

BID PACKAGE 02 – ADDENDUM 04

Date: February 18, 2020

Re: Wilma P Mankiller Health Center Expansion

From: James R Childers Architect, Inc.
45 South 4th Street
Fort Smith, Arkansas 72901

02-18-20



This addendum forms part of the Contract Documents, and modifies the documents as noted below. Acknowledge receipt of this addendum in the space provided on the bid form. Failure to do so may subject the bidder to disqualification.

- Item 01** A1.11 – Card reader removed room 01-11-05. Card reader added to room 01-11-06.
A6.10 – Revised hardware sets for the following doors: 01-00-09, 01-05-02, 01-05-05, 01-08-13, 01-09-07, 01-11-05, 01-11-06, 01-12-00, 01-12-04, 01-13-10, 01-13-11, 01-15-10, 01-16-04, 02-05-11, 02-05-12, 02-17-08, 02-17-09, 02-17-29, 02-17-30, 02-17-34A, 02-17-34B, 02-17-46, 03-19-01.
Refer to attached MEP narrative.
- Item 02** Updated table of contents and added sections listed below in volume 01
087100 – Door Hardware

Updated table of contents and added sections listed below in volume 02
23 2500 – HVAC Water Treatment
- Item 03** Revised Benco/Adec Dental Equipment Drawings



5214 W. Village Parkway, Suite 120, Rogers, AR 72758 | 479-899-6370

CHANGE NARRATIVE LETTER

TO: MATHEW THOMAS- CHILDERS ARCHITECTS
FROM: STEPHEN EDMONDSON, TREY SMITH, BETSY WELLS– HP ENGINEERING, INC.
DATE: 2/18/2020
PROJECT: WPMHC EXPANSION BID PACKAGE 02 ADDENDUM 04

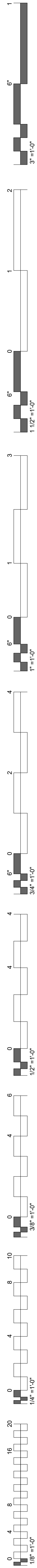
MECHANICAL DESIGN ITEMS

1. M1.01
 - a. Added TG-1 to Air Device Schedule.
2. M1.02
 - a. Mini Split Air Conditioning Schedule – Increase size of MAC-11.
 - b. Removed Dental Equipment Louver Schedule.
 - c. Removed Dental Equipment Exhaust Fan Schedule.
3. M4.03
 - a. Added roof cap for fume hood.
4. M5.03
 - a. Increased size of MAC-11 in pump room
 - b. Removed fans and louvers from pump room.
 - c. Added exhaust duct and roof cap to fume hood in lab.
 - d. Added transfer grille to lab.
 - e. Added keynote 23.74.
5. M6.05
 - a. Added transfer grille to lab.

ELECTRICAL DESIGN ITEMS

1. E1.04
 - a. Add power for fume hood on circuit L3B-47
 - b. Add note stating "VERIFY MOUNTING HEIGHT OF RECEPTACLES IN LAB WITH MIDMARK PRIOR TO ROUGH-IN"
2. E1.20
 - a. Added card readers.
3. E1.21
 - a. Added and removed card readers.
4. E1.22
 - a. Add note stating "VERIFY MOUNTING HEIGHT OF DATA OUTLETS IN LAB WITH MIDMARK PRIOR TO ROUGH-IN"
5. E3.03
 - a. Added circuit L3B-47 for fume hood.
 - b. Circuit breaker for vacuum equipment upsized.
6. E3.04
 - a. Circuit breaker L4A-44,46 upsized.

END OF RESPONSES



WILMA P. MANKILLER HEALTH CENTER EXPANSION

BID PACKAGE 02

(CIVIL / ARCHITECTURAL / STRUCTURAL / MEP)

INDEX OF DRAWINGS - BID PACKAGE 02			
SHEET NUMBER	SHEET NAME	12-06-19 - BID PACKAGE 02	01-16-20 - BID PACKAGE 02 - ADDENDUM 01
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C101	ENLARGED PROPOSED SITE PLAN		
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CPI00	OVERALL PAVING AND STRIPING PLAN		
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CPI02	ENLARGED PAVING PLAN		
CPI03	ENLARGED STRIPING PLAN		
CPI04	ENLARGED STRIPING PLAN		
CPI05	OVERALL JOINTING PLAN		
CP000	PAVING DETAILS		
CP001	STRIPING & HANDICAP DETAILS		
CP002	JOINTING DETAILS		
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CG101	ENLARGED GRADING PLAN		
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CG103	ENLARGED GRADING PLAN		
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CG505	WALLS A, B & C DETAILS		
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EQ1.12	EQUIPMENT PLAN LEVEL 01 SECTOR 02		
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Grand total: 226			



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808 TRAVIS STREET, SUITE 200
HOUSTON, TX 77002
(281) 589-5800



1316 E 35TH PLACE, SUITE 100
TULSA, OK 74105
(918) 382-9120

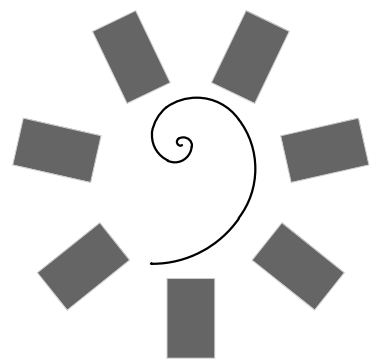
MECHANICAL / ELECTRICAL / PLUMBING ENGINEER

CIVIL ENGINEER

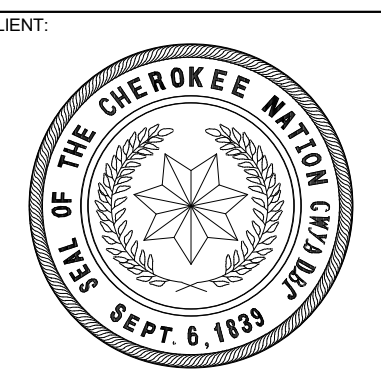
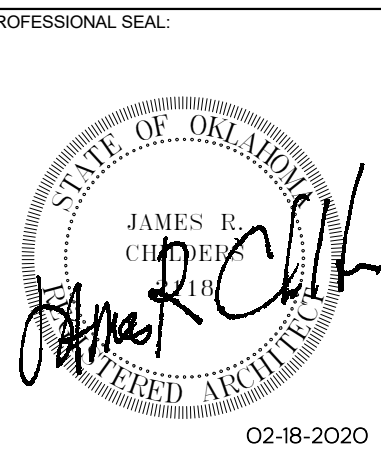
STRUCTURAL ENGINEER

FIRE PROTECTION / LIFE SAFETY

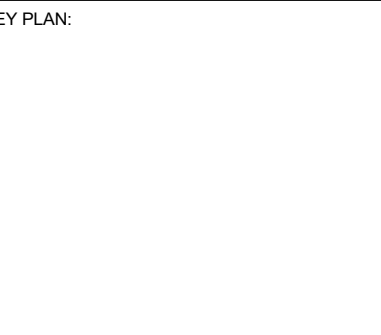
EQUIPMENT PLANNER



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WILMA P. MANKILLER HEALTH CENTER
EXPANSION
STILWELL, OKLAHOMA



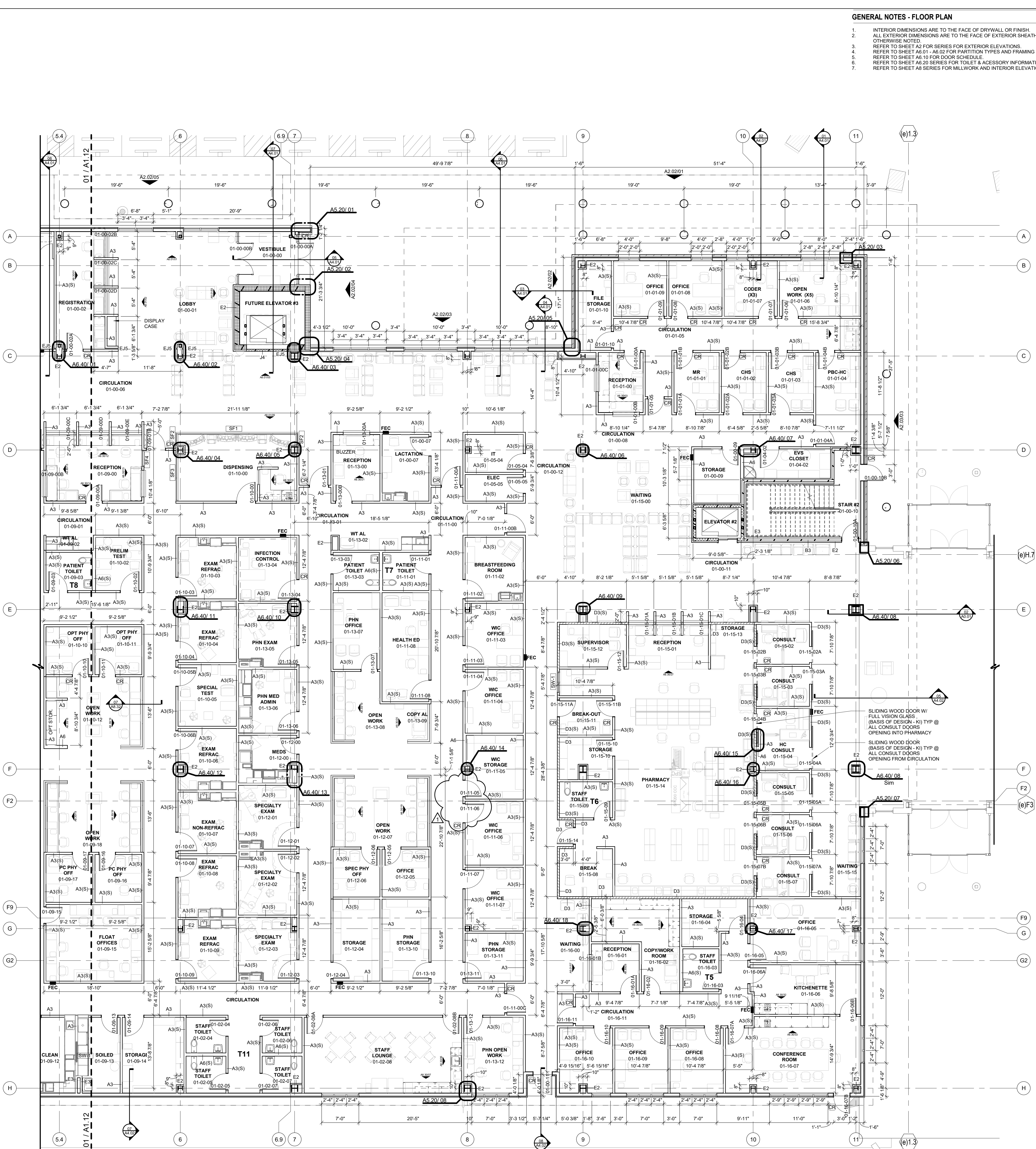
PROJECT PHASE:
BID PACKAGE 02

#	DATE	REVISIONS
1	1/19/20	BID PACKAGE 02 - ADD 01
2	2/19/2020	BID PACKAGE 02 - ADD 04

DATE: 12-06-19
JOB NUMBER: 18-01.01

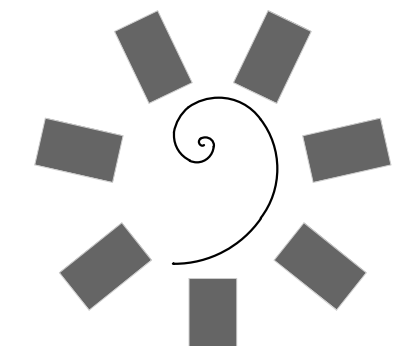
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G0.02

COVER / INDEX

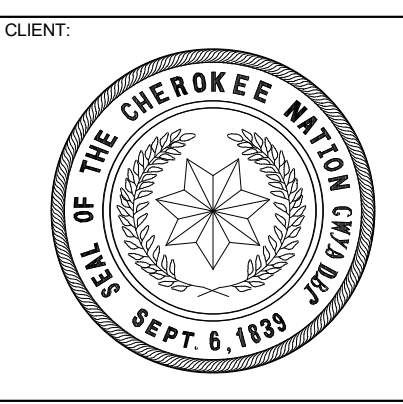
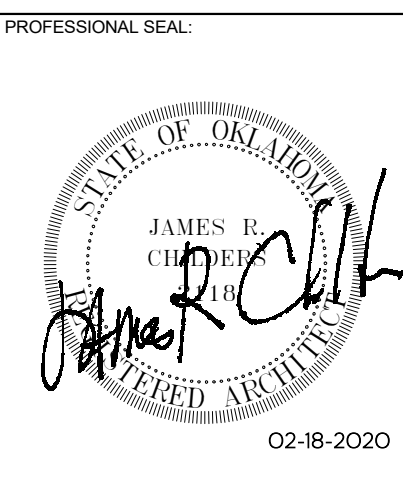


GENERAL NOTES - FLOOR PLAN

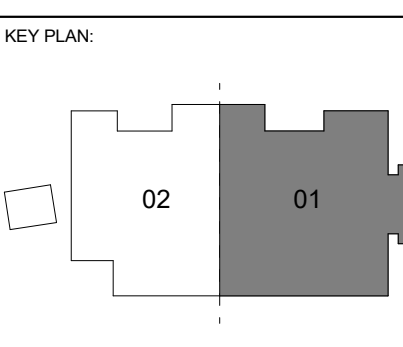
1. INTERIOR DIMENSIONS ARE TO THE FACE OF DRYWALL OR FINISH.
2. ALL EXTERIOR DIMENSIONS ARE TO THE FACE OF EXTERIOR SHEATHING, UNLESS OTHERWISE NOTED.
3. REFER TO SHEET A2 FOR SERIES FOR EXTERIOR ELEVATIONS.
4. REFER TO SHEET A2 FOR PARTITION TYPES AND FRAMING DETAILS.
5. REFER TO SHEET A6.10 FOR DOOR SCHEDULE.
6. REFER TO SHEET A6.20 SERIES FOR TOILET & ACCESSORY INFORMATION.
7. REFER TO SHEET A8 SERIES FOR MILLWORK AND INTERIOR ELEVATIONS.



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**WILMA P. MANKILLER HEALTH CENTER
EXPANSION**
STILWELL, OKLAHOMA

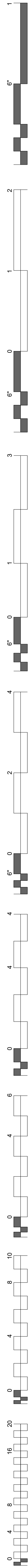


PROJECT PHASE:
BID PACKAGE 02

#	DATE	REVISIONS
1	2/18/2020	BID PACKAGE 02 - ADD 04

DATE: 12-06-19
JOB NUMBER: 18-01.01

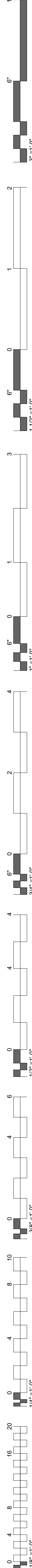
SHEET NUMBER:
A1.11
FLOOR PLAN LEVEL 01
SECTOR 01





NOTE:
CONTRACTOR SHALL CONFIRM PIPE SIZES
FOR AIR, VAC, N02 AND 02 WITH BENCO





EXPANSION TANK SCHEDULE

TAG	DESCRIPTION	MFR	MODEL	ASME CONSTRUCTION (YES/NO)	CAPACITY (GALLONS)	ACCEPTANCE (GALLONS)	INITIAL TANK PRESSURE (PSIG)	NOTES
ET-1	HEATING WATER EXPANSION TANK	ARMSTRONG	A200-L	YES	30	30	12	35% ETYLENE GLYCOL
ET-2	CHILLED WATER EXPANSION TANK	ARMSTRONG	A300-L	YES	50	50	12	35% ETYLENE GLYCOL

PUMP SCHEDULE

TAG	MFR	MODEL	TYPE	SERVICE	GPM	SYSTEM HEAD (ft)	MAX HP	VOLTS / PHASE	NOTES
CHWP-1	GRUNDFOS	HYDRO MPCE 3CRE64-2-2	TRIPLEX	CHILLED WATER	620	150	(3) 20	460 / 3	SEE BELOW
HWP-1	GRUNDFOS	HYDRO MPCE 3CRE20-2	TRIPLEX	HEATING WATER	230	100	(3) 5	460 / 3	SEE BELOW

GENERAL NOTES APPLICABLE TO ALL UNITS:
1) PUMPS TO BE FURNISHED WITH INTEGRAL MOTOR VFD'S
2) PUMPS TO BE VERTICAL, MULTI-STAGE WITH SHAFT COUPLING
3) PUMPS TO HAVE LIFETIME ALIGNMENT GUARANTEE
4) SUCTION AND DISCHARGE HEADERS TO BE 316L STAINLESS STEEL
5) PUMP BASEPLATE SHALL BE 304 STAINLESS STEEL
6) ON-BOARD PUMP CONTROLLER SHALL CASCADE AND SEQUENCE PUMPS FOR MAXIMUM EFFICIENCY
7) PUMP CURVES SHALL BE PROGRAMMED INTO CONTROLLER
8) ENTIRE SYSTEM (PUMPS, VFD'S, CONTROLLER) SHALL BE MADE BY A SINGLE MANUFACTURER
9) PUMPS TO BE OPERATED IN PARALLEL CONTROL
10) EACH SMD MOUNTED SYSTEM SHALL INCLUDE ALL PIPE, VALVES AND FITTINGS, AND OFFER SINGLE POINT CONNECTIONS
11) FURNISH EACH SYSTEM WITH BACNET INTERFACE CARD
12) SYSTEM DESIGNED FOR 2 PUMPS TO HANDLE FULL LOAD WITH 3RD PUMP AS BACKUP
13) FURNISH EACH SYSTEM WITH DIFFERENTIAL PRESSURE TRANSDUCERS
14) SCOR 65K ON AHU 100K

AIR DEVICE SCHEDULE

TAG	DESCRIPTION	MFR	MODEL	FACE SIZE	FRAME SIZE	NECK SIZE	MATERIAL/ FINISH	MAX FLOW
CD-1	CEILING DIFFUSER, LOUVERED FACE, ADJUSTABLE	PRICE	AMD	9x9	12x12	6	ALUMINUM/ WHITE	100 CFM
CD-2	CEILING DIFFUSER, LOUVERED FACE, ADJUSTABLE	PRICE	AMD	18X18	24x24	8	ALUMINUM/ WHITE	200 CFM
CD-3	CEILING DIFFUSER, LOUVERED FACE, ADJUSTABLE	PRICE	AMD	18x18	24x24	10	ALUMINUM/ WHITE	350 CFM
CD-4	CEILING DIFFUSER, LOUVERED FACE, ADJUSTABLE	PRICE	AMD	18x18	24x24	12	ALUMINUM/ WHITE	475 CFM
EAG-1	EGG CRATE EXHAUST GRILLE	PRICE	80	12X12	14X14	N/A	ALUMINUM/ WHITE	500 CFM
EAG-2	EGG CRATE EXHAUST GRILLE	PRICE	80	22X22	24X24	N/A	ALUMINUM/ WHITE	1000 CFM
LR-1	LINEAR 1" SLOT RETURN WITH SDA PLENUM	PRICE	SDR	1", 1 SLOT	60"	N/A	ALUMINUM/ REF ARCH	200 CFM
LS-1	LINEAR 1" SLOT DIFFUSER WITH SDA PLENUM, 1 SLOT	PRICE	SDS	1", 1 SLOT	48"	N/A	ALUMINUM/ REF ARCH	150 CFM
LS-2	LINEAR 1" SLOT DIFFUSER WITH SDA PLENUM, 1 SLOT	PRICE	SDS	1", 1 SLOT	60"	N/A	ALUMINUM/ REF ARCH	200 CFM
LS-3	LINEAR 1" SLOT DIFFUSER WITH SDA PLENUM, 2 SLOT	PRICE	SDS	1", 2 SLOT	60"	N/A	ALUMINUM/ REF ARCH	400 CFM
LS-4	LINEAR 1" SLOT DIFFUSER WITH SDA PLENUM, 1 SLOT	PRICE	SDS	1", 1 SLOT	24"	N/A	ALUMINUM/ REF ARCH	100 CFM
LV-1	WIND DRIVEN RAIN LOUVER	GREENHECK	EVH-501	12X14	N/A	N/A	ALUMINUM/ WHITE	150 CFM
LV-2	WIND DRIVEN RAIN LOUVER	GREENHECK	EVH-501	22X36	N/A	N/A	ALUMINUM/ REF ARCH	1300 CFM
RAG-1	EGG CRATE RETURN GRILLE	PRICE	80	22x22	24x24	REF PLANS	ALUMINUM/ WHITE	2500 CFM
STG-1	SIDEWALL RETURN GRILLE 30° DEFLECTION 1/2" O.C. SPACING BLADES PARALLEL TO LONG DIMENSION	PRICE	630	8x8	10x8	N/A	ALUMINUM/ WHITE	250 CFM
STG-2	SIDEWALL RETURN GRILLE 30° DEFLECTION 1/2" O.C. SPACING BLADES PARALLEL TO LONG DIMENSION	PRICE	630	8x8	10x10	N/A	ALUMINUM/ WHITE	300 CFM
TG-1	SIDEWALL TRANSFER GRILLE, 35 DEGREE DEFLECTION	PRICE	630	14X14	16X16	N/A	ALUMINUM/ WHITE	672 CFM
TS-1	MAXIMUM SECURITY GRILLE, 30 DEGREE DEFLECTION, FIELD WELD INSTALL	PRICE	630	10x10	12x12	N/A	ALUMINUM/ WHITE	120 CFM

GENERAL NOTES APPLICABLE TO ALL UNITS:
1. COORDINATE AIR DEVICE DEFLECTION ADJUSTMENTS WITH THE MECHANICAL ENGINEER DURING AIR BALANCE.
2. PROVIDE 2" FACTORY FIBERGLASS WRAP ON ALL SUPPLY AIR DIFFUSERS WITH BACKSIDE NOT EXPOSED TO SPACE.
3. FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.
4. ALL AIR DEVICES ARE 4-WAY THROW UNLESS OTHERWISE NOTED IN SCHEDULES OR WITH FLOW ARROWS ON DRAWINGS.
5. REFER TO SPECIFICATIONS FOR APPROVED ALTERNATES.
6. BRANCH DUCT SIZE SHALL BE SAME AS NOTED DIFFUSER NECK SIZE UNLESS NOTED OTHERWISE. PROVIDE TRANSITION WHERE DUCT SIZE DIFFERS FROM NECK SIZE.
7. WHERE FINISH AND COLOR ARE NOTED TO BE SELECTED BY ARCHITECT/OWNER, THIS CONTRACTOR SHALL PROVIDE A COLOR PALETTE SAMPLE FOR FINAL APPROVAL WITH THE SUBMITTALS.
8. COORDINATE WITH ARCHITECT'S REFLECTED CEILING PLAN TO PROVIDE APPROPRIATE FRAME TYPE AND MOUNTING ACCESSORIES.
9. EQUALS PER SPECIFICATIONS.

EXHAUST FAN SCHEDULE

TAG	DESCRIPTION	MFR	MODEL	DRIVE	FLOW	ESP	RPM	VOLTS / PH	POWER	CONTROL TYPE	ACCESSORIES
EF-1	CABINET EXHAUST FAN	GREENHECK	SP-A125	DIRECT	75	0.25	1100	120/1	21 W	WALL SWITCH	A, F, G, I
EF-2	CABINET EXHAUST FAN	GREENHECK	SP-A125	DIRECT	75	0.25	1100	120/1	21 W	WALL SWITCH	A, F, G, I
EF-3	CABINET EXHAUST FAN	GREENHECK	SP-A125	DIRECT	75	0.25	1100	120/1	21 W	WALL SWITCH	A, F, G, I
EF-4	CABINET EXHAUST FAN	GREENHECK	SP-A125	DIRECT	75	0.25	1100	120/1	21 W	WALL SWITCH	A, F, G, I
EF-5	RECTANGULAR INLINE DUCT FAN	GREENHECK	SQ-120-VG	DIRECT	1300	1	1654	120/1	1/2 HP	CONTINUOUS, BAS	A, G, H
EF-6	RECTANGULAR INLINE DUCT FAN	GREENHECK	SQ-97-VG	DIRECT	150	0.8	1494	120/1	1/4 HP	CONTINUOUS, BAS	A, G, H
EF-7	DOWNBLAST EXHAUST FAN	GREENHECK	G-090-VG	DIRECT	300	0.25	1058	120/1	1/10 HP	WALL SWITCH	B
EF-8	DOWNBLAST EXHAUST FAN	GREENHECK	G-143-VG	DIRECT	1250	0.8	1133	120/1	1/2 HP	CONTINUOUS, BAS	B
EF-9	CABINET EXHAUST FAN	GREENHECK	SP-A125	DIRECT	75	0.25	1100	120/1	21 W	WALL SWITCH	A, F, G, I
EF-10	RECTANGULAR INLINE DUCT FAN	GREENHECK	SQ-90-VG	DIRECT	250	0.3	1194	120/1	1/10	T-STAT	A, D, H

GENERAL NOTES APPLICABLE TO ALL UNITS:
1. PROVIDE PRE-WIRED FACTORY MOUNTED INTEGRAL DISCONNECT DEVICE (NEMA 3R FOR EXTERIOR).
2. PROVIDE VARIABLE SPEED CONTROLLER FACTORY INSTALLED IF AVAILABLE ON ALL DIRECT DRIVE FANS FOR FAN BALANCING.
3. PROVIDE BELT TENSIONER ON ALL BELT DRIVE FANS.
4. PROVIDE WALL SLEEVE, FAN GUARD, EXTERIOR WEATHER HOOD AND MOTORIZED DAMPER WITH TIME DELAY CONTROLS ON ALL WALL MOUNTED PROPELLER FANS.
5. MOUNT FAN SPEED CONTROLLER IN ACCESSIBLE LOCATION ABOVE CEILING UNLESS OTHERWISE NOTED.
6. PROVIDE ROOF CURB TO MATCH ROOF TYPE AND SLOPE AT ALL ROOF MOUNTED FANS.

NOTES
A. PROVIDE BACKDRAFT DAMPER.
B. PROVIDE MOTORIZED DAMPER WITH TIME DELAY FAN START. MECHANICAL CONTRACTOR RESPONSIBLE FOR INSTALLING FAN, ROOF CURB, BACK DRAFT DAMPER, AND ALL INTERNAL POWER AND CONTROL WIRING AS REQUIRED TO PROVIDE FULLY OPERATIONAL FAN AND DAMPER.
C. PROVIDE WITH VARIABLE FREQUENCY DRIVE SAME SIZE AS LISTED MOTOR HORSE POWER. PROVIDE WITH INVERTER DUTY (NEMA MG1 PART 31), MOTOR-MOUNTED GROUNDING RING. REFER TO VARIABLE FREQUENCY DRIVE SCHEDULE FOR SPECIFICATIONS.
D. PROVIDE SPUN ALUMINUM VENT CAP, COOK MODEL "PP" WITH ROOF CURB.
E. PROVIDE MANUFACTURER'S BRICK VENT. COLOR TO BE SELECTED BY ARCHITECT.
F. PROVIDE MANUFACTURER'S WHITE ALUMINUM GRILLE.
G. PROVIDE BIRD SCREEN.
H. PROVIDE ISOLATOR KIT.
I. PROVIDE MANUFACTURER'S WALL CAP.
J. PROVIDE GREASE COLLECTION CUP.

ROOFTOP CHILLED WATER VAV AIR HANDLING UNIT WITH HOT WATER HEAT

				SUPPLY FAN					EXHAUST FAN					HEATING COIL WATER (REHEAT)										COOLING COIL WATER										CIRCUIT #1 - SINGLE POINT POWER				CIRCUIT #2 - UV LIGHTS				CIRCUIT #3 - LIGHTS & SWITCH				CIRCUIT #4 - RECEPTACLE				
TAG	DESCRIPTION	MFR	MODEL	DRIVE TYPE	FAN HP (4)	CFM (10)	ESP (IN-WG) (3)	TSP (IN-WG) (6.91)	RPM (2842)	FAN HP (4) 3.5	CFM (17500)	ESP (IN-WG) (2)	TSP (IN-WG) (2.66)	RPM (2180)	FLUID (35% ETHYLENE GLYCOL)	CAPACITY (569.36)	EAT / LAT (°F) (35 / 65)	FACE AREA (SQ FT) (32.63)	MAX FACE VELOCITY (FPM) (536)	MAX APD (IN-WG) (0.078)	HEAT ROWS (1)	FINS / FT (81)	GPM (62.74)	MAX WPD (FT) (7.46)	ENT / LVG WATER TEMP (°F) (180 / 160)	FLUID (35% ETHYLENE GLYCOL)	SENS / TOT CAP (MBH) (557.50 / 837.34)	EAT DB / WBS (°F) (80 / 67)	LAT DB / ARE (SQ FT) (51.10 / 51)	FACE AREA (SQ FT) (33.53)	MAX FACE VELOCITY (FPM) (522)	MAX APD (IN-WG) (1.325)	ROWS (8)	GPM (196.3)	MAX WPD (FT) (29.84)	EWT / LWT (°F) (45 / 55)	OA CFM (4175)	PRIMARY AIR FILTERS ((12) MERV 8 / (12) MERV 13)	PRE-AIR FILTER ((12) MERV 5)	FLA (AMPS) (75.2)	MCA (AMPS) (78.70)	MOCP (AMPS) (90)	MCA (AMPS) (3.85)	MOCP (AMPS) (15)	MCA (AMPS) (3.26)	MOCP (AMPS) (15)	MCA (AMPS) (10)	MOCP (AMPS) (15)	WEIGHT (LB) (11500)	NOTES (1-18)
AHU-1	ROOFTOP MULTI-ZONE	TRANE	CSAA035	DIRECT	(4) 10	17500	3	6.91	2842	(4) 3.5	17500	2	2.66	2180	35% ETHYLENE GLYCOL	569.36	35 / 65	32.63	536	0.078	1	81	62.74	7.46	180 / 160	35% ETHYLENE GLYCOL	557.50 / 837.34	80 / 67	51.10 / 51	33.53	522	1.325	8	196.3	29.84	45 / 55	4175	((12) MERV 8 / (12) MERV 13)	((12) MERV 5)	75.2	78.70	90	3.85	15	3.26	15	10	15	11500	1-18
AHU-2	ROOFTOP MULTI-ZONE	TRANE	CSAA021	DIRECT	(4) 5	10500	3	6.21	3738	(4) 2.5	10500	2	2.65	2717	35% ETHYLENE GLYCOL	341.62	35 / 65.89	19.83	529	0.078	1	80	35.12	2.91	180 / 160	35% ETHYLENE GLYCOL	332.18 / 497.27	80 / 67	51.30 / 51.20	20.81	505	1.179	8	116.57	12.35	45 / 55	2750	((7) MERV 13 / (7) MERV 8)	((7) MERV 5)	52	54.05	60	1.93	15	3.26	15	10	15	7500	1-17
AHU-3	ROOFTOP MULTI-ZONE	TRANE	CSAA035	DIRECT	(4) 10	17500	3	6.89	2842	(4) 3.5	17500	2	2.66	2180	35% ETHYLENE GLYCOL	569.36	35 / 65	32.63	536	0.078	1	81	62.74	7.46	180 / 160	35% ETHYLENE GLYCOL	557.50 / 837.34	80 / 67	51.10 / 51	33.53	522	1.325	8	196.3	29.84	45 / 55	4175	((12) MERV 8 / (12) MERV 13)	((12) MERV 5)	75.2	78.70	90	3.85	15	3.26	15	10	15	11500	1-17
AHU-4	ROOFTOP MULTI-ZONE	TRANE	CSAA021	DIRECT	(4) 5	10500	3	6.91	3738	(4) 2.5	10500	2	2.65	2717	35% ETHYLENE GLYCOL	341.62	35 / 65.89	19.83	529	0.078	1	80	35.12	2.91	180 / 160	35% ETHYLENE GLYCOL	332.18 / 497.27	80 / 67	51.30 / 51.20	20.81	505	1.179	8	116.57	12.35	45 / 55	2500	((7) MERV 13 / (7) MERV 8)	((7) MERV 5)	52	54.05	60	1.93	15	3.26	15	10	15	7500	1-17

GENERAL NOTES APPLICABLE TO ALL UNITS:
1. PROVIDE STANDARD ROOF CURB.
2. PROVIDE THROUGH THE BASE ELECTRICAL.
3. PROVIDE UNIT MOUNTED CONVENIENCE OUTLET.
4. E.C. TO PROVIDE DISCONNECT SWITCH.
5. PROVIDE BACNET INTERFACE.
6. PROVIDE 0-100% ECONOMIZER.
7. PROVIDE OUTSIDE AIRFLOW MONITOR.
8. PROVIDE STAINLESS STEEL DRAIN PAN.
9. PROVIDE DOUBLE WALL CONSTRUCTION.
10. PROVIDE PHASE LOSS MONITORING THROUGH BAS.
11. DIRECT DRIVE FAN AND MOTOR ASSEMBLIES TO BE INTERNALLY ISOLATED FROM THE UNIT CASING WITH 2" DEFLECTION SPRING ISOLATORS.
12. PROVIDE WITH HYDRONIC PIPING HOUSING.
13. PROVIDE 2X2 FAN ARRAY FOR SUPPLY AND EXHAUST.
14. PROVIDE FACTORY MOUNTED VFD'S. PROVIDE 1 VFD PER SUPPLY FAN (QTY. 4). PROVIDE 1 VFD TO SERVE ALL EXHAUST FANS (QTY. 1).
15. PROVIDE WITH SINGLE POINT POWER.
16. PROVIDE WITH UV LIGHTS.
17. PROVIDE WITH 5 YEAR FACTORY WARRANTY
18. SCOR 65K ON AHU 100K

ACCEPTABLE MANUFACTURERS
A. DAIKIN NORTH AMERICA
B. YORK-A JOHNSON CONTROL COMPANY
C. TRANE
D. AAO

GENERAL NOTE:
ALL RECTANGULAR DUCT SIZES SHOWN ARE THE OUTSIDE METAL DIMENSIONS. DUCT DIMENSIONS ALREADY HAVE ALLOWANCES FOR THE INSULATION LINER WHERE APPLICABLE IN THE RECTANGULAR DUCTS. AT DUAL WALL DUCTS, THE DIMENSION SHOWN IS THE OUTSIDE METAL DUCT SIZE AND ALREADY HAS ALLOWANCES FOR THE INSULATION THICKNESS.

NOTE: NO LINED DUCT IN KITCHEN

MECHANICAL DUCTWORK & INSULATION SCHEDULE

SERVICE	DUCT TYPE	INSULATION TYPE	INSULATION THICKNESS
ALL RUNOUTS TO SUPPLY DIFFUSERS AND RETURN GRILLES CONCEALED ABOVE CEILINGS ALL SUPPLY AIR DIFFUSERS (BACKSIDE NOT EXPOSED TO SPACE) FRESH AIR SUPPLY DUCT	ROUND WRAPPED OR RECTANGULAR LINED, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER	2" WRAP OR 1-1/2" LINER, R VALUE=6.0
FRESH AIR EXHAUST DUCT	ROUND WRAPPED OR RECTANGULAR LINED, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER, N/A IF IN UNCONDITIONED SPACE	2" WRAP, R VALUE=6.0 2" WRAP OR 1-1/2" LINER, R VALUE=6.0
RESTROOM EXHAUST DUCT	ROUND WRAPPED OR RECTANGULAR LINED, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER	2" WRAP OR 1-1/2" LINER, R VALUE=6.0
ALL MEDIUM PRESSURE CONSTANT VOLUME AND VAV SUPPLY AIR DUCT OR FIRST 20' FROM AIR HANDLER OR PACKAGED UNIT	DOUBLE WALL SPIRAL WITH PERFORATED METAL LINER	FIBERGLASS EQUAL TO UNITED MCGILL ACOUSTIC - K27	1-1/2", R VALUE=6.0
ALL MEDIUM PRESSURE CONSTANT VOLUME AND VAV SUPPLY AIR DUCT BEYOND 20' FROM AIR HANDLER OR PACKAGED UNIT	ROUND WRAPPED OR RECTANGULAR LINED, AS INDICATED ON PLANS.	FIBERGLASS WRAP OR MATTE FACED FIBERGLASS LINER	2" WRAP OR 1-1/2" LINER, R VALUE=6.0
FUMEHOOD EXHAUST DUCT	304 STAINLESS STEEL SEALED WITH MASTIC JOINT SEALER	FIBERGLASS WRAP	1-1/2", R VALUE=6.0
FLAMMABLE STORAGE EXHAUST DUCT	EXPLOSION PROOF AND CORROSION PROOF WELDED 304 STAINLESS STEEL	FIBERGLASS WRAP	1-1/2", R VALUE=6.0
ALL SUPPLY AND RETURN DUCT SERVING SOUND SENSITIVE ROOMS GREASE DUCT	DOUBLE WALL SPIRAL WITH PERFORATED METAL LINER 16 GAUGE CARBON STEEL WELDED AIR TIGHT AT ALL JOINTS AND SEAMS. METAL FASTENERS SHALL NOT PENETRATE DUCT WALL	FIBERGLASS EQUAL TO UNITED MCGILL ACOUSTIC - K27 THERMAL CERAMICS FIREMASTER UL LISTED FOR ZERO CLEARANCE TO COMBUSTIBLES	1-1/2", R VALUE=6.0 3"

HYDRONIC ACCESSORIES SCHEDULE

TAG	DESCRIPTION	MFR	MODEL	TANK MIXTURE	TANK VOLUME (GALLONS)	PRESSURE RANGE (PSI)	MAKE-UP CAPACITY (GPM @ PSI)	HP	VOLT/PH	ACCESSORIES
CPF-1	CHEMICAL FEEDER WITH PUMP	GRUNDFOS	GMPD-23050	35% GLYCOL	50	10-70	1.8 @70	1/3	120/1	1-7
CPF-2	CHEMICAL FEEDER WITH PUMP	GRUNDFOS	GMPD-23050	35% GLYCOL	50	10-70	1.8 @70	1/3	120/1	1-7

ACCESSORIES:
1. PROTECTIVE LOW WATER CUT-OFF ALARM.
2. HCA CONTROLS
3. 1/3 HP BRASS ROTARY VANE PUMP
4. MAGNETIC STARTER
5. PRESSURE TANK WITH PRESSURE CONTROLS
6. PROVIDE WITH PRESSURE GAUGES, PRESSURE REDUCING VALVE AND SYSTEM ISOLATION VALVES.
7. PROVIDE 110V SIGNAL FOR A REMOTE ALARM.

AIR SEPARATOR SCHEDULE

MARK	SERVES	MFR	MODEL	VOLUME (GAL)	WEIGHT (LB)	ACCESSORIES
AS-1	HEATING WATER SYSTEM	SPIROTHERM	VDT 600 FA	19.8	3	260 STEEL MESH STRAINER
AS-2	CHILLED WATER SYSTEM	SPIROTHERM	VDT 600 FA	19.8	3	260 STEEL MESH STRAINER

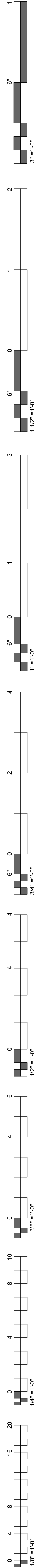
GENERAL MECHANICAL NOTES

- SUBMISSION OF PROPOSAL IN CONNECTION WITH THIS WORK SHALL IMPLY THAT THE BIDDER HAS EXAMINED THE JOB SITE UNDER WHICH HE WILL BE OBLIGATED TO OPERATE SHOULD HE BE AWARDED THE WORK UNDER THIS CONTRACT. NO EXTRA CHARGE WILL BE ALLOWED FOR FAILURE OF ANY BIDDER TO EXAMINE THE SITE PRIOR TO BID.
- ALL RECTANGULAR DUCT SIZES SHOWN ARE THE OUTSIDE METAL DIMENSIONS. DUCT DIMENSIONS ALREADY HAVE ALLOWANCES FOR THE INSULATION LINER WHERE APPLICABLE IN THE RECTANGULAR DUCTS. AT DUAL WALL DUCTS, THE DIMENSION SHOWN IS THE OUTSIDE METAL DUCT SIZE AND ALREADY HAVE ALLOWANCES FOR THE INSULATION THICKNESS.
- ALL WORK SHALL CONFORM TO STATE AND LOCAL CODES, RULES, REGULATIONS, AND ORDINANCES WHICH SHALL TAKE PRECEDENCE OVER THE PLANS IF CONFLICTS EXIST BETWEEN THEM.
- THE DRAWINGS INDICATE THE GENERAL LAYOUT REQUIREMENTS FOR EQUIPMENT, FIXTURES, PIPING, DUCTWORK, ETC. FINAL LAYOUT SHALL BE MODIFIED TO FIT ACTUAL SITE CONDITIONS.
- COORDINATE ALL WORK WITH THE OWNER AND ALL OTHER CONTRACTORS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING, AND PROTECTION OF MATERIALS. PROVIDE LABOR TO RECEIVE UNLOAD, STORE, PROTECT, AND TRANSFER TO POINT OF INSTALLATION OF ANY OWNER-FURNISHED ITEMS.
- IN CASES OF EQUIPMENT SUBSTITUTION, CONTRACTOR IS RESPONSIBLE FOR VERIFYING THAT ALL SYSTEMS AND COMPONENTS WILL FIT PROPERLY PRIOR TO FABRICATION OR ORDERING. INSTALLED DUCTS MAY BE RESIZED BY THE CONTRACTOR TO FIT FIELD CONDITIONS AS LONG AS THE INSTALLED DUCTS SHALL HAVE EQUAL FRICTION LOSS TO THOSE SHOWN. RECTANGULAR DUCTS SHALL NOT BE CHANGED TO ROUND DUCTS. PROVIDE COMPLETE SHEET METAL SHOP DRAWINGS TO ENGINEER SHOWING ACTUAL DUCT SIZES, ARRANGEMENTS, AND UNIT LOCATIONS TO BE INSTALLED. THIS SHALL BE DONE PRIOR TO FABRICATION OR INSTALLATION.
- INSTALL ACOUSTIC TURNING VANES IN ELBOWS IN RECTANGULAR DUCTS 20" AND LARGER. INSTALL RADIUS TYPE ELBOWS IN RECTANGULAR DUCTS SMALLER THAN 20".
- USE 45 DEGREE TAKE-OFF FITTINGS AT ALL ROUND SUPPLY BRANCH TAKEOFFS. PROVIDE BALANCE DAMPERS AT ALL SUPPLY DUCT RUNOUTS TO GRILLES. LOCATE AS FAR AS POSSIBLE FROM GRILLES IN AN ACCESSIBLE LOCATION. PROVIDE ACCESS PANELS IN SOLID WALLS AND CEILINGS FOR BALANCING DAMPERS.
- USE FLEX DUCTS FOR FINAL CONNECTION TO ALL CEILING DIFFUSERS, AND WHERE NECESSARY, SIDEWALL DIFFUSERS, AND LIMIT TO 6' MAX. LENGTHS.
- PROVIDE A COMPLETE AND OPERATING MECHANICAL SYSTEM, INCLUDING ALL INCIDENTAL ITEMS AND CONNECTIONS NECESSARY FOR PROPER OPERATION OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM MAY NOT BE INDICATED.
- THE MECHANICAL INSTALLATION SHALL BE SAFE, RELIABLE, ENERGY EFFICIENT AND EASILY MAINTAINED WITH ADEQUATE PROVISIONS ALLOWED FOR ACCESS TO EQUIPMENT.
- THE MECHANICAL SYSTEM SHALL OPERATE QUIETLY WITH NOISE LEVELS BELOW THE CRITERIA RECOMMENDED FOR THE APPLICATION BY ASHRAE. PROVIDE CORRECTIVE ACTION AS REQUIRED TO REDUCE OBJECTIONABLE NOISE OR VIBRATION.
- AT PENETRATIONS THROUGH FIRE WALLS, ANY PVC PIPE OR DUCT SHOULD BE EXTERNALLY SLEEVED WITH STEEL, FERROUS, OR COPPER MATERIALS. SECURELY FASTENED TO THE FIRE RATED ASSEMBLY, AND ANY SPACE BETWEEN THE SLEEVE AND THE ASSEMBLY PENETRATED SHALL BE PROTECTED USING MATERIAL THAT CONFORMS TO ASTM E 814 OR UL 1479, SUCH AS FIRE STOP FS-1900, OR FLAME STOPPER 5000.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CORING AND BEAM PENETRATIONS AS IT RELATES TO HIS WORK.
- CONTRACTOR SHALL NOT INSTALL ANY MAINTENANCE ITEMS ABOVE HARD CEILINGS. THIS SHALL INCLUDE VALVES, DAMPERS, OR ANY OTHER ITEMS THAT REQUIRE ACCESS AFTER CONSTRUCTION IS COMPLETED. IF INSTALLATION ABOVE A HARD CEILING OF THESE ITEMS CANNOT BE AVOIDED, THEN PROVIDE CEILING ACCESS DOORS EQUAL TO AUCODOR MODEL FW-505 WHERE REQUIRED. AT FIRE-RATED WALLS, USE EQUIVALENT OF AUCODOR MODEL FB-5060. MINIMUM SIZE SHALL BE 12"x12". USE 18"x18" WHEN PERSONNEL ACCESS IS REQUIRED.
- PROVIDE AN INSULATED BACK ON ALL THERMOSTATS AND TEMPERATURE SENSORS THAT ARE MOUNTED ON CMU OR HOLLOW WALLS. PROVIDE SHALLOW DEVICE EXTENSION BOX BEHIND T-STATS AND SENSORS ON MASONRY WALLS IN COMMERCIAL / RETAIL SPACES.
- PROVIDE FIRE DAMPERS AT ALL FIRE-RATED WALLS AND FLOOR PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE BARRIER WALLS AND CEILINGS.
- IF A CENTRAL FIRE ALARM SYSTEM IS REQUIRED FOR THIS PROJECT, MECHANICAL CONTRACTOR SHALL INSTALL DUCT MOUNTED SMOKE DETECTORS PROVIDED BY FIRE ALARM CONTRACTOR. REFER TO ELECTRICAL NOTES FOR EXACT REQUIREMENTS. MECHANICAL CONTRACTOR SHALL IDENTIFY A SET OF TERMINALS FOR EQUIPMENT SHUTDOWN ON ALL FAN POWERED EQUIPMENT REQUIRING SHUTDOWN CONTROLS. FIRE ALARM CONTRACTOR SHALL WIRE FROM DUCT MOUNTED SMOKE DETECTOR TO SHUTDOWN TERMINALS TO SHUT DOWN FAN OPERATION WHEN SMOKE IS DETECTED.
- AT PENETRATIONS THROUGH FIRE WALLS, ANY PVC PIPE OR DUCT SHOULD BE EXTERNALLY SLEEVED WITH STEEL, FERROUS, OR COPPER MATERIALS. SECURELY FASTENED TO THE FIRE RATED ASSEMBLY, AND ANY SPACE BETWEEN THE SLEEVE AND THE ASSEMBLY PENETRATED SHALL BE PROTECTED USING MATERIAL THAT CONFORMS TO ASTM E 814 OR UL 1479, SUCH AS FIRE STOP FS-1900, OR FLAME STOPPER 5000.
- REFER TO ELECTRICAL DRAWINGS FOR SMOKE DAMPER AND FIRE-SMOKE DAMPER DETAIL. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL DAMPERS WITH MOTORIZED ACTUATORS AND INSTALL SMOKE DETECTORS AND PROVIDE WIRING FOR FAN SHUTDOWN CONTROLS. COORDINATE WITH ELECTRICAL CONTRACTOR AND PROVIDE DAMPER ACTUATOR COMPATIBLE WITH ELECTRICAL WIRING PROVIDED. PROVIDE ANY WIRING OR COMPONENTS NOT PROVIDED BY THE ELECTRICAL CONTRACTOR THAT ARE REQUIRED TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
- AHEAD OF ALL VAV BOX INLETS, INSTALL STRAIGHT DUCT EQUIVALENT TO AT LEAST 2 DIAMETERS IN LENGTH WHETHER SHOWN ON PLANS OR NOT.
- SEISMIC PROTECTION FOR CONCERNS OF ALL BUILDING SYSTEMS INCLUDING BUT NOT LIMITED TO MECHANICAL, PLUMBING, AND ELECTRICAL MUST MEET MINIMUM REQUIREMENTS OF ALL APPLICABLE CODES FOR BUILDINGS' CLASSIFIED SEISMIC PROTECTION MEASURES TO BE APPLIED SHALL BE INSTALLED IN STRICT ACCORDANCE WITH LOCAL, STATE, AND/OR FEDERAL CODES AND WITH MANUFACTURER'S REQUIREMENTS. THE MOST STRINGENT SHALL APPLY.
- NO RECTANGULAR DUCT SMALLER THAN 10"x10"

MECHANICAL PIPING & INSULATION SCHEDULE

NOTE: ALL EXTERIOR INSULATED PIPING TO BE PROVIDED WITH ALUMINUM JACKET.

SERVICE	PIPING TYPE	INSULATION TYPE
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DUCT SILENCER SCHEDULE

TAG	MANUF.	MODEL	FLOW DIRECTION	AIRFLOW (CFM)	LENGTH (IN)	FACE DIMMENSION			FACE VELOCITY (FPM)	SILENCER PD IN WG	PD W/ SYSTEM EFFECTS IN WG	MINIMUM DYNAMIC INSERTION LOSS (dB)								NOTES
						WIDTH (IN)	HEIGHT (IN)					63	125	250	500	1K	2K	4K	8K	
SL-AHU-1R	VIBRO-ACOUSTICS	RED-HV-FB-L24517	RETURN	17500	72	34	64	-1125	0.12	0.3		9	12	17	28	25	26	20	17	A,B,C,E
SL-AHU-1S	VIBRO-ACOUSTICS	RED-UHV-F3-L24517	SUPPLY	17500	108	26	60	+1569	0.16	0.16		8	18	20	32	43	37	27	19	A,B,C,D
SL-AHU-2R	VIBRO-ACOUSTICS	RED-HV-FB-L24517	RETURN	10500	72	38	42	-947	0.13	0.32		6	12	20	28	36	35	28	23	A,B,C,E
SL-AHU-2S	VIBRO-ACOUSTICS	EXRED-HV-F7-L24517	SUPPLY	10500	60	24 (36)	40	+1575	0.26	0.26		6	9	16	21	33	35	27	21	A,B,C,D,F
SL-AHU-3R	VIBRO-ACOUSTICS	RED-UHV-FB-L24517	RETURN	17500	72	34	64	-1125	0.07	0.17		7	10	11	24	24	26	19	17	A,B,C,E
SL-AHU-3S	VIBRO-ACOUSTICS	DEXRED-UHV-FX-L24517	SUPPLY	17500	144	26 (32)	60	+1569	0.11	0.24		11	23	24	34	47	39	29	30	A,B,C,G,D
SL-AHU-4R	VIBRO-ACOUSTICS	RED-HV-FCL24517	RETURN	10500	96	36	42	-1000	0.09	0.09		9	15	22	30	31	30	23	21	A,B,C,E
SL-AHU-4S	VIBRO-ACOUSTICS	EXRED-HV-F7-L24517	SUPPLY	10500	48	24 (36)	40	+1575	0.2	0.26		5	7	12	18	27	24	20	18	A,B,C,D,H

- GENERAL NOTES APPLICABLE TO ALL:
- LENGTH SHOWN FOR ELBOW SILENCER IS CENTERLINE LENGTH
 - VELOCITY SHOWN IS + (FORWARD FLOW) OR - (REVERSE FLOW) AS DEFINED BY ASTM E477-13.
 - PRESSURE DROP, DYNAMIC INSERTION LOSS AND SELF GENERATED NOISE PER ASTM E477-13.
 - MAXIMUM PRESSURE DROP WITH SYSTEM EFFECTS = SILENCER PRESSURE DROP PER ASTM E477-13 + SYSTEM EFFECTS FOR NEARBY DUCT ELEMENTS.

- NOTES:
- A. RED = RECTANGULAR ELBOW DISSIPATIVE. EXRED ELBOW DISSIPATIVE
- B. HTL CASING
- C. ELBOW SILENCER
- D. CASING TO BE HTLEQUIVALENT TO 10 GUAGE DUCT WALL TO CONTROL BREAKOUT.
- E. CASING TO BE HTL EQUIVALENT TO 12 GUAGE DUCT WALL TO CONTROL BREAKOUT.
- F. DUCT DIMENSION 24"x40", OUTSIDE CASING DIMENSION 36"x40".
- G. DOUBLE ELBOW SILENCER WITH EXTENDED WIDTH. DUCT DIMENSION 26"x60", OUTSIDE CASING DIMENSION 32"x60".
- H. EXTENDED WIDTH SILENCER. DUCT DIMENSION 24"x40", OUTSIDE CASING DIMENSION 36"x40".

MINI SPLIT AIR CONDITIONER SCHEDULE

INDOOR UNIT	OUTDOOR UNIT	DESCRIPTION	MFR	MODEL (INDOOR/OUTDOOR)	CFM	SEER	COOLING CAPACITY (BTU/HR)	HEATING CAPACITY (BTU/HR)	VOLTS / PH	MCA	MOCP	NOTES
MAC-01	MCU-01	COOLING ONLY DX SYSTEM	MITSUBISHI	PKA-A12HA7/PUY-A12NKA7	335	20.8	12,000	-	208-230 / 1	14 A	15 A	A,B,C
MAC-02	MCU-02	COOLING ONLY DX SYSTEM	MITSUBISHI	PKA-A12HA7/PUY-A12NKA7	335	20.8	12,000	-	208-230 / 1	14 A	15 A	A,B,C
MAC-03	MCU-03	COOLING ONLY DX SYSTEM	MITSUBISHI	PKA-A12HA7/PUY-A12NKA7	335	20.8	12,000	-	208-230 / 1	14 A	15 A	A,B,C
MAC-04	MCU-04	COOLING ONLY DX SYSTEM	MITSUBISHI	PKA-A18HA7/PUY-A18NKA7	335	18.5	18,000	-	208-230 / 1	14 A	15 A	A,B,C
MAC-05	MCU-05	COOLING ONLY DX SYSTEM	MITSUBISHI	PKA-A18HA7/PUY-A18NKA7	335	18.5	18,000	-	208-230 / 1	14 A	15 A	A,B,C
MAC-06	MCU-06	HEAT PUMP DX SYSTEM	MITSUBISHI	PKA-A24HA7/PUZ-A24NKA7	635	21.4	24,000	28000	208-230 / 1	19 A	25 A	A,B
MAC-07	MCU-07	HEAT PUMP DX SYSTEM	MITSUBISHI	PKA-A12HA7/PUZ-A12NKA7	335	20.8	12,000	18000	208-230 / 1	14 A	15 A	A,B
MAC-08	MCU-08	HEAT PUMP DX SYSTEM	MITSUBISHI	PKA-A24HA7/PUZ-A24NKA7	635	21.4	24,000	28000	208-230 / 1	19 A	25 A	A,B
MAC-09	MCU-09	HEAT PUMP DX SYSTEM	MITSUBISHI	PKA-A18HA7/PUZ-A18NKA7	335	18.5	18,000	22000	208-230 / 1	14 A	15 A	A,B
MAC-10	MCU-10	COOLING ONLY DX SYSTEM	MITSUBISHI	PKA-A18HA7/PUY-A18NKA7	335	18.5	18,000	22000	208-230 / 1	14 A	15 A	A,B
MAC-11	MCU-11	COOLING ONLY DX SYSTEM	MITSUBISHI	PKA-A18HA7/PUY-A18NKA7	335	18.5	18,000	22000	208-230 / 1	14 A	15 A	A,B
MAC-12	MCU-12	COOLING ONLY DX SYSTEM	MITSUBISHI	PKA-A18HA7/PUY-A18NKA7	335	18.5	18,000	22000	208-230 / 1	14 A	15 A	A,B
MAC-13	MCU-13	HEAT PUMP DX SYSTEM	MITSUBISHI	PKA-A18HA7/PUZ-A18NKA7	335	18.5	18,000	22000	208-230 / 1	14 A	15 A	A,B

- GENERAL NOTES APPLICABLE TO ALL UNITS:
- MAC & MCU COMPRISE A SINGLE AIR-CONDITIONING SPLIT SYSTEM AND INCLUDE MICROPROCESSOR CONTROLS, PROVIDE WALL MOUNT FOR WIRELESS REMOTE. ON/OFF 24-HOUR TIMER AND WASHABLE AIR FILTER.

- NOTES
- A. PROVIDE WITH PROGRAMMABLE THERMOSTAT.
- B. PROVIDE WITH CONDENSATE PUMP: ASPEN MODEL MINI-TANK.
- C. LOW AMBIENT COOLING-100% NOMINAL CAPACITY AT 5 F.

GAS UNIT HEATER SCHEDULE

TAG	DESCRIPTION	MFR	MODEL	MBH	FAN HP	FLA	VOLTS / PH	WEIGHT	CONTROL TYPE
GUH-1	GAS UNIT HEATER WITH SEPARATED COMBUSTION	TRANE	GTNE003ATA	30	1/20	3	120/1	60 LB	THERMOSTAT
GUH-2	GAS UNIT HEATER WITH SEPARATED COMBUSTION	TRANE	GTNE003ATA	30	1/20	3	120/1	60 LB	THERMOSTAT

- GENERAL NOTES APPLICABLE TO ALL UNITS:
- SINGLE STAGE, DIRECT SPARK IGNITION.
 - PROVIDE WITH 30 DEGREE DOWN DISCHARGE NOZZLE.
 - PROVIDE WITH CONCENTRIC VENT KIT.
 - PROVIDE WITH WALL MOUNTED THERMOSTAT.
 - SUPPORT FROM STRUCTURE PER MFR RECOMMENDATIONS.
 - E.G. TO PROVIDE DISCONNECT SWITCH.

AHU - 03 VAV BOX WITH HOT WATER REHEAT SCHEDULE

TAG	DESCRIPTION	MFR	MODEL	VALVE SIZE (IN.)	COOLING				HEATING										VOLTS / PH	WEIGHT (LBS.)	NOTES
					DESIGN COOLING CFM	MINIMUM COOLING CFM	APD @ DESIGN FLOW (IN. WG)	INLET VELOCITY (FPM)	VALVE AIRFLOW (CFM)	EAT (°F)	LAT (°F)	COIL CAPACITY (MBH)	EWT (°F)	DELTA TEMP (°F)	NO. OF ROWS	COIL FLOW (GPM)					
VAV-3.01	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	06	6	460	140	0.37	2343	140	55	90 °F	6.89	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-3.02	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF10	10	1230	540	0.33	2255	540	55	90 °F	19.79	180	40	1	1	24 / 1	34	A,C,D,E		
VAV-3.03	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF10	10	1300	400	0.36	2384	400	55	90 °F	16.66	180	40	1	0.9	24 / 1	34	B,C,D,E		
VAV-3.04	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF08	8	720	400	0.27	2063	400	55	90 °F	13.13	180	40	1	0.7	24 / 1	25	A,C,D,E		
VAV-3.05	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF10	10	1200	500	0.32	2200	500	55	90 °F	18.93	180	40	1	1	24 / 1	34	A,C,D,E		
VAV-3.06	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF10	10	1250	530	0.34	2292	530	55	90 °F	19.58	180	40	1	1	24 / 1	34	B,C,D,E		
VAV-3.07	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	430	240	0.33	2190	240	55	90 °F	8.58	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-3.08	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF14	14	2500	1350	0.22	2339	1350	55	90 °F	43.38	180	40	1	2.2	24 / 1	53	A,C,D,E		
VAV-3.09	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF10	10	1250	700	0.34	2292	700	55	90 °F	23.03	180	40	1	1.2	24 / 1	34	A,C,D,E		
VAV-3.10	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF10	10	1400	550	0.41	2567	550	55	90 °F	20	180	40	1	1	24 / 1	34	B,C,D,E		
VAV-3.11	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF08	8	560	300	0.41	2200	300	55	90 °F	16.07	180	40	1	0.5	24/1	24	A,C,D,E		

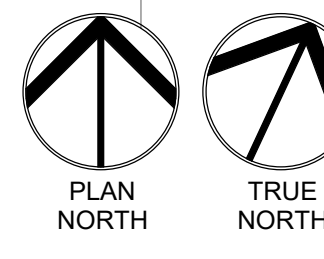
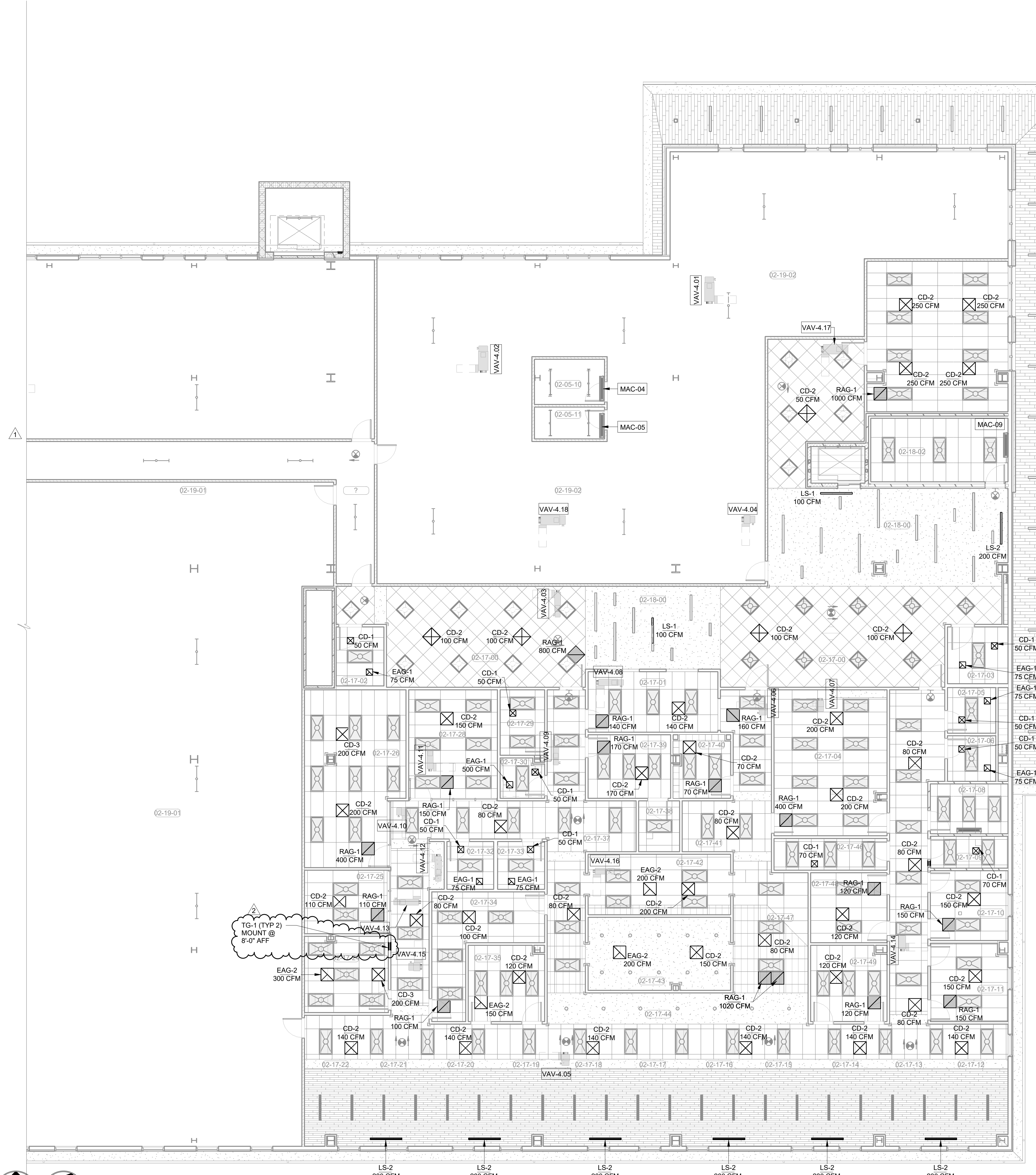
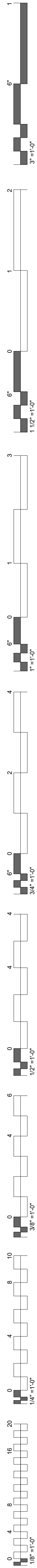
GENERAL NOTES APPLICABLE TO ALL UNITS:

- DDC PROPORTIONAL HOT WATER VALVE
- PROVIDE WITH FACTORY DISCONNECT
- PROVIDE WITH POWER FUSE
- PROVIDE WITH FACTORY MOUNTED 120V TO 24 V TRANSFORMER
- DOUBLE WALL CONSTRUCTION

- A. PROVIDE 2-WAY VALVE ON HOT WATER COIL.
- B. PROVIDE 3-WAY VALVE ON HOT WATER COIL.
- C. PROVIDE FACTORY MOUNTED AND PRE-PROGRAMMED, PRESSURE INDEPENDENT, BACNET DDC CONTROLLER WITH AIRFLOW MEASUREMENT AND WIRELESS COMMUNICATION RECEIVER
- D. PROVIDE WITH WIRELESS ZONE TEMPERATURE SENSOR
- E. PROVIDE WITH FACTORY WIRED AND TAGGED HOT WATER VALVE AND PIPING PACKAGE...

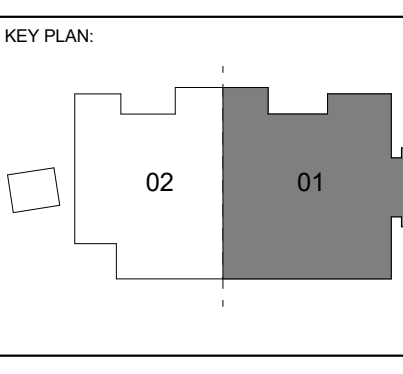
AHU - 01 VAV BOX WITH HOT WATER REHEAT SCHEDULE

TAG	DESCRIPTION	MFR	MODEL	VALVE SIZE (IN.)	COOLING				INLET VELOCITY (FPM)	VALVE AIRFLOW (CFM)	HEATING								VOLTS / PH	WEIGHT (LBS.)	NOTES
					DESIGN COOLING CFM	MINIMUM COOLING CFM	APD @ DESIGN FLOW (IN. WG)	EAT (°F)			LAT (°F)	COIL CAPACITY (MBH)	EWT (°F)	DELTA TEMP (°F)	NO. OF ROWS	COIL FLOW (GPM)					
VAV-1.01	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF12	12	1600	1600	0.31	2037	500	55	90 °F	18.42	180	40	1	1.02	24 / 1	43	A,C,D,E		
VAV-1.02	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF08	8	600	120	0.08	2017	120	55	90 °F	5.79	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.03	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF10	10	1300	1300	0.36	2384	400	55	90 °F	15.3	180	40	1	0.85	24 / 1	34	A,C,D,E		
VAV-1.04	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	250	150	0.03	1719	125	55	90 °F	4.83	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.05	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	100	100	0.02	1146	75	55	90 °F	4.83	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.06	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	200	200	0.28	2037	200	55	90 °F	6.95	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.07	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	400	400	0.28	2037	260	55	90 °F	7.61	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.08	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF08	8	600	600	0.2	1719	440	55	90 °F	11.95	180	40	1	0.66	24 / 1	24	A,C,D,E		
VAV-1.09	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	120	30	0.02	1300	30	55	90 °F	3.64	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.10	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF10	10	110	110	0.34	2292	35	55	90 °F	14.76	180	40	1	0.8	24 / 1	34	A,C,D,E		
VAV-1.11	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	1250	1250	0.02	1261	375	55	90 °F	3.39	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.12	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	120	120	0.07	1833	40	55	90 °F	5.08	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.13	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF08	8	800	800	0.33	2292	650	55	90 °F	17.45	180	40	1	0.9	24 / 1	24	A,C,D,E		
VAV-1.14	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	110	110	0.02	1261	35	55	90 °F	3.39	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.15	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	360	360	0.23	1833	360	55	90 °F	8.45	180	40	1	0.6	24 / 1	24	A,C,D,E		
VAV-1.16	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	330	330	0.11	2420	100	55	90 °F	5.41	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.17A	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF12	12	1750	1750	0.36	2228	700	55	90 °F	22.38	180	40	1	1.3	24 / 1	43	A,C,D,E		
VAV-1.17B	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF12	12	1500	1500	0.28	1910	700	55	90 °F	22.38	180	40	1	1.3	24 / 1	43	A,C,D,E		
VAV-1.18	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF08	8	600	600	0.2	1719	175	55	90 °F	7.77	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.19	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	210	210	0.05	2406	210	55	90 °F	7.07	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.20	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	400	400	0.28	2037	400	55	90 °F	8.72	180	40	1	0.6	24 / 1	24	A,C,D,E		
VAV-1.21	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	390	390	0.27	1986	225	55	90 °F	8.36	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.22	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	220	220	0.05	2521	175	55	90 °F	7.55	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.23	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	350	350	0.13	2567	205	55	90 °F	8.05	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.24	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	100	100	0.02	1146	30	55	90 °F	3.24	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.25	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	360	360	0.23	1833	250	55	90 °F	8.73	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.26	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF08	8	600	600	0.2	1719	200	55	90 °F	9.19	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.27	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	200	200	0.05	2292	120	55	90 °F	6.46	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.28	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	100	100	0.02	1146	30	55	90 °F	3.24	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.29	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	400	400	0.28	2037	400	55	90 °F	10.78	180	40	1	0.6	24 / 1	24	A,C,D,E		
VAV-1.30	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	225	225	0.03	1604	100	55	90 °F	4.33	180	40	1	0.5	24 / 1	24	B,C,D,E		
VAV-1.31	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF10	10	1040	1040	0.25	1907	630	55	90 °F	21.65	180	40	1	0.5	24 / 1	34	A,C,D,E		
VAV-1.32	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF08	8	640	190	0.22	1833	190	55	90 °F	9	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.33	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	300	300	0.09	2200	120	55	90 °F	6.46	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.34	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	300	300	0.09	2200	120	55	90 °F	6.46	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.35	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	440	440	0.34	2241	300	55	90 °F	9.39	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.36	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	200	200	0.05	2292	100	55	90 °F	5.97	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.37	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	420	420	0.31	2139	420	55	90 °F	11.09	180	40	1	0.6	24 / 1	24	A,C,D,E		
VAV-1.38	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	500	500	0.44	2546	500	55	90 °F	12.28	180	40	1	0.7	24 / 1	24	A,C,D,E		
VAV-1.39	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	300	300	0.09	2200	120	55	90 °F	6.46	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.40	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	250	250	0.07	1833	160	55	90 °F	7.28	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.41	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF06	6	360	360	0.23	1833	360	55	90 °F	10.14	180	40	1	0.6	24 / 1	24	A,C,D,E		
VAV-1.42	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	400	400	0.09	2200	120	55	90 °F	6.46	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.43	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	200	200	0.05	2292	80	55	90 °F	5.42	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.44	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF05	5	230	230	0.06	1687	230	55	90 °F	8.43	180	40	1	0.5	24 / 1	24	A,C,D,E		
VAV-1.45	SINGLE DUCT VAV TERMINAL UNIT W/ HOT WATER REHEAT	TRANE	VCWF04	4	200	200	0.03	1719	150	55	90 °F	7.09	180	40	1	0.5	24 / 1	24	A,C,D,E		



1 ENLARGED MECHANICAL CEILING PLAN LEVEL 02 SECTOR 01
1/8" = 1'-0"

**WILMA P. MANKILLER HEALTH CENTER
EXPANSION**
STILWELL, OKLAHOMA



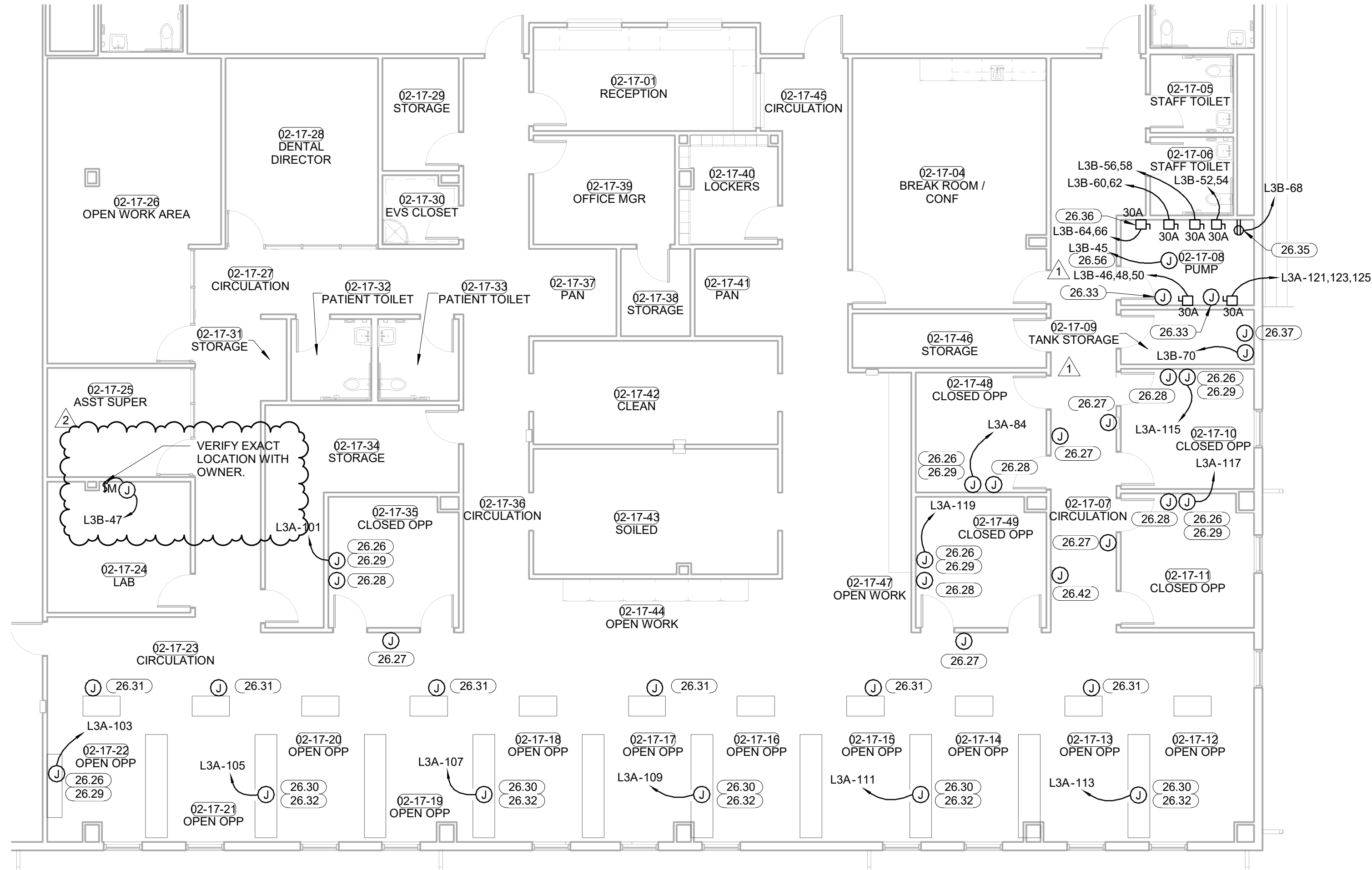
PROJECT PHASE:
BID PACKAGE 02

#	DATE	REVISIONS
1	1/19/20	BID PACKAGE 02 - ADD 01
2	2/18/20	BID PACKAGE 02 - ADD 04

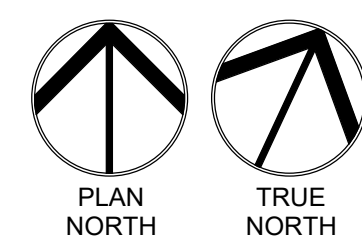
DATE: 12-06-19
JOB NUMBER: 18-01.01

SHEET NUMBER:
M6.05

MECH CEILING
PLAN LEVEL 02
SECTOR 01

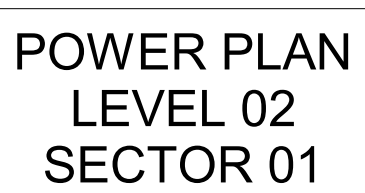


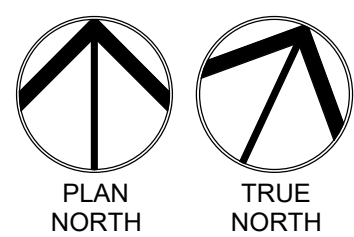
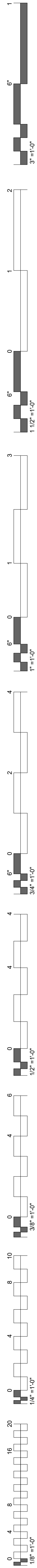
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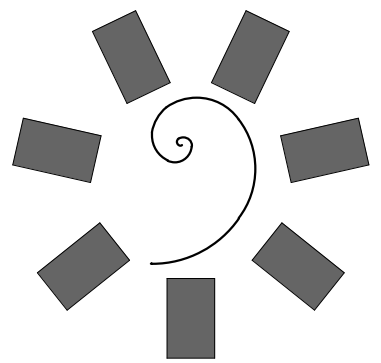
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DENTAL EQUIPMENT NOTES
VERIFY LOCATION AND ELECTRICAL REQUIREMENTS OF ALL DENTAL EQUIPMENT WITH DENTAL EQUIPMENT PROVIDER PRIOR TO ROUGH-IN.
SEE Q SHEETS FOR ADDITIONAL ELECTRICAL REQUIREMENTS.

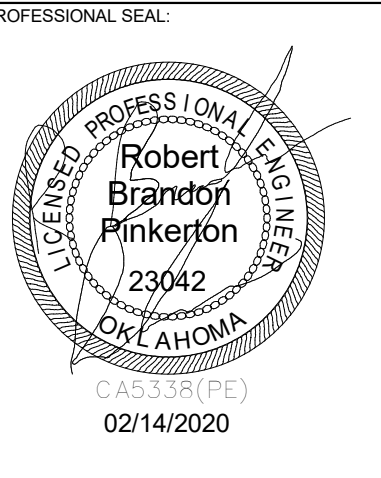




1 SYSTEMS PLAN LEVEL 01 SECTOR 01
1/8" = 1'-0"



**James R. Childers
Architect, Inc.**
45 South 4th Street
Fort Smith, AR 72901
479-783-2450
www.childersarchitect.com



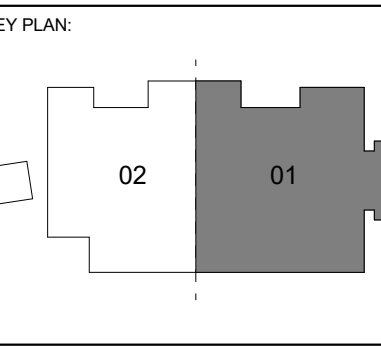
CONSULTANT LOGO

HP ENGINEERING
PROJECT NO. 18068R
100 % COMPLETE

HP ENGINEERING INC.
5214 W. KILLAGE PARKWAY
SUITE 120
ROCKWELL, AR 72768
(479) 699-6370
www.hpsouthwestinc.com



**WILMA P. MANKILLER HEALTH CENTER
EXPANSION**
STILWELL, OKLAHOMA



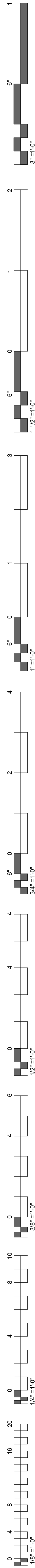
PROJECT PHASE:
BID PACKAGE 02

#	DATE	REVISIONS
1	2/18/20	BID PACKAGE 02 - ADD 04

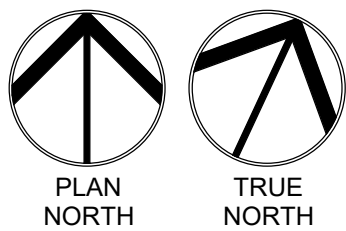
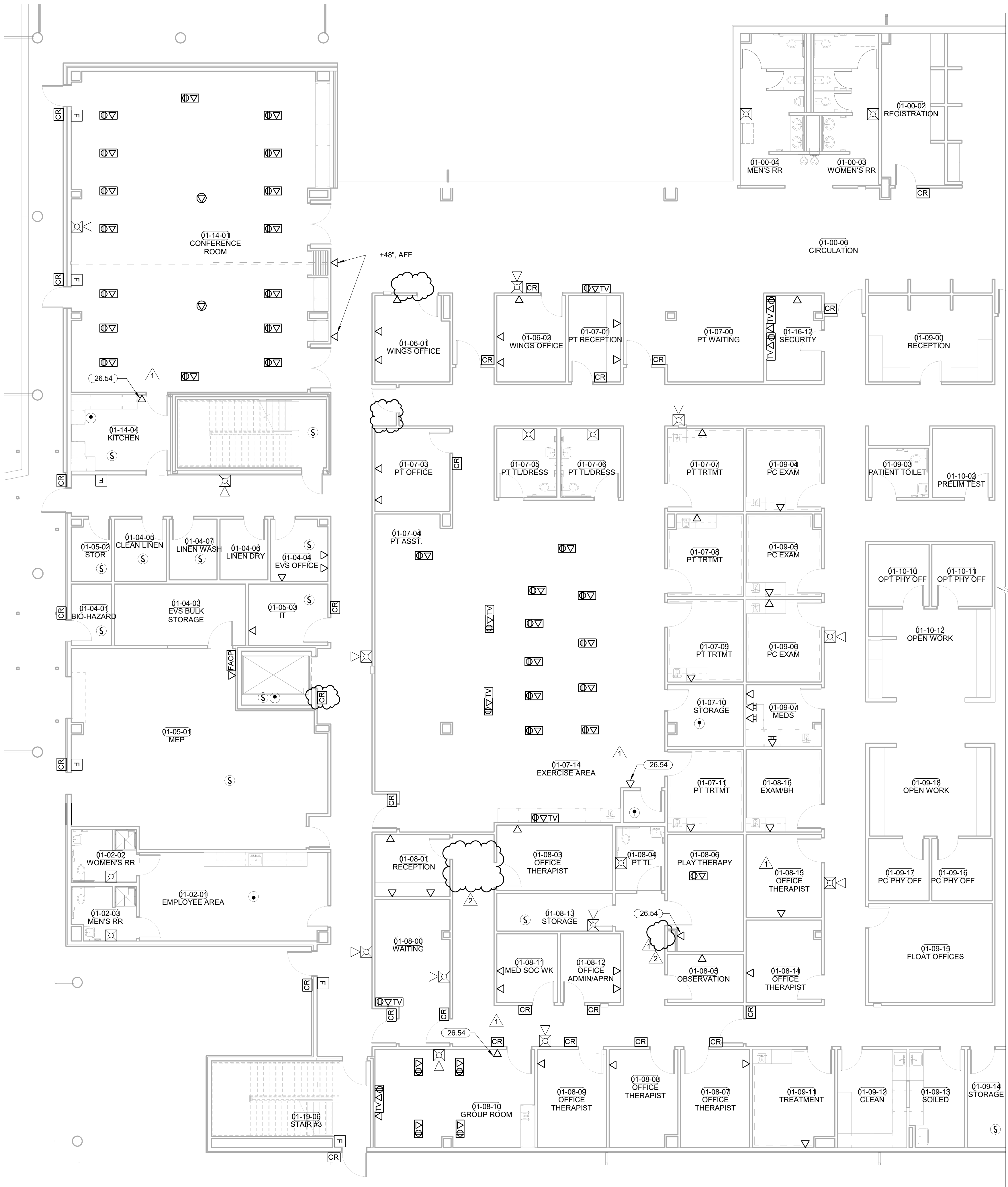
DATE: 12-06-19
JOB NUMBER: 18-01.01

SHEET NUMBER:
E1.20

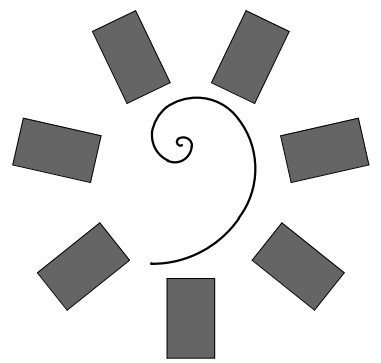
**SYSTEMS PLAN
LEVEL 01
SECTOR 01**



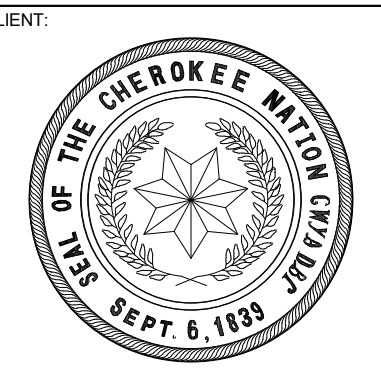
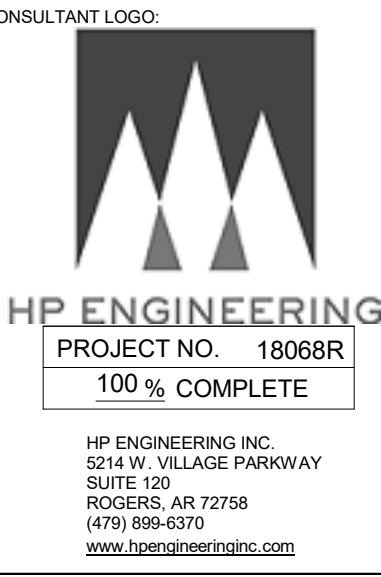
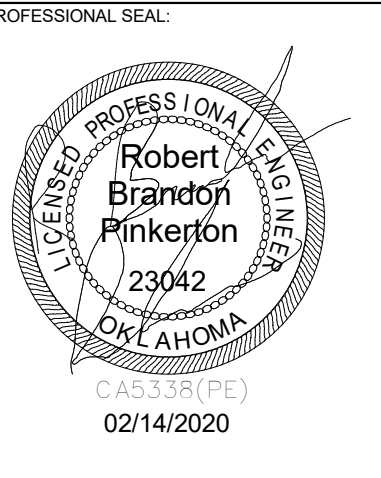
KEYNOTES	
26.54	WALL-MOUNTED TELEPHONE TO BE SPECIFIED BY OWNER. MOUNT AT +48" UNLESS DIRECTED OTHERWISE BY OWNER.



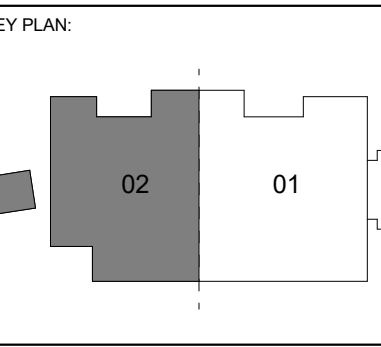
1 SYSTEMS PLAN LEVEL 01 SECTOR 02
1/8" = 1'-0"



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**WILMA P. MANKILLER HEALTH CENTER
EXPANSION**
STILWELL, OKLAHOMA



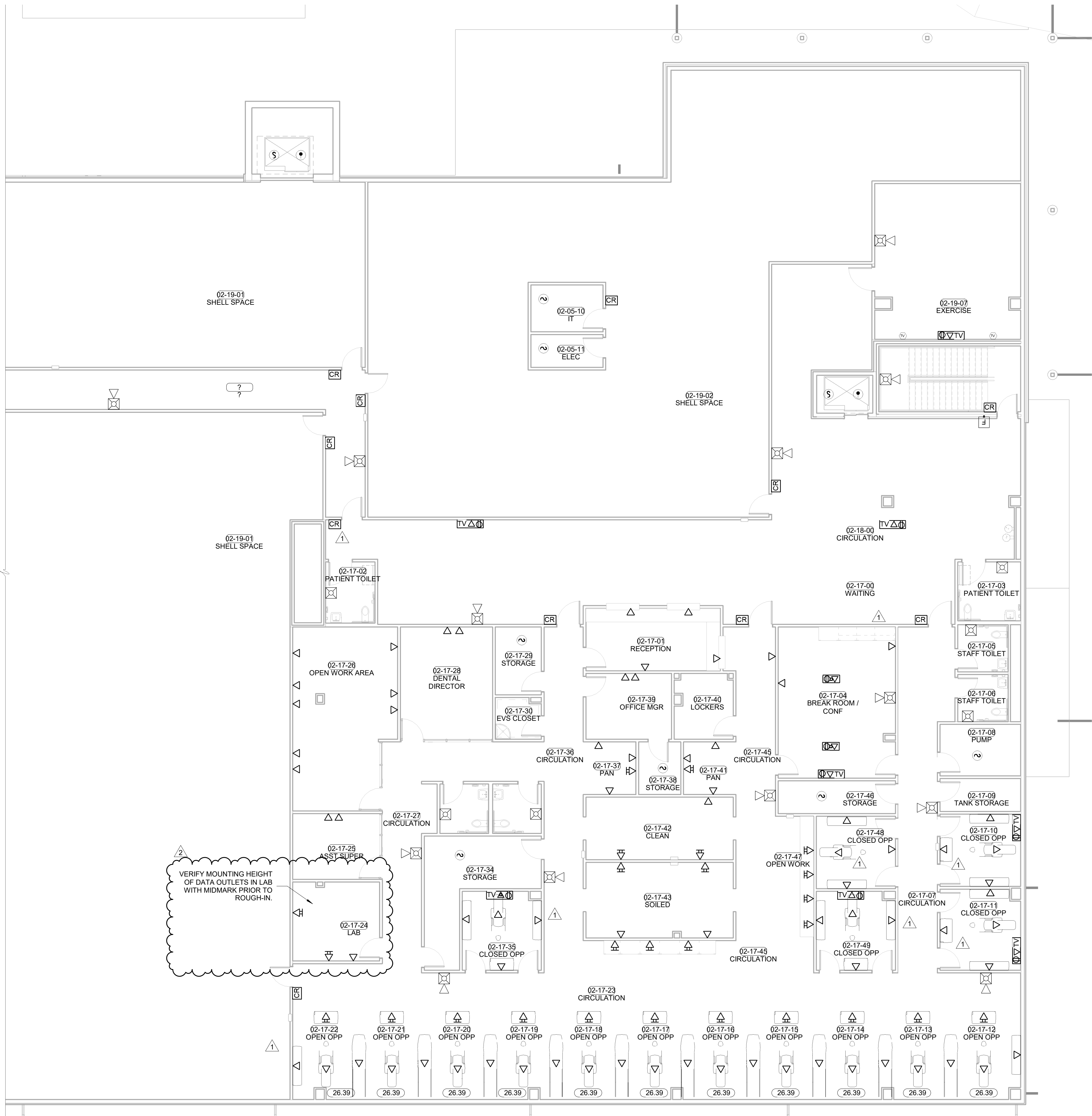
PROJECT PHASE:
BID PACKAGE 02

#	DATE	REVISIONS
1	1/19/20	BID PACKAGE 02 - ADD 01
2	2/18/20	BID PACKAGE 02 - ADD 04

DATE: 12-06-19 JOB NUMBER: 18-01.01

SHEET NUMBER:
E1.21

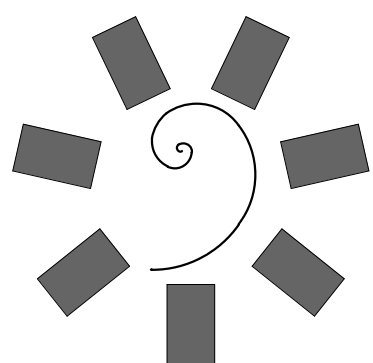
**SYSTEMS PLAN
LEVEL 01
SECTOR 02**



1 SYSTEMS PLAN LEVEL 02 SECTOR 01

KEYNOTES

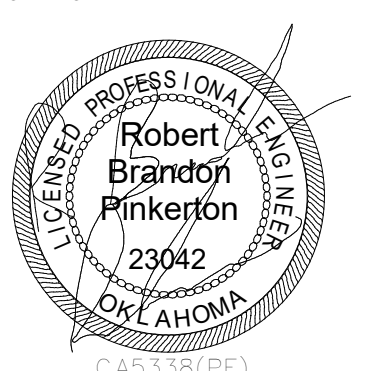
26.39	REFER TO ADEC DRAWINGS AND PROVIDE A CONTINUOUS CONDUIT PATH AS DRAWN IN THE ADEC PLAN.
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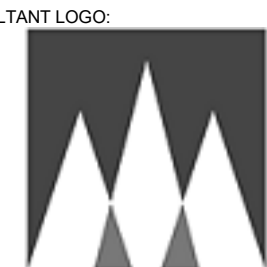
James R. Childers
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Fort Smith, AR 72901
479-783-2480
www.childersarchitect.com

PROFESSIONAL SEAL



02/14/2021



HP ENGINEERING

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HP ENGINEERING INC.
5214 W. VILLAGE PARKWAY
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ROGERS, AR 72758
(479) 899-6370
www.hpengeeringinc.com

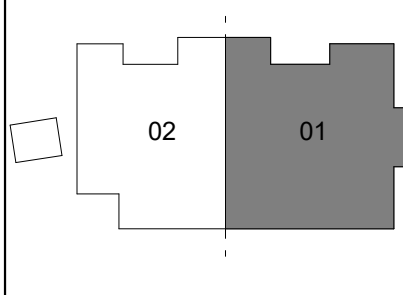
CLIENT



WILMA P. MANKILLER HEALTH CENTER
EXPANSION

STILWELL, OKLAHOMA

KEY PLAN



PROJECT PHASE

BID PACKAGE 02

REVISIONS		
#	DATE	DESCRIPTION
1	1/10/20	BID PACKAGE 02 - ADD 01
2	2/18/20	BID PACKAGE 02 - ADD 04

DATE:

12-06-19

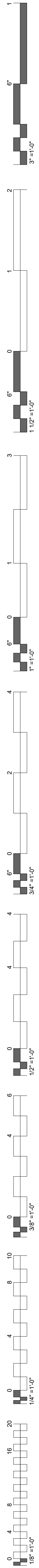
JOB NUMBER:	
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18-01.01

SHEET NUMBER:

E1.22

SYSTEMS PLAN
LEVEL 02
SECTOR 01



Branch Panel: L1A

NEW

Location: MEP 01-05-01
Supply From: T1
Mounting: SURFACE
Enclosure: NEMA 1

Volts: 120/208 Vye
Phases: 3
Wires: 4

A.I.C. Rating: (7) FULLY RATED
Mains Type: MCB
Mains Rating: 300 A

Notes:

CKT	Load Name	CB	P	Wire	A	B	C	Wire	P	CB	Load Name	
1	6430 TABLE 10-02	20	1	--	600	180	132	180	--	1	20	OUTDOOR SERVICE RECEPTACLE
2	AHU-3 VAV POWER	20	1	--	--	--	--	--	--	1	20	WINGS OFFICE COPIER/PRINTER 06-01
5	PT EXAM TABLE 07-11	20	1	--	360	1440	360	180	180	20	PT EXAM TABLE 08-16	
7	PC EXAM TABLE 09-04	20	1	--	--	--	--	--	--	15	ICE MAKER 07-13(4)	
9	MEDS WORK BENCH 09-07	20	1	--	--	--	360	1620	--	20	CIRCULATION TV/RECEPTACLES 00-06	
11	KITCHEN OVEN 14-04 (4)	50	2	#6	8250	360	8250	360	--	20	KH-1	
13	SHUNT TRIP CONTROL	20	1	--	--	--	--	--	--	20	PC EXAM TABLE 09-06	
15	PT TABLE 07-09	20	1	--	--	0	2500	--	180	900	20	CONFERENCE RM FLOORBOXES 14-01
19	PT TABLE 07-08	20	1	--	360	1500	--	--	--	20	NOURISHMENT RECEPTACLES 07-13	
21	CONFERENCE RM RECEPTACLES 14-01	20	1	--	--	1400	360	--	--	20	CONFERENCE RM FLOORBOXES 14-02	
23	WINGS OFFICE RECEPTACLES 06-01	20	1	--	--	--	1080	360	--	20	CONF. PROJECTOR SCREEN 14-01	
25	EVS OFFICE RECEPTACLES 04-04	20	1	--	1440	360	--	--	--	20	HOT WATER HEATER-2	
27	PT OFFICE RECEPTACLES 07-03	20	1	--	--	360	720	--	--	20	PT EXAM TABLE 09-05	
29	PT ASST RECEPT FLOOR BOX 07-04	20	1	--	--	--	1400	960	--	20	PT OFFICE RECEPTACLES 07-03	
31	IT DEDICATED RECEPTACLES 05-03	20	1	--	360	860	--	--	--	20	CONFERENCE RM RECEPTACLES 14-02	
33	EXERCISE AREA FLOORBOXES 07-14	20	1	--	--	500	360	--	500	720	20	MEDS RECEPTACLE 09-07
35	EXERCISE AREA FLOORBOXES 07-14	20	1	--	--	--	500	720	--	20	EXERCISE AREA TV/RECEPS 07-14	
37	EXERCISE AREA RECEPTACLES 07-14	20	1	--	1130	360	--	--	--	20	MEDS RECEPTACLES 09-07	
39	CONFERENCE RM FLOORBOXES 14-01	20	1	--	--	2000	1620	--	10	1	20	SECURITY RECEPTACLES 16-12
41	EF-5	20	1	--	--	--	373	180	--	20	PRELIM TEST RECEPTACLES 10-02	
43	ELEVATOR SIMPLEX SUMP PUMP	20	1	--	180	720	--	--	--	20	PRELIM TEST RECEPTACLES 10-02	
45	ELEVATOR PIT GFCI	20	1	--	--	180	540	--	--	20	PT RECEPTION RECEPTACLESS 07-01	
47	BOILER 2	20	1	--	--	--	960	1080	--	20	PT TRTMT 07-08	
49	WATER HEATER-1	20	1	--	360	1080	--	--	--	20	WINGS OFFICE RECEPTACLES 06-02	
51	CONFERENCE RM FLOORBOXES 14-02	20	1	--	--	2000	720	--	--	20	PT TRTMT RECEPTACLES 07-07	
53	AHU-1 VAV POWER	20	1	--	--	--	552	1285	--	20	CIRCULATION RECEPTACLES 07-02	
55	WATER FOUNTAIN/RESTROOM SERV(4)	20	1	--	665	1440	--	--	--	20	SECURITY CPU RECEPTACLES 16-12	
57	FACP (3)	20	1	--	--	360	900	--	--	20	TREATMENT RECEPTACLES 09-11	
59	WINGS OFFICE COPIER/PRINTER 01-02	20	1	--	--	--	180	900	--	20	PC EXAM RECEPTACLES 09-06	
61	STORAGE REFRIGERATOR 07-10	20	1	--	600	360	--	--	--	20	CONF. PROJECTOR SCREEN 14-01	
63	PT TRTMT RECEPTACLES 07-11	20	1	--	--	900	1105	--	--	20	PC EXAM/MB RECEPTACLES 09-08	
65	STORAGE REFRIGERATOR 07-10	20	1	--	--	600	900	--	--	20	PT TRTMT RECEPTACLES 07-09	
67	FLOAT OFFICES RECEPTACLES 09-15	20	1	--	720	1080	--	--	--	20	FLOAT OFFICES RECEPTACLES 09-15	
69	FLOAT OFFICES RECEPTACLES 09-15	20	1	--	--	1080	360	--	--	20	FLOAT OFFICES COPIER/PRINTER 01-15	
71	PC EXAM RECEPTACLES 09-04	20	1	--	--	720	720	--	--	20	SOILED ROOM RECEPTACLES 09-13	
73	PC PHY OFF RECEPTACLES 09-16	20	1	--	900	1080	--	--	--	20	OPEN WORK CPU RECEPTACLES 09-18	
75	OPEN WORK CPU RECEPTACLES 09-18	20	1	--	--	1080	900	--	--	20	PC PHY OFF RECEPTACLES 09-17	
77	OPEN WORK FLOORBOX 09-18	20	1	--	--	500	900	--	--	20	PC EXAM RECEPTACLES 09-06	
79	SPACE	--	--	--	0	360	--	--	--	20	BAS CONTROL	
81	SPACE	--	--	--	0	1080	--	--	--	20	01-05-01 MEP RECEPTACLES	
83	SPACE	--	--	--	--	--	0	0	--	--	SPACE	
85	SPACE	--	--	--	--	--	--	--	--	--	SPACE	
87	PANEL F1A (8)	60	3	--	1380	6667	1020	6667	--	3	200	GENERATOR 2 LOAD CENTER (8)
89	SPACE	--	--	--	--	--	1260	6667	--	--	--	SPACE
91	SPARE	20	1	--	0	0	--	--	--	1	20	SPARE
93	SPARE	20	1	--	0	0	0	0	--	1	20	SPARE
95	SPARE	20	1	--	--	--	0	0	--	1	20	SPARE
97	SPARE	20	1	--	0	0	--	--	--	1	20	SPARE
99	SPARE	20	1	--	--	--	0	0	--	1	20	SPARE
101	SPACE	--	--	--	--	--	0	0	--	--	SPACE	
103	SPACE	--	--	--	0	0	--	--	--	SPACE		
105	SPACE	--	--	--	0	0	0	0	--	SPACE		
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111	SPACE	--	--	--	--	--	0	0	--	SPACE		
113	SPACE	--	--	--	--	--	0	0	--	SPACE		
115	SPACE	--	--	--	0	0	--	--	--	SPACE		
117	SPACE	--	--	--	--	--	0	0	--	SPACE		
119	SPACE	--	--	--	--	--	0	0	--	SPACE		
121	SPACE	--	--	--	0	0	--	--	--	SPACE		
123	SPACE	--	--	--	0	0	0	0	--	SPACE		
125	SPACE	--	--	--	--	--	0	0	--	SPACE		
Total Load:					35152 VA	31004 VA	32847 VA					
Total Amps:					295 A	258 A	276 A					

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Hvac	720 VA	100.00%	720 VA	
Other	4560 VA	100.00%	4560 VA	Total Conn. Load: 99002 VA
Power	21665 VA	100.00%	21665 VA	Total Est. Demand: 77943 VA
Receptacle	53264 VA	59.39%	31632 VA	Total Conn. Current: 275 A
Kitchen	16500 VA	100.00%	16500 VA	Total Est. Demand: 216 A
Continuous	2293 VA	125.00%	2866 VA	

Branch Panel: L2A

NEW

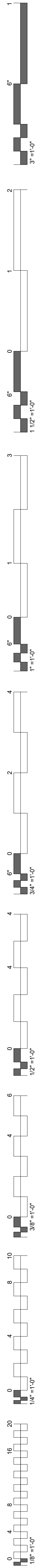
Location: ELEC 01-05-05
Supply From: T-2
Mounting: SURFACE
Enclosure: NEMA 1

Volts: 120/208 Vye
Phases: 3
Wires: 4

A.I.C. Rating: (7) FULLY RATED
Mains Type: MCB
Mains Rating: 225 A

Notes:

CKT	Load Name	CB	P	Wire	A	B	C	Wire	P	CB	Load Name
1	DISPENSING RECEPTACLES 10-00	20	1		1040	360			1	20	DISPENSING CPU RECEPTACLES 10-00
3	DISPENSING FLOORBOXES 10-03	20	1			1860	1260			20	EXAM REFRAC RECEPTACLES 10-03
5	INFECTION CONTROL RECEP.TS 13-04	20	1				1080	1130		20	WT AL 13-02/TOILET 11-01/TOILET 13-03
7	RECEPTION RECEPTACLES 13-00	20	1		900	540				20	RECEPTION RECEPTACLES 13-00
9	LACATION RECEPTACLES 09-07	20	1			900	360			20	IT DEDICATED RECEPTACLES 05-04
11	IT DEDICATED RECEPTACLES 05-04	20	1				360	1080		20	ELEC RMIT RM RECEPTACLES 05-05
13	PHN EXAM RECEPTACLES 13-05	20	1		360	1620				20	EXAM REFRAC RECEPTACLES 10-04(4)
15	PHN EXAM RECEPTACLES 13-05(4)	20	1				900	360		20	SPECIAL TEST RECEPTACLES 10-05
17	SPECIAL TEST RECEPTACLES 10-05	20	1				180	360		20	PHNMED ADMIN RECEPTACLES 13-06
19	5050 REFRIGERATOR 13-06	20	1		900	600				20	5054 FREEZER 13-06
21	KICHENETTE REFRIGERATOR 16-06	20	1				600	360		20	PHNMED ADMIN RECEPTACLES 13-06
23	EXAM REFRAC RECEPTACLES 10-06(4)	20	1				1260	720		20	MEDS RECEPTACLES 12-00
25	EXAM NON-REFRAC RECEP.TS 10-07(4)	20	1		1440	720				20	SPECIALTY EXAM RECEPTACLES 12-01
27	SPECIALTY EXAM RECEPTACLES 12-02	20	1			720	1260			20	EXAM REFRAC RECEPTACLES 10-08
29	EXAM REFRAC TV/RECEPTACLES 12-03	20	1				1440	720		20	SPECIALTY EXAM RECEPTACLES 12-03
31	TOILET RECS. 02-04,02-05,02-06,02-07	20	1		820	1080				20	CIRCULATION RECEPTACLES 13-01
33	STAFF LOUNGE RECEPTACLES 02-08	20	1			720	1000			20	STAFF LOUNGE REFRIGERATOR 02-08
35	STAFF LOUNGE REFRIGERATOR 02-08	20	1					1000	360	20	COPIER/PRINTER 01-06
37	STAFF LOUNGE ICE MAKER 02-08	20	1		1800	1501				20	STAFF LOUNGE MICROWAVE 02-08
39	STAFF LOUNGE MICROWAVE 02-08	20	1			1334	900			20	PHN OPEN WORK RECEPTACLES 13-12
41	PHN OPEN WORK RECEPTACLES 13-12	20	1					900	900	20	CIRCULATION RECEPTACLES
43	OFFICE RECEPTACLES 12-05	20	1		900	900				20	SPEC PHY OFF RECEPTACLES 12-06
45	OPEN WORK CPU RECEPTACLES 12-07	20	1			1080	500			20	OPEN WORK FLOORBOX 12-07
47	OPEN WORK RECEPTACLES 12-07	20	1					1080	1680	15	KITCHENETTE ICE MAKER 16-06
49	OPEN WORK COPIER/PRINTER 13-08	20	1		180	1080				20	OPEN WORK RECEPTACLES 13-08
51	PHN OFFICE RECEPTACLES 13-07	20	1			1080	900			20	RECEPTION CPU RECEPTACLES 09-00
53	HEALTH ED RECEPTACLES 11-08	20	1				900	720		20	HEALTH ED RECEPTACLES 11-08
55	BREASTFEEDING RECEPTACLES 11-02	20	1		720	1080				20	WIC OFFICE RECEPTACLES 11-03
57	PHARMACY COPIER/PRINTER 15-14	20	1			180	1080			20	WIC OFFICE RECEPTACLES 11-04
59	CONSULT RECEP.TS 15-02, 15-03, 15-04	20	1			1080	540			20	WIC STORAGE RECEPTACLES 11-06
61	WIC OFFICE RECEPTACLES 11-06	20	1			900	180			20	OPEN WORK COPIER/PRINTER 15-12
63	WIC OFFICE RECEPTACLES 11-07	20	1			1080	1080			20	RECEPTION RECEPTACLES 09-00
65	OFFICE RECEPTACLES 16-10	20	1				900	180		20	WORK ROOM COPIER/PRINTER 01-02
67	OFFICE RECEPTACLES 16-06	20	1		900	180				20	RECEPTION RECEPTACLE 13-00
69	OFFICE RECEPTACLES 16-08	20	1			900	360			20	SPEC EXAM TABLE 12-02
71	CONF. ROOM TV/FLOORBOXES 16-07(4)	20	1				1260	1360		20	CONF. ROOM RECEPTACLES 16-07
73	KITCHENETTE RECEPTACLES 16-06	20	1		540	900				20	CIRCULATION RECEPTACLES/TV 00-11
75	KITCHENETTE MICROWAVE 16-06 (6)	20	1	#10		1668	696			15	EF-6
77	OFFICE RECEPTACLES 16-05	20	1				1440	360		20	SPECIALTY EXAM RECEPTACLES 12-01
79	WORKROOM RECEPTACLES 16-01	20	1		1465	540				20	WORKROOM RECEPTACLES 16-02
81	WORKROOM RECEPTACLES 16-02	20	1		720	540		360	1680	20	WORKROOM RECEPTACLES 16-02
83	RECEPTION CPU RECEPTACLES 16-01	20	1			540	600			20	SUMP PUMP RECEPTACLE
85	BREAK CPU RECEPTACLES 15-08	20	1		540	600	900			20	6403 EQUIPMENT 10-05
87	6404 EQUIPMENT 10-06	20	1			600	900			20	5050 REFRIGERATOR 12-00
89	5054 FREEZER 12-00	20	1				900	8250	#10	25	STAFF LOUNGE OFFICE 02-08(4)
91	CONFERENCE REFRIGERATOR 18-00	20	1		360	8250				20	OPENWORK CPU RECEPTACLES 01-06
93	CRBY RECEPTACLES 01-00	20	1			1800	1080			20	OPENWORK CPU RECEPTACLES 01-06
95	RECEPTION CPU RECEPTACLES 09-00	20	1				900	1080		20	PHARMACY REFRIGERATOR 15-14
97	AHU-2 VAV POWER	20	1		456	600				20	LOUNGE RECEPTACLES 02-08
101	KICHENETTE COFFE 16-06(4)	25	2	#10		8250	360		8250	0	SPARE
103	SPARE	20	1	--	0	0				1	SPARE
105	SPARE	20	1	--	0	0				1	SPARE
107	SPARE	20	1	--	0	0				1	SPARE
109	SPARE	20	1	--	0	0				1	SPARE
111	SPACE	20	1	--	0	0				1	SPARE
113	SPACE	20	1	--	0	0				1	SPARE
115	SPACE	20	1	--	0	0				1	SPARE
117	SPACE	20	1	--	0	0				1	SPARE
119	SPACE	20	1	--	0	0				1	SPARE
121	SPACE	20	1	--	0	0				1	SPARE
123	SPACE	20	1	--	0	0				1	SPARE
125	SPACE	20	1	--	0	0				1	SPARE
Total Load:					35312 VA	3738 VA		44414 VA			
Total Amps:					294 A	314 A		4770 A			



Branch Panel: L4A												NEW											
Location: ELEC 02-05-12						Volts: 120/208 Wye						A.I.C. Rating: (7) FULLY RATED											
Supply From: T4						Phases: 3						Mains Type: MCB											
Mounting: SURFACE						Wires: 4						Mains Rating: 200 A											
Enclosure: NEMA 1																							
Notes:																							
CKT	Load Name					CB	P	Wire	A	B	C	Wire	P	CB	Load Name					CKT			
1	AHU-1 UV					15	1	--	462	1456				2	15	MCU-01					2		
3	AHU-1 GFCl					15	1	--		360	1456										4		
5	AHU-1 LIGHTING					15	1	--			391	1456									6		
7	AHU-2 UV					15	1	--	232	1456				2	15	MCU-02					8		
9	AHU-2 LIGHTING					15	1	--		391	1456										10		
11	AHU-2 GFCl					15	1	--			180	1456			2	15	MCU-03					12	
13	AHU-3 UV					15	1	--	462	1456				2	15	MCU-05					14		
15	AHU-3 GFCl					15	1	--		1200	1456										16		
17	AHU-3 LIGHTING					15	1	--			391	1456			2	15	MCU-04					18	
19	AHU-4 UV					15	1	--	232	1456											20		
21	AHU-4 LIGHTING					15	1	--		391	1976										22		
23	AHU-4 GFCl					15	1	--			180	1976		#10	2	25	MCU-06					24	
25	SPARE					20	1	--	0	1456												26	
27	SECTOR 2 SERVICE					20	1	--		1440	1456											28	
29	ELEVATOR CAB LIGHTS					20	1	--			200	1976		#10	2	25	MCU-08					30	
31	SPARE					20	1	--	0	1976												32	
33	ROOF MAINTENANCE RECEPTACLE					20	1	--		180	1456											34	
35	SPARE					20	1	--			0	1456										36	
37	SPARE					20	1	--	0	1976				#10	2	25	MCU-10					38	
39	SPARE					--	--	--		0	1976											40	
41	SPARE					--	--	--			0	0		#1	1	20	SPARE					42	
43	SPARE					--	--	--	0	1976				#10	2	30	MCU-11					44	
45	SPARE					--	--	--		0	1976											46	
47	SPARE					--	--	--			0	0		#2	2	20	SPARE					48	
49	SPARE					--	--	--	0	0												50	
51	SPARE					--	--	--		0	0			--	1	20	SPARE					52	
53	SPARE					--	--	--			0	0		--	--	--	SPACE					54	
55	SPARE					--	--	--	0	0				--	--	--	SPACE					56	
57	SPARE					--	--	--		0	0			--	--	--	SPACE					58	
59	SPARE					--	--	--			0	0		--	--	--	SPACE					60	
61	SPARE					--	--	--	0	0				--	--	--	SPACE					62	
63	SPARE					--	--	--		0	0			--	--	--	SPACE					64	
65	SPARE					--	--	--			0	0		--	--	--	SPACE					66	
67	SPARE					--	--	--	0	0				--	--	--	SPACE					68	
69	SPARE					--	--	--		0	0			--	--	--	SPACE					70	
71	SPARE					--	--	--			0	0		--	--	--	SPACE					72	
73	SPARE					--	--	--	0	0				--	--	--	SPACE					74	
75	SPARE					--	--	--		0	0			--	--	--	SPACE					76	
77	SPARE					--	--	--			0	0		--	--	--	SPACE					78	
79	SPARE					--	--	--	0	0				--	--	--	SPACE					80	
81	SPARE					--	--	--		0	0			--	--	--	SPACE					82	
83	SPARE					--	--	--			0	0		--	--	--	SPACE					84	
Total Load:									14596 VA			17170 VA			11118 VA								
Total Amps:									126 A			148 A			93 A								
Load Classification						Connected Load			Demand Factor			Estimated Demand			Panel Totals								
Hvac						36192 VA			100.00%			36192 VA											
Power						200 VA			100.00%			200 VA			Total Conn. Load: 42894 VA								
Receptacle						3540 VA			100.00%			3540 VA			Total Est. Demand: 43622 VA								
Lighting - Exterior						2952 VA			125.00%			3690 VA			Total Conn. Current: 119 A								
															Total Est. Demand... 121 A								

Branch Panel: HE4										NEW																																							
Location: ELEC 02-05-12										Volts: 480/277 Wye																																							
Supply From: HE1										Phases: 3																																							
Mounting: SURFACE										Wires: 4																																							
Enclosure: NEMA 1										A.I.C. Rating: (7) FULLY RATED																																							
										Mains Type: MLO																																							
										Mains Rating: 100 A																																							
Notes:																																																	
CKT	Load Name										CB	P	Wire	A	B	C	Wire	P	CB	Load Name										CKT																			
1	SPARE										20	1	--	0	0			--	1	20	SPARE										2																		
3	SPARE										20	1	--		0	0			--	1	20	SPARE										4																	
5	SPARE										20	1	--		0	0			--	1	20	SPARE										6																	
7	SPARE										20	1	--	0	0				--	1	20	SPARE										8																	
9	SPARE										--	--	--		0	0			--	--	--	SPARE										10																	
11	SPARE										--	--	--			0	0			--	--	--	SPARE										12																
13	SPARE										--	--	--		0	0				--	--	--	SPARE										14																
15	SPARE										--	--	--			0	0			--	--	--	SPARE										16																
17	SPARE										--	--	--				0	0			--	--	--	SPARE										18															
19	SPARE										--	--	--		0	0				--	--	--	SPARE										20																
21	SPARE										--	--	--			0	0			--	--	--	SPARE										22																
23	SPARE										--	--	--				0	0			--	--	--	SPARE										24															
25	SPARE										--	--	--		0	0				--	--	--	SPARE										26																
27	SPARE										--	--	--			0	0			--	--	--	SPARE										28																
29	SPARE										--	--	--				0	0			--	--	--	SPARE										30															
31	SPARE										--	--	--		0	0				--	--	--	SPARE										32																
33	SPARE										--	--	--			0	0			--	--	--	SPARE										34																
35	SPARE										--	--	--				0	0			--	--	--	SPARE										36															
37	SPARE										--	--	--		0	0				--	--	--	SPARE										38																
39	SPARE										--	--	--			0	0			--	--	--	SPARE										40																
41	SPARE										--	--	--				0	0			--	--	--	SPARE										42															
										Total Load: 0 VA 0 VA 0 VA																																							
										Total Amps: 0 A 0 A 0 A																																							
Load Classification										Connected Load										Demand Factor										Estimated Demand										Panel Totals									
																																								Total Conn. Load: 0 VA									
																																								Total Est. Demand: 0 VA									
																																								Total Conn. Current: 0 A									
																																								Total Est. Demand... 0 A									

Project Manual

Bid Package 02
Addendum No.04
Volume I
Divisions 08

Cherokee Nation WILMA P. MANKILLER HEALTH CENTER EXPANSION

Stilwell, Oklahoma

February 18, 2020

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LEGEND

First Column: **Current Date for Section**
 Second Column: Checked Indicates Section is Included in Current Issue
 Third Column: Section Number
 Fourth Column: Section Title



Feb. 14, 2020

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Bid Package 02	Construction Documents	Dec. 06, 2019
Bid Package 02	Addendum No. 01.	Jan. 10, 2020
Bid Package 02	Addendum No. 02	Jan. 27, 2020
Bid Package 02	Addendum No. 03	Feb. 05, 2020
Bid Package 02	Addendum No.04	Feb. 18, 2020

NOTE FOR REVISED SPECIFICATION SECTIONS

1. DELETED INFORMATION IS INDICATED BY A STRIKETHROUGH (IE, ~~THIS IS DELETED~~).
2. NEW INFORMATION IS INDICATED BY A DOUBLE UNDERLINE (IE, THIS IS ADDED).
3. ALL REVISED INFORMATION IS FURTHER IDENTIFIED BY A HEAVY VERTICAL LINE TO THE RIGHT OF ALL REVISIONS IN EACH INDIVIDUAL SPECIFICATION SECTION (REFER TO HEAVY BOLD LINE TO THE RIGHT FOR AN EXAMPLE).

VOLUME 1

CIVIL, STRUCTURAL, ARCHITECTURAL

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

	<input type="checkbox"/>	00 1115	Invitation to Bid
	<input type="checkbox"/>	00 2113	Instructions to Bidders
2019-11-01	<input type="checkbox"/>	00 3100	Available Project Information
	<input type="checkbox"/>	00 4100	Bid Form
	<input type="checkbox"/>	00 5200	Agreement Form
	<input type="checkbox"/>	00 6100	Bonds
2019-11-01	<input type="checkbox"/>	00 7200	General Conditions
	<input type="checkbox"/>	00 7300	Supplementary Conditions

DIVISION 01 - GENERAL REQUIREMENTS

<input type="checkbox"/>	01 0500	Design Selections
<input type="checkbox"/>	01 0510	Exterior Design Selections
<input type="checkbox"/>	01 0520	Interior Design Selections
<input type="checkbox"/>	01 1000	Summary

	<input type="checkbox"/>	01 2100	Allowances
	<input type="checkbox"/>	01 2200	Unit Prices
	<input type="checkbox"/>	01 2300	Alternates
2019-11-01	<input type="checkbox"/>	01 2500	Substitution Procedures
2019-11-01	<input type="checkbox"/>	01 2500a	Substitution Procedure Form
2019-11-01	<input type="checkbox"/>	01 2600	Contract Modification Procedures
2019-11-01	<input type="checkbox"/>	01 2900	Payment Procedures
2019-11-01	<input type="checkbox"/>	01 2900a	Project Cost Summary Form
2019-11-01	<input type="checkbox"/>	01 3100	Project Management and Coordination
2019-11-01	<input type="checkbox"/>	01 3200	Construction Progress Documentation
	<input type="checkbox"/>	01 3233	Photographic Documentation
2019-11-01	<input type="checkbox"/>	01 3300	Submittal Procedures
2019-11-01	<input type="checkbox"/>	01 4000	Quality Requirements
	<input type="checkbox"/>	01 4200	References
2019-11-01	<input type="checkbox"/>	01 4323	Special Inspection
2019-11-01	<input type="checkbox"/>	01 4339	Visual Mock-Up Requirements
2019-11-01	<input type="checkbox"/>	01 4516	Field Test for Water Leakage
2019-12-06	<input type="checkbox"/>	01 4529	Testing Laboratory Services
2019-12-06	<input type="checkbox"/>	01 4534	Testing of Piping Systems
2019-11-01	<input type="checkbox"/>	01 5000	Temporary Facilities and Controls
2019-11-01	<input type="checkbox"/>	01 6000	Product Requirements
2019-11-01	<input type="checkbox"/>	01 7300	Execution
2019-11-01	<input type="checkbox"/>	01 7416	Clean Up (Site Maintenance)
2019-11-01	<input type="checkbox"/>	01 7419	Construction Waste Management and Disposal
	<input type="checkbox"/>	01 7420	LEED Construction Waste Management and Disposal
2019-11-01	<input type="checkbox"/>	01 7700	Closeout Procedures
2019-11-01	<input type="checkbox"/>	01 7823	Operations and Maintenance Data
2019-11-01	<input type="checkbox"/>	01 7839	Project Record Documents
2019-11-01	<input type="checkbox"/>	01 7900	Demonstration and Training
	<input type="checkbox"/>	01 8111	Sustainable Construction Requirements
	<input type="checkbox"/>	01 8112	LEED Construction Requirements
	<input type="checkbox"/>	01 8113	LEED Construction Requirements for New Construction and Major Renovations
	<input type="checkbox"/>	01 8123	LEED Construction Requirements for Commercial Interiors
	<input type="checkbox"/>	01 8133	LEED Construction Requirements for Core and Shell Development
	<input type="checkbox"/>	01 8143	LEED Construction Requirements for Schools
2019-11-01	<input type="checkbox"/>	01 9113	General Commissioning Requirements

DIVISION 02 - EXISTING CONDITIONS

2019-11-01	<input type="checkbox"/>	02 1113	Demolition
2019-11-01	<input type="checkbox"/>	02 4116	Building Demolition
2019-11-01	<input type="checkbox"/>	02 4119	Selective Demolition

DIVISION 03 - CONCRETE

	<input type="checkbox"/>	03 0150	Concrete Patching
2019-11-01	<input type="checkbox"/>	03 1000	Concrete Forming and Accessories
	<input type="checkbox"/>	03 1500	Concrete Accessories
2019-11-01	<input type="checkbox"/>	03 2000	Concrete Reinforcing
2019-12-06	<input type="checkbox"/>	03 2100	Steel Reinforcement (Sidewalk)
2019-11-01	<input type="checkbox"/>	03 3000	Cast-In-Place Concrete
2019-12-06	<input type="checkbox"/>	03 3053	Cast-in Place Concrete (Site work)
	<input type="checkbox"/>	03 3500	Concrete Finishing
2019-12-06	<input type="checkbox"/>	03 3536	Concrete Finishing (Site work)
	<input type="checkbox"/>	03 3543	Polished Concrete
	<input type="checkbox"/>	03 3600	Special Concrete Finishes
	<input type="checkbox"/>	03 3800	Post-Tensioned Concrete
2019-11-01	<input type="checkbox"/>	03 4000	Precast Concrete
2019-12-06	<input type="checkbox"/>	03 4500	Architectural Precast Concrete
	<input type="checkbox"/>	03 4713	Tilt-Up Concrete
	<input type="checkbox"/>	03 4900	Glass-Fiber Reinforced Precast Concrete (GFRC)
	<input type="checkbox"/>	03 5216	Lightweight Insulating Concrete
	<input type="checkbox"/>	03 5300	Concrete Toppings
	<input type="checkbox"/>	03 5416	Hydraulic Cement Underlayment

DIVISION 04 – MASONRY

2019-12-06	<input type="checkbox"/>	04 2100	Masonry Veneer
2019-11-01	<input type="checkbox"/>	04 2200	Reinforced Unit Masonry
	<input type="checkbox"/>	04 2300	Glass Unit Masonry
	<input type="checkbox"/>	04 4200	Exterior Stone Cladding
	<input type="checkbox"/>	04 4216	Steel Supported Stone Cladding
	<input type="checkbox"/>	04 7200	Cast Stone Masonry
	<input type="checkbox"/>	04 7500	Adhered Masonry Veneer

DIVISION 05 – METALS

2019-11-01	<input type="checkbox"/>	05 1000	Structural Steel
2019-11-01	<input type="checkbox"/>	05 1213	Architecturally Exposed Structural Steel (AESS)
	<input type="checkbox"/>	05 1636	Barrier Cables
2019-11-01	<input type="checkbox"/>	05 2100	Steel Joists Framing
	<input type="checkbox"/>	05 5214	Ornamental & Misc. Metals
2019-11-01	<input type="checkbox"/>	05 3000	Steel Decking
	<input type="checkbox"/>	05 3123	Steel Roof Deck System
	<input type="checkbox"/>	05 3133	Permanent Metal Forming
2019-11-01	<input type="checkbox"/>	05 4000	Cold-Formed Steel Framing
	<input type="checkbox"/>	05 4300	Slotted Channel Framing
2019-12-06	<input type="checkbox"/>	05 5000	Metal Fabrications
2019-11-01	<input type="checkbox"/>	05 5100	Metal Stairs
	<input type="checkbox"/>	05 5213	Pipe and Tube Railings
2019-12-06	<input type="checkbox"/>	05 5214	Ornamental & Misc. Metals

<input type="checkbox"/>	05 5300	Metal Gratings
<input type="checkbox"/>	05 5813	Ornamental Metal Column Covers
<input type="checkbox"/>	05 7000	Ornamental Metal
<input type="checkbox"/>	05 7300	Ornamental Handrails and Railings

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

2019-12-06	<input type="checkbox"/>	06 1053	Miscellaneous Rough Carpentry
2019-12-06	<input type="checkbox"/>	06 1643	Exterior Gypsum Sheathing
2019-12-06	<input type="checkbox"/>	06 4023	Interior Architectural Woodwork
	<input type="checkbox"/>	06 4223	Slatwall Paneling
	<input type="checkbox"/>	06 6100	Simulated Stone Fabrications
2019-12-06	<input type="checkbox"/>	06 6400	Plastic (FRP) Paneling
	<input type="checkbox"/>	06 6413	Translucent Resin Panel Fabrications
	<input type="checkbox"/>	06 6419	Simulated Stone Paneling
	<input type="checkbox"/>	06 6713	Louvered Light Diffusers
	<input type="checkbox"/>	06 6813	Plastic Gratings

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

	<input type="checkbox"/>	07 0151	Preparation for Re-Roofing
	<input type="checkbox"/>	07 0152	Patching of Existing Roofing
	<input type="checkbox"/>	07 1114	Asphalt Mastic Dampproofing
	<input type="checkbox"/>	07 1328	Pre-Applied Sheet Waterproofing
	<input type="checkbox"/>	07 1352	Modified Bituminous Sheet Waterproofing
	<input type="checkbox"/>	07 1413	Hot Fluid-Applied Rubberized Asphalt Waterproofing
	<input type="checkbox"/>	07 1416	Cold Fluid Applied Waterproofing
	<input type="checkbox"/>	07 1616	Crystalline Waterproofing
	<input type="checkbox"/>	07 1700	Bentonite Waterproofing
	<input type="checkbox"/>	07 1800	Traffic Coatings
	<input type="checkbox"/>	07 1900	Water Repellents
2019-12-06	<input type="checkbox"/>	07 2100	Thermal Insulation
2020-01-27	<input type="checkbox"/>	07 2119	Spray-Applied Foam Insulation
2019-12-06	<input type="checkbox"/>	07 2400	EIFS
	<input type="checkbox"/>	07 2423	DEFS for Soffits
2019-12-06	<input type="checkbox"/>	07 2500	Mechanically Fastened Air and Water Barriers
2019-11-01	<input type="checkbox"/>	07 2600	Under-Slab Vapor Retarder
	<input type="checkbox"/>	07 2613	Rubberized Asphalt Vapor Retarders
	<input type="checkbox"/>	07 2713	Self-Adhering Air and Water Barriers
	<input type="checkbox"/>	07 3113	Asphalt Shingles
	<input type="checkbox"/>	07 3127	Simulated Slate Roofing
	<input type="checkbox"/>	07 3200	Roof Tiles
2019-12-06	<input type="checkbox"/>	07 4114	Metal Roof Panels
	<input type="checkbox"/>	07 4213	Formed Metal Wall Panels
	<input type="checkbox"/>	07 4229	Terra Cotta Wall Panels
	<input type="checkbox"/>	07 4243	Composite Metal Wall Panels
	<input type="checkbox"/>	07 4263	Insulated-Core Metal Wall Panels
2019-12-06	<input type="checkbox"/>	07 5013	Single-Ply Membrane Roofing
	<input type="checkbox"/>	07 5216	Modified Bituminous Membrane Roofing
	<input type="checkbox"/>	07 5556	Fluid-Applied Protected Membrane Roofing

	<input type="checkbox"/>	07 5563	Vegetated Protected Membrane Roofing
2019-12-06	<input type="checkbox"/>	07 6200	Flashing and Sheet Metal
2020-01-27	<input type="checkbox"/>	07 7200	Roof Accessories
	<input type="checkbox"/>	07 7600	Roof Pavers and Pedestal Assemblies
2020-01-27	<input type="checkbox"/>	07 8116	Cementitious Fireproofing
	<input type="checkbox"/>	07 8123	Intumescent Mastic Fireproofing
	<input type="checkbox"/>	07 8413	Penetration Firestopping
2019-12-06	<input type="checkbox"/>	07 8446	Fire-Resistive Joint Firestopping
	<input type="checkbox"/>	07 9100	Preformed Joint Seals
2019-12-06	<input type="checkbox"/>	07 9200	Joint Sealants
2019-12-06	<input type="checkbox"/>	07 9500	Expansion Control

DIVISION 08 - OPENINGS

	<input type="checkbox"/>	08 0610	Door Schedule
2019-12-06	<input type="checkbox"/>	08 1113	Hollow Metal Doors and Frames
	<input type="checkbox"/>	08 1114	Interior Hollow Metal Frames
	<input type="checkbox"/>	08 1170	Steel Fire Door and Frame Assembly
	<input type="checkbox"/>	08 1216	Interior Aluminum Frames
2019-12-06	<input type="checkbox"/>	08 1416	Prefinished Flush Wood Doors
	<input type="checkbox"/>	08 1433	Stile and Rail Wood Doors
2019-12-06	<input type="checkbox"/>	08 3113	Access Doors and Frames
	<input type="checkbox"/>	08 3213	Sliding Aluminum-Framed Glass Doors
2019-12-06	<input type="checkbox"/>	08 3313	Coiling Counter Doors
2019-12-06	<input type="checkbox"/>	08 3323	Overhead Coiling Doors
	<input type="checkbox"/>	08 3326	Overhead Coiling Grilles
	<input type="checkbox"/>	08 3338	Interior Side Coiling Grilles
2019-12-06	<input type="checkbox"/>	08 3400	Special Function Doors
	<input type="checkbox"/>	08 3513	Folding Doors
	<input type="checkbox"/>	08 3515	Accordion Folding Fire Doors
	<input type="checkbox"/>	08 3613	Sectional Overhead Doors
	<input type="checkbox"/>	08 4110	Interior Storefront
	<input type="checkbox"/>	08 4127	Exterior All-Glass Entrances and Storefronts
	<input type="checkbox"/>	08 4128	Interior All-Glass Entrances and Storefronts
	<input type="checkbox"/>	08 4213	Exterior Aluminum Entrance Doors
	<input type="checkbox"/>	08 4216	Interior Aluminum Entrance Doors
	<input type="checkbox"/>	08 4229	Automatic Entrances
	<input type="checkbox"/>	08 4233	Revolving Entrance Doors
	<input type="checkbox"/>	08 4243	Medical Specialty Sliding Entrances
	<input type="checkbox"/>	08 4400	Glazed Aluminum Framing Systems
	<input type="checkbox"/>	08 4426	Structural Glass Curtainwall
	<input type="checkbox"/>	08 4500	Translucent Insulating Panel Assemblies
	<input type="checkbox"/>	08 5113	Aluminum Windows
2019-12-06	<input type="checkbox"/>	08 5619	Sliding Pass Windows
	<input type="checkbox"/>	08 5656	Bullet-Resistive Windows
	<input type="checkbox"/>	08 6200	Unit Skylights
	<input type="checkbox"/>	08 6300	Metal-Framed Skylights
2020-02-14	<input checked="" type="checkbox"/>	08 7100	Door Hardware
	<input type="checkbox"/>	08 7121	Interior Automatic Door Operators for Staff Use
	<input type="checkbox"/>	08 7122	Automatic Door Operators for the Disabled
2019-12-06	<input type="checkbox"/>	08 8000	Glazing
2019-12-06	<input type="checkbox"/>	08 8300	Unframed Mirrored Glazing
	<input type="checkbox"/>	08 8816	Between Glass Blinds Units

<input type="checkbox"/>	08 8840	Switchable Privacy Glass Units
<input type="checkbox"/>	08 9100	Wall Louvers

DIVISION 09 – FINISHES

	<input type="checkbox"/>	09 0565	Floor Preparation for Renovation Work
	<input type="checkbox"/>	09 0600	Room Finish Schedule
	<input type="checkbox"/>	09 2300	Gypsum Plastering
	<input type="checkbox"/>	09 2400	Portland Cement Plastering
	<input type="checkbox"/>	09 2600	Veneer Plastering
	<input type="checkbox"/>	09 2613	Gypsum Veneer Plastering
	<input type="checkbox"/>	09 2713	GFRG Fabrications
2019-12-06	<input type="checkbox"/>	09 2900	Gypsum Board Assemblies
2019-12-06	<input type="checkbox"/>	09 3000	Tiling
2019-12-06	<input type="checkbox"/>	09 5113	Acoustical Panel Ceilings
	<input type="checkbox"/>	09 5133	Acoustical Metal Pan Ceilings
	<input type="checkbox"/>	09 5135	Snap-in Metal Pan Ceilings
	<input type="checkbox"/>	09 5423	Linear Metal Ceilings
	<input type="checkbox"/>	09 5436	Suspended Decorative Grids
2019-12-06	<input type="checkbox"/>	09 5451	Linear Wood Wall and Ceiling Systems
	<input type="checkbox"/>	09 6115	Concrete Floor Sealer
2019-12-06	<input type="checkbox"/>	09 6116	Liquid Floor Hardener
	<input type="checkbox"/>	09 6119	Moisture Floor Treatment
	<input type="checkbox"/>	09 6340	Stone Flooring
	<input type="checkbox"/>	09 6400	Wood Flooring
2019-12-06	<input type="checkbox"/>	09 6500	Resilient Flooring
2019-12-06	<input type="checkbox"/>	09 6513	Resilient Base and Accessories
	<input type="checkbox"/>	09 6520	Interlocking Rubber Tile Flooring
2019-12-06	<input type="checkbox"/>	09 6566	Resilient Athletic Flooring
	<input type="checkbox"/>	09 6603	Precast Terrazzo Flooring for Stairs
	<input type="checkbox"/>	09 6613	Thick-Set Terrazzo Flooring
	<input type="checkbox"/>	09 6623	Thin-Set Terrazzo Flooring
	<input type="checkbox"/>	09 6723	Resinous Flooring
2019-12-06	<input type="checkbox"/>	09 6800	Carpeting
	<input type="checkbox"/>	09 6900	Access Flooring
	<input type="checkbox"/>	09 7200	Wall Covering
	<input type="checkbox"/>	09 7213	Tackboard Wall Coverings
	<input type="checkbox"/>	09 7500	Interior Stone Facing
	<input type="checkbox"/>	09 7723	Fabric Wrapped Panels
	<input type="checkbox"/>	09 8433	Acoustical Wall Panels
2019-12-06	<input type="checkbox"/>	09 9100	Painting
	<input type="checkbox"/>	09 9413	Textured Interior Coatings
	<input type="checkbox"/>	09 9600	High-Performance Coatings
	<input type="checkbox"/>	09 9613	Multicolored Interior Coatings
	<input type="checkbox"/>	09 9653	Elastomeric Coatings
	<input type="checkbox"/>	09 9663	Textured Acrylic Coating

DIVISION 10 - SPECIALTIES

	<input type="checkbox"/>	10 1100	Visual Display Boards
	<input type="checkbox"/>	10 1146	Visual Display Fabrics
2019-12-06	<input type="checkbox"/>	10 1400	Interior Signage
	<input type="checkbox"/>	10 1443	Photoluminescent Exit Path Marking System
	<input type="checkbox"/>	10 1700	Telephone Specialties
2019-12-06	<input type="checkbox"/>	10 2113	Toilet Compartments
2019-12-06	<input type="checkbox"/>	10 2115	Cubicle Specialties
	<input type="checkbox"/>	10 2213	Wire Mesh Partitions
	<input type="checkbox"/>	10 2223	Accordion Folding Partitions
2019-12-06	<input type="checkbox"/>	10 2238	Operable Panel Partition
	<input type="checkbox"/>	10 2239	Vertically Folding Panel Partitions
2019-12-06	<input type="checkbox"/>	10 2613	Wall and Corner Guards
2019-12-06	<input type="checkbox"/>	10 2813	Toilet Accessories
	<input type="checkbox"/>	10 2819	Shower Doors and Enclosures
	<input type="checkbox"/>	10 4116	Emergency Key Cabinets
2019-12-06	<input type="checkbox"/>	10 4400	Fire Protection Specialties
	<input type="checkbox"/>	10 4450	Automated External Defibrillators (AED)
2019-12-06	<input type="checkbox"/>	10 5113	Metal Lockers
	<input type="checkbox"/>	10 5116	Wood Lockers
	<input type="checkbox"/>	10 5503	USPS-Delivery Postal Specialties
	<input type="checkbox"/>	10 5506	Private-Delivery Postal Specialties
	<input type="checkbox"/>	10 5713	Wall Mounted Coat Rack and Shelf
	<input type="checkbox"/>	10 7113	Exterior Sun Control Devices
2019-12-06	<input type="checkbox"/>	10 7310	Aluminum Walkways and Canopies
	<input type="checkbox"/>	10 7500	Flagpoles

DIVISION 11 - EQUIPMENT

2019-12-06	<input type="checkbox"/>	11 1300	Loading Dock Equipment
	<input type="checkbox"/>	11 2400	Building Maintenance Equipment
	<input type="checkbox"/>	11 5213	Projection Screens
2019-12-06	<input type="checkbox"/>	11 7000	Medical Equipment
	<input type="checkbox"/>	11 7313	Wall-Mounted Fold-Up Writing Surface
	<input type="checkbox"/>	11 7316	Wall-Mounted Chart Rack

DIVISION 12 - FURNISHINGS

	<input type="checkbox"/>	12 2113	Horizontal Louver Blinds
	<input type="checkbox"/>	12 2116	Vertical Louver Blinds
2019-12-06	<input type="checkbox"/>	12 2413	Roller Window Shades
	<input type="checkbox"/>	12 2500	Between Glass Blinds
	<input type="checkbox"/>	12 3553	Laboratory Casework
	<input type="checkbox"/>	12 3571	Stainless Steel Casework
	<input type="checkbox"/>	12 3640	Stone Countertops
2019-12-06	<input type="checkbox"/>	12 3661	Simulated Stone Countertops
	<input type="checkbox"/>	12 4816	Entrance Floor Grilles
	<input type="checkbox"/>	12 4843	Entrance Floor Mats
	<input type="checkbox"/>	12 6300	Stadium Seating
	<input type="checkbox"/>	12 9313	Bicycle Racks

DIVISION 13 - SPECIAL CONSTRUCTION

<input type="checkbox"/>	13 2817	Ballpark Netting and Supports
<input type="checkbox"/>	13 3448	Pre-Fabricated Rooftop Helipad
<input type="checkbox"/>	13 4900	Radiation Protection
<input type="checkbox"/>	13 4923	RF/MRI Modular Shielding Enclosure

DIVISION 14 - CONVEYING EQUIPMENT

2019-12-06	<input type="checkbox"/>	14 1000	Dumbwaiters
	<input type="checkbox"/>	14 2100	Electric Traction Elevators
	<input type="checkbox"/>	14 2400	Hydraulic Elevators
	<input type="checkbox"/>	14 3100	Escalators
	<input type="checkbox"/>	14 9100	Chutes
	<input type="checkbox"/>	14 9200	Pneumatic Tube Systems

DIVISION 31 - EARTHWORK

2019-11-01	<input type="checkbox"/>	31 1100	Cleaning and Grubbing
	<input type="checkbox"/>	31 2119	Site Grading
2019-11-01	<input type="checkbox"/>	31 2300	Excavation & Fill
2019-11-01	<input type="checkbox"/>	31 2311	Earthwork for Building Construction
2019-12-06	<input type="checkbox"/>	31 2333	Trenching
2019-11-01	<input type="checkbox"/>	31 2500	Erosion Control
2019-11-01	<input type="checkbox"/>	31 2573	Temporary Silt Fence
2019-12-06	<input type="checkbox"/>	31 3116	Termite Control
2019-12-06	<input type="checkbox"/>	31 4134	Excavation/Trench & Shore
	<input type="checkbox"/>	31 6218	Mini-Piles
2019-11-01	<input type="checkbox"/>	31 6613	Aggregate Piers

DIVISION 32 - EXTERIOR IMPROVEMENTS

2019-12-06	<input type="checkbox"/>	32 1123	Aggregate Base Course
2019-12-06	<input type="checkbox"/>	32 1313	Concrete Paving
	<input type="checkbox"/>	32 1413	Interlocking Precast Concrete Paving
	<input type="checkbox"/>	32 1416	Brick unit Paving
	<input type="checkbox"/>	32 1440	Stone Paving
2019-12-06	<input type="checkbox"/>	32 1613	Concrete Curb & gutters
2019-12-06	<input type="checkbox"/>	32 1614	Concrete Side Walk
	<input type="checkbox"/>	32 1715	Parking Accessories
	<input type="checkbox"/>	32 3113	Chain Link Fencing
	<input type="checkbox"/>	32 3115	Tubular Steel Fencing
	<input type="checkbox"/>	32 3117	Gate Operators
	<input type="checkbox"/>	32 3121	Cable Guardrail System
2019-12-06	<input type="checkbox"/>	32 3223	Segmental Retaining Walls

DIVISION 33 - UTILITIES

2019-12-06	<input type="checkbox"/>	33 0516	Manholes Vaults
2019-12-06	<input type="checkbox"/>	33 0526	Utility Line Marking
2019-12-06	<input type="checkbox"/>	33 0527	Connection to Existing Utilities
2019-12-06	<input type="checkbox"/>	33 0533	Plastic Pipe (water & San. Swr.)
2019-12-06	<input type="checkbox"/>	33 1113	HDPE Potable Water Pipe
2019-12-06	<input type="checkbox"/>	33 1216	Valves
2019-12-06	<input type="checkbox"/>	33 1219	Hydrants
2019-12-06	<input type="checkbox"/>	33 1300	Disinfection of Waterlines
2019-12-06	<input type="checkbox"/>	33 4100	Storm Drainage

END OF TABLE OF CONTENTS

SECTION 08 71 00

DOOR HARDWARE

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. Mechanical and electrified door hardware for:
 - a. Swinging doors.
 - b. Sliding doors.
 - c. Gates.
- 2. Electronic access control system components, including:
 - a. Biometric access control reader.
 - b. Electronic access control devices.
- 3. Field verification, preparation and modification of existing doors and frames to receive new door hardware.
- 4. Lead-lining door hardware items required for radiation protection at door openings.

- B. Exclusions: Unless specifically listed in hardware sets, hardware is not specified in this section for:

- 1. Windows
- 2. Cabinets (casework), including locks in cabinets
- 3. Signage
- 4. Toilet accessories
- 5. Overhead doors

- C. Related Sections:

- 1. Division 01 Section "Alternates" for alternates affecting this section.
- 2. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
- 3. Division 09 sections for touchup finishing or refinishing of existing openings modified by this section.
- 4. Division 13 Section "Radiation Protection" for requirements for lead-lining for door hardware at openings indicated to receive radiation protection.

5. Division 26 sections for connections to electrical power system and for low-voltage wiring.
6. Division 28 sections for coordination with other components of electronic access control system.

1.3 REFERENCES

A. UL - Underwriters Laboratories

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Key Systems and Nomenclature

C. ANSI - American National Standards Institute

1. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties

1.4 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 requirements.
2. Highlight, encircle, or otherwise specifically identify on submittals deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.
3. Prior to forwarding submittal, comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.

B. Action Submittals:

1. Product Data: Product data including manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample or sample installations of each type of exposed hardware unit in finish indicated, and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier in like-new condition. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule: Submit schedule with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Indicate complete designations of each item required for each door or opening, include:
 - a. Door Index; include door number, heading number, and Architects hardware set number.
 - b. Opening Lock Function Spreadsheet: List locking device and function for each opening.
 - c. Type, style, function, size, and finish of each hardware item.
 - d. Name and manufacturer of each item.
 - e. Fastenings and other pertinent information.
 - f. Location of each hardware set cross-referenced to indications on Drawings.
 - g. Explanation of all abbreviations, symbols, and codes contained in schedule.
 - h. Mounting locations for hardware.
 - i. Door and frame sizes and materials.
 - j. Name and phone number for local manufacturer's representative for each product.
 - k. Operational Description of openings with any electrified hardware (locks, exits, electromagnetic locks, electric strikes, automatic operators, door position switches, magnetic holders or closer/holder units, and access control components). Operational description should include how door will operate on egress, ingress, and fire and smoke alarm connection.
 - 1) Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work that is critical in Project construction schedule.
5. Key Schedule:
 - a. After Keying Conference, provide keying schedule listing levels of keying as well as explanation of key system's function, key symbols used and door numbers controlled.
 - b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
 - c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
 - d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
 - e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion.
 - 1) Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
 - f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

6. Templates: After final approval of hardware schedule, provide templates for doors, frames and other work specified to be factory prepared for door hardware installation.

C. Informational Submittals:

1. Qualification Data: For Supplier, Installer and Architectural Hardware Consultant.
2. Product Certificates for electrified door hardware, signed by manufacturer:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
3. Certificates of Compliance:
 - a. Certificates of compliance for fire-rated hardware and installation instructions if requested by Architect or Authority Having Jurisdiction.
 - b. Installer Training Meeting Certification: Letter of compliance, signed by Contractor, attesting to completion of installer training meeting specified in "QUALITY ASSURANCE" article, herein.
 - c. Electrified Hardware Coordination Conference Certification: Letter of compliance, signed by Contractor, attesting to completion of electrified hardware coordination conference, specified in "QUALITY ASSURANCE" article, herein.
4. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by qualified testing agency, for door hardware on doors located in accessible routes.
5. Warranty: Special warranty specified in this Section.

D. Closeout Submittals:

1. Operations and Maintenance Data : Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Name, address, and phone number of local representative for each manufacturer.
 - d. Parts list for each product.
 - e. Final approved hardware schedule, edited to reflect conditions as-installed.
 - f. Final keying schedule
 - g. Copies of floor plans with keying nomenclature
 - h. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.
 - i. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

1.5 QUALITY ASSURANCE

- A. Product Substitutions: Comply with product requirements stated in Division 01 and as specified herein.
1. Where specific manufacturer's product is named and accompanied by "No Substitute," including make or model number or other designation, provide product specified. (Note: Certain products have been selected for their unique characteristics and particular project suitability.)

- a. Where no additional products or manufacturers are listed in product category, requirements for “No Substitute” govern product selection.
 2. Where products indicate “acceptable manufacturers” or “acceptable manufacturers and products”, provide product from specified manufacturers, subject to compliance with specified requirements and “Single Source Responsibility” requirements stated herein.
- B. Supplier Qualifications and Responsibilities: Recognized architectural hardware supplier with record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that provides certified Architectural Hardware Consultant (AHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
 1. Warehousing Facilities: In Project's vicinity.
 2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
 3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
 4. Coordination Responsibility: Coordinate installation of electronic security hardware with Architect and electrical engineers and provide installation and technical data to Architect and other related subcontractors.
 - a. Upon completion of electronic security hardware installation, inspect and verify that all components are working properly.
- C. Installer Qualifications: Qualified tradesmen, skilled in application of commercial grade hardware with record of successful in-service performance for installing door hardware similar in quantity, type, and quality to that indicated for this Project.
- D. Architectural Hardware Consultant Qualifications: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
 1. For door hardware, DHI-certified, Architectural Hardware Consultant (AHC).
 2. Can provide installation and technical data to Architect and other related subcontractors.
 3. Can inspect and verify components are in working order upon completion of installation.
 4. Capable of producing wiring diagrams.
 5. Capable of coordinating installation of electrified hardware with Architect and electrical engineers.
- E. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
 1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.
 2. Manufacturers that perform electrical modifications and that are listed by testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.
- F. Fire-Rated Door Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

- G. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
 - 1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
- H. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
- I. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release latch. Locks do not require use of key, tool, or special knowledge for operation.
- J. Accessibility Requirements: For door hardware on doors in an accessible route, comply with governing accessibility regulations cited in "REFERENCES" article, herein.
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of wrist and that operate with force of not more than 5 lbf (22.2 N).
 - 2. Maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
 - b. Sliding or Folding Doors: 5 lbf (22.2 N) applied parallel to door at latch.
 - c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - 3. Bevel raised thresholds with slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
 - 4. Adjust door closer sweep periods so that, from open position of 70 degrees, door will take at least 3 seconds to move to 3 inches (75 mm) from latch, measured to leading edge of door.
- K. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01.
 - 1. Attendees: Owner, Contractor, Architect, Installer, Owner's security consultant, and Supplier's Architectural Hardware Consultant.
 - 2. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - b. Preliminary key system schematic diagram.
 - c. Requirements for key control system.
 - d. Requirements for access control.
 - e. Address for delivery of keys.
- L. Pre-installation Conference: Conduct conference at Project site.
 - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 2. Inspect and discuss preparatory work performed by other trades.
 - 3. Inspect and discuss electrical roughing-in for electrified door hardware.
 - 4. Review sequence of operation for each type of electrified door hardware.
 - 5. Review required testing, inspecting, and certifying procedures.

M. Coordination Conferences:

1. Installation Coordination Conference: Prior to hardware installation, schedule and hold meeting to review questions or concerns related to proper installation and adjustment of door hardware.
 - a. Attendees: Door hardware supplier, door hardware installer, Contractor.
 - b. After meeting, provide letter of compliance to Architect, indicating when meeting was held and who was in attendance.
2. Electrified Hardware Coordination Conference: Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.
 - a. Attendees: electrified door hardware supplier, doors and frames supplier, electrified door hardware installer, electrical subcontractor, Owner, Owner's security consultant, Architect and Contractor.
 - b. After meeting, provide letter of compliance to Architect, indicating when coordination conference was held and who was in attendance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
 1. Deliver each article of hardware in manufacturer's original packaging.
- C. Project Conditions:
 1. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
 2. Provide secure lock-up for door hardware delivered to Project, but not yet installed. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- D. Protection and Damage:
 1. Promptly replace products damaged during shipping.
 2. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work.
 3. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- E. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
- F. Deliver keys to Owner by registered mail or overnight package service.

1.7 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete. Concrete, reinforcement, and formwork requirements are specified in Division 03.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.
- F. Direct shipments not permitted, unless approved by Contractor.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Years from date of Substantial Completion, for durations indicated.
 - a. Closers:
 - 1) Mechanical: 30 years.
 - b. Automatic Operators: 2 year.
 - c. Exit Devices:
 - 1) Mechanical: 3 years.
 - 2) Electrified: 1 year.
 - d. Locksets:
 - 1) Mechanical: 3 years.
 - 2) Electrified: 1 year.
 - e. Key Blanks: Lifetime
 - 2. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.

1.9 MAINTENANCE

- A. Maintenance Tools:

1. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and particular project suitability to insure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- E. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

- A. Fasteners
 1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
 2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
 3. Provide concealed fasteners for hardware units exposed when door is closed except when no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless thru-bolts are required to fasten hardware securely. Review door specification and advise Architect if thru-bolts are required.
 4. Install hardware with fasteners provided by hardware manufacturer.
- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
- C. Cable and Connectors: Hardwired Electronic Access Control Lockset and Exit Device Trim:
1. Data: 24AWG, 4 conductor shielded, Belden 9843, 9841 or comparable.
 2. DC Power: 18 AWG, 2 conductor, Belden 8760 or comparable.
 3. Provide type of data and DC power cabling required by access control device manufacturer for this installation.
 4. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with sufficient number and wire gauge with standardized Molex plug connectors to accommodate electric function of specified hardware. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.3 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Ives 5BB series
2. Acceptable Manufacturers and Products: Hager BB series, McKinney TA/T4A series

B. Requirements:

1. Provide five-knuckle, ball bearing hinges conforming to ANSI/BHMA A156.1.
2. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
 - a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
 - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
3. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
4. 2 inches or thicker doors:
 - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
5. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
6. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
7. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins

8. Width of hinges: 4-1/2 inches (114 mm) at 1-3/4 inch (44 mm) thick doors, and 5 inches (127 mm) at 2 inches (51 mm) or thicker doors. Adjust hinge width as required for door, frame, and wall conditions to allow proper degree of opening.
9. Doors 36 inches (914 mm) wide or less furnish hinges 4-1/2 inches (114 mm) high; doors greater than 36 inches (914 mm) wide furnish hinges 5 inches (127 mm) high, heavy weight or standard weight as specified.
10. Provide hinges with electrified options as scheduled in the hardware sets. Provide with sufficient number and wire gage to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component.
11. Provide mortar guard for each electrified hinge specified.
12. Provide spring hinges where specified. Provide two spring hinges and one bearing hinge per door leaf for doors 90 inches (2286 mm) or less in height. Provide one additional bearing hinge for each 30 inches (762 mm) of additional door height.

2.4 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Corbin-Russwin – Mechanical; Schlage ND Series - Electrified
2. Acceptable Manufacturers and Products: No Substitution.

B. Requirements:

1. Provide cylindrical locks conforming to the following standards and requirements:
 - a. ANSI/BHMA A156.2 Series 4000, Grade 1.
 - b. UL 10C for 4'-0" x 10'-0" 3-hour fire door.
 - c. Florida Building Code (ASTM E330, E1886, E1996) and Miami Dade (TAS 201, 202, 203) requirements for hurricanes.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide cylindrical locksets exceeding the ANSI/BHMA A156.2 Grade 1 performance standards for strength, security, and durability in the categories below:
 - a. Abusive Locked Lever Torque Test – minimum 3,100 inch-pounds without gaining access
 - b. Cycle life - tested to minimum 10 million cycles per ANSI/BHMA A156.2 Cycle Test with no visible lever sag or use of performance aids such as set screws or spacers.
4. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2 inch latch throw. Provide proper latch throw for UL listing at pairs.
5. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
6. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
8. Provide electrified options as scheduled in the hardware sets.
9. Lever Trim: Solid cast levers without plastic inserts, and wrought roses on both sides.
 - a. Lever Design: Dane.
 - b. Knurled finishes at openings serving rooms considered to be hazardous.

2.5 EXIT DEVICES

LOW PROFILE PUSH BAR EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: Von Duprin 99-series.
2. Acceptable Manufacturer and Product: No Substitution.

- B. The maximum exit device projection shall be a maximum of 3-1/16" when activated. The exit device bar shall have an average minimum thickness of .201". The pushpad surface shall be constructed of stainless steel; pushpads with plastic or Lexan coatings shall not be acceptable. Nylon bearings and stainless steel springs shall be used for long life and durability. Only torsion or compression springs are acceptable. Extension type springs are not acceptable. All device covers shall be of cast brass, deep drawn steel or stainless steel. Latchbolts shall be of stainless steel and shall have a deadlocking latch for extra security, except at full-glass or two-light glass doors requiring narrow stile device. Mounting screws shall be concealed to deter tampering. All ferrous parts shall be zinc coated to prevent rusting.
- C. Single point, one quarter turn hex dogging shall be standard on panic listed devices. Optional key cylinder dogging shall be available, and furnished if so indicated in the hardware sets, on panic listed devices. Devices with hex key dogging shall be easily field converted to cylinder dogging.
- D. All devices shall be listed by Underwriters Laboratories for safety as panic hardware. Fire rated devices shall be UL listed for A label and lesser class doors, 4' x 8' single and 8 x 8' pair. The model number shall be located on the end cap; devices having the model number located other than on the end cap shall not be acceptable.
- E. All exit devices shall have a unitized installation feature and may be cut in the field to size. Devices shall be closed on all sides with no pinch points. The pushpad shall be designed to prevent pinching of the fingers when depressed.
- F. Exit Device trim to be throughbolted. Lever trim to be heavy duty forged escutcheon with free wheeling levers.
- G. All exit devices shall conform to Federal Specification FF-H-1820, and be certified as meeting ANSI A156.3, Grade 1 requirements.

2.6 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer: Corbin-Russwin
2. Acceptable Manufacturers: No Substitution

B. Requirements:

1. Provide permanent cylinders/cores to match Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision, Section 12, Grade 1; permanent cylinders; cylinder

face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.

2. Replaceable Construction Cores.
 - a. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
 - 1) 3 construction control keys
 - 2) 12 construction change (day) keys.
 - b. Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2.7 KEYING

- A. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
- B. Provide cylinders/cores keyed into Owner's existing factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
- C. Requirements:
 1. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
 - a. Master Keying system as directed by the Owner.
 2. Forward biting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.
 3. Provide keys with the following features:
 - a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
 - b. Patent Protection: Keys and blanks protected by one or more utility patent(s).
 4. Identification:
 - a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication "Keying Systems and Nomenclature" for identification. Blind code marks shall not include actual key cuts.
 - b. Identification stamping provisions must be approved by the Architect and Owner.
 - c. Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
 - d. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
 - e. Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
 5. Quantity: Furnish in the following quantities.
 - a. Change (Day) Keys: 3 per cylinder/core.

- b. Master Keys: 6.

2.8 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer: Telkee
2. Acceptable Manufacturers: HPC, Lund

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
 - a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
 - b. Provide hinged-panel type cabinet for wall mounting.

2.9 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product: LCN 4040 series
2. Acceptable Manufacturers and Products: No Substitution.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
2. Provide door closers with fully hydraulic, full rack and pinion action cast iron cylinder.
3. Closer Body: 1-1/4 inch (32 mm) diameter, with 5/8 inch (16 mm) diameter heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. OPTION LCN No Substitute: Cylinder body to have "FAST" power adjust speed dial to visually indicate spring power.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.10 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide push plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick and beveled 4 edges. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
2. Provide push bars of solid bar stock, diameter and length as scheduled. Provide push bars of sufficient length to span from center to center of each stile. Where required, mount back to back with pull.
3. Provide offset pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
4. Provide flush pulls as scheduled. Where required, provide back-to-back mounted model.
5. Provide pulls of solid bar stock, diameter and length as scheduled. Where required, mount back to back with push bar.
6. Provide pull plates 4 inches (102 mm) wide by 16 inches (406 mm) high by 0.050 inch (1 mm) thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches (102 mm) wide plate, adjust width to fit.
7. Provide wire pulls of solid bar stock, diameter and length as scheduled.
8. Provide decorative pulls as scheduled. Where required, mount back to back with pull.

2.11 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide kick plates, mop plates, and armor plates minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes of plates:
 - a. Kick Plates: 10 inches (254 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - b. Mop Plates: 4 inches (102 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs
 - c. Armor Plates: 36 inches (914 mm) high by 2 inches (51 mm) less width of door on single doors, 1 inch (25 mm) less width of door on pairs

2.12 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers: Glynn-Johnson
2. Acceptable Manufacturers: Rixson, Sargent

B. Requirements:

1. Provide heavy duty concealed mounted overhead stop or holder as specified for exterior and interior vestibule single acting doors.
2. Provide heavy duty concealed mounted overhead stop or holder as specified for double acting doors.
3. Provide heavy or medium duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking wall, open against equipment, casework, sidelights, and where conditions do not allow wall stop or floor stop presents tripping hazard.
4. Where overhead holders are specified provide friction type at doors without closer and positive type at doors with closer.

2.13 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide convex type where mortise type locks are used and concave type where cylindrical type locks are used.
2. Where a wall stop cannot be used, provide universal floor stops for low or high rise options.
3. Where wall or floor stop cannot be used, provide medium duty surface mounted overhead stop.

2.14 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer: Zero International
2. Acceptable Manufacturers: National Guard, Reese

B. Requirements:

1. Provide thresholds, weather-stripping (including door sweeps, seals, and astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Size of thresholds:
 - a. Saddle Thresholds: 1/2 inch (13 mm) high by jamb width by door width
 - b. Bumper Seal Thresholds: 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.

2.15 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer: Ives
2. Acceptable Manufacturers: Burns, Rockwood

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.16 FINISHES

A. Finish: BHMA 626/652 (US26D); except:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Continuous Hinges: BHMA 630 (US32D)
3. Continuous Hinges: BHMA 628 (US28)
4. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
5. Protection Plates: BHMA 630 (US32D)
6. Overhead Stops and Holders: BHMA 630 (US32D)
7. Door Closers: Powder Coat to Match
8. Wall Stops: BHMA 630 (US32D)
9. Latch Protectors: BHMA 630 (US32D)
10. Weatherstripping: Clear Anodized Aluminum
11. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Existing Door and Frame Compatibility: Field verify existing doors and frames receiving new hardware and existing conditions receiving new openings. Verify that new hardware is compatible with existing door and frame preparation and existing conditions.
- C. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Where on-site modification of doors and frames is required:

1. Carefully remove existing door hardware and components being reused. Clean, protect, tag, and store in accordance with storage and handling requirements specified herein.
2. Field modify and prepare existing door and frame for new hardware being installed.
3. When modifications are exposed to view, use concealed fasteners, when possible.
4. Prepare hardware locations and reinstall in accordance with installation requirements for new door hardware and with:
 - a. Steel Doors and Frames: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
 - b. Wood Doors: DHI WDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
 - c. Doors in rated assemblies: NFPA 80 for restrictions on on-site door hardware preparation.

3.3 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 2. Custom Steel Doors and Frames: HMMA 831.
 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- C. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- D. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- F. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- G. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- H. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches (750 mm) of door height greater than 90 inches (2286 mm).
- I. Lock Cylinders: Install construction cores to secure building and areas during construction period.
 1. Replace construction cores with permanent cores as indicated in keying section.

- J. Lead Protection: Lead wrap hardware penetrating lead-lined doors. Levers and roses to be lead lined. Apply kick and armor plates on lead-lined doors with adhesive as recommended by manufacturer.
- K. Wiring: Coordinate with Division 26, ELECTRICAL sections for:
 - 1. Conduit, junction boxes and wire pulls.
 - 2. Connections to and from power supplies to electrified hardware.
 - 3. Connections to fire/smoke alarm system and smoke evacuation system.
 - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 - 5. Testing and labeling wires with Architect's opening number.
- L. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- M. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
- N. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- O. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
 - 1. Configuration: Provide least number of power supplies required to adequately serve doors with electrified door hardware.
- P. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- Q. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- R. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- T. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

- A. Architectural Hardware Consultant: Engage qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
 - 1. Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Provide training for Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Division 01 Section "Demonstration and Training."

3.8 DOOR HARDWARE SCHEDULE

- A. Locksets, exit devices, and other hardware items are referenced in the following hardware sets for series, type and function. Refer to the above-specifications for special features, options, cylinders/keying, and other requirements.
- B. Hardware Sets:

Hardware Group No. 001

For use on Door #(s):

01-15-02A 01-15-03A 01-15-04A 01-15-05A 01-15-06A 01-15-07A

Provide each SL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	NOTE		ADS

18-01.01 WPMHC Expansion
Childers Architect
2020-02-14

Door Hardware

087100-20

Hardware Group No. 002

For use on Door #(s):

01-00-02B	01-00-02C	01-00-02D	01-00-07A	01-01-00B	01-01-00C
01-05-01B	01-05-01G	01-08-01A	01-09-00B	01-09-00C	01-09-00D
01-09-00E	01-13-00A	01-13-01A	01-15-01A	01-15-01B	01-15-01C
01-16-01B	02-17-01B	02-17-01C	02-17-01D		

Provide each RU door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	NOTE			UNK

Hardware Group No. 103

For use on Door #(s):

01-04-04	01-07-03	01-09-16	01-09-17	01-12-05	01-12-06
01-15-12	01-16-01A	01-16-05	01-16-08	01-16-09	01-16-10
01-16-12	02-17-39				

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK			C-R
1	EA	CYLINDER			C-R
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 103A

For use on Door #(s):

02-17-25	02-17-28
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Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK			C-R
1	EA	CYLINDER			C-R
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	SEAL SET			UNK

Hardware Group No. 103W

For use on Door #(s):

01-08-14	01-08-15	01-11-03	01-11-04	01-11-07
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Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK			C-R
1	EA	CYLINDER			C-R
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 201

For use on Door #(s):

01-09-07 01-11-05

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	STOREROOM	CL3557 IC6 NZD W/ CT6	626	C-R
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 201W

For use on Door #(s):

01-08-03 01-09-14 01-13-06

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	626	IVE
1	EA	STOREROOM	CL3557 IC6 NZD W/ CT6	626	C-R
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 207

For use on Door #(s):

01-07-10

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	STOREROOM	CL3557 IC6 NZD W/ CT6	626	C-R
1	EA	CYLINDER			C-R
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 207W

For use on Door #(s):

01-04-02

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	626	IVE
1	EA	STOREROOM	CL3557 IC6 NZD W/ CT6	626	C-R
1	EA	CYLINDER			C-R
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 301

For use on Door #(s):

01-02-02	01-02-03	01-02-04	01-02-05	01-02-06	01-02-07
01-15-09	01-16-03	02-17-05	02-17-06	02-17-32	02-17-33

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK	CL3520 NZD		C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 301W

For use on Door #(s):

01-00-07	01-07-05	01-07-06	01-08-04	01-09-003	01-11-01
01-11-02	01-13-03	02-17-02	02-17-03		

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK	CL3520 NZD		C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 403SW

For use on Door #(s):

01-13-05

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	626	IVE
1	EA	PASSAGE/CLOSET	CL3510 NZD	626	C-R
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 403W

For use on Door #(s):

01-07-07	01-07-08	01-07-09	01-07-11	01-08-05	01-09-04
01-09-05	01-09-06	01-09-11	01-10-02	01-10-03	01-10-04
01-10-05B	01-10-06B	01-10-07	01-10-08	01-10-09	01-12-01
01-12-02	01-12-03				

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	626	IVE
1	EA	PASSAGE/CLOSET	CL3510 NZD	626	C-R
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 501

For use on Door #(s):

01-02-01	01-02-08A	01-02-08B	01-05-01A	01-06-01	01-07-12
01-09-12	01-09-13	01-09-15	01-13-00B	01-13-12	01-14-04A
01-14-04B	01-16-02	01-16-06A	01-16-06B	01-16-07A	02-17-04A
02-17-04B	02-17-24	02-19-01B			

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK			C-R
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 501A

For use on Door #(s):

02-17-26

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK			C-R
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	SEAL SET			UNK

Hardware Group No. 501W

For use on Door #(s):

01-04-05

01-04-06

01-04-07

01-10-00

01-11-08

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK			C-R
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 503

For use on Door #(s):

02-17-38

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK			C-R
1	EA	CYLINDER			C-R
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 503W

For use on Door #(s):

01-01-01A

01-01-02A

01-01-03A

01-01-04A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK			C-R
1	EA	CYLINDER			C-R
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 507

For use on Door #(s):

01-08-06

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	CYLINDRICAL LOCK			C-R
1	EA	CYLINDER			C-R
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 603W

For use on Door #(s):

01-08-16

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 HT 5 X 4.5	652	IVE
1	EA	PUSH/PULL LATCH	HL6 5" A (MOUNT/WITH HANDLES POINTING DOWNWARD)	626	SCH
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 700M

For use on Door #(s):

01-14-01A

01-14-02A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	224HD	628	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE	99-L-06	626	VON
1	EA	PANIC HARDWARE	99-L-DT-06	626	VON
2	EA	CYLINDER			C-R
1	EA	CYLINDER			C-R
1	EA	CYLINDER			C-R
2	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS	626	IVE
2	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 701

For use on Door #(s):

01-07-02A 01-11-00B 02-19-07

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224HD	628	IVE
1	EA	PANIC HARDWARE	99-L-06	626	VON
1	EA	CYLINDER			C-R
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 711

For use on Door #(s):

02-18-00

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224HD	628	IVE
1	EA	PANIC HARDWARE	99-L-NL-06	643E	VON
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. 731CR

For use on Door #(s):

01-14-03

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224HD	628	IVE
1	EA	FIRE EXIT HARDWARE	99-L-BE-F-06	626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

Hardware Group No. 731R

For use on Door #(s):

01-00-10A 01-19-06A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224HD	628	IVE
1	EA	FIRE EXIT HARDWARE	99-L-BE-F-06	626	VON
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

Hardware Group No. 800AV

For use on Door #(s):

01-00-00B

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	224HD	628	IVE
2	EA	DUMMY PUSH BAR	330	626	VON
2	EA	90 DEG OFFSET PULL	8190HD 10" A	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	SEAL SET			UNK
1	EA	ASTRAGAL			UNK

Hardware Group No. 801L

For use on Door #(s):

02-17-10A 02-17-10B 02-17-11A 02-17-11B 02-17-35A 02-17-35B
02-17-40 02-17-48A 02-17-48B 02-17-49A 02-17-49B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224HD	628	IVE
1	EA	DEADBOLT			C-R
1	EA	CYLINDER			C-R
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8302 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER

Hardware Group No. C001

For use on Door #(s):

01-15-02B 01-15-03B 01-15-04B 01-15-05B 01-15-06B 01-15-07B

Provide each SL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	NOTE			ADS

Hardware Group No. C201

For use on Door #(s):

01-00-09	01-01-01B	01-01-02B	01-01-03B	01-01-04B	01-01-05
01-01-06	01-01-07	01-01-08	01-01-09	01-01-10	01-05-02
01-05-04	01-05-05	01-06-02	01-07-01	01-08-01B	01-08-11
01-08-12	01-08-13	01-10-10	01-10-11	01-11-06	01-12-00
01-12-04	01-13-07	01-13-10	01-13-11	01-15-10	01-15-11A
01-15-11B	01-15-14	01-16-04	02-05-10	02-05-11	02-05-12
02-17-01A	02-17-08	02-17-09	02-17-29	02-17-30	02-17-34A
02-17-34B	02-17-46	02-19-16	02-19-21		

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU STOREROOM LOCK	ND80TDEU RHO RX CON 12V/24V DC	626	SCH
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY			UNK

Hardware Group No. C201C

For use on Door #(s):

01-01-00A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU STOREROOM LOCK	ND80TDEU RHO RX CON 12V/24V DC	626	SCH
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY			UNK

Hardware Group No. C201W

For use on Door #(s):

01-04-03	01-05-03	01-07-02B	01-07-02C	01-08-02	01-08-07
01-08-08	01-08-09	01-08-10	01-13-04	02-17-07	

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 5 X 4.5	626	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU STOREROOM LOCK	ND80TDEU RHO RX CON 12V/24V DC	626	SCH
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY			UNK

Hardware Group No. C205

For use on Door #(s):

03-19-01

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU STOREROOM LOCK	ND80TDEU RHO RX CON 12V/24V DC	626	SCH
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	328AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-223	A	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY			UNK

Hardware Group No. C205I

For use on Door #(s):

01-04-01

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU STOREROOM LOCK	ND80TDEU RHO RX CON 12V/24V DC	626	SCH
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	328AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY			UNK

Hardware Group No. C207

For use on Door #(s):

01-00-02A

01-09-00A

02-19-02B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	626	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU STOREROOM LOCK	ND80TDEU RHO RX CON 12V/24V DC	626	SCH
1	EA	CYLINDER			C-R
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY			UNK

Hardware Group No. C711

For use on Door #(s):

01-07-14 01-08-00A 01-08-00B 01-09-01A 01-09-01B 01-11-00A
 01-11-00C 01-13-01 01-16-11 02-19-01A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-L-NL-06-CON 24 VDC	626	VON
1	EA	CYLINDER			C-R
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC		VON

Hardware Group No. C711C

For use on Door #(s):

02-17-23 02-17-36 02-17-45

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-L-NL-06-CON 24 VDC	626	VON
1	EA	CYLINDER			C-R
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC		VON

Hardware Group No. C711R

For use on Door #(s):

02-18-02 02-19-08 02-19-30

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC FIRE EXIT HARDWARE	RX-QEL-99-L-NL-F-06-CON 24 VDC	626	VON
1	EA	CYLINDER			C-R
1	EA	CYLINDER			C-R
1	EA	SURFACE CLOSER	4040XP REG OR PA AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	626	IVE
1	EA	WALL STOP	WS406/407CCV	626	IVE
1	EA	GASKETING	188SBK (USE SILENCERS AT NON-RATED DOORS)	BK	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC		VON

Hardware Group No. C714AM

For use on Door #(s):

01-00-00A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	224HD EPT	628	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-EO-CON 24 VDC	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-NL-OP-110MD-CON 24 VDC	626	VON
1	EA	CYLINDER			C-R
1	EA	CYLINDER			C-R
2	EA	90 DEG OFFSET PULL	8190HD 10" A	630	IVE
2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	SEAL SET			UNK
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-223	A	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
2	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC		VON

Hardware Group No. C715

For use on Door #(s):

01-00-10B	01-00-11	01-00-13	01-00-14	01-05-01C	01-13-01B
01-14-01B	01-14-02B	01-16-07B	01-19-06B		

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-99-NL-OP-110MD-CON 24 VDC	626	VON
1	EA	CYLINDER			C-R
1	EA	CYLINDER			C-R
1	EA	90 DEG OFFSET PULL	8190HD 10" A	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	328AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-223	A	ZER
1	EA	MULTITECH READER	MT15 12 VDC	BLK	SCE
1	EA	DOOR CONTACT	679-05	WHT	SCE
1	EA	POWER SUPPLY			UNK
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC		VON

End of Section

Project Manual

Bid Package 2
Addendum No.04
Volume 2
Divisions 23

Cherokee Nation WILMA P. MANKILLER HEALTH CENTER EXPANSION

Stilwell, Oklahoma

February 18, 2020

Division	Section Title	Pages
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PROCUREMENT AND CONTRACTING DOCUMENTS GROUP

SPECIFICATIONS GROUP

Facility Services Subgroup

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

23 2500 HVAC Water Treatment

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END OF TABLE OF CONTENTS



CA5338 (PE)



CA5338 (PE)

SECTION 23 2500

HVAC WATER TREATMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes the following HVAC water-treatment systems:
 - 1. Bypass chemical-feed equipment and controls.
 - 2. Chemical treatment test equipment.
 - 3. HVAC water-treatment chemicals.
 - 4. Glycol feed systems.
 - 5. Antifreeze Solutions.

1.03 DEFINITIONS

- A. EEPROM: Electrically erasable, programmable read-only memory.
- B. Low Voltage: As defined in NFPA 70 for circuits and equipment operating at less than 50 V or for remote-control, signaling power-limited circuits.
- C. RO: Reverse osmosis.
- D. TDS: Total dissolved solids.
- E. UV: Ultraviolet.

1.04 PERFORMANCE REQUIREMENTS

- A. Water quality for HVAC systems shall minimize corrosion, scale buildup, and biological growth for optimum efficiency of HVAC equipment without creating a hazard to operating personnel or the environment.
- B. Base HVAC water treatment on quality of water available at Project site, HVAC system equipment material characteristics and functional performance characteristics, operating personnel capabilities, and requirements and guidelines of authorities having jurisdiction.
- C. Closed hydronic systems, including hot-water heating, chilled water, and glycol cooling, shall have the following water qualities:
 - 1. pH: Maintain a value within 9.0 to 10.5.
 - 2. "P" Alkalinity: Maintain a value within 100 to 500 ppm.
 - 3. Boron: Maintain a value within 100 to 200 ppm.
 - 4. Chemical Oxygen Demand (non-glycol systems): Maintain a maximum value of 100 ppm.
 - 5. Soluble Copper: Maintain a maximum value of 0.20 ppm.
 - 6. TDS: Maintain a maximum value of 10 ppm.

7. Ammonia: Maintain a maximum value of 20 ppm.
8. Free Caustic Alkalinity: Maintain a maximum value of 20 ppm.
9. Microbiological Limits:
 - a. Total Aerobic Plate Count: Maintain a maximum value of 1000 organisms/ml.
 - b. Total Anaerobic Plate Count: Maintain a maximum value of 100 organisms/ml.
 - c. Nitrate Reducers: Maintain a maximum value of 100 organisms/ml.
 - d. Sulfate Reducers: Maintain a maximum value of 0 organisms/ml.
 - e. Iron Bacteria: Maintain a maximum value of 0 organisms/ml.

1.05 ACTION SUBMITTALS

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for the following products:
 1. Bypass feeders.
 2. Chemical solution tanks.
 3. Injection pumps.
 4. Chemical test equipment.
 5. Chemical material safety data sheets.
 6. Glycol feed systems.
- B. Shop Drawings: Pretreatment and chemical treatment equipment showing tanks, maintenance space required, and piping connections to HVAC systems. Include plans, elevations, sections, details, and attachments to other work.
 1. Wiring Diagrams: Power and control wiring.

1.06 INFORMATIONAL SUBMITTALS

- A. Field quality-control test reports.
- B. Other Informational Submittals:
 1. Water-Treatment Program: Written sequence of operation on an annual basis for the application equipment required to achieve water quality defined in the "Performance Requirements" Article above.
 2. Water Analysis: Illustrate water quality available at Project site.

1.07 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For sensors, injection pumps, and controllers to include in emergency, operation, and maintenance manuals.

1.08 QUALITY ASSURANCE

- A. HVAC Water-Treatment Service Provider Qualifications: An experienced HVAC water-treatment service provider capable of analyzing water qualities, installing water-treatment equipment, and applying water treatment as specified in this Section.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.09 MAINTENANCE SERVICE

- A. Scope of Maintenance Service: Provide chemicals and service program to maintain water conditions required above to inhibit corrosion, scale formation, and biological growth for cooling, chilled-water piping heating, hot-water piping, condenser-water piping and equipment. Services and chemicals shall be provided for a period of one year from date of Substantial Completion, and shall include the following:
1. Initial water analysis and HVAC water-treatment recommendations.
 2. Startup assistance for Contractor to flush the systems, clean with detergents, and initially fill systems with required chemical treatment prior to operation.
 3. Periodic field service and consultation.
 4. Customer report charts and log sheets.
 5. Laboratory technical analysis.
 6. Analyses and reports of all chemical items concerning safety and compliance with government regulations.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Ampion Corp.
 2. Anderson Chemical Co, Inc.
 3. Aqua-Chem, Inc.; Cleaver-Brooks Div.
 4. Barclay Chemical Co.; Water Management, Inc.
 5. Boland Trane Services
 6. GE Betz.
 7. GE Osmonics.
 8. H-O-H Chemicals, Inc.
 9. Metro Group, Inc. (The); Metropolitan Refining Div.
 10. ONDEO Nalco Company.
 11. Watcon, Inc.

2.02 MANUAL CHEMICAL-FEED EQUIPMENT

- A. Bypass Feeders: Steel, with corrosion-resistant exterior coating, minimum 3-1/2-inch fill opening in the top, and NPS 3/4 bottom inlet and top side outlet. Quarter turn or threaded fill cap with gasket seal and diaphragm to lock the top on the feeder when exposed to system pressure in the vessel.
1. Capacity: 5 gal.
 2. Minimum Working Pressure: 125 psig.

2.03 GLYCOL FEED SYSTEM

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Advantage Controls.
- B. Description:

1. 55 gallon poly tank and painted steel stand.
2. Digital controller with heavy duty NEMA 4X enclosure with gasketed Lexan viewing door.
3. Singel 1/3 hp, 1.5 GPM pump.
4. Schedule 80 PVC piping.
5. Low level switch with audible alarm.
6. Dry contact alarm.
7. Pressure relief valve.
8. Pressure gauge (0-100 psi)
9. 120 VAC, 60 Hz. Prewired unit with 16 AWG 3-wire grounded plug.

2.04 CHEMICALS

- A. Chemicals shall be as recommended by water-treatment system manufacturer that are compatible with piping system components and connected equipment, and that can attain water quality specified in Part 1 "Performance Requirements" Article.

2.05 ANTIFREEZE SOLUTION

- A. Propylene Glycol: Dowfrost by Dow Chemical Company with corrosion inhibitors and environmental stabilizer additives to be mixed with water to protect piping circuit and connected equipment from physical damage caused by freezing or corrosion.
- B. Quantity: Sufficient solution for initial system startup and for preventive maintenance for one year from date of Substantial Completion.
- C. Dilution Water: Chloride content shall be less than 25 ppm, sulfate less than 25 ppm, and hardness less than 100 ppm.

PART 3 - EXECUTION

3.01 WATER ANALYSIS

- A. Perform an analysis of supply water to determine quality of water available at Project site.

3.02 INSTALLATION

- A. Install chemical application equipment on concrete bases, level and plumb. Maintain manufacturer's recommended clearances. Arrange units so controls and devices that require servicing are accessible. Anchor chemical tanks and floor-mounting accessories to substrate.
- B. Install water testing equipment on wall near water chemical application equipment.
- C. Install interconnecting control wiring for chemical treatment controls and sensors.
- D. Mount sensors and injectors in piping circuits.
- E. Bypass Feeders: Install in closed hydronic systems, including hot-water heating, chilled water, and equipped with the following:
 1. Install bypass feeder in a bypass circuit around circulating pumps, unless otherwise indicated on Drawings.
 2. Install test-coupon assembly in bypass circuit around circulating pumps, unless otherwise indicated on Drawings.
 3. Install a gate or full-port ball isolation valves on inlet, outlet, and drain below feeder inlet.
 4. Install a swing check on inlet after the isolation valve.

3.03 PRE-OPERATIONAL CLEANING

A. Closed Systems

1. System Preparation
 - a. Contractor shall flush all systems, including mud from drop legs. Remove, clean and replace all strainers. All systems shall contain the highest quality of water available.
 - b. Complete circulation must be achieved during the cleaning procedure. A minimum flow rate of 2 feet per second shall be maintained to ensure the cleaning chemicals will work properly. All electric, air, and thermostatic operated valves shall be open. All dead end runs shall be looped together with piping not less than 1/3 the size of the run. This piping is to remain in place until the cleaning is complete.
 - c. A minimum of 1 1/2" ball or gate valve is to be permanently installed in the low point of each system for the purpose of draining the system.
 - d. The cleaner shall not require external heat to ensure its effectiveness.
2. Cleaning Procedure
 - a. Add recommended quantity of cleaning chemical directly into the closed loop before the recirculating pumps to ensure rapid mixing and distribution throughout the system. A small amount of antifoam may be added to prevent excessive foaming. Refer to MSDS for safety information.
 - b. Recirculate the system for 16-24 hours.
 - c. Open and drain mud legs and low points periodically during the cleaning process. Drain system completely paying particular attention to mud from drop legs and all low points.
 - d. Refill the system with clean potable water. Clean all strainers. Recirculate for 8-12 hours and completely drain the system.
 - a. Refill the system. The length of time between the completion of the cleaning procedure and the addition of the corrosion inhibitor shall not exceed 24 hours. Test the dilute solution using gas chromatography to verify concentration of glycol, and forward report to Architect (testing equipment for Owner's permanent use is not required).
 - b. Add the recommended level of closed loop inhibitor. The system is now ready for operation.
 - c. A service report shall be generated on-site by the water treatment representative certifying that the system has been cleaned in accordance with the above procedure and shall be copied to the mechanical contractor.

B. Water Treatment Service Program

1. Provide start-up service and regular service program visits for a period of one year from start-up, to include:
 - a. Recommendations for installation and system start-up.
 - b. Initial treatment dosages.
 - c. Training of operating personnel on proper feed and control techniques.
 - d. Service visits and consultation meetings as required.
 - e. Provide necessary log sheets and record forms.
 - f. Provide laboratory and technical assistance as required.

3.04 CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment to allow service and maintenance.

- C. Make piping connections between HVAC water-treatment equipment and dissimilar-metal piping with dielectric fittings. Dielectric fittings are specified in Section 23 2113 "Hydronic Piping."
- D. Install shutoff valves on HVAC water-treatment equipment inlet and outlet. Metal general-duty valves are specified in Section 23 0523 "General-Duty Valves for HVAC Piping."
- E. Refer to Section 22 1119 "Domestic Water Piping Specialties" for backflow preventers required in makeup water connections to potable-water systems.
- F. Confirm applicable electrical requirements in electrical Sections for connecting electrical equipment.
- G. Ground equipment according to Section 26 0526 "Grounding and Bonding for Electrical Systems."
- H. Connect wiring according to Section 26 0519 "Low-Voltage Electrical Power Conductors and Cables."

3.05 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.
- B. Tests and Inspections:
 - 1. Inspect field-assembled components and equipment installation, including piping and electrical connections.
 - 2. Inspect piping and equipment to determine that systems and equipment have been cleaned, flushed, and filled with water, and are fully operational before introducing chemicals for water-treatment system.
 - 3. Place HVAC water-treatment system into operation and calibrate controls during the preliminary phase of HVAC systems' startup procedures.
 - 4. Do not enclose, cover, or put piping into operation until it is tested and satisfactory test results are achieved.
 - 5. Test for leaks and defects. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 - 6. Leave uncovered and unconcealed new, altered, extended, and replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
 - 7. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow test pressure to stand for four hours. Leaks and loss in test pressure constitute defects.
 - 8. Repair leaks and defects with new materials and retest piping until no leaks exist.
- C. Remove and replace malfunctioning units and retest as specified above.
- D. Comply with ASTM D 3370 and with the following standards:
 - 1. Silica: ASTM D 859.
 - 2. Steam System: ASTM D 1066.
 - 3. Acidity and Alkalinity: ASTM D 1067.
 - 4. Iron: ASTM D 1068.
 - 5. Water Hardness: ASTM D 1126.

3.06 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain HVAC water-treatment systems and equipment. Refer to Section 01 7900 "Demonstration and Training."
- B. Training: Provide a "how-to-use" self-contained breathing apparatus video that details exact operating procedures of equipment.

END OF SECTION