



Evanston Animal Shelter

Bid # 22-70

ADDENDUM No. 5

January 17, 2023

Any and all changes to the Contract Document are valid only if they are included by written addendum to all potential respondents, which will be mailed, emailed and/or faxed prior to the proposal due date to all who are known to have received a complete bid document. Each respondent must acknowledge receipt of any addenda by indicating on the Bid Form. Each respondent, by acknowledging receipt of any addenda, is responsible for the contents of the addenda and any changes to the bid proposal therein. Failure to acknowledge receipt of any addenda may cause the proposal to be rejected. If any language or figures contained in this addendum are in conflict with the original document, this addendum shall prevail.

This addendum consists of the following:

1. Addendum Number Five (5) is attached and consists of a total of fifteen (15) pages including this cover sheet. Any changes to the drawings or specifications noted within Addendum Number Five (5) will be reflected in subsequent drawing issues.

Please feel free to call (847-866-2971) or email (johngonzalez@cityofevanston.org) with any questions or comments.

Sincerely,

John Gonzalez
Purchasing Specialist

Evanston Animal Shelter

Bid # 22-70

ADDENDUM No. 5

January 17, 2023

This addendum forms a part of the Specifications and Bid Documents for Bid # 22-70 and modifies these documents. This addendum consists of this letter and the following re-issued drawings and specifications:

Drawings:

DRAWINGS RE-ISSUED WITH THIS ADDENDUM

E7-1 - ELECTRICAL SCHEDULES

Specifications:

SPECIFICATIONS RE-ISSUED WITH THIS ADDENDEM

10 5113 FL - Metal Lockers
26 2413 - SWITCHBOARDS

Attachments:

(List of drawings and specs noted at beginning)

Note: Acknowledgment of this Addendum is required in the Bid.

3" = 1'-0"
 1" = 1'-0"
 1/2" = 1'-0"
 1/4" = 1'-0"
 1/8" = 1'-0"
 1/16" = 1'-0"
 1" = 30'-0"

DISTRIBUTION PANEL MDP

ENCLOSURE: NEMA PB 1
 FED FROM: UTILITY TRANSFORMER
 LOCATION: ELECTRIC 14
 METER: DPM

SOLID NEUTRAL GROUND BUS

MAIN: 1,600 A MCB
 VOLTS: 120/208 Wye
 PHASE: 3
 WIRE: 4
 SCCR: 65 kA
 ISC UNKNOWN 0 A

NOTES: PROVIDE MAIN CIRCUIT BREAKER WITH ILLINOIS SOLID STATE CIRCUIT BREAKER AND IAERI ABC ENERGY REDUCTION SYSTEM. LOADS NOTED WITH "PM" SHALL BE PROVIDED WITH POWER METER (26 0913) OR MOLDED CASE CIRCUIT BREAKER ELECTRONIC TRIP UNITS CAPABLE OF METERING (26 2413).

CKT NO.	LOAD DESCRIPTION	Load	POLES	FRAME	TRIP	TYPE	ACC.	WIRE AND RACEWAY	CIRCUIT KEY
1	SPD-1	0 kVA	3	100 A	60 A	MCCB		4#6 & #10 GND IN 1" C.	
2	PANEL PP1	43.42 kVA	3	200 A	200 A	MCCB		REFER TO RISER DIAGRAM	PM
3	PANEL PP2	133.66 kVA	3	400 A	400 A	MCCB	100%	REFER TO RISER DIAGRAM	PM
4	GCC	0 kVA	3	1,600 A	1,600 A	MCCB		LSI, AER	*KEY
5	RTU-1	24.48 kVA	3	100 A	90 A	MCCB		3#3 & #8 GND IN 1" C.	*PM
6	RTU-2	125 kVA	3	400 A	400 A	MCCB		3#600KCM & #3 GND IN 3" C.	*PM
7	RTU-3	50 kVA	3	200 A	175 A	MCCB		3#3/0 & #6 IN 1 1/2" C.	*PM
8	RTU-4	52.2 kVA	3	200 A	175 A	MCCB		3#2/0 & #6 GND IN 1 1/2" C.	*PM
9	IWH-1.1	36 kVA	3	200 A	125 A	MCCB		3#1 & #6 GND IN 1 1/4" C.	*PM
10	SPACE (250A FRAME)	0 kVA	--	--	--	--	--	--	
11	SPACE (250A FRAME)	0 kVA	--	--	--	--	--	--	
12	SPACE (250A FRAME)	0 kVA	--	--	--	--	--	--	

LOAD SUMMARY (INCLUDES ALL TUBS IN THIS PANEL)			
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
HVAC	440.614 kVA	100.00%	440.614 kVA
Lighting	7.912 kVA	100.00%	7.912 kVA
Other	0.1 kVA	100.00%	0.1 kVA
Power	8.16 kVA	100.00%	8.16 kVA
Receptacles	43.42 kVA	61.52%	26.71 kVA
TOTALS*			
	TOTAL CONNECTED LOAD:		500.21 kVA
	TOTAL ESTIMATED DEMAND LOAD:		483.496 kVA
	TOTAL CONNECTED AMPS:		1388.43 A
	TOTAL ESTIMATED DEMAND AMPS:		1,342.1 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.
 CIRCUIT KEY... *PM = CIRCUIT POWER METERING CAPABILITY, *KEY = PROVIDE GCC CIRCUIT BREAKER AND MAIN CIRCUIT BREAKER WITH KEY INTERLOCK.

PANEL PP1

ENCLOSURE: NEMA PB 1
 FED FROM: 200 A/3P MCCB @ MDP
 LOCATION: DOG ISOLATION 15

SOLID NEUTRAL GROUND BUS

MAIN: 200 A MLO
 VOLTS: 120/208 Wye
 PHASE: 3
 WIRE: 4
 SCCR: 65 kA
 ISC UNKNOWN 0.00 kA

NOTES:

CKT NO.	LOAD DESCRIPTION	OC PD	WIRE SIZE	VD %	A	B	C	VD %	WIRE SIZE	OC PD	LOAD DESCRIPTION	CKT NO.
1	Receptacles	20 A	12 12 12	0.54	0.36	0.6		1.46	12 12 12	1	20 A EWC	2
3	Receptacles	20 A	12 12 12	0.58		0.36	0.9	1.05	12 12 12	1	20 A Receptacles	4
5	Receptacles	20 A	12 12 12	0.53		0.36	0.36	0.49	12 12 12	1	20 A Receptacles	6
7	Receptacles	20 A	12 12 12	0.54	0.18			0.23	12 12 12	1	20 A Receptacles	8
9	Receptacles	20 A	12 12 12	0.84		0.54	1.08	2.41	10 10 10	1	20 A Exterior Receptacles	10
11	Receptacles	20 A	2 12	0.6		0.5	0.42	0.91	12 12 12	1	20 A Receptacles	12
13	Receptacles	20 A	2 12	0.5	0.18			0.18	12 12 12	1	20 A Receptacles	14
15	Receptacles	20 A	12 12 12	0.54		0.54	0.84	1.1	12 12 12	1	20 A Receptacles	16
17	Receptacles	20 A	2 12	0.37		0.5	1.18	1.07	12 12 12	1	20 A Receptacles	18
19	Receptacles	20 A	2 12	0.5	0.9			0.83	12 12 12	1	20 A Receptacles	20
21	Roof Receptacles	20 A	12 12 12	1.72		1.08	0.18	0.21	12 12 12	1	20 A Receptacles	22
23	Receptacles	20 A	2 12	0.48		0.5	0.18	0.1	12 12 12	1	20 A Receptacles	24
25	Receptacles	20 A	2 12	0.5	0.18			0.19	12 12 12	1	20 A Receptacles	26
27	Receptacles	20 A	12 12 12	0.5		0.36	1.08	1.96	10 10 10	1	20 A Receptacles	28
29	Receptacles	20 A	2 12	0.54		0.5	0.36	0.3	12 12 12	1	20 A Receptacles	30
31	Receptacles	20 A	2 12	0.54		0.5	0.54	1.2	12 12 12	1	20 A Receptacles	32
33	Receptacles	20 A	12 12 12	0.33		0.18	0.72	0.97	12 12 12	1	20 A Receptacles	34
35	Receptacles	30 A	2 10 10	1.7		2.5	0.9	1.56	12 12 12	1	20 A Receptacles	36
37	Receptacles	20 A	2 12	0.5	0.9			1.7	12 12 12	1	20 A Receptacles	38
39	Receptacles	20 A	12 12 12	2.69		0.9	0.9	1.48	12 12 12	1	20 A Receptacles	40
41	Receptacles	20 A	12 12 12	0.77		0.36	1.28	1.28	10 10 10	1	20 A Receptacles	42
43	Receptacles	20 A	12 12 12	2.41	1.08	0.36		0.75	12 12 12	1	20 A Receptacles	44
45	Receptacles	20 A	12 12 12	0.22		0.18	0.18	0.2	12 12 12	1	20 A Receptacles	46
47	Receptacles	20 A	12 12 12	0.35		0.18	0.18	0.18	12 12 12	1	20 A Receptacles	48
49	Receptacles	20 A	12 12 12	0.38	0.18	0.18		0.21	12 12 12	1	20 A Receptacles	50
51	HAND DRYER, "P", "GFI"	20 A	10 10 10	2.15		1.5	1.5	2.4	12 12 12	1	20 A HAND DRYER, "P", "GFI"	52
53	HAND DRYER, "P", "GFI"	20 A	12 12 12	2.62		1.5	1.5	2.25	12 12 12	1	20 A HAND DRYER, "P", "GFI"	54
55	Receptacles	20 A	12 12 12	2.62	0.9	0.36		0.18	12 12 12	1	20 A Receptacles	56
57	Receptacles	20 A	12 12 12	0.74		0.36	0.36	0.45	12 12 12	1	20 A Receptacles	58
59	Receptacles	20 A	12 12 12	0.8		0.36	1	1.93	10 10 10	1	20 A Receptacles	60
61	Receptacles	20 A	12 12 12	0.07	0.36	0.72		1.04	10 10 10	1	20 A Receptacles	62
63	Receptacles	20 A	10 10 10	1.52		0.9	0.1	0.1	12 12 12	1	15 A GAS CONTROLLER	64
65	EXTERIOR LOCKERS	15 A	12 12 12	1.45		0.5	0.72	10	10 10 10	1	20 A Tree Receptacles	66
67	SPARE	20 A	1	--	--	0	0	--	--	--	1 20 A SPARE	68
69	SPARE	20 A	1	--	--	0	0	--	--	--	1 20 A SPARE	70
71	SPARE	20 A	1	--	--	0	0	--	--	--	1 20 A SPARE	72
73	SPARE	20 A	1	--	--	0	0	--	--	--	1 20 A SPARE	74
75	SPARE	20 A	1	--	--	0	0	--	--	--	1 20 A SPARE	76
77	SPARE	20 A	1	--	--	0	0	--	--	--	1 20 A SPARE	78
79	SPARE	20 A	1	--	--	0	0	--	--	--	1 20 A SPARE	80
81	SPARE	20 A	1	--	--	0	0	--	--	--	1 20 A SPARE	82
83	SPARE	20 A	1	--	--	0	0	--	--	--	1 20 A SPARE	84

LOAD SUMMARY			
LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
Receptacles	43.42 kVA	61.52%	26.71 kVA
TOTALS*			
	TOTAL CONNECTED LOAD:		43.42 kVA
	TOTAL ESTIMATED DEMAND LOAD:		26.71 kVA
	TOTAL CONNECTED AMPS:		120.52 A
	TOTAL ESTIMATED DEMAND AMPS:		74.1 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.
 CIRCUIT KEY NOTES: *P = PROVIDE CIRCUIT BREAKER WITH PADLOCK HASP, *GFI = PROVIDE CIRCUIT BREAKER AS GFI TYPE.

PANEL PP2

ENCLOSURE: NEMA PB 1
 FED FROM: 400 A/3P MCCB @ MDP
 LOCATION: ELECTRIC 14

SOLID NEUTRAL GROUND BUS

MAIN: 400 A MLO
 VOLTS: 120/208 Wye
 PHASE: 3
 WIRE: 4
 SCCR: 65 kA
 ISC UNKNOWN 0.00 kA

NOTES: PROVIDE PANEL WITH INDIVIDUAL BRANCH CURRENT POWER METERING CAPABILITY. REFER TO 26 09 13 FOR ADDITIONAL INFORMATION.

CKT NO.	LOAD DESCRIPTION	OC PD	WIRE SIZE	VD %	A	B	C	VD %	WIRE SIZE	OC PD	LOAD DESCRIPTION	CKT NO.					
INV 1	Lighting	20 A	1 10 10	10	2.95	0.96	0.5		12 12 12	1	20 A FACP - Fire Alarm Control Panel	2					
INV 3	Lighting	20 A	1 10 10	10	2.03		0.65	0.05	12 12 12	1	20 A FAA - Fire Alarm Annunciator	4					
INV 5	Lighting	20 A	1 10 10	10	1.37			0.63	0.1	0.33	12 12 12	1	20 A FP ELECTRIC BELL	6			
7	Lighting	20 A	1 10 10	10	2.13	1.05	0.36		0.07	12 12 12	1	20 A ELEC RM: Receptacles	8				
9	Lighting	20 A	1 10 10	10	2.59		1.14	0.1		10 10 10	1	20 A PUBLIC ART	10				
11	Lighting	20 A	1 10 10	10	1.62			0.98	1.98	1.4	10	2	30 A CU-1	12			
13	Lighting	20 A	1 10 10	10	1.22	0.56	1.98		--	--	--	--	14				
15	Lighting	20 A	1 12 12	12	1.95		0.65	1.67		0.91	8 8 8 3	35 A	UH-1	16			
17	Site Lighting	20 A	1 8 8	8	0.47			0.19	1.67	--	--	--	--	18			
19	Lighting	20 A	1 10 10	10	0.97	0.65	1.67		--	--	--	--	20				
21	Lighting	20 A	1 10 10	10	0.53		0.55	0.83		12	12	1	20 A AC-1	22			
23	BUILDING SIGNAGE	20 A	1 10 10	10				1	2.64	1	8	8	3	40 A BP-1	24		
25	CAB-1	30 A	3 10 10	10	2.26	2.5	2.64		--	--	--	--	--	26			
27		--	--	--	--	--	--		2.5	2.64	--	--	--	28			
29		--	--	--	--	--	--		2.5	0.67	1.26	12 12 12	1	15 A EF-4	30		
31	EF-3	20 A	1 12 12	12	1.93	1.13			2.3	10 10 10	1	20 A EF-2	32				
33	EF-1	15 A	1 12 12	12	1.87		0.67	4.33		2.65	8 8 8 3	50 A	TAB-5	34			
35	TAB-6	15 A	3 10 10	10	0.42			1.17	4.33	--	--	--	--	36			
37		--	--	--	--	--	--		1.17	4.33	--	--	--	38			
39		--	--	--	--	--	--		1.17	4.33		0.93	8 8 8 3	50 A	TAB-7	40	
41	TAB-9	15 A	3 12 12	12	0.57			1.17	4.33	--	--	--	--	42			
43		--	--	--	--	--	--		1.17	4.33	--	--	--	44			
45		--	--	--	--	--	--		1.17	5		1.19	6 6 6 3	60 A	TAB-10	46	
47	TAB-14	15 A	3 12 12	12	1.46			1	5	--	--	--	--	48			
49		--	--	--	--	--	--		1	5	--	--	--	50			
51		--	--	--	--	--	--		1	1		1.06	12 12 12	3	15 A	TAB-13	52
53	TAB-11, TAB-4, TAB-2	15 A	3 12 12	12	0.69			1	1		1	1	--	--	--	54	
55		--	--	--	--	--	--		1	1		--	--	--	56		
57		--	--	--	--	--	--		1	3	</						

SECTION 105113 - METAL LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Knocked-down corridor lockers.
 - 2. Exterior parcel lockers.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of metal locker.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker.
- B. Shop Drawings: For metal lockers.
 - 1. Include plans, elevations, sections, details, and attachments to other work.
 - 2. Show locker trim and accessories.
 - 3. Include locker identification system and numbering sequence.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Full-size units of the following metal locker hardware items equal to 10 percent of amount installed for each type and finish installed, but no fewer than two units:
 - a. Identification plates.
 - b. Hooks.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

1.9 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.10 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures.
 - b. Faulty operation of latches and other door hardware.
 - 2. Damage from deliberate destruction and vandalism is excluded.
 - 3. Warranty Period for Knocked-Down Metal Lockers: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain metal lockers and accessories from single source from single locker manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Accessibility Requirements: For lockers indicated to be accessible, comply with applicable provisions in ICC A117.1 and 2018 Illinois Accessibility Code.

2.3 KNOCKED-DOWN CORRIDOR LOCKERS

- A. Manufacturers: Subject to compliance with requirements, products by one of the following:
1. ASI Storage Solutions.
 2. Global Industrial.
 3. Lyon
 4. Penco.
 5. **Scranton Products.**
- B. Doors: One piece; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.
1. Doors for box lockers less than 15 inches (381 mm) wide may be fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
 2. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; welded to inner face of doors.
 3. Stiffeners: Manufacturer's standard full-height stiffener fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet; welded to inner face of doors.
 4. Door Style: Vented panel as follows:
 - a. Louvered Vents: No fewer than three louver openings at top and bottom for double-tier lockers.
- C. Body: Assembled by riveting or bolting body components together. Fabricate from unperforated steel sheet with thicknesses as follows:
1. Tops, Bottoms, and Intermediate Dividers: 0.024-inch (0.61-mm) nominal thickness, with single bend at sides.
 2. Backs and Sides: 0.024-inch (0.61-mm) nominal thickness, with full-height, double-flanged connections.
 3. Shelves: 0.024-inch (0.61-mm) nominal thickness, with double bend at front and single bend at sides and back.
- D. Frames: Channel formed; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet; lapped and factory welded at corners; with top and bottom main frames factory welded into

vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.

1. Cross Frames between Tiers: Channel formed and fabricated from same material as main frames; welded to vertical main frames.
2. Frame Vents: Fabricate face frames with vents.

E. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees; self-closing.

1. Hinges: Manufacturer's standard, steel, continuous or knuckle type.

F. Locks: Digital keypad locks.

G. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high.

H. Hooks: Manufacturer's standard ball-pointed type hooks, aluminum or steel; zinc plated.

I. Continuous Zee Base: Fabricated from manufacturer's standard thickness, but not less than 0.060-inch (1.52-mm) nominal-thickness steel sheet.

1. Height: 4 inches (102 mm).

J. Recess Trim: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.

K. Filler Panels: Fabricated from manufacturer's standard thickness, but not less than 0.036-inch (0.91-mm) nominal-thickness steel sheet.

L. Boxed End Panels: Fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet.

M. Finished End Panels: Fabricated from 0.024-inch (0.61-mm) nominal-thickness steel sheet.

N. Center Dividers: Fabricated from 0.024-inch (0.61-mm) nominal-thickness steel sheet.

O. Materials:

1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.

P. Finish: Baked enamel or powder coat.

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

2.4 EXTERIOR PARCEL LOCKERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Quadient, "Parcel Pending Standard Outdoor Locker System" or comparable product.

B. Doors: One piece; fabricated from 18-gauge double reinforced cold-rolled steel construction.

1. Door Style: Unperforated panel.
 2. Size and Configuration: As indicated on Drawings.
- C. Body: Assembled by welding body components together. Fabricate from unperforated steel sheet with thicknesses as follows:
1. 18-gauge double reinforced.
 2. Rain, salt, and wind (category 3) resistant.
- D. Hinges: Welded to door and attached to door frame with no fewer than two factory-installed rivets per hinge that are completely concealed and tamper resistant when door is closed; fabricated to swing 180 degrees.
1. Hinges: Manufacturer's standard, steel, continuous or knuckle type.
- E. Locks: Digital keypad locks.
- F. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high.
- G. Continuous Sloping Tops: Manufacturer's standard awning.
- H. Materials:
1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
 2. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with A60 (ZF180) zinc-iron, alloy (galvannealed) coating designation.
- I. Finish: Baked enamel or powder coat.
1. Color: As selected by Architect from manufacturer's full range.

2.5 LOCKS

- A. Digital Keypad Locks: Battery-powered electronic keypad with reprogrammable manager and owner codes that override access. Three consecutive incorrect code entries shall disable lock for three minutes.
1. Designed for shared or temporary access by multiple users, with user-defined code to lock and unlock. Provide LED indicator to show when lock is in use.

2.6 FABRICATION

- A. Fabricate metal lockers square, rigid, without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges safe to touch and free of sharp edges and burrs.
1. Form body panels, doors, shelves, and accessories from one-piece steel sheet unless otherwise indicated.

2. Provide fasteners, filler plates, supports, clips, and closures as required for complete installation.
- B. Fabricate each metal locker with an individual door and frame; individual top, bottom, and back; and common intermediate uprights separating compartments. Factory weld frame members of each metal locker together to form a rigid, one-piece assembly.
- C. Equipment: Provide each locker with an identification plate and the following equipment:
 1. Double-Tier Units: One double-prong ceiling hook and two single-prong wall hooks.
- D. Knocked-Down Construction: Fabricate metal lockers using nuts, bolts, screws, or rivets for preassembly at plant prior to shipping.
- E. Accessible Lockers: Fabricate as follows:
 1. Locate bottom shelf no lower than 15 inches (381 mm) above the floor.
 2. Where hooks, coat rods, or additional shelves are provided, locate no higher than 48 inches (1219 mm) above the floor.
- F. Continuous Base: Formed into channel or zee profile for stiffness, and fabricated in lengths as long as practical to enclose base and base ends of metal lockers; finished to match lockers.
- G. Filler Panels: Fabricated in an unequal leg angle shape; finished to match lockers. Provide slip-joint filler angle formed to receive filler panel.

2.7 ACCESSORIES

- A. Fasteners: Zinc- or nickel-plated steel, slotless-type, exposed bolt heads; with self-locking nuts or lock washers for nuts on moving parts.
- B. Anchors: Material, type, and size required for secure anchorage to each substrate.
 1. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls, floors, and support bases, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install lockers level, plumb, and true; shim as required, using concealed shims.
 - 1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Using concealed fasteners, install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion.
 - 2. Anchor single rows of metal lockers to walls near top and bottom of lockers.
- B. Knocked-Down Lockers: Assemble with standard fasteners, with no exposed fasteners on door faces or face frames.
- C. Equipment:
 - 1. Attach hooks with at least two fasteners.
 - 2. Attach door locks on doors using security-type fasteners.
 - 3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
 - a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
- D. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
 - 1. Attach recess trim to recessed metal lockers with concealed clips.
 - 2. Attach filler panels with concealed fasteners. Locate filler panels where indicated on Drawings.

3.3 ADJUSTING

- A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.

3.4 PROTECTION

- A. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit use during construction.
- B. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 105113

SECTION 26 2413 - SWITCHBOARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Main Distribution Switchboards: [MDP-#]

1.2 RELATED SECTIONS AND WORK

- A. Refer to the Electrical Distribution Diagram and Electrical Schedules for size, rating, and configuration.

1.3 REFERENCES

- A. ANSI C12 - Code for Electricity Metering
- B. ANSI C57.13 - Requirements for Instrument Transformers
- C. NEMA AB 1 - Molded Case Circuit Breakers
- D. NEMA KS 1 - Enclosed Switches
- E. NEMA PB 2 - Dead Front Distribution Switchboards

1.4 SUBMITTALS

- A. Include front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars per phase, neutral, and ground; switchboard instrument details; instructions for handling and installation of switchboard; and electrical characteristics including voltage, frame size and trip ratings, withstand ratings, and time-current curves of all equipment and components.
- B. Arc Energy Reduction Documentation: Submit documentation to demonstrate the arc energy reduction system is set to operate at a value below the available arcing current.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in 48-inch maximum width shipping splits, unless approved otherwise by both the Contractor and Architect/Engineer, individually wrapped for protection, and mounted on shipping skids.
- B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- C. Handle in accordance with NEMA PB2.1 and manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of Section 26 0500.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Approved Manufacturers:

1. Square D Class 2700 QED-2, I-Line, Powerstyle
2. Siemens
3. Eaton

2.2 RATINGS

- A. Definitions:

1. Series rated equipment shall be defined as equipment that can achieve a required UL AIC rating with an upstream device such as a main breaker or a combination of devices to meet or exceed a required UL AIC rating. All series rated equipment shall have a permanently attached nameplate indicating that device rating must be maintained. Refer to Section 26 0553 for additional requirements.
2. Fully rated equipment shall be defined as equipment where all devices in that equipment shall carry a minimum of the AIC rating that is specified.

- B. The switchboards for this project shall be fully rated.

2.3 SWITCHBOARD CONSTRUCTION AND RATINGS

- A. Factory-assembled, dead front, metal-enclosed, and self-supporting switchboard assembly conforming to NEMA PB2, and complete from incoming line terminals to load-side terminations.
- B. Switchboard electrical ratings and configurations as shown on the drawings.
- C. Line and Load Terminations: Accessible from the front only of the switchboard, suitable for the conductor materials used.
- D. Main Section Devices: Individually mounted and compartmented.
- E. Distribution Section Devices: Group or individually mounted.
- F. Auxiliary Section Devices: Individually mounted and compartmented.
- G. Bus Connections: Bolted, accessible from front only for maintenance. Plug-on connections may be utilized with Architect/Engineer's pre-approval by addenda.
- H. Bus bars shall be fully isolated, braced for minimum ampere rms symmetrical rating as indicated on drawings.

- I. The bus shall extend the full height of the distribution sections to provide space for future breakers.
 - J. Provide a 1 X 1/4-inch copper ground bus through the length of the switchboard.
 - K. Enclosure shall be NEMA PB 2; Type 1 - General-Purpose. Sections shall align at front and rear. Provide removable panel access or hinged door with flush lock and all keyed alike. Door hardware shall provide swing clear operation (180-degree swing).
 - L. Switchboard Height: NEMA PB 2; 92 inches, excluding floor sills, lifting members and pull boxes.
 - M. Maximum enclosure length shall be 72-inches.
 - N. Finish: Manufacturer's standard light gray enamel over external surfaces. Coat internal surfaces with minimum one coat corrosion-resisting paint, or plate with cadmium or zinc.
 - O. Pull Section: Same construction as switchboard, size as shown on the drawings. Depth and height to match switchboard. Arrange as shown on the drawings.
 - P. Future Provisions: In addition to the spare devices shown, provide a minimum of 15 inches of fully equipped space for future devices with bussing and bus connections, suitably insulated and braced for short circuit currents. Continuous current rating as indicated on the drawings.
 - Q. Suitable for use as service entrance equipment. Provide line side (service style) barriers.
- 2.4 SWITCHING, OVER-CURRENT PROTECTIVE DEVICES, AND ARC ENERGY REDUCTION
- A. Molded Case Circuit Breakers: Provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide breaker interrupting ratings as indicated on the plans. Where necessary to meet interrupting ratings, breakers shall be provided with automatically resetting current limiting elements in each pole.
 - B. Solid State Molded Case Circuit Breakers: Provide molded case switch with electronic sensing, timing, and tripping circuits for fully adjustable time current characteristic settings including ground fault trip, instantaneous trip, long time trip, long time delay, short time trip, and short time delay. Trip setting shall be field programmable with a sealable clear cover. Provide breaker interrupting ratings as indicated on the plans.
 - C. Arc Energy Reduction:
 - 1. Provide an arc energy reduction system to reduce the clearing time of an arc flash event. The arc energy reduction system shall be provided for overcurrent protection devices rated 1,200 amps or larger.
 - 2. Energy-Reducing Maintenance Switch: Provide an energy-reducing maintenance switch visual status indication when engaged. Install the maintenance switch in the first section of the electrical equipment.

2.5 INSTRUMENTS AND SENSORS

A. Electronic Power Monitor: Refer to Section 26 0913.

B. Advanced Trip Units:

1. Trip units shall include high accuracy power, energy, and power quality metering capable of delivering ANSI C12.1 accurate energy readings. Metering accuracy of the complete system, including current sensors, auxiliary CTs, and the trip unit, shall be min. +/- 0.5% of reading for current and voltage values.

a. The unit shall be capable of monitoring the following data:

- 1) Individual phase, neutral, and ground current**
- 2) Voltage phase-to-phase and phase-to-neutral**
- 3) Minimum and maximum current and voltage values**
- 4) Watts, Vars, VA, Watthours, Varhours, VA hours, Peak demand, Present demand, and energy consumption.**
- 5) Power Factor**

2.6 CAPTURED KEY INTERLOCK SWITCH

A. Captured Key Interlock Switch: Keyed switch, captured key style for interlock operation, corrosion resistant construction. Refer to plans for lock quantities, keyed-alike relationships, and additional information.

B. Key: Custom heavy duty, non-snap under hand force, corrosion resistant, with key-ring / lanyard hole. Keys shall not be reproducible to prevent copying.

C. Approved Manufacturers:

1. Kirk Key (HD Key Series)
2. Allen Bradley Bolt Interlock Series
3. Haake HST Series

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install switchboard in locations shown on the drawings, in accordance with manufacturer's written instructions and NEMA PB 2.1.

B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.

3.2 FIELD QUALITY CONTROL

- A. Inspect completed installation for physical damage, proper alignment, anchorage, and grounding.
- B. Measure insulation resistance of each bus section phase to phase and phase to ground for one minute each. Test voltage shall be 1000 volts, and minimum acceptable value for insulation resistance is 2 megohms.
- C. Check tightness of accessible bolted bus joints using a calibrated torque wrench. Tightness shall be in accordance with manufacturer's recommended values.
- D. Physically test key interlock systems to ensure proper function.

3.3 ADJUSTING AND CLEANING

- A. Adjust all operating mechanisms for free mechanical movement.
- B. Touch up scratched or marred surfaces to match original finish.
- C. Provide time/current trip curves for all adjustable protection devices that require setting. Also provide curves and equipment information for associated new and existing fixed devices that require coordination with new protection devices. Submit time/current curves in hard copy or electronic format.
- D. Adjust trip and time delay settings to values as scheduled, or as instructed by the Architect/Engineer.
- E. Where two levels of ground fault are provided, test ground fault circuit breakers to prove selective coordination in accordance with manufacturer's directions. Provide testing documentation with Operating & Maintenance Manual submittals.

END OF SECTION