 NB8713 ETL (Cyl. Dogging)	US32D	SA
4 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
4 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
2 Surface Closer	351 UO (RA or P/A arm as required)	EN	SA
2 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
2 Wall Stop	400 / 403 (type as applicable)	US26D	RO
1 Astragal	357SP		PE
2 Silencer	608 / 609 (type as applicable)		RO

Notes: * Outswing doors - Install astragal on pull side of the active leaf.
* Inswing doors - Install astragal on push side of the inactive leaf.

Set: 25.0

Doors: A113A, A121, A134, C102, C103, C104, C105, C106, C107, C110, C111, C112, C113, C114, C115, C116, C124A, C124B, C129, D102, D103, D104, D105, D106, D109, D110, D111, D112, D113, D114, D120A, D120B, D125, E103, E110, E111B, E114B, E116B, E119B, E122B, E123B, E126B, E134A, E134B, E139, E141, E142

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Classroom Lock	8237 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
2 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 26.0

Doors: A123, A124A, B116C, E127

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Classroom Lock	8237 LNP LC	US26D	SA

1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 UO (RA or P/A arm as required)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 27.0

Doors: A116A, A130A, A130B, A139A, B116A, B120

3 Hinge, Full Mortise, Hvy Wt	T4A3786 (NRP and Size as required)	US26D	MK
1 Classroom Lock	8237 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 27.1

Doors: A139B

3 Hinge, Full Mortise, Hvy Wt	T4A3786 (NRP and Size as required)	US26D	MK
1 Classroom Lock	8237 LNP LC	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE
1 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Gasketing	S88D		PE

Set: 28.0

Doors: A109, A117, B119, E105, E109, E113, E115, E121, E125

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Privacy Set	49 8265 LNP w/occupancy indicator	US26D	SA

2 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO
1 Coat Hook	RM811	US26D	RO

Set: 29.0

Doors: C117, E108, E112, E120

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Privacy Set	49 8265 LNP w/occupancy indicator	US26D	SA
1 Concealed Overhead Stop	1-X36	630	RF
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
3 Silencer	608 / 609 (type as applicable)		RO
1 Coat Hook	RM811	US26D	RO

Set: 30.0

Doors: C128, D124, E128, E140, E145

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Privacy Set	49 8265 LNP w/occupancy indicator	US26D	SA
1 Surface Closer	351 UO (RA or P/A arm as required)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO
1 Coat Hook	RM811	US26D	RO

Set: 31.0

Doors: A111B, A113B

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Passage Set	8215 LNP	US26D	SA
1 Surface Closer	351 UO (RA or P/A arm as required)	EN	SA
1 Kick Plate	K1050 8" high X 2" LDW CSK BEV	US32D	RO
2 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Wall Stop	400 / 403 (type as applicable)	US26D	RO
3 Silencer	608 / 609 (type as applicable)		RO

Set: 32.0

Doors: C118, E104

3 Hinge, Full Mortise	TA2714 (NRP and Size as required)	US26D	MK
1 Passage Set	8215 LNP	US26D	SA
1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 Surface Closer	351 CPS (HW SPG STP Arm)	EN	SA
1 Mop Plate	K1050 4" high X 2" LDW CSK BEV	US32D	RO
1 Threshold	2005AP ES14L x P380		PE
1 Gasketing	S88D		PE
1 Door Bottom	4131CRL		PE

Set: 33.0

Doors: B111A, B115

1 SFIC Mortise Cylinder Housing	Size and Cam as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE

Notes: * Balance of hardware by door manufacturer.

Set: 33.1

Doors: B-Gate

4 Gate Hinges	Gate Hinges by the Gate Manufacturer		OT
4 Door Spring	453	D4	MK
1 Rim Exit Device	10 W 03W S SN1 (Size as Required)	630	DE
1 SFIC Rim Cylinder Housing	Tail as required	US32D	SA
1 SFIC Core	SFIC Cylinder Core to be supplied under allowance		BE

Set: 34.0

1 Repair Kit	QC-R001	MK	
1 Crimp Tool	QC-R003	MK	
1 Test Unit	WT2	SA	
1 Push Button	PB4LAN-2	SU	

END OF SECTION 08 71 06

SECTION 11 40 00 FOOD SERVICE EQUIPMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section as though bound herein.

B. K.E.C. may offer voluntary alternates by submittal in writing, along with supporting literature and other data, at the time the bid is submitted. Voluntary Alternates shall not be confused with items listed as "equals" in the item specifications. Although they will be given consideration after award of the Contract, voluntary alternates will not be considered in the judgment about award of the Contract. Change in the Contract price proposed for the voluntary alternate(s) shall reflect all possible costs to be encountered should the voluntary alternate(s) be accepted and incorporated in the work.

C. If the K.E.C. discovers an apparent conflict or discrepancy between portions of the Contract Documents that appears to be inconsistent or is not reasonably inferred from the intent of the Contract Documents, the Contractor shall include in their bid the most stringent and demanding, or highest cost, requirement.

D. The utility schedule information is based on the prime spec equipment shown in the specifications. In the event the K.E.C. proposes to furnish an approved equal to the prime spec equipment, the K.E.C. shall be responsible for any upcharges incurred because of plumbing, mechanical, or electrical changes necessary for the equipment being provided

1.02 SUMMARY

A. Provide labor and materials required to deliver, uncrate, assemble, set in place, level, install, supervise, and coordinate the installation of the food service equipment and accessories as indicated on drawings and as specified, exclusive of utility connections.

B. Utility roughs-ins, final connections, and interconnection of components will be performed by Divisions 22 and 26.

1. Work provided by Division 22 shall include, but not be limited to, the following:

   a. Rough-in mechanical and plumbing services

   b. Drain line piping and components from the rough-in to the equipment connections.

   c. Supply line piping and components from the rough-in to the equipment connections.

   d. Traps, strainers, unions, piping, service valves and vents.

   e. Install escutcheons on utility lines which extend through equipment.

   f. Install faucets, pre-rinse assemblies, quick disconnect assemblies, hose station, pot fillers, and vacuum breakers, and check valves and flow control valves as furnished with the equipment.

   g. Disconnection of existing equipment which is to be removed or relocated.

h. Paint, or chrome sleeve, all exposed water and gas piping (above counter height or in a direct line of sight) as directed by the Architect.

2. Work provided by Division 26 shall include, but not be limited to the following:

a. Rough-in electrical service.

b. Conduit and conductors from the rough-in to the equipment and between remote controls and the equipment.

c. Electrical outlets in walls, floor, and ceiling.

d. Disconnect switches as required by the electrical code.

e. Disconnection of existing equipment which is to be removed or relocated.

3. Work provided by various other trades shall include, but not be limited to, the following:

a. Raised concrete or masonry bases and platforms.

b. Floor depressions, wall openings, recesses and holes through walls, floor, and ceiling as required for piping and ducts.

4. Refer to item specifications for additional work and requirements.

1.03 DEFINITIONS

A. The term "Kitchen Equipment Contractor", "Contractor", or "K.E.C." is defined as the person or company that will contract for the work specified in this section.

B. The Consultant for this section of the work is *FOOD SERVICE CONSULTANTS, INC., DBA VORNDRAN AND ASSOCIATES, 3125 STERLING RIDGE COVE, FORT WAYNE, INDIANA 46825-1704*. The Consultant is responsible to the Architect for ascertaining that the work complies with the requirements of this section.

C. The term "provide" is defined as "Contractor furnish and install."

D. Transmit reports, submissions, questions, or correspondence to the Architect for distribution.

1.04 SUBMITTAL

A. Refer to Section 01 33 23 and Section 01 77 00.

B. Submit one (1) set of shop drawings (in PDF format) for review. Upon final review of drawings, distribute prints to the various trades.

C. Shop drawings to include a plan, elevation, and cross sections through each equipment item. Indicate anchor devices, reinforcements, dimensions, gauges, holes, radii, cutouts and details of construction, installation, and relation to adjoining work. Do not start fabrication until final reviews are received. Draft shop drawings at 1 inch per foot scale.

D. Rough-in drawings to show accurately the curbs, platforms, gutters, sleeves, pipe stubs, refrigerant lines, water supply lines, drains, floor drains, electrical services and other utility connections required. Coordinate work with the various trades. Draft rough-in drawings at ½ inch per foot scale.

E. Submit product data brochures for review prior to equipment purchase. Brochure to contain a product data sheet for each manufacturer, along with a typewritten cover sheet indicating the item number, quantity, manufacturer, and model number, mechanical and electrical services required, and a listing of accessories specified. Assemble cover sheet and literature in order. Partial lists submitted from time to time will be rejected. Bind brochure in a three (3) ring hard back black binder.

F. Ventilation system shop drawings shall include a scaled roof plan indicating the locations of the exhaust duct termination in comparison to other roof equipment in the same area and information on automatic power/fuel shut-off to cooking appliances in accordance with provisions in Indiana Mechanical Code and Indiana Building Code.

G. Submit, when requested, a copy of the manufacturer's order acknowledgement for each item of pre-fabricated equipment. Acknowledgement to show date item was ordered and the scheduled shipping date.

H. Submit samples when requested. Samples will not be returned unless specifically requested.

I. Guarantee equipment and accessories for one (1) year from date of substantial completion. covering replacement cost and/or labor cost of defective material and adjustment of controls. School projects shall be guaranteed for one (1) year from the date of the first day of the school opening. Provide a five (5) year parts and labor warranty for *ALL* remote refrigeration components for the walk-ins, and a five (5) year compressor only warranty for all self-contained refrigerated units.

J. Submit operating / maintenance manuals prior to completion of work. Manual to contain directions and recommendations for the operation, care, adjustment, service, and maintenance of equipment. Provide parts list and diagrams showing parts location and assembly. Provide one (1) copy of the manual in PDF format. Identify each item of equipment with bookmarks. Arrange in alphabetical order.

K. Submit a listing of the name and address of equipment manufacturers used, along with the name and address of the local service agencies. Include listing as a part of the maintenance and operation manuals.

L. Submit three signed copies of pressure vessel inspection report. Inspector's report to be completed by a qualified pressure vessel inspector. Test all pressure equipment.

1.05 QUALITY ASSURANCE

A. Manufacture and install equipment and accessories in strict compliance with and, if applicable, bear the seal of UL, NEMA, ASME, NSF, AGA, ANSI, OSHA and NFPA.

B. Manufacture and install equipment in strict conformity with Public Health Service Publication - "Food Service Sanitation Manual" and applicable governmental codes and regulations.

C. Provide safety guards on equipment in compliance with codes.

D. Approval of contractor's drawings and other data does not relieve the Contractor from responsibility of complying with codes and regulations.

E. Provide, at no extra charge, equipment, trim and accessories which may be required by codes and regulations.

F. The custom equipment fabricator will be subject to the acceptance of the Architect, Consultant, and Owner. Fabricator must have the plant, personnel, and engineering

facilities to properly design, detail and fabricate high quality equipment. Equipment shall be of standard unit assembly, manufactured by one manufacturer and of uniform design, material, and finish.

G. Manufacturer's catalog designations are intended to represent the standards required. Equipment furnished must closely conform thereto in design, construction, capacity, and function, to the manufacturer and model specified. Where catalog designations are given, the items shall be complete as described and shown in the catalog, unless exceptions are specified.

1.06 DELIVERY STORAGE AND HANDLING

A. Acquire approved "off-site" storage to house equipment if provisions cannot be made at the job site.

B. Ship fittings to the job site as follows:

1. Wrap and identify with tag naming the job, the supplier, the items enclosed and the item to which it is to be attached at the job.

2. Fittings to be delivered to various trades involved. Obtain a receipt signed by the foreman.

3. Do not ship fittings or accessories inside larger items of equipment.

C. Continuously maintain protection of work from damage. Protect the Owner's property and that of other contractors from injury or loss arising about this contract, and repair or replace damage, injury or loss. Damage to equipment not directly attributed to separate trades shall be the responsibility of the K.E.C.

D. Permanently fasten manufacturer’s nameplates to the equipment. One nameplate of the fabricator will be allowed in each room.

E. Equipment of a like nature (cooking batteries, carts, self-leveling dispensers, etc.) shall be of one manufacturer to insure uniformity of design and to simplify service and maintenance.

1.07 PROJECT CONDITIONS

A. Prior to fabrication of equipment, field measure and verify in-place construction.

B. Fit equipment into the space provided regardless of the manufacturer's standards. Variations in equipment not recessed or built into fixed spaces, shall in no case be sufficient to materially change capacity of the equipment.

C. Field inspect conditions at site and verify that the rough-ins were properly installed. Compensate the various trades for relocations of rough-ins caused by inaccuracy of drawings.

D. Notify the Consultant and Architect in writing of discrepancies between the contract documents and the actual conditions on the job site prior to equipment fabrication.

E. Pay for the cost incurred for special equipment; for removal or replacement of portions of the building if required for delivery and installation of equipment specified; as well as other costs incurred if work specified under this section must be done by others due to jurisdictional agreements or other conditions.

F. Coordinate work specified under "WORK BY OTHERS", or other work that may arise incidental to completing the project. Furnish installing trades with information and assistance for the proper installation of equipment and components.

G. Supervise the installation of the equipment and components. Submit to the Architect the name, address and telephone number of the supervisor. The Contractor agrees to accept collect telephone calls from the Consultant or Architect.

PART 2 PRODUCTS

2.01 MECHANICAL WORK INCLUDED IN CONTRACT

A. Work provided by this section shall include, but not be limited to, the following:

1. Chrome plated faucets with check valves, swing spout, soft flow aerators, and union coupling inlets. Equip faucets for 160° to 180° hot water with heat resistant red handle. Faucets and components shall be as follows:

a. Pre-Rinse, Backsplash
T & S B B-0133-CR-B8TP
Chicago Faucet 510 / 902B / 851
Fisher 2210 / 2902 / 2925

b. Faucet, Backsplash
T & S B-0231-CR with B-199-2-F-12 aerator (1.20 gpm)
Chicago Faucet 540LD
Fisher 3252

c. Faucet, ¾" Backsplash mounted
T & S B-0290 with B-199-2-F-12 aerator (1.20 gpm)
Fisher 5412
Chicago Faucet

d. Pot Filler, Wall mounted
T & S B-0610
Chicago Faucet 512
Fisher 2240

e. Pot Filler, Deck mounted
Fisher 2340
T & S
Chicago Faucet

f. Pantry Faucet, Single
T & S B208
Chicago Faucet 349-L7
Fisher 3010

g. Hose Reel, Wall mounted
T & S B-7222
Chicago Faucet 538
Fisher 2980

h. Mixing faucet valve
T & S B512
Chicago Faucet 525
Fisher 2805

i. Water Outlet
   T & S BLB
   Chicago Faucet 988-E1-M
   Fisher 2905 or 2906

j. Vacuum Breaker - ¾"
   T & S B-457, B-458
   Watts
   Arrowhead

   Vacuum Breaker - ½"
   T & S B-455, B-456
   Watts
   Arrowhead

k. Vacuum Breaker, Anti Siphon
   Watts 800 series
   T & S B963
   Crane

l. Check Valves
   T & S Brass CVH
   Watts
   Crane

   T & S Brass CVV
   Watts
   Crane

m. Quick disconnect Assemblies
   Dormont
   Greitzer
   Connect It, Inc.

n. Drain Valve Assemblies
   CHG DSS-8000
   Kason
   Fisher

2. Waste outlets with stainless steel twist handle, stainless steel drain valve body, a self centering face flange, a flat stainless steel "snap-in" strainer plate and a chrome plated tailpiece. Overflow fittings will not be required unless specifically stated in the item specifications.

3. Control valves required for operation, located convenient to the operator. Extension stems with supports shall be chrome plated. Equip steam valves with heat resistant red handles.

4. Chrome plated vacuum breakers on threaded faucets, hose stations and on fixtures where the water inlets are placed below the water level.

5. Backflow preventers on pre-rinse units.

6. Anti-siphon pressure type vacuum breakers on hose reels.

7. Angle flange or deck and wall flange where vacuum breakers extend through equipment.

8. Special valves, regulators, strainers, pressure reducing valves, control valves, thermometers, pressure gauges, keyed water flow restrictors and accessories required by code or necessary for the operation of equipment.

9. Quick disconnect with couplers and flexible double wall stainless steel hose with built in restraining device and double shut-off at ends. Disconnect hoses for steam lines to be insulated. Assemblies to be color coded: Yellow for gas, green for steam, red for hot water and blue for cold water. Provide equipment chain retainer.

2.02 ELECTRICAL WORK INCLUDED IN CONTRACT

A. Work provided by this section shall include, but not be limited to, the following:

1. Plugs matching the receptacles specified in the Electrical Section of specifications. Plugs to be manufactured by Hubbell, Leviton, or GE.

2. Grounded receptacles mounted in type "IB" enclosures equipped with stainless steel faceplates and boxes where receptacles are exposed. Do not furnish twist lock unless specified. Receptacles mounted on tables and counters shall be equipped with ground fault interrupts (GFI).

3. Controls, thermostats, starters, motor control switches, switches and contactors. Furnish remote mounted components to Division 26 for mounting.

4. Magnetic starters with NEMA enclosure for motors sized as required by codes.

5. Type "ND" single throw heavy duty industrial, quick make - quick break disconnect switch with interlocked cover control where called for in the item specifications.

6. NEMA type 4 enclosures for controls, disconnects, magnetic starters and other components which are located in wet or damp areas.

7. Bolted type circuit breaker where called for in the item specifications. Verify with Architect as to the manufacturer.

8. Three wire or four wire type "SO" neoprene cord and plug sets with one leg grounded to equipment.

9. Anaconda Sealtite Type "EF", Electri-Flex, or Cantex conduit and waterproof boxes. Unprotected flexible metal conduit will not be accepted.

10. Conduit and conductors in conduit raceway for fabricated equipment.

11. Low voltage control circuits on equipment operating on voltages over 120 volts.

12. Totally enclosed, fan cooled motors where exposed to damp and wet areas.

13. Motors less than ½ horsepower, for solenoid valves and lighting shall be 120 volt, single phase. Unless otherwise noted motors greater than ½ horsepower shall be three phase. Motors shall have ball and thrust type bearings, totally enclosed, 55º rise above 40º ambient continuous duty. Motors shall have low starting torque, current characteristics, with NEMA frames.

2.03 HARDWARE

A. Hardware other than stainless steel shall be heavy duty chrome plated brass, with concealed fasteners.

B. Provide master keyed locks. Refrigeration equipment locks shall be keyed alike and fabricated equipment door and drawer locks shall be keyed alike.

2.04 FABRICATED EQUIPMENT

A. Material shall be new prime quality, full gauge thickness, of composition indicated by names or abbreviations stated in item specifications.

B. Stainless Steel shall be type 302 or type 304, with a No. 4 finish, as designated by the American Iron and Steel Institute and shall be austenitic.

C. Galvanized steel angles, bars, channels, piping, tubing, and sheets shall be uniformly ductile in quality and free from hard spots, runs, blisters, spelter, checks and other surface defects. Material shall be mild steel, galvanized by the hot dip process, unless otherwise specified.

D. Welds shall be of same basic composition as sheets or parts welded. Joints shall be fully welded. Pits, cracks, discolorations, distortion and depressions will not be acceptable. Grind smooth and polish welded joints, flush with the adjoining material and neatly finish to harmonize therewith. Soldered, lapped, fillet corners and bolted joints will not be acceptable in place of welded seamless construction.

E. Burrs, projections and fins are not acceptable on sheared edges. Neatly grind miters and bullnosed corners to a uniform condition.

F. Bolts, screws and rivets are not acceptable on exposed surfaces of equipment. Where bolts or studs are welded to the underside of stainless steel surfaces, the reverse side of the weld shall be neatly finished to blend in with the adjacent surface. Depressions at these points will not be acceptable. Cap bolt threads and studs with a suitable lock washer and chromium plated brass acorn nut. Bolts used to fasten trim shall be stainless steel.

G. Fabricate metal table tops, sinks and drainboards of 14 gauge stainless steel. Sound deaden underside of tops, drainboards, and sinks with an NSF approved sound deadening product. Provide tacky tape between all support channel and metal table tops. Exposed table top corners shall be radiused 1¾".

H. Edges, corners, rims and backsplash shall be die formed of same sheet as top. Cove intersection of tops at backsplash and rims on a ¾" radius. Rim and backsplash tops shall be level.

I. Backsplash shall be flanged back a minimum of 2" at 45º and down 1" at 45º. Enclose ends and rear of exposed backsplash.

J. Provide raised die formed ferrule around punch or drilled holes in table tops and shelves.

K. Sink back, bottom and front shall be formed of one continuous sheet with the ends welded into place. Construct bottom by creasing or forming the metal downward from each wall a minimum of one degree distinct slope toward the waste receptacle which shall be recessed a minimum of ⅜" below the adjoining surfaces. Provide double wall partition between each pair of sink compartments with rounded top edge. Provide sinks having two or more compartments with full length, full height flush stainless steel front panel to conceal joint between sinks. Turn back panel at sides and bottom and weld to sink bowl. Cove sink corners on a ¾" radius.

L. Slope drainboards, dishtable tops and beverage stand tops, urn drainers and troughs with an integral pitch towards the drain water receptor to ensure positive drainage and to eliminate water pockets.

M. Reinforce tops with 12 gauge channels, one channel provided on tops up to 36" wide and two channels on tops over 36" wide. Provide open base tables with channel runner at each pair of legs. Exposed channels shall be stainless steel. Attach top to the channel reinforcements with studs welded to the underside of top. Seal intersection of channel edge and underside of top with silicone.

N. Cabinet type enclosures shall be 16 gauge stainless steel. Round exposed vertical corners on a ¾" radius die. Flange top and bottom off at 2" right angles to the body and weld in corner gusset plates. The walls of cabinet shall be a fully welded seamless assembly with channels and box sections corners. A STRUCTURAL ANGLE FRAMEWORK SUPPORTING THE ENCLOSURE IS NOT ACCEPTABLE. Provide individual compartments separated by a partition, enclosing sinks, machinery and drawers from the balance of the base cabinet. Weld partition to the cabinet body.

O. Doors shall be flush mounted double pan construction, with ½" thick semi-rigid fiberglass board between the two panels. Door face shall be 16 gauge steel and back face shall be 20 gauge stainless steel. Internally reinforce doors 24" wide and greater with a 4" wide channel to prevent warpage. Tack weld intersection of front and rear door face around inside perimeter. Corners shall be fully welded. Space tack welds no greater than 6" apart. Grind smooth and polish all welds. Balance of space to be sealed with silicone.

P. Provide sliding doors with rubber button bumpers, die stamped stainless steel flush mounted door pull, sheaves, nylon rollers with stainless steel ball bearings, overhead aluminum door track and a bronze or stainless steel door guide bar attached to the bottom of cabinet.

Q. Provide lockable hinged doors with rubber button bumpers, stainless steel lift off hinge, die stamped stainless steel flush mounted door pull and a Component Hardware Model M27-2490, FMP, or Kason catch. Provide locks on all doors housing machinery and power panels.

R. Drawer assembly to be flush mounted double pan construction the same as described for doors. Provide two (2) rubber button bumpers, one on each side of drawer face, drawer insert, self closing drawer slides, die stamped stainless steel flush mounted door pull and a cylinder lock. Provide 20" × 20" × 5" deep Component Hardware Model S80-2020, FMP, or Kason drawer insert, set loosely in a perimeter supporting channel frame with drawer face welded to the frame. Provide Component Hardware model S-52, FMP, or Kason ball bearing roller drawer slides with adjustable stops at the fully opened position mounted to the channel frame. Enclosed drawers on open base table in an 18 gauge stainless steel enclosure.

S. Fabricate shelves of 16 gauge stainless steel with formed edges, reinforced with channels, the same as specified for tops.

T. Construct stationary shelves on open base tables formed with edge set on tangent point of leg and fully welded to leg.

U. Provide solid stationary shelves in enclosed base cabinets with back and ends turned up 2" and coved on a ¼" minimum radius. Tack weld turn up to cabinet body and calk joint with silicone. Provide ¾" diameter perforations spaced on 4" center on shelves in heated base cabinets.

V. Construct pipe slots through undershelves with turned up edge on four sides. Provide cabinets with an inner duct to conceal vertical piping.

W. Tubular leg assemblies shall consist of 1⅝" diameter 16 gauge stainless steel tubular legs and 1" diameter 16 gauge stainless steel crossrails. Fit top of legs into fully enclosed stainless steel sockets. Continuously weld sockets to reinforcing channel on underside of table tops, or to the reinforced stainless steel corner pads under sink corners. Bottom of pipe legs to be finished off smoothly and overlap the foot or caster stem. Crossrails shall be mitered and fully welded to each leg.

X. Provide NSF labeled casters. Medium and heavy duty casters of 4", 5", and 6" diameter shall have a minimum capacity of 200 lbs. with double ball bearing raceway and non-marking neoprene soft tread ball bearing wheels with drilled axle and grease fittings. Casters shall be Component Hardware Group, Darnell, or Jarvis.

Y. Provide fully enclosed bullet shaped stainless steel feet with a slightly rounded foot at bottom and an extra long threaded stem at the top.

2.05 FINISHES

A. Polish exposed stainless steel to a No. 4 commercial mill finish. Where unexposed, polish to a No. 2B finish. Satin finish exposed surfaces.

B. Paint and coatings shall be durable, non-toxic, non-dusting, non-flaking and mildew resistant, complying with NSF standards and governing regulations. Apply in accordance with the manufacturer's recommendations.

C. Clean metal prior to painting and paint with a rust inhibiting primer. Finish with two (2) coats of enamel in color selection determined by the Architect. Do not paint galvanized shelving.

2.06 REFRIGERATION SYSTEMS

A. Provide refrigeration systems complete with components required for operation, designed for direct expansion, employing thermostatic expansion valves and pressure switches. Refrigeration systems must meet all required code criteria noted in OBC Mechanical Code Section 11, and/or all state and local codes as required.

B. Rate compressors on the American Society of Refrigeration Engineers Standards, based on a maximum operating time of 16 hours per day on 100º F days. Mount compressor, condenser, motor, and auxiliary equipment on a single rigid base. Automatically control each unit by a suction pressure switch and a high pressure cut-off. Provide relief lines required by the codes, capped with screen vent fittings.

C. Provide the following components:

1. Sporlan, Ansul, or Cooper liquid line dryer.

2. Suction line accumulators on air cooled condensers which are located remote and outside the building.

3. Room temperature thermostats and solenoid valves.

4. Strainers ahead of all valves.

5. Type "L" copper refrigerant piping.

6. Vibration eliminators and flexible tubing in suction and liquid lines.

7. Wrought copper recessed solder fittings for refrigeration lines.

8. Type "L" copper piping with cast brass or wrought copper water line piping.

9. Sta-Brite, Sil-Fos 15, or Stay-Silv 15 silver solder.

10. Drip gutters under uncovered pipes, valves, and fittings.

11. Pipe hangers spaced a maximum of 96" on center and adjusted to the drop required.

12. Packless shutoff valves with port area equal to pipe area.

13. Charging valves located at the compressor.

14. Sporlan, Alco or Detroit Lubricator Thermostatic expansion valves.

15. Liquid line solenoid valves with port area equal to pipe area.

16. Cover refrigerant lines and chilled water lines with ¾" minimum thickness refrigerant pipe insulation with joints neatly cut and glued with adhesive. Exposed exterior insulation shall be UV protected or wrapped.

17. Pipe sleeves constructed of steel and molded vinyl large enough to permit covered insulated pipes to pass through.

18. Oil traps located at base of vertical risers in suction lines and at outlet of evaporator. Depth of trap to be three times the suction pipe diameter with a minimum horizontal dimension.

19. Equalizing line from expansion valve on compressor side of expansion bulb. Suction lines to be pitched from high point at coil to compressor. It may be necessary to rise to avoid pipes, ducts, etc. There shall be a trap of minimum dimensions at base of each vertical rise if over 48".

D. Design system for not over two lbs. loss between compressor and evaporator. Dehydrate system and hold at 150 lbs. pressure for a period of twelve hours without loss of pressure.

E. Test the refrigeration system for a period of three days making required adjustments.

F. Water cooled units using water at 85º F and a maximum rise of 20º F, not exceeding 1¼ gallons of water per minute per ton. Provide oil traps, positive liquid level indicating cocks and water regulating valves. Where several water-cooled compressors are manifolded together, one water control valve or several in parallel shall regulate the flow of water to the entire group, but a separate solenoid valve shall be provided for each compressor to prevent flow through same when not in operation. Provide water gate valve rated at 125 PSIG along with unions in water lines on each compressor head at inlet and outlet with water piping offset so heads may be removed.

PART 3 EXECUTION

3.01 PREPARATION

A. Fit equipment accurately in space provided. Notify the Architect in writing of modifications required to receive equipment.

B. Verify electrical and mechanical services at job site prior to ordering equipment. Information shown on drawings does not relieve the Contractor of this responsibility.

3.02 INSTALLATION

A. Assist in moving equipment so other trades can make connections and be on the job to level and adjust equipment as the last connection is made. During installation instruct the trades on hook up of the various items of equipment.

B. Equipment fit adjacent to walls, ceilings, floors and corners shall be tight. Allow selvage for a perfect fit.

3.03 SEALING AND TRIMMING

A. Caulk joints with GE Silastic, Component Hardware, or Dow Corning 732 RTV sealant. Joints exceeding ⅜" in width shall be trimmed with a stainless steel channel and caulked with sealant.

3.04 START-UP AND TESTING

A. Start-up, test and inspect equipment after installation under operating conditions. If inspection or test shows defects, correct the defects and repeat inspection and test.

B. Equipment must be operable prior to the demonstration of equipment by the manufacturer.

3.05 ADJUSTING

A. Adjust service equipment to be in perfect operating condition when turned over to the Owner at completion of work.

3.06 CLEANING

A. Keep premises free from accumulation of waste material during progress of work and, at completion, leave the premises clean and the equipment washed down, polished and ready for use.

3.07 TOUCH-UP

A. Polish out scratches in stainless steel and touch up scratches on painted surfaces.

3.08 DEMONSTRATION OF EQUIPMENT

A. Schedule the equipment manufacturer’s representatives to appear and teach the Owner’s Staff on the correct operation, maintenance, and safety features of all the equipment.

B. After instruction, prepare a letter stating that equipment was demonstrated, and personally checked by the manufacturer's representative, and found to be operating properly. Acceptance of the installation will not be contemplated until the letter, signed by the Owner, is received.

C. A representative of the supplier of the kitchen equipment must be present in the kitchen during the demonstration by the appropriate equipment manufacturer.

3.09 INSPECTION AND PUNCH LIST

A. When it has been concluded that work is installed, operating and substantially complete, prepare a "punch list" of items yet to be completed and forward a copy to the Architect and the Consultant.

B. The Architect will request the Consultant to inspect the equipment after receipt of the punch list. If inspection reveals that the installation is not substantially complete or the punch list is not of a minor nature, and another inspection is required, then a Certificate of Substantial Completion will not be issued.

C. Reimburse the Consultant for subsequent inspections (including long distance telephone calls) and time of the Consultant. If the costs have not been paid before final payment, the costs will be deducted from the Contractor's final payment.

D. Immediately upon completion of the Consultant's inspection, correct punch list items. When items have been corrected, the Contractor shall notify the Architect in writing that the installation is ready for inspection.

3.10 EQUIPMENT SCHEDULE / SPECIFICATIONS

The following equipment schedule/specifications refers to various items of food service equipment shown on the Contract Drawings. The Contract Drawings and notes form a part of these specifications and shall be as binding as if written herein.

ITEM NO. 1 - AIR CURTAIN, AUTOMATIC
QUANTITY - ONE
MFG. AND MODEL: MARS STD248-1U-D-WHITE
ELEC. REQ'M'TS: 208V-3

Install unit above door in accordance with the manufacturers recommendations. Equip unit with air velocity control for variable air speed, air directional controls, motor with sealed ball bearings, and starting and running thermal protection devices.

Division 26 furnish and install a door contact switch to activate the fan when the selector switch is set to automatic. Division 26 provide a three position switch with "automatic, manual and off" positions flush mounted in the building wall adjacent to the door and wired to the electrical terminal on the unit.

ITEM NO. 2 - LOCKER
QUANTITY - LOT

Not in Kitchen Equipment Contract. Unit to be furnished and installed by Others.

ITEM NO. 3 - WALK-IN COOLER / FREEZER
QUANTITY - ONE
MFG. AND MODEL: THERMO KOOL
ELEC. REQ'M'TS: 120-1 / 208-3

Walk-in shall be the size and shape as shown on the plans, approved, and listed in accordance with UL, NSF and constructed in accordance with all state and local codes and all Energy Independence and Security Act of 2007 requirements. Refer to the last page of this section for additional information to be submitted prior to installation.

Provide sectional pre-fabricated wall and ceiling panels constructed and joined together per manufacturer's standard. Panels to be equipped with compression gaskets. Seal all wall and floor sections to building floor with silicone. Where the span of the ceiling is too great to support itself, provide hanger rods attached to the building structural system. Provide all steel, hanger rods, and turnbuckles required. Installation of complete assembly shall be by factory authorized personnel. K.E.C. to submit installer's name and record prior to installation. Refrigeration system shall be installed by, and serviced by, a local refrigeration specialist approved by the Owner and/or Owner's representative. Refer to standard form at the end of this section.

Floor shall be built up on the site and installed in a floor recess, the depth as shown on the drawings. Install a 15" high, metal clad, insulated pre-fabricated curb around perimeter of exterior walls and below all party walls. Curb shall be anchored in the floor recess by clip angles attached to pit floor with nylon tap-its. Furnish and install 4" thick urethane insulation and .004" thick polyethylene vapor barrier in the floor recess. Division 03 shall furnish and install a concrete pad in the size shown in the drawings. Division 09 to provide the floor covering over the floor insulation, along with compacted back-fill between the walk-in panels and building walls. Refer to details for construction and room finish schedule for type of floor covering.

Base shall be furnished and installed by Division 09 and shall be of the same material as the floor.

Base shall be 4" high, 20 gauge stainless steel with top and bottom crimped in opposite directions. Attach to all exposed interior and exterior wall panels and apply sealant to the top and bottom.

Insulation for wall and ceiling panels shall be reaction injection molded urethane (no CFC's used) and contain wall, ceiling, and door insulation of at least R–25 for coolers and R–32 for freezers. Insulation for wall panels shall be 4" thick. Ceiling panels shall be 4" thick, single piece, and self-supporting. Interior height of unit shall be a minimum of 8'-0".

Exposed exterior finish of wall panels shall be 20 gauge type 302 or 304 stainless steel with a No. 4 finish.

Interior finish of wall panels and ceiling panels shall be .032" smooth aluminum with white baked on acrylic finish.

Doors shall be off-set type construction insulated with urethane insulation. Interior surface of door shall be the same finish as adjacent wall panels.

Exterior finish shall be 20 gauge type 302 or 304 stainless steel with a No. 4 finish.

Door frames shall be equipped with heating elements at jamb, sill and head. Elements shall be factory wired to a junction box mounted on top of the ceiling panels. Equip each door with magnetic gasket, adjustable bottom sweep gasket, International 850 series hydraulic door closer with hold open device, heated vision panel in freezer door, unheated vision panel in cooler door, three (3) Kason 1346 chrome plated cam-action hinges, Kason 27C polished chrome handle with two (2) keys for each door, heated cylinder locks for freezer, latch with inside release, and 36" high stainless steel kickplates on the interior and exterior.

Provide all exterior doors with a Curtron, Polar-Flex, or Ardco two-piece strip door, constructed of clear vinyl strips in accordance with the manufacturer's instructions. Strip door to meet all Energy Independence and Security Act of 2007 requirements.

Interior lighting shall meet all Energy Independence and Security Act of 2007 requirements.

Provide Kason model 1810LX LED series compact light fixtures with high impact Lexan lens. Lights shall be controlled by an automatic motion sensor with indicator light mounted in the interior of the wall panel adjacent to the door. Division 26 to mount fixtures on ceiling panels and shall punch all holes through cooler/freezer ceilings for final wiring. Division 26 to seal all conduit access holes with cold temperature polyurethane expanding foam. Mount fixtures in locations shown in the manufacturer's shop drawings. All conduit shall be installed on the exterior top of ceiling and not within the interior of the compartment. Provide a Kason model 1807LW light fixture above each door on the interior.

Air pressure relief ports shall be provided for each compartment through the walls or ceiling. Ports shall be the design as standard with the cooler manufacturer. Division 26 to wire all electrically heated air pressure relief ports.

Thermometers shall be located and mounted on the exterior walls near the entrance doors and in full view of the kitchen. Thermometers shall be of the electronic digital type or of the dial type. Dial type thermometers shall be 6" diameter

Provide personnel alarm consisting of a lighted press switch located on an interior wall and adjacent to the door which activates an alarm horn. Division 26 to wire from the alarm to the 12V transformer, run sensor wire into the walk-in space, connect wires on the K.E.C. furnished personnel switch, and connect the output wires to the terminals on the K.E.C. furnished dry contact relay base.

Provide a phone alarm system which will automatically dial a pre-programmed telephone number and sound an alarm tone when the temperature falls below the alarm set-point. The phone alarm with redial the pre-programmed number until the unit is disabled, or if conditions return to normal. K.E.C. mount control unit in a location to be determined by Owner / Architect and provide additional telephone line as necessary. K.E.C. coordinate installation with Division 26 and Security System Contractor. Refer to manufacturer's wiring diagram.

Trim at side walls and closure panels to finished ceiling shall be the same finish as the exterior wall panels. Refer to drawings for details.

Coil supports to be provided in a ceiling panel of each compartment to support the cooling coils. Mounting nuts and bolts shall be non-corrosive. Sleeves through walls for refrigeration lines, electrical lines and drains shall be of extruded vinyl.

Unit cooler evaporator shall be equipped with fan blade guards, aluminum housing and all controls required for operation. Provide a disconnect switch and mount to the rear of the unit. Division 26 wire power to the evaporator through the disconnect switch and from the junction box on the evaporator to the remote temperature thermostat and the solenoid valve with Sealtite conduit. Evaporator fan motors less than 1 horsepower require electronically commutated (EC) or 3 phase design.

Cooler evaporator fan shall be controlled by an inter-lock switch mounted at the door. Fan shall shut down when the door is ajar.

Unit freezer evaporator shall be equipped with fan blade guards, aluminum housing, electric defrost, drain pan heater, timers, thermostats and all components required for proper operation. Provide unit with the following special components and controls: Built-in thermostats and timer to return system to freezing cycle and to delay the start of fan motors after the completion of the defrost cycle, a timer with a stop defrost cycle in the event of thermostat failure. K.E.C. to provide a thermostatically controlled heater tape or internal drainpipe heater for the condensate drain line. Heater to be wired by Division 26 to the freezer coil "hot" terminal (see the mfr's wiring diagram). Division 26 wire from the remote timer located at compressor to the junction box on the freezer coil and from the junction box on the coil to the room

temperature thermostat with Sealtite conduit. Evaporator fan motors less than 1 horsepower require electronically commutated (EC) or 3 phase design.

Freezer evaporator fan shall be controlled by an inter-lock switch mounted at the door. Fan shall shut down when the door is ajar.

Condensate drain lines shall be extended from all coils to the open sight wastes by Division 22. All lines shall be type "L" hard copper using sweat fittings. Division 22 to provide a union fitting directly below the coils to all easy removal of the bottom pan of the coils. Drain lines to be secured to the cooler - freezer walls with 1" corrosion-resistant stand-offs and shall be concealed where possible. The walk-in installer shall punch all holes through cooler / freezer walls and assist Division 22 as to the proper installation of the drain lines. Division 22 to insulate total length of drain piping in both the cooler and freezer with 1" thick closed-cell insulation equal to Rubatex model R-180-FS, RBX, or Owens Corning pipe insulation.

Scroll compressors shall be completely pre-wired to the defrost cycle timers, starters, disconnect switch and other related components which are mounted on the compressor frame. Compressor fan motors less than 1 horsepower shall be required to be electronically commutated (EC), permanent split capacitor (PSC), or 3 phase design. Provide anti-vibration devices and a plastic sign with ¾" high letters stating the refrigerant type and the name of the walk-in which the compressor is refrigerating. Refrigerant to be R448A or similar HFC type. Provide with crank case heaters and reverse acting pressure controls.

Compressor shall be enclosed in an RDM Products PSE Series, Kool-Star, or Heatcraft all-weather outdoor housing, constructed of a galvanized steel frame and an exterior skin of anodized aluminum. Provide hinged and lockable louvered access doors with padlock and a removable top. Housing shall be painted in a custom color as selected by the Architect.

Enclose compressor rack with metal framed expanded metal panels. Front side panels shall be removable for service.

Compressors shall be mounted on a painted steel floor mounted angle iron rack.

Provide the following coils and compressors:

Room	Evap. Temp.
COOLER	+25
FREEZER	- 20

ITEM NO. 4 - SHELF UNIT, MOBILE
QUANTITY - EIGHTEEN
MFG. AND MODEL: METROMAXQ

Shelf unit shall be constructed of reinforced polymers with continuous glass fibers and thermoset resin composite. Exterior surfaces shall be hi-impact thermoplastic resin. Shelves shall be adjustable along the height of the posts. Shelf mats shall be open grid style and totally removable with out the use of tools. Posts shall be mounted on 5" dia. casters two equipped with brakes and revolving donut type bumpers. Each unit shall consist of four (4) 63" high posts and four (4) shelves.

ITEM NO. 5 - HIGH DENSITY SHELF SYSTEM
QUANTITY - ONE SET
MFG. AND MODEL: METROMAXi TOP-TRACK SYSTEM

Shelf unit shall be constructed of reinforced polymers with continuous glass fibers and thermoset resin composite. Exterior surfaces shall be hi-impact thermoplastic resin. Posts shall be adjustable along the height of the posts. A pointer in the window of the shelf wedge lock connector determines the height of

each shelf. Provide posts with donut type bumpers and mount on a 5" dia. rigid casters. Shelf mats shall be open grid style and totally removable with out the use of tools. Each unit shall consist of four (4) 86" posts and five (5) shelves.

ITEM NO. 6 - SHELF UNIT
QUANTITY - FOUR
MFG. AND MODEL: METROMAXi

Shelf unit shall be constructed of reinforced polymers with continuous glass fibers and thermoset resin composite. Exterior surfaces shall be hi-impact thermoplastic resin. Shelves shall be adjustable along the height of the posts. Shelf mats shall be open grid style and totally removable with out the use of tools. Posts shall be mounted on a leveling foot. Each unit shall consist of four (4) 86" posts and five (5) shelves.

ITEM NO. 7 - DUNNAGE PLATFORM, FIXED
QUANTITY - ONE
MFG. AND MODEL: METRO HP2248PD

Dunnage platform shall be the size as shown on the drawings and constructed of double wall one piece seamless polyethylene construction and include built-in Microban® antimicrobial product protection.

ITEM NO. 8 - CLOTHES WASHER
QUANTITY - ONE
ELEC. REQ'M'TS: 120-1

Not in Kitchen Equipment Contract. Unit to be furnished and installed by the Owner.

ITEM NO. 9 - CLOTHES DRYER
QUANTITY - ONE
ELEC. REQ'M'TS: 120/208-1

Not in Kitchen Equipment Contract. Unit to be furnished and installed by the Owner.

ITEM NO. 10 - SPARE NUMBER

ITEM NO. 11 - WALL CABINET
QUANTITY - THREE
MFG. AND MODEL: CONOVER CUSTOM FABRICATION

Wall cabinets shall be the size and shape as shown on the drawings and mounted on wall secure and sealed. Top of wall cabinet shall be mounted 80" above the finished floor. Equip cabinets with door pulls, locks and a sloping dust cover matching the exterior finish of the cabinets extending the full length of the cabinets and fillers.

ITEM NO. 12 - HAND SINK
QUANTITY - THREE

Not in Kitchen Equipment Contract. Unit to be furnished and installed by Division 22.

ITEM NO. 13 - DISPOSER
QUANTITY - ONE
MFG. AND MODEL: IN SINK ERATOR SS-200 / AS-101
ELEC. REQ'M'TS: 480-3

Provide disposer with removable safety baffle, stainless steel cone welded to the table top and a control assembly attached to the underside of the table top. Mount disposer, cone and control assembly in accordance with manufacturer's instructions. The furnishing and installation of all piping and wiring and the installation of all related components furnished with the disposer shall be the responsibility of Divisions 22 and 26. Refer to disposer piping diagram for method of installation.

Control assembly shall consist of a NEMA 4 stainless steel watertight control box, automatic reversing magnetic contactors, 24 volt solid state control circuit with transformer, optional timed run or continuous run, post water flush with adjustable timer set for 30 seconds, water tight start-stop buttons, solenoid valves, three-year warranty, disposer load sensor, and a line disconnect switch interlocked with cover.

Control assembly shall consist of a NEMA 4 watertight control box, magnetic contactor, flow interlock switch, quick opening valves, and a quick disconnect. Control assembly shall be designed for "water to start" operation. Provide a T & S Brass Model 455 or 456 vacuum breaker assembly and flow control valves as required.

ITEM NO. 14 - VEGETABLE PREP TABLE
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM STAINLESS

Top shall be the size and shape as shown on the drawings, constructed of 14 gauge stainless steel and reinforced on the underside with 12 gauge stainless steel channels. Sound deaden the underside. Openings in the top shall be die stamped and completely finished. Field joints shall be welded, ground and polished smooth. Backsplash to be provided along wall sides and sealed thereto with silicone.

Sink compartments shall be the size and shape as shown, constructed of 14 gauge stainless steel and made as an integral part of the top. Crease bottom of sink bowl and pitch to the drain. Provide a T & S Brass model B-0231-CR faucet assembly with B-199-2-F-12 aerator, and a CHG DSS-8000 lever waste assembly or T&S Brass model B-3990-3X modular push-pull waste valve.

Cut out the top and weld the cone sink of the disposer thereto. Adjacent to the disposer provide a stainless steel bracket for mounting the disposer controls. Above disposer provide a pre-rinse assembly which is hereinafter specified.

Provide a T & S Brass model B-0133-12CRB8TP, Fisher, or Chicago DuraPull pre-rinse assembly equipped with an 8” wall mount workboard faucet, polished chrome plated brass body and escutcheon, add-on faucet with compression cartridge with spring check and lever handle, 12” swing nozzle with stream regulator outlet, compression cartridges with spring checks, lever handles, in-line vacuum breaker, quick-disconnect assembly, EB-0107 spray valve, B-0108 Jet Spray valve, ½" NPT male inlets, 6” adjustable wall bracket, spray valve holder, and an overhead spring. Unit shall be certified to ASME, NSF, and DOE 2019 compliant.

Stationary undershelf shall be constructed of 16 gauge stainless steel. Shelf shall be fully welded to legs with weld ground and polished to blend with the adjacent surfaces.

Crossrails shall be 1" diameter × 16 gauge stainless steel tubing. Crossrails shall be fully welded to legs and ground and polished to blend with adjacent surfaces. Omit the crossrails where shown to allow space for carts.

Legs shall be constructed of 1⅝" diameter × 16 gauge stainless steel tubing equipped with stainless steel gussets and stainless steel adjustable bullet type feet.

ITEM NO. 15 – ICE MACHINE
QUANTITY - ONE
MFG. AND MODEL: MANATOWOC IYF0300A / D400
ELEC. REQ'M'TS: 120-1

Provide ice maker with an automatic ice maker shut down device to cut off production when the bin is full. Provide vacuum breaker on incoming water line to the ice maker. Refrigeration system shall be self contained and air cooled. Ice maker shall be complete with an ice storage bin the same finish as the ice maker unit. Provide unit with water filter system with spun polypropylene pre-filtration, spun polypropylene post filter, with food grade phosphate scale inhibitor crystals and a food grade activated carbon filter, cord and plug set and standard 6" high adjustable legs.

ITEM NO. 16 - SLICER
QUANTITY - ONE
MFG. AND MODEL: HOBART HS7
ELEC. REQ'M'TS: 120-1

Provide unit with 13” CleanCut™ knife, removable ring guard cover, zero knife exposure, heavy-gauge stainless steel knife cover, removable knife, top-mounted borazon stone sharpener operation, 1⁄2 HP knife drive motor, timing belt for automatic drive system, variable four-speed automatic carriage with front mounted controls, three stroke lengths interlocks, home-start position, no-volt release housing and base, burnished aluminum base, machine grooves on gauge plate and knife cover, exclusive tilting, removable carriage system, electroless nickel plated single slide rod with reservoir wick in transport, double-action indexing cam, manual lift handle, ergonomic-style handle, rear-mounted, removable meat/vegetable grip arm, and a cord and plug set. Provide the following optional accessories: low fence, food chute, slaw tray, debris deflector,

ITEM NO. 17 - SLICER TABLE, MOBILE
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM FABRICATION

Table shall be the size as shown on the drawings, x 28" high with top constructed of 14 ga. SS. Provide turn down edge on all sides, bullnose corners and sound deaden. Mount table on 1-5/8" dia. legs equipped with SS gussets, 16 ga. SS undershelf and 5" dia. casters, two equipped with brakes. Legs shall be constructed of 16 ga. SS.

ITEM NO. 18 - ISLAND WORK TABLE
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM FABRICATION
ELEC. REQ'M'TS: 120V-1

Top shall be the size and shape as shown on the drawings, constructed of 14 ga. SS and reinforced on the underside with 12 ga. steel channels. Sound deaden the underside. Openings in the top shall be die stamped and completely finished.

Sink compartment shall be the size and shape as shown, constructed of 14 ga. SS and made as an integral part of the top. Crease bottom of sink bowl and pitch to the drain.

Directly behind the sink provide an integral full length, fully enclosed SS utility riser extending from a 6" high integral formed curb on the table top to a point 6" above the finished ceiling. Equip chase with a full height access panel along one side starting at a point 12" above the table surface and terminating at a point 6" below the finished ceiling. Attach riser to the curb on the table top with concealed fasteners and seal around juncture with silicone.

Cabinet below sink shall be enclosed on the back and ends. Front to be equipped with a hinged door with friction catch and SS die stamped pull. Back or bottom shall be neatly cut out to allow for utilities.

Provide (3), three tier drawers. Cabinet base enclosing the drawers shall have the back, bottom and ends enclosed.

Doors enclosing cabinet base shall be provided where shown. Doors shall be the same finish as the face of the cabinet body. Refer to drawings for location and type of doors.

Stationary undershelf shall be constructed of 16 ga. SS. Shelf shall be fully welded to legs with weld ground and polished to blend with the adjacent surfaces.

Grounded electrical receptacles shall be provided on the equipment where shown. Receptacles to be complete with outlet box and SS faceplate. Wire the receptacles to a common junction box, ready for final connection by Division 16. Receptacles shall be flush mounted in the cabinet base. Provide three 120 volt duplex receptacles and one 208 volt receptacle.

Legs shall be constructed of 1-5/8" dia. x 16 ga. SS tubing equipped with SS gussets and SS adjustable bullet type feet. Leg gussets shall be fully welded to the top reinforcing channels.

Mount cabinet on 1-5/8" dia. x 16 ga. SS legs equipped with top mounting plate and SS adjustable bullet type feet.

ITEM NO. 19 - CAN OPENER
QUANTITY - ONE
MFG. AND MODEL: EDLUND S11

Can opener shall be equipped with replaceable knife. Mount can opener on table in location to be determined by the Owner.

ITEM NO. 20 - SPARE NUMBER

ITEM NO. 21 - RACK, MOBILE
QUANTITY - THREE
MFG. AND MODEL: CRES COR 207-UA-13A

Provide rack with 5" dia. casters, twelve (12) 18" x 26" wire shelves and eighteen (18) Wearever aluminum 18" x 26" trays, and crossbrace reinforcing rods and vinyl cover.

ITEM NO. 22 - CART, UTILITY
QUANTITY - THREE
MFG. AND MODEL: METRO (2) BC2030-24, (1) BC2030-34

Provide cart with three shelves and or two shelves push handle, and casters.

ITEM NO. 23 - PAN STORAGE CABINET, MOBILE
QUANTITY - ONE
MFG. AND MODEL: CRES COR 100-1841D

Provide cabinet with full height door, edgemount type door latch, and 5" dia. casters.

ITEM NO. 24 - ISLAND WORK TABLE
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM FABRICATION
ELEC. REQ'M'TS: 120V-1, 208V-1

Top shall be the size and shape as shown on the drawings, constructed of 14 ga. SS and reinforced on the underside with 12 ga. steel channels. Sound deaden the underside. Openings in the top shall be die stamped and completely finished.

Sink compartment shall be the size and shape as shown, constructed of 14 ga. SS and made as an integral part of the top. Crease bottom of sink bowl and pitch to the drain.

Directly behind the sink provide an integral full length, fully enclosed SS utility riser extending from a 6" high integral formed curb on the table top to a point 6" above the finished ceiling. Equip chase with a full height access panel along one side starting at a point 12" above the table surface and terminating at a point 6" below the finished ceiling. Attach riser to the curb on the table top with concealed fasteners and seal around juncture with silicone.

Provide a upper stainless steel shelf as shown on plan.

Cabinet below sink shall be enclosed on the back and ends. Front to be equipped with a hinged door with friction catch and SS die stamped pull. Back or bottom shall be neatly cut out to allow for utilities.

Provide (3) three tier drawers. Cabinet base enclosing the drawers shall have the back, bottom and ends enclosed.

Doors enclosing cabinet base shall be provided where shown. Doors shall be the same finish as the face of the cabinet body. Refer to drawings for location and type of doors.

Stationary undershelf shall be constructed of 16 ga. SS. Shelf shall be fully welded to legs with weld ground and polished to blend with the adjacent surfaces.

Grounded electrical receptacles shall be provided on the equipment where shown. Receptacles to be complete with outlet box and SS faceplate. Wire the receptacles to a common junction box, ready for final connection by Division 16. Receptacles shall be flush mounted in the cabinet base. Provide three 120 volt duplex receptacles and one 208 volt receptacles.

Legs shall be constructed of 1-5/8" dia. x 16 ga. SS tubing equipped with SS gussets and SS adjustable bullet type feet. Leg gussets shall be fully welded to the top reinforcing channels.

Mount cabinet on 1-5/8" dia. x 16 ga. SS legs equipped with top mounting plate and SS adjustable bullet type feet.

ITEM NO. 25 - SECTIONIZER
QUANTITY - ONE
MFG. AND MODEL: SUNKIST GROWERS 100

Provide unit with 10 different interchangeable blade cups..

ITEM NO. 26 - WORK TABLE
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM FABRICATION

Top shall be the size and shape as shown on the drawings, constructed of 14 ga. SS and reinforced on the underside with 12 ga. steel channels. Sound deaden the underside.

Provide a tier drawers. Cabinet base enclosing the drawers shall have the back, bottom and ends enclosed.

Doors enclosing cabinet base shall be provided where shown. Doors shall be the same finish as the face of the cabinet body. Refer to drawings for location and type of doors.

Stationary undershelf shall be constructed of 16 ga. SS. Shelf shall be fully welded to legs with weld ground and polished to blend with the adjacent surfaces.

Mount cabinet on 1-5/8" dia. x 16 ga. SS legs equipped with top mounting plate and SS adjustable bullet type feet.

ITEM NO. 27 - MIXER 20 QUART W/ STAND
QUANTITY - ONE
MFG. AND MODEL: HOBART HL-200 / HW-HL2012
ELEC. REQ'M'TS: 120-1

Provide mixer with an "on-off" switch, attachment hub, three speed selector switch, timer and a cord and plug set. Furnish the basic accessory package which includes a stainless steel bowl, "B" flat beater, and "D" wire whip. Provide the following options: splash cover, "P" pastry knife, bowl scraper, ingredient chute.

ITEM NO. 28 - PASS-THRU FOOD WARMER
QUANTITY - TWO
MFG. AND MODEL: TRAULSEN RHF232WP-HHG
ELEC. REQ'M'TS: 120/208-1

Provide food warmer with self-contained heating system with thermostats, thermometer, and cord and plug set.

Doors shall be hinged as indicated on the drawings and equipped with stainless steel hinges, magnetic gasket, pull handle and cylinder lock and two keys.

Doors on "kitchen side" shall be half-size and equipped with glass panel front.

Doors on "serving side" shall be half-size and equipped with glass panel front.

Controls, thermometers, temperature gauges, on-off switches and indicator lights shall be mounted on the "kitchen side" of the cabinet. Exterior shall be stainless steel where exposed.

Interior of unit shall be fitted with universal angle slides in upper portion of compartments and three (3) standard removable shelves in each of the lower compartments.

Mount on 5" diameter casters equipped with top mounting plate and brakes on two casters.

ITEM NO. 29 - COLD FOOD PASS-THRU
QUANTITY - TWO
MFG. AND MODEL: TRAULSEN RHT232WPUT-HHG
ELEC. REQ'M'TS: 120-1

Provide unit with self-contained refrigeration system with compressor, thermometer, automatic condensate evaporator, and cord and plug set.

Doors shall be hinged as indicated on the drawings and equipped with stainless steel hinges, magnetic gasket, pull handle and cylinder lock and two keys.

Doors on "kitchen side" shall be half-size and equipped with glass panel front.

Doors on "serving side" shall be half-size and equipped with glass panel front.

Controls, thermometers, temperature gauges, on-off switches and indicator lights shall be mounted on the "kitchen side" of the cabinet. Exterior shall be stainless steel where exposed.

Interior of unit shall be fitted with universal angle slides in upper portion of compartments and three (3) standard removable shelves in each of the lower compartments.

Mount on 5" diameter casters equipped with top mounting plate and brakes on two casters.

ITEM NO. 30 - SPARE NUMBER

ITEM NO. 31 – BRAISING PAN
QUANTITY - ONE
MFG. AND MODEL: GROEN BPM-40E-TKO
ELEC. REQ'M'TS: 480-3

Provide kettle with all accessories required for operation including an "on-off" switch, indicator light, electronic ignition system, pressure limit control, low water cut-off, pressure gauge, water level gauge, thermostat, junction box, one piece hinged dome cover with condensate ring and a spring actuator, 2" diameter tangent draw-off valve with clear plastic drain hose with hose clamp from the draw-off valve to the floor trough, one (1) solid strainer and one (1) perforated strainer with positive locking device, pan support, one (1) 12" × 20" × 6" steam table pan with integral CHG E18-1822 mini basket drain and clear plastic drain hose, double pantry faucet with stainless steel mounting brackets,

ITEM NO. 32 - FLOOR DRAIN TROUGH
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM FABRICATION

Trough shall be the size and shape as shown on the drawings and constructed of 14 ga. SS. Provide a 2" wide ledge with a 1" turndown so the finished floor can be brought level with the top. Cove all corners on a 3/4" radius and pitch the trough to a SS box pattern waste with removable SS perforated basket and SS strainer cover. Provide bottom of box pattern waste with drain connector sleeves designed so that Division 15 can properly make the final connection. Co-ordinate installation and assist Division 15 in making the final plumbing connection. Assume all responsibility for unit being set square and level. The ledge which the grating rests on shall extend around the perimeter of the pan.

Grating shall be "Corgrate FW60PF" pultruded fiberglass flush top wide flange I beam with yellow grit surface. Cross bars shall be provided on 6" centers. Grating depth shall be 1.0" x 1.5" x 0.6". Width between top flange shall be .90". Grating shall be manufactured by IKG Industries, Harsco Corporation, Nashville, Tn 37224. Grating to be made in easily removable sections, not exceeding 24" in length. The main bearing bars shall run perpendicular to the length of the stainless steel support ledge.

ITEM NO. 33 - CONVECTION STEAMER
QUANTITY - ONE
MFG. AND MODEL: GROEN (2) HY-5GF
ELEC. REQ'M'TS: 120V-1

Pressureless steamer shall be stainless steel double wall construction with insulation between the inner and outer walls. Provide a door activated interlock that automatically shuts off steam to the compartment when the door is opened. Controls shall include a timer selector switch, temperature time delay, indicator lights, solenoid valve, pressure relief valve, vacuum breaker on water lines, and an automatic cold water steam condenser system. Manufacture approved water filter system.

Unit shall be heated by a gas fired generator equipped with an automatic water level control, low water cut-off, water strainer, pressure gauge, water gauge glass, pressure control, safety relief valve, pressure reducing valve, traps and an automatic boiler drain and cold water condenser, safety pilot, vacuum breaker on water lines, and 62,000 BTU burner. Mount on SS legs equipped with SS adjustable feet.

ITEM NO. 34 – CAN OPENER (not shown on plan)
QUANTITY - ONE
MFG. AND MODEL: EDLUND 270
ELEC. REQ'M'TS: 120V-1

Can opener shall be equipped with spring loaded replaceable knife and gear, stainless steel housing and cord and plug set.

ITEM NO. 35 – COMBI OVEN
QUANTITY - ONE
MFG. AND MODEL: RATIONAL PLUS 102E
ELEC. REQ'M'TS: 480V3

Provide unit with steam, hot air or combination of both operating modes. Unit shall include mode selector for cooking modes, separate controls for temperature, core temperature and time settings. LED display. Provide stainless steel removable pan racks. Exterior finish shall be SS.

Provide installation kit for 480V3ph, box each of cleaner tables and rinse tabs, mobile stand, USB data memory stick. pressure spray bottle, a hose with spray nozzle and retaining hook, water pressure regulator, manufacture approved water treatment system, and manufacturers stand and casters. Full complement of frying wire racks. Provide manufacture approved water treatment system for unit.

ITEM NO. 36 - CONVECTION OVEN
QUANTITY - ONE
MFG. AND MODEL: SOUTH BEND ES/20SC
ELEC. REQ'M'TS: 480V3

Provide with stainless steel french type lockable hinged doors, gas pressure regulator, manual gas shut-off, gas burners assembly, automatic thermal overload protection, "on-off" switch, blower motor with switch, indicator lights, door interlock switch, draft diverter, interior compartment lights with switch, electronic ignition system, solid state temperature control system with one hour timer, electric buzzer working in conjunction with a timer, glass vision panels in doors, and a two speed fan motor. Interior finish shall be porcelain enamel and equipped with five (5) pan racks for each compartment. Exterior finish shall be stainless steel. Mount on 5" diameter casters, two equipped with brakes.

ITEM NO. 37 - COOKING VENTILATION SYSTEM
QUANTITY - ONE
MFG. AND MODEL: MASTER AIR
ELEC. REQ'M'TS: 120-1 AND 480-3

Provide ventilation system meeting all the requirements of NFPA 96, U.L., bear the NSF No. 908 seal and equipped with exhaust hood, roof top exhaust fan unit, roof top make up air supply unit, furnace, fire control system, connecting ductwork, roof curbs, start-up, balance, and service.

The furnishing and installation of the complete ventilation package shall be the responsibility of the hood manufacturer.

Per International Mechanical Code (IMC 507.2.1.1), a control system shall be provided to start the exhaust system when cooking appliances are turned on. This shall be accomplished with the use of temperature sensors mounted in the exhaust hood collars. The temperature sensors shall be connected to a temperature controller with a digital display. The temperature controller shall be provided with a locking adjustable set point, and a digital readout, indicating duct temperature. When cooking appliances

are turned on, the temperature sensors shall read the duct temperature increase and signal a relay. The relay shall close the motor starter coil circuits and actuate the fans. A stop button shall be used to turn the system off. Division 26 provide wiring from the temperature controller relay to the motor starter coil terminals.

Provide exhaust hood with all hanging devices and support steel as required to complete the installation and hang the hood. Grease filter frame to be stainless steel and equipped with a built in pitch to drain to a stainless steel removable catch pan. Duct collars with fusible link actuated fire dampers shall be provided if required by U.L. listing requirements and/or local code requirements.

Hood interior shall be constructed of stainless steel.

Exterior face of hood shall be stainless steel.

Above body of canopy provide a bulkhead to enclose the area from the top of hood to the finished ceiling. Bulkhead shall be constructed of same material as the exterior finish of the hood body.

Grease extractors to be the baffle type, UL listed and constructed of stainless steel. Provide stainless steel blank off panels as required.

Condensate baffles shall be located above the steam producing equipment, constructed of stainless steel and slanted and louvered. Provide with drain trough and condensate receptacle.

Ceiling discharge make up air plenum to be provided at ceiling along the full length of the hood fronts. Plenum to include perforated air baffles and adjustable louvers to provide for even air distribution. Plenums to be constructed of steel with off white finish.

Provide Component Hardware Flame Gard® L82-1040-22 light fixtures. Fixtures shall extend the full length of hood and equipped with rapid start ballasts. Fixtures shall be two (2) tube vapor proof fixtures completely sealed and gasketed, equipped with fluorescent tubes and glass shields. Wire fixtures to a common junction box and switch. Wiring for fixtures to be concealed in a wire chase. Chase to extend the full length of hood on all sides and equipped with removable stainless steel covers on outside of hood body. Fixture to provide approximately 90 foot candles of light on the cooking surface.

The hood manufacturer to provide the light switch and fan control switches to the raceway manufacturer for installation in the raceway riser.

Provide provisions for mounting the Utility Raceway System which is specified as another item of equipment. Verify with the raceway manufacturer for mounting requirements and details.

Provide (1) Loren Cook Model **CPV centrifugal blower of the belt driven type and single width-single inlet. Blower and power assembly to be constructed of steel. All seams shall be continuously welded and leak-proof. Blower wheel shall be backwardly inclined, flat blade type and constructed of non-sparking aluminum. Bearings to be grease lubricated, anti-friction ball, pillow block type. Drives shall be designed for 165% of rated horsepower, connected with oil resistant non-static belts. Fan unit to include inlet companion flange, drain at lowest point of the scroll, access door for maintenance, disconnect switch, and weather cover. Fan discharge to be top horizontal. Exterior surfaces to be painted factory standard gray enamel. Provide vibration isolators on all fan units.

Provide upblast roof mounted exhaust fan with disconnect switch, bird screen and the necessary controls required for operation.

Supply fan to be equipped with enameled exterior body, blower with sealed bearings, adjustable drive sheave and motor base plate, open drip proof motor, factory wired disconnect switch, intake shroud with washable aluminum filters. Combination volume/fire damper to be mounted in unit make up air outlet. Damper to be motorized and interwired with kitchen hood fire protection system micro switch. Damper to close when unit is turned off to prevent outside air infiltrating into building. Damper will close shutting off

make up air into the kitchen during normal operation if actuated by fire system micro switch or dampers fusible linkage. Provide unit with extended air intake shroud with mesh filter if required by codes.

Provide model DFPN direct gas-fired make up air furnace installed as an integral part of the fan system. Furnace shall be factory assembled, tested and adjusted for operation conditions as shown on the plans. Cabinet enclosing the furnace shall be constructed of 18 gauge steel and painted with enamel. Cabinet to be provided with a lift out door with stainless steel handle. Outside air shroud to fit without modification on the intake end of gas furnace cabinet. Air pressure drop through furnace shall be adjustable with pre-drilled baffle plates to maintain pressure drop between 0.4" and 0.55" water column. Provide furnace with spark ignition system, Maxitrol electronic control system, gas pressure regulators and all controls and accessories required for proper operation. Provide a temperature sensing device in the make-up air plenum.

The furnishing and installation of ducts shall be the responsibility of the hood manufacturer.

Exhaust ducts to be constructed of 16 gauge black iron steel with continuous liquid tight external welds. Provide cleanouts as required.

Supply duct to be constructed of steel in the gauge as required by ASHRAE. Make up air ducts shall be per SMACNA low pressure standards and internally insulated.

Supplier of ductwork to provide two-hour rated exhaust duct wrap. Wrap to be dual layer uncompressed insulation banded to the duct with stainless steel banding strips. The duct wrap system to be installed in strict accordance with the ASTM E 2336.

Factory authorized agency to start-up, balance system, and perform a capture and containment test. Test to be verified by simulated cooking utilizing smoke candles, smoke puffers, or other approved means. Submit balance report and test results, and provide one (1) year free service with two (2) on-site inspections.

RELATED RESPONSIBILITIES BY OTHER TRADES
The following lists the responsibility of work:

Ducts and hangers:	Section 11 40 00
Wiring of electrical components:	Section 26
Drain line and water supply:	Section 22

ITEM NO. 38 - UTILITY RACEWAY
QUANTITY - ONE
MFG. AND MODEL: AVTEC EIDG
ELEC. REQ'M'TS: 120/480-3

Utility raceway shall be manufactured in accordance with the latest editions of NEC, NEMA, NFPA ASME and OSHA and shall incorporate UL listed and AGA certified components. Raceway shall be shipped from the factory in the longest section possible. The raceway manufacturer shall provide a supervisor for on-site inspection and testing of system upon completion of the installation. The wiring and piping of all field joints shall be the responsibility of Division 22 and Division 26.

Raceway shall be mounted from the building ceiling thru the ventilator and equipped with floor pedestals.

Mechanical compartment shall be isolated from electrical compartment. All piping shall be color coded. Provide the following mechanical components:

Ball type shut-off valves for all incoming services.

Gas hoses shall be T&S HG-4-S Safe-T-Link™ series gas connector kit with flexible gas line,

Water line piping shall be type "L" copper tubing with soldered fittings. Cover water lines with thermal closed cell insulation.

Gas piping shall be black iron pipe with welded threadolets to branch connections and drip tee in service riser. Provide ball type shut-off valves for each individual item of equipment.

Provide a remote electric gas solenoid valve equipped with a delay circuit to eliminate instantaneous power interruptions. System shall be complete with solenoid valve, delay circuit and reset button. The reset to be equipped with delay, warning light solid state whistle all mounted in the raceway control center. Division 26 to wire from fire fuel shut-off system to building alarm system and from the reset station to the remote valve. Division 22 to provide a gas line loop and install the gas valve in the main gas line prior servicing the raceway.

Electrical compartment shall be completely enclosed, accessible by removable of concealed screws. Internal electrical main feeder shall be bus bar type having balanced load and phases. Bus bar shall be manufacturer from 100% copper and mounted on non-conductive insulators, equipped with connection lugs for individual breakers.

Provide 16 gauge stainless steel breaker plate for each electrical connection equipped with circuit breaker and LED status indicators, tri-color, all mounted in riser. On each breaker plate provide U.L. listed ground fault equipment protection device. GFEP shall be U.L. listed 24 volt, power sensitive type with test button for any voltage, amperage or phase. Connected equipment, developing an internal current leakage to ground, or power supply, will be automatically disconnected from its power source without affecting the operation of any other connected equipment. System shall sense field current of all phases. System shall not depend on ground wire connection to function.

Branch circuit wiring for each electrical connection plate shall be phase identified and sized in accordance with circuit breaker rated ampacity. Provide stainless steel connection plate for each electrical connection equipped with grounding type receptacle having specific NEMA polarized configuration, and metallic label with permanently lettered electrical characteristics.

Individual branch connection plates shall be spaced on 12" centers and readily interchangeable by maintenance personnel to facilitate changes. Provide quick-connect and quick disconnect means of separating each ground fault device, fire-fuel shut-off and all control wiring from the distribution system to facilitate changing of connection plates.

Field joints for each branch circuit wiring shall be connected by wiring between insulated terminal strips. Terminal strips and branch wiring shall be numbered to simplify connections.

Provide matching power supply cords and/or pre-wired flexible conduit with 120 volt and 250 volt cord sets over 60 amperes, and all 480 volt cord sets being shielded and not arcing type. Include braided stainless steel restrainer.

Control tower at one end to include: duplex receptacle, shunt type circuit breaker, main electrical breaker, individual branch circuit breakers, test for ground fault protection, manual fuel reset station with delay, warning lights, solid state alarm and main electrical disconnect.

Provide illuminated fan control switch flush mounted in the vertical riser. Wiring from the switch to the fans shall be the responsibility of Division 26.

Ventilator light switch shall be flush mounted in the raceway control tower. Wiring from the switch to the junction boxes on the ventilator shall be the responsibility of Division 26.

Provide illuminated supply air heat/cool switch showing cool air, non-tempered air and hot air. Wiring from the switch to air make up unit shall be the responsibility of Division 26.

ITEM NO. 39 – SPARE NUMBER

ITEM NO. 40 – SPARE NUMBER

ITEM NO. 41 – HOT WATER DISPENSER
QUANTITY - ONE
MFG. AND MODEL: HATCO AWD-12
ELEC. REQ'M'TS: 208V-1

Hot water dispenser shall be mounted to in accordance with the manufacturers instructions. Dispenser shall be capable of delivering a minimum of 18 gallons of water per hour. Provide temperature adjustment, tank assembly, wall mounting bracket and a cord and plug set.

ITEM NO. 42 - HOT FOOD CABINET
QUANTITY – TWO
MFG. AND MODEL: CRESCOR CO151-FUA-12DE
ELEC. REQ'M'TS: 208V1

Provide unit with stainless interior, universal removable shelves and a cord and plug.

ITEM NO. 43 - BACK COUNTER
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM STAINLESS
ELEC. REQ'M'TS: 120-1

Top shall be the size and shape as shown on the drawings, constructed of 14 gauge stainless steel and reinforced on the underside with 12 gauge steel channels. Sound deaden the underside. Openings in the top shall be die stamped and completely finished. Backsplash to be provided along wall sides and sealed thereto.

Cabinet base shall be located below the top as shown on the drawings and constructed of 16 gauge stainless steel with all seams welded and ground to a smooth finish.

Provide a tier of three (3) drawers. Cabinet base enclosing the drawers shall have the back, bottom and ends enclosed.

Hinged doors enclosing cabinet base shall be provided where shown. Doors shall be the same finish as the face of the cabinet body. Provide door with CHG M27-2490, FMP, or Kason spring catch, door locks, and CHG P63-1012, FMP, or Kason die-stamped pull.

Bottom and intermediate shelves shall be constructed of 16 gauge stainless steel with front edge turned down 1-½" and back ½" at a 45º angle. Turn back and sides up 1-½" and seal to the cabinet body.

Ground Fault Interruptible electrical receptacles shall be provided on the equipment where shown. Receptacles to be complete with outlet box and stainless steel faceplate. Wire the receptacles to a common junction box, ready for final connection by Division 26. Receptacles shall be flush mounted in the cabinet base.
Provide one (1) GFI 120 volt duplex receptacles.

Mount cabinet on 1⅝" diameter × 16 gauge stainless steel legs equipped with top mounting plate and stainless steel adjustable bullet type feet.

ITEM NO. 44 - TRAY DISPENSER
QUANTITY - TWO
MFG. AND MODEL: LEVELMATIC MOT2-1014

Provide dispenser with self-leveling mechanism, 4" dia. casters, two equipped with brakes, SS top flange and ss silverware unit which sit on top with silverware basket inserts
Verify with Owner the exact size and type of tray to be dispensed.

ITEM NO. 45 - HOT FOOD MODULE, MOBILE - CUSTOM- 34" H
QUANTITY - ONE
MFG. AND MODEL: COLORPOINT FE5-CPA-M / PMG TM2N-A
ELEC. REQ'M'TS: 208V-1

Top shall be the size and shape as shown on the drawing, constructed of 14 ga. stainless steel with mirror finished rims.

Provide two (2) 8" wide stainless steel shelf flush with counter top mounted on stainless steel fold down brackets.

Provide unit with standard wattage recessed hot food wells. Provide unit interlocking device, and a cord and angled plug set.

Drains shall be manifold and extended below the cabinet base. Provide an easily accessible ball valve. Top shall be mounted on a fiberglass base locked enclosure in custom color to be selected.

Enclosure shall be equipped with full length SS bottom shelf. Mount unit on 5" diameter casters two equipped with brakes.

Above counter top where shown provide a straight glass front food protector with angled brackets for self serve and the option of not self serve with 3/8” glass top shelf and glass end enclosures. Uprights hasll have brushed #4 finish. Unit shall span without center support.

ITEM NO. 46 - FIRE CONTROL SYSTEM
QUANTITY - ONE
MFG. AND MODEL: ANSUL R-102
ELEC. REQ'M'TS: 120-1

Fire control system shall be designed and installed to conform with the latest editions of the National Fire Protection Association Standards, Underwriters Laboratories UL-300 standard and the local and state authorities having jurisdiction. System shall be approved by the State Fire Marshal and/or State Rating Bureau.

Fire extinguishing nozzles shall be provided in all ducts, plenum chambers and in or above all surfaces of equipment which poses a potential fire hazard. System shall be installed complete with filled and chemical cylinders, chemical piping, gauges, mounting brackets, trip mechanism, nozzles, fusible link housings, special fittings, manual and integral release, stainless steel cable, cornering boxes, and fusible links. Chemical tanks shall be activated by a remote manually operated pull station located near the exit and working in conjunction with the fusible links located within the hood. Centerline of pull station box to be mounted 48” above finished floor.

All piping and conduit shall be concealed where possible. All exposed piping, fittings and conduit shall be encased in a chrome plated sleeve or the piping and fittings shall be individually chromed. All piping shall be installed in an absolute vertical and horizontal plain. All changes in direction of piping must be made by a Venturi or a 90 degree elbow.

Provide a micro switch at the chemical tank location with contacts "open" under fire condition. Division 26 to wire from the micro switch to the following:

to the holding coil of hood exhaust fan to turn fan on in the event of a fire.

to the building fire alarm panel alarm circuit.

to the motorized fire damper in the supply air fan system.

to the electrically operated automatic gas shut off valve and reset,

to the fire safety control shut off devices which are specified as a part of the utility raceway,

to fuel and power shut down devices.

An electronic gas shut off valve to be provided with this system and valve shall be installed in the gas line by Division 22. Division 26 furnish control wiring as required.

Division 26 provide U.L. listed industrial type power contactors, shunt trips with 120 volt holding coils with contact ratings matching the cooking equipment to be shut down in the event of a fire.

K.E.C. to submit fire protection information with the ventilation hood submittals. Information to include the following:

- Identify the location of the manual fire pull station in a scaled floor plan. The location of the suppression tanks to be indicated in the submittal as required.
- Identify each piece of existing equipment located under the new kitchen hood. Identify if equipment is gas or electric.
- Submit a drawing complete with fire suppression piping layout locating the drops.

Install the fire control system chemical tanks and components in an enclosed cabinet mounted on one end of the range hood. Cabinet shall be constructed of 16 gauge. steel matching the exterior fascia of the hood. Front of cabinet to be equipped with a hinged double panel door with latches and pull.

ITEM NO. 47 - COLD FOOD MODULE, MOBILE 34"H
QUANTITY - TWO
MFG. AND MODEL: COLORPOINT 50-CFMAX / PMG TM2N-A
ELEC. REQ'M'TS: 120V-1

Top shall be the size and shape as shown on the drawing, constructed of 14 ga. stainless steel with mirror finished rims. Provide one (1) 8" wide stainless steel shelf flush with counter top mounted on stainless steel fold down brackets.

Provide unit with mechanically refrigerated cold pan (meeting requirements of NSF standard no. 7) equipped with self contained refrigeration system complete with on-off switch and drain, unit interlocking device, and a cord and plug set.

Drain line to extend below the cabinet base. Provide an easily accessible ball valve. Top shall be mounted on a fiberglass base enclosure in custom color to be selected. Enclosure shall be equipped with hinged doors, full length SS bottom shelf. Mount unit on 5" diameter casters two equipped with brakes.

Above counter top where shown provide a straight glass front food protector with angled brackets for self serve and the option of not self serve with 3/8” glass top shelf and glass end enclosures. Uprights hasll have brushed #4 finish. Unit shall span without center support.

ITEM NO. 48 – FROST TOP MODULE, MOBILE 34"H
QUANTITY - ONE
MFG. AND MODEL: COLORPOINT 50-CFT / PMG TM2N-A
ELEC. REQ'M'TS: 120V-1

Top shall be the size and shape as shown on the drawing, constructed of 14 ga. stainless steel with mirror finished rims. Provide one (1) 8" wide stainless steel shelf flush with counter top mounted on stainless steel fold down brackets.

Provide unit with mechanically refrigerated cold pan (meeting requirements of NSF standard no. 7) equipped with self contained refrigeration system complete with on-off switch and drain, unit interlocking device, and a cord and plug set.

Drain line to extend below the cabinet base. Provide an easily accessible ball valve. Top shall be mounted on a fiberglass base enclosure in custom color to be selected. Enclosure shall be equipped with hinged doors, full length SS bottom shelf. Mount unit on 5" diameter casters two equipped with brakes.

Above counter top where shown provide a straight glass front food protector with angled brackets for self serve and the option of not self serve with 3/8” glass top shelf and glass end enclosures. Uprights hasll have brushed #4 finish. Unit shall span without center support.

ITEM NO. 49 - UTILITY MODULE, MOBILE 34" H
QUANTITY - ONE
MFG. AND MODEL: COLORPOINT 50-ST
ELEC. REQ'M'TS: 120V-1

Top shall be the size and shape as shown on the drawing, constructed of 14 ga. stainless steel with mirror finished rims.

Provide one (2) 8" wide stainless steel shelf flush with counter top mounted on stainless steel fold down brackets. Provide unit with unit interlocking device. Top shall be mounted on a fiberglass base enclosure in custom color to be selected. Provide a 16 amp flush mounted receptacle.

Enclosure shall be equipped with hinged doors, full length SS bottom and intermediate shelf. Mount unit on 5" diameter casters two equipped with brakes. Provide one outlet flush in cabinet base.

ITEM NO. 50 - SPARE NUMBER

ITEM NO. 51 - CASHIER MODULE, MOBILE 34"H
QUANTITY - ONE
MFG. AND MODEL: COLORPOINT 28CSE

Top shall be the size and shape as shown on the drawing, constructed of 14 ga. stainless steel with mirror finished rims. Provide two (2) 8" wide stainless steel shelf flush with counter top mounted on stainless steel fold down brackets. Provide unit with unit interlocking device, shelf below and a cash drawer with lock and change insert.

Top shall be mounted on a fiberglass base enclosure in custom color to be selected and equipped with a stainless steel base liner and a 1" dia. foot rest secured to the liner walls. Mount unit on 5" diameter casters two equipped with brakes.

ITEM NO. 52 - CASH HANDLING SYSTEM
QUANTITY - ONE
ELEC. REQ'M'TS: 120-1

Not in Kitchen Equipment Contract. Unit to be furnished and installed by the Owner.

ITEM NO. 53 - CONDIMENT MODULE, MOBILE 34" H
QUANTITY - ONE
MFG. AND MODEL: COLORPOINT 50-ST

Top shall be the size and shape as shown on the drawing, constructed of 14 ga. stainless steel with mirror finished rims.

Provide one (2) 8" wide stainless steel shelf flush with counter top mounted on stainless steel fold down brackets. Provide unit with unit interlocking device. Top shall be mounted on a fiberglass base enclosure in custom color to be selected.

Enclosure shall be equipped with hinged doors, full length SS bottom and intermediate shelf. Mount unit on 5" diameter casters two equipped with brakes. Provide one outlet flush in cabinet base.

ITEM NO. 54 - MILK COOLER, MOBILE
QUANTITY - TWO
MFG. AND MODEL: TRUE TMC-49-HC
ELEC. REQ'M'TS: 120-1

Provide cooler with a self contained refrigeration system. Top and drop front door shall be stainless steel. Mount door on stainless steel hinges and equip with perimeter vinyl gasket and a lock. Provide manufacturers standard casters and an electrical cord and plug set. Cabinet body shall be white acrylic baked enamel finish with cow patter and “got Milk” logo on the exterior and a galvanized steel interior.

ITEM NO. 55 - PAN DRYING RACK
QUANTITY - TWO
MFG. AND MODEL: METROMAX 24X48

Shelf unit shall be constructed of reinforced polymers with continuous glass fibers and thermoset resin composite. Exterior surfaces shall be hi-impact thermoplastic resin. Shelves shall be adjustable along the height of the posts. Shelf mats shall be open grid style and totally removable with out the use of tools. Posts shall be mounted on 5" dia. casters two equipped with brakes and revolving donut type bumpers.
Each unit shall consist of four (4) 74" high posts and four (4) shelves. Provide the following special components with each unit: Rear and side wire closure panels finished in a gray epoxy.

ITEM NO. 56 - SOILED DISHTABLE
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM STAINLESS

Top shall be the size and shape as shown on the drawings, constructed of 14 gauge stainless steel and reinforced on the underside with 12 gauge steel channels. Sound deaden the underside of top. Openings in the top shall be die stamped and completely finished. Field joints shall be welded, ground

and polished smooth. Backsplash to be provided along wall sides and sealed thereto. Turn top down into the washer as per manufacturer's instructions. Extend top through wall and construct as detailed.

Scrap trough shall be welded as an integral part of the dishtable top. Trough shall be constructed of 14 gauge stainless steel and made as an integral part of the dishtable. Bottom to have all corners coved on a ¾" radius and be sloped to the disposer sink. Where trough-intersects the sink weld continuously and grind and polish smooth.

Below table top provide stainless steel support brackets for mounting the disposer control panel and the trough throttling valve. Bracket for disposer panel shall be mounted so the front face of the disposer control panel will not extend out beyond the face of the table.

Provide a disposer sink adapter with a minimum 6" diameter throat opening adapter for mounting the disposer to the underside of sink compartment. Adjacent to disposer provide a stainless steel bracket for mounting the disposer controls.

Sink compartment shall be the size and shape as shown, constructed of 14 gauge stainless steel and made as an integral part of the top. Crease bottom of sink bowl and pitch to the drain. Provide a T & S Brass model B-0231-CR faucet assembly with B-199-2-F-12 aerator, and a CHG DSS-8000 lever waste assembly or T&S Brass model B-3990-3X modular push-pull waste valve.

Provide 14 gauge stainless steel horizontal blocking on the inside of the riser to provide support for the wall bracket that is specified with the pre-rinse assembly.

Provide a T & S Brass model B-0133-CRB8TP, Fisher, or Chicago DuraPull pre-rinse assembly equipped with an 8" wall mount workboard faucet, polished chrome plated brass body and escutcheon, compression cartridges with spring checks, lever handles, in-line vacuum breaker, quick-disconnect assembly, EB-0107 spray valve, B-0108 Jet Spray valve, ½" NPT male inlets, 6" adjustable wall bracket, spray valve holder, and an overhead spring. Unit shall be certified to ASME, NSF, and DOE 2019 compliant.

End of trough opposite the disposer shall be fitted with a custom stainless steel fully welded trough nozzle equipped with a ¾" water inlet. Water supplying the inlet shall be controlled thru a ¾" diameter ball type throttling valve complete with a ¾" chrome plated vacuum breaker assembly. Below table top provide stainless steel support brackets for mounting the disposer control panel and the trough throttling valve. Bracket for disposer panel shall be mounted so the front face of the disposer control panel will not extend out beyond the face of the table. Directly above the disposer throat opening and flush with the dishtable top surface provide a removable solid stainless steel cover.

Cut out top and weld a stainless steel disposer cone thereto. Cone sink shall serve as a scrap chute. Cone sink shall be 15" diameter.

Stationary undershelf shall be constructed of 16 gauge stainless steel. Shelf shall be fully welded to legs with weld ground and polished to blend with the adjacent surfaces.

Crossrails shall be 1" diameter × 16 gauge stainless steel tubing. Crossrails shall be fully welded to legs and ground and polished to blend with adjacent surfaces. Omit the crossrails where shown.

Legs shall be constructed of 1⅝" diameter × 16 gauge stainless steel tubing equipped with stainless steel gussets and stainless steel adjustable bullet type feet.

ITEM NO. 57 – UTENSIL WASHING / CLEAN DISHTABLE
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM STAINLESS

Top shall be the size and shape as shown on the drawings, constructed of 14 gauge stainless steel and reinforced on the underside with 12 gauge steel channels. Sound deaden the underside of top. Field joints shall be welded, ground and polished smooth. Turn top down into the washer as per manufacturer's instructions. Backsplash to be provided along wall sides and sealed thereto.

Limit switch to be provided and located on the end of the table in such a manner as to be tripped by dishracks to turn off the dishwasher when the table is filled with racks. Wire complete to dishwasher starter panel. A rake arm limit switch will not be accepted. Provide limit switch with a 14 gauge stainless steel spring activated pressure plate located in front of the micro-switch and attached to inside of dishtable roll rim with a stainless steel hinge. Enclose the main body of the micro switch with a removable 18 gauge stainless steel housing.

Provide a stainless steel rack guide welded to top where indicated on the drawings.

Sink compartments shall be the size and shape as shown, constructed of 14 gauge stainless steel and made as an integral part of the top. Crease bottom of sink bowl and pitch to the drain.

Provide a Provide a T & S Brass model B-2278-01, Fisher, or Chicago pre-rinse assembly equipped with a B-0107C spray valve with locking ring and heatproof handle, check valves, in-line vacuum breaker, stainless steel flexible hose, and a wall bracket. Pre-rinse assembly to be EPAct 2005 compliant and shall have a flow rate of not more than 1.6 gallons per minute.

Above center partitions of sink bowls and mounted to backsplash, provide T & S Brass model B-0290, Fisher, or Chicago fast flow faucets. Faucet to be equipped with street EL inlets and locknuts. Provide bottom of soak and wash sink bowls with a CHG DSS-8000 lever waste assembly or T&S Brass model B-3990-3X modular push-pull waste valve.

Disposer cone shall be welded and shall appear as an integral part of the top. Below table top provide a stainless steel bracket for mounting the disposer control panel. Bracket shall be mounted so the front face of the control panel will not extend out beyond the face of the table.

Cut out top and weld a stainless steel disposer cone thereto. Cone sink shall serve as a scrap chute. Cone sink shall be 15" diameter.

Stationary undershelf shall be constructed of 16 gauge stainless steel. Shelf shall be fully welded to legs with weld ground and polished to blend with the adjacent surfaces.

Crossrails shall be 1" diameter × 16 gauge stainless steel tubing. Crossrails shall be fully welded to legs and ground and polished to blend with adjacent surfaces. Omit the crossrails where shown.

Legs shall be constructed of 1⅝" diameter × 16 gauge stainless steel tubing equipped with stainless steel gussets and stainless steel adjustable bullet type feet. Leg gussets shall be fully welded to the top reinforcing channels.

ITEM NO. 58 - HOSE REEL
QUANTITY - ONE
MFG. AND MODEL: T & S BRASS B7272-01

Hose reel shall consist of an open s/s retractable hose reel and spray with fifteen (15) feet of heavy duty 3/8" hose, mounting bracket, B-1420 squeeze valve with locking ring, heatproof handle and quick-connect socket assembly, 019652-40 3/8" live swivel, B-1421 spray face nozzle, B-1422 jet spray nozzle, B-1423

fan spray nozzle, B-1428 fan-jet spray nozzle, BR10 brush attachment, (2) B-CVH1-2 ½" check valves, HW-2B-36 flexible connector hose with close nipple, 3/8" NPT quick disconnect, stainless steel braid and extruded coating, B-0963 chrome plated vacuum breaker w/ integral check valve, B-0109-01 wall bracket and a B-0512 chrome plated mixing valve.

Hose reel shall be mounted 90" above the finished floor to the plumbing connections. The mixing valve shall be installed below the table top near the front edge of top. Provide Division 22 with assistance in the proper installation of the hose reel piping.

Division 22 shall pipe from the rough-in to the remote located mixing valves and from the mixing valve with a single tempered water line to the hose reel. Tempered water line to be concealed within the building wall and above the finished ceiling.

ITEM NO. 59 - DISPOSER
QUANTITY - ONE
MFG. AND MODEL: IN SINK ERATOR SS-300 / AS-101
ELEC. REQ'M'TS: 480-3

Provide disposer with a minimum 6" diameter sink mounting assembly kit, removable safety baffle, and a control assembly. Install the disposer in the bottom of the sink in accordance with the manufacturer's instructions. The furnishing and installation of all piping and wiring and the installation of all related components furnished with the disposer shall be the responsibility of Divisions 22 and 26. Refer to disposer piping diagram for method of installation.

Control assembly shall consist of a NEMA 4 stainless steel watertight control box, automatic reversing magnetic contactors, 24 volt solid state control circuit with transformer, optional timed run or continuous run, post water flush with adjustable timer set for 30 seconds, water tight start-stop buttons, solenoid valves, three-year warranty, disposer load sensor, and a line disconnect switch interlocked with cover.

Control assembly shall consist of a NEMA 4 watertight control box, magnetic contactor, flow interlock switch, quick opening valves, and a quick disconnect. Control assembly shall be designed for "water to start" operation. Provide a T & S Brass Model 455 or 456 vacuum breaker assembly and flow control valves as required.

ITEM NO. 60 – SPARE NUMBER

ITEM NO. 61 - RACK TYPE DISHWASHER
QUANTITY - ONE
MFG. AND MODEL: HOBART CL44En-ADV
ELEC. REQ'M'TS: 480-3

Dishwasher shall be a fully automatic rack type conveyor machine equipped with chrome plated vacuum breakers, water pressure reducing valves set at 20 PSIG., Rapid Return Drive™ system, ball detent clutch drive system, anti-jam protection, configurable NSF pot and pan conveyor dwell, configurable de-lime alert, double wall insulated hinged doors with SST and UHMW door seals, Auto-Position™ rinse arms, top mounted digital display, temperature/pressure gauges, line strainers, vent fan control option, wash chamber sized to accommodate 18" × 26" sheet pans, magnetic type motor controllers with thermal overload protection devices for motors and thermostatic temperature controls with low water cut-off devices for heat, two (2) end hoods with all welded 16 gauge stainless steel vent risers with stainless steel ceiling trim extending up 6" above the finished ceiling and stainless steel adjustable feet. The installation of the pressure reducing and pressure regulating valves and vacuum breakers furnished with the machine shall be the responsibility of Division 22.

Tank shall be heated by an electric heating immersion heating element, controlled by an "on-off" switch and thermostat with low water protection.

Provide unit with the following optional accessories: six (6) PEG type plastic dish racks, six (6) COM type combination dish racks, six (6) sheet pan racks for 18" × 26" pans, stainless steel front panel, stainless steel splash guards, automatic fill, 30kw Booster Heater with hot water pressure regulator, a combination temperature pressure gauge on the water inlet, a shock stop in the hot water line, and single point utility connection.

Provide unit with a model DWT-1 drain water tempering system to reduce the drain water below 140º. Tempering system shall consist of two thermostats, one rated at 100º and the other rated at 135º, both wired to a control box. The operation is as follows: When drain water reaches 100º, a solenoid is activated allowing the flow of cold water into the drain system. A red warning light will be activated if the water reaches 135º. The warning light indicates that either the cold water supply is turned off, or the flow rate is too low to cool the water. System shall be installed in a location so that the warning light can be easily viewed by the operator. The tempering system requires a cold water feed and 120 volt single phase electrical service.

ITEM NO. 62 - DISHWASHER END RISER EXHAUST SYSTEM
QUANTITY - ONE
MFG. AND MODEL: MASTER AIR DWR
ELEC. REQ'M'TS: 120-1

Provide two (2) all welded 16 gauge stainless steel vent risers extending straight up from the dishwasher end hoods to a point 6" above the finished ceiling where they shall be connected to a 20 gauge stainless steel fully welded exhaust transition terminating to the exhaust fan on roof. Exhaust transition duct to slope slightly downwards towards the risers to allow condensation to drain from ducts in to the vent risers. Provide a backdraft damper in the duct and stainless steel trim where duct risers extend through the finished ceiling.

Provide one (1) roof mounted exhaust blower of the down blast spun aluminum type. Fan to include disconnect switch and a bird screen.

Roof curb to be consistent with other curbs furnished for this project. Curb to be 18 gauge all welded galvalume construction, internally insulated with rigid fiberglass and foil backing.

Work by other Trades:

Roofer: Roof Curb furnished and installed by K.E.C. and flashed by roofing contractor. Roofing contractor to provide cant if required.

Structural: Frame roof curb opening as required.

Electrical: Division 26 provide power to rooftop unit. Provide wiring and connect from dishwasher control panel to exhaust fan.

HVAC: Provide net room supply air demand as indicated on the drawings. This air volume is required only when the condensate exhaust hood system is in operation.

ITEM NO. 63 – SPARE NUMBER

ITEM NO. 64 – SPARE NUMBER

ITEM NO. 65 – SPARE NUMBER

ITEM NO. 66 - DISPOSER
QUANTITY - ONE
MFG. AND MODEL: IN SINK ERATOR SS-200 / AS-101
ELEC. REQ'M'TS: 480-3

Provide disposer with removable safety baffle, stainless steel cone welded to the table top and a control assembly attached to the underside of the table top. Mount disposer, cone and control assembly in accordance with manufacturer's instructions. The furnishing and installation of all piping and wiring and the installation of all related components furnished with the disposer shall be the responsibility of Divisions 22 and 26. Refer to disposer piping diagram for method of installation.

Control assembly shall consist of a NEMA 4 stainless steel watertight control box, automatic reversing magnetic contactors, 24 volt solid state control circuit with transformer, optional timed run or continuous run, post water flush with adjustable timer set for 30 seconds, water tight start-stop buttons, solenoid valves, three-year warranty, disposer load sensor, and a line disconnect switch interlocked with cover.

Provide a T & S Brass Model 457 or 458 vacuum breaker assembly and flow control valves as required. Control assembly shall consist of a NEMA 4 watertight control box, magnetic contactor, flow interlock switch, quick opening valves, and a quick disconnect. Control assembly shall be designed for "water to start" operation. Provide a T & S Brass Model 455 or 456 vacuum breaker assembly and flow control valves as required.

ITEM NO. 67 - MOP SINK
QUANTITY - ONE

Not in Kitchen Equipment Contract. Unit to be furnished and installed by Division 22.

ITEM NO. 68 - MICRO WAVE
QUANTITY - ONE
MFG. AND MODEL: AMANA MSO5353
ELEC. REQ'M'TS: 208-1

Provide micro-wave oven with cord and plug set, ten (1) power levels, twenty (2) programmable memory pads, timer, drop down door, digital display and interior oven light. Provide each unit with four (4) 10" × 12" × 2.5" deep Cambro model 22HP pans and four (4) model 20HPCH lids.

ITEM NO. 69 – SPARE NUMBER

ITEM NO. 70 – SPARE NUMBER

ITEM NO. 71 - MIXER, 5 QUART
QUANTITY - ONE

MFG. AND MODEL: HOBART N5
ELEC. REQ'M'TS: 120V1

Provide mixer with an "on-off" switch, attachment hub, four speed selector switch, timer, magnetic starter with push button station and thermal overload and low voltage protection and a electrical terminal box. Furnish standard attachments.

ITEM NO. 72 – SS WALL CAP AND UTILITY CHASE
QUANTITY - ONE
MFG. AND MODEL: CONOVER CUSTOM FABRICATION

Provide 16 ga. SS wall cap to cover the top of the dwarf wall. Verify size prior to construction. Wall cap shall be one piece with fully welded seams and exposed edges turned down as shown on the drawings. All corners shall be fully welded, ground and polished smooth. Attach wall caps to the dwarf wall with concealed fasteners. Seal to wall with silicone. Refer to details for construction

Provide a 16 ga. SS utility chase extending up from the top of the dwarf wall to a point 6" above the finished ceiling. Chase to enclose the electrical and mechanical services which drop from above. Chase to be equipped with an angle frame and shall be securely attached to wall and ventilator. Provide an access panel, removable without the use of tools. Seal chase to wall and ventilator with silicone. Chase shall be sized to accommodate the gas line, hot and cold water lines and electrical lines. Verify size prior to fabrication.

END OF SECTION 11 40 00

KITCHEN EQUIPMENT CONTRACTOR'S
WALK-IN INSTALLATION AUTHORIZATION FORM

This form shall be completed and forwarded for approval prior to installation of the Walk-In and accompanying Refrigeration System.

Project: _____ Location: _____

K.E.C.: _____ Proj. Mgr: _____

Walk-In Mfr: _____ Mfr Rep: _____

Name of Authorized Installer: _____

The following shall be completed by the Walk-In Factory Personnel

Installation Factory Authorized by: _____

Position: _____ Signature: _____

Refrigeration System Installed by: _____

Location: _____ Name of Lead Installer: _____

Refrigeration Industry Affiliation(s): _____

Signature of K.E.C. Representative: _____ Date: _____

SECTION 23 09 93 - HVAC SEQUENCE OF OPERATION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Sections included under Division 1, General Requirements, and Section 23 05 00 of this Division are included as a part of this Section as though bound herein.

B. Refer to Division 01 Section “Alternates” that may affect the Work of this Section.

C. Refer to the details and schedules on the Drawings for additional requirements.

D. Refer to specifications for additional requirements.

1.2 SECTION INCLUDES

A. This Section includes the sequences of operation for the HVAC equipment and systems.

B. The Temperature Control Contractor shall read all other Drawings and Specifications, become familiar with requirements and scope of the Project, and include such coordination work as may be required.

C. Sequences of operation shall meet or exceed the requirements of ASHRAE standard 90.1.

1.3 SUBMITTALS

A. Submittals are required and shall include detailed descriptions of the proposed sequence of operations for all HVAC systems specific to the project.

1.4 BUILDING SET POINTS

A. All set points and other variables noted in the sequences are to be adjustable from the web accessible graphical user interface so that the owner does not have to go to the school or open any programming software to change the settings. Access to the adjustable settings shall be password protected and an audit log shall track who made what changes and when they were made.

B. Refer to sequence of operations of individual equipment for set points specific to each designated zone.

Winter Design:

Occupied Mode	**Unoccupied Mode**
70 deg. F	55 deg. F

Summer Design:

Occupied Mode	**Unoccupied Mode**
75 deg. F, 60 percent RH	85 deg. F, 60 percent RH

1.5 SEQUENCE OF OPERATION

A. Energy Recovery Units (ERV-C1, ERV-D1, ERV-E1):
   1. Provide a microprocessor based direct digital control system that shall provide the following:
      a. Direct Digital Controller interface.
      b. Occupied-unoccupied control.
      c. Necessary operating interlocks.

2. Heating Warm-Up
   a. The system shall be disabled.
   b. The supply fan and exhaust fan will not run.
   c. The outside air damper(s), exhaust air bypass, outside air bypass dampers, shall remain closed.
3. Cooling Pull-Down
   a. The system shall be disabled.
   b. The supply fan and exhaust fan will not run.
   c. The outside air damper(s), exhaust air bypass, outside air bypass dampers, shall remain closed.
4. Occupied Cycle
   a. The supply fan shall run continuously. The supply fan variable frequency controller shall be modulated via a signal from the direct digital controller. A duct static pressure signal located near the end of each primary duct run shall send a signal to the direct digital controller, with the lowest pressure driving the controller. The DDC controller shall monitor the fan speed and modulate the VFC accordingly.
   b. Airflow monitoring stations located in the outside air stream shall monitor the quantity of outside air entering the building.
   c. The exhaust fan shall run continuously. Air flow shall be measured using an air flow monitoring station. Provide multiple airflow monitoring stations where required by multiple exhaust air ducts.
5. Unoccupied Cycle
   a. The direct digital controller shall automatically program the unit to the unoccupied control mode.
   b. The unit may be manually placed into full occupied cycle during unoccupied time through the DDC controller for a pre-programmed period of time (adj.).
   c. Upon entering the unoccupied mode, the outside air damper(s) shall be closed, the supply fans and exhaust fans shall not run, outside air bypass damper(s) shall be closed, exhaust air bypass damper(s) shall be closed.
6. Safeties
   a. Provide an automatic software reset safety high limit in the discharge air duct to stop the supply fan and exhaust fan if discharge static pressure goes above 6 inches W.C. (adj.). System shall be capable of being reset through software at the temperature control computer.
   b. Provide individual differential pressure sensing across filters and send alarm to BAS panel requesting filter change. Include independent alarm for each filter bank at each air handling unit. Pre-filters and primary filters shall be monitored independently. Alarms and set-points shall be capable of being reset through software at the temperature control computer.
   c. The system provided must be capable of manually positioning all damper operators, and the cooling and heating valve actuators, if all levels of DDC control fail.
   d. A fan proving device will indicate the fan status for each fan and send an alarm to the central BAS panel indicating fan failure.
   e. Provide a manual reset differential pressure switch in return air and outside air mixing box section to stop supply fan and exhaust fan upon detection of outside air and/or return air control damper failure. Static set point to be adjustable.
   f. Monitor outdoor air inlet temperature, supply air temperature, supply air dewpoint, return air temperature, heat exchanger leaving air temperature (both exhaust and outside), return air humidity and CO2 in addition to all sensors required to meet sequences.
   g. All safeties must be reset prior to fans operating in automatic or hand mode.
7. Monitor outdoor airflow and exhaust airflow.

B. Variable Air Volume Air Handling Units (AHU-A1, A2, A3, A4, C1, D1, E1):
1. Provide a microprocessor based direct digital control system that shall provide the following:
   a. Direct Digital Controller interface.
   b. Occupied-unoccupied control.

c. Necessary operating interlocks.

2. Heating Warm-Up
   a. The system shall be enabled with an optimum start schedule 2 hours maximum (adj.) prior to the start of occupied mode.
   b. The supply fan will run. The heating water valve shall be opened to provide 85 degrees F. (adj.) discharge air temperature.
   c. The outside air damper and outside air dampers shall remain closed until the return air temperature is within the heating mode of control (68 degrees F adj.). The return damper shall be full open.
   d. When the return air temperature reaches 68 degrees F, the unit shall index to standby mode. In standby mode, the unit shall assume the occupied sequence of operation, while the outdoor air damper remains closed. The unit shall remain in standby mode until indexed to occupied mode by the occupied schedule, the outside air damper shall be ramped open and the return air damper shall be ramped closed linearly over a 10 minute (adj.) period to prevent "nuisance" low limit alarms.
   e. VAV terminals shall be started 5 minutes (adj.) prior to start of supply fan.
   f. The VAV reheat controller assumes the occupied mode of operation, reverses the control action of the damper to modulate the air flow between maximum flow and reheat minimum flow values to maintain the zone temperature. The heating valve supplements the warm air available from the air handling unit. When the zone temperature reaches set-point, the system will automatically index to occupied cycle.
3. Cooling Pull-Down
   a. The system shall be enabled with an optimum start schedule 2 hours maximum (adj.) prior to the start of occupied mode.
   b. The supply fan will run.
   c. If the outside air can be used as determined through an enthalpy controlled economizer for cooling pull-down, the outside air damper shall be open during the pull-down cycle. If the outside air enthalpy is such that it cannot be used for cooling pull-down, the outside air damper shall remain closed and the chilled water control valve open until the return air temperature reaches 77 degrees F (adj.). The return damper shall be full open. Chilled water control valve and outside air damper shall modulate to maintain a unit leaving air temperature above 55 degrees F (adj.).
   d. The VVR terminals shall be indexed to full airflow and the associated reheat coils shall be fully closed.
   e. When the return air temperature reaches 77 degrees F (adj.), the unit shall index to standby mode. In standby mode, the unit shall assume the occupied sequence of operation, while the outdoor air damper remains closed. The unit shall remain in standby mode until indexed to occupied mode by the occupied schedule, the outside air damper shall be ramped open and the return air damper shall be ramped closed linearly over a 10 minute (adj.) period to prevent "nuisance" low limit alarms.
4. Occupied Cycle
   a. The supply fan shall run continuously. The supply fan variable frequency controller shall be modulated via a signal from the direct digital controller. A duct static pressure signal located near the end of each primary duct run shall send a signal to the direct digital controller, with the lowest pressure driving the controller. The DDC controller shall monitor the fan speed and modulate the VFC accordingly.
   b. On an increase or decrease in required system air flow, the return air damper shall modulate as necessary to reduce return air flow and maintain the minimum outside air quantities as scheduled on the Drawings. Airflow monitoring stations located in the outside air stream shall monitor the quantity of outside air entering the building. An alarm shall be generated anytime the outside airflow is below the defined minimum outside airflow (adj.). The minimum variable frequency controller set point shall be as required to meet the minimum outside air requirements. At minimum air flow, the outside air damper shall be open and the return air damper shall be closed.

c. Discharge air temperature shall be maintained by staging the cooling and heating water control valve in association with an enthalpy controlled economizer. Discharge air temperature reset shall be employed per the following schedule. The temperature control system to determine critical space via a calculation as follows:

$$CoolingDemand\% = \frac{(actual_flow_rate - \min imum_flow_rate)}{(\max imum_flow_rate - \min imum_flow_rate)} * 100$$

1) DAT is 55 deg F (adj.). When the critical zone cooling demand is 50%, the SAT is 62 deg F (adj.). When the critical zone cooling demand is 100%, supply air temperature (SAT)
2) Control system to evaluate every 5 minutes (adj). If any zone is above 90% (adj.) cooling demand, decrease SAT by 1 deg F. If no zone is greater than 80% (adj.), increase SAT by 1 deg F.

d. A mixed air low limit sensor shall modulate the outside air damper and the return air damper through the DDC controller to maintain the minimum mixed air temperature at 45 deg F (adj.) to keep the unit from shutting down on low limit freeze protection. The sensor shall be installed in a serpentine manner to cover as much surface area as possible.

e. Outside air enthalpy below return air enthalpy
1) Upon a rise in discharge air temperature, the outside air damper shall modulate open, as required to maintain discharge air temperature.
2) On a continued rise in discharge air temperature, with the outside air damper 100 percent open, the chilled water coil shall modulate open as required to maintain discharge air temperature.
3) Upon a drop in discharge air temperature, the chilled water control valve shall modulate closed as required to maintain discharge air temperature.
4) Upon a continued drop in discharge air temperature, with the chilled water valve closed, the outside air damper shall modulate to its minimum position as required to maintain discharge air temperature.
5) Upon a continued drop in discharge air temperature, with the chilled water valve closed, outside air damper at their minimum position , the heating water valve shall modulate as required to maintain discharge air temperature.
6) Upon a rise in space humidity above 60 percent RH (adj.), and the outdoor air temperature below 50 degrees F. (adj.), the outside air damper shall modulate open, and the heating water control valve shall be modulated to maintain space temperature.

f. Outside air enthalpy above return air enthalpy
1) Upon a rise in discharge air temperature, the chilled water control valve shall modulate as required to maintain discharge air temperature.
2) Upon a drop in discharge air temperature, the chilled water control valve shall modulate closed as required to maintain discharge air temperature.
3) Upon a rise in space humidity above 60 percent RH (adj.), the outside air damper shall remain at its minimum position, the chilled water control valve shall be opened to maintain a unit leaving air temperature above 55 degrees F (adj.), and the terminal unit heating water control valves shall be modulated to maintain space temperature. The BAS shall generate an alarm if it does not permit the unit to enter the dehumidification mode because it detects that the Hot Water System is not enabled and cannot provide the reheat necessary for dehumidification. A visible graphic to be displayed on the BAS.

g. Static pressure shall be reset by modulating the supply fan variable frequency controller via a signal from the direct digital controller. Static pressure reset shall be employed based on the zone level VAV damper position. Static pressure reset shall be employed per the following schedule. All variables for the reset schedule shall be adjustable.

1) The controller shall measure duct static pressure and modulate the supply fan VFC speed to maintain a duct static pressure set point. The speed shall not drop below 30% (adj.).
2) The static pressure set point shall be reset based on VAV damper location. VAV damper position will be known by polling the terminal units every 10 minutes (adj.). All VAV damper position must be verified by BAS.
3) The initial duct static pressure set point shall be 1.5 in. (adj.)
4) If the most open terminal unit is more than 95% (adj.) open, the static pressure set point shall be increased by 0.1".
5) If the most open terminal unit is between 90% (adj.) and 95%, (adj.) no change is to occur.
6) If the most open terminal unit is less than 90% (adj.) open, the static pressure set point shall be reduced by 0.1".
7) The set point shall incrementally reset up to a maximum of 1.8 in. (adj.).
8) The set point shall incrementally reset down to a minimum of 1.3 in. (adj.).

5. Unoccupied Cycle

a. The direct digital controller shall automatically program the unit to the unoccupied control mode.

b. The unit may be manually placed into full occupied cycle during unoccupied time through the DDC controller for a pre-programmed period of time (adj.).

c. Upon entering the unoccupied mode, the outside air damper shall be closed, the return air damper shall be open, the fans shall not run.

d. A space mounted humidity sensor(s) will enable the unit and shall place the unit into dehumidification mode anytime the space humidity rises above 60 percent RH (adj.) during unoccupied cycle. The supply fan shall run and the cooling coil control valve shall be opened to maintain a supply air temperature above 55 degrees (min.). The VAV terminals shall be indexed to occupied mode. The VAV terminals primary air dampers and heating water control valves shall be modulated to maintain reduced unoccupied space temperatures. If the outside air enthalpy is below the return air enthalpy, outside air shall be used in conjunction with the chilled water coil. If the outside air enthalpy is above the return air enthalpy, the outside air damper shall remain closed. Once the space humidity level reaches set-point, the system shall return to unoccupied mode. Minimum unit run-time of 30 min. (adj.) is required.

1) The BAS shall generate an alarm if it does not permit the unit to enter the dehumidification mode because it detects that the Hot Water System is not enabled and cannot provide the reheat necessary for dehumidification. A visible graphic to be displayed on the BAS.

e. Should (2) or more VAV terminal unit space temperatures fall below the unoccupied heating set-point or one below 50 degrees (adj.), the BAS shall start the supply fan and modulate the VFC accordingly. Once enabled, the supply fan shall operate for a minimum of 30 minutes (adj.). The outside air damper shall remain closed with the return air damper open and the heat wheel off. The respective VAV terminal unit requiring heat shall modulate its primary air damper and heating water control valve to maintain the reduced unoccupied space temperature set –point.

f. A night purge cycle shall be utilized during the cooling mode any time the outdoor air enthalpy is below the indoor air enthalpy. The system shall utilize 100 percent outside air economizer to purge the building and reduce the indoor air enthalpy. Duct static pressure set-point will be a .75"W.C. during this cycle. Night purge to be utilized from 4 hours before to 2 hours before scheduled occupancy (adj.). Maintain a unit leaving air temperature above 55 degrees F (adj.).

g. When the outside air temperature is below 35 degrees F. (adj.), the heating water control valve shall be modulated to maintain 65 degrees F. (adj.) air handling unit cabinet temperature as determined by the mixed air temperature sensor.

6. Safeties

a. Provide an automatic software reset safety high limit in the discharge air duct to stop the supply fan, exhaust fan, and heat wheel if discharge static pressure goes above 6 inches W.C. (adj.). System shall be capable of being reset through software at the temperature control computer.

b. Provide an automatic software reset safety low limit thermostat upstream of cooling coils and downstream of heating coils set to close the outside air damper, open the heating coil valve full, stop the supply fan and exhaust fan if the air temperature drops below 38 degrees (adj.). System shall automatically reset when freezing condition has been eliminated. Provide software to lock out the unit if the low limit trips and resets itself three times without being reset by an authorized operator through the web graphics.

c. Provide individual differential pressure sensing across the filters and send alarm to BAS panel requesting filter change. Include independent alarm for each filter bank at each air handling unit. Alarms and set-points shall be capable of being reset through software at the temperature control computer. A software adjustment is to be utilized to accurately represent the "dirtiness" of filters when airflow is below maximum.

d. The system provided must be capable of manually positioning all damper operators, and the cooling and heating valve actuators, if all levels of DDC control fail.

e. A fan proving device will indicate the fan status for each fan and send an alarm to the central BAS panel indicating fan failure.

f. Provide a manual reset differential pressure switch in return air and outside air mixing box section to stop supply fan, exhaust fan, and heat wheel upon detection of outside air and/or return air control damper failure. Static set point to be adjustable.

g. Monitor mixed air temperature, outdoor air inlet temperature, supply air temperature, return air temperature, heat wheel leaving air temperature (both exhaust and outside), return air humidity and CO2 in addition to all sensors required to meet sequences.

h. Monitor heating water and chilled water control valve location, in addition to all sensors required to meet sequences.

i. All safeties must be reset prior to fans operating in either automatic or Hand mode.

j. Maintain a unit leaving air temperature above 55 degrees F (adj.) in all modes.

k. VAV terminal damper positions for all zones shall be modulated open as required to maintain minimum air handling unit supply fan(s) speed, as required by the unit manufacturer.

7. All unit dampers shall be factory installed. The temperature control contractor shall provide and install all damper actuators.

8. Contractor shall provide a humidity sensor for each temperature control zone, as indicated in the control drawings. Humidity reading shall be viewable as part of the AHU graphics. If a sensor detects humidity levels in excess of set-point, an alarm shall be sent to the BAS.

9. Contractor shall provide a carbon dioxide (CO2) sensor in the main return air duct(s) to the air handler for each floor. Carbon dioxide reading shall be viewable as part of the AHU graphics. If a sensor detects CO2 levels in excess of 1500ppm (adj.), an alarm shall be sent to the BAS.

10. Monitor supply fan airflow.

C. Single Zone Variable Volume Air Handling Unit (AHU-B1):

1. Provide a microprocessor based direct digital control system that shall provide the following:
   a. Direct Digital Controller interface.
   b. Occupied-unoccupied control.
   c. Necessary operating interlocks.
2. Heating Warm-Up
   a. The system shall be enabled with an optimum start schedule 2 hours maximum (adj.) prior to the start of occupied mode.
   b. The supply fan shall run continuously.
   c. The outside air damper shall remain closed, the heating water control valve shall be open, the return air damper shall remain open until the return air temperature is within the heating mode of control (68 degrees F adj.).
   d. When the return air temperature reaches 68 degrees F, the unit shall index to standby mode. In standby mode, the unit shall assume the occupied sequence of operation, while the outdoor air damper remains closed. The unit shall remain in standby mode until indexed to occupied mode by the occupied schedule, the outside air damper shall be ramped open and the return air damper shall be ramped closed linearly over a 10 minute (adj.) period to prevent "nuisance" low limit alarms.
3. Cooling Pull-Down
   a. The system shall be enabled with an optimum start schedule 2 hours maximum (adj.) prior to the start of occupied mode.
   b. The supply fan will run continuously.
   c. If the outside air can be used as determined through an enthalpy controlled economizer for cooling pull-down, the outside air damper shall be modulated open and used during the pull-down cycle. If the outside air enthalpy is such that it cannot be used for cooling pull-down, the outside air damper shall remain closed and the chilled water control valve open until the return air temperature reaches 77 degrees F (adj.). Chilled water control valve and outside air damper shall modulate to maintain a unit leaving air temperature above 55 degrees F (adj.).
   d. When the return air temperature reaches 77 degrees F (adj.), the unit shall index to standby mode. In standby mode, the unit shall assume the occupied sequence of operation, while the outdoor air damper remains closed. The unit shall remain in standby mode until indexed to occupied mode by the occupied schedule, the outside air damper shall be ramped open and the return air damper shall be ramped closed linearly over a 10 minute (adj.) period to prevent "nuisance" low limit alarms.
4. Occupied Cycle
   a. The supply fan shall run continuously. DDC controller shall monitor the fan speed and any alarms from the VFC.
   b. The controller shall measure the zone temperature and shall modulate the supply fan VFD speed to maintain zone temperature set point. The fan speed shall increase as the zone temperature rises above cooling set point, or as the zone temperature drops below heating set point. The supply fan VFD speed shall not drop below 30% (adj.) or speed required to inflate fabric ductwork.
   c. Outside air enthalpy below return air enthalpy
      1) Upon a rise in space temperature, the outside air damper shall modulate open, as required to maintain space temperature. Outside air damper shall modulate open to maintain a unit leaving air temperature above 55 degrees F (adj.) during economizer modes.
      2) On a continued rise in space temperature, with the outside air damper 100 percent open, the chilled water coil shall modulate open as required to maintain space temperature.
      3) Upon a drop in space temperature, the chilled water control valve shall modulate closed as required to maintain space temperature.

4) Upon a continued drop in space temperature, with the chilled water valve closed, the outside air damper shall modulate to its minimum position as required to maintain space temperature.

5) Upon a continued drop in space air temperature, with the chilled water valve closed and outside air damper at its minimum position, the heating water valve shall modulate as required to maintain space air temperature.

6) Upon a rise in space humidity above 60 percent RH (adj.), and the outdoor air temperature above 50 degrees F. (adj.), the outside air damper shall modulate open, the chilled water control valve shall be opened full, and the heating water control valve shall be modulated to maintain space temperature.

7) Upon a rise in space humidity above 60 percent RH (adj.), and the outdoor air temperature below 50 degrees F. (adj.), the outside air damper shall modulate open, and the heating water control valve shall be modulated to maintain space temperature. Maintain a unit leaving air temperature above 55 degrees F (adj.).

d. Outside air enthalpy above return air enthalpy

1) Upon a rise in space temperature, the outside air damper shall stay at its minimum position and the chilled water control valve shall modulate as required to maintain space temperature.

2) Upon a drop in space temperature, the chilled water control valve shall modulate closed as required to maintain space temperature.

3) Upon a rise in space humidity above 60 percent RH (adj.), the outside air damper shall remain at its minimum position, the chilled water control valve shall be opened full, and the heating water control valve shall be modulated to maintain space temperature. The BAS shall generate an alarm if it does not permit the unit to enter the dehumidification mode because it detects that the Hot Water System is not enabled and cannot provide the reheat necessary for dehumidification. A visible graphic to be displayed on the BAS. Maintain a unit leaving air temperature above 55 degrees F (adj.).

e. The outside air damper minimum position shall be modulated between the low and high minimum positions as required to maintain the carbon dioxide levels in the space below 1500 PPM (adj.) .as determined by a space mounted carbon dioxide sensor. Damper is to remain at a minimum position until carbon dioxide set-point is exceeded.

1) Upon a rise in carbon dioxide levels above 1000 PPM (adj.), the air handling unit outside air damper shall modulate to maintain space carbon dioxide levels (As determined by space mounted carbon dioxide senor). The air handling unit chilled water or heating water control valves shall be modulated to maintain air handling unit supply air temperature. Supply fan shall modulate to total design airflow when carbon dioxide levels exceed set-point during occupied mode.

2) Once space mounted carbon dioxide sensors have been satisfied, the air handling unit outside air damper shall be ramped to the minimum scheduled position linearly over a 10 minute (adj.) period to prevent "nuisance" low limit alarms.

f. A mixed air low limit sensor shall modulate the outside air damper and the return air damper through the DDC controller to maintain the minimum mixed air temperature at 45 deg F (adj.) to keep the unit from shutting down on low limit freeze protection.

g. The outside air flow shall be monitored through the ductwork mounted air flow monitoring station.

1) An alarm shall be generated for periods of time when outside airflow is below defined minimum outside airflow (adj.). Alarms shall be capable of being reset through software at the temperature control computer.

5. Unoccupied Cycle

a. The direct digital controller shall automatically program the unit to the unoccupied control mode.

b. The supply fan shall be OFF until enabled by BAS to maintain unoccupied set-points.

c. The controller shall measure the zone temperature and shall modulate the supply fan VFD speed to maintain zone temperature set point. The fan speed shall increase as the zone temperature rises above cooling set point, or as the zone temperature drops below heating set point. The supply fan VFD speed shall not drop below 30% (adj.).

d. To prevent short cycling, the unit shall run for a minimum adjustable time, and be off for a minimum adjustable time. (Both user definable).

e. The unit may be manually placed into full occupied cycle during unoccupied time through the DDC controller for a pre-programmed period of time.

f. The outside air damper shall be closed, the return air damper shall be open, and the supply fan shall cycle as required to maintain space set point of 55 degrees F. (adj.) in the winter and 78 degrees F. (adj.) and 60 percent RH (adj.) in the summer.

g. A space mounted humidity sensor shall enable the unit and place the unit into dehumidification mode anytime the space humidity rises above 60 percent RH (adj.) during unoccupied cycle. The supply fan shall run, the cooling coil control valve shall be open 100 percent and the heating water control valve shall be modulated to maintain reduced unoccupied space temperature. If the outside air enthalpy is below the return air enthalpy, outside air shall be used in conjunction with the chilled water coil. If the outside air enthalpy is above the return air enthalpy, the outside air damper shall remain closed. Once the space humidity level reaches set-point, the system shall return to unoccupied mode. Maintain a unit leaving air temperature above 55 degrees F (adj.).

   1) The BAS shall generate an alarm if it does not permit the unit to enter the dehumidification mode because it detects that the Hot Water System is not enabled and cannot provide the reheat necessary for dehumidification. A visible graphic to be displayed on the BAS.

h. A night purge cycle shall be utilized during the cooling mode any time the outdoor air enthalpy is below the indoor air enthalpy by 10% (adj.). The system shall utilize 100 percent outside air economizer to purge the building and reduce the indoor air enthalpy. Minimum runtime of 30 minutes. Night purge to be utilized from 4 hours before to 2 hours before scheduled occupancy (adj.). Maintain a unit leaving air temperature above 55 degrees F (adj.).

i. When the outside air temperature is below 35 degrees F. (adj.), the heating water control valve shall be modulated to maintain 65 degrees F. (adj.) air handling unit cabinet temperature as determined by the mixed air temperature sensor.

6. Safeties

a. Provide an automatic software reset safety low limit thermostat downstream of heating coils set to close the outside air economizer damper, open the heating coil valve full, and stop the supply fan if the air temperature drops below 38 degrees (adj.). System shall automatically reset when freezing condition has been eliminated. Provide software to lock out the unit if the low limit trips and resets itself three times without being reset by an authorized operator through the web graphics.

b. Provide a software reset safety high limit in the discharge air duct to stop the supply fan, if discharge static pressure goes above 5 inches W.C. (adj.). System shall be capable of being reset through software at the temperature control computer.

c. Provide differential pressure sensing across air filters and send alarm to BAS panel requesting filter change. Include independent alarm for each filter bank at each air handling unit. Pre-filters and primary filters shall be monitored independently. Alarms and set-points shall be capable of being reset through software at the temperature control computer.

d. The system provided must be capable of manually positioning all damper operators, and the cooling and heating valve actuators, if all levels of DDC control fail.

e. A fan proving device will indicate the fan status for each fan and send an alarm to the central BAS panel indicating fan failure.

f. Provide a manual reset differential pressure switch in return air and outside air mixing box section to stop supply fan, exhaust fan, and heat wheel upon detection of outside air and/or return air control damper failure. Static set point to be adjustable.

g. Monitor supply air temperature, return air temperature, cooling coil leaving air temperature, heating coil leaving air temperature, outdoor air temperature, mixed air temperature, return air humidity and CO2 in addition to all sensors required to meet sequences.

h. Heating and chilled water coil circulating pumps shall be energized by the DDC controller any time the outdoor air temperature is below 35 degrees F. (adj). The DDC shall monitor run status via a current transducer and an alarm shall be sent to the BAS indicating pump failure, if failure is lost for more than 10 seconds (adj.).

i. All safeties must be reset prior to fans operating in either automatic or Hand mode.

j. Maintain a unit leaving air temperature above 55 degrees F (adj.) in all modes.

7. Contractor shall provide a carbon dioxide (CO2) sensor for each temperature control zone, as indicated in the control drawings. Carbon dioxide reading shall be viewable as part of the AHU graphics. If a sensor detects CO2 levels in excess of 1000ppm, an alarm shall be sent to the BAS.

8. Contractor shall provide a humidity sensor for each temperature control zone, as indicated in the control drawings. Humidity reading shall be viewable as part of the AHU graphics. If a sensor detects humidity levels in excess of set-point, an alarm shall be sent to the BAS.

9. Contractor shall provide a carbon dioxide (CO2) sensor in the main return air duct to the air handler. Carbon dioxide reading shall be viewable as part of the AHU graphics. If a sensor detects CO2 levels in excess of 1000ppm, and alarm shall be sent to the BAS.

10. All unit dampers shall be factory installed. The Contractor shall provide and install all damper actuators.

11. Monitor supply fan airfow.

D. Boilers and Heating Water Pumps

1. Provide a microprocessor based direct digital control system that shall provide the following:

a. Boilers and heating water pumps shall be enabled from the BAS, to operate based on the following outside air temperature schedule by the BAS. Boilers and pumps operation, supply and return temperature, and flow shall be monitored and alarmed through the BAS, via integration with the equipment.

b. The boilers shall have a boiler controller furnished by the Temperature Control Contractor. The boiler controller shall interface directly to the BMS system. Coordinate with the boiler manufacturer for information on point scaling, override, and set-point control capabilities.

c. Mounting and wiring of the boiler controller shall be provided by the Contractor.

d. All available point information from the heating water system shall be routed to the BAS.

e. The boilers high and low temperature alarms, low water cutoff, flow switch, and flame failure shall be routed to the BAS.

f. The pump status shall be monitored by a current sensing relay. If the lead pump fails to start or is not confirmed within two minutes after the command to start has been initiated through the BAS, the standby pump shall be indexed to start and an alarm shall be initiated.

g. Provide automatic alternating lead/lag operation through the BAS.

h. The building heating water supply temperature sensor and the outside air temperature sensor, through the DDC/BAS output signal, shall modulate the heating water supply temperature to maintain the following supply temperature reset schedule in a linear sequence.

Heating Water Supply Temperature	O.A.Temperature
140 Degrees F (adj.)	<20 degrees F (adj.)
100 Degrees F (adj.)	60 degrees F (adj.)
100 Degrees F (adj.)	Above 60 degrees F (adj.)

i. The Contractor to furnish flow switch, and temperature sensors for heating water system required by boiler manufacturer, and instruct Installing Contractor on proper location and proper installation of the temperature sensors. The Contractor to wire between all devices and control panels.

j. When the heating water system is enabled, the lead boiler module shall start and fire. The unit shall increase input until the input reaches a point of 65 percent input (Transfer Set Point - adjustable). Upon a reduced heating demand, the lead boiler shall decrease input to match building load. Upon a continued heating demand, the lead boiler shall be held at the Transfer set point for a delayed time of 10 minutes (adj.), at which point the boiler controller shall prepare to start the next boiler by decreasing the input on the first boiler to minimum firing rate. At this point, the next boiler shall enable to minimum firing rate. All firing boilers inputs shall continue to increase equally to increase the heating water system temperature as required by the BAS system.

k. The isolation valve associated with the lead boiler shall be open at all times. The isolation valves associated with the lag boilers shall be open for 5 minutes (adj.) prior to energizing the lag boiler, and shall remain open to 10 minutes (adj.) after boiler(s) are disabled. All isolation valves are to be fail “OPEN”.

l. Upon a reduced heating demand, with multiple boilers firing, boilers shall decrease inputs equally until all firing boilers are at minimum firing rate for a delayed time of 2 minutes (adj.) as which point the boiler controller shall disable the latest added boiler. The remaining boiler(s) shall increase or decrease inputs as required until a boiler is to be enabled or disabled based on the Transfer Points – in which case the above scenarios are to occur.

m. Boiler inputs shall be modulated down in response to the BAS in a reverse manner. Each boiler shall come off line at the transfer set-point to maximize the condensing of the boiler system, when the system utilizes condensing boilers.

n. Boilers shall automatically be alternated as the lead boiler based on equal run time hours, and season. Condensing boilers shall always be used for the lead boilers when outdoor air temperature is above 20 degrees F. (adj.).

o. Each boiler shall operate a minimum of 10 minutes (adj.) and turn off for a minimum of 5 minutes (adj.).

p. Primary pumps or variable speed heating water pumps shall run a minimum of 2 minutes (adj.) prior to enabling it’s associated boiler, and shall remain running for a minimum of 10 minutes (adj.) after the associated boiler has been disabled.

q. If the lead boiler fails to start when energized by the BAS system, a lag boiler shall start. At this time an alarm shall be initiated through the BAS system.

r. The lead heating water pump, either primary or variable speed heating water pump) shall run continuously.

s. A variable frequency controller for each heating pump, either secondary or variable speed heating water pump, shall vary pump speed in response to differential pressure sensors located in the heating water system. VFC shall respond to sensor with the lowest pressure**.** Upon enable, the lead pump will start and be proven by the pump differential switch. The DDC Controller will monitor differential pressure between the heating water supply and return lines in locations as denoted on the Drawings. The DDC Controller will increase or decrease the pump speed to maintain the desired set-point at the lowest pressure point. Upon lead pump obtaining 100 percent speed for 10 minutes (adj.), the lag pump will start. The DDC Controller will increase or decrease the pump speeds so that each pump is providing 50 percent of the system flow. Should the pumps fall below 50 percent speed for a minimum of 10 minutes (adj.), the lag pump will turn off and the lead pump speed will be controlled to maintain set-point.

t. Provide temperature sensors, differential pressure sensors, flow meter, wiring and programming of all devices to the BAS system. Coordinate with other trades for proper balancing and start-up of system. Coordinate boiler controller interface with boiler manufacturer.

u. The Building Automation System shall automatically start/stop and alternate pumps with the “off” pump as a backup, should the lead pump fail.

v. The minimum speed for the heating water pumps shall be as required to maintain the minimum flow rate through the boilers as required by the unit manufacturer, or the minimum flow rate recommended by the pump manufacturer, whichever flow rate is larger. The rate of speed change on the heating water pumps shall not exceed the requirements of the boiler manufacturer. Contractor shall be responsible to provide additional bypass if the boiler purchased can’t meet the minimum water flows listed in the schedule.

w. Condensing boilers or small boilers only shall be energized along with heating water pumps shall be enabled any time that any of the systems are in dehumidification mode.

x. Boiler plant and hot water pumps are to be monitored for dehumidification mode. The BAS shall generate an alarm and not permit the units to enter the dehumidification mode because it detects that the Hot Water System is not enabled, or in alarm, and cannot provide the reheat necessary for dehumidification. A visible graphic to be displayed on the BAS.

y. Upon alarm of all boilers in the heating plant, with the outside air temperature above 50 degrees F and the chillers energized, the hot water pumps are to be commanded “OFF” to prevent the heating water from extracting cooling at the reheat coils.

E. Water Chillers (outdoor, air-cooled chillers)

1. The chillers shall be supplied complete with all operating and safety controls. The Contractor shall wire the flow switch supplied (or differential pressure sensor) by the chiller manufacturer. The conduit and wiring from the outdoor chiller control panel to the chiller interface panel located in the mechanical room shall be by the Contractor.

2. The chillers shall be provided with open protocol communication boards for full communication via BACnet. This contractor shall coordinate exact requirements with chiller manufacturer. If the existing chillers are not equipped with communication boards, the temperature control contractor shall provide new communication boards as required to communicate with the chiller. The chiller manufacturer must provide submittals to the Contractor of all wiring diagrams and points lists including override capability and scaling values. The chiller manufacturer shall provide all software CD’s, licenses, and connections tools to the Contractor for setup and servicing, which is to be turned over to the owner at project completion.

3. The BAS shall enable the chiller control circuit and the chilled water pumps on a call for cooling anytime the outdoor air temperature is above 50 degrees (adj.). The chiller control panel shall prove flow through the chiller before allowing chiller to operate. Pressure transducers and interlock wiring shall be furnished and installed by the Contractor. Flow switch (or internal differential pressure sensor) provided by chiller manufacturer.

4. Once energized, the chiller shall automatically operate to maintain required water temperature, based on chilled water supply temperature set-point reset, down to 42 degrees F. (adj.).

5. <u>Chilled Water Supply Temperature – Set-point Reset:</u>
The chilled water supply temperature set-point shall reset using a trim and respond algorithm based on cooling requirements. The chilled water supply temperature set-point shall reset to a lower value (42 degrees F – adj.) as the facility's chilled water valves open beyond a user definable threshold (90% open, adj.). Once the chilled water coils are satisfied (valves closing below 90% open, adj.) then the chilled water supply temperature set-point shall gradually rise over time to reduce cooling energy use. Maximum set-point to be 50 degrees F (adj.).

6. Lock out the chiller system below 50 degrees F (adj.). outside air temperature during occupied mode, and during "unoccupied" sequence from the BAS.

7. The mechanical cooling system shall be locked out in “unoccupied” sequence unless building zone temperature rises above 85 degrees F (adj.) or 60 percent relative humidity (adj.).
8. Provide sensors in the building chilled water supply and return for indication through the Global Control Panel.
9. Temperature Control Contractor shall install chiller interface panel, provide wiring between chiller and panel, and provide all wiring and programming required to communicate with the chiller interface panel. Chiller interface panel furnished by the chiller manufacturer. Provide a specific graphics screen on the BAS for all points provided through the chiller interface panel. Coordinate communications protocol with chiller manufacturer. The following chiller control functions shall be accessible through the central BAS:
    a. Chilled water inlet temperature
    b. Chilled water outlet temperature
    c. Chilled water flow
    d. Evaporator refrigerant pressure
    e. Evaporator refrigerant temperature
    f. Evaporator approach temperature
    g. Condenser refrigerant pressure
    h. Condenser refrigerant temperature
    i. Compressor refrigerant discharge temperature
    j. Percent RLA
    k. Compressor running status
    l. Manual reset alarm occurrence
    m. Communication status
    n. Chiller enable/disable
    o. Chiller water set-point
    p. Demand limit set-point
10. The BAS will enable the chiller upon either of the following conditions.
    a. The outside air temperature is above 50 degrees (adj.) and any HVAC zone is an occupied state.
    b. The outside air temperature is above 80 degrees (adj.) all HVAC zones are in an unoccupied state, and the average HVAC zone temperature is above 85 degrees (adj.).
11. The BAS will enable the lead chilled water pump along with the chiller.
12. Once the chiller is enabled, it will prove flow via the interlocked flow switch and automatically operate chiller to maintain a leaving water temperature of chilled water supply temperature – set-point reset, down to 42 degrees F. (adj.).

F. Chilled Water Pumps
1. Primary Chilled Water Pumps
    a. The BAS will enable the primary chilled water pumps, either primary or variable speed chilled water pumps, when there is a command for their associated chiller to be operational. The primary chilled water pumps shall remain enabled for a period of 5 minutes (adj.) after the chillers have been disabled.
    b. Upon enable, the lead pump will start and be proven on. The DDC Controller will monitor differential pressure between the chilled water supply and return lines in locations as denoted on the Drawings. The DDC Controller will increase or decrease the pump speed to maintain the desired set-point at the lowest pressure point. Upon lead pump obtaining 100 percent speed for 10 minutes (adj.), the lag pump will start. The DDC Controller will increase or decrease the pump speeds so that each pump is providing 50 percent of the system flow. Should the pumps fall below 65 percent speed (adj.), for a minimum of 10 minutes (adj.), the lag pump will turn off and the lead pump speed will be controlled to maintain set-point.
    c. The chilled water pumps shall modulate to maintain the minimum required chiller differential pressure required by unit manufacturer.

d. Provide automatic weekly alternating lead/lag operation through the BAS to maintain equal runtimes of the pumps. Provide a software lead/lag override switch in the graphics for the owner to use during pump service.

e. The minimum speed for the variable speed chilled water pumps shall be as required to maintain the minimum flow rate through the chiller as required by the unit manufacturer, or the minimum flow rate recommended by the pump manufacturer, whichever flow rate is larger. The rate of speed change on the chilled water pumps shall not exceed the requirements of the chiller manufacturer.

f. The Building Automation System shall automatically start/stop and alternate pumps with the "off" pump as a backup, should the lead pump fail.

2. Secondary Chilled Water Pumps

a. The BAS will enable the secondary chilled water pumps, when there is a command for cooling inside the building.

b. Upon enable, the lead pump will start and be proven on. The DDC Controller will monitor differential pressure between the chilled water supply and return lines in locations as denoted on the Drawings. The DDC Controller will increase or decrease the pump speed to maintain the desired set-point at the lowest pressure point. Upon lead pump obtaining 100 percent speed for 10 minutes (adj.), the lag pump will start. The DDC Controller will increase or decrease the pump speeds so that each pump is providing 50 percent of the system flow. Should the pumps fall below 65 percent speed (adj.), for a minimum of 10 minutes (adj.), the lag pump will turn off and the lead pump speed will be controlled to maintain set-point.

c. Provide automatic alternating lead/lag operation through the BAS.

d. Provide automatic weekly alternating lead/lag operation through the BAS to maintain equal runtimes of the pumps. Provide a software lead/lag override switch in the graphics for the Owner to use during pump service.

e. The BAS shall automatically start/stop and alternate pumps with the "off" pump as backup, should the lead pump fail.

F. Fan Coil Units

1. Provide a microprocessor based direct digital control system that shall provide the following:

a. Direct Digital Controller interface.

b. Occupied-unoccupied control.

c. Necessary operating interlocks.

2. Heating Warm-Up

a. The system shall be enabled with an optimum start schedule of 1 hour maximum (adj.) prior to the start of occupied mode.

b. The supply fan shall run continuously.

c. The unit heating water control valve shall be modulated upon until the room temperature is within the heating model of control (68 degrees F adj.).

d. When room temperature reaches 68 degrees F., the unit shall index to occupied mode.

3. Cooling Pull-Down

a. The system shall be enabled with an optimum start schedule of 1 hour maximum (adj.) prior to the start of occupied mode.

b. The supply fan shall run continuously.

c. The unit chilled water control valve shall be modulated open until the room temperature is within the cooling mode of control (77 degrees F. adj.).

d. When room temperature reaches 77 degrees F., the unit shall index to occupied mode.

4. Occupied Cycle

a. The supply fan shall run continuously

b. Upon a rise in room temperature above set point, the chilled water control valve shall be modulated as required to maintain the room set point temperature.

c. Upon a drop in room temperature below set point, the heating water control valve shall be modulated open to maintain room set point temperature.

5. Unoccupied Cycle
   a. The direct digital controller shall automatically program the unit to unoccupied mode.
   b. The unit may be manually placed into full occupied cycle during unoccupied time through the DDC controller for a preprogrammed period of time.
   c. Upon a drop in room temperature, the unit supply fan shall cycle on and the heating water control valve shall modulate to maintain room temperature set point of 55 degrees F. (adj.).
   d. Upon a rise in room temperature, the unit supply fan shall cycle on and the direct expansion cooling shall cycle on to maintain room temperature set point of 78 degrees F. (adj.).
6. Safeties
   a. Provide an automatic software reset low limit thermostat downstream of the heating coil set to stop the supply fan and open the heating control valve full if air temperature drops below 45 degrees F (adj.). System shall automatically reset when freezing condition has been eliminated. Provide software to lockout the unit if the low limit trips and reset itself three times without being reset by an authorized operator through the web graphics.
   b. To prevent short cycling, the unit shall run for a minimum adjustable time and shall be off for a minimum adjustable time.
   c. Turn the fan off and close the heating and chilled water valves upon detection of condensate overflow. Alarm the BAS.
   d. The system provided must be capable of manually positioning heating and chilled water valve actuator, if all levels of DDC control fail.
   e. A fan proving device will indicate the fan status for each fan and send an alarm to the central BAS panel indicating fan failure.
   f. All safeties must be reset prior to fans operating in either automatic or hand mode.

G. Variable Air Volume Terminal Unit Controllers
1. VVR Reheat Terminal Units
   a. The system shall be enabled with an optimum start schedule 2 hours maximum (adj.) prior to the start of occupied mode.
   b. During occupied cycle, a wall-mount electronic temperature sensor shall modulate the primary air damper to maintain space temperature. On a drop in space temperature below set point, the primary air damper shall modulate to its 50% position and the heating coil control valve will modulate open as required to maintain space set point. On a continued drop in space temperature, the heating coil control valve shall remain open and the primary air valve shall modulate from 50% airflow to maximum airflow as required to maintain space temperature. Conversely, on a rise in space temperature, the heating coil control valve shall close and the primary air damper shall modulate as required to maintain set point.
   c. During the unoccupied cycle, the primary air damper shall be closed. If space temperature is below unoccupied heating space set point, associated control zone(s) shall be energized and VVR terminals primary air damper shall be set to 50% open for all terminal units in zone. The heating coil control valve shall be modulated as required to maintain unoccupied set-point. If space temperature is above unoccupied cooling space set point, associated control zone(s) shall be energized and VVR terminals primary air damper shall be set to maximum airflow for all terminal units in zone. Once unoccupied set points have been achieved for 30 min. (adj.) associated air handling units shall shut down and VVR terminal primary air damper shall close.
   d. When morning warm-up is initiated by the Building Automation System, the VVR controller assumes the occupied mode of operation, reverses the control action of the damper to modulate the air flow between maximum flow and reheat 50% flow values to maintain the zone temperature. The heating valve supplements the warm air available from the air handling unit. When the zone temperature reaches set-point, the system will automatically index to occupied cycle.

e. The terminal unit manufacturer shall furnish and factory-install the velocity sensor, and control transformer. The Temperature Control Contractor shall furnish the heating coil control valve and DDC controller as required to each terminal unit. The VVR reheat terminal shall be configured for N.O. air damper operation, direct acting temperature sensors and N.O. heating valves. Any relays necessary for this operation shall be furnished and installed by the Temperature Control Contractor.

f. The Temperature Control Contractor shall furnish the DDC controller and damper operator, complete with a detailed wiring diagram to the terminal unit manufacturer for factory installation. All control equipment to be mounted and wired by the terminal unit manufacturer at cost to the terminal unit manufacturer.

g. The Contractor shall provide and install a discharge air sensor in the discharge airstream of VAV terminals. The sensor value shall be included on the graphic screen for the terminal.

2. The Contractor shall graphically display variable air volume terminal information in a matrix format, for each terminal unit associated with a given air handling unit. Matrix to include(at a minimum):
   a. VAV Box Description
   b. Room Name (or space being served)
   c. VAV Box Mode of operation
   d. Space temperature
   e. Space set-points (heating / cooling)
   f. VAV airflow
   g. VAV airflow set-point
   h. VAV Box Damper position
   i. VAV Box % cooling
   j. VAV Box % heating
   k. VAV Box entering air temperature (From associated AHU).
   l. VAV Box leaving air temperature.

H. Cabinet Heaters
1. An electronic low voltage adjustable temperature sensor/controller shall open the heating water control valve and cycle the unit fan on a call for heating. BAS system shall have controls graphic.

I. Propeller Unit Heaters
1. An electronic low voltage adjustable temperature sensor/controller shall open the heating water control valve and cycle the unit fan on a call for heating. BAS system shall have controls graphic.

J. Electric Cabinet Unit Heaters
1. An electronic low voltage adjustable temperature sensor/controller shall enable the unit fan and electric heating coil on a call for heating. BAS system shall have controls graphic.

K. Electric Propeller Unit Heaters
1. An electronic low voltage adjustable temperature sensor/controller shall enable the unit fan and electric heating coil on a call for heating. BAS system shall have controls graphic.

L. Exhaust Fans
1. Exhaust fans as scheduled shall operate based on time of day schedule.
2. Exhaust fans as scheduled shall be energized on a rise in room temperature above 85 degrees F. (adj.) as determined by a wall mounted, BAS temperature sensor.
3. Exhaust fans as scheduled shall be controlled by Division 26 Contractor.
4. See Exhaust Fan Schedules on the Drawings.
5. A motor current operated switch shall input fan status to a DDC panel for all exhaust fans.

M. Self-Contained Cooling Units

1. The Contractor shall mount and wire thermostat provided by unit manufacturer. Control sequence shall be part of unit mounted controls. The Contractor shall monitor room temperature through the central BAS panel and alarm if room temperature rises above 85 degrees F (adj.).

N. Building Relief

1. Provide a wall mounted static pressure sensor in each zone. Relief air control dampers shall modulate open as required to maintain a slight positive pressure in the building. Refer to contract documents for quantity and locations of relief dampers in each zone. The BAS shall generate an alarm if building zone is reading negative pressure for 30 min. (adj.). Initial set-point to be 0.05" WC to open relief air dampers. Coordinate final setpoint adjustment with Balancing Contractor.

O. Variable Frequency Controller.

1. The Building Automation System shall monitor alarms and outputs from the VFC, via BACnet Communication Interface.

P. Kitchen Hoods

1. Provide necessary contacts to enable Kitchen make-up air unit(s) and associated temperature control zones when kitchen hood(s) and/or dishwasher fans are in operation.

Q. Make-Up Water Monitoring

1. The contractor shall provide a water meter in the make-up water connection to the heating water system and chilled water system to monitor the make-up water usage through the BAS.

R. Kitchen Cooler(s) and Freezer(s)

1. The contractor shall install temperature sensors in the cooler(s) and freezer(s) to monitor temperatures through the BAS. Provide alarm if temperature rises above desired temperatures.

S. Carbon Monoxide Detector

1. Provide a carbon monoxide detector in rooms with gas fired equipment and monitor through the building automation system. Detector shall send an alarm signal to the building automation system any time the carbon monoxide level exceeds 35 ppm (adj.).

T. Boiler Room Emergency Shut-Down

1. Provide an emergency shut-down button switch in the boiler room to shut-down all gas-fired equipment upon activation.
2. Emergency shut-down button switch shall be located near the door in the path of egress from the boiler room.
3. Activation of the emergency shut-down switch shall send an alarm to the building automation system.
4. Coordinate shutdown of power to boilers with electrical contractor.

U. Smoke Detection

1. Contractor shall wire between smoke detector and unit to shut-down unit on smoke detection.

V. Carbon Dioxide Sensor

1. Install carbon dioxide sensor(s) as shown on the drawings and/or as required by the sequence of operations.
2. Install outside carbon dioxide sensor.
3. Carbon dioxide levels shall be monitored through the building automation system.

W. Humidity Sensor

1. Install humidity sensor as shown on the drawings and/or as required by the sequence of operations.

X. Fire Alarm

1. Coordinate with Division 26 Electrical Contractor and provide necessary contacts to shut down all mechanical equipment during a fire alarm. The system shall be capable of restarting equipment globally upon a “no alarm signal” from the fire alarm panel.

Y. Snow Day, 1 Hour Delay, 2 Hour Delay, 3 Hour Delay

1. Snow day, 1 hour delay, 2 hour delay, 3 hour delay routine shall be provided to return all systems to unoccupied mode upon indication by system operator.

Z. Unoccupied Set-point

1. The Building Automation System shall be setup to allow a global change to unoccupied mode set-points from the temperature control system.

AA. Emergency Shutdown

1. The Building Automation System shall shutdown all mechanical equipment. Shutdown shall be located on the Temperature Control System graphic home page and shutdown key switch to be located at each building. Coordinate shutdown key switch location with school district representative.

BB. Emergency Generator

1. The following is a list of all the equipment which will receive emergency power from the generator. The Temperature Control Contractor shall ensure that all controls serving the equipment are also provided with emergency power.
   a. Building Automation System and associated control panels
   b. Master Boiler and associated control panel
      1) Master Boiler (BLR-1) to be coordinated between temperature controls, Div. 23 and Div. 26 Contractors
   c. Hot Water Pump – HHWP-1 and associated VFC
   d. Self-contained cooling unit CRU-1/CU-A1 – which serves Main Control/Equipment Room A129 – with contacts/controls for generator mode which disables electric heat and humidifier during generator mode.
2. Temperature Control Contractor shall provide for the above equipment, systems and building areas to operate while the rest of the building is without power. The Contractor shall provide a means of monitoring the transfer switches in order to receive a signal indicating that the emergency generators are enabled in non-testing mode from the transfer switches. When this signal is received the systems above shall operate to maintain service to the areas of the building indicated above. The equipment shall start sequentially so as to not create a large initial surge on the emergency generator.
3. All control wiring and accessories required between the emergency generator and the BAS shall be by the Temperature Control Contractor.

CC. Day/Night Zones

1. The following shall be the accepted zone control. Zone control shall include all air handling units, power terminal units, unit ventilators, fan coil units, blower coil units, variable-volume terminals, and exhaust fans. All zones to include capabilities through the direct digital controller for override setting to full occupied cycle during unoccupied cycle.
2. Zones: Refer to drawings for temperature control zone information. Each temperature control zone shall be included with independent schedules.

DD. Critical Alarms

1. Critical alarms shall dial or send text to personal cell telephones, personal home telephones, and send email messages to school district employees as determined by the school corporation. Alarms shall be setup and active prior to building occupancy. The following will be considered critical alarms:
   a. Any boiler alarm.
   b. Any air handling unit manual low-limit or freeze-stat alarm,

c. Any air handling unit fan failure.
d. Any circulation pump failure
e. Any space temperature dropping below 45 degrees F. (adj.) or rising above 85 degree F (adj.).
f. Kitchen freezer temperature rise above 30 degrees F (adj.)
g. Cooler system temperature rise above 43 degrees (adj.)
h. Make-up water high flow rate.
i. Any technology room temperature above 85 degrees F.
j. Any other alarm deemed critical by the school corporation and/or Architect/Engineer.
k. Refer to all sequences of operation for additional alarms.

EE. Energy Monitoring/Demand Limiting

1. The BAS shall monitor the electrical consumption and demand. The temperature control contractor shall be responsible to provide a separate meter if communication can not be made at the switchgear.
2. The BAS shall monitor natural gas usage.
3. The building automation system shall be set up to accept a signal from the local electric utility provider do go into demand limiting mode. Upon receipt of that signal, the system shall reduce the electric demand by turning off, cycling, or limiting equipment operation as defined by the agreement between the utility provider and the Owner.
4. The BAS shall also be set up to have demand limiting capabilities, if the local utility provider is not capable of providing such signal. The BAS shall monitor the electrical demand, from the electrical switchgear. The temperature controls contractor is responsible to provide trended data to the district on a monthly basis, for the first year of building ownership. Trended data can be in the form of digital or hard copy reports, graphs, and hourly data concerning electrical demand. From this data, the district and temperature controls contractor will determine the electrical demand limit (adj.) to trigger demand limiting mode. All requirements from the electrical utility will over-ride the school district values, or control strategies.
   a. Until the electrical demand limit is determined from trended data, an initial electrical demand limit shall be equal to the largest demand value measured over the past 9 months through the electrical switchgear.
   b. Once the electrical demand limit (adj.) is determined, the BAS shall utilize this value to trigger demand limiting mode:
      1) Upon electrical demand approaching 85% (adj.) electrical demand limit (adj.), the BAS shall send an alarm, via email, to all personnel requested by the district, informing them that the electrical demand critical value (adj.) – as determined by district is approaching. At this point, corrective action is requested by the building occupants in order to reduce electrical demand. It will be the responsibility of the owner to receive email and request corrective action by building occupants.
      2) Upon electrical demand reaching 95% (adj.) electrical demand limit, all cooling set-points are to be globally changed to a value of 75 degrees F (adj.) and all air handling units supply temperature setpoints shall be raised by 2 degrees F. (adj). An email is to be sent to all personnel requested by the district.
         a) If the above corrective action reduces electrical demand below the electrical demand critical value for a period of one hour (adj.), all cooling set-points are to be globally reset to prior values.
      3) Upon electrical demand continuing to meet or exceed electrical demand limit, for a period of 30 minutes (adj.), all cooling set-points are to be globally increased to a value of 76 degrees F (adj.) and all air handling units supply temperature setpoints shall be raised by 2 degrees F. (adj). An email is to be sent to all personnel requested by the district.

a) If the above corrective action reduces electrical demand below the electrical demand critical value for a period of one hour (adj.), all cooling set-points are to be globally reduced back to 75 degrees F. The set-points are to be restored to initial values, in the opposite sequence.

4) Upon electrical demand continuing to meet or exceed electrical demand limit, for a period of 30 minutes (adj.), all cooling set-points are to be globally increased to a value of 77 degrees F (adj.) and all air handling units supply temperature setpoints shall be raised by 2 degrees F. (adj). An email is to be send to all personnel requested by the district.

a) If the above corrective action reduces electrical demand below the electrical demand critical value for a period of one hour (adj.), all cooling set-points are to be globally reduced back to 76 degrees F. The set-points are to be restored to initial values, in the opposite sequence.

5. A graphics package dashboard shall be created to monitor the electric, gas and water usage in the building. A spreadsheet shall be developed to accumulate consumption based on monthly usage, and yearly usage for all (3) utilities. A kbtuh/SF amount shall also be tracked to allow the owner to compare the usage. The spreadsheet shall be set up to allow the owner to easily print out.

END OF SECTION 23 09 93