Glenwood Springs High School Annex Renovation 1405 Grand Ave Glenwood Springs, CO 81601

CONSTRUCTION DOCUMENTS 04/05/24





	WA	ALL TYPES			DRAWING IND	ΞX		ALTERNA	TES
INTERIOR	INTERIO	INTERIOR	INTERIOR	Sheet Number	SHEET LIST Sheet Name over		#1 - MECHANICAL / MECHANICAL SHE EXTEND NEW CAR #2 - SEE ELECTRIC	ALTERNATE TO REMOVE BASE BOAF ETS FOR REMOVAL NOTES. ARCHITI PET TO WALLS AND PROVIDE NEW CAL. PROVIDE PRICE TO TRACE EXIS	RD HEAT IN ROOM 205. REFER TO ECTURE - WALLS MAY NEED TO BE PA BASE. STING CIRCUITS AND LABEL EXISTING
HEAD	BOT. OF DECK, REF STRUCT DWGS SEALANT TOP TRACK	HEAD	BOT. OF DECK, REF STRUCT DWGS SEALANT	A0.1 Inc A0.2 Co A1.1 Sit A1.2 Sit A1.3 Sit D2.1 De D6.1 De A2.2 Pro A5.1 De	dex Sheet ode Summary te Plan te Plan Enlarged te Details emo Building Floor Plans emo Reflected Ceiling Plan roposed Main Floor Plan etails				
PLAN	4" STEEL STUD, REF STRUCT FOR SPACING 3-1/2" FULL HEIGHT SOUND ATTENUATION BATT 5/8" GWB EA SIDE OF MTL STUDS TYP REF FINISH	PLAN	TOP TRACK 6" STEEL STUD, REF STRUCT FOR SPACING 5-1/2" FULL HEIGHT SOUND ATTENUATION BATT	A6.1ReA7.1EnStructural-S-100StrMech and Plum-M0.0MeM0.1MeM0.2Me	eflected Ceiling Plan nlarged Plans rructural Notes and Details echanical Cover Sheet echanical Schedules echanical Specifications				
BASE	BOTTOM TRACK SEALANT FLOOR STRUCTURE	BASE	5/8" GWB EA SIDE OF MTL. STUDS. TYP. REF FINISH SCHEDULE BOTTOM TRACK SEALANT FLOOR STRUCTURE	M2.0MeMD2.1MePlaM2.1MeM3.1MeElectrical-E0.0EleE0.1Ele	echanical Lower Level Plan echanical Upper Level Demo an echanical Upper Level Plan echanical Diagrams ectrical Cover Sheet ectrical Schedules				
TYPE 4 IN	TERIOR PARTITION	TYPE 5 IN	TERIOR PARTITION	E0.2 Ele E2.0 Ele ED2.1 Ele E2.1 Ele EL2.1 Lic	ectrical Schedules ectrical Lower Level Plan ectrical Upper Level Demo Plan ectrical Upper Level Plan ahting Upper Level Plan			SYMBO	LS
	TO TYPE 22, EXCEPT SUBSTITUTE MOISTURE RESISTANT GYP BOARD AT WET AREAS BEHIND TILE		TO TYPE 21, EXCEPT SUBSTITUTE MOISTURE SISTANT 5/8" GYP BOARD AT WET AREAS BEHIND TILE		<u></u>		$\begin{array}{c} 1 \\ A101 \\ 1/8" = 1'-0" \\ \hline 1 \\ \hline 1 \\ \hline \\ \hline \end{array}$		LE & SCALE PARTITION OR WA TYPE
TYPE 4R SIM BOTI STRI TYPE 4A GYP UND	TO TYPE 22, EXCEPT SUBSTITUTE 5/8" TYP "X" GYP BOAR H SIDES OF WALL FROM FLOOR TO UNDERSIDE OF UCTURE, TO PROVIDE 1 HOUR FIRE RATING PER UL U465 TO TYPE 22, EXCEPT ADD ANOTHER LAYER OF 5/8" TYP " BOARD ON UNITS SIDE OF WALL FROM FLOOR TO ERSIDE OF STRUCTURE	TYPE 5R SIM STF	TO TYPE 21, EXCEPT SUBSTITUTE 5/8" TYP "X" GYP BOARD TH SIDES OF WALL FROM FLOOR TO UNDERSIDE OF RUCTURE, TO PROVIDE 1 HOUR FIRE RATING PER UL U465				A101 EXTE 1 A101 1 INTER	RIOR ELEVATION	DOOR TAG SIZE AS DESI ON DOOR SCHDULE WINDOW TAG ALL WINDOWS ARE TO E HINGED PER EXTERIOR
					٨R			SION NUMBER	ELEVATION DRAWINGS KEYNOTE TAG
	COLOF	R AND MATERIALS SCHEDULE - BASIS OF DESIGN	J		ADL				ELEVATION
SYMBOL GENERAL_LOCATION	MANUFACTURER PRODU	CT NAME COLOR / FINISH	SIZE REMARKS	HEADER	A AMPERE AB ANCHOR BOLT ACT ACOUSTICAL CEILING TILE	FD FLOOR DRAIN FE FIRE EXTINGUISHER FEC FIRE EXTINGUISHER	P POLE PAN PANTRY PERF PERFORATED	•	+124'-0" SPOT ELEVATION
COUSTIC PANEL CEILING C-1 CLASSROOMS	ARMSTRONG FINE FISSURED-HIGH ACOUST	TICS SQUARE LAY-IN - 1714 WHITE W/ WHITE GRID	24" x 48"x3/4" NRC: .55	ACOUSTIC PANEL CEILING	AFF ABOVE FINISHED FLOOR AFG ABOVE FINISHED GRADE ALT ALTERNATE	FT FEET FG FIBERGLASS FF FINISH FLOOR FH FIRE HYDRANT	PLAM PLASTIC LAMINATE PNT PAINT POLY POLYETHYLENE POLYISO POLYISOCYANURATE	1 A101	WALL SECTION & SECTION
GENERAL WALL BASE RESTROOM FLOOR TILE BASE WITH COVE	ROPPEVINYL - TYPE TV - 700 SERIESDALTILENATURAL HUES 1 - 5X12 COVE	TBD E BASE FLAT TOP BIRCH QH84	4" H 5"X12" INSTALL IN ALL RESTROOMS	BASE BASE	ALUM ALUMINUM ARCH ARCHITECT(URAL) BD BEDROOM BKG BACKGROUND	FLG FLANGE FLUOR FLUORESCENT FOF FACE OF FINISH FP FIREPLACE FRZ FREEZER	POLYSTPOLYSTYRENEPRVPRESSURE RELIEVE VALVEPROPREJECTIONPSFPRESSURE PER SQUARE FOOTPSIPRESSURE PER SQUARE INCH	A101 SI	M DETAIL SECTION
PT-1 FIELD	TANDUS CENTIVA 2N DPOWER 04987	VARICOLOR 71605	6' ROLLS	CARPET	BM BEAM BRG BEARING BRD BOARD	FS FLOOR SINK FT FIRE TREATED FTG FOOTING	PTPRESSURE TREATEDPVCPOLYVINYL CHLORIDEPWPOTABLE WATER		
1 FOR WALL TILE T-1, T-2, T-3	MAPEI EPOXY	WHITE 00		GROUT	B.O. BOTTOM OF BOT BOTTOM BRKR BREAKER BTU BRITISH THERMAL UNIT BTUH BTU PER HOUR	GA GAUGE GAL GALLON GALV GALVANIZED GL GALVANIZED IBON	REINF REINFORCE(D), (ING) RCP REFLECTED CEILING PLAN REF REFRIGERATOR	PROJEC	T DIRECTORY
1 FIELD PAINT 2 3103 CLASSROOM	SHERWIN WILLIAMS SHERWIN WILLIAMS	DISTRICT STANDARD COLOR COLOR TBD	REPAINT OF EX WD WAINSCOT	PAINT PAINT	BTWN BETWEEN BLDG BUILDING BUR BUILT UP ROOFING	G GAS GMMU GLASS MESH MORTAR UNIT(S) GND GROUND	SAT SUSPENDED ACOUSTICAL TILE SCH SCHEDULE SD STORM DRAIN	OWNER	BEN BOHMFALK C00: ROARING FORK SCHOOLS
RESTROOM WALL TILE RESTROOM FLOOR TILE RESTROOM WALL CAP	DALTILENATURAL HUES 1DALTILEHARMONISTDALTILENATURAL HUES 1	BIRCH QH84 COMPOSURE HM23 BIRCH QH84	12X12INSTALL IN ALL RESTROOMS12X12INSTALL IN ALL RESTROOMS4X12INSTALL IN ALL RESTROOMS	TILING TILING TILING	C CONDUIT C/C CENTER TO CENTER CFM CUBIC FEET PER MINUTE CJ CONTROL JOINT CL CENTER LINE	GR GRADE, GRADING GYP GYPSUM GWB GYPSUM WALL BOARD H&V HEATING & VENTILATING	SFSQUARE FOOT (FEET)SHTSHEETSIMSIMILARSLHSPRING LOADED HINGESSPECSPECIFICATION(S)	OWNERS REPRESENTATIVE	E: DYNAMIC PROGRAM MANAGEME (303) 775-5051
RANSITIONS R-1 RESTROOM WALL TILE EDGE TRIM	SCHLUTER JOLLY	SATIN ANODIZED ALUMINUM	HEIGHT TO MATCH TILE AND SETTING BED THICKNESS	TRANSITIONS	CLG CEILING CLOS CLOSET CMP CORRUGATED METAL PIPE	HDO HIGH DENSITY OVERLAY HDPE HIGH DENSITY POLYETHYLENE HEIGHT	SS STAINLESS STEEL SSFC SOLID SURFACE STL STEEL STIEE STIEFENED	ARCHITECT	TAB ASSOCIATES, Inc. 56 EDWARDS VILLAGE BLVD SUIT EDWARDS, CO 81632
	SCHLUTER RENO-TK	AE	INSTALLER TO VERIFY SIZE	TRANSITIONS	COL COLUMN CONC CONCRETE CONT CONTINUOUS, CONTINUE	HK HOOK(S) HM HOLLOW METAL	STIFF STIFFENER STN STONE STRUCT STRUCTURAL SUSP SUSPENDED		(970) 766-1470
ALK OFF CARPET DC-1 3105 CLASSROOM	TANDUS CENTIVA ASSERTIVE ACTION 04837	CHROMIUM 26201	24X24 MODULAR	WALK OFF CARPET	CORR CORRUGATED CTC CENTER TO CENTER CW COLD WATER X CROSS	HORZ HORIZONTAL HP HORSE POWER HW HOT WATER HWC HOT WATER CIRCULATION	T&G TOUNGE AND GROOVE TC TEMPERATURE CONTROL THK THICKNESS		P.O. BOX 4989 EAGLE, CO 81631 (303) 318-6539
					D DEEP OR DEPTH OR DRYER DTL DETAIL DIAG DIAGONAL	HR HOUR	THRUTHROUGHT.O.TOP OFTRANSVTRANSVERSETSTUBE STEEL	MEP ENGINEERS	BG BUILDING WORKS 222 CHAPEL PLACE UNIT AC-201 AVON, CO 81620 (970) 949-6108
					DIA DIAMETER DIAPH DIAPHRAM DIN DINING DHW DOMESTIC HOT WATER DR DOOR	JT JOINT KIT KITCHEN KV KILOVOLT KVA KILOVOLT AMPERE	TYPTYPICALUGUNDERGROUNDUNOUNLESS NOTED OTHERWISE	CONTRACTOR	TBD
					DWG DRAWING EA EACH ELEC ELECTRICAL	LIV LIVING LND LAUNDRY	VBVAPOR BARRIERVERTVERTICALVESTVESTIBULEVVOLT		
	C	DATUM REFERENCE			EWC ELECTRIC WATER COOLER ELEV ELEVATION, ELEVATOR	MAX MAXIMUM MH MANHOLD MECH MECHANICAL	WB WEATHER BARRIER WC WATER CLOSET OR		
T.C	DATUM REFERENCE FOR D. GYPCRETE = EL. 100'-0" ON	THIS PROJECT IS THE MAIN	N FINISH FLOOR LEVEL QUALS 5814.5' ON SITE PLAN		EMBED EMBEDMENT EM EMERGENCY EX EXISTING EXIST EXISTING EXP EXPANSION	MFR MANUFACTURE(R) MH MANHOLD MIN MINIMUM MST MASTER BED MTI METAI	WATER COLOMIN WD WOOD WWF WELDED WIRE FABRIC W WEST OR WATER OR WIDE OR WATT OR WASHER OR WIDTH		
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he drawings, specifications and other documents prepared base documents and shall retain, without limitation, all commo	by the Architect (TAB Associates, Inc.) for this Project are instru- on law, statutory and other reserved rights, including the copyrig	iments of the Architect's service for use solely with respect ht hereof. No person, whether having come rightly into pos	to this Project and, unless otherwise provided in writing, the Architect shall be dea session hereof or otherwise, shall employ these documents on any other project,	med the sole and exclusive author of nor for additions to this Project nor for paterial which is issued in confidence		OC ON CENTER OPP OPPOSITE OZ OUNCE(S)			

D BE PATCH, TING PANELS. R WALL DESIGNATED TO BE RIOR NGS TION N & PARTIAL ON EMENT V OLS EMENT

D SUITE 210

Ô Ô WOMEN B104 COMMUNITY B101 1562.82 SF -_____ E CLASSROOM **MEN** B103 20 AV 79 PERSONS ••• B102 40 ____<u>- ~ ``</u> ENTRY 100

2 LOWER LEVEL CODE PLAN A0.2 1/8" = 1'-0"

CONSTRUCTION NARRATIVE SCOPE OF WORK ISLIMITED TO THE UPPER (MAIN) LEVEL OF THE BUILDING. LOWER LEVEL REMAINS AS IS.

EXISTING SQAURE FOOTAGE: LOWER LEVEL- 4,050 SQFT

UPPER LEVEL - 4,050 SQFT OCCUPANT LOADS: LOWER LEVEL - 86 OCCUPANTS

UPPER LEVEL - 134 OCCUPANTS TOTAL OCC- 220 OCCUPANTS

APPROXIMATE SQUARE FOOTAGE OF ALTERATIONS IS: 3,400 SQFT

EGRESS NARRATIVE LOWER LEVEL - NO CHANGE

UPPER LEVEL EAST HALF -CLASSROOM 205 - TWO EGRESS POINTS TO THE EAST AND SOUTH DIRECT TO THE

EXTERIOR. WEST HALF -

CLASSROOMS 203 AND 240 - EXIT TO THE MAIN CORRIDOR. TWO EXITS FROM CORRIDOR TO THE EAST AND WEST. EAST EXITING IS THROUGH DOWN EXISTING EXIT STAIR AND CORRIDORS ON LOWER LEVEL. WEST EXISTING IS THROUGH EXISTING EXITING STAIR.

EGRESS DOORS

ALL EGRESS DOORS TO THE EXTERIOR WILL HAVE FREE EGRESS WITH PANIC DEVICES. DOORS WITH NOTED OCCUPANT LOAD OF 50 OR OVER WILL ALSO HAVE FREE EGRESS WITH PANIC DEVICE ELECTRONIC DOOR LOCKS DO NOT HAMPER EGRESS

EXISTING BATHROOM INFORMATION 220 OCCUPANTS

WATER CLOSETSLAVATORIES1 PER 50 = 31 PER 50 = 3 <u>CATEGORY</u> MALE (110) FEMALE (110) 1 PER 50 = 3 1 PER 50 = 3 DRINKING FOUNTAINS (220) 1 PER 100 = 3

PROPOSED BATHROOM INFORMATION 220 OCCUPANTS

CATEGORY	WATER CL	OSETS	LAVATORIES
EXISTING			
MALE	2 WC- 1 UR	RINAL	3
FEMALE	3 WC		3
NEW			
UNISEX	2 WC		2
DRINKING FOUNTA	AINS -	1 EXISTING	AND 1 REMOVED
		2 NEW	

TOTAL REMAINING AND NEW: 3 JANITORS EXISTING

IECC Info/Requirements CLIMATE ZONE 5B

No Fire Supression System Existing Fire Alarm - Full Addressible IEBC - CHAPTER 8 - LEVEL 2 ALTERATION

GENERAL PROJECT INFORMATION ADDRESS: GLENWOOD SPRINGS HIGH SCHOOL ANNEX BUILDING 1405 GRAND AVE

SQUARE FOOTAGE: 8,100 SQFT YEAR BUILT: UNKNOWN

NUMBER OF STORIES: 2

BUILDING CONSTRUCTION INFORMATION: TYPE OF CONSTRUCTION: TYPE VB NOT FULLY SPRINKLED

GLENWOOD SPRINGS, CO 81601

9 AM P:\2404 Glenwood Springs High - Annex Renovation\01 Drawing Files\05 Construction Documents\2024

EXISTING CURB EXISTING CONCRETE WALK

EXISTING CURB

GRASS

CONCRETE CURB TIES INTO EX AT STREET

GRASS

EXISTING CURB

NEW TOP OF CUTB

1' - 0"

 $-\mathbf{x}$

 \bigcirc

-NEW TOP OF CUTB FLUSH WITH EX

SLOPE DOWN

DETECTABLE DOME ZONE

APPROX 6" DROP

EX CONC PAN

MAX SLOPE 1:12

6 ACCESSIBLE CURB RAMP

2 LANDING AND RAMP

GENERAL DEMOLITION NOTES:

1. DEMOLITION GENERAL NOTES APPLY TO ALL DEMOLITION SHEETS.

- 2. COORDINATE DEMOLITION AND PHASING EFFORTS WITH ARCHITECT AND OWNER'S REPRESENTATIVES. EVERY EFFORT SHALL BE MADE TO MINIMIZE DISRUPTION OF OWNER'S OPERATIONS AND TO PROVIDE BUILDING USER'S SAFETY. EXCESSIVE NOISE AND VIBRATION SHALL BE PRE-APPROVED AND COORDINATED WITH OWNER'S REPRESENTATION.
- 3. COORDINATE DISRUPTION OF UTILITY SERVICES WITH OWNER AND AS SATISFIED.
- 4. VERIFY EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS AND NOTIFY ARCHITECT OF DISCREPANCIES.
- 5. ITEMS NOT SHOWN DASHED ARE TO REMAIN. ALL DASHED ITEMS REPRESENT ITEMS TO BE REMOVED. COORDINATE REMOVAL WITH NEW ITEMS SHOWN IN DRAWINGS.
- 6. REMOVE EXISTING WALLS, DOORS, MILLWORK, PLUMBING FIXTURES, CEILINGS, SOFFITS, MARKERBOARDS, ETC. IN THEIR ENTIRETY AND AS REQUIRED TO EXECUTE DEMOLITION AND CONSTRUCTION WORK AS DESCRIBED ON THE DRAWINGS.
- 7. THE OWNER SHALL RESERVE THE RIGHT TO SALVAGE ANY MATERIALS.
- 8. PROVIDE PROTECTIONS FOR EXISTING BUILDING MATERIALS AND EQUIPMENT FROM DAMAGE DUE TO DEMOLITION OR CONSTRUCTION-RELATED INCIDENT PREFORMED UNDER THIS CONTRACT.
- 9. REFER TO MEP AND STRUCTURAL DRAWINGS FOR ADDITIONAL ITEMS TO BE REMOVED, CAPPED OR ALTERED.
- 10. IF NEW CONSTRUCTION IS SHOWN ON OTHER DRAWINGS IT IS ASSUMED DEMOLITION IS REQUIRED IF EXISTING WALLS, FINISHES AND ETC. ARE CURRENTLY PRESENT.
- 11. CONTRACTOR TO COORDINATE REMOVAL OF EXISTING ITEMS WITH INSTALLATIONS OF NEW ITEMS.
- 12. COORDINATE NEW STRUCTURAL ITEMS WITH REMOVAL OF EXISTING ITEMS. REFER TO STRUCTURAL PLANS FOR ADDITIONAL STRUCTURAL WORK TO EXISTING STRUCTURE.
- 13. IT IS ASSUMED ITEMS NOT TAGGED AS REMOVED OR SALVAGED WILL BE REMOVED IF ATTACHED TO WALL, CABINET, OR OTHER ITEMS. THIS INCLUDES ITEMS ON WALLS, CEILINGS AND FLOORS.
- 14. ALL PLUMBING SHOWN AS DASHED AND NOT SPECIFICALLY NOTED WILL BE REMOVED. ALL PLUMBING NEEDS TO BE MODIFIED TO MATCH NEW LAYOUT. REFER TO PLUMBING PLANS FOR EXTENT OF WORK.
- 15. DRAWINGS ATTEMPT TO SHOW EXISTING CONDITIONS. BUT, ALL EXISTING CONDITIONS MAY NOT BE SHOWN OR VISIBLE ON SITE. CARE MUST BE TAKEN TO ABANDON, TURNOFF OR OTHERWISE SECURE EXISTING ELEMENTS THAT NEED TO BE REMOVED WITH REMOVED STRUCTURE. WHEN CONFLICTS ARE FOUND CONTACT ARCHITECT FOR DIRECTION.
- 16. REFER TO DEMO REFLECTED CEILING PLANS FOR ADDITIONAL WORK
- 17. ALL HARDWARE TO BE SALVAGED FOR OWNER OR REUSE FOR NEW CONSTRUCTION.
- 18. DISTRICT WILL REMOVE FURNITURE, ART WORK AND ETC UNLESS NOTED OTHERWISE.
- 19. NOT ALL ITEMS TAGGED FOR CLARITY. ASSUME REMOVE IF DASHED.

DEMOLITION LEGEND

_ _ _ _ EXISTING CONSTRUCTION TO REMAIN _____

NOTES:

DEMOLITION DEFINITION

- REMOVE: DETACH ITEMS FROM E CONSTRUCTION AND LEGALLY DIS OFF SITE, UNLESS OTHERWISE IN REMOVED AND SALVAGED OR REM REINSTALLED.
- 2. SALVAGE: DETACH ITEMS FROM E CONDITIONS AND RETURN TO OW REUSE.
- . REMOVE AND REINSTALL: DETACH EXISTING CONDITIONS, PREPARE TEMPORARY STORE AS REQUIRED THEM AS INDICATED.
- . EXISTING: EXISTING ITEMS OF CO ARE NOT TO BE REMOVED AND TH OTHERWISE INDICATED TO BE RE OR REMOVED AND REINSTALLED.
- . DRAWINGS ATTEMPT TO SHOW E CONDITIONS. BUT, ALL EXISTING NOT BE SHOWN OR VISIBLE ON SI TAKEN TO ABANDON, TURNOFF O

	Keynote Leger
Key Value	Keynot
D201	REMOVE EXIST
D202	REMOVE EXIST
D204	REMOVE EXIST WHICH STOP A LEVEL AND CE CONTINUES AC
D205	REMOVE EXIST
D206	EXISTING MEC CHASE
D207	EXISTING ROO REMAINS
D208	REMOVE EXIS
D209	EXISTING ROO
D210	SALVAGE EXIS BOARD
D211	REMOVE WALL NEW DOOR, CO AND ALIGN WI ⁻ BRICK COURSI
D212	EXISTING BASI HEAT TO REMA
D213	PORTION OF E BOARD HEAT T REMOVED, RE
D214	EXISTING DOO
D215	EXISTING STAI
D216	EXISTING WAL
D217	EXISTING WINI REMAIN
D218	DEMO CABINE ATTACHED ITE
D219	REMOVE OVEN
D220	
D221	SALVAGE EX S
UZZZ	SALVAGED FO REINSTALLATI
D224	REMOVE EXIS DRINKING FOU
D225	SALVAGE EX C SPEAKERS
D226	SALVAGE EXIS EXTINGUISHEF CABINET
D227	REMOVE WALL BEYOND CEILII
D228	EXISTING ACC DOOR SECURI REVISIONS
D229	EXISTING CAR REMAIN
D230	REMOVE EXIS SALVAGE ENO IN A REPAIR IN REMOVED WAI
D231	SALAVAGE EXI FRAME AND HA FOR RELOCAT 01
D232	SALVAGE EX MARKERBOAR RELOCATION
D233	SALAVAGED E DOOR, FRAME HARDWARE FO REINSTALLATIO

		Exhibit A
	NOTES:	
DEN	OLITION DEFINITIONS:	
REMOVE: DET CONSTRUCTI OFF SITE, UN REMOVED AN REINSTALLED	TACH ITEMS FROM EXISTING ON AND LEGALLY DISPOSE OF THEM LESS OTHERWISE INDICATED TO BE ID SALVAGED OR REMOVED AND D.	
SALVAGE: DE CONDITIONS , REUSE.	TACH ITEMS FROM EXISTING AND RETURN TO OWNER READY FOR	
REMOVE AND EXISTING COI TEMPORARY THEM AS INDI	REINSTALL: DETACH ITEMS FROM NDITIONS, PREPARE THEM FOR REUSE, STORE AS REQUIRED AND REINSTALL CATED.	Associates
EXISTING: EX ARE NOT TO I OTHERWISE I OR REMOVED	ISTING ITEMS OF CONSTRUCTION THAT BE REMOVED AND THAT ARE NOT NDICATED TO BE REMOVED, SALVAGED, O AND REINSTALLED.	0056 Edwards Village Blvd. Suite 210 Edwards, CO 81632 (970) 766-1470
DRAWINGS A CONDITIONS. NOT BE SHOW TAKEN TO AB SECURE EXIS REMOVED WI	TTEMPT TO SHOW EXISTING BUT, ALL EXISTING CONDITIONS MAY VN OR VISIBLE ON SITE. CARE MUST BE ANDON, TURNOFF OR OTHERWISE TING ELEMENTS THAT NEED TO BE TH REMOVED STRUCTURE.	email: tab@vail.net email: tab@vail.net www.tabassociates.com <u>Civil Engineer</u> <u>Structural Engineer</u>
Koy Value	Keynote Legend	(303) 318-6539 Mechanical Engineer BG Building Works (970) 949-6108
Key value		Electrical Engineer BG Building Works
D201	REMOVE EXISTING DOOR AND FRAME	(970) 949-6108
D202	REMOVE EXISTING DOOR, FRAME REMAINS	
D204	REMOVE EXISTING WALLS WHICH STOP AT CEILING	HEREGORY 15
D205		3058.17. 20
D205 D206	EXISTING MECHANICAL	COLOS ARCHIM
D207	EXISTING ROOF DRAIN	
D208	REMOVE EXISTING	
D209	EXISTING ROOM NO DEMO	
D210	BOARD REMOVE WALL AS REO FOR	
0211	NEW DOOR, COORDINATE AND ALIGN WITH EXISTING BRICK COURSING	
D212	EXISTING BASE BOARD HEAT TO REMAIN	
D213	PORTION OF EX BASE BOARD HEAT TO BE	
D214	REMOVED, RE MEP EXISTING DOOR TO REMAIN	
D215 D216	EXISTING STAIR TO REMAIN EXISTING WALL TO REMAIN	
D217	EXISTING WINDOW TO REMAIN	
D218	DEMO CABINETS AND ALL ATTACHED ITEMS	
D219 D220	REMOVE OVEN REMOVE FRIDGE	
D221	SALVAGE EX SCREEN	
DZZZ	SALVAGED FOR REINSTALLATION D2	
D224	REMOVE EXISTING DRINKING FOUNTAIN	
D225	SALVAGE EX CLOCKS AND SPEAKERS	
D226	SALVAGE EXISTING FIRE EXTINGUISHER AND CABINET	
D227	REMOVE WALLS WHICH GO BEYOND CEILING LEVEL.	0 <u>0</u>
D228	EXISTING ACCESS AND DOOR SECURITY, NO	
D229	REVISIONS EXISTING CARPET TO	
D230	REMAIN REMOVE EXISTING CARPET,	
	IN A REPAIR IN 204 AT	
D231	SALAVAGE EXISTING DOOR,	
	FOR RELOCATION, TO DOOR	
D232	SALVAGE EX MARKERBOARD FOR	
D233	RELOCATION SALAVAGED EXISTING	Revisions:
	DOOR, FRAME AND HARDWARE FOR	
	REINSTALLATION	
		Issue Dates:
		SD-03/07/2024 CD-04/05/2024
		Sheet Title:
		Building
		Floor
		Plans
		Project No: 2404
		Sheet No:
		I U2.1

1 UPPER LEVEL DEMO RCP

EXISTING ACT CEILING TO BE REMOVED

RCP Demo Key

EXISTING GYPSUM BOARD CEILING TO BE

	NOTES:					
	Kevnote Legend					
Koy Valuo	Kovnoto Toxt					
Ney value	Reynole Text					
A616	NEW LIGHT FIXTURES IN ROOM - RE: ELEC, PROVIDE NEW CEILING TILES AS NEEDED TO FILL HOLES REMAINING FROM REMOVE 2X4 FIXTURES					
D603	EX CEILING NO WORK					
D604	REMOVE EXISTING CEILING, SALVAGE ALL EXISTING LIGHTING, MECH DIFFUSERS AND ITEMS MOUNTED TO CEILING. SUPPORT MECHANICAL DIFFUSERS IN EXISTING LOCATIONS. LIGHT FIXTURES TO BE RELOCATED.					
D606	REMOVE EXISTING HARD LID CEILING AND ITEMS ATTACHED THERE TO.					
D607	PORTION OF EXISTING CEILING TO REMAIN,					
D608	REMOVE PORTION OF EXISTING CEILING.					
D609	WALLS BELOW ARE BEING REMOVED. EXISTING CEILING CURRENLTY CONTINUES OVER WALLS BELOW.					
D610	EX WALL SPEAKERS, SALVAGE ON REMOVED WALLS AND KEEP ON WALLS NOT REMOVED.					
D611	EX EXIT SIGNS REMAIN					
D612	SALAVAGE EXISTING LIGHT FIXTURES FOR RELOCATION					
D613	EX PROJECTOR TO REMAIN					
D614	SALAVAGE EX PROJECTOR FOR RELOCATION					
D615	EXISTING WALLS STOP AT EXISTING CEILING. REMOVE PORTION OF CEILING IN NEW CORRIDOR.					
D617	REMOVE EXISTING					

REMOVE EXISTING DRYWALL BULKHEAD

								Γ	OOR SCHE	EDULE									
	L	OCATION			DOOR	DOOR	DOOR	DOOR	FRAME	FRAME	FRAME	FRAME	GLASS				Door Fire		
Mark	FROM ROOM	TO ROOM	WIDTH	HEIGHT	THICKNESS	TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH	DEPTH	TYPE	HEAD	JAMB	SILL	Rating	HARDWARE	REMARKS
01	CORRIDOR	CLASSROOM 2	3' - 0"	6' - 8"	1 3/4"	EX	EWD	EX	EX	EHM	PT	5 1/4"					20 MIN	6	
02	CORRIDOR	RR	3' - 0"	6' - 8"	1 3/4"	1	WD	ST	1	HM	PT	5 1/4"						2	
03	RR	CORRIDOR	3' - 0"	6' - 8"	1 3/4"	1	WD	ST	1	HM	PT	5 1/4"						2	
04	CORRIDOR	CLASSROOM	3' - 0"	6' - 8"	1 3/4"	1	WD	ST	1	HM	PT	5 1/4"					20 MIN	1	EX BEING RELOCATED HAS DOOR LABEL
05	CLASSROOM		3' - 0"	6' - 8"	1 3/4"	1	НМ	PT	1	HM	PT	0"						3	ACCESS CONTROL, VIF FRAME DEPTH
07	STAIRS		6' - 0"	7' - 0"	1 3/4"	EX	EHM	EX	EX	EHM	EX	0"						5	NOWORK
08	CLASSROOM 3	CORRIDOR	3' - 0"	6' - 8"	1 3/4"							0"							

1 UPPER LEVEL A2.2 1/4" = 1'-0"

4 EXISTING ACCESS NO WORK

5 EXISTING DOOR AND HARDWARE NO NEW WORK.

6 REUSES EXISTING HARDWARE

SIGNAGE SCHEDULE

NUM	NAME	NAME	QTY	TYPE
	ENGLISH	SPANISH		
3101	OFFICE	OFFICINA	1	2-B
3102	CLASSROOM	AULA	1	2-B
3103	CLASSROOM	AULA	2	2-B
3104	OFFICE	OFFICINA	1	2-B
3105	CLASSROOM	AULA	1	2-B
3106	MDF		1	2-A
3107	STORAGE	ALMACENAMIENT	O 1	2-A
3108	RESTROOM	BANO	1	3-B
3109	RESTROOM	BANO	1	3-B
3113	JANITOR	CONSERJE	1	2-A

SPANISH TEXT TO BE CONFIRMED IN SHOPS WITH DISTRICT

		 Exhibit A
OOR PLAN GEN	NOTES:	
REMAIN. REP ADJACENT FII NEW CONSTR FINISHES. REI GUIDELINES F	AIRED SURFACES TO BE FLUSH WITH NISH SURFACES. TO SAME QUALITY AS RUCTION PRIOR TO INSTALLING NEW FER TO THE FINISH MANUFACTURER'S FOR INSTALLATION.	
CEILINGS, ET(RADIATING, A	C. SO AS TO MAINTAIN THE FIRE- DD FIRE-SMOKE DAMPERS WHERE NEW	
DUCTS CROS PATCH WALLS SO AS TO REC PATCH AND L NEW WORK A	S. ADD FIRE STOP AT ALL S AT REMOVED RECEPTACLE OPENINGS CEIVE SUBSEQUENT WORK. EVEL FLOOR SUBSTRATES TO RECEIVE S SCHEDULED.	TAB Associates The Architectural Balance 0056 Edwards Village Blvd. Suite 210
COORDINATE EXISTING. DO NOT SCAL	ALL FLOOR CORE DRILLING WITH	Edwards, CO 81632 (970) 766-1470 fax: (970) 766-1471 email: tab@vail.net
ALL SPOT ELE OUTSIDE THE ELEVATIONS. BUILDING REF ELEVATIONS. SHOULD CON	EVATIONS SHOWN ON THE FLOOR PLANS BUILDING RELATE TO USGS ALL SPOT ELEVATIONS INSIDE THE ER TO BUILDING REFERENCE NOTIFY ARCHITECT IMMEDIATELY DITIONS BE FOUND CONTRADICTORY TO	www.tabassociates.com <u>Civil Engineer</u> <u>Structural Engineer</u> Jirsa Hedrick (303) 318-6539
ALL ANGLES S	INGS. SHOWN ON THE FLOOR PLANS ARE 90 LESS OTHERWISE NOTED.	<u>Mechanical Engineer</u> BG Building Works (970) 949-6108 <u>Electrical Engineer</u> BG Building Works
ALL DIMENSIC	NS ARE TO FACE OF STUD. L TYPE IS 4, UNLESS NOTED	(970) 949-6108
. COORDINATE	CEILING REMOVAL AND PATCHING AT WITH NEW PLUMBING, PATCH WITH	
MATERIAL TO COORDINATE PLANS. PROV EXSITING ROO	MATCH EXISTING. ROOF PENETRATIONS WITH MEP IDE TERMINATIONS AND PATCHES PER DFING MFG DETAILS.	MACK MACK SOD837000
	Keynote Legend	
Key Value	Keynote Text	
A204	EXISTING ROOF DRAIN PIPE TO REMAIN, NEW FRAMED BOX, PROVIDE CLEANOUT	
A205	EXISTING DOOR TO REMAIN	
A206 A208	INSTALL NEW DOOR INSTALL SALVAGED SCREEN	
A211	TYPICAL ALL EXISTING EXTERIOR WINDOWS TO REMAIN, WINDOW	e 160
A212	INSTALL SALVAGED MARKERBOARD	A ∧ A ⊗ 0 ∞
A213 A214	EXISTING STAIRS, NO WORK INSTALL NEW ADA	
A215	ACTUATOR INSTALL NEW DISTRICT DOOR CAMERA AND SECURITY ACCESS	nne ran _{pring}
A217 A219	EX MECHANICAL SHAFT REINSTALL RECESSED FIRE EXTINGUSER CABINET AND	S A S G S
A220		H Of %
A221	EXISTING WALL MOUNTED FIRE EXTENGUISHER, NO	GSS 3S
A222	PATCH EXISTING CARPET AT REMOVED WALL. PATCH WITH SALAVAGE PIECE	00
A223	CLEAN BRICK OF MISC DRYWALL, MUD AND ETC AT REMOVED WALLS	
A224	INSTALL SALAVAGED DOOR, FRAME AND HARDWARE	
A225	PATCH EX DRYWALL AT REMOVED WALLS	
A220	WINDOW WITH WALL TYPE SIMILAR TO TYPE 5	
A227 A228	INFILL WALL WITH NEW PATCH TO MATCH EX.	Revisions:
	PATCH WOOD WAINSCOT BELOW	No Description Date
A229 A230	NEW 4'X8' MARKERBOARD REINSTALL SALVAGED	
A231	SHORT THROW PROJECTOR ABOVE	
A232	INSTALL CARPET PATCH AT REMOVED BASE, PATCH	
A233	NEW DOUBLE DRINKING FOUNTAIN - ELKAY I2STI8WSSP, STANDARD,	Issue Dates: SD-03/07/2024 CD-04/05/2024
A235	ACCESSISBLE AND BOTTLE FILLER	
A200	ACCESS LADDER - SIMILAR TO KATTSAFE.COM, CAGED	Sheet Title:
	PROVIDE BRACKETS, ANCHORS AND	Proposed
	INSTALLATION. FULLY INSTALLED BY GC.	Main Floor
IX-1 IX-2	NEW CARPET EX FLOOR FINISH	Pian
IX-4	INSTALL NEW TANDUS ABRASIVE ACTION II, CHARCOAL, WALK-OFF CARPET TILE	
IX-6	ALL EXISTING AND NEW DRYWALL, AND ALL OTHER EX PAINTED ITEMS TO BF	Project No: 2404
IX-7	PAINTED. EXISTING UNPAINTED BRICK	
IX-8	IO NOT BE PAINTED NEW RUBBER BASE, NOT REQUIRED AT BASEBOARD HEAT	Sheet No:

4 HM DOOR HEAD EXTERIOR 45.1 3" = 1'-0"

-EDGE OF DOOR FRAME -EDGE OF WALL BEYOND

TAB Associates The Architectural Balance 0056 Edwards Village Blvd. Suite 210 Edwards, CO 81632 (970) 766-1470 fax: (970) 766-1471 email: tab@vail.net www.tabassociates.com Civil Engineer Structural Engineer Jirsa Hedrick (303) 318-6539 Mechanical Engineer BG Building Works (970) 949-6108 Electrical Engineer BG Building Works (970) 949-6108 Seal FLERESDRY NO 058 7000 ARC

Exhibit A

81601 Reno Ave Φ CO Annex Grand d Springs (Glenwood GSHS 1405

Revisions: Description Date

Issue Dates: SD-03/07/2024 CD-04/05/2024 Sheet Title: Details Project No: 2404 Sheet No: A5.1

1 UPPER LEVEL RCP A6.1 1/4" = 1'-0"

NOTES:						
CP NOTES:						
ALL CEILINGS	S SHALL BE AS NOTED ON PLANS.					
SEE MECHAN MOUNTING L CEILINGS IS I	VICAL AND ELECTRICAL DRAWINGS FOR OCATIONS OF ITEMS WHERE NO REQUIRED OR INDICATED.					
LIGHTS, DIFF DETECTORS, SHALL BE CE THEY OCCUF	USERS, EXIT SIGNS, SMOKE , AND FIRE ALARMS SPEAKERS/STROBES :NTERED IN THE CEILING TILES IN WHICH R, UNLESS NOTED OTHERWISE.					
CENTER ALL SPACE UNLE ORIGIN OR D	CEILING GRIDS IN EACH ROOM OR SS OTHERWISE INDICATED WITH A GRID IMENSION.					
REFER TO EL FOR NEW LIG	ECTRICAL AND MECHANICAL DRAWINGS . SHTS AND REGISTERS.					
	Keynote Legend					
Key Value	Keynote Text					
A603	EX CEILING NO WORK					
A604	NEW CEILING WITH EXISTING LIGHTS AND DIFFUSERS RELOCATED. REINSTALL IN EXISTING OR SLIGHTLY MODIFIED LOCATION TO ALIGN WITH NEW GRID					
A605	RELOCATED FIXTURE					
A606	NEW LIGHT FIXTURES					
A607	PORTION OF EXISTING CEILING TO REMAIN, FIXTURES AND MECH DIFFUSERS TYPICALLY IN CURRENT LOCATIONS. SOME FIXTURES RELOCATED AND SOME NEW PER MEP.					
A608	NEW CEILING					
A610	EX WALL SPEAKERS, SALVAGE ON REMOVED WALLS AND KEEP ON WALLS NOT REMOVED.					
A611	EX EXIT SIGNS REMAIN					
A612	NEW EXIT SIGN					
A613	NEW WALLS TO DECK ABOVE, SHOWN WITH DASHED LINE					
A614	EXISTING FIXTURE RELOCATED					
A616	NEW LIGHT FIXTURES IN ROOM - RE: ELEC, PROVIDE NEW CEILING TILES AS NEEDED TO FILL HOLES REMAINING FROM REMOVE					

2X4 FIXTURES

	Keynote Leg
Key Value	Keyn
A701	ACCESSIBLE DISPENSER
A702	ACCESSIBLE DISPENSER
A703	MIRROR
A704	ACCESSIBLE DISPENSER
A705	HORIZONTAL
A706	VERTICAL GF
A707	WALL SINK
A708	PROVIDE PIP UNDER SINK
A710	GYPSUM WA FINISH, EPO>
A711	FLOOR TILE
A712	RUBBER FLO - TILE TO CAF
A713	INSTALL BLA PLYWOOD SH UPPER MIRR REMAINING F THICKNESS E FLUSH WITH FRAME.
A714	INSTALL ROU PLYWOOD SH VERTICAL GF MOUNT. INST WITH ESCUT

TOILET PAPER DISPENSERS PAPER TOWEL DISPENSERS SOAP DISPENSERS

GENERAL NOTES

DESIGN CRITERIA

1.	All work shall conform to the minimum standards of the International Existing Buildings Code, 2021 edition and any other regulatory agencies that have authority over any portion of the work.
2.	Design Loads
	Dead Loads
	Existing Building Dead Loads are Unchanged
	Live Loads
	Floor
	Classroom 40 psf

50 psf

Retail Corridors above 1st floor	100 psf (non-reducible) 80 psf
Stairs	100 psf (non-reducible)
Snow Criteria is :	
Pg = 50 psf, Ce = 1.0, Ct 7	1.0 = , Is = 1.0, P _f = 40 psf.
Risk Category	II

Wind and Seismic Criteria: This is a level 2 alteration with no significant changes to the building's lateral force resisting system. Wind and Seismic loads have not been evaluated.

SHOP DRAWINGS AND SUBMITTALS

Office

- 1. The Contractor shall coordinate, review and submit shop drawings that identify all penetrations for all trades through structural walls, slabs, beams, and columns. A single drawing of each portion of the structure identifying locations and sizes of all sleeves and blockouts shall be submitted for review and approval six weeks prior to placing concrete in these structural elements. Penetrations not shown on the approved shop drawings will not be permitted in the field. Penetrations include all pipes, sleeves, conduit, blockouts, elements exceeding 1/3 the slab thickness, and other openings through concrete including slab-on-metal deck. Prior approval must be obtained from engineer for all coring of concrete and shall be reviewed on a case-
- by-case basis. Shop drawings and calculations for all informational and action submittals as noted in project specifications shall be submitted to the Architect/Engineer for approval prior to fabrication or construction of all structural items including the following: concrete and masonry reinforcement, embedded steel items, structural steel, metal decking, shear stud layout, stairs, pre-engineered wood and pre-engineered cold-formed steel. Approved shop drawings shall be submitted to the local Building Department by the contractor for record only. Allow 2 weeks for review of shop drawings.
- 3. The general contractor shall submit any substitution request to the Architect/Engineer prior to making any changes. The request shall include all information required for the engineer to fully evaluate the substitution and determine any required compensation for the evaluation.
- 4. Design, materials, equipment, and products other than those described below or indicated on the drawings may be considered for use, provided prior approval is obtained from the Owner, Architect/Engineer, and the applicable governing code authority.

CONSTRUCTION

- 1. All omissions or conflicts between the various elements of the working drawings and/or specifications shall be brought to the attention of the Architect/Engineer before proceeding with any work so involved. 2. A detail, section, or elevation reference may be indicated only once on a structural construction drawing, but is to be used at all like and similar conditions. Typical and/or standard detail references may not be indicated on plan. Contractor is
- responsible for determining which details apply. 3. No modification shall be made to any structural member without the approval of the Architect/Engineer. This also applies to any openings for plumbing, electrical, and mechanical trades.
- 4. Contractor must check all dimensions, framing conditions, and site conditions before starting work. Architect/Engineer shall be notified immediately of any discrepancies or possible deficiencies.
- 5. The structural drawings have been completed using the available information regarding existing conditions. The structural engineer has not field verified any existing conditions. It is the responsibility of the General Contractor to field verify the existing conditions and notify the architect and engineer of any discrepancies before proceeding with work.
- 6. The Contractor shall be responsible for all excavation procedures and protection of adjacent property, structures, utilities, etc. in accordance with all national, state, and local ordinances.
- Stability of the structural frame during construction is the responsibility of the General Contractor. The structural frame is not complete until all connections to lateral force resisting elements have been made, inspected as required by the building official, and accepted by the engineer. This includes all diaphragm elements such as metal deck, plywood and gypsum board wall sheathing, metal straps, concrete topping, tie rods, and the like. All concrete elements must have reached their required strength. Temporary bracing of the structure during construction should be provided by the General Contractor and
- their Sub-Contractors as necessary. 8. Do not place backfill against basement walls until basement and first floors are in place or wall has been adequately shored. Forces due to hydrostatic pressure have not been included in the design of foundation walls.
- 9. All mechanical and electrical equipment purchases shall be coordinated with the structural drawings by the General Contractor. This includes equipment size, weight, openings, required support, etc. Any discrepancies shall be brought to the architect's and engineer's attention prior to equipment purchase
- 10. The contractor shall not stockpile any building materials or equipment in a manner that will exceed the load carrying capacity, cause damage, or create excessive deflection to any structural element. The contractor shall contact the engineer for evaluation of locations where it may be necessary for heavy equipment or building material stockpiles prior to placement of these items on any structural element.
- 11. For any item that requires a change or correction due to contractor error or deficiency in construction, the contractor shall submit plans, details, and calculations for the proposed solution. These shall be reviewed by the Architect/Engineer prior to completion of the work. Some corrections may require submitted documentation to be stamped and signed by a professional engineer who is registered in the project jurisdiction.
- 12. Nothing contained within the contract documents shall relieve the general contractor and the subcontractors of: a. responsibility to determine any aspect of how the work is to be performed b. dealing with matters of safety of personnel
- c. safety of property d. superintending of the work
- e. construction means and methods

STRUCTURAL STEEL

PRODUCTS AND MATERIALS

- Wide flange shapes shall be ASTM A992 Round hollow structural sections shall be ASTM A500 Grade C (46 ksi).
- Square and rectangular hollow structural sections (HSS) shall be ASTM A500 Grade C (50 ksi). Pipe sections shall be ASTM A53 Grade B (35 ksi).
- Miscellaneous structural steel such as angles and channels shall be ASTM A36 / ASTM A572-50. Plates shall be ASTM A36 unless noted otherwise. Plates used for any type of moment connection shall be ASTM A572-50.
- All welding electrodes shall conform to ASTM E70XX. The minimum fillet weld size shall be 3/16", unless noted otherwise. Headed anchor studs shall conform to ASTM A108 (60 ksi).
- Anchor rods and unfinished rods shall conform to ASTM F1554, Grade 36. 10. Bolted connections are to be of high-strength ASTM A325-N bolts, unless noted otherwise. A minimum of two bolts is required
- for all beam connections. Minimum required connection capacity is 12 kips LRFD factored load unless noted otherwise. 11. High-strength bolts shall conform to the provisions of the "Specification for Structural Joints Using High-Strength Bolts", latest
- edition, as approved by the Research Council on Structural Connections. 12. All structural steel exposed to weather shall be hot-dip galvanized, unless noted otherwise. See specifications for additional
- galvanizing information. 13. All structural steel shall be shop coated with an approved rust inhibitive primer. Do not prime beams that are to receive

fireproofing. SHOP DRAWINGS

- 1. Shop drawings for all structural steel indicated on the structural drawings shall be submitted for review to the Structural Engineer prior to fabrication. 2. Connections shall be as shown in schedules and sections in the drawings. Any changes to the connections proposed by the
- contractor shall be submitted with the structural steel shop drawings. This connection submittal shall include calculations stamped and signed by the contractor's engineer

CONSTRUCTION

- FABRICATION AND ERECTION 1. All fabrication and erection shall conform to the latest edition of the AISC Manual of Steel Construction.
- 2. All members are to be erected with natural mill camber or induced camber up, unless noted otherwise on the plans. 3. <For composite steel beam floors only>. Screed concrete topping to a constant thickness over the beams. Do not screed to a constant elevation. HOLES AND OPENINGS
- 1. No holes other than those specifically detailed shall be allowed through structural steel members. No cutting or burning of structural steel shall be permitted without written consent from the Architect/Engineer. WELDING 1. A Certified Welder approved by the authority having jurisdiction in accordance with AWS, Structural Welding Code D1.1,
- shall perform all welding. BOLTING
- 1. All high-strength bolts in bearing type connections shall be snug tight. The snug tight condition is defined as the tightness that exists when all plies in a joint are in firm contact. A few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench may attain this. All high-strength bolts shown on the drawings as slip critical or subject to tension loads shall be tightened to a bolt tension not less than that given in Table 8.1 for the RCSC Specification for Structural Joints using High-Strength Bolts. Tightening shall be done by the turn-of-nut method, by a direct tension indicator, or by properly calibrated wrenches. Provide hardened washers under the nut or bolt head, whichever is the element turned in tightening. Bolts not indicated as slip critical shall not be pre-tensioned. 2. For slip-critical bolted assemblies the assembly surface, including those adjacent to the washer, shall be free of mill
- scale, oil, paint or other coatings. ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS)
- 1. Structural steel noted as AESS on the structural drawings shall conform to project specifications for detailing, fabrication, and erection of AESS. 2. All AESS shall be free of mill marks, have welds ground smooth, and piece marks covered. The surface preparation of AESS shall conform to SSPC-SP 3 power tool cleaning.
- 3. All exposed field welds shall be uniform and smooth with any field welding aids removed.
- MISCELLANEOUS STRUCTURAL STEEL 1. Miscellaneous structural steel includes any steel that is not specifically included in the framing of the building superstructure. Superstructure steel may include beams, columns, trusses, girders, joists, braces, frames, and any
- associated connections, parts, and subparts. 2. The structural steel supplier shall supply all necessary steel items, whether indicated on the drawings or not, that fulfill the structural design and architectural design intent for the structure. These items may include edge angles, closure angles,
- deck support, miscellaneous plates, etc. For SOMD projects only: < Openings in roof or floor decks with concrete may be as shown on structural, architectural, or MEP drawings. If openings are not dimensioned on structural plans, refer to architectural or MEP drawings. Unless noted otherwise, openings in decks 24"x24" or less shall be reinforced with 1- #5 in concrete above flutes on all four sides of opening. Reinforcement shall extend 2'-0" minimum beyond edge of opening or have a standard hook. All openings shall have 2'-0" minimum clear between them. For any opening that does not meet this requirement, refer to plans and details for required reinforcing.>
- 4. Openings in metal roof deck without concrete may be as shown on structural, architectural, or MEP drawings. If openings are not dimensioned on structural plans, refer to architectural or MEP drawings. Openings in deck shall be reinforced as shown in the structural drawings.

STEEL JOISTS

- Steel joists shall be designed, fabricated, and erected in accordance with Steel Joist Institute (SJI) Specification. Where steel joists bear on structural steel framing the joist nearest each column on each side of the beam shall be bolted to the beam. Joist bridging shall conform to SJI specifications unless otherwise shown on plans. Joist supplier shall verify that the metal deck, joists, and joist girders meet any size, spacing, support, and/or bridging restrictions imposed by Underwriters Laboratories designated floor or roof systems listed in the architectural drawings. All welds shall be by joist supplier unless noted otherwise.
- Joist Supplier shall submit calculations for all non-uniformly loaded joists. 3. Install all required bridging and miscellaneous steel prior to installing deck.

CONCRETE

DESIGN CRITERIA

preparing and reporting of proposed mix designs. production until Engineer has reviewed mix designs. PRODUCTS AND MATERIALS

Mix Type	Intended Use of Concrete
А	Exterior Ramps, Stairs an Walls, and Footings
	Footnotes: 1. Normal w 2. Slump to

exposed to weather.

approved by Architect/Engineer.

CONSTRUCTION

- CONCRETE COVER Concrete exposed to earth without forms. Concrete poured in forms bu #5 bars or smaller... Bars larger than #5.... Concrete not exposed to ear Slabs, walls and joists.. Beams and column bars..
- (principal reinf., ties and stirrups) CONSTRUCTION JOINTS AND CONTROL JOINTS
- as detailed or as approved by the Engineer.
- CONCRETE TOLERANCES Tops of walls and columns..
- Plumbness Plan alignment.. Cross-sectional dimension.
- Size and location of sleeves and blockouts.. Slab and beam soffits... CONDUITS, PIPES, AND SLEEVES

COND	UITS, FIFES, AND SLE
Embed	ded conduits, pipes, an
а.	Any and all conduits, p

Concrete walls: following:

> b. The conduit shall be placed between vertical reinforcement layers. The conduit shall be placed in the middle third of the wall for single layer vertical reinforcement.

ARCHITECTURAL REQUIREMENTS Provide 3/4" chamfers at all exposed corners.

- the concrete, curbs and slab depressions. CONCRETE PLACEMENT
- FORMWORK AND SHORING
- 347. Reshoring required for 3 floors minimum.
- **MISCELLANEOUS** specifications.

REINFORCING STEEL

- **PRODUCTS AND MATERIALS**
- 2. Reinforcing to be welded or field bent shall be ASTM A706, Grade 60. Welding of reinforcing steel shall conform to AWS D1.4, using proper low hydrogen electrodes.

place in an ICC approved and audited facility.

SHOP DRAWINGS

Requirements for Structural Concrete.

CONSTRUCTION

- **REINFORCING DEVELOPMENT AND SPLICES** 1. <All bars in concrete shall be lapped a minimum of 36 bar diameters (2'-0" min.) at all splices.> <OR> <All bars in
- a. Top bars at midspan b. Bottom bars - over supports
- REINFORCING AT OPENINGS
- slabs and walls, unless noted otherwise. Provide 2- #5 bars at all reentrant and opening corners
- GENERAL REINFORCING REQUIREMENTS 1. All reinforcing bar bends shall be made cold with a bar bender at the ACI 318 specified minimum radius. Do not use added heat to bend bars.
- reinforcing is provided. Provide all accessories necessary to support reinforcing at positions shown on the plan.
- placed in the field at the discretion of the Engineer.

1. Concrete work shall conform to all requirements of the International Building Code and ACI 318, Building Code Requirements for Structural Concrete, latest approved editions. 2. Prepare concrete mix designs for each type and strength of concrete, using either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method is used, use an independent testing facility acceptable to Engineer for Submit written reports to Engineer of each proposed mix design at least 15 days prior to start of work. Do not begin concrete

Design mixes shall provide concrete with the following properties as indicated on drawings and schedules: CONCRETE MIX MATRIX¹

	Compressive Strength 28-day	Maximum W/C Ratio	Maximum Aggregate Size²	Recommended Slump ²	Air Content ³	Required Admixtures
ł	4500psi	0.45	1"	5-8"	6% ± 1.5%	AEA ⁴

eight concrete unless noted otherwise. be determined by Contractor and Mix Supplier with final approval by Engineer.

3. Air content may be reduced by 1.0% for f'c \geq 5000psi. 4. Air entraining admixture.

2. Portland Cement shall conform to ASTM C150, Type I / II. Blended Cements, if used, shall conform to ASTM C595 Type IL, or ASTM C1157 (GU). Aggregate for normal weight concrete shall conform to all requirements and tests of ASTM C33. Aggregate for lightweight concrete shall conform to all requirements and tests of ASTM C330. Concrete mixing operations,

4. Water-reducing admixtures shall conform to ASTM C494, and be used in strict accordance with the manufacturer's recommendations. An air-entraining agent conforming to the ASTM C260 shall be used in all concrete mixes for work which is Use accelerating admixtures in cold weather only when approved by Architect/Engineer. Use of admixtures will not relax cold weather placement requirements. Do not use calcium chloride. Use set retarding admixtures during hot weather only when

Clear concrete coverage for reinforcing bars shall be as follows unless noted otherwise:

it exposed to earth or weather:	•
· · · · · · · · · · · · · · · · · · ·	1 1/2"
	2"
rth or weather:	
	3/4"
	1 1/2"

1. Control joints shall be provided in all slabs-on-grade at a maximum spacing of 10'-0" OC for 4" slabs and 12'-0" OC for 5" slabs, unless noted otherwise. Joints shall be 1/8" wide x (thickness/4)" deep continuous sawed joint or pre-molded joint. Joints shall be provided at all column centerlines, corners and ends of walls, re-entrant corners and any other areas with high crack potential. Proposed joint locations shall be submitted to the architect for approval prior to completion of work. . Slabs, walls, footings and beams shall not have joints in a horizontal plane. Any stop in concrete work must be made at guarter point of span with vertical bulkheads and horizontal keys, unless otherwise shown. All construction joints shall be

Concrete tolerances shall be as specified in ACI 117 and as follows:

-3/4", +0" 1/4" in 10 feet, 1" maximum total 1/2" in 20 feet, 1" maximum total -1/4", +1/2"

1/4" in 10 feet, 3/4" maximum total

+1/4"

nd sleeves in concrete:

pipes, and sleeves embedded in structural concrete shall be shown in plan or thoroughly described in writing and provided to the Structural Engineer for written approval a minimum of six weeks prior to installation. See General Notes Shop Drawings and Submittals Item 1 All blockouts in foundation walls and footings must be approved by the Structural Engineer prior to construction. All embedded items shall be located as to not impair the strength of the construction of the concrete member. Contractor shall coordinate the installation of all embedded items and penetrations. Cost of additional reinforcement or where conduit is to be provided with Schedule 40 uncoated or galvanized steel pipe (ASTM 53)

Horizontal conduit shall not be embedded within a slab on grade.

Conduits shall not be embedded horizontally in any wall, length wise. Conduits shall not be embedded vertically in any wall less than 8" thick.

. For other conditions, proposed conduits less than or equal to 1 1/2" outside diameter shall conform to the a. No embedment shall disrupt the placement of the reinforcing steel.

Refer to Architectural drawings for reveals, areas of textured concrete or special finishes, items required to be cast into

1. All concrete shall be consolidated by vibration, spading, rodding, or forking so that concrete is thoroughly worked around the reinforcement and embedded items and into corners of forms without segregation of materials.

1. The Contractor shall design all forms and supporting shores in conformance with ACI 347. Design shall include rate and method of placing concrete and construction loads, including vertical, horizontal, and impact loads. Forms shall be substantial and sufficiently tight to prevent leakage of mortar and properly braced or tied to maintain position and shape. 2. Forms shall be removed in such a manner as not to impair safety and serviceability of the structure. All concrete to be exposed by form removal shall have sufficient strength not to be damaged thereby. Reshore until 28 days after placement, and for full duration where construction loads exceed specified service loads. Reshoring shall conform to ACI

1. Cracking of concrete slabs due to shrinkage is expected. The general contractor shall anticipate repairing cracks in all slabs but particularly at the parking levels. Rout and seal all cracks 0.01 inch wide and greater as described in the

1. Reinforcing steel shall conform to ASTM A615, Grade 60. Reinforcing to be welded or field bent shall be ASTM A706, Grade

Epoxy-coated reinforcing steel shall conform to ASTM A775 and shall be coated prior to fabrication. Welded wire reinforcement (WWR) shall conform to ASTM A1064, Fy=65 ksi. WWR must lap one full mesh plus 2" at side and end laps, but not less than 6" and shall be wired together. WWR shall be placed in the center of slabs-on-grade or in the center of the concrete thickness above the deck for slabs on form deck, unless noted otherwise. Studrail shear reinforcing shall be made of Low Carbon Steel, C1015 in accordance with ASTM A1044, ASTM A36, and ASTM A29 with a minimum yield of 50,000 psi and a minimum tensile strength of 60,000 psi and a maximum 20% elongation in 2" as manufactured by Decon or Suncoast. The complete and finished studrail shall be ICBO evaluated and all welding must take

. Detail reinforcing elements in accordance with the latest editions of the ACI Detailing Manual and ACI Building Code

concrete shall be lapped in accordance with the "Concrete Reinforcing Tension Lap Splice Length (Class B)" schedule provided in these drawings unless specifically noted otherwise.> 2. Extend and anchor all horizontal bars at corners and intersections to fully develop the bar. All top reinforcing shall terminate with standard hooks at ends of slabs, construction joints, beams, walls, and foundations unless noted otherwise. 3. Continuous bars in walls, beams and grade beams shall be spliced as follows:

1. Provide 2- #5 bars (1 each face) with 2'-0" projection around all openings greater than 10" in any dimension in concrete

2. Dowels for walls and columns shall be the same size and spacing as the wall/column reinforcing, unless noted otherwise. B. Corner bars shall be provided at each mat of horizontal wall reinforcing and shall match horizontal bar size and spacing. 4. All stirrups shall have a minimum of 2- #4 horizontal reinforcing bars provided as spacers when no other horizontal

. <For large cast-in-place projects only> Quote price separately for providing an allowance for additional reinforcing, fabrication and placing of ______ feet of #5 (Grade 60) reinforcing. Reinforcing shall be added to the shop drawings or

STATEMENT OF SPECIAL INSPECTIONS - 2021 IBC

THE ENGINEER OF RECORD. REQUIREMENTS ARE NOTED IN CHARTS PROVIDED ON THE CONSTRUCTION DOCUMENTS, AS WELL AS IN THE SPECIFICATIONS. THE NAMES AND CREDENTIALS OF THE SPECIAL INSPECTORS TO BE USED SHALL BE SUBMITTED TO THE BUILDING OFFICIAL. A. ALL SPECIAL INSPECTORS SHALL BE QUALIFIED TO INSPECT MATERIALS BASED ON CERTIFICATION, TRANING OR EXPERIENCE AS REQUIRED, AND MUST MEET SPECIFICATION STANDARDS. SPECIAL INSPECTOR DUTIES: A. SPECIAL INSPECTOR SHALL REVIEW ALL WORK REQUIRED ON THE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS. COMPLIANCE SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF UNCORRECTED, THEY SHALL BE REPORTED TO THE EOR. SPECIAL INSPECTOR SHALL KEEP A LOG OF ALL NON-COMPLIANCE ITEMS, INCLUDING THOSE NOTED ON STRUCTURAL OBSERVATION REPORTS. SPECIAL INSPECTOR SHALL SUBMIT A FINAL REPORT.

CONTRACTOR DUTIES: CONTRACTOR SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE OWNER AND BUILDING OFFICIAL PRIOR TO THE COMMENCEMENT OF WORK. THE STATEMENT SHALL CONTAIN ACKNOWLEDGEMENT OF THE SPECIAL INSPECTION REQUIREMENTS ON THE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS. B. CONTRACTOR SHALL NOTIFY THE RESPONSIBLE SPECIAL INSPECTOR THAT WORK IS READY FOR INSPECTION A MINIMUM OF 24 HOURS BEFORE SUCH INSPECTION IS REQUIRED. 2. ALL WORK, INCLUDING REPAIRS, SHALL REMAIN ACCESSIBLE AND EXPOSED UNTIL IT HAS BEEN OBSERVED BY THE SPECIAL INSPECTOR. D. CONTRACTOR SHALL PROVIDE CURRENT DRAWINGS AND SPECIFICATIONS TO THE SPECIAL INSPECTOR. THIS INCLUDES ALL STRUCTURAL OBSERVATIONS, REPORTS, AND REPAIR DOCUMENTATION.

E. ALL REPAIRS SHALL BE INSPECTED AT THE COST OF THE CONTRACTOR. NON-COMPLIANCE ITEMS SHALL BE RESOLVED IN A TIMELY MANNER.

TYPE

Inspect reinforcment, including prestressing tendons, and verify placement. Reinforcing bar welding: a. Verify weldability of reinforcing bars other than ASTM A706. b. Inspect single-pass fillet welds, maximum 5/16"; and c. Inspect all other welds. Inspect anchors cast in concrete. Inspect anchors post-installed in hardened concrete members. a. Adhesive anchors installed in horizontally or upwardly inclined orientatations to resist sustained tension loads. b. Mechanical anchors and adhesive anchors not defined in 4.a. Verifying use of required design mix. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the te the concrete. Inspect concrete and shotcrete placement for proper application techniques. Verify maintenance of specified curing temperature and techniques. Inspect prestressed concrete for: a. Application of prestressing forces; and Grouting of bonded prestressing tendons Inspect erection of precast concrete members. For precast concrete diaphragm connections for reinforcement at joints classified as moderate or high deformability elements (in structures assigned to Seismic Design Category C,D,E or F, inspect such connections and reinforcement in the field for : a. Installation of the embedded parts b. Completion of the continuity of reinforcement across joints. c. Completion of connections in the field Inspect installation tolerances of precast concrete diaphragm connctions for compliance with ACI 550.5 Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and for beams and structural slabs.

Inspect formwork for shape, location and dimensions of the concrete member being formed.

RAMP/LANDING AT (E) WALL

SPECIAL INSPECTIONS AND STRUCTURAL TESTING SHALL BE PROVIDED BY A THIRD PARTY AGENCY EMPLOYED BY THE OWNER. SPECIAL INSPECTIONS AND TESTING SHALL BE PROVIDED AS REQUIRED IN CHAPTER 17 OF THE IBC AND BY

B. SPECIAL INSPECTOR SHALL FURNISH SPECIAL INSPECTION REPORTS TO THE ENGINEER OF RECORD, ARCHITECT, CONTRACTOR, OWNER, AND BUILDING OFFICIAL ON A WEEKLY BASIS OR MORE FREQUENTLY. ALL ITEMS NOT IN

SPECIAL INSPECTOR SHALL REINSPECT ALL NON-COMPLIANCE ITEMS UPON REPAIR BY THE CONTRACTOR TO MEET THE CONSTRUCTION DOCUMENTS OR REPAIR BASED ON ENGINEER OF RECORD DIRECTIVES.

SPECIAL INSPECTOR SHALL FURNISH A FINAL LETTER TO THE EOR AT THE COMPLETION OF THE PROJECT STATING THAT ALL INSPECTIONS HAVE BEEN COMPLETED AND ALL DISCREPANCIES HAVE BEEN RESOLVED.

REQUIRED THIRD PARTY SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION - 2021 IBC

	CONTINUOUS	PERIODIC SPECIAL	REFERENCED	IBC
	SPECIAL INSPECTION	INSPECTION	STANDARD	REFERENCE
	-	Х	ACI 318: Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	-
	-	-	AWS D1.4 ACI 318: 26.6.4	-
	-	Х	AWS D1.4 ACI 318: 26.6.4	-
	-	Х	AWS D1.4 ACI 318: 26.6.4	-
	Х	-	AWS D1.4 ACI 318: 26.6.4	-
	-	Х	ACI 318: 17.8.2	-
	-	-		-
	Х	-	ACI 318: 17.8.2.4	-
	-	Х	ACI 318: 17.8.2	-
	-	Х	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2,
emperature of	х	-	ASTM C 172 ASTM C 31 ACI 318: 26.5, 26.12	1908.10
	Х	-	ACI 318: 26.5	-
	-	Х	ACI 318: 26.5.3-26.5.5	-
	-	-		-
	Х	-	ACI 318: 26.10	-
	Х	-	ACI 318: 26.10	-
	-	Х	ACI 318: Ch. 26.9	-
(MDE HDE)			ACI 318: Ch. 26.13.1.3	
	X X X	- -	ACI 550.5	
	-	Х	ACI 318: 26.13.1.3	
rms from	-	X	ACI 318: 26.11.2	-
	-	Х	ACI 318: 26.11.1.2 (b)	

(3) MASONRY LINTEL AT NEW DOOR

-~FIELD VERIFY BELOW GRADE

MECHANICAL EQUIPMENT WIRING	S AND CO	JNNECT	JNS			MECHANICAL STS				
	FURNISHED	SET IN PLACE	WIRED/	FIXTURE CONNECTION SCHEDULE	PIPING SYMBOLS	EQUIPMENT ABBREVIATIONS	PLAN ABBREVIATIONS	PIPING DESIGNATIONS		DUCTWORK LEGEND
ITEM	UNDER	OR MTD. UNDER	CONNECTED UNDER	TAG DESCRIPTION HW CW WASTE VENT	G 90° ELBOW DN	AHU AIR HANDLING UNIT	AAV AIR ADMITTANCE VALVE	HYDRONIC PIPING	SINGLE LINE	DESCRIPTION
			-	BS BAR SINK 1/2" 1/2" 1-1/2" 1-1/2" CS CLOTHES WASHER OUTLET BOX 1/2" 1/2" 1/2" 1 1/2"		AS AIR SEPARATOR	ABV ABOVE	-CS - CONDENSER SUPPLY		90° ELBOW DOWN (ROUND DUCT ONL
1. EQUIPMENT MOTORS AND THERMAL OVERLOADS, RESISTANCE HEATERS.	MD	MD	ED	DF DRINKING FOUNTAIN / WATER COOLER - 1/2" 1-1/2" 1-1/2"	TEE UP	BB BASE BOARD	AFG ABOVE FINISHED GRADE	CR — CONDENSER RETURN		
2 VFD'S, MOTOR CONTROLLERS; MAGNETIC STARTERS, REDUCED VOLTAGE	MD	ED(a)	ED	DM DISH MACHINE ROUGH-IN 3/4" 3/4" 2" 1-1/2"	BUTTERFLY VALVE	BT BUFFER TANK	AUTO AUTOMATIC			ROUND 90° ELBOW UP (ROUND DUCT O
2. STARTERS AND OVERLOAD RELAYS.			ED	DW DISHWASHER ROUGH-IN 1/2" - 2" 1-1/2" FD FLOOR DRAIN - - 2" 1-1/2"	GLOBE VALVE	CC COOLING COIL CH CHILLER	BCS BUILDING CONTROL SYSTEM BDD BACK DRAFT DAMPER			OFFSET TO CHANGE ELEVATION (AT 30° WHEN POSSIBLE)
DISCONNECT SWITCHES (FUSED OR NON-FUSED), HP RATED SWITCHES, 3. THERMAL OVERLOAD SWITCHES AND FUSES AND MANUAL OPERATING	ED(a)	ED(a)	ED	FRIG REFRIG/ICE MAKER BOX - 1/2" -	CHECK VALVE	CP OR P CIRC PUMP	BFG BELOW FINISHED GRADE			D = DROP R = RISE
SWITCHES. PUSHBUTTON STATIONS, PILOT LIGHTS, MULTI-SPEED SWITCHES, FLOAT				FS FLOOR SINK - - 2" 1-1/2"		CT COOLING TOWER	BLDG BUILDING	- FCR - FLOOR COOLING RETURN	\square	ROUND RADIUS ELBOW
 SWITCHES, THERMOSTATS, CONTROL RELAYS, TIMECLOCKS, CONTROL TRANSFORMERS, CONTROL PANELS, MOTOR VALVES, DAMPER ACTUATORS, SOLENOID VALVES, ED AND DE ONITOUES AND INTERLOCKS 	MD	MD	MD(b)	HB HOSE BIB - 3/4 - - HS HAND SINK 1/2" 1/2" 1-1/2" 1-1/2"	BALL VALVE	COH CABINET UNIT HEATER CV CONSTANT VOLUME BOX	C COMMON (OR CLOSED)			
SOLENOID VALVES, EP AND PE SWITCHES AND INTERLOCKS.				KS KITCHEN SINK W/ OR W/O DISPOSAL 1/2" 1/2" 2" 1-1/2"	FLOW BALANCING VALVE	DC DUCT COIL	CA COMBUSTION AIR	GROUND LOOP/GEOTHERMAL SUPPLY GROUND LOOP/GEOTHERMAL RETURN		90° STRAIGHT TEE
5. 120 VOLT POWER FOR BAS PANELS, FIRE PROTECTION AND BOILER CONTROLS.	ED	ED	ED	LAV LAVATORY 1/2" 1/2" 1-1/2" 1-1/2" MSB MOP SERVICE BASIN 3/4" 3/4" 3" 2"	PLUG VALVE IN RISER	DEF DISHWASHER EXHAUST FAN	CC CONTROLS CONTRACTOR CDBBC CONTINUATION DESIGN BUILD			90° CONICAL TEE
6. FIRE/SMOKE DAMPERS AND ELEVATOR VENT DAMPERS.	MD	MD	ED(c)	SH/SHWR SHOWER 3/4" 3/4" 2" 1-1/2"	DRAIN VALVE W/ HOSE END	ECU EVAPORATIVE COOLING UNIT	BY CONTRACTOR CFM CUBIC FEET PER MINUTE (AIR FLOW RATE)	GF GLYCOL FEED	لم	
MD = MECHANICAL DIVISION				SH/TUB SHOWER/BATHTUB 3/4" 2" 1-1/2"	TEMPERATURE CONTROL VALVE (2-WAY)	EF EXHAUST FAN	CIP CAST IN PLACE			45° BRANCH
ED = ELECTRICAL DIVISION				TOB BATHTOB 3/4" 3/4" 2" 1-1/2" SS SERVICE SINK 1/2" 1/2" 3" 2"	PRESSURE REDUCING VALVE	ET EXPANSION TANK	CLG CEILING (OR COOLING)			
				TD TRENCH DRAIN - - 3" 2"		EWH ELECTRIC WATER HEATER	CONC CONCRETE	- HWS(LT) - HEATING WATER SUPPLY (LOW TEMP) - HWR(LT) - HEATING WATER RETURN (LOW TEMP)		45° CONICAL TEE
(a) IF FURNISHED AS PART OF FACTORY-WIRED EQUIPMENT, THEN WIRING AND CO				UR URINAL (BLOWOUT) - 1" 2" 1-1/2" UR URINAL (WASHDOWN) - 3/4" 2" 1-1/2"		F FURNACE	COND CONDENSATE		<mark>≻ →</mark>	SIZE OR SHAPE TRANSITION
 (b) CARRYING FULL LOAD CURRENT FURNISHED BY MD AND WIRED BY ED SHALL B SHOWN ON DRAWINGS OR MUTUAL AGREEMENT IS MADE BETWEEN THE CONTR 	HEY SHALL BE CON BE LOCATED AT THE RACTORS WITH NO	E DEVICE BEING CON	TROL DEVICES TROLLED, UNLESS	OR ORINAL (WASHDOWN) - - 3/4 2 1-1/2 0 UR URINAL (WATERLESS) - - 2" 1-1/2"		FP FAN POWERED BOX	CONN CONNECT (OR CONNECTION)	- RMS - RADIANT FLOOR SUPPLY		
(c) WIRING FROM ALARM CONTACTS TO ALARM SYSTEM BY ED; ALL CONTROL FUN	ICTION WIRING BY I	MD. DUCT DETECTOR	RS FURNISHED BY	WC WATER CLOSET (FLUSH VALVE) - 1" 4" 2"		GF GLYCOL FEEDER	COTG CLEANOUT TO GRADE		≻ +→	ROUND FLEXIBLE DUCT
GENERAL NOTES: THE ABOVE LIST DOES NOT ATTEMPT TO INCLUDE ALL				WC WATER CLOSET (FLUSH TANK) - 1/2" 4" 2" WS WORK SINK 3/4" 3/4" 2" 1-1/2"		H HUMIDIFIER HC HEATING COIL	CW COLD WATER	-SMS- SNOWMELT SUPPLY		
COMPLETE SYSTEM SHALL BE INCLUDED IN THE BASE CONTRACT.						HP HEAT PUMP	DHW DOMESTIC HOT WATER RECIRC			90° ELBOW DN (NEGATIVE PRESSUR
	IS	SUE LOG		1. SIZES SHOWN ARE MINIMUM PIPE SIZES TO A SINGLE FIXTURE. LARGER		HX HEAT EXCHANGER	DN DOWN	STEAM & CONDENSATE PIPING	<u>۲</u>	90° ELBOW DN (POSITIVE PRESSURE
				SIZES MAY BE INDICATED ON PLANS WHERE REQUIRED.	Y AIR VENT Y PRESSURE - TEMP. TAP	MAU MAKE-UP AIR UNIT	DW DOMESTIC WATER	-HPR- HIGH PRESSURE CONDENSATE RETURN		
			/	 MINIMUM DOMESTIC PIPE SIZE TO (2) OR MORE FIXTURES IS 3/4". REV MANUEACTURED'S INSTALLATION INSTRUCTIONS FOR INDIRECT WASTE 	PRESSURE GAUGE W/ PIG TAIL & COCK	MCC MOTOR CONTROL CENTER	(E) EXISTING	MPS		90° ELBOW UP (NEGATIVE PRESSUR
			/	SIZES.	THERMOMETER	MV MIXING VALVE	EA EXHAUST AIR	MPR MEDIUM PRESSURE CONDENSATE RETURN LPS LOW PRESSURE STEAM	\	
<i>#</i> ТІТІ С				4. WASTE AND VENT SIZES SHOWN ABOVE APPLY TO INDIVIDUAL VENTING ONLY. WHERE ALLOWED, INDIVIDUAL VENT CONNECTIONS MAY BE OMITTED OR	VACUUM BREAKER	RF RETURN (OR RELIEF) AIR FAN	EAT ENTERING AIR TEMPERATURE EC ELECTRICAL CONTRACTOR	-LPR - LOW PRESSURE CONDENSATE RETURN		90° ELBOW UP (POSITIVE PRESSURE
				SIZES MAY VARY WHEN CIRCUIT VENTS, COMMON VENTS, WASTE STACK VENTS, WET VENTS, OR COMBINATION DRAIN AND VENT SYSTEMS ARE USED.	STRAINER W/ BLOW-OFF VALVE	RZ RADIANT ZONE	EWT ENTERING WATER TEMPERATURE	PUMPED CONDENSATE	\sim	90° RADIUS ELBOW
M0.0 MECHANICAL COVER SHEET √ M0.1 MECHANICAL SCHEDULES √				ALTERNATIVE VENTING METHODS.	-►► SHOCK ABSORBER	SB SUMP BASIN	EXH EXHAUST		لم ،	
M0.2 MECHANICAL SPECIFICATIONS				5. PROVIDE TRAP PRIMER FOR ALL FLOOR DRAINS AND FLOOR SINKS NOT LOCATED IN FOOD SERVICE AREAS.	HORIZONTAL CLEANOUT	SF SUPPLY FAN	FA FREE AREA			90° RADIUS ELBOW W/TURNING VAN
M2.0 MECHANICAL LOWER LEVEL PLAN $$				6. MINIMUM SIZE FOR WASTE AND VENT PIPING BENEATH SLAB IS 2".	I VERTICAL CLEANOUT Image: Construction of the second secon	SP SUMP PUMP	FBO FURNISHED BY OWNER	PG PROPANE GAS	<u>۲</u>	
MD2.1 MECHANICAL UPPER LEVEL DEMO PLAN √ M2.1 MECHANICAL UPPER LEVEL PLAN √				7. ALL FIXTURES LISTED ARE NOT NECESSARILY USED ON THIS PROJECT.	FLOOR SINK	TMV THERMOSTATIC MIXING VALVE	FCO FLOOR CLEANOUT	LP — LIQUID PROPANE GAS	<u>ر</u>	SQUARE DUCT SPLIT
				8. REFER TO APPLIANCE SCHEDULES (BY OTHERS) FOR ADDITIONAL PLUMBING FIXTURE CONNECTIONS SUCH AS INSTA-HOTS, COFFEE MAKERS, AND	ROOF DRAIN	UH UNIT HEATER	FD FIRE DAMPER	- D - DRAIN PIPE	<u>آ</u> سح	ROUND DUCT SPLIT
				GARBAGE DISPOSALS.	O DECK/ROOF DRAIN ABOVE TC TEMPERATURE CONTROLLER OR SENSOR	VR VARIABLE VOLUME BOX W/ REHEAT VV VARIABLE VOLUME BOX	FFI FOR FURTHER INFORMATION		~	
				 PROVIDE ICE MAKER BOX ROUGH IN W/ 1/2"CW CONNECTION FOR ALL REFRIGERATOR LOCATIONS. 		WH WATER HEATER	GC GENERAL CONTRACTOR		ہ آ_ے	SPLIT BRANCH TAKE-OFF WITH SQUA ELBOW & SPLITTER DAMPER
'\' ISSUED AS PART OF A SET ' NOT PART OF SET				10. DESIGNER TO CONFIRM FLOW RATE OF FLOOR DRAINS, FLOOR SINKS, ETC.			GHX GROUND HEAT EXCHANGER	-FOR-FUEL OIL RETURN	$\dot{\tau}$	SPI IT BRANCH TAKE-OFF WITH RADI
				WITH ACTUAL SIZE REQUIRED.		PLAN SYMBOLS	GPM GALLONS PER MINUTE (WATER FLOW RATE)	FOV-FUEL OIL VENT	\sum	ELBOW & SPLITTER DAMPER
				REFERENCE SAMPLE	STEAM TRAP TEST CHAMBER	CONTROL PANEL/RADIANT MANIFOLD	HW HOT WATER		M	POSITIVE PRESSURE RISER,
				RE ⁻ B/M400 FEI	STEAM TRAP: FT-FLOAT & THERMOSTATIC	CARBON MONOXIDE SENSOR	HWC HOT WATER RECIRC	RS REFRIGERANT SUCTION		
					ID-THERMODYNAMIC IB-INVERTED BUCKET		ILO IN LIEU OF KW KILOWATTS	RL — REFRIGERANT LIQUID		NEGATIVE PRESSURE RISER, TYPICAL RETURN, EXHAUST OR OUTSIDE AIF
				$\left(\begin{array}{c} \\ \\ \\ \end{array} \right) \left(\begin{array}{c} \\ \\ \\ \end{array} \right) \left(\begin{array}{c} \\ \\ \\ \\ \\ \\ \end{array} \right) \left(\begin{array}{c} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$	BP-BALANCED PRESSURE	Image: Second	LAT LEAVING AIR TEMPERATURE	—GWS— GROUND WATER SUPPLY	Ť	
						SP DUCT STATIC PRESSURE SENSOR	LF LINEAR FOOT	GWR		
					NOTES	P ROOM PRESSURE SENSOR	MC MECHANICAL CONTRACTOR		Ĩ●	FIRE DAMPER
				REFER TO:	1. ALL SYMBOLS, ABBREVIATIONS, AND DESIGNATIONS ON LEGEND SHEET ARE NOT NECESSARILY USED ON	PLUMBING/HVAC RISER	MFR MANUFACTURER		- አ ጥ	
					2 THIS DRAWING SET CONSISTS OF DATA GENERATED IN		MOD MOTOR OPERATED DAMPER		۵ ا	SMOKE DAMPER
				ſ]	PART, BY OTHER PARTIES. NOT ALL SYMBOLOGIES AND NOTATION CONVENTIONS OCCURRING IN THIS	SECTION CUT LETTER/SHEET SHOWN ON POINT OF DISCONNECTION	NC NORMALLY CLOSED		<u> </u>	
				PROJECT ALTITUDE	DRAWING SET ARE NECESSARILY DEFINED ON THESE LEGENDS. CONSULT THE ENGINEER IN THE EVENT	POINT OF NEW CONNECTION				WUTON OFERATED DAMPER (MOD)
				XXXX' ABOVE SEA LEVEL	SYMBOLOGY OR NOTATION INTERPRETATION IS REQUIRED.		NO NORMALLY OPEN	F(DRY) ORY FIRE PIPING		MANUAL VOLUME DAMPER, SINGLE BL. DAMPER (SBD) FOR ROUND OR <10" T/
							OA OUTSIDE AIR		<u>لم الم الم الم الم الم الم الم الم الم ا</u>	UPPUSED BLADE DAMPER (OBD) >10" 1
					DUCT/PIPE RISER DESIGNATION KEY	AIR DEVICE DESIGNATION KEY	OBD OPPOSED BLADE VOLUME DAMPER			BACKDRAFT DAMPER
							OSA OUTSIDE AIR			
							RA RETURN AIR	ACID WASTE PIPE		SWOKE DETECTOR
					CH - CHILLED WATER	RE: GRD SCHEDULE.	RE: REFER TO: REQ'D REQUIRED	AV — ACID VENT PIPE	<u>∠^{24x36}</u>	DUCT SIZE: FIRST NUMBER IS PLAN WI
					HW - HEATING WATER G - GAS	# = AIR QUANTITY (CFM) CA = COMBUSTION AIR	REQ'MTS REQUIREMENTS			
					W V - WASTE AND/OR VENT PR - PIPING RISER (MISC TYPES)	EXH = EXHAUST OSA = OUTSIDE AIR	SA SUPPLY AIR	- ST - STORM DRAIN PIPE		
					ST - STORM DRAIN ST(OF) - SECONDARY STORM DRAIN	$A = RETURN$ $12x_{6}$ $XFR = TRANSFER$	SP STATIC PRESSURE	- ST(UF) - STURM DRAIN OVERFLOW 		
						SIZE (INCHES) OR MINIMUM	SS STAINLESS STEEL			
					EA/EXH - EXHAUST AIR OA/OSA - OUTSIDE AIR	FREE AREA REQUIRED IN SQUARE FEET.	TA THROW-AWAY (TRANSFER AIR)			
					PR 203RA-RETURN AIRSA-SUPPLY AIR		UNO UNLESS NOTED OTHERWISE			
							W/ WITH			
						INDICATES AIR	WCO WALL CLEANOUT			
							WRT WITH REGARD TO			
						NOTE:	W/C WATER COOLED			
						FOR STANDARD MODULE SIZE REGISTERS, SIZE GIVEN IS NECK SIZE. REFER TO GRD SCHEDULE FOR MODULE SIZE.	XFR TRANSFER		l	
							Ø DIAMETER			

MECHANICAL EQUIPMENT WIRING	S AND CO	JNNECT	ONS				MECHANICAL 313				
		SET IN PLACE	WIRED/	FIXTURE CONNECTIO	N SCHEDULE	PIPING SYMBOLS	EQUIPMENT ABBREVIATIONS	PLAN ABBREVIATIONS	PIPING DESIGNATIONS		DUCTWORK LEGEND
ITEM	UNDER	OR MTD. UNDER	CONNECTED UNDER	TAG DESCRIPTION	HW CW WASTE VENT	G 90° ELBOW DN	AHU AIR HANDLING UNIT	AAV AIR ADMITTANCE VALVE		SINGLE LINE	DESCRIPTION
			ONDER	BS BAR SINK	1/2" 1/2" 1-1/2" 1/0" 0" 1.1/2"	0	AS AIR SEPARATOR				90° ELBOW DOWN (ROUND DUCT ONI
1. EQUIPMENT MOTORS AND THERMAL OVERLOADS, RESISTANCE HEATERS.	MD	MD	ED	DF DRINKING FOUNTAIN / WATER COOLER	- 1/2" 1-1/2" 1-1/2"		BB BASE BOARD	AFG ABOVE FINISHED GRADE	CONDENSER RETURN		
- VED'S MOTOR CONTROLLERS' MAGNETIC STARTERS, REDUCED VOLTAGE				DM DISH MACHINE ROUGH-IN	3/4" 3/4" 2" 1-1/2"	BUTTERFLY VALVE	BT BUFFER TANK	AUTO AUTOMATIC			ROUND 90° ELBOW UP (ROUND DUCT O
2. STARTERS AND OVERLOAD RELAYS.	MD	ED(a)	ED	DW DISHWASHER ROUGH-IN	1/2" - 2" 1-1/2" - - 2" 1-1/2"	SHUT OFF (BALL, GATE, BUTTERFLY)	CC COOLING COIL	BCS BUILDING CONTROL SYSTEM			
DISCONNECT SWITCHES (FUSED OR NON-FUSED), HP RATED SWITCHES, 3. THERMAL OVERLOAD SWITCHES AND FUSES AND MANUAL OPERATING	ED(a)	ED(a)	ED	FRIG REFRIG/ICE MAKER BOX	- 1/2"		CP OR P CIRC PUMP	BFG BELOW FINISHED GRADE			D = DROP R = RISE
SWITCHES.				FS FLOOR SINK	2" 1-1/2"	FLOW CONTROL VALVE	CT COOLING TOWER	BLDG BUILDING	FCS FLOOR COOLING SUPPLY FCR FLOOR COOLING RETURN		ROUND RADIUS ELBOW
4. TRANSFORMERS, CONTROL PANELS, MOTOR VALVES, DAMPER ACTUATORS,	MD	MD	MD(b)	HB HOSE BIB	- 3/4"		CUH CABINET UNIT HEATER	B/N BETWEEN			
SOLENOID VALVES, EP AND PE SWITCHES AND INTERLOCKS.				KS KITCHEN SINK W/ OR W/O DISPOSAL	1/2 1/2 1-1/2 1-1/2 1/2" 1/2" 2" 1-1/2"	FLOW BALANCING VALVE	DC DUCT COIL	CA COMBUSTION AIR	GLS GROUND LOOP/GEOTHERMAL SUPPLY		90° STRAIGHT TEE
5. 120 VOLT POWER FOR BAS PANELS, FIRE PROTECTION AND BOILER CONTROLS.	. ED	ED	ED	LAV LAVATORY	1/2" 1/2" 1-1/2" 1-1/2"	PLUG VALVE IN RISER	DEF DISHWASHER EXHAUST FAN	CC CONTROLS CONTRACTOR			
				MSB MOP SERVICE BASIN	3/4" 3/4" 3" 2"		EBH ELECTRIC BASEBOARD HEATER	CDBBC CONTINUATION DESIGN BUILD BY CONTRACTOR			90° CONICAL TEE
6. FIRE/SMOKE DAMPERS AND ELEVATOR VENT DAMPERS.	MD	MD	ED(c)	SH/TUB SHOWER/BATHTUB	3/4 3/4 2 1-1/2 3/4" 3/4" 2" 1-1/2"	TEMPERATURE CONTROL VALVE (2-WAY)	EF EXHAUST FAN	CFM CUBIC FEET PER MINUTE (AIR FLOW RATE)			
MD = MECHANICAL DIVISION ED = ELECTRICAL DIVISION				TUB BATHTUB	3/4" 3/4" 2" 1-1/2"	TEMPERATURE CONTROL VALVE (3-WAY)	ERU ENERGY RECOVERY UNIT	CLG CEILING (OR COOLING)			
NOTES:				SS SERVICE SINK	1/2" 1/2" 3" 2" - - 3" 2"		ET EXPANSION TANK	CO CLEANOUT	- HWS(LT) - HEATING WATER SUPPLY (LOW TEMP)		45° CONICAL TEE
(a) IF FURNISHED AS PART OF FACTORY-WIRED EQUIPMENT, THEN WIRING AND CO	NNECTIONS ONLY	BY ED		UR URINAL (BLOWOUT)	- 1" 2" 1-1/2"	VENTURI/FLOW INDICATOR	F FURNACE	CONC CONCRETE COND CONDENSATE	- HWR(LT) - HEATING WATER RETURN (LOW TEMP)		
IF ANY OF THESE DEVICES CARRY THE FULL LOAD CURRENT TO ANY MOTOR TH	IEY SHALL BE CON			UR URINAL (WASHDOWN)	- 3/4" 2" 1-1/2"	PUMP & EQUIPMENT CONNECTOR	FC FAN COIL	CONN CONNECT (OR CONNECTION)	- RMS - RADIANT FLOOR SUPPLY		SIZE OR SHAPE TRANSITION
SHOWN ON DRAWINGS OR MUTUAL AGREEMENT IS MADE BETWEEN THE CONTR	RACTORS WITH NO	CHANGE IN THE CO	ONTRACT PRICE.	UR URINAL (WATERLESS)	2" 1-1/2"		FP FAN POWERED BOX GE GLYCOL FEEDER	CONTR'R CONTRACTOR	- RMR - RADIANT FLOOR RETURN		
(c) WIRING FROM ALARM CONTACTS TO ALARM SYSTEM BY ED; ALL CONTROL FUN- ED, SET IN PLACE BY MD.	CTION WIRING BY M	MD. DUCT DETECTC	RS FURNISHED BY	WC WATER CLOSET (FLUSH TANK)	- 1/2" 4" 2"	PIPE ANCHOR	H HUMIDIFIER	COTG CLEANOUT TO GRADE			
GENERAL NOTES: THE ABOVE LIST DOES NOT ATTEMPT TO INCLUDE ALL C	COMPONENTS. AL	L ITEMS NECESS	ARY FOR A	WS WORK SINK	3/4" 3/4" 2" 1-1/2"	PIPE EXPANSION JOINT	HC HEATING COIL	DHR DOMESTIC HOT WATER RECIRC			90° ELBOW DN (NEGATIVE PRESSUR
				NOTES:			HP HEAT PUMP	DHW DOMESTIC HOT WATER	STEAM & CONDENSATE PIPING		
	ISS			1. SIZES SHOWN ARE MINIMUM PIPE SIZES TO A SIZES MAY BE INDICATED ON PLANS WHERE	A SINGLE FIXTURE. LARGER F REQUIRED	AIR VENT	KEF KITCHEN EXHAUST FAN	DN DOWN	-HPS - HIGH PRESSURE STEAM	\sim	90° ELBOW DN (POSITIVE PRESSURE
MECHANICAL SHEET INDEX				2. MINIMUM DOMESTIC PIPE SIZE TO (2) OR MO	DRE FIXTURES IS 3/4".	PRESSURE - TEMP. TAP	MAU MAKE-UP AIR UNIT	DWR DOMESTIC HOT WATER RECIRC			
				3. RE: MANUFACTURER'S INSTALLATION INSTR	RUCTIONS FOR INDIRECT WASTE	PRESSURE GAUGE W/ PIG TAIL & COCK		(E) EXISTING			90° ELBOW UP (NEGATIVE PRESSUR
				SIZES.		THERMOMETER	P PUMP	EA EXHAUST AIR	- LPS - LOW PRESSURE STEAM		
# TITLE				4. WASTE AND VENT SIZES SHOWN ABOVE APP WHERE ALLOWED, INDIVIDUAL VENT CONNE	PLY TO INDIVIDUAL VENTING ONLY. ECTIONS MAY BE OMITTED OR	Yacuum Breaker	RF RETURN (OR RELIEF) AIR FAN	EC ELECTRICAL CONTRACTOR	- LPR - LOW PRESSURE CONDENSATE RETURN		
				VENTS, WET VENTS, OR COMBINATION DRAI	INMON VENTS, WASTE STACK IN AND VENT SYSTEMS ARE USED. REQUIRED TO USE THESE		RZ RADIANT ZONE	EWT ENTERING WATER TEMPERATURE	PC PUMPED CONDENSATE		90° RADIUS ELBOW
M0.0MECHANICAL COVER SHEET $$ M0.1MECHANICAL SCHEDULES $$				ALTERNATIVE VENTING METHODS.		FLOW SWITCH	SB SUMP BASIN	EXH EXHAUST (F) FUTURE		· ــــــــــــــــــــــــــــــــــــ	
M0.2 MECHANICAL SPECIFICATIONS				 PROVIDE TRAP PRIMER FOR ALL FLOOR DRA LOCATED IN FOOD SERVICE AREAS. 	AINS AND FLOOR SINKS NOT	HORIZONTAL CLEANOUT	SF SUPPLY FAN	FA FREE AREA	-MG- MEDIUM PRESSURE GAS		90° RADIUS ELBOW W/TURNING VAN
M2.0 MECHANICAL LOWER LEVEL PLAN $$				6. MINIMUM SIZE FOR WASTE AND VENT PIPINO	G BENEATH SLAB IS 2".		SP SUMP PUMP	FBO FURNISHED BY OWNER	PG	<u>۲</u>	
MD2.1 MECHANICAL UPPER LEVEL DEMO PLAN √ M2.1 MECHANICAL UPPER LEVEL PLAN √				7. ALL FIXTURES LISTED ARE NOT NECESSARII	ILY USED ON THIS PROJECT.	FLOOR SINK	TMV THERMOSTATIC MIXING VALVE	FCO FLOOR CLEANOUT FCT FOR CONTINUATION	LP — LIQUID PROPANE GAS	<u> </u>	SQUARE DUCT SPLIT
				8. REFER TO APPLIANCE SCHEDULES (BY OTHE FIXTURE CONNECTIONS SUCH AS INSTA-HO	IERS) FOR ADDITIONAL PLUMBING	ROOF DRAIN	UH UNIT HEATER	FD FIRE DAMPER	- D - DRAIN PIPE	→ 1	ROUND DUCT SPLIT
				GARBAGE DISPOSALS.		DECK/ROOF DRAIN ABOVE	VR VARIABLE VOLUME BOX W/ REHEAT	FFI FOR FURTHER INFORMATION			
ISSUE LOG KEY:				 PROVIDE ICE MAKER BOX ROUGH IN W/ 1/2"C REFRIGERATOR LOCATIONS. 	CW CONNECTION FOR ALL		WH WATER HEATER	FSD COMBINATION FIRE/SMOKE DAMPER GC GENERAL CONTRACTOR			SPLIT BRANCH TAKE-OFF WITH SQUA ELBOW & SPLITTER DAMPER
'√' ISSUED AS PART OF A SET ' ' NOT PART OF SET				10. DESIGNER TO CONFIRM FLOW RATE OF FLO	OOR DRAINS, FLOOR SINKS, ETC.			GHX GROUND HEAT EXCHANGER	-FOR- FUEL OIL RETURN	$\left \frac{1}{\gamma} \right $	
'*' ISSUED FOR INFORMATION ONLY				WITH ACTUAL SIZE REQUIRED.			PLAN SYMBOLS	GPM GALLONS PER MINUTE (WATER FLOW RATE)	-FOV-FUEL OIL VENT	بال ح	ELBOW & SPLITTER DAMPER
				REFE	RENCE SAMPLE	STEAM TRAP TEST CHAMBER	CONTROL PANEL/RADIANT MANIFOLD	HP HORSEPOWER HW HOT WATER	FUEL OIL FILL		POSITIVE PRESSURE RISER,
						STEAM TRAP: ET-FL OAT & THERMOSTATIC	CO2 CARBON DIOXIDE SENSOR	HWC HOT WATER RECIRC			TYPICALLY SUPPLY
				RE: B/M400 FFI		TD-THERMODYNAMIC IB-INVERTED BUCKET		ILO IN LIEU OF			NEGATIVE PRESSURE RISER, TYPICAL RETURN, EXHAUST OR OUTSIDE AIF
					FFI = FOR FURTHER INFORMATION	TS-THERMOSTATIC BP-BALANCED PRESSURE	Image: Second	KW KILOWATTS			
							THERMOSTAT	LF LINEAR FOOT		€ F/S	COMBINATION FIRE & SMOKE DAMPE
						NOTES	P ROOM PRESSURE SENSOR	LWT LEAVING WATER TEMPERATURE		Γ	
					DIAGRAM LETTER	1. ALL SYMBOLS, ABBREVIATIONS, AND DESIGNATIONS	EPO EMERGENCY POWER OFF SWITCH	MC MECHANICAL CONTRACTOR MFR MANUFACTURER			FIRE DAMPER
					- REFER TO:	THIS PROJECT.	PLUMBING/HVAC RISER	MOD MOTOR OPERATED DAMPER	-HWC- DHW RECIRCULATION	Τø	SMOKE DAMPER
						2. THIS DRAWING SET CONSISTS OF DATA GENERATED, IN PART, BY OTHER PARTIES. NOT ALL SYMBOLOGIES AND	SECTION CUT LETTER/SHEET SHOWN ON	(N) NEW	-XX° HW- DOMESTIC HOT WATER AT SERVICE TEMP		
					PROJECT ALTITUDE	NOTATION CONVENTIONS OCCURRING IN THIS DRAWING SET ARE NECESSARILY DEFINED ON THESE		NC NORMALLY CLOSED NEC NATIONAL ELECTRIC CODE			MOTOR OPERATED DAMPER (MOD)
					XXXX' ABOVE SEA LEVEL	LEGENDS. CONSULT THE ENGINEER IN THE EVENT SYMBOLOGY OR NOTATION INTERPRETATION IS	ACCESS PANEL	NIC NOT IN CONTRACT	F F F F FIRE LINE	<u>Υ</u>	MANUAL VOLUME DAMPER, SINGLE BL
							SNOWMELT MANIFOLD	NO NORMALLY OPEN	-F(DRY)- DRY FIRE PIPING		DAMPER (SBD) FOR ROUND OR <10" T/ OPPOSED BLADE DAMPER (OBD) >10" T
								OBD OPPOSED BLADE VOLUME DAMPER			BACKDRAFT DAMPER
						DUCT/PIPE RISER DESIGNATION KEY	AIR DEVICE DESIGNATION KEY	OC ON CENTER		$\left \frac{\lambda}{\gamma} \right $	
								OSA OUTSIDE AIR			SMOKE DETECTOR
						PIPING SIDE:		RE: REFER TO:		24x36	
						CH - CHILLED WATER DW - DOMESTIC WATER	RE: GRD SCHEDULE.	REQ'D REQUIRED			DUCT SIZE: FIRST NUMBER IS PLAN WII SECOND NUMBER IS DEPTH.
						HW - HEATING WATER G - GAS	# = AIR QUANTITY (CFM) CA = COMBUSTION AIR	REQ'MTS REQUIREMENTS			
						VV V - WASTE AND/OR VENT PR - PIPING RISER (MISC TYPES) ST - STOPM DRAIN	EXH = EXHAUST $OSA = OUTSIDE AIR$ $RA = DETUDN$	SF SQUARE FOOT (FEET)	- ST (OF) - STORM DRAIN OVERFLOW		
						ST(OF) - SECONDARY STORM DRAIN	12x6 XFR = TRANSFER	SP STATIC PRESSURE	-SD- SECONDARY DRAIN		
						AIR SIDE:	SIZE (INCHES) OR MINIMUM	SS STAINLESS STEEL		· · · · · · · · · · · · · · · · · · ·	
						PR EA/EXH - EXHAUST AIR OA/OSA - OUTSIDE AIR	FREE AREA REQUIRED IN SQUARE FEET.	TYP TYPICAL	CA — CA — COMPRESSED AIR PIPE		
						203 RA - RETURN AIR SA - SUPPLY AIR		UNO UNLESS NOTED OTHERWISE		_ ′	
								W/ WITH			
							INDICATES AIR INLET DEVICE.	WCO WALL CLEANOUT			
								WRT WITH REGARD TO			
							<u>NOTE</u> :	W/C WATER COOLED			
							FOR STANDARD MODULE SIZE REGISTERS, SIZE GIVEN IS NECK SIZE. REFER TO GRD SCHEDULE FOR MODULE SIZE.	XFR TRANSFER		'	1
								Ø DIAMETER			

MECHANICAL SYSTEMS LEGEND

Exhibit A

									FAN	SCHI	EDUL	E				
						FAN			MOT	FOR						
							E	SP					OPER.	MANUFACTURER*		
MARK	SERVICE	TYPE	CFM	DRIVE	RPM	SONES	@ S.L. (IN	@ ALT (IN	MHP (WATT)	VOLT	PHASE	VFD	(LBS)	& MODEL #	ACCESSORIES	REMARKS
							WC)	WC)	,							
	DESTROOM		100	FOM	NIA	0.6	0.0	0.05	47\\\	100	1	V			FV-VS15VK1:	
	RESTROOM	CEILING	100	ECM	NA	0.6	0.3	0.25	47 VV	120	I	Ŷ	-	PANASONIC FV-1115VK3	TIME DELAY	-
			100	ECM	NIA	0.6	0.3	0.25	47\\\	120	1	V			FV-VS15VK1:	
EF-2	JANITOR	CEILING	100	ECIM	NA	0.6	0.5	0.25	47 VV	120	I	T	-	PANASONIC FV-1115VK3	TIME DELAY	-
-	-	_	-	-		_		-	_	-	_	-	-	-	-	-
ALTERNAT	E MANUFACT	URERS:														
*		COOK, GRE	ENHECK,	TWIN CITY,	PENN, BRO	DAN										

NOTES: ALL NOTES ARE NOT NECESSARILY USED ON THE PROJECT

A: B:

							PUN	/IP SCI	HEDUI	E				
									MOTOR					
MARK	SERVICE	TYPE	GPM	TDH (FT)	(IN.)	SIZE (IN.)	FLUID	WATTS	RPM	VOLT	PHASE	& MODEL #	ACCESSORIES	REMARKS
HWP-1	HEATING WATER CIRC	IN-LINE	26	30	1.5	NA	30% PG	474W	VARIES	120	1	GRUNDFOS MAGNA1 40-120 GF	BACK FLOW PREVENTOR	BUILDING AUTOMATION INTERFACE
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALTERNA	TE MANUFAC	TURERS:	•			•		•		•				
*	B&G, TACO,	ARMSTRON	G											
NOTES: A	LL NOTES AR	E NOT NEC	ESSARILY	USED ON TH	E PROJECT.									
A:														
B:														

						DUC	T HEA	ATING		SCH	IEDUL	E (HYI	DRON	IC)		
								F	IEATING C	OIL						
			0.011		AIR	CONDITIC	NS	WATE	R CONDIT	IONS		COIL				
MARK	SERVICE	TYPE	DIMENSION	CFM	E.A.T. DB (°F)	L.A.T. DB (°F)	SENS. MBH	E.W.T. (°F)	L.W.T. (°F)	GPM	FLUID TYPE	MAX. WTR P.D. (FT)	MAX. AIR P.D. (IN.)	& MODEL #	ACCESSORIES	REMARKS
DC-1	RTU-3	INLINE DUCT	18x20	1200	45	95	65	160	130	5	30% P.G.	3	0.1	MODINE HEATCRAFT 4WB	-	2-ROW MINIMUM, DUCT MOUNTED
DC-2	RTU-4	INLINE DUCT	18x20	800	45	95	48	160	130	4	30% P.G.	3	0.1	MODINE HEATCRAFT 4WB	-	2-ROW MINIMUM, DUCT MOUNTED
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ALTERNAT	E MANUFAC	TURERS:												·		
				UBOTEO												

* PRICE, GREENHECK, NAILOR, TITUS, ENVIROTEC

 NOTES: ALL NOTES ARE NOT NECESSARILY USED ON THE PROJECT.

 A:

 B:

	PLUMBING FIXTURE SCHEDULE									
SYMBOL	TYPE	A.D.A.	FINISH	DESCRIPTION	MANUFACTURER* & MODEL #	FAUCET TRIM MFR.* & MODEL #	GPM/GPF	ACCESSORIES	REMARKS	
P1	WATER CLOSET	Y	WHITE	FLOOR MOUNT, FLUSH VALVE	AMERICAN STANDARD MADERA FLOWISE 3461.576	NA	1.6	HEAVY DUTY SEAT; FLUSHVALVE	BATTERY OPERATED; PROVIDE DEDUCT PRICING FOR MANUAL FLUSHVALVE	
P2	LAVATORY	Y	WHITE	WALL HUNG	AMERICAN STANDARD DECORUM 9024.001EC	AMERICAN STANDARD SELECTRONIC 6055.105	0.5	THERMOSTATIC MIXING VALVE	BATTERY OPERATED; PROVIDE DEDUCT PRICING FOR MANUAL FAUCET	
P3	FLOOR DRAIN	Ν	POLISHED BRONZE	FINISH FLOOR DRAIN	ZURN ZB415B	NA	NA	TRAP PRIMER OR TRAP GUARD	-	
P4	DRINKING FOUNTAIN	Y	STAINLESS	WALL HUNG, HIGH/LOW, BOTTLE FILLER	ELKAY LVRCGRNTL8WSK	NA	NA	-	VANDAL-RESISTANT, 120V, 6A	
	-	-	-	-	-	-	-	-	-	
MANUFAC	TURERS:									
FIXTURE:	AMERICAN STAN	DARD, UNIVERSA	AL RUNDLE, F	IAT STERN WILLIAMS						
FAUCET:	SPEAKMAN, DEL	TA, AMERICAN S	TANDARD, CH	ICAGO						
DRAIN:	SIOUX CHIEF, ZU	IRN, JOSAM, WAE	DE, JR SMITH							
GENERAL	NOTES:									
A:										
B:										

SCHEDULE NOTES:

- 1. ALL STARTERS FOR MECHANICAL EQUIPMENT SHALL BE FURNISHED UNDER THIS CONTRACT AND SET IN PLACE AND WIRED BY EC. VFD'S NOT INCLUDED AS PART OF THE EQUIPMENT WIRING PACKAGE SHALL BE FURNISHED BY THE MC, AND SET IN PLACE AND WIRED BY THE EC, U.N.O.
- 2. NOT ALL EQUIPMENT REQUIRED UNDER THIS CONTRACT IS NECESSARILY SPECIFIED ON THE SCHEDULE SHEETS. PLAN & DIAGRAM NOTATIONS AND PROJECT MANUAL CONTAIN EQUIPMENT SPECIFICATIONS AS WELL.
- 3. NOT ALL CAPACITIES, CHARACTERISTICS, AND CONSTRUCTION FEATURES REQUIRED ARE NECESSARILY INDICATED IN THE EQUIPMENT SCHEDULES. RE: PLANS AND SPECIFICATIONS FOR ADDITIONAL REQ'MTS.
- 4. CAPACITIES, CHARACTERISTICS, AND CONSTRUCTION FEATURES OF THE SCHEDULED EQUIPMENT ARE HEREBY INCORPORATED INTO THE PROJECT REQUIREMENTS. EQUIVALENT PRODUCTS PERFORMANCE AND CONSTRUCTION FEATURES SHALL MEET OR EXCEED THAT OF THE SPECIFIED EQUIPMENT WHETHER SCHEDULED OR NOT.
- 5. NOT ALL EQUIPMENT AVAILABLE FROM LISTED "EQUIVALENT" MANUFACTURERS LISTED IS NECESSARILY EQUIVALENT TO THE BASIS OF DESIGN EQUIPMENT SPECIFIED. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ANY COSTS, RESULTANT CHANGES TO OTHER DIVISIONS, AND SPATIAL REQ'MTS FOR EQUIPMENT OTHER THAN SCHEDULED.
- 6. ALL MANUFACTURERS REPRESENTATIVES SHALL READ AND UNDERSTAND THE CONTROL DIAGRAMS AND COORDINATE WITH TCC TO PROVIDE A FULLY FUNCTIONING SYSTEM AS DESCRIBED IN THE CONTROL DIAGRAMS.

FOR ALL DIMENSIONS.

- 4. EXAMINATION OF BIDDING DOCUMENTS.

DRAWINGS AND SPECIFICATIONS.

HIS FAILURE TO MAKE THE WRITTEN REQUESTS AS DESCRIBED ABOVE.

- REQUIREMENTS WITH MECHANICAL AND OTHER WORK.
- 2) PROVIDE ALL FEATURES WHICH ARE STANDARD ON THE BASIS OF DESIGN PLUS ANY SPECIFIED OPTIONS.
- IMPERATIVE. MAKE REASONABLE ALLOWANCES FOR UNSEEN CONDITIONS.
- MAY BE ACCESSIBLE WHEN COMPILING BID.

- NOTED OTHERWISE.
- CONTRACTOR SHALL OBTAIN AND VERIFY EXACT UTILITY COMPANY DRAWINGS AND REQUIREMENTS.

- THE ARCHITECT, OWNER, AND ENGINEER.

- REQUIREMENT SHALL APPLY

- CERTIFICATES OF COMPLETION.

- WORK ARE DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO ADDITIONAL COST TO OWNER.
- COMMISSIONING PROCESS REQUIREMENTS INCLUDE:
- UPON COMPLETION OF CHECKLISTS.
- THE CXA.
- CALIBRATION OF INSTRUMENTS AND CONTROLS. RECOMMENDATIONS.

MECHANICAL SPECIFICATIONS

1. DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK. REFER TO ARCHITECTURAL DRAWINGS

2. ALL SUBCONTRACTORS SHALL BE LICENSED, EXPERIENCED, AND THOROUGHLY KNOWLEDGEABLE IN THEIR RESPECTIVE AREAS OF THE CONSTRUCTION INDUSTRY AND SHALL PERFORM IN A RESPONSIBLE MANNER WITH ESTABLISHED CONSTRUCTION SEQUENCE, SHALL RECOGNIZE THE PRIORITY OF THE CONSTRUCTION DOCUMENTS, AND SHALL INFORM THE PRIME CONTRACTOR OF POTENTIAL PROBLEMS WHEN THE CONSTRUCTION DOCUMENTS ARE UNCLEAR OR INCONSISTENT

3. SUBCONTRACTORS SHALL BE RESPONSIBLE TO NOTIFY THE PRIME CONTRACTOR OF DISCREPANCIES OR CONFLICTS IN THE CONSTRUCTION DOCUMENTS FOUND DURING BIDDING AND/OR PRIOR TO PERFORMING THE WORK.

A. EACH BIDDER SHALL EXAMINE THE BIDDING DOCUMENTS CAREFULLY, AND NOT LATER THAN SEVEN (7) DAYS PRIOR TO THE DATE OF RECEIPT OF BIDS. SHALL MAKE WRITTEN REQUEST TO THE ARCHITECT FOR INTERPRETATION OR CORRECTION OF ANY DISCREPANCIES, AMBIGUITIES, INCONSISTENCIES, OR ERRORS THEREIN WHICH THEY MAY DISCOVER. THE ARCHITECT WILL ISSUE ANY INTERPRETATION OR CORRECTION AS AN ADDENDUM. ONLY A WRITTEN INTERPRETATION OR CORRECTION BY ADDENDUM SHALL BE BINDING. NO BIDDER SHALL RELY UPON INTERPRETATIONS OR CORRECTIONS GIVEN BY ANY OTHER METHOD. IF DISCREPANCIES. AMBIGUITIES. INCONSISTENCIES, OR ERRORS ARE NOT COVERED BY ADDENDUM OR WRITTEN DIRECTIVE, THE CONTRACTOR SHALL INCLUDE IN HIS BID, LABOR MATERIALS AND METHODS OF CONSTRUCTION RESULTING IN HIGHER COST. AFTER AWARD OF CONTRACT, NO ALLOWANCE OR EXTRA COMPENSATION WILL BE MADE ON BEHALF OF THE CONTRACTOR DUE TO

B. FAILURE TO REQUEST CLARIFICATION DURING THE BID PERIOD OF ANY INADEQUACY, OMISSION, OR CONFLICT WILL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES. THE SIGNING OF THE CONTRACT WILL BE CONSIDERED AS IMPLICITLY DENOTING THAT THE CONTRACTOR HAS A THOROUGH COMPREHENSION OF THE FULL INTENT AND SCOPE OF THE CONSTRUCTION CONTRACT

PROVIDE A BASE BID WHICH SHALL INCLUDE ONLY SPECIFIED EQUIPMENT OR EQUIPMENT LISTED AS EQUIVALENT. NO SUBSTITUTIONS FOR THE LISTED EQUIPMENT SHALL BE ALLOWED IN THE BASE BID.

A. THE MANUFACTURER OF EQUIPMENT OR MATERIALS FIRST NAMED ON THE DRAWINGS IS THE BASIS OF DESIGN. OTHER MANUFACTURERS LISTED ARE CONSIDERED GENERAL EQUIVALENTS ONLY.

B. COORDINATION OF GENERAL EQUIVALENTS AND SUBSTITUTIONS: WHERE CONTRACT DOCUMENTS PERMIT SELECTION FROM SEVERAL GENERAL EQUIVALENTS, OR WHERE SUBSTITUTIONS ARE AUTHORIZED, COORDINATE CLEARANCE AND OTHER INTERFACE

1) PROVIDE NECESSARY ADDITIONAL ITEMS SO THAT SELECTED OR SUBSTITUTED ITEM OPERATES EQUIVALENT TO THE BASIS OF DESIGN AND PROPERLY FITS IN THE AVAILABLE SPACE ALLOCATED FOR THE BASIS OF DESIGN.

3) BE RESPONSIBLE FOR ASSURING THAT PIPING, CONDUIT, DUCT, FLUE, AND OTHER SERVICE LOCATIONS FOR GENERAL EQUIVALENTS OR SUBSTITUTIONS DO NOT CAUSE ACCESS, SERVICE, OR OPERATIONAL DIFFICULTIES ANY GREATER THAT WOULD BE ENCOUNTERED WITH THE BASE DESIGN.

6. INASMUCH AS DESIGN FOR REMODEL AND/OR REHABILITATION REQUIRES THAT CERTAIN ASSUMPTIONS BE MADE REGARDING EXISTING CONDITIONS, AND BECAUSE SOME OF THESE ASSUMPTIONS CANNOT BE VERIFIED WITHOUT DESTROYING OTHERWISE ADEQUATE OR SERVICEABLE PORTIONS OF THE BUILDING. THE ENGINEER CANNOT ASSURE THE OWNER OR THE CONTRACTOR THAT THE PROFESSIONAL CONSULTING SERVICES HEREIN ENCOMPASS ALL CONTINGENCIES. FIELD COORDINATION DURING CONSTRUCTION IS

THE EXISTING BUILDING WILL BE OCCUPIED BY THE OWNER DURING CONSTRUCTION. CONTINUED OPERATION OF THE FACILITY SHALL NOT BE HINDERED BY THIS WORK. ACCOUNT FOR ALL ADDITIONAL COSTS WHICH MAY BE INCURRED DUE TO THE DIFFICULTY OF WORKING OVER AND AROUND EMPLOYEES, FURNITURE, EQUIPMENT, ETC.; AND DUE TO THE HOURS OF THE DAY IN WHICH AN AREA

8. BE RESPONSIBLE TO FIELD VERIFY EXISTING EQUIPMENT OR DUCTWORK REMAINING TO BE CONNECTED TO NEW OR EXISTING SYSTEMS. PROVIDE DUCTWORK, PIPING, CONTROLS, DIFFUSERS, ETC., AS REQUIRED TO RESTORE CONTINUITY OF SYSTEM (S), OR TO MAKE NEW WORK MEET EXISTING CONDITIONS, WHETHER INDICATED OR NOT. 9. THE SUBCONTRACTOR SHALL VERIFY EXISTENCE AND LOCATION OF ALL UTILITY SERVICES AND COORDINATE AS REQUIRED BY THEIR RESPECTIVE AREA OF THE CONSTRUCTION, NOTIFYING THE PRIME CONTRACTOR OF VARIATIONS OR CONFLICTS. 10. IF NOT SPECIFICALLY DEFINED IN THESE CONSTRUCTION DOCUMENTS, MATERIALS AND/OR EQUIPMENT SHALL BE IDENTIFIED BY THE SUBCONTRACTOR WITH SUFFICIENT TIME TO ALLOW SELECTION, PURCHASE, AND DELIVERY TO MAINTAIN CONSTRUCTION SCHEDULE. 11. PROVIDE MECHANICAL DEMOLITION AS REQUIRED. REFER TO ARCHITECTURAL DEMOLITION DRAWINGS FOR LOCATION AND EXTENT OF DEMOLITION REQUIRED. VISIT SITE PRIOR TO BID TO DETERMINE EXTENT OF WORK INVOLVED. EXISTING FIXTURES, MECHANICAL

EQUIPMENT, ETC., BEING REMOVED SHALL BE RETURNED TO THE OWNER. DISPOSE OF ALL REMOVED PIPING, DUCTWORK, ETC. UNLESS 12 VERIEV EXACT LOCATIONS OF EXISTING UNDERGROUND UTILITIES PIPING AND RACEWAY SYSTEMS PRIOR TO TRENCHING

13. ALL DUCTWORK, DIFFUSERS, PIPING, FIXTURES, AND EQUIPMENT SHOWN IN LIGHT LINE WEIGHT IS EXISTING AND NEW IS INDICATED BY HEAVIER LINE WEIGHT, EXCEPT WHERE NOTED. PIPES, DUCTWORK, EQUIPMENT, ETC. TO BE REMOVED, ARE SHOWN HATCHED. 14. OFFSET PIPING, DUCTWORK, ETC. AS NECESSARY TO ACCOMMODATE STRUCTURE, BEAMS, COLUMNS, AND EXISTING EQUIPMENT 15. ALL EXISTING SUPPORT RODS AND STRAPS NOW SUPPORTING DUCTS, PIPES, AIR TUBING, ELECTRICAL CONDUIT, ETC. THAT ARE REMOVED TO ALLOW ROOM FOR INSTALLATION OF NEW EQUIPMENT SHALL BE RELOCATED AND REINSTALLED, OR REPLACED IF

16. ALL "CAPPED" SANITARY AND VENT LINES SHALL BE RECONNECTED OR RE-ROUTED AS NECESSARY TO PREVENT "DEAD-ENDS" IN THE PIPING. ALL PIPING SHALL DRAIN TO ACTIVE SANITARY WASTE LINES AND ALL BRANCHES WITH TRAPS SHALL BE ADEQUATELY VENTED. 17. CAP ALL DEMOLISHED AND ABANDONED DUCT TAKE-OFFS AT TRUNK DUCT.

18. WORK SHALL BE PERFORMED IN A PROFESSIONAL MANNER CONSISTENT WITH INDUSTRY STANDARDS AND TO THE SATISFACTION OF 19. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PERFORM HIS/HER WORK IN CONFORMANCE WITH ALL APPLICABLE CODES, ORDINANCES

AND LIFE SAFETY FEATURES AS REQUIRED BY LOCAL. STATE, OR NATIONAL AUTHORITIES. THE CONTRACTOR SHALL VERIFY WITH THE ARCHITECT IF MODIFICATION OF HIS/HER WORK IS REQUIRED FOR COMPLIANCE. 20. ALL WORK OF ALL TRADES MUST BE IN STRICT COMPLIANCE WITH, OR EXCEED THE MINIMUM MATERIAL AND METHOD REQUIREMENTS

OF THE 2021 VERSION OF THE INTERNATIONAL BUILDING MECHANICAL PLUMBING ENERGY CONSERVATION FUEL GASS AND FIRE CODES AND THE 2023 NATIONAL ELECTRICAL CODE, MOST CURRENT NFPA, ALL LOCAL ORDINANCES AND AMENDMENTS AND MANUFACTURER'S INSTALLATION RECOMMENDATIONS. IF A CONFLICT BETWEEN THOSE PUBLICATIONS EXISTS, THE MOST STRINGENT

21. MECHANICAL WORK SHALL CONFORM TO THE FOLLOWING CODES:

ALL LOCAL. CITY, COUNTY. AND STATE CODES AABC - ASSOCIATE AIR BALANCE COUNCIL

ADC - AIR DIFFUSION COUNCIL

AGA - AMERICAN GAS ASSOCIATION

AMCA - AIR MOVING AND CONTROL ASSOCIATION ANSI - AMERICAN NATIONAL STANDARDS INSTITUTE

ASHRAE - AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS

ASME - AMERICAN SOCIETY OF MECHANICAL ENGINEERS

ASTM - AMERICAN SOCIETY OF TESTING MATERIALS AWWA - AMERICAN WATER WORKS ASSOCIATION

NFPA - NATIONAL FIRE PROTECTION ASSOCIATION

OSHA - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

UL - UNDERWRITERS' LABORATORIES

SMACNA - SHEET METAL AND AIR CONDITIONING NATIONAL ASSOCIATION

GVI - GAS VENT INSTITUTE, EDITION 10-A

22. PAY FOR AND SECURE ALL REQUIRED PERMITS AND INSPECTIONS. PRIOR TO FINAL PAYMENT, TURN OVER TO ARCHITECT ALL

23. WARRANTY THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP. THE WARRANTY SHALL BE FOR A PERIOD OF ONE YEAR AFTER THE OWNER'S ACCEPTANCE. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT COST TO THE OWNER.

24. SUBMIT O&M MANUALS WITHIN 90 DAYS OF ACCEPTANCE IN ACCORDANCE WITH DIVISION 1 REQUIREMENTS. IN THE ABSENCE OF DIVISION 1 REQUIREMENTS, O&M MANUALS SHALL INCLUDE: SUBMITTAL DATA STATING SIZES AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, MANUFACTURER'S OPERATING MANUALS AND MAINTENANCE MANUALS WITH REQUIRED ROUTINE MAINTENANCE ACTIONS IDENTIFIED, NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, HVAC CONTROLS AND SYSTEM MAINTENANCE, RECOMMENDED SENSOR CALIBRATION SCHEDULE, WIRING DIAGRAM AND SYSTEM SCHEMATICS, AND A NARRATIVE OF HOW EACH SYSTEM IS TO OPERATE INCLUDING RECOMMENDED SETPOINTS.

25. SUBMIT RECORD DOCUMENTS TO ARCHITECT WITHIN 90 DAYS OF COMPLETION. DOCUMENTS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTING, ETC.

26. SYSTEMS SHALL BE COMPLETE, OPERABLE, AND READY FOR CONTINUOUS OPERATION PRIOR TO ACCEPTANCE BY THE OWNER. 27. SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. PERFORM AT A MINIMUM ALL CODE REQUIRED TESTS OR SYSTEMS. IF TESTS OF

28. THE OWNER WILL ENGAGE A COMMISSIONING AGENT FOR THE PROJECT. THE CONTRACTOR SHALL INCLUDE IN THEIR BID ADEQUATE TIME TO PARTICIPATE IN THE IECC COMMISSIONING PROCESS WITH THE COMMISSIONING AUTHORITY (CXA), COMMISSIONED SYSTEMS INCLUDE HVAC SYSTEMS AND CONTROLS, DOMESTIC HOT WATER HEATING SYSTEMS, AND EXTERIOR LIGHTING CONTROLS.

A. INTEGRATING COMMISSIONING PROCESS ACTIVITIES PROVIDED BY THE CXA INTO THE CONSTRUCTION SCHEDULE. B. ATTENDING A CONSTRUCTION PHASE CONTROL COORDINATION MEETING

C. REVIEW, ACCEPT, AND COMPLETE PRE-FUNCTIONAL CHECKLISTS PROVIDED BY THE CXA. SUBMIT NOTIFICATIONS OF READINESS D. REVIEW, ACCEPT, AND PARTICIPATE IN SYSTEM FUNCTIONAL PERFORMANCE TEST PROCEDURES PROVIDED AND WITNESSED BY

E. EVALUATE PERFORMANCE DEFICIENCIES IDENTIFIED IN TEST REPORTS AND EQUIPMENT INSTALLATIONS, RECOMMEND CORRECTIVE ACTION AND COOPERATE WITH THE CXA FOR RESOLUTION OF ITEMS. . CERTIFY THE WORK IS COMPLETE AND SYSTEMS ARE OPERATIONAL ACCORDING TO THE CONTRACT DOCUMENTS INCLUDING

29. ALL MATERIALS AND/OR EQUIPMENT SHALL BE HANDLED AND INSTALLED AS PER THE MANUFACTURER'S SPECIFICATIONS AND

30. SUBMIT ALL MECHANICAL DIVISION SHOP DRAWING AND PRODUCT DATA AT ONE TIME. PARTIAL SUBMITTALS WILL BE REJECTED.

31. SHOP DRAWING SUBMITTALS SHALL STATE CAPACITIES, SIZES, ETC., OF ALL EQUIPMENT AND SHALL BE CERTIFIED AND INCLUDE COMPUTER BASED PROJECT SPECIFIC SELECTIONS WHERE APPLICABLE. CLEARLY MARK EACH SHOP DRAWING, CATALOG CUT AND/OR SPECIFICATION SHEET TO INDICATE THOSE PRODUCTS AND FEATURES WHICH ARE INTENDED TO BE FURNISHED. SPECIFICALLY INDICATE ANY DEVIATIONS FROM THE DESIGN INTENT. ENGINEER RESERVES THE RIGHT TO REQUIRE CORRECTION AT NO COST TO OWNER FOR DEVIATIONS NOT SPECIFICALLY INDICATED IN THE SUBMITTALS. REVIEW AND APPROVAL OF SHOP DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF FURNISHING EQUIPMENT AND MATERIALS OF PROPER DIMENSION, SIZE, QUANTITY, QUALITY AND ALL PERFORMANCE CHARACTERISTICS TO EFFICIENTLY PERFORM THE REQUIREMENTS AND INTENT OF THE CONTRACT DOCUMENTS. SUBMITTAL SHALL BE BOUND AND INDEXED IN A NEAT AND ORDERLY MANNER.

32. SUBMITTALS SHALL INCLUDE, BUT NOT BE LIMITED TO: EQUIPMENT, FIXTURES, INSULATION, DIFFUSERS, PUMPS, FANS, PIPING, VALVES, COILS, BASEBOARD, BOILERS, FURNACES, CONTROLS, AND FIRE PROTECTION.

33. FAILURE TO ORDER, OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS, EQUIPMENT, OR INSTALLATION METHODS.

34. PROVIDE NECESSARY TRENCHING, BACKFILL, EXCAVATION, SUPPORTS, SAWCUTTING AND PATCHING, CONCRETE/PAVING, ETC., AS REQUIRED. BACKFILL TRENCHES IN 6" LAYERS AND TO 90% COMPACTION AND PATCH TO MATCH EXISTING GRADE.

35. REPAIR ALL ACCIDENTAL OR INTENTIONAL DAMAGE TO MATCH EXISTING CONSTRUCTION WITH NO NOTICEABLE DIFFERENCE IN CONTINUITY, APPEARANCE OR FUNCTION.

36. COORDINATE ALL PENETRATIONS OF THE FLOOR SLAB PRIOR TO COMMENCING WORK. UTILIZE X-RAY AND VISUAL INVESTIGATION OF EXISTING CONDITIONS AS REQUIRED PRIOR TO DRILLING OR CUTTING. COORDINATE ALL NEW PENETRATIONS WITH OTHER DIVISIONS

37. FIRE STOPPING REQUIREMENT. PENETRATIONS THROUGH RATED WALLS AND FLOORS SHALL BE SEALED WITH A MATERIAL CAPABLE OF PREVENTING THE PASSAGE OF FLAMES AND HOT GASSES WHEN SUBJECTED TO THE REQUIREMENTS OF THE TEST STANDARD SPECIFIC FOR FIRE STOPS ASTM-E-814. ACCEPTABLE MATERIALS INCLUDE: DOW CORNING RTV FIRE STOP FOAM FOR BARE PIPE. METAL CONDUIT, AND ELECTRICAL CABLE; 3M FIRE DAM 150 CAULK FOR BARE PIPE, METAL CONDUIT, AND BUILDING CONSTRUCTION GAPS; 3M CP-25 CAULK AND FS-195 INTUMESCENT STRIPS FOR INSULATED PIPES, PLASTIC PIPE OR CONDUIT, AND ELECTRICAL CABLE. SUBMIT UL LISTED APPLICATION DATA FOR EACH TYPE OF PENETRATION ENCOUNTERED.

OF THE WORK. ALL CONTRACTORS ARE INDIVIDUALLY RESPONSIBLE FOR ALL PENETRATIONS REQUIRED BY THEIR DIVISIONS.

38. DUCTS, PIPING, AND CONDUITS PENETRATING THROUGH THE ROOF SHALL HAVE ROOF FLASHING COMPATIBLE WITH THE ROOFING SYSTEM. SEE ARCHITECTURAL DRAWINGS. IN THE ABSENCE OF ANY OTHER REQUIREMENTS, PROVIDE SHEET LEAD TYPE FLASHING FOR PLUMBING VENTS IN BUILT-UP ROOFS, TALL CONE WITH EPDM BOOT FOR PIPE AND CONDUIT IN SINGLE PLY MEMBRANE ROOFS, AND CURBED ROOF PENETRATIONS IN ALL TYPES OF ROOF. INSTALLATION SHALL BE WATERTIGHT.

39. ALL FLOOR DRAINS SHALL BE EQUIPPED WITH TRAP PRIMERS. PROVIDE TRAP PRIMERS WITH BACKFLOW PREVENTERS AND CONNECT TO THE NEAREST COLD WATER PIPING ADJACENT TO A FLUSHING FIXTURE. PROVIDE ELECTRONIC TRAP PRIMERS FOR ANY AREAS WHERE THE NEAREST ADJACENT FLUSHING FIXTURES ARE NOT WITHIN A REASONABLE DISTANCE OR STRUCTURAL OBSTRUCTIONS PREVENT GRAVITY SLOPING OF TRAP PRIMER LINES. THE ADDED COST OF ELECTRIC POWER FOR ELECTRONIC TRAP PRIMERS SHALL BE BORNE BY THE PLUMBING CONTRACTOR. INSTALL ALL TRAP PRIMER VALVES AND ASSOCIATED SYSTEMS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

40. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR ALL CEILING PENETRATIONS AND AIR DEVICE LOCATIONS.

41. COORDINATE ARCHITECTURAL, STRUCTURAL, MECHANICAL, FIRE PROTECTION, ELECTRICAL, AND TECHNOLOGY DESIGN DRAWINGS PRIOR TO INSTALLATION. 42. CAREFULLY VERIFY ELECTRICAL SERVICE VOLTAGE AND PHASE AVAILABLE.

43. MOUNT ALL STATS AT 48" AFF IN "ACCESSIBLE" AREAS, 4'6" AFF IN OTHER AREAS, UNLESS NOTED OTHERWISE. COORDINATE LOCATION

OF ANY CONFLICTS PRIOR TO BEGINNING THERMOSTAT INSTALLATION.

44. SUBMIT A WRITTEN BALANCE REPORT BY A NEBB OR AABC CERTIFIED BALANCING CONTRACTOR IN ACCORDANCE WITH NEBB. TABB. OR AABC STANDARDS. BALANCING PROCEDURES SHALL BE IN ACCORDANCE WITH NEBB OR AABC GUIDELINES FOR PROPORTIONAL BALANCE. SUBMIT REPORT ON STANDARD NEBB FORMS OR SUBMIT FORMS FOR REVIEW PRIOR TO BALANCING. MEASUREMENTS SHALL INCLUDE ALL MOTOR AMPERAGE AND VOLTAGE READINGS: MOTOR AND FAN RPMS: STATIC PRESSURE AT INLET AND OUTLET OF ALL PACKAGED EQUIPMENT, FANS, COILS, AND FILTERS; PITOT TUBE MEASUREMENT OF SUPPLY, EXHAUST, RETURN, AND OUTSIDE AIR MAIN DUCTS. AT MINIMUM OUTSIDE AIR. AND 100% (ECONOMIZER) OUTSIDE AIR: VELOCITY DISTRIBUTION ACROSS THE FACE OF FILTERS: AIR INLET AND OUTLETS; WATER FLOW AT ALL FLOW MEASUREMENT STATIONS; INLET AND OUTLET PRESSURE AT PUMPS WITH FLOW CALCULATED FROM THE PUMP CURVE; WATER FLOW, TEMPERATURE DROP, AND PRESSURE DROP AT ALL COILS.

A. PROVIDE BELTS AND SHEAVES AS REQUIRED FOR DRIVE CHANGES TO ADJUST FAN SPEED. B. ADJUST FLOWS TO WITHIN 10% OF REQUIRED QUANTITY. WHERE ROOM AIR PRESSURE RELATIONSHIP ARE REQUIRED TO BE MAINTAINED AS SHOWN BY A DIFFERENTIAL OF SUPPLY AND EXHAUST/RETURN OR BY NOTE, ADJUST SUPPLY TO WITHIN 10% AND THEN ADJUST EXHAUST/RETURN TO PROVIDE THE INDICATED ROOM PRESSURE. IF ACTUAL QUANTITY IS LESS THAN 90%. INVESTIGATE CAUSE, ATTEMPT TO RECTIFY AND NOTIFY ENGINEER. SUBMITTAL OF BALANCE REPORT WITH LESS THAN REQUIRED FLOWS WITHOUT EXPLANATION IS CAUSE FOR REJECTION OF REPORT.

C. SUBMIT IN ELECTRONIC PDF FORMAT. 45. DUCTWORK:

A. FLEXIBLE DUCTWORK SHALL HAVE AN OUTER JACKET OF FIRE RETARDANT POLYETHYLENE VAPOR BARRIER MATERIAL. UNIFORM LAYER OF FIBERGLASS INSULATION, HIGH-STRENGTH GALVANIZED STEEL HELIX ENCAPSULATED IN REINFORCED "RIP STOP" ALUMINUM LAMINATE INTERIOR CORE, UL LISTED AND LABELED, CLASS 1 AIR DUCT. WORKING PRESSURE RATING: POSITIVE 6", NEGATIVE 4". FLEXMASTER TYPE 5 OR EQUIVALENT. SUBMIT SAMPLES TO DETERMINE EQUIVALENCE.

B. FLEXIBLE CONNECTION: EQUIVALENT TO VENTFAB, FIREPROOF GLASS CLOTH, 10" W.C. RATED. C. ROUND DUCT: SPIRAL SEAM, GALVANIZED STEEL. DIE STAMPED OR 5 GORE ELBOWS. "SNAP-LOCK", LONGITUDINAL SEAM DUCT, OR ADJUSTABLE FITTINGS ARE ACCEPTABLE ON INDIVIDUAL GRILLE/DIFFUSER RUNOUTS ONLY.

D. INSULATION: INTERNALLY LINE ALL RECTILINEAR SUPPLY, OUTSIDE AIR, RETURN AIR DUCTS, EXHAUST AIR RISERS, AND MAKE UP AIR RISERS WITH 1", 1.5 LB/CF, BLACK MATTE COATED INSULATING DUCT LINER, INSULATION CONDUCTIVITY VALUE NOT EXCEEDING 0.27 BTU*IN/(HR*FT^2*F). LINER SHALL BE COATED AND SEALED AND SHALL MEET ASTM C1071. MATERIAL SHALL MEET ALL THE REQUIREMENTS OF NFPA-90. INSTALL WITH ADHESIVE AND WELDED PINS IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS"

2) EXTERNALLY WRAP ALL ROUND SUPPLY AIR DUCTS WITH FLEXIBLE GLASS FIBER. ANSI/ASTM C612: 0.002 INCH FOIL SCRIM FACING. ALL RAW EDGES OF INSULATION SHALL BE NEATLY TRIMMED AND SEALED WITH MASTIC

E. DUCTWORK: G60 GALVANIZED SHEET STEEL: LOCK FORMING QUALITY: CONSTRUCTED TO THE LATEST EDITION OF SMACNA "HVAC DUCT CONSTRUCTION STANDARDS"; +/- 1" WC PRESSURE CLASSIFICATION, SEAL CLASS "B"; WITH GALVANIZED STEEL FASTENERS, ANCHORS, ANGLES, STRAPS, ETC.

F. SEAL ALL SEAMS (LONGITUDINAL AND TRANSVERSE) AIRTIGHT WITH UNITED MCGILL "UNI-GRIP" UL LISTED, WATER BASED, NON-HARDENING, ELASTIC SEALANT OR EQUIVALENT. TAPE NOT ALLOWED.

46. PROVIDE ¼" GALVANIZED MESH SCREEN ON ALL COMBUSTION AIR DUCTS OR OPENINGS, AND ALL OPEN END RETURN AND EXHAUST

47. ALL DUCTWORK DIMENSIONS ARE OUTSIDE SHEET METAL DIMENSIONS. DUCT LINER HAS BEEN ACCOUNTED FOR WITHIN RECTANGULAR DUCTWORK.

48. DUCTWORK NOTES:

A. DIFFUSER NECK SIZE IS SAME AS FLEXIBLE DUCT SIZE.

B. UNLESS OTHERWISE NOTED, ALL CHANGES IN DIRECTION SHALL BE MADE WITH RADIUS ELBOWS WITH RADIUS TO CENTERLINE EQUAL TO 1.5 DUCT WIDTH.

1) WHERE REQUIRED FOR SPACE CONSTRAINTS, PROVIDE SQUARE THROAT ELBOWS WITH SINGLE WIDTH (NON-AIRFOIL) TURNING VANES

2) FOR DUCT DEPTHS OF 36" OR LESS, PROVIDE MANUFACTURED SINGLE WIDTH (NON-AIRFOIL) TURNING VANES, WITH SPACING IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS FOR "STANDARD SPACING". USE DOUBLE THICKNESS BLADES FOR DUCT DEPTHS GREATER THAN 36". USE NO TRAILING EDGES.

C. ALL FLEXIBLE DUCTS SHALL NOT EXCEED EIGHT FEET IN LENGTH. D. RETURN AIR PLENUM: THE HVAC SYSTEM WILL USE THE SPACE ABOVE THE CEILING ON EACH FLOOR AS A RETURN AIR PLENUM. CONFORM TO THE REQUIREMENTS OF NFPA AND LOCAL CODE REQUIREMENTS FOR ALL MATERIAL INSTALLED IN THE RETURN AIR

HVAC UNIT. THE MAXIMUM VELOCITY OF RETURN AIR IN PLENUM SHALL GENERALLY NOT EXCEED 250 FEET PER MINUTE, NOR EXCEED 750 FEET PER MINUTE AT ANY CROSS-SECTION OF THE RETURN AIR PATH. 49. DUCTWORK SPECIALTIES

A. VOLUME AND SPLITTER DAMPERS: GALVANIZED SHEET METAL WITH VENTFABRICS, INC., VENTLOCK OR EQUAL OPERATING HARDWARE. FOR ACCESSIBLE DAMPERS, PROVIDE NO. 620, 635 OR 637 DIAL REGULATORS, NO. 635 OR 637 SQUARE END BEARING, AND NO. 635 SPRING END BEARING, AS APPLICABLE. FOR INACCESSIBLE DAMPERS, PROVIDE NO. 666 CONCEALED DAMPER REGULATOR, WITH PAINTED COVER (COLOR BY ARCHITECT) AND BEARINGS AS ABOVE. FOR MEDIUM PRESSURE DUCTS, PROVIDE NO. 635 HIVEL DIAL REGULATOR AND NO. 609 HIVEL END BEARING FOR ACCESSIBLE DAMPERS.

B. MULTI-LOUVER VOLUME DAMPERS: TITUS AG-35-B OPPOSED BLADE, ANEMOSTAT OR EQUAL. SEE DETAIL REGARDING REMOTE ACCESS TO VOLUME DAMPERS.

C. FIRE-SMOKE DAMPERS: RUSKIN, AIR BALANCE, INC. OR EQUAL, UL LABELED AND IN CONFORMANCE WITH NFPA 90A. ALL DAMPERS TO BE OUT OF AIRSTREAM, TYPE B OR C RATED FOR A MINIMUM OF 1-1/2 HOURS (2 HOURS WHERE NOTED), UL LABEL AND AS APPROVED BY LOCAL AUTHORITIES. MOUNT DAMPERS WITHIN 16-GAGE SLEEVES HELD IN PLACE WITH RETAINING ANGLES. COORDINATE LOCATION OF ACCESS PANELS TO PERMIT EASY ACCESS TO FUSIBLE LINK.

D TURNING VANES FOR LOW PRESSURE DUCTS' SMACNA SMALL DOUBLE VANE PLATE NO. 228 OR EQUAL WITH AIRFOIL BLADES FOR DUCTS 36" OR LESS IN WIDTH; SMACNA FIG. 3.23 FOR DUCTS GREATER THAN 36" WIDE. FOR MEDIUM PRESSURE DUCTS: SMACNA FIG. 3-23.

E. ACCESS PANELS:

1) REINFORCED, GALVANIZED SHEET METAL WITH AIRTIGHT GASKETS RATED FOR PRESSURES AND SERVICE INTENDED. MILCOR OR EQUAL. PROVIDE HINGES AND VENTFABRICS. INC. VENTLOCK LATCHES. 2) DUCT ACCESS PANELS FOR HAND ENTRY ONLY: NO. 90 SASH TYPE LATCH. MINIMUM SIZE: 18" X 18". 3) DUCT AND PLENUM ACCESS DOORS FOR BODY ENTRY: NO. 310 LATCH, OPERABLE FROM BOTH SIDES OF DOOR. MINIMUM SIZE:

4) REFERENCE OTHER SECTIONS FOR CEILING/ WALL ACCESS PANELS. F. BACKDRAFT DAMPERS: PROVIDE COUNTERWEIGHT TYPE BACKDRAFT DAMPERS IN ALL DUCTS OPENING TO THE OUTSIDE RUSKIN MODEL CBS-7 OR APPROVED EQUAL.

50. SUPPORT PIPE WITH ROD AND CLEVIS, RING HANGERS, TRAPEZE, OR CLAMPS. NO PIPE TAPE OR STRAPPING ALLOWED. ALL HANGERS SHALL BE SIZED FOR OD OF INSULATION, IF ANY. PROTECT INSULATED LINES WITH 20 GA SHEET METAL SHIELDS AND PROVIDE CALCIUM SILICATE INSULATION INSERTS FOR ALL INSULATED PIPING MAINTAIN VAPOR BARRIER ON ALL COLD LINES. ISOLATE BARE COPPER LINES FROM HANGERS WITH VIBRASORB OR EQUIVALENT, COPPER COATED HANGERS ARE NOT SUFFICIENT, WRAPPING PIPE WITH TAPE NOT ACCEPTABLE

51. NEW HOT AND COLD WATER BRANCHES TO BE ROUTED FROM NEAREST HOT WATER AND COLD WATER OF LINE SIZE EQUAL TO OR GREATER THAN NEW BRANCH--TYPICAL

52. REFER TO PLUMBING FIXTURE CONNECTIONS SCHEDULE FOR PIPE SIZES TO INDIVIDUAL PLUMBING FIXTURES.

53. PROVIDE SHOCK ARRESTERS AT ALL DOMESTIC HOT AND COLD WATER BRANCHES SERVING FIXTURES AND EQUIPMENT WITH QUICK CLOSING VALVES. SUCH FIXTURES AND EQUIPMENT INCLUDES FLUSH VALVE WATER CLOSETS, DISHWASHERS, ICE MACHINES, AND CLOTHES WASHERS. SHOCK ARRESTERS SHALL BE CONSTRUCTED WITH A PISTON IN A SEALED COPPER TUBE CHAMBER, AND APPROVED FOR INSTALLATION WITHIN WALLS WITHOUT ACCESS PANELS. SIOUX CHIEF OR EQUIVALENT. BELLOWS TYPE NOT ACCEPTABLE.

54. DOMESTIC HOT AND COLD PIPING INSIDE BUILDING--BURIED LINES, TYPE "K" SOFT ANNEALED COPPER WATER TUBE, SINGLE LENGTH TO AVOID FITTINGS, (WROUGHT COPPER FITTINGS WHERE UNAVOIDABLE) AND 1100°F SOLDER. NON-BURIED LINES, TYPE "L" HARD COPPER WATER TUBE, WROUGHT COPPER FITTINGS AND NO LEAD 95-5 SOLDER.

55. COPPER PIPE VALVES AND SPECIALTIES

- A. GATE VALVES BRONZE, CLASS 125, 200 LB. W.O.G. B. BALL VALVES - BRONZE, CLASS 125, 600 LB. W.O.G.
- C. CHECK VALVES BRONZE, CLASS 125, 200 LB. W.O.G.
- ARMSTRONG CBV, GERAND, OR FLOWSET, B&G CIRCUIT SETTER. E. DIRECT UNIONS: FURNISH AND INSTALL A DIELECTRIC UNION AT EACH CONNECTION BETWEEN DISSIMILAR METALS.

WITH WALL FINISH, AND TO AVOID CASEWORK, FURNITURE, DOOR SWINGS, HEAT SOURCES, AND EXTERIOR WALLS. NOTIFY ENGINEER

PLENUM. PROVIDE A COMPLETE RETURN AIR PATH BETWEEN ALL RETURN AIR DEVICES (GRILLES ETC.) AND THEIR RESPECTIVE

D. BALANCING VALVES - 125 PSI W.P. FOR 250 DEGREE FAHRENHEIT SERVICE TIGHT SHUTOFF, TOUR AND ANDERSON STA,

56. MATERIALS; SOIL, WASTE, AND VENT PIPING (INSIDE BUILDING)

60. MATERIALS; HYDRONIC PIPING

- A. LINES BURIED BELOW GROUND: STANDARD WEIGHT, CAST IRON SOIL PIPE, AND FITTINGS. HUB AND SPIGOT WITH NEOPRENE GASKETS. B. LINES BURIED BELOW GROUND: SCHEDULE 40 SOLID CORE PVC PIPE ACCORDING TO ASTM D 2665 DRAIN, WASTE AND VENT AND
- PVC SOCKET FITTINGS ACCORDING TO ASTM D 2665 AND ASTM D 3311 DWV PATTERNS AND TO FIT SCHEDULE 40 PIPE. ASSEMBLED WITH ASTM F 656 ADHESIVE PRIMER AND ASTM D 2564 SOLVENT CEMENT. C. LINES ABOVE GROUND: STANDARD WEIGHT. CAST IRON SOIL PIPE, AND FITTINGS. HUB AND SPIGOT WITH NEOPRENE GASKETS, OR
- NO HUB WITH STANDARD CLAMPS. UP THROUGH 2-1/2" MAY BE STANDARD WEIGHT, GALVANIZED STEEL PIPE WITH BLACK, WROUGHT IRON DRAIN FITTINGS, OR DWV COPPER TUBE WITH DWV FITTINGS AND 95-5 NO LEAD SOLDER.
- 57. PROVIDE EXPANSION JOINTS OR LOOPS ON ALL HEATING WATER PIPING RUNS IN EXCESS OF 50 FEET AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- 58. GRADE AND VALVE ALL HEATING WATER PIPING WITH 3/4" HOSE END VALVES TO PERMIT COMPLETE DRAINAGE OF THE SYSTEM. VENT ALL HIGH POINTS IN EQUIPMENT ROOMS AS NECESSARY WITH AUTOMATIC AIR VENTS PIPED TO CONVENIENT DRAIN. ALL HIGH POINTS IN SYSTEM OUTSIDE OF EQUIPMENT ROOMS WITH COMBINATION AUTOMATIC/MANUAL AIR VENTS AS REQUIRED TO RELIEVE AIR IN THE
- 59. PROVIDE PLASTIC GROMMETS ON ALL HEATING WATER PIPING PASSING THROUGH WOOD JOISTS AND STUDS.
- A. ABOVE GRADE, UP THROUGH 2-1/2": SCHEDULE 40 STEEL PIPE WITH MALLEABLE IRON THREADED FITTINGS, OR TYPE "L" COPPER TUBE WITH WROUGHT COPPER FITTINGS AND 95-5 NO LEAD SOLDER.
- 61. DRAIN AND RECEPTOR PIPING FOR COMBUSTION CONDENSATE--NOT BURIED--TYPE: SCHEDULE 40 SOLID-WALL PVC. PVC FITTINGS, AND PVC CEMENT; BURIED--TYPE: SCHEDULE 80 SOLID-WALL PVC, PVC FITTINGS, AND PVC CEMENT. ALL BURIED PIPE SHALL BE SURROUNDED WITH 4" OF CLEAN SAND. PROVIDE NEUTRALIZATION SYSTEMS AS RECOMMENDED BY COMBUSTION APPLIANCE MANUFACTURER.
- 62. INDOOR PIPING INSULATION INSULATE ALL NEW HEATING WATER, DOMESTIC WATER, DOMESTIC HOT WATER, AND DOMESTIC HOT WATER RECIRCULATION PIPING WITH ULAPPROVED WHITE ALL SERVICE MINERAL FIBER SNAP-ON PIPE INSULATION INSULATE FITTINGS WITH MINERAL FIBER BLANKET INSULATION AND PRE-MOLDED PVC COVERS ALL MATERIALS SHALL HAVE A SMOKE DEVELOPED RATING OF 50 OR LESS AND A FLAME SPREAD RATING OF 25 OR LESS. PROVIDE CALCIUM SILICATE THERMAL INSERT AT HANGERS AND SUPPORTS. INSULATION SHALL PASS UNINTERRUPTED THROUGH HANGERS. VAPOR BARRIERS SHALL BE CONTINUOUS AND SEALED WITH "NON-BREATHING" VAPOR BARRIER MASTIC ON PIPING OPERATING AT TEMPERATURES BELOW AMBIENT. ALL RAW EDGES OF INSULATION SHALL BE NEATLY TRIMMED AND SEALED WITH MASTIC.
- A. INSULATION THICKNESS BELOW BASED ON INSULATION CONDUCTIVITY VALUE NOT EXCEEDING 0.27 BTU*IN/(HR*FT^22*°F): 1) HEATING WATER (LESS THAN 200°F) - NPS 1.25 AND LESS, 1.5" THICK; NPS 1.5 AND GREATER, 2" THICK. RUNOUTS WITHIN 4 FEET OF TERMINAL AND 1" PIPE DIAMETER OR LESS, 1" THICK.
- 2) DOMESTIC HOT WATER (DHW) AND DOMESTIC HOT WATER RECIRCULATION: ALL PIPE SIZES 1" THICK; NON-RECIRCULATED DHW RUNOUTS WITHIN 8 FEET OF FIXTURES - 1/2" THICK.
- 3) DOMESTIC COLD WATER: ALL PIPE SIZES 1/2" THICK.
- 63. CLEAN, STERILIZE, FLUSH, AND FILL ALL NEW SYSTEMS, PRIOR TO STARTUP. INCLUDE LABOR AND MATERIALS FOR FINAL FILL. 64. IDENTIFICATION: LABEL ALL NEW PIPING AND EQUIPMENT. PROVIDE FULL BAND OR STRIP TYPE MARKERS AND FLOW ARROWS ON PIPING. PROVIDE ENGRAVED PLASTIC VALVE TAGS WITH VALVE NUMBER AND ATTACH WITH STANDARD CHAIN OR S-HOOKS. PROVIDE

65. FIRE PROTECTION DESIGN/BUILD REQUIREMENTS:

ENGRAVED PLASTIC SIGN ON OR NEAR SPECIFIED EQUIPMENT

- A. THE FIRE SPRINKLER CONTRACTOR SHALL SERVE AS THE ENGINEER OF RECORD FOR ALL WORK PERFORMED UNDER THIS DIVISION. IF REQUIRED BY THE AUTHORITY HAVING JURISDICTION. (AHJ) SUBMIT COMPLETE FIRE SPRINKLER SYSTEM SHOP DRAWINGS AND HYDRAULIC CALCULATIONS, GENERATED BY CONTRACTOR. SHOP DRAWINGS SHALL BE A MINIMUM 1/8" SCALE, AND SHALL SHOW DEVICE AND APPLIANCE LOCATIONS, BUILDING BACKGROUND INFORMATION, ROOM OCCUPANCY DESCRIPTIONS, DOOR SWINGS FIRE RATINGS AND FIRE PROTECTION SYSTEM LAYOUT AND DETAILS. SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BE SEALED BY A PROFESSIONAL ENGINEER OR NICET III LICENSED TECHNICIAN REGISTERED IN THE STATE OF COLORADO. SUBMIT SHOP DRAWINGS AND HYDRAULIC CALCULATIONS TO THE BUILDING AND FIRE DEPARTMENTS AS A DEFERRED SUBMITTAL AND OBTAIN THEIR APPROVAL BEFORE SUBMISSION TO THE ARCHITECT.
- B. EXTEND THE EXISTING SPRINKLER SYSTEM. ADD NEW SPRINKLER HEADS IN ACCORDANCE WITH NFPA 13, ALL APPLICABLE CODES AND ORDINANCES AND PROJECT REQUIREMENTS TO COMPLETE THE WORK.
- C. SYSTEM SHALL BE INSTALLED COMPLETE AND OPERATIONAL, INCLUDING WATER FLOW INDICATOR, CONNECTIONS TO EXISTING ALARM, DRAIN PIPING, IDENTIFICATION SIGNS, ETC.
- D. WORK SHALL BE PERFORMED BY A QUALIFIED FIRE SPRINKLER INSTALLER WITH A MINIMUM OF FIVE (5) YEARS EXPERIENCE IN SIMILAR INSTALLATIONS.
- E. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO AND DURING INSTALLATION.
- F. PROVIDE AN EXTRA STOCK OF SIX (6) SPRINKLER HEADS, THREE (3) OF EACH TYPE, AND A SPRINKLER WRENCH. SPRINKLER HEADS SHALL MATCH EXISTING IN ADJACENT AREAS.

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	Revisions.	
No	Description	Date
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Issue Dates PERMIT-04/05/2024

Sheet Title: **MECHANICAL** PECIFICATION

2404

Sheet No:

MECHANICAL NOTES:

- 1. RE:M3.1 FOR MECHANICAL DIAGRAMS. 2. THE SPACE ABOVE CEILING IS BEING UTILIZED AS A RETURN AIR PLENUM. ALL RETURN GRILLES SHALL BE PROVIDED WITH SOUND BOOTS AND A DIRECT PATH TO THE AIR HANDLING SYSTEM RETURN DUCT, OPEN TO PLENUM. WHERE FULL HEIGHT WALLS ARE INSTALLED AND THE RETURN AIR PATH IS COMPROMISED, THE SOUND BOOT SHALL EXTEND THROUGH THE WALL OR TRANSFER AIR DUCTS SHALL BE PROVIDED. OTHERWISE, PROVIDE Z- OR U- DUCT TRANSFER THROUGH WALL. TRANSFER DUCTS AND
- SOUND BOOTS SHALL BE LINED SHEET METAL. NON-METAL DUCT NOT PERMITTED.
- 3. MAINTAIN MIN. 3 FT BETWEEN ENVIRONMENTAL EXH TERMINATIONS AND OPENINGS INTO BUILDING. 4. ALL BRANCH HEATING WATER PIPE TO TERMINAL HEATING EQUIPMENT ARE 3/4" PIPE, U.N.O.
- 5. ALL VALVES SHALL BE INSTALLED ABOVE DROP-IN CEILINGS IN ACCESSIBLE LOCATIONS, OR WITH
- ACCESS PANELS IN HARD-LID CEILINGS. 6. REFER TO THE PLUMBING FIXTURE CONNECTION SCHEDULE FOR PIPE SIZES TO INDIVIDUAL FIXTURES.
- 7. NOT ALL REQUIRED CLEANOUTS ARE NECESSARILY SHOWN ON THESE PLANS. PROVIDE CLEANOUTS ON WASTE, VENT AND STORM PIPING AS REQUIRED BY CODE AND FOR REASONABLE MAINTENANCE BASED ON ACTUAL FIELD INSTALLATION. COORDINATE
- 8. INSTALL THERMOSTATIC MIXING VALVES, ASSE 1070 LISTED, AT EACH PUBLIC HANDWASHING LAVATORY/SINK. SIZE TO MATCH HW PIPE SIZE.
- 9. TERMINATE PLUMBING VENTS NOT LESS THAN 18" ABOVE ROOF.

LOCATIONS WITH ARCHITECT/ENGINEER.

DEMOLITION NOTES:

- 1. ADDITIONAL STORM, HYDRONIC, DOMESTIC, WASTE AND VENT PIPING MAY BE ROUTED IN SPACE THAT IS NOT REPRESENTED, BUT IS TO REMAIN. OTHER SYSTEMS MAY EXIST WITHIN THE SPACE THAT ARE NOT REPRESENTED ON THESE DRAWINGS; MODIFICATIONS TO THESE SYSTEMS ARE NOT ANTICIPATED.
- 2. FIELD VERIFY ALL COMPONENTS PRIOR TO DEMOLITION. THE INFORMATION ON THIS SHEET WAS OBTAINED, IN PART, FROM HISTORIC DESIGN DRAWINGS. ONLY PORTIONS OF THE SYSTEMS WERE ACCESSIBLE FOR VISUAL CONFIRMATION DURING DESIGN PROCESS.
- 3. PROVIDE PRELIMINARY TESTING OF EXISTING HYDRONIC SYSTEMS. MEASURE CURRENT FLUID FLOW RATE THROUGH ALL EXISTING COILS, RADIANT, AND SNOWMELT ZONES FOR THE CURRENTLY INSTALLED SYSTEMS. SUBMIT REPORT OF MEASURED VALUES TO ENGINEER FOR REVIEW AND CONFIRMATION OF SYSTEM DESIGN ASSUMPTIONS

PRIOR TO DEMOLITION.

- 4. PROVIDE PRELIMINARY TESTING OF EXISTING HVAC DUCTWORK SYSTEMS. MEASURE CURRENT AIR FLOW RATES AT ALL EXISTING SUPPLY, RETURN, AND EXHAUST REGISTERS. MEASURE TOTAL AIR FLOWS AT MAIN DUCT BRANCHES AND ALL FAN SYSTEMS. SUBMIT REPORT OF MEASURED VALUES TO ENGINEER FOR REVIEW AND CONFIRMATION OF SYSTEM DESIGN ASSUMPTIONS PRIOR TO
- DEMOLITION. 5. (E) WASTE SYSTEM SERVING SPACE IS LOCATED IN THE CEILING OF THE SPACE BELOW.
- 6. REMOVE ALL MECHANICAL ITEMS INDICATED.
- FOR LATER CONNECTION. 8. SEAL ALL OPEN DUCTS DURING CONSTRUCTION TO
- MITIGATE DUST AND DEBRIS FROM SYSTEM. CAP DUCTWORK IN LOCATIONS THAT ARE NOT BEING RECONNECTED.
- 9. REMOVE ALL DEMOLISHED COLD WATER, HOT WATER AND HOT WATER RECIRCULATION PIPING BACK TO BRANCH FROM MAIN TO ELIMINATE ALL DEAD ENDS IN DOMESTIC WATER PIPING.
- 10. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES OF INFORMATION REPRESENTED IN THE DOCUMENTS VERSUS WHAT IS FOUND IN THE FIELD.
- 11. COORDINATE PATCHING AND REPAIRS OF WALLS, CEILINGS AND FLOORS WITH ARCHITECT. 12. PATCH STRUCTURAL OPENINGS IN FLOORS, WALLS AND ROOFS THAT WERE PREVIOUSLY OCCUPIED BY

ENGINEER'S REQUIREMENTS.

7. TEMPORARILY SEAL OR CAP PIPING TO BE RE-USED

SYSTEMS AND EQUIPMENT DEMOLISHED UNDER THIS CONTRACT IN ACCORDANCE WITH STRUCTURAL

1 MECHANICAL UPPER LEVEL PLAN SCALE: 1/4" = 1'-0"

MECHANICAL NOTES:

- 1. RE:M3.1 FOR MECHANICAL DIAGRAMS. 2. THE SPACE ABOVE CEILING IS BEING UTILIZED AS A RETURN AIR PLENUM. ALL RETURN GRILLES SHALL BE PROVIDED WITH SOUND BOOTS AND A DIRECT PATH TO THE AIR HANDLING SYSTEM RETURN DUCT, OPEN TO PLENUM. WHERE FULL HEIGHT WALLS ARE INSTALLED AND THE RETURN AIR PATH IS COMPROMISED, THE SOUND BOOT SHALL EXTEND THROUGH THE WALL OR TRANSFER AIR DUCTS SHALL BE PROVIDED. OTHERWISE, PROVIDE Z- OR U- DUCT TRANSFER THROUGH WALL. TRANSFER DUCTS AND
- SOUND BOOTS SHALL BE LINED SHEET METAL. NON-METAL DUCT NOT PERMITTED.
- TERMINATIONS AND OPENINGS INTO BUILDING. 4. ALL BRANCH HEATING WATER PIPE TO TERMINAL HEATING EQUIPMENT ARE 3/4" PIPE, U.N.O.
- 5. ALL VALVES SHALL BE INSTALLED ABOVE DROP-IN CEILINGS IN ACCESSIBLE LOCATIONS, OR WITH
- ACCESS PANELS IN HARD-LID CEILINGS. 6. REFER TO THE PLUMBING FIXTURE CONNECTION
- 7. NOT ALL REQUIRED CLEANOUTS ARE NECESSARILY SHOWN ON THESE PLANS. PROVIDE CLEANOUTS ON WASTE, VENT AND STORM PIPING AS REQUIRED BY CODE AND FOR REASONABLE MAINTENANCE BASED
- LOCATIONS WITH ARCHITECT/ENGINEER. 8. INSTALL THERMOSTATIC MIXING VALVES, ASSE 1070 LISTED, AT EACH PUBLIC HANDWASHING

ON ACTUAL FIELD INSTALLATION. COORDINATE

9. TERMINATE PLUMBING VENTS NOT LESS THAN 18" ABOVE ROOF.

3. MAINTAIN MIN. 3 FT BETWEEN ENVIRONMENTAL EXH

SCHEDULE FOR PIPE SIZES TO INDIVIDUAL FIXTURES.

LAVATORY/SINK. SIZE TO MATCH HW PIPE SIZE.

BGPROJECTS/11235.00 GSHS ANNEX RENOVATION/CAD/BGCE CAD/11235.00_M3.1.DWG

GENERAL NOTES:

- 1. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT 'AS-BUILT' CONDITIONS. FIELD VERI CONDITIONS PRIOR TO SUBMITTING FINAL BIDS. CAREFULLY COORDINATE NEW WORK AND DEMOLITION WITH ALL OTHER DISCIPLINES AND EXISTIN
- 2. SYSTEM OUTAGES SHALL BE PERMITTED ONLY AT TIMES APPROVED BY OWNER IN WRITING. WORK WHICH COULD RESULT IN AN ACCIDENTAL OUTAGE (BEYOND BRANCH CIRCUITS) SHALL BE PERFORMED WITH THE OWNER'S MAINTENANCE PERSONNEL ADVISED OF SUCH WORK.
- 3. SERVICE SHALL BE MAINTAINED TO EXISTING AREAS DURING CONSTRUCTION. CONTRACTOR SHALL PROVIDE PORTABLE GENERATORS, CABLES, OUTLETS, ETC. AS REQUIRED TO MAINTAIN CONTINUITY OF SERVICE. PLACEMENT OF SUCH PORTABLE EQUIPMENT SHALL BE SUBJECT TO OWNER APPROVAL.
- 4. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE ENGINEER.
- 5. WORK, MATERIALS, AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE, AND NATIONAL CODES AND ORDINANCES.
- 6. SECURE AND PAY FOR ALL PERMITS AND FEES NECESSARY FOR EXECUTION AND COMPLETION OF ELECTRICAL WORK. FURNISH TO THE ARCHITECT A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS.
- 7. CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS, EQUIPMENT, OR INSTALLATION METHODS.
- 8. EXISTING SYSTEMS AND CONDITIONS SHOWN ON DRAWINGS FOR EXISTING BUILDINGS ARE TO BE NOTED "FOR GUIDANCE ONLY". THE ELECTRICAL CONTRACTOR TO FIELD CHECK ALL EXISTING CONDITIONS PRIOR TO BIDDING AND TO INCLUDE IN HIS BID AN ALLOWANCE FOR REMOVAL AND/OR RELOCATION OF EXISTING CONDUITS, WIRES, DEVICES, FIXTURES, OR OTHER EQUIPMENT AS INDICATED ON THE PLANS OR AS REQUIRED TO COORDINATE AND ADAPT NEW AND EXISTING ELECTRICAL
- SYSTEM TO ALL OTHER WORK AS REQUIRED. 9. ALL PENETRATIONS THROUGH FIRE RATED WALLS, FLOORS OR PARTITIONS SHALL BE SEALED TO PREVENT THE SPREAD OF SMOKE AND FIRE THROUGH THEM. THE FIRE RATING OF THE PENETRATION SEAL SHALL AT A MINIMUM BE THE SAME RATING AS THAT OF THE FLOOR OR WALL. REFER TO SPECIFICATIONS FOR ADDITIONAL
- INFORMATION. 10. EXPOSED CONDUIT SHALL BE INSTALLED IN STRAIGHT LINES, PARALLEL WITH OR AT RIGHT ANGLES TO THE BUILDING STRUCTURE. DO NOT LOOP EXCESS FLEXIBLE
- CONDUIT IN CEILING SPACE. 11. PROVIDE A SEPARATE CODE SIZED GREEN EQUIPMENT GROUND CONDUCTOR IN ALL CONDUITS AND RACEWAYS CONTAINING LINE VOLTAGE CIRCUITS. FOR ALL 20A CIRCUITS, EQUIPMENT GROUND CONDUCTOR SIZE SHALL MATCH PHASE CONDUCTOR SIZE. FOR CIRCUITS UPSIZED FOR VOLTAGE DROP INCREASE EQUIPMENT GROUNDING CONDUCTOR SIZE PER CODE.
- 12. THE CONTRACTOR SHALL DO ALL CUTTING AND PATCHING OF THE EXISTING CONSTRUCTION WORK WHICH MAY BE REQUIRED FOR THE PROPER INSTALLATION OF THE ELECTRICAL WORK. ALL PATCHING SHALL BE OF THE SAME MATERIALS, WORKMANSHIP AND FINISH AS, AND SHALL ACCURATELY MATCH ALL SURROUNDING WORK.
- 13. INSTALL ALL MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ANY DEVIATIONS SHALL BE BROUGHT TO THE ARCHITECT/ENGINEER'S ATTENTION PRIOR TO INSTALLATION.
- 14. FINAL CONNECTIONS TO EQUIPMENT SHALL BE IN ACCORDANCE WITH MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS, AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.
- 15. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION, OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.
- 16. UPON COMPLETION OF ALL ELECTRICAL WORK, ELECTRICAL CONTRACTOR SHALL ADJUST AND TEST ALL CIRCUITS AND ANY OTHER ELECTRICAL ITEMS SHALL BE IMMEDIATELY REPAIRED OR REPLACED WITH ALL NEW EQUIPMENT AND THAT PART OF THE SYSTEM SHALL THEN BE RETESTED. ALL SUCH REPLACEMENT OR REPAIR SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER.
- 17. AFTER COMPLETION OF WORK UNDER THIS SECTION, CLEAN-UP ALL RESULTANT DEBRIS FROM THIS WORK AND REMOVE FROM THE SITE. 18. ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L. OR OTHER RECOGNIZED TESTING FACILITY.
- 19. ALL WIRING SHALL BE INSTALLED IN LISTED METALLIC RACEWAYS, UNLESS NOTED OTHERWISE. CONNECTORS SHALL BE INSULATED THROAT TYPE. MINIMUM RACEWAY SIZE IS 3/4". BRANCH CIRCUITS 25A AND LARGER SHALL BE INSTALLED IN INDIVIDUAL RACEWAYS, BRANCH CIRCUITS 20A AND SMALLER MAY BE GROUPED INTO RACEWAYS AS TO NOT EXCEED 6 CURRENT-CARRYING 75-DEGREE CONDUCTORS, OR 9 CURRENT-CARRYING 90-DEGREE CONDUCTORS, IN A SINGLE RACEWAY. METAL CLAD CABLE IS PERMITTED.
- 20. WIRE SHALL BE COPPER, 75 DEGREE CELSIUS RATED FOR GENERAL USE. SIZES INDICATED ARE FOR INSTALLATION IN A MAXIMUM 30 DEGREE CELSIUS AMBIENT. CONDUCTOR AMPACITY SHALL BE DERATED FOR HIGHER AMBIENT INSTALLATIONS.
- 21. PROVIDE NEW UPDATED PANELBOARD DIRECTORIES FOR EXISTING AND NEW CIRCUITS BEING UTILIZED FOR COMPLETION OF PROJECT.
- 22. PANEL DIRECTORIES SHALL BE REMOVABLE. ROOM NAMES AND NUMBERS SHALL BE AS DIRECTED BY OWNER. DIRECTORIES SHALL BE TYPED AND INSTALLED UNDER CLEAR PLASTIC COVERS.
- 23. GUARANTEE THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP WHICH MAY OCCUR UNDER NORMAL USAGE FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT COST TO THE OWNER.
- 24. SYSTEMS SHALL BE COMPLETE, OPERABLE, AND READY FOR CONTINUOUS OPERATION.

BID ALTERNATE PROVIDE LINE ITEM BREAKOUT COST TO TRACE EXISTING BRANCH CIRCUITS AND PROVIDE NEW PANEL DIRECTORIES FOR ALL BRANCH CIRCUIT PANELS.

	MECHANICAL EQUIPMENT SCHEDULE														
MARK	DESCRIPTION	VOLT / PHASE	HP	WATTS	FLA	MCA	FEEDER	SPECIFIC NOTES							
EF-1	EXHAUST FAN	120/1		47			2-#12, #12 GRD								
EF-2	EXHAUST FAN	120/1		47			2-#12, #12 GRD								
HWP-1	HEATING WATER CIRCULATION PUMP	120/1		474			2-#12, #12 GRD								

RIFY ALL EXISTING	
ING CONDITIONS.	

	MECHANICAL EQUIPMENT WIRING	AND CC	NNECTI	ONS
	ITEM	FURNISHED UNDER	SET IN PLACE OR MTD. UNDER	WIRED/ CONNECTED UNDER
1.	EQUIPMENT MOTORS AND THERMAL OVERLOADS, RESISTANCE HEATERS.	MD	MD	ED
2.	VFD'S, MOTOR CONTROLLERS; MAGNETIC STARTERS, REDUCED VOLTAGE STARTERS AND OVERLOAD RELAYS.	MD	ED(a)	ED
3.	DISCONNECT SWITCHES (FUSED OR NON-FUSED), HP RATED SWITCHES, THERMAL OVERLOAD SWITCHES AND FUSES AND MANUAL OPERATING SWITCHES.	ED(a)	ED(a)	ED
4.	PUSHBUTTON STATIONS, PILOT LIGHTS, MULTI-SPEED SWITCHES, FLOAT SWITCHES, THERMOSTATS, CONTROL RELAYS, TIMECLOCKS, CONTROL TRANSFORMERS, CONTROL PANELS, MOTOR VALVES, DAMPER ACTUATORS, SOLENOID VALVES, EP AND PE SWITCHES AND INTERLOCKS.	MD	MD	MD(b)
5.	120 VOLT POWER FOR BAS PANELS, FIRE PROTECTION AND BOILER CONTROLS.	ED	ED	ED
6.	FIRE/SMOKE DAMPERS AND ELEVATOR VENT DAMPERS.	MD	MD	ED(c)

MD = MECHANICAL DIVISION ED = ELECTRICAL DIVISION

NOTES: (a) IF FURNISHED AS PART OF FACTORY-WIRED EQUIPMENT, THEN WIRING AND CONNECTIONS ONLY BY ED

COMPLETE SYSTEM SHALL BE INCLUDED IN THE BASE CONTRACT.

IF ANY OF THESE DEVICES CARRY THE FULL LOAD CURRENT TO ANY MOTOR THEY SHALL BE CONNECTED BY ED. CONTROL DEVICES b) CARRYING FULL LOAD CURRENT FURNISHED BY MD AND WIRED BY ED SHALL BE LOCATED AT THE DEVICE BEING CONTROLLED, UNLESS SHOWN ON DRAWINGS OR MUTUAL AGREEMENT IS MADE BETWEEN THE CONTRACTORS WITH NO CHANGE IN THE CONTRACT PRICE. WIRING FROM ALARM CONTACTS TO ALARM SYSTEM BY ED; ALL CONTROL FUNCTION WIRING BY MD. DUCT DETECTORS FURNISHED BY ED, SET IN PLACE BY MD. GENERAL NOTES: THE ABOVE LIST DOES NOT ATTEMPT TO INCLUDE ALL COMPONENTS. ALL ITEMS NECESSARY FOR A

ISSUE LOG ELECTRICAL SHEET INDEX TITLE ELECTRICAL COVER SHEET E0.0 E0.1 ELECTRICAL SPECIFICATIONS E0.2 TECHNOLOGY SPECIFICATIONS ED2.1 ELECTRICAL UPPER LEVEL DEMO PLAN E2.0 ELECTRICAL LOWER LEVEL PLAN E2.1 ELECTRICAL UPPER LEVEL PLAN LIGHTING UPPER LEVEL PLAN EL2.1 ISSUE LOG KEY: $\sqrt{}$ ' ISSUED AS PART OF A SET ' NOT PART OF SET *' ISSUED FOR INFORMATION ONLY

N.E.C. Load Justification Form PROJECT NAME: GSHS ANNEX ALTERATIONS ENGINEER: MAS ELECTRICAL UTILITY: GS 4/1/2024
 208
 VOLTS

 3
 PHASE

 4
 WIRE

 600
 AMPS
 EXISTING ELECTRICAL SERVICE: 12 MONTH PEAK DEMAND ON THIS ELECTRICAL SERVICE ACCORDING TO UTILITY: 26.67 kW ASSUMING A 0.8 POWER FACTOR, THE MAX kVA IS: 33.34 kVA MAX kVA x 125% PER THE NEC: 41.67 kVA · (kVA FROM LINE 4 x 1000) / VOLTAGE: 115.67 AMPS . LOAD ADDED AS A RESULT OF THE PROJECT: WATER FOUNTAIN COPIER $= \frac{1200}{481} VA$ $= \frac{60}{2160} VA$ LIGHTING EXHAUST FANS (2) RECEPTACLES (12) 12.49 AMPS . TOTAL LOAD ADDED: LOAD REMOVED FROM THE ELECTRICAL SERIVCE AS A RESULT OF THE PROJECT: $= \frac{8000}{1000} V.$ $= \frac{1000}{2700} V.$ $= \frac{2700}{864} V.$ RANG/OVEN MICROWAVE REFRIGERATOR RECEPTACLES (15) LIGHTING = <u>864</u> V = <u>1250</u> V DISPOSAL TOTAL LOAD REMOVED FROM THE ELECTRICAL SERVICE: 41.12 AMPS (ELECTRICAL SERIVCE CAPACITY) - ((AMPS OF EXISTING ELECTRICAL LOAD) + (AMPS OF LOAD ADDED) - (AMPS OF LOAD REMOVED)): 512.96 AMPS OF SPACE CAPACI REMAINING

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3				L	(E) LIGHTING	STAIRS UPPER OFF.	1	20		+		20	1		(E) RECEPT.	201-207				4
5				L	(E) LTG UPPE	R OFF.	1	20			+	20	1		(E) RECEPT 2	205-206				6
7				L	(E) LTG OUTS	SIDE FRONT	1	20	+			20	1		(E) RECEPT.					8
9				L	(E) LTG. 101		1	20		+		20	1		(E) RECEPT.					10
11				L	(E) LTG. 101		1	20			+	20	1		(E) OC-1					12
13				L	(E) LTG 101		1	20	+			20	1		(E) DC-1					14
15				L	(E) LTG 108		1	20		+		20	2							16
17				L	(E) LTG 103-1	04	1	20			+	20	2		(E) EHB					18
19				R	(E) KITCH REC	CEPT WEST	1	20	+			50	0							20
21				R	(E) RECEPT 1	03-104	1	20		+		50	2		(E) HVAC3 CI				22	
23				R	(E) RECEPT. 1	101	1	20			+	20	1		WATER FOU				24	
25				R	(E) RECEPT B	BOARD RM.	1	20	+			20	1		COPIER (1)				26	
27				R	(E) RECEPT 1	08	1	20		+										28
29					(E) EHA		1	20			+	25	3		(E) LOWER E	NTRY CAB HEATER				30
31					(E) PLUGMOL	D	1	20	+											32
33					(E) PLUGMOL	D	1	20		+		45	2		(E) SPARE					34
35					(E) FACP		1	20			+	15	2		(E) SPARE					36
37									+			20	1		(E) SHUNT TR	RIP CKT				38
39					(E) HVAC 3		3	20		+		20	0							40
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(R) REC	EPTACLES		0			0		NEC	220		0	1	C.				
(LM) LR	G. MOTOR		0			0		2	5%		0	1	D.				
(M) MOT	ORS (ALL)		0			0		10	0%		0	1	E.				
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FLUORESCENT STR WALL MOUNTED LIN RECESSED OR SU FIXTURE WITH CEILING MOUNTED I WALL MOUNTED EX WALL MOUNTED CO ◀ → EMERGENCY LIGHTS EXTERIOR POLE MC EXTERIOR POST (B K CEILING FAN CEILING FAN WITH L LIGHTING CONT \$ WALL MOUNTED SW ³ THREE-WAY SWITCH \$⁴ FOUR-WAY SWITCH J DOOR JAMB SWITC SK KEY SWITCH DIMMER SWITCH KX WALL MOUNTED DEV RA ROOM CONTROLLE RL PLUG LOAD CONTRO (O)→ OCCUPANCY/VACAN WIRELESS OCCUPA CEILING MOUNTED HO → OCCUPANCY/VACAN H@ → WIRELESS OCCUPA CORNER MOUNTED DAYLIGHT PHOTO SE

ELECTRICAL SYSTEMS LEGEND

DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER - WALL MOUNTED

POWER SYMBOLS

SINGLE RECEPTACLE - WALL MOUNTED

DUPLEX RECEPTACLE - WALL MOUNTED

QUADPLEX RECEPTACLE - WALL MOUNTED

ISB DUPLEX RECEPTACLE WITH USB PORTS - WALL MOUNTED

LIGH	ITING	FIXTURE SYMBOLS
0	RECESSE	D LIGHTING FIXTURE
O>	DIRECTIO	NAL/ADJUSTABLE RECESSED LIGHTING FIXTURE
Ø	SURFACE	MOUNTED LIGHT
Φ	PENDANT	MOUNTED LIGHT
Ŭ.	WALL MOU	JNTED LIGHT
Ъ	WALL MOU	JNTED UP-LIGHT
⊳	MONO-PO	INT LIGHTING FIXTURE
Ū-	RECESSE	D STEP LIGHT
юн	FLUORES	CENT STRIP LIGHT
ॼ	WALL MOU	JNTED LINEAR FLUORESCENT LIGHT
	RECES	SED OR SURFACE MOUNTED FLUORESCENT TROFFER
		URE WITH EMERGENCY BACKUP OR ON EM CIRCUIT
⊗	CEILING M	OUNTED EXIT SIGN W/ FACES & ARROWS AS SHOWN
€H	WALL MOU	JNTED EXIT SIGN W/ FACES & ARROWS AS SHOWN
₽	WALL MOU	JNTED COMBO EXIT SIGN/ EGRESS LIGHT
₽	EMERGEN	CY LIGHTS
_ 	EXTERIOR	POLE MOUNTED LIGHT
Ø	EXTERIOR	POST (BOLLARD) MOUNTED LIGHT
$\prec X$	CEILING F	AN
	CEILING F	AN WITH LIGHT
LIGH	ITING	CONTROL SYMBOLS
\$	WALL MOU	JNTED SWITCH
\$ ³	THREE-WA	AY SWITCH
\$ ⁴	FOUR-WA	Y SWITCH
\$ ^J	DOOR JAN	IB SWITCH
\$ ^K	KEY SWIT	СН
\$ ^D	DIMMER S	WITCH
$\mathbf{W}^{\mathbf{XX}}$	WALL MOU	JNTED DEVICE
	WIRELESS	WALL MOUNTED DEVICE
RA	ROOM CO	NTROLLER
RL	PLUG LOA	D CONTROLLER
<u>@</u> →	OCCUPAN	CY/VACANCY PROGRAMMED SENSOR - CEILING MOUNTED
	WIRELESS CEILING M	OCCUPANCY/VACANCY PROGRAMMED SENSOR - OUNTED
H⊚ →	OCCUPAN	CY/VACANCY PROGRAMMED SENSOR - CORNER MOUNTED
H@⇒	WIRELESS CORNER M	OCCUPANCY/VACANCY PROGRAMMED SENSOR -
*	DAYLIGHT	PHOTO SENSOR
() (*)	WIRELESS	DAYLIGHT PHOTO SENSOR
LIGH	ITING	DRAWING SYMBOLS
		ALIGNMENT LINE
OBJECT		CENTER LINE DESIGNATION
TAGE:		120/208V, 3PH, 4W
	S:	225
N:		

		DUPLEX RECEPTACLE; GFCI - WALL MOUNTED
	e	DUPLEX RECEPTACLE; HALF SWITCHED - WALL MOUNTED
	e	DUPLEX RECEPTACLE; ISOLATED GROUND - WALL MOUNTED
	₽	DUPLEX RECEPTACLE; HALF DIMMED - WALL MOUNTED
		DUPLEX RECEPTACLE; FULL DIMMED - WALL MOUNTED
	⊘ H	SPECIAL OUTLET AS NOTED - WALL MOUNTED
-	₽	DUPLEX RECEPTACLE - CEILING MOUNTED; TYP. ALL TYPES
-	Ð	FLUSH FLOOR MOUNTED DUPLEX RECEPTACLE; TYP. ALL TYPES
-		FLUSH FLOOR MOUNTED DUPLEX RECEPTACLE AND TELECOM
-	Эн	JUNCTION BOX - WALL MOUNTED
-	J	JUNCTION BOX - FLUSH FLOOR MOUNTED
	J	JUNCTION BOX - CEILING MOUNTED
-		MULTI-OUTLET PLUG STRIP
-		POWER/TELECOM POLE
	$\overline{\ominus}$	MECHANICAL EQUIPMENT POWER CONNECTION
-	$\overline{\bigcirc}$	KITCHEN EQUIPMENT POWER CONNECTION
-	$\overline{\mathbf{\cdot}}$	POOL EQUIPMENT POWER CONNECTION
-	TS	TIMER SWITCH
-	Ъ	FUSED DISCONNECT
-		NON FUSED DISCONNECT
-	X	MOTOR STARTER
-	СВ	ENCLOSED CIRCUIT BREAKER
-	PB	PULL BOX
-	•	PUSH BUTTON
-	ТС	TIME CLOCK
-	<u> </u>	PHOTO-CELL
-	<u> </u>	TRANSFORMER
-	Ż	PANELBOARD OR LOADCENTER
-	С	CONTACTOR
-	$\overline{\mathcal{A}}$	ELECTRIC MOTOR
-	<u></u>	METER
-		THERMOSTAT
-	ATS	AUTOMATIC TRANSFER SWITCH
		CIRCUIT HOMERUN
-		CONDUIT RUN
-		CONDUIT RUN BELOW GRADE
-		
-		CONDUIT DOWN
-	\$	SWITCH
1 -		THERMAL OVERLOAD SWITCH
-	¢V	VARIABLE SPEED SWITCH
-	• ⊀	KEY SWITCH
-		-I INE DIAGRAM SYMBOLS
-		
-		FUSE
-		CIRCUIT BREAKER
-		CURRENT TRANSFORMER
-	ر عد	
-		METER
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1		BUILDING STEEL GROUND CONNECTION

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BEC	-	
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	-	COMMUNITY (CABLE) ANTENNA TELEVISION STSTEM
	-	
	-	
	-	
	-	
	-	GARBAGE DISPOSAL
DW	-	DISHWASHER
(E)	-	EXISTING
EM	-	EMERGENCY
EWC	-	ELECTRIC WATER COOLER
FA	-	FIRE ALARM
FACP	-	FIRE ALARM CONTROL PANEL
FBO	-	FURNISHED BY OTHERS
GC	-	GENERAL CONTRACTOR
GFI	-	GROUND FAULT CIRCUIT INTERRUPTER
GRD	-	GROUND
IAW	-	IN ACCORDANCE WITH
IC	-	INTERMEDIATE CROSS-CONNECT
IDF	-	INTERMEDIATE DISTRIBUTION FRAME
IG	-	ISOLATED GROUND
IR	-	INFRARED
LAN	-	LOCAL AREA NETWORK
MDF	-	MAIN DISTRIBUTION FRAME
(N)	-	NEW
NIC	-	NOT IN CONTRACT
NL	-	NIGHT LIGHT
NTS	-	NOT TO SCALE
ос	-	ON CENTER
PA	-	PUBLIC ADDRESS
RFF	-	REFRIGERATOR
SPD	_	
ог <i>В</i>	_	
' TTB	_	
TV99	-	
	-	
	-	
	-	
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V	-	
W	-	
WAN	-	WIDE AREA NETWORK
WAP	-	WIRELESS ACCESS POINT
WLAN	-	WIRELESS LOCAL AREA NETWORK
WP	-	WEATHERPROOF
XP	-	EXPLOSIONPROOF
+18"	-	MOUNTING HEIGHT TO CENTERLINE OF DEVICE ABOVE FINISH FLOOR (VERIEV W/ ARCH FLE

NOTES:

- LIGHT LINEWEIGHT INDICATES EXISTING.
- HATCHED AREAS INDICATE DEMOLITION.
- 'C' ADJACENT TO A DEVICE INDICATES MOUNTING ABOVE COUNTERTOP.

▲ EXISTING ELECTRICAL ONE-LINE DIAGRAM SCALE: NONE

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TRANSFORMER

AUTOMATIC TRANSFER SWITCH

NOTE: ALL SYMBOLS SHOWN ON LEGEND ARE NOT NECESSARILY USED.	
ON SYSTEM	
GOR	
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Exhibit A

BG BUILDINGWORKS systems fulfilled ALBUQUERQUE | AVON | DENVER | FORT COLLINS

SECTION 26 00 10 - GENERAL PROVISIONS SHALL BE FOLLOWED. PART 1 - GENERAL 2.03 BID ALTERNATE(S) A. REFER TO DIVISION 1 FOR ADDITIONAL INFORMATION. 1.01 PROJECT DESCRIPTION B. ALTERNATE(S) FOR MATERIAL AND EQUIPMENT A. THIS PROJECT IS A REMODEL OF A HIGH SCHOOL ANNEX BUILDING. THE RENOVATION PROJECT IS APPROXIMATELY 3,400 SQUARE FEET 1. EQUIPMENT AND MATERIAL BID ALTERNATE(S) SHALL BE PROPOSED AS ADDITIVE OR DEDUCTIVE ALTERNATE(S) TO SPECIFIED ITEMS BY LOCATED AT THE SECOND FLOOR OF THE GLENWOOD SPRINGS HIGH SCHOOL ANNEX BUILDING IN GLENWOOD SPRINGS, COLORADO. SUBMITTING IT AS A SEPARATE LINE ITEM FROM THE BASE BID ON THE BIDDER'S LETTERHEAD. 1.02 PROVISIONS 2. SUCH BID ALTERNATE PROPOSALS SHALL NOT BE SUBSTITUTED OR INCLUDED IN THE BASE BID. BID ALTERNATE PROPOSAL(S) MUST BE ACCOMPANIED BY FULL DESCRIPTIVE DATA ON THE PROPOSED EQUIPMENT, TOGETHER WITH A STATEMENT OF THE COST TO BE ADDED OR A. WORK PERFORMED UNDER THIS DIVISION OF THE SPECIFICATIONS SHALL CONFORM TO THE REQUIREMENTS OF DIVISION 1, AND THE DEDUCTED FOR EACH ITEM. THE BID ALTERNATE SHALL INCLUDE ALL MATERIALS, EQUIPMENT, LABOR, CONNECTIONS, COORDINATION WITH ELECTRICAL DRAWINGS AND ALL ITEMS HEREINAFTER SPECIFIED. ALL OTHER TRADES, ETC. FOR A COMPLETE AND OPERATIONAL SYSTEM. 1. THE DRAWINGS AND SPECIFICATIONS FOR THE ELECTRICAL WORK ARE INTENDED TO DESCRIBE A COMPLETE ELECTRICAL SYSTEM; 3. THE CONTRACTOR SHALL SUBMIT THE BID ALTERNATES AT THE TIME THE BASE BIDS ARE DUE. OMISSION OF MINOR ITEMS OBVIOUSLY NECESSARY TO ACCOMPLISH THE ABOVE INTENT SHALL NOT RELIEVE THE CONTRACTOR FROM PROVIDING SAME 2.04 SUBSTITUTIONS 2. PRIOR TO ANY WORK BEING PERFORMED UNDER THIS DIVISION EXAMINE ARCHITECTURAL AND MECHANICAL DRAWINGS AND SPECIFICATIONS AND IF ANY DISCREPANCIES OCCUR BETWEEN THEM AND THE ELECTRICAL DRAWINGS AND SPECIFICATIONS, REPORT A. BIDDER'S CHOICE: MATERIAL OR EQUIPMENT LISTED BY SEVERAL MANUFACTURERS' NAMES ARE INTENDED TO BE BIDDER'S CHOICE, AND ANY SAME TO THE ARCHITECT IN WRITING AND OBTAIN WRITTEN INSTRUCTIONS FOR THE WORK. OF THE LISTED MANUFACTURERS MAY BE USED IN THE BASE BID 3. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC BUT SHALL BE FOLLOWED AS CLOSELY AS ACTUAL CONSTRUCTION OF THE BUILDING WILL B. PERFORMANCE SPECIFICATIONS: WHEN ANY ITEM IS SPECIFIED BY REQUIREMENTS TO MEET A PERFORMANCE, INDUSTRY OR REGULATING PERMIT. ALL CHANGES FROM DRAWINGS NECESSARY TO MAKE THE ELECTRICAL WORK CONFORM TO THE BUILDING AS CONSTRUCTED BODY STANDARD, OR IS SPECIFIED BY A GENERIC SPEC, (NO MANUFACTURER'S NAME LISTED) NO PRIOR REVIEW BY THE ENGINEER IS NEEDED SHALL BE MADE WITHOUT COST TO THE OWNER. UNLESS SPECIFICALLY CALLED FOR IN THESE SPECIFICATIONS. 4. COORDINATE THE ELECTRICAL WORK WITH THE GENERAL CONTRACTOR AND BE RESPONSIBLE TO HIM FOR SATISFACTORY PROGRESS OF C. CONTRACTOR TO BE RESPONSIBLE FOR ANY CHANGES AND COSTS TO ACCOMMODATE ANY EQUIPMENT EXCEPT THE FIRST NAMED IN THE SAME. COORDINATE ELECTRICAL WORK WITH ALL OTHER TRADES ON THE PROJECT WITHOUT COST TO THE OWNER. SPECIFICATION 5. DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS ON ARCHITECTURAL DRAWINGS AND IN FIELD PRIOR TO COMMENCEMENT OF WORK. D. SUBSTITUTIONS OF MATERIAL (CONTRACTOR AND OWNER INITIATED) 6. ALL WORK AND MATERIALS COVERED BY DRAWINGS AND SPECIFICATIONS SHALL BE SUBJECT TO REVIEW AT ANY TIME BY 1. OTHER ITEMS OF MATERIAL AND EQUIPMENT NOT LISTED AS EQUIVALENTS MAY BE OFFERED (AT THE CONTRACTOR'S OPTION) AS REPRESENTATIVES OF THE ARCHITECT AND OWNER. IF THE ARCHITECT OR OWNER'S AGENT FINDS ANY MATERIAL OR INSTALLATION THAT SUBSTITUTIONS TO SPECIFIED ITEMS BY SUBMITTING IT AS A SEPARATE PRICE WITH HIS BASE BID ON THE BIDDER'S LETTERHEAD DOES NOT CONFORM TO THESE DRAWINGS AND SPECIFICATIONS, CONTRACTOR SHALL REMOVE THE MATERIAL FROM THE PREMISES AND 2. SUCH SUBSTITUTE PROPOSALS SHALL NOT BE INCLUDED UNDER THE BASE BID AND MUST BE ACCOMPANIED BY FULL DESCRIPTIVE DATA CORRECT THE INSTALLATION TO THE SATISFACTION OF THE AGENT. ON THE PROPOSED EQUIPMENT, TOGETHER WITH A STATEMENT OF THE COST TO BE DEDUCTED FOR EACH ITEM AND ALL DEVIATIONS FROM SPECIFIED ITEMS HIGHLIGHT ALL DIFFERENCE FROM SPECIFIED FOUIPMENT. IF ANY SUCH SUBSTITUTIONS ARE TO BE CONSIDERED. 7. IN ACCEPTANCE OR REJECTION OF INSTALLED ELECTRICAL SYSTEMS, NO ALLOWANCE WILL BE MADE FOR LACK OF SKILL ON THE PART OF THE CONTRACTOR SHALL SUBMIT A LIST OF THE PROPOSED SUBSTITUTION ITEMS WITHIN 14 DAYS OF AWARD OF CONTRACT. LATE THE INSTALLERS REQUESTS FOR PROPOSED SUBSTITUTIONS SHALL NOT BE ACCEPTED BY THE ENGINEER DUE TO SCHEDULING OR DELIVERY CONCERNS. 1.03 WORK INCLUDED 3. IF SUBSTITUTIONS ARE REJECTED, ELECTRICAL CONTRACTOR SHALL SUPPLY BASE BID ITEM AS SPECIFIED. A. THE ELECTRICAL SYSTEM REQUIRED FOR THIS WORK TO INCLUDE, BUT IS NOT NECESSARILY LIMITED TO: 2.05 PRODUCT HANDLING 1. COMPLETE BRANCH CIRCUIT WIRING FOR LIGHTING, MOTORS, RECEPTACLES, JUNCTION BOXES, AND SIMILAR USES. A. USE ALL MEANS NECESSARY TO PROTECT ELECTRICAL SYSTEM MATERIALS BEFORE, DURING AND AFTER INSTALLATION AND TO PROTECT THE 2. LIGHTING FIXTURES, WALL SWITCHES, RECEPTACLES AND SIMILAR ITEMS. INSTALLED WORK AND MATERIALS OF ALL OTHER TRADES 3. LIGHTING CONTROL SYSTEM. B. IN THE EVENT OF DAMAGE, IMMEDIATELY MAKE ALL REPAIRS AND REPLACEMENTS NECESSARY TO THE APPROVAL OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER 4. CONDUITS AND BOXES FOR DATA SYSTEM. C. UPON COMPLETION OF ALL INSTALLATIONS LAMPING AND TESTING THOROUGHLY INSPECTALL EXPOSED PORTIONS OF THE FLECTRICAL 5. FIRE ALARM SYSTEM AS REQUIRED BY NATIONAL, STATE, AND LOCAL CODES. INSTALLATION AND COMPLETELY REMOVE ALL EXPOSED LABELS, SOIL, MARKINGS, AND FOREIGN MATERIALS. 6. BRANCH CIRCUITS FOR WATER FOUNTAINS. PART 3 - EXECUTION 7. DISCOVERY AND DOCUMENTATION OF EXISTING BRANCH CIRCUITS FOR BUILDINGS. (ADD ALTERNATE) 3.01 WORKMANSHIP AND COMPLETION OF INSTALLATION 1.04 CODES AND STANDARDS A. CONTRACTOR'S PERSONNEL AND SUBCONTRACTORS SELECTED TO PERFORM THE WORK SHALL BE WELL VERSED AND SKILLED IN THE TRADES A. THE APPLICABLE AND ENFORCED EDITIONS OF THE FOLLOWING CODES AND PUBLISHED STANDARDS (INCLUDING SUPPLEMENTS AND OFFICIAL INVOLVED. INTERPRETATIONS) ARE MINIMUM REQUIREMENTS: B. COORDINATE ELECTRICAL EQUIPMENT AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS. 1. NFPA 70 - NATIONAL ELECTRICAL CODE (NEC). C. SEQUENCE, COORDINATE, AND INTEGRATE INSTALLATIONS OF ELECTRICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK 2. NFPA 72 - NATIONAL FIRE ALARM CODE. GIVE PARTICULAR ATTENTION TO LARGE EQUIPMENT REQUIRING POSITIONING PRIOR TO CLOSING-IN THE BUILDING NFPA 101 - LIFE SAFETY CODE. D. ANY CHANGES OR DEVIATIONS FROM THE DRAWINGS AND SPECIFICATIONS MUST BE ACCEPTED IN WRITING BY THE ARCHITECT/ENGINEER. ALL 4. COLORADO DEPARTMENT OF HEALTH "RULES AND REGULATIONS GOVERNING SCHOOLS IN THE STATE OF [COLORADO]" ERRORS IN INSTALLATION SHALL BE CORRECTED AT THE EXPENSE OF THE CONTRACTOR. ALL SPECIALTIES SHALL BE INSTALLED AS DETAILED ON THE DRAWINGS. WHERE DETAIL OR SPECIFIC INSTALLATION REQUIREMENTS ARE NOT PROVIDED, MANUFACTURER'S RECOMMENDATIONS 5. CONFORM TO ALL APPLICABLE STATE AND LOCAL CODES SHALL BE FOLLOWED 6. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI). E. UPON COMPLETION OF WORK, ALL EQUIPMENT AND MATERIALS SHALL BE INSTALLED COMPLETE. THOROUGHLY CHECKED, CORRECTLY ADJUSTED, AND LEFT READY FOR INTENDED USE OR OPERATION. ALL WORK SHALL BE THOROUGHLY CLEANED AND ALL RESIDUE SHALL BE 7. NATIONAL ELECTRICAL SAFETY CODE (NESC). REMOVED FROM SURFACES. EXTERIOR SURFACES OF ALL MATERIAL AND EQUIPMENT SHALL BE DELIVERED IN A PERFECT, UNBLEMISHED 8. AMERICANS WITH DISABILITIES ACTS (ADA) AND AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) 117. 9. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA) F. CONTRACTOR SHALL PROVIDE A COMPLETE INSTALLATION, INCLUDING ALL REQUIRED LABOR, MATERIAL, CARTAGE, INSURANCE, PERMITS, AND 10. UNDERWRITER'S LABORATORIES (UL). 11. INSULATED CABLE ENGINEERS ASSOCIATION (ICEA) 3.02 PROGRESS OF WORK 12. INTERNATIONAL BUILDING CODE. A. ORDER THE PROGRESS OF ELECTRICAL WORK TO CONFORM TO THE PROGRESS OF THE WORK OF THE OTHER TRADES. COMPLETE THE ENTIRE INSTALLATION AS SOON AS THE CONDITION OF THE BUILDING WILL PERMIT. ANY COST RESULTING FROM DEFECTIVE OR ILL-TIMED 13. INTERNATIONAL MECHANICAL CODE. WORK PERFORMED UNDER THIS SECTION SHALL BE BORNE BY THIS CONTRACTOR. 14. INTERNATIONAL FIRE CODE. 3.03 CUTTING AND PATCHING 15. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE). A. PROVIDE ALL CUTTING, TRENCHING, BACKFILLING, PATCHING AND REFINISHING OR RESURFACING REQUIRED FOR ELECTRICAL WORK IN A 16. SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA). MANNER MEETING THE APPROVAL OF THE ENGINEER AND AT NO ADDITIONAL COST TO THE OWNER. B. COMPLY WITH REQUIREMENTS OF UNDERWRITERS LABORATORIES FOR ALL ITEMS INSTALLED FOR WHICH U.L. STANDARDS HAVE BEEN B. ALL OPENINGS MADE IN FIRE-RATED WALLS, FLOORS, OR CEILINGS SHALL BE PATCHED AND MADE TIGHT IN A MANNER TO CONFORM TO THE ESTABLISHED. RE RATING FOR THE SURFACE PENETRATED C. THE DRAWINGS AND SPECIFICATIONS TAKE PRECEDENCE WHEN THEY ARE MORE STRINGENT THAN CODES, STATUTES, OR ORDINANCES IN EFFECT. APPLICABLE CODES, ORDINANCES, STANDARDS AND STATUTES TAKE PRECEDENCE WHEN THEY ARE MORE STRINGENT OR CONFLICT 3.04 DELIVERY AND STORAGE OF MATERIALS WITH THE DRAWINGS AND SPECIFICATIONS. A. ARRANGE AND BE HELD RESPONSIBLE FOR DELIVERY AND SAFE STORAGE OF MATERIALS AND EQUIPMENT FOR ELECTRICAL INSTALLATION. 1.05 EXAMINATION OF BIDDING DOCUMENTS B. CAREFULLY CHECK MATERIALS FURNISHED TO THIS CONTRACTOR FOR INSTALLATION, AND PROVIDE RECEIPT ACKNOWLEDGING ACCEPTANCE OF DELIVERY AND CONDITION OF THE MATERIALS RECEIVED. THEREAFTER, ASSUME FULL RESPONSIBILITY FOR ITS SAFEKEEPING UNTIL THE A. EACH BIDDER SHALL EXAMINE THE BIDDING DOCUMENTS CAREFULLY, AND NOT LATER THAN SEVEN DAYS PRIOR TO THE DATE OF RECEIPT OF FINAL INSTALLATION HAS BEEN REVIEWED AND ACCEPTED. BIDS. SHALL MAKE WRITTEN REQUEST TO THE ARCHITECT FOR INTERPRETATION OR CORRECTION OF ANY DISCREPANCIES. AMBIGUITIES. INCONSISTENCIES, OR ERRORS THEREIN WHICH HE MAY DISCOVER. THE ARCHITECT WILL ISSUE ANY INTERPRETATION OR CORRECTION AS AN 3.05 PROTECTION OF WORK AND PROPERTY ADDENDUM. ONLY A WRITTEN INTERPRETATION OR CORRECTION BY ADDENDUM SHALL BE BINDING. NO BIDDER SHALL RELY UPON INTERPRETATIONS OR CORRECTIONS GIVEN BY ANY OTHER METHOD. IF DISCREPANCIES, AMBIGUITIES, INCONSISTENCIES, OR ERRORS ARE A. WHERE THERE ARE EXISTING FACILITIES, BE RESPONSIBLE FOR THE PROTECTION THEREOF, WHETHER OR NOT SUCH FACILITY IS TO BE NOT COVERED BY ADDENDUM OR WRITTEN DIRECTIVE, CONTRACTOR SHALL INCLUDE IN HIS BID, LABOR, MATERIALS AND METHODS OF REMOVED OR RELOCATED. MOVING OR REMOVING ANY FACILITY MUST BE DONE SO AS NOT TO CAUSE INTERRUPTION OF THE WORK OF CONSTRUCTION RESULTING IN HIGHER COST. AFTER AWARD OF CONTRACT, NO ALLOWANCE OR EXTRA COMPENSATION WILL BE MADE ON **OWNER'S OPERATION** BEHALF OF THE CONTRACTOR DUE TO HIS FAILURE TO MAKE THE WRITTEN REQUESTS AS DESCRIBED ABOVE. B. CLOSE ALL CONDUIT OPENINGS WITH CAPS OR PLUGS DURING INSTALLATION. COVER ALL FIXTURES AND EQUIPMENT AND PROTECT AGAINST B. FAILURE TO REQUEST CLARIFICATION DURING THE BID PHASE OF ANY INADEQUACY, OMISSION, OR CONFLICT WILL NOT RELIEVE THE INJURY. AT THE FINAL COMPLETION, CLEAN ALL WORK AND DELIVER IN AN UNBLEMISHED CONDITION, OR REFINISH AND REPAINT AT THE CONTRACTOR OF THEIR RESPONSIBILITIES. THE SIGNING OF THE CONTRACT WILL BE CONSIDERED AS IMPLICITLY DENOTING THAT THE DISCRETION OF THE ARCHITECT CONTRACTOR HAS A THOROUGH COMPREHENSION OF THE FULL INTENT AND SCOPE OF THE WORKING DRAWINGS AND SPECIFICATIONS. C. ANY EQUIPMENT OR CONDUIT SYSTEMS FOUND TO HAVE BEEN DAMAGED OR CONTAMINATED ABOVE "MILL" OR "SHOP" CONDITIONS SHALL BE REPLACED OR CLEANED TO THE ENGINEER'S SATISFACTION. 1.06 EXAMINATION OF PREMISES A. VISIT SITE PRIOR TO BID AND VERIFY THAT CONDITIONS ARE AS INDICATED. CONTRACTOR SHALL INCLUDE IN HIS BID COSTS REQUIRED TO 3.06 FINAL ACCEPTANCE MAKE HIS WORK MEET EXISTING CONDITIONS. A. FINAL ACCEPTANCE BY THE OWNER WILL NOT OCCUR UNTIL ALL OPERATING INSTRUCTIONS ARE RECEIVED AND OWNER'S PERSONNEL HAVE BEEN THOROUGHLY INDOCTRINATED IN THE MAINTENANCE AND OPERATION OF ALL EQUIPMENT 1.07 EXISTING CONDITIONS B. OPERATING MANUAL, PARTS LISTS, AND INDOCTRINATION OF OPERATING AND MAINTENANCE PERSONNEL: FURNISH THE SERVICES OF A A. EXISTING SYSTEMS AND CONDITIONS SHOWN ON DRAWINGS FOR EXISTING BUILDINGS ARE TO BE NOTED "FOR GUIDANCE ONLY". THE QUALIFIED REPRESENTATIVE OF THE SUPPLIER FOR EACH ITEM OR SYSTEM ITEMIZED BELOW WHO SHALL INSTRUCT SPECIFIC PERSONNEL, AS ELECTRICAL CONTRACTOR SHALL FIELD CHECK ALL EXISTING CONDITIONS PRIOR TO BIDDING AND IS TO INCLUDE IN HIS BID AN ALLOWANCE DESIGNATED BY THE OWNER. IN THE OPERATION AND MAINTENANCE OF THAT ITEM OR SYSTEM. FOR EXTENSION, REMOVAL AND/OR RELOCATION OF EXISTING CONDUITS, WIRES, DEVICES, FIXTURES, OR OTHER EQUIPMENT AS INDICATED ON THE PLANS OR AS REQUIRED TO COORDINATE AND ADAPT NEW AND EXISTING ELECTRICAL SYSTEM TO ALL OTHER WORK. C. DELIVER COMPLETE OPERATING MANUALS AND PARTS LISTS TO THE OWNER (OR HIS DESIGNATED REPRESENTATIVE) AT THE TIME OF THE B. WHERE THE REUSE OF EXISTING CONDUITS, WIRES, DEVICES, ETC. IS PERMISSIBLE, MAKE CERTAIN THAT THE WIRING FOR SAME IS ABOVE REQUIRED INDOCTRINATION. FULLY EXPLAIN THE CONTENTS OF THE MANUALS AS PART OF REQUIRED INDOCTRINATION AND INSTRUCT THE OWNER'S PERSONNEL IN THE CORRECT PROCEDURE IN OBTAINING SERVICE, BOTH DURING AND AFTER THE GUARANTEE PERIOD. THE CONTINUOUS FROM OUTLET TO OUTLET AND THAT SUCH CIRCUIT OR SYSTEMS SHALL PASS THROUGH NO OUTLET OR JUNCTION BOXES WHICH OPERATING MANUAL AND PARTS LISTS SHALL GIVE COMPLETE INFORMATION AS TO WHOM THE OWNER SHALL CONTACT FOR SERVICE AND MAY BE RENDERED INACCESSIBLE BY THE STRUCTURAL CHANGES TO BE MADE TO THE BUILDING. EXISTING CONDUITS, WIRE, DEVICES, ETC. PARTS, INCLUDING THE ADDRESS AND PHONE NUMBER. FURNISH EVIDENCE THAT AN AUTHORIZED SERVICE ORGANIZATION REGULARLY WHICH ARE NOT INDICATED FOR REUSE SHALL BECOME THE PROPERTY OF THIS CONTRACTOR HOWEVER LIGHTING FIXTURES. PANEL FUSED CARRIES A COMPLETE STOCK OF REPAIR PARTS FOR THESE ITEMS (OR SYSTEMS), AND THAT THE ORGANIZATION IS AVAILABLE FOR SERVICE. SWITCHES, CIRCUIT BREAKERS, FIRE ALARM EQUIPMENT, ETC. SHALL BECOME THE PROPERTY OF THE OWNER. SERVICE SHALL BE FURNISHED WITHIN TWENTY FOUR (24) HOURS AFTER REQUESTED. C. SYSTEM OUTAGES SHALL BE PERMITTED ONLY AT TIMES APPROVED BY OWNER IN WRITING. WORK WHICH COULD RESULT IN AN ACCIDENTAL D. CLEAN UP: REMOVE ALL MATERIALS, SCRAP, ETC., RELATIVE TO THE ELECTRICAL INSTALLATION AND LEAVE THE PREMISES AND ALL OUTAGE (BEYOND BRANCH CIRCUITS) SHALL BE PERFORMED WITH THE OWNER'S MAINTENANCE PERSONNEL ADVISED OF SUCH WORK. EQUIPMENT, LAMPS, FIXTURES, ETC. IN A CLEAN, ORDERLY CONDITION. ANY COSTS TO THE OWNER FOR CLEAN UP OF THE SITE WILL BE D. SERVICE SHALL BE MAINTAINED TO EXISTING AREAS DURING CONSTRUCTION. CONTRACTOR SHALL PROVIDE PORTABLE GENERATORS, CHARGED AGAINST THE CONTRACTOR. CABLES, OUTLETS, ETC. AS REQUIRED TO MAINTAIN CONTINUITY OF SERVICE. PLACEMENT OF SUCH PORTABLE EQUIPMENT SHALL BE SUBJECT E. ACCEPTANCE DEMONSTRATION: UPON COMPLETION OF THE WORK, AT A TIME TO BE DESIGNATED BY THE ARCHITECT, THE CONTRACTOR TO OWNER APPROVAL. GENERATOR SYSTEM SHALL BE COMPLETE AND OPERABLE AND SHALL INCLUDE REQUIRED ACCESSORIES, FUEL TANKS, SHALL DEMONSTRATE FOR THE OWNER THE OPERATION OF THE ENTIRE INSTALLATION, INCLUDING ALL SYSTEMS PROVIDED UNDER THIS PIPING, MUFFLER, BLOCK HEATER, BATTERY CHARGER, ETC. CONTRACT E. PROVIDE NEW UPDATED PANELBOARD DIRECTORIES FOR EXISTING AND NEW CIRCUITS BEING UTILIZED FOR COMPLETION OF PROJECT. 3.07 IDENTIFICATION 1.08 PERMITS, FEES & NOTICES A. GENERAL: PROVIDE THE FOLLOWING SERVICES AND MATERIALS TO ASSIST THE OWNER IN OPERATION AND MAINTENANCE. A. OBTAIN AND PAY FOR ALL NECESSARY PERMITS, INSPECTIONS AND CERTIFICATES THAT MAY BE NECESSARY FOR THE FULL COMPLETION OF B. DIRECTORY CARDS, NAMEPLATES AND LABELS: NO TEMPORARY MARKINGS, WHICH ARE VISIBLE ON EQUIPMENT, SHALL REMAIN AFTER THE THE WORK. FURNISH THE ARCHITECT WITH A CERTIFICATE OF FINAL INSPECTION AND APPROVAL FROM THE AHJ OVER THE ELECTRICAL PROJECT IS COMPLETE. REPAINT TRIMS, HOUSING, ETC., WHERE SUCH MARKINGS CANNOT BE READILY REMOVED. DEFACED FINISHES MUST INSTALLATION. BE REFINISHED. ALL ENGRAVED METAL OR PLASTIC NAMEPLATES SHALL BE WHITE LETTERS ON A BLACK OR GRAY BACKGROUND. RAISED B. NOTIFY PROPER AUTHORITIES WHEN WORK IS READY FOR INSPECTIONS REQUIRED BY APPLICABLE CODES, RULES AND REGULATIONS, LETTER TYPE TAPE SHALL NOT BE USED. NO ABBREVIATIONS IN LABELING WILL BE PERMITTED WITHOUT SPECIAL APPROVAL. ALL ALLOWING SUFFICIENT TIME FOR INSPECTIONS TO BE MADE WITHOUT HINDERING PROGRESS OF THE WORK. FURNISH TO THE OWNER COPIES PANELBOARDS SHALL BE LABELED AS DESIGNATED ON THE ELECTRICAL DRAWINGS. THOROUGHLY CLEAN SURFACE TO WHICH PRESSURE OF INSPECTION CERTIFICATES OF ACCEPTANCE. SENSITIVE TYPE LABELS ARE APPLIED TO ASSURE ADHERENCE OF LABEL, DIRECTORY CARDS, NAMEPLATES, AND LABELS SHALL INDICATE THE GENERAL AREA AND TYPE OF ELECTRICAL LOAD SERVED BY EACH CIRCUIT. PROVIDE THE FOLLOWING TYPES OF LABELS AT THESE LOCATIONS. 1.09 TESTS 1. FOR ALL BRANCH CIRCUIT PANELBOARD DIRECTORIES, PROVIDE NEATLY TYPED, REMOVABLE CARDS AND PROTECTIVE PLASTIC FACES. SPARE CIRCUIT BREAKERS SHALL BE IDENTIFIED AS SUCH. A. UPON COMPLETION OF ALL WORK AND ADJUSTMENT OF ALL EQUIPMENT, PROVIDE COMPLETE OPERATIONAL TESTS OF ALL ELECTRICAL EQUIPMENT PROVIDED UNDER THIS DIVISION. 2. FOR ALL RECEPTACLE DEVICE PLATES, PROVIDE ONE-EIGHTH INCH (1/8") MINIMUM HEIGHT LETTERS ON WHITE (NORMAL POWER) AND RED EMERGENCY POWER) NAMEPLATES INDICATING PANEL AND CIRCUIT NUMBER. 1.10 WARRANTY 3.08 ELECTRICAL PROVISIONS FOR ROOFS A. GUARANTEE THAT ALL WORK GOVERNED BY THIS DIVISION SHALL BE FREE OF DEFECTS IN WORKMANSHIP, MATERIALS AND PARTS FOR A PERIOD OF ONE (1) YEAR AFTER WRITTEN ACCEPTANCE. PROMPTLY REPAIR, REVISE, AND REPLACE DEFECTS AS DIRECTED WITH NO A. RACEWAYS PENETRATING ROOFS SHALL BE INSTALLED IN A MANNER TO PRESERVE THE INTEGRITY OF THE ROOF. PROVIDE FLASHING AND ADDITIONAL COST TO THE OWNER (LAMPS AND FUSES ARE EXEMPT). COUNTER FLASHING FOR ALL ROOF PENETRATIONS REQUIRED FOR THE WORK. 1.11 RECORD DRAWINGS B. CONDUITS ROUTED ABOVE ROOFS SHALL BE INSTALLED A MINIMUM OF TWELVE INCHES (12") ABOVE THE FINISHED ROOF SURFACE, SUPPORTED ON METAL STANDS INSTALLED WITH FLASHING AND COUNTER FLASHING, WITH MAXIMUM SPACING OF TEN FEET (10'-0"). A. DURING THE PROGRESS OF THE WORK, MAINTAIN AN ACCURATE RECORD OF THE INSTALLATION OF THE ELECTRICAL SYSTEM. UPON C. PROVIDE WEATHERPROOF DUPLEX RECEPTACLES ON ROOF SO THAT NO EQUIPMENT INSTALLED ON THE ROOF IS MORE THAN TWENTY-FIVE COMPLETION OF THE ELECTRICAL INSTALLATION, TRANSFER ALL RECORD DATA TO PRINTS OF THE ORIGINAL DRAWINGS. DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERNATES, REROUTINGS, ETC. AS A CONDITION OF ACCEPTANCE OF THE PROJECT, FEET (25'-0") FROM A RECEPTACLE. CONNECT TO NEAREST RECEPTACLE CIRCUIT UNLESS INDICATED ON PLANS. DELIVER TO THE ARCHITECT ONE COPY OF THE RECORD DRAWINGS. 3.09 CONSTRUCTION LIGHTING AND POWER 1.12 PROTECTION A. PROVIDE ALL TEMPORARY FACILITIES REQUIRED TO SUPPLY CONSTRUCTION POWER AND LIGHT. INSTALL AND MAINTAIN FACILITIES IN A MANNER THAT WILL PROTECT THE PUBLIC AND WORKMEN. COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS. PERMANENT LUMINAIRES A. OF PEOPLE: ARRANGE BARRIERS, SIGNS, ETC. AS REQUIRED TO MINIMIZE THE HAZARD OF PEOPLE. COMPLY WITH APPLICABLE SAFETY AND HEALTH REGULATIONS. COORDINATE AS NECESSARY WITH THE OWNER AND THE GENERAL CONTRACTOR. SHALL NOT BE USED FOR TEMPORARY LIGHTING. B. OF WORK: TAKE ALL MEASURES NECESSARY TO PROTECT THE WORK BOTH BEFORE AND AFTER INSTALLATION, TO ASSURE THAT IT WILL BE IN B. THE GENERAL CONTRACTOR SHALL PAY FOR ALL POWER AND LIGHT USED BY HIM AND HIS SUBCONTRACTORS WHERE CONSTRUCTION POWER IS SEPARATELY METERED, OR IS TAKEN FROM THE PERMANENT PROJECT METERED SERVICE SOLELY FOR CONSTRUCTION USE. CLEAN, UNDAMAGED, UNBLEMISHED CONDITION WHEN TURNED OVER TO THE OWNER. REPAIR/REPLACE WORK DAMAGED DURING CONSTRUCTION. 3.10 REMODELING PROVISIONS PART 2 - PRODUCTS A. EXISTING SYSTEMS AND CONDITIONS SHOWN ON THE DRAWINGS ARE PROVIDED FOR REFERENCE ONLY. THE ELECTRICAL CONTRACTOR SHALL FIELD CHECK ALL EXISTING CONDITIONS PRIOR TO BIDDING AND SHALL INCLUDE IN HIS BID AN ALLOWANCE FOR THE REMOVAL AND 2.01 STANDARD FOR MATERIALS RELOCATION OF EXISTING CONDUITS, WIRES, DEVICES, FIXTURES, OR OTHER EQUIPMENT AS INDICATED ON THE PLANS OR AS REQUIRED TO COORDINATE AND ADAPT NEW AND EXISTING ELECTRICAL SYSTEMS TO ALL OTHER WORK REQUIRED FOR THIS PROJECT A. ALL ELECTRICAL MATERIAL SHALL BE NEW AND OF THE QUALITY AND TYPE SPECIFIED B. WHERE THE REUSE OF EXISTING CONDUITS, OUTLETS, JUNCTION BOXES, ETC., IS PERMISSIBLE, MAKE CERTAIN THAT THE WIRING FROM THEM B. MANUFACTURER AND CATALOG NUMBER SHOWN IN THESE SPECIFICATIONS OR ON DRAWINGS ARE INTENDED AS A GUIDE TO QUALITY. IS CONTINUOUS FROM OUTLET TO OUTLET. PROVIDE MODIFICATIONS TO ASSURE THAT CIRCUITS, OR SYSTEM, SHALL NOT PASS THROUGH EQUIVALENT MATERIALS AND EQUIPMENT OF OTHER MANUFACTURERS WILL BE CONSIDERED PROVIDED SUCH SUBSTITUTIONS ARE OUTLETS OR JUNCTION BOXES WHICH MAY BE RENDERED INACCESSIBLE BY CHANGES TO BE MADE TO THE BUILDING. EXISTING CONDUITS, REQUESTED IN ACCORDANCE WITH THE PROVISIONS OF PARAGRAPH 2.03 AND SHALL INCLUDE ALL INFORMATION NECESSARY TO SUPPORT WIRE, DEVICES, FIXTURES, ETC., WHICH SHALL BE REMOVED SHALL BECOME THE PROPERTY OF THIS CONTRACTOR UNLESS OTHERWISE THE CLAIM OF EQUIVALENCY. C. NO EXTENSION OF COMPLETION DATE SHALL BE ALLOWED FOR TIME LOST IN CONSIDERATION. SHIPPING, OR INSTALLATION OF APPROVED C. CONNECT NEW WORK TO EXISTING IN A MANNER THAT WILL ASSURE PROPER RACEWAY GROUNDING THROUGHOUT IN CONFORMANCE WITH SUBSTITUTIONS. REVIEW OF SUBSTITUTIONS SIGNIFIES GENERAL EQUALITY OF MATERIALS AND EQUIPMENT ONLY. THIS REVIEW DOES NOT THE NATIONAL ELECTRICAL CODE. RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PROPER OPERATION OF THE SYSTEM, COMPLIANCE WITH SPECIFICATIONS AND IECESSARY CHANGES DUE TO DIMENSIONAL DIFFERENCES OR SPACE REQUIREMENTS. REMODEL WORK CUTTING AND PATCHING: THE CONTRACTOR SHALL PERFORM CUTTING CHANNELING CHASING DRILLING FTC. AS REQUIRED TO INSTALL OR REMOVE ELECTRICAL EQUIPMENT IN AREAS OF REMODELING. THIS WORK SHALL BE PERFORMED SO AS TO MINIMIZE DAMAGE TO PORTIONS OF WALL FINISHES, SURFACES, PLASTERING, OR THE STRUCTURE WHICH ARE TO BE REUSED, RESURFACED, PLASTERED OR 2.02 SHOP DRAWINGS PAINTED UNDER ANOTHER DIVISION OF THESE SPECIFICATIONS A. SHOP DRAWINGS REQUIRED FOR THIS PROJECT ARE AS FOLLOWS: E. CAREFULLY COORDINATE WITH THE REQUIRED REMODELING WORK, CUTTING AND PATCHING ETC., PERFORMED BY THE OTHER TRADES. 1. LIGHTING FIXTURES REMOVE OR RELOCATE EXISTING ELECTRICAL CONDUITS. WIRES. DEVICES. FIXTURES AND OTHER EQUIPMENT AS NECESSARY 2. LIGHTING CONTROL DEVICES AND/OR SYSTEM F. ALL OUTAGES ON PORTIONS OF EXISTING ELECTRICAL SYSTEMS SHALL BE MINIMIZED AND SHALL BE AT A TIME AND OF DURATION AS ACCEPTED BY THE OWNER. 3. WIRING DEVICES 4. FIRE ALARM AND DETECTION SYSTEM 3.11 ELECTRICAL DEMOLITION B. PRESENT SHOP DRAWING SUBMITTAL DATA AT ONE TIME, IN ELECTRONIC (PDF) FORMAT, INDEXED IN A NEAT AND ORDERLY MANNER. PARTIAL A. EXAMINATION SUBMITTALS WILL NOT BE ACCEPTED. PROVIDE FOUR SETS OF SUBMITTAL DATA, UNLESS NOTED OTHERWISE IN DIVISION I 1. VERIFY FIELD MEASUREMENTS AND EXISTING CIRCUITING ARE AS INDICATED ON DRAWINGS. C. PLACE ORDERS FOR ALL EQUIPMENT IN TIME TO PREVENT ANY DELAY IN CONSTRUCTION SCHEDULE OR COMPLETION OF PROJECT. IF ANY

THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT. THAT UNDERSTANDING OF THE DESIGN CONCEPT IS DEMONSTRATED BY INDICATING WHICH EQUIPMENT AND MATERIALS THE CONRACTOR INTENDS TO PROVIDE AND BY DETAILING THE FABRICATION AND INSTALLATION METHODS THE CONTRACTOR INTENDS TO USE. CONTRACTOR FURTHER AGREES THAT IF DEVIATIONS, DISCREPANCIES, OR CONFLICTS BETWEEN SHOP DRAWING SUBMITTALS AND CONTRACT DOCUMENTS IN THE FORM OF DESIGN DRAWINGS AND SPECIFICATIONS ARE DISCOVERED FITHER PRIOR TO OR AFTER SHOP DRAWING SUBMITTALS ARE PROCESSED BY THE ENGINEER, THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL CONTROL AND

2. VERIFY THAT ABANDONED WIRING AND EQUIPMENT SERVE ONLY ABANDONED FACILITIES.

3. DEMOLITION DRAWINGS ARE BASED ON FIELD OBSERVATION AND EXISTING RECORD DOCUMENTS AND MAY NOT BE COMPREHENSIVE. CONTRACTOR TO VERIFY EXISTING CONDITIONS AND REPORT DISCREPANCIES TO ARCHITECT BEFORE DISTURBING EXISTING INSTALLATION.

4. BEGINNING OF DEMOLITION MEANS INSTALLER ACCEPTS EXISTING CONDITIONS.

B. PREPARATION 1. DISCONNECT ELECTRICAL SYSTEMS IN WALLS, FLOORS, AND CEILINGS SCHEDULED FOR REMOVAL

- 2. COORDINATION OUTAGES WITH ARCHITECT/OWNER
- 3. PROVIDE TEMPORARY WIRING AND CONNECTIONS TO MAINTAIN EXISTING SYSTEMS IN SERVICE DURING CONSTRUCTION. WHEN WORK
- MUST BE PERFORMED ON ENERGIZED EQUIPMENT OR CIRCUITS, USE PERSONNEL EXPERIENCED IN SUCH OPERATIONS 4. FIRE PROTECTION, FIRE ALARM, AND DETECTION SYSTEMS SHALL BE MAINTAINED AND CAPABLE OF PROPER OPERATION DURING CONSTRUCTION. THE LOCAL FIRE MARSHALL SHALL BE NOTIFIED BEFORE CONSTRUCTION STARTS, WHEN SCHEDULED INTERRUPTIONS ARE EXPECTED AND AFTER CONSTRUCTION IS COMPLETE. PROTECT AND SUPPORT LIFE SAFETY SYSTEMS ROUTED THROUGH AREAS OF
- DEMOLITION. 5. EXISTING TELEPHONE SYSTEM: MAINTAIN EXISTING SYSTEM IN SERVICE. DISABLE SYSTEM ONLY TO MAKE SWITCHOVERS AND MINIMIZE OUTAGE DURATION.
- C. DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK 1. DEMOLISH AND EXTEND EXISTING ELECTRICAL WORK UNDER PROVISIONS OF DIVISION 1, DIVISION 2, AND THIS SECTION.
- 2. REMOVE, RELOCATE, AND EXTEND EXISTING INSTALLATIONS TO ACCOMMODATE NEW CONSTRUCTION.
- 3. REMOVE ABANDONED WIRING TO SOURCE OF SUPPLY
- WITH WALLS AND FLOORS, AND PATCH SURFACES.
- AND REMOVED. PROVIDE BLANK COVER FOR ABANDONED OUTLETS, WHICH ARE NOT REMOVED. 6. DISCONNECT AND REMOVE ABANDONED PANELBOARDS AND DISTRIBUTION EQUIPMENT
- 7. DISCONNECT AND REMOVE ELECTRICAL DEVICES AND EQUIPMENT SERVING UTILIZATION EQUIPMENT THAT HAS BEEN REMOVED.
- 8. DISCONNECT AND REMOVE ABANDONED LUMINAIRES. REMOVE BRACKETS, STEMS, HANGERS, AND OTHER ACCESSORIES.
- AS APPROPRIATE
- SPECIFIED IN INDIVIDUAL SECTION.
- D. CLEANING AND REPAIR 1. CLEAN AND REPAIR EXISTING MATERIALS AND EQUIPMENT, WHICH REMAIN OR ARE TO BE REUSED
- 2. PANELBOARDS: CLEAN EXPOSED SURFACES AND CHECK TIGHTNESS OF ELECTRICAL CONNECTIONS. REPLACE DAMAGED CIRCUIT BREAKERS AND PROVIDE CLOSURE PLATES FOR VACANT POSITIONS. PROVIDE TYPED CIRCUIT DIRECTORY SHOWING REVISED CIRCUITING
- 3. LUMINARIES: REMOVE EXISTING LUMINAIRES FOR CLEANING. USE MILD DETERGENT TO CLEAN ALL EXTERIOR AND INTERIOR SURFACES; RINSE WITH CLEAN WATER AND WIPE DRY. REPLACE LAMPS. NON-OPERATIONAL BALLASTS. AND BROKEN ELECTRICAL PARTS.

END OF SECTION 26 00 10

- E. INSTALLATION
- 1. INSTALL RELOCATED MATERIALS AND EQUIPMENT UNDER THE PROVISIONS OF DIVISION 1

SECTION 26 10 00 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL (Not Used)

PART 2 - PRODUCTS

- 2.01 RACEWAYS AND FITTINGS
- A. CONDUIT:
- 1. CONDUITS SUBJECT TO MECHANICAL DAMAGE OR WHERE OTHERWISE REQUIRED BY CODE SHALL BE GALVANIZED RIGID HEAVY WALL CONDUIT; ALL OTHER CONDUIT MAY BE ELECTRIC METALLIC TUBING. 2. FLEXIBLE METALLIC CONDUIT SHALL BE USED WHERE VIBRATION OR OTHER REASONS DO NOT ALLOW SOLID CONNECTIONS TO MOTORS,
- (LIQUIDTIGHT) SHALL BE USED
- WALLS AND ABOVE CEILINGS 2.02 WIRE AND CABLE
- A. VOLTAGE RANGE 0 TO 24: HIGH CONDUCTIVITY COPPER, THERMO-PLASTIC INSULATION, 300 VOLT RATING. B. VOLTAGE RANGE 24 TO 600: HIGH CONDUCTIVITY COPPER, MOISTURE-RESISTANT THERMO-PLASTIC INSULATION, 600 VOLT 75°C RATING FOR
- INSTALLATIONS CONDUCTORS.
- 2.03 WIRE CONNECTIONS A. ALL ELECTRICAL CONNECTIONS SHALL BE ELECTRICALLY AND MECHANICALLY SECURE, USING THE FOLLOWING METHODS: 1. WIRE SIZE #8 AND SMALLER--PRESSURE TYPE CONNECTORS (SCOTCH-LOK) OR EQUIVALENT.
- 2. WIRE SIZE #6 AND LARGER--MECHANICAL OR COMPRESSION LUGS, BURNDY, T & B, ILSCO OR EQUIVALENT. BE LISTED AS SUITABLE FOR 75°C.
- 2.04 SURFACE RACEWAYS
- BY ARCHITECT.
- 2.05 OUTLET BOXES
- A. OUTLET BOXES SHALL BE: ONE PIECE STEEL, GALVANIZED, STEEL CITY ELECTRIC, APPLETON ELECTRIC, RACO OR APPROVED EQUIVALENT. WHERE NMC OR ENT IS USED. PLASTIC BOXES ARE ACCEPTABLE
- 2.06 DEVICES A. WIRING DEVICES SHALL BE SPECIFICATION GRADE AND RATED AT 20 AMPERES FOR LIGHT SWITCHES AND 20 AMPERES FOR DUPLEX
- RECEPTACLES. SWITCHES, RECEPTACLES, AND OTHER DEVICES SHALL BE LEVITON DECORA STYLE, OR PASS SEYMOUR, COOPER, OR HUBBELL EQUIVALENT. COLOR SHALL BE IVORY UNLESS NOTED OTHERWISE BY ARCHITECT. B. SWITCHES SHALL BE 120/277V, 20A, ROCKER TYPE.
- C. DIMMERS
- 1. SWITCHBOX-MOUNTED MANUAL DIMMER TO PROVIDE FULL RANGE, CONTINUOUSLY VARIABLE CONTROL OF LIGHT INTENSITY. 2. OPERATES AT THE RATED CAPACITY ACROSS THE FULL AMBIENT TEMPERATURE RANGE INCLUDING MODIFIED CAPACITIES FOR GANGED
- CONFIGURATIONS WHICH REQUIRE REMOVAL OF FINS. 3. DIMMER SHALL BE COMPATIBLE WITH CORRESPONDING LOAD TYPE, INCLUDING FIXTURE, DRIVER, AND OR LAMP. LUTRON DIVA OR EQUAL.
- D. WALL SWITCH OCCUPANCY SENSORS: 120/277V, ADJUSTABLE TIME DELAY UP TO 20 MINUTES, 180 DEGREE FIELD OF VIEW SWITCH A MINIMUM COVERAGE AREA OF 300 SQUARE FEET. SENSOR TECHNOLOGY TO BE DUAL TECHNOLOGY
- E. AREA OCCUPANCY SENSORS: 120/277V, ADJUSTABLE TIME DELAY UP TO 30 MINUTES 360 DEGREE FIELD OF VIEW. MANUFACTURER SHALL BE WATT STOPPER OR APPROVED EQUAL. SPECIFICATIONS AS SHOWN IN THE FOLLOWING APPLICATIONS:
- F. WALL PLATES SHALL BE SMOOTH, HIGH-IMPACT THERMOPLASTIC.
- DIE-CAST ALUMINUM WITH LOCKABLE COVER
- 2.07 DISCONNECTS A. SAFETY SWITCHES SHALL BE HEAVY-DUTY, QUICK-MAKE, QUICK-BREAK WITH COVER INTERLOCK, FUSIBLE OR NON-FUSIBLE, AND GROUNDING
- LUGS IN ENCLOSURE TO SUIT LOCATIONS AND REQUIREMENTS. G.E., SIEMENS, SQUARE D, CUTLER-HAMMER. PART 3 - EXECUTION

3.01 CONDUIT INSTALLATION

REQUIRED.

BE WATERTIGHT

3.02 WIRE INSTALLATION

CIRCUIT BREAKERS

3.03 WIRING DEVICE INSTALLATION

UNI ESS OTHERWISE INDICATED

3.05 EQUIPMENT FURNISHED BY OTHERS AND/OR OWNER

3.04 DEVICES

- A. MAKE CONDUIT BENDS WITH STANDARD CONDUIT ELBOWS OR CONDUIT BENT TO NOT LESS THAN THE SAME RADIUS. ALL BENDS SHALL BE FREE FROM DENTS OR FLATTENING.
- B. CAP CONDUIT ENDS TO PREVENT ENTRANCE OF FOREIGN MATERIALS DURING CONSTRUCTION. C. RUN CONCEALED CONDUITS IN A DIRECT LINE. RUN EXPOSED CONDUITS PARALLEL TO, OR AT RIGHT ANGLES WITH, LINES OF THE BUILDING.
- AND STEAM PIPING. D. RUN UNDERGROUND CONDUITS A MINIMUM OF 2' 0" BELOW GRADE.
- SEALANT OR EQUIVALENT F. ALL EMPTY RACEWAY SYSTEMS SHALL HAVE A POLYPROPYLENE PULLWIRE OR EQUAL, AND SHALL BE IDENTIFIED AT ALL JUNCTION. PULL AND

POINTS OF EACH INDIVIDUAL CONDUIT.

A. BRANCH CIRCUIT CONDUCTORS SHALL BE AS FOLLOWS:

ENCLOSED WIRE AND CONNECTIONS WITHOUT CROWDING. SIZE ALL BOXES PER N.E.C. ARTICLE 370.

B. SWITCH AND RECEPTACLE OUTLET BOXES SHALL BE STANDARD BOXES WITH COVER PLATES. WHERE MORE THAN ONE SWITCH OR DEVICE IS LOCATED AT ONE POINT. USE GANG BOXES AND GANG COVER PLATES. C. FLUSH MOUNT LIGHTING SWITCHES OR CONTROL DEVICES 4'0" TOP-OF-DEVICE ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED. FLUSH MOUNT WALL TYPE RECEPTACLES AND OTHER WALL MOUNTED WIRING DEVICES AND OUTLETS 18 INCHES CENTERLINE ABOVE FINISHED FLOOR

D. ROUTE DEDICATED NEUTRAL CONDUCTORS ON LINE AND LOAD SIDE OF DIMMERS PER MANUFACTURER'S INSTRUCTIONS.

EIGHT (8) DUPLEX RECEPTACLES SHALL BE ON ANY ONE BRANCH CIRCUIT. CIRCUITS SERVING BATHROOM GFCI RECEPTACLES MAY SERVE LIGHTING BUT SHALL NOT SERVE ANY OTHER RECEPTACLES. 5. LIGHTING BRANCH CIRCUIT SHALL NOT BE LOADED TO MORE THAN 70% OF BREAKER RATING, IN EFFECT, 14 AMPS PER CIRCUIT.

B. THE DRAWINGS INDICATE THE GENERAL DIRECTION OF ROUTES OF BRANCH CIRCUIT HOME RUNS. CONTINUE ALL SUCH HOME RUNS TO

PANELS AS THOUGH THE ROUTES WERE COMPLETELY INDICATED.

1. CONDUCTORS SHALL BE CONTINUOUS FROM OUTLET BOX TO OUTLET BOX, OR JUNCTION BOX, WITH NO SPLICES EXCEPT IN SUCH BOXES. A. REVIEW ARCHITECTURAL AND MECHANICAL DRAWINGS BEFORE INSTALLING OUTLETS. CHANGING OF OUTLETS TO CONFORM TO THESE

DRAWINGS AND ANY OTHER SLIGHT CHANGE IN MOUNTING HEIGHT OR LOCATION OF OUTLETS REQUIRED SHALL BE CONSIDERED AS A PART OF THIS CONTRACT. USE OUTLET BOXES OF SUFFICIENT SIZE AND SHAPE TO BEST SUIT THE PARTICULAR LOCATION AND TO CONTAIN THE

3. UNLESS INDICATED ON THE DRAWINGS, (THE MINIMUM) WIRE USED FOR BRANCH CIRCUITS SHALL BE #12 THWN PROTECTED BY 20 AMPERE 4. BRANCH CIRCUITS FOR RECEPTACLES SHALL BE ON 20 AMP, SINGLE POLE CIRCUIT BREAKERS WITH #12 CONDUCTORS. NO MORE THAN

G. NON-METALLIC AND FLEXIBLE METAL CONDUITS SHALL HAVE A CODE-SIZED COPPER GROUNDING CONDUCTOR. INCREASE CONDUIT SIZE AS H. CONDUITS PENETRATING THROUGH ROOF SHALL HAVE ROOF FLASHING WITH CAULK TYPE COUNTER FLASHING SLEEVE. INSTALLATION SHALL

TERMINATION POINTS USING PERMANENT METALLIC TAGS. TAG SHALL INDICATE INTENDED USE OF CONDUIT, ORIGINATION, AND TERMINATION

A. SUPPORT ALL PANELS, JUNCTION BOXES AND OTHER ELECTRICAL DEVICES IN A MANNER AS REQUIRED BY THE N.E.C. USE EXTRA BRACING,

SUPPORTS, ETC. AS NECESSARY TO PROVIDE A PROPER AND SUBSTANTIAL BASE TO WHICH ALL ELECTRICAL EQUIPMENT IS ATTACHED.

1. FOR GENERAL APPLICATIONS THROUGH SIZE #8: THWN 75⁰C WIRE AND FULL SIZE GROUND, OR TYPE THHN 90⁰C.

2. BRANCH CIRCUIT CONDUCTORS THROUGH SIZE #10 TO BE SOLID, #8 AND LARGER STRANDED.

INSTALL ALL CONDUITS AT LEAST 6" AWAY FROM FLUES, STEAM AND HOT WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER E. SEAL ALL CONDUIT PENETRATIONS OF FIRE RATED WALLS, FLOOR, OR CEILINGS WITH U.L. LISTED "DOW CORNING" #2000 OR #2001 FIRE STOP

1. LARGE ROOM SENSOR - DUAL TECHNOLOGY WITH BOTH INFRARED AND ULTRASONIC TYPE SENSING, MINIMUM COVERAGE OF 1,000 SQUARE G. WET LOCATIONS WEATHERPROOF COVER PLATES SHALL BE NEMA250, COMPLYING WITH TYPE 3R WEATHER RESISTANT IN-USE RATING

A. SURFACE METAL RACEWAYS: GALVANIZED STEEL WITH SNAP-ON COVERS. MANUFACTURERS STANDARD ENAMEL FINISH IN COLOR SELECTED B. MANUFACTURER SHALL BE THOMAS& BETTS CORPORATION, WALKER SYSTEMS, INC, (THE WIREMOLD COMPANY), OR APPROVED EQUAL.

B. WIRE TERMINATION PROVISIONS FOR PANELBOARDS, CIRCUIT BREAKERS, SAFETY SWITCHES, AND ALL OTHER ELECTRICAL APPARATUS SHALL

GENERAL USE. FOR HID FIXTURES AND WIRING WITHIN 3 INCHES OF FLUORESCENT BALLASTS, WIRE SHALL BE COPPER, MINIMUM 90°C RATED. SIZES INDICATED ARE FOR INSTALLATION IN A MAXIMUM 30°C AMBIENT. CONDUCTOR AMPACITY SHALL BE DERATED FOR HIGHER AMBIENT C. CONDUCTORS USED SPECIFICALLY FOR EQUIPMENT OR SERVICE GROUND MAY BE BARE OR HAVE INSULATION TO MATCH CIRCUIT/FEEDER

EQUIPMENT, ETC. FLEX MAY ALSO BE USED TO FISH IN EXISTING WALLS OR WHERE REQUIRED TO CONNECTION IN MILLWORK. THE USE OF FLEX SHALL BE HELD TO A MINIMUM. WHERE FLEXIBLE METALLIC CONDUIT IS USED IN AREAS SUBJECT TO MOISTURE, PVC-COATED FLEX 3. WHERE APPROVED BY APPLICABLE CODES, TYPE "MC" METAL CLAD CABLE MAY BE USED FOR BRANCH CIRCUITS, WHEN CONCEALED IN

9. REPAIR ADJACENT CONSTRUCTION AND FINISHES DAMAGED DURING DEMOLITION AND EXTENSION WORK 10. MAINTAIN ACCESS TO EXISTING ELECTRICAL INSTALLATIONS, WHICH REMAIN ACTIVE. MODIFY INSTALLATION OR PROVIDE ACCESS PANEL 11. EXTEND EXISTING INSTALLATIONS USING MATERIALS AND METHODS COMPATIBLE WITH EXISTING ELECTRICAL INSTALLATION, OR AS

CONNECTIONS. NOTIFY OWNER/ARCHITECT IN WRITING AT LEAST 24 HOURS BEFORE PARTIALLY OR COMPLETELY DISABLING SYSTEM.

4. REMOVE EXPOSED ABANDONED CONDUIT, INCLUDING ABANDONED CONDUIT ABOVE ACCESSIBLE CEILING FINISHES. CUT CONDUIT FLUSH

5. DISCONNECT ABANDONED OUTLETS AND REMOVE DEVICES. REMOVE ABANDONED OUTLETS IF CONDUIT SERVICING THEM IS ABANDONED

B. SEE MECHANICAL DRAWINGS FOR LOCATION OF MECHANICAL EQUIPMENT. PROVIDE SERVICE TO, AND CONNECT EQUIPMENT AS REQUIRED. C. INSPECT OWNER FURNISHED EQUIPMENT FOR DAMAGE, DEFECTS, MISSING COMPONENTS, ETC. REPORT DEFICIENCIES TO THE OWNER D. ROUGH-IN EQUIPMENT FURNISHED BY OWNER TO LOCATIONS AS REQUIRED. FINAL CONNECTIONS WILL BE MADE BY ELECTRICAL

IMMEDIATELY. DO NOT INSTALL OR CONNECT DEFICIENT EQUIPMENT

SECURE CONDUITS, DISCONNECTS, OR DEVICES TO DUCTWORK OR MECHANICAL EQUIPMENT

DRIVERS/POWER SUPPLIES, POLES, HANGERS, PAINTING, PLASTER FRAMES, ETC.

INSTALLATION WITHIN SPACES AS DEFINED IN NFPA 70 - THE NATIONAL ELECTRICAL CODE.

SYSTEM. ALL RECESSED FIXTURES TO HAVE THERMAL PROTECTION DEVICE.

ALLOWABLE THD REQUIREMENTS ALLOWED PER STANDARD ANSI C82.11.

6. INTERFERENCE: EMI AND RFI COMPLIANT WITH FCC 47 CFR PART 15.

4. PROVIDE WITH INTEGRAL SHORT CIRCUIT, OPEN CIRCUIT, AND OVERLOAD PROTECTION.

INSTALLATION WITHIN SPACES AS DEFINED IN NFPA 70 - THE NATIONAL ELECTRICAL CODE.

1. HAVE AN OPERATING POWER FACTOR ≥ 0.9 AT FULL LOAD, AND NOT LESS THAN 0.8 AT DIMMED LEVEL.

POWER AND TO OPERATE WITH AN LED LUMINAIRE WITH MINIMUM OUTPUT OF 600 LUMENS FOR MINIMUM 1-1/2 HOURS.

END OF SECTION 26 50 00

C. DIMMABLE DRIVERS FOR LED - IN ADDITION TO THE GENERAL SPECIFICATION CRITERIA ABOVE:

FINAL CONNECTION TO FIXTURE SHALL BE MADE WITH A FLEXIBLE U.L. APPROVED ASSEMBLY.

7. MEET ELECTRICAL AND THERMAL CONDITIONS AS DESCRIBED IN LM-80 SECTION 5.0.

REPLACED AT CONTRACTOR'S EXPENSE. ALL FINISHES SHALL BE UNMARRED UPON PROJECT COMPLETION.

PROCESS PRIOR TO PLACING ORDER FOR FIXTURES. MODIFY CATALOG NUMBERS ACCORDINGLY PRIOR TO PURCHASE.

CONTRACTOR.

3.06 EQUIPMENT CONNECTIONS

ACTUALLY SUPPLIED.

AND/OR LIGHTING DESIGNER

PROJECT SCHEDULE

SPECIFICATION CRITERIA

REQUIREMENTS

LUMINAIRE SCHEDULE.

PART 2 - PRODUCTS

2.02 LED LIGHTING

2.01 SCREW BASE FIXTURES

REQUIREMENTS

LUMINAIRE SCHEDULE.

2.03 EMERGENCY OR NIGHT LIGHTING

PART 3 - EXECUTION

ASSEMBLIES

INSTALLATION.

FOR CLEANING REFLECTORS AND OTHER SURFACES.

LOCATION OF FIXTURES

3.01 INSTALLATION

CHANGE IN LIGHT SOURCE OUTPUT.

5. HAVE AN OPERATING POWER FACTOR \geq 0.9.

APPLICATIONS AND MOUNTING CONDITIONS SPECIFIED.

3. INAUDIBLE ABOVE 27 DBA AMBIENT SOUND LEVEL

PART 1 - GENERAL

1.01 PROVISIONS

SECTION 26 50 00 - LIGHTING & LIGHTING CONTROLS

Exhibit A

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A. FINAL CONNECTIONS TO MOTORS, AND OTHER VIBRATING EQUIPMENT SHALL BE WITH SEAL TITE FLEX AND APPROVED FITTINGS. DO NOT B. FINAL CONNECTIONS TO EQUIPMENT SHALL BE IN ACCORDANCE WITH MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS, AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT

A. PROVIDE ALL INTERIOR AND EXTERIOR LIGHTING FIXTURES AS SHOWN ON THE PLANS AND HEREINAFTER SPECIFIED. ALL FIXTURES, HARDWARE, AND ACCESSORIES SHALL BE PROVIDED TO MAKE A COMPLETE AND OPERABLE LIGHTING SYSTEM, INCLUDING LAMPS, B. FIXTURES SHALL BE PROVIDED AS SHOWN IN THE FIXTURE SCHEDULE. CATALOG NUMBERS SHOWN ARE THE LATEST AVAILABLE AT THE TIME OF DESIGN. IF DISCREPANCIES OCCUR BETWEEN DESCRIPTION AND CATALOG NUMBER, VERIFY INFORMATION WITH ELECTRICAL ENGINEER C. VERIFY FINAL COMPLETE PART NUMBERS, INCLUDING DRIVERS AND ACCESSORIES OF ALL LIGHTING FIXTURES THROUGH SUBMITTAL REVIEW

1. ALTERNATELY, THE CONTRACTOR MAY BE REQUIRED TO PAY TO AIR FREIGHT FIXTURES TO THE CONSTRUCTION SITE, AT NO ADDITIONAL CHARGE TO THE OWNER, IF THIS WILL RESULT IN THE SPECIFIED FIXTURES BEING AVAILABLE FOR INSTALLATION IN TIME TO MEET THE D. COMPLY WITH UL 1598. INCLUDE RECOMMENDED LAMPS AND DRIVER, BALLASTS, OR TRANSFORMER. LABELS SHALL BE LOCATED WHERE THEY WILL BE READILY VISIBLE TO SERVICE PERSONNEL, BUT NOT SEEN FROM NORMAL VIEWING ANGLES WHEN LAMPS ARE IN PLACE. E. ALL LUMINAIRES AND DRIVERS SHALL OPERATE WITHIN THE TEMPERATURE LIMITS OF THEIR DESIGN AND AS SPECIFIED BY UL IN THE F. DRIVERS FOR LED SHALL BE LISTED AND SO LABELED PER UL 8750 AND UL 1310, AND SHALL MEET OR EXCEED THE FOLLOWING GENERAL 1. DESIGNED AND TESTED TO BE COMPATIBLE WITH THE LUMINAIRE LIGHT SOURCE OPERATING CURRENT, VOLTAGE, AND OUTPUT POWER 2. HOUSED IN A UL COMPLIANT AND LISTED ENCLOSURE, SUITABLE FOR REMOTE INSTALLATION WHERE REQUIRED, AND LISTED FOR

4. PROVIDE SMOOTH, FLICKER-FREE, DIMMABLE LIGHT OUTPUT FROM 100% TO LESS THAN 1%, UNLESS OTHERWISE INDICATED IN THE G. LUMINAIRES, REFLECTORS, LOUVERS AND ACCESSORIES WHICH ARE DAMAGED, BLEMISHED, OR IMPREGNATED WITH FINGERPRINTS SHALL BE

A. SCREW BASE FIXTURES TO BE COMPLETE WITH LAMPS, AND ALL NECESSARY ACCESSORIES TO PROVIDE FOR THEIR INSTALLATION.

A. LED FIXTURES TO BE COMPLETE WITH ALL NECESSARY ACCESSORIES TO PROVIDE FOR THEIR INSTALLATION. PROVIDE NECESSARY BLOCKING OR OTHER PROTECTION TO MAINTAIN SEPARATION OF RECESSED FIXTURES FROM COMBUSTIBLE MATERIAL AND BUILDING INSULATION B. DRIVERS FOR LED: LISTED AND SO LABELED PER UL 8750 AND UL 1310, AND SHALL MEET OR EXCEED. THE FOLLOWING GENERAL SPECIFICATION 1. DESIGNED AND TESTED TO BE COMPATIBLE WITH THE LUMINAIRE LIGHT SOURCE OPERATING CURRENT, VOLTAGE, AND OUTPUT POWER 2. DESIGNED, FABRICATED, AND TESTED TO OPERATE AT AN INPUT VOLTAGE OF 120 - 277V AC AT ±10% AT 60HZ, WITH NO PERCEPTIBLE 3. CONTRIBUTE LESS THAN 20% TOTAL HARMONIC DISTORTION, OPERATING AT FULL RATED LOAD, AND SHALL NOT EXCEED THE MAXIMUM

8. HOUSED IN A UL COMPLIANT AND LISTED ENCLOSURE, SUITABLE FOR REMOTE INSTALLATION WHERE REQUIRED, AND LISTED FOR

2. PROVIDE SMOOTH, FLICKER-FREE, DIMMABLE LIGHT OUTPUT FROM 100% TO LESS THAN 1%, UNLESS OTHERWISE INDICATED IN THE 3. 0-10VDC TYPE DIMMING CONTROL PROTOCOL, UNLESS OTHERWISE NOTED IN THE LUMINAIRE SCHEDULE OR REQUIRED.

A. FIXTURES INDICATED AS BEING ON EMERGENCY, OR NIGHT LIGHT CIRCUITS SHALL BE PROVIDED WITH SELF-CONTAINED BATTERY POWERED INVERTER UNIT FOR DIRECT MOUNTING IN FIXTURE PROVIDE UNIT WITH FULLY AUTOMATIC TWO RATE CHARGER, NICKEL CADMIUM BATTERY AC "ON" PILOT LIGHT, AND TEST SWITCH. DESIGN AND WIRE UNIT TO AUTOMATICALLY TRANSFER TO BATTERY SUPPLY ON LOSS OF NORMAL AC

A. INSTALL LIGHTING FIXTURES STRAIGHT AND TRUE WITH REFERENCE TO ADJACENT WALLS, AND SECURELY FASTEN TO AND SUPPORT BY STRUCTURAL MEMBERS OF THE BUILDING. REFER TO ARCHITECTURAL OR INTERIOR REFLECTED CEILING PLANS AND ELEVATIONS FOR EXACT B. FIXTURES RECESSED IN "T-BAR" CEILING SHALL BE SUPPORTED INDEPENDENTLY OF CEILING SYSTEM, WITH FOUR #12 HANGER WIRES UP TO STRUCTURE. SECURE HANGER WIRES TO CORNERS OF FIXTURE. CLIP FIXTURE TO GRID ON TWO SIDES WITH FACTORY-FURNISHED CLIPS. C. COORDINATE LAYOUT AND INSTALLATION OF RECESSED LIGHTING FIXTURES WITH OTHER CONSTRUCTION TRADES INCLUDING, BUT NOT LIMITED TO, STRUCTURAL ASSEMBLIES, MECHANICAL SYSTEM, FIRE-SUPPRESSION SYSTEM, TECHNOLOGY SYSTEMS, AND PARTITION D. EXAMINE ROUGHING-IN FOR LUMINAIRE TO VERIFY ACTUAL LOCATIONS OF LUMINAIRE AND ELECTRICAL CONNECTIONS BEFORE LUMINAIRE E. CLEAN LUMINAIRES INTERNALLY AND EXTERNALLY AFTER INSTALLATION. USE METHODS AND MATERIALS RECOMMENDED BY MANUFACTURER

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PART 1 - GENERAL 1.01 SUMMARY

- drawings, except as specifically noted otherwise.
- 1. Category 6, unshielded twisted-pair plenum horizontal data cables.

- 6. Telecommunications Outlets and Faceplates.
- audiovisual cabling infrastructure.
- 1.05 INSTALLATION

 - section. And in compliance with Category 6A for WAPs.
- regulations and requirements of the FCC.
- codes applicable to the installation.
- D. The locations of stub-ups, outlets, panels, equipment racks and other related products as indicated on the drawings are approximately correct and are understood to be subject to such revision as may be found necessary or desirable at the time of installation. Contractor should have precise and definite locations accepted by the Owner before proceeding with the installation.
- E. Telecommunications outlets shall be flush wall mounted or within surface mount boxes, as shown on the drawings: 1. Horizontal cabling shall not be spliced but must be continuous from the TR to the workstation
- outlets. 2. The proximity of horizontal and backbone cabling to electrical facilities that generate high levels of electromagnetic interference (EMI) shall be taken into account. These facilities

- include, but are not limited to copiers, motors, transformers and fluorescent lighting. TIA/EIA 569 standards shall provide separation requirements.
- F. The maximum pulling tensions for 4-pair, 24 AWG horizontal UTP cables should not exceed 25 pounds per cable.
- G. All horizontal cables shall be terminated according to the TIA/EIA T568B wiring scheme. H. The connecting hardware used shall be installed to provide minimal signal impairment by preserving
- wire pair twists as closely as possible to the point of mechanical termination. The amount of
- inches.
- drawings. PART 2 - PRODUCTS

2.01 GENERAL

- A. Protect all materials and equipment from damage during storage at the site and throughout the construction period. Equipment and materials shall be protected during shipment and storage against physical damage, dirt, moisture, cold and rain. If items are damaged, do not install, but take immediate steps to obtain replacement.

 - A. General
 - 1. The cable shall meet all requirements of ANSI/TIA/EIA-568B. 2. The cable shall meet all requirements of ANSI/ICEA Publication S-80-576 that are applicable

 - to four-pair inside wiring cable for plenum within a building. 3. Horizontal data cabling shall be Category 6, 4-pair UTP cabling with manufacturer transmission characteristics specified up to 250 MHz. Shall meet Category 6A standard for data cabling run to WAP locations.
 - 4. Plenum rated cable shall be used in plenum rated spaces. 5. Cat 6 cable shall be minimum standards compliant, no substitutions for heavy, E or + rated
 - Cat 6 cables.
 - a. Horizontal Cat 6 plenum data cable shall be blue in color. b. Horizontal Cat 6 plenum voice VoIP cable shall be violet in color. c. Horizontal Cat 6 plenum IP security device cable shall be yellow in color.

 - d. Horizontal Cat 6 plenum IP 'BAS, AV, or other building systems' device shall be orange in color. 6. Cat 6A cable shall be minimum standards compliant, no substitutions for Cat 6A cables. a. Each WAP outlet location requires (2) Cat 6A cables.

 - B. Manufacturer:

1. Amp Netconnect 2. No substitution

2.03 CLASSROOM MULTI-MEDIA CABLING

- A. General 1. Audiovisual cabling infrastructure shall be installed from wall mounted teacher workstation multi-media outlet locations through to accessible ceiling space, and routed to wall mount

 - multi-media plate located adjacent to wall-mount short throw projector. Coordinate location

 - with associated power outlet. permanently wired. Final location as coordinated with Architect and District.
- 2. For each classroom, (1) wall mounted teacher multi-media outlet location shall be provide, 3. Conduit and junction boxes provided by the E.C. Conduit to be sized for included cabling, max
- 40% fill, and routed to accessible ceiling spaces.
- 4. Plenum rated cable shall be used in plenum rated spaces. 5. For wall mounted teacher multi-media outlet location, at minimum, cabling shall be provided for the following:
- a. (2) HDMI
- b. (1) VGA
- c. Other, if specifically requested by District during project planning and design. 6. All cabling shall be provided with associated modular connector, and plug into bulkhead
- inserts on faceplate at each end location.
- 7. Reference drawings for locations and additional requirements. 8. Data requirement: TC to provide separate box with 2-port data outlet adjacent to:
- a. Teacher multi-media outlet plate, wall mount
- 9. Data requirement: TC to provide separate box with 1-port data outlet adjacent to: a. Projector multi-media outlet plate, wall mount near ceiling, near projector
- 10. Refer to section 275116 for Classroom Audio System requirements.

TECHNOLOGY SPECIFICATIONS:

A. General

SECTION 27 1513 COMMUNICATIONS COPPER HORIZONTAL CABLING

A. Section consists of furnishing all equipment, supplies and materials, tools, services and facilities and in performing installation of horizontal cabling and outlets in accordance with the specifications and

- B. The work of this section shall include, but not be limited to installation of the following:
- 2. Category 6, unshielded twisted-pair plenum horizontal voice cables.
- 3. Category 6A, unshielded twisted-pair plenum horizontal wireless cables. 4. Category 6, unshielded twisted-pair plenum horizontal cables for data connectivity of other
- building system IP devices such as security cameras, AV components, etc. 5. Cat 6 Telecommunications Connectors, Cat 6A where required for WAPs.
- 7. Category 6 unshielded twisted-pair patch cords for data communications cross-connects in the TR as well as at the workstation. Category 6A where required for WAPs. 8. Multi-media cables and associated connectors, where shown on drawings for classroom
- A. Install all equipment in strict accordance with the manufacturer's recommendations and in
- compliance with TIA/EIA Category 6 Telecommunications Standards, as specified in the references B. The installation shall be in compliance with the requirements of the NEC, OSHA and the rules,
- C. The installation shall comply with federal, city, county and state laws, ordinances, regulations, and

- untwisting in a pair as a result of termination to connecting hardware shall be no greater than 0.25 I. All cables shall be installed with J-hook type supports above ceiling on 5-foot centers. E.C. shall
- provide conduit stubs up into accessible ceiling space unless otherwise noted on the floor plan
- 2.02 HORIZONTAL DATA / VOICE / WAP / IP DEVICE CABLING
 - b. Horizontal Cat 6A plenum WAP cable shall be green in color. 7. Note all intercom-paging 'speaker cabling' shall be white in color, refer to section 275116.

2.04 TELECOMMUNICATION DATA OUTLET CONNECTIONS

- 1. For data, voice, security camera, and other IP device locations, telecommunications outlet/connectors shall consist of 8-position, Cat 6 modular RJ-45 jacks, in quantities and locations as shown on the drawings. Contractor shall furnish and install colored IDC inserts that match the color of the cable installed for all systems.
- 2. For WAP outlet locations, telecommunications outlet/connectors shall consist of 8-position, Cat 6A modular RJ-45 jacks, in quantities and locations as shown on the drawings. Each
- WAP outlet location requires (2) Cat 6A connectors. Contractor shall furnish and install colored IDC inserts that match the color of the cable installed for all systems. 3. All outlets shall be produced by the same manufacturer and shall be designed to snap into
- and out of the faceplate. 4. The outlets shall terminate the horizontal cables using insulation displacement type contacts
- (IDC). 5. The outlets shall support TIA/EIA T568B color-coding for terminating the horizontal cables. 6. All outlets shall be high-density modular jacks for high-speed network applications using data
- transmission rates with frequencies up to 250 MHz. Shall meet Category 6A standard for data cabling run to WAP locations. 7. The outlets shall be ANSI/TIA/EIA 568B certified and fully comply with ANSI/TIA/EIA- 568B transmission requirements.
- 8. Connectors for data cabling shall be Cat 6 blue in color.
- 9. Connectors for voice VoIP cabling shall be Cat 6 violet in color. 10. Connectors for IP security device cabling shall be Cat 6 yellow in color.
- 11. Connectors for IP 'BAS, AV, or other building systems' IP device cabling shall be Cat 6 orange 12. Connectors for WAP cabling shall be Cat 6A green in color. Each WAP outlet location requires (2) Cat 6A connectors.
- B. Manufacturer: 1. Amp Netconnect
- 2. No substitution
- 2.05 DATA OUTLET FACEPLATES A. General
 - 1. Telecom contractor shall be responsible for coordinating final faceplate colors and
 - requirements with all electrical outlets and architect prior to install. 2. All faceplates shall be capable of receiving modular inserts. Inserts will include Cat 6, Cat 6A
 - and other multi-media cabling connectors as required. 3. Provide wall mounted, duplex and quad faceplates as noted on the drawings.
 - 4. Provide surface mounted data port boxes above ceiling for WAPs, IP CCTV cameras and any other above ceiling mounted cabling. 5. All unused ports shall be filled with blank inserts.
 - 6. All faceplate types shall provide designation labels with protective clear plastic covers, or
 - equivalent, for circuit identification. 7. Designation labels for faceplates shall be typed and not handwritten.
 - 8. Contractor to reference T9.0 for faceplate, surface box, modular connector details.
 - 9. Reference drawings for requirements, locations, and faceplate details.
- B. Manufacturer: 1. Amp Netconnect
- 2. No substitution 2.06 FACEPLATES FOR WALL MOUNTED VOICE ONLY OUTLETS
- A. General
- 1. Shall be flush mounted single gang wall plates stainless steel. 2. All wall mounted faceplates for voice outlets mounted at +46" A.F.F. shall be wall telephone jacks/faceplates. Faceplates shall be constructed of metal and shall include two (2) screwmounting studs for wall-mounted phones.
- B. Manufacturer:
- 1. Amp Netconnect
- 2. No substitution 2.07 PATCH CORDS
- A. Patch cords shall consist of 24 AWG thermoplastic insulated stranded conductors formed into four individually unshielded twisted pairs and enclosed by a thermoplastic jacket.
- B. Patch cords shall be factory-terminated with an 8-position, modular RJ-45 plug on both ends. C. Patch cords shall be TIA/EIA 568A certified and comply fully with TIA/EIA 568A Category 6
- transmission requirements and shall be 100% transmission tested. Shall meet Category 6A standard for patch cords used for WAP device application. D. All patch cables shall be TIA/EIA T568B color-coding compliant to match the installed connector
- and patch panel products.
- E. Telecom Contractor shall furnish and owners IT staff shall install.1. One Category 6, 10' patch cord for each installed data cable at device end.
- 2. One Category 6, 6' patch cord for each installed data cable at TR end.
- 3. One Category 6A, 6' patch cord for each installed WAP data cable at TR end. Note, patch cord not required to be provided for device end.
- 4. Color match patch cords to connectors, cable and system as identified above.
- F. Contractor to verify with Owner prior to purchasing any patch cords, the correct lengths, colors, and quantities. Contractor shall calculate required lengths for the Communications room patch cords from the rack elevation drawings.
- G. Manufacturer: 1. Amp Netconnect
- 2. No substitution
- PART 3 EXECUTION
- 3.01 GENERAL
- A. Refer to Section 27 0500.

1 ELECTRICAL LOWER LEVEL PLAN SCALE: 1/4" = 1'-0"

	FLAG NOTES:
1	DISCONNECT POWER TO EXISTING HEATING PUMP FOR REPLACEMENT. RECONNECT NE TO EXISTING CIRCUIT. COORDINATE WITH MECHANICAL CONTRACTOR.

DEMOLITION NOTES:

- 1. DEMOLITION PLAN INDICATES A DESIRED SCOPE OF WORK; THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY IN FIELD PRIOR TO START OF WORK.
- 2. CONDITIONS MAY EXIST WHERE (E) CABLING AND/OR EQUIPMENT IS INSTALLED WITHIN AN AREA OF DEMOLITION THAT IS INTENDED TO REMAIN IN ORDER TO KEEP SYSTEMS OUTSIDE OF THE AREA OF DEMOLITION IN OPERABLE CONDITION. CONTRACTOR SHALL PROVIDE APPROPRIATE PROTECTION AND EXERCISE CARE WHEN PERFROMING DEMOLITION AROUND SUCH CABLING AND EQUIPMENT.
- 3. ALL SYSTEMS LOCATED OUTSIDE THE AREA OF DEMOLITION ARE INTENDED TO REMAIN OPERABLE.
- 4. FOR ALL ITEMS TO BE DEMOLISHED REMOVE CIRCUIT BACK TO POINT OF CONNECTION. MAKE BRANCH CIRCUIT WITH REMAINING DEVICES CONTINUOUS.
- 5. ELECTRICAL CONTRACTOR SHALL REMOVE ALL DEMOLISHED ITEMS FROM SITE UNLESS OWNER WISHES TO RETAIN. ITEMS REMOVED FROM SITE SHALL BE DISPOSED OF IN A LEGAL MANNER.
- 6. EVERY ATTEMPT WAS MADE TO LOCATE ALL ITEMS TO BE INCLUDED IN THE DEMOLITION SCOPE IN THIS OCCUPIED SPACE. ELECTRICAL CONTRACTOR SHALL PROVIDE A REASONABLE ALLOWANCE TO INCLUDE THE REMOVAL OF ITEMS NOT INDICATED ON THE ELECTRICAL DEMOLITION PLAN.
- 7. EAST HALF OF BUILDING IS CURRENTLY SERVED BY PANELS L1B AND L1C. THERE IS NO PANEL DIRECTORY FOR PANEL L1B. PROVIDE LINE ITEM ADD ALTERNATE COST TO TRACE CIRCUITS IN PANEL L1B AND PROVIDE UPDATED PANEL DIRECTORY.
- 8. PRESERVE AND PROTECT EXISTING LIGHTING AND RECEPTACLE CIRCUITS SERVING LIGHTING FIXTURES AND RECEPTACLES BEING DEMO'D AND RELOCATED. RE-USE EXISTING LIGHTING BRANCH CIRCUITS AND ADJUST SWITCHING TO MEET NEW PROGRAM. REUSE BRANCH CIRCUITS FOR EXISTING RECEPTACLES IN EXISTING WALLS TO BE DEMO'D FOR NEW OR RELOCATED RECEPTACLES.

DEMO FLAG NOTES: 1 REMOVE EXISTING RECEPTACLE AND PRESERVE

- CIRCUIT FOR RELOCATION. RECEPTACLE SHALL BE REMOVED FOR ADDITION OF DOOR. 2 EXISTING LIGHTING FIXTURE TO BE REMOVED AND
- PRESERVED FOR RELOCATION. 3 REMOVE EXISTING RECEPTACLE AND SWITCH FOR EXISTING DISPOSAL, PRESERVE CIRCUIT FOR EXTENSION TO NEW RECEPTACLES.
- 4 REMOVE EXISTING 2X4 LAY-IN TROFFERS. REMOVE AND DISPOSE OF EXISTING FIXTURES FROM SITE. DISPOSE OF EXISTING FLUORESCENT LAMPS IN COMPLIANCE WITH EPA REGULATIONS.
- 5 EXISTING CEILINGS IN EAST CLASSROOM #3105 AND OFFICES #202, 203, & 204. REMOVE ALL LIGHTING FIXTURES AND PROTECT FOR RE-INSTALLATION IN NEW CEILING.

Exhibit A

TAB

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42215

DATA OUTLET DIAGRAM PLAN SYMBOL: 🛛 🗸 NO SCALE

1 ELECTRICAL UPPER LEVEL PLAN SCALE: 1/4" = 1'-0"

POWER NOTES:

- 1. REFER TO ARCHITECTURAL PLANS AND INTERIOR ELEVATIONS FOR FINAL RECEPTACLE AND DEVICE PLACEMENT. COORDINATE ALL RECEPTACLE MOUNTING LOCATIONS WITH FIXTURES, APPLIANCES, FURNITURE, CABINETRY, AND OTHER EQUIPMENT PRIOR TO ROUGH-IN. 2. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR CIRCUIT, DISCONNECT, AND CONDUCTORS FOR MECHANICAL EQUIPMENT. 3. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR FIELD COORDINATING THE LOCATION OF ELECTRICAL EQUIPMENT, JUNCTION BOXES, DISCONNECTS, ETC. EC SHALL BE RESPONSIBLE FOR COORDINATION AND
- 4. COORDINATE POWER CONNECTIONS FOR OWNER PROVIDED EQUIPMENT AND APPLIANCES, AND ALL OTHER EQUIPMENT PROVIDED BY OTHER DIVISIONS WITH SUBMITTAL DATA CUT SHEETS, WIRING DIAGRAMS, AND MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. FIELD COORDINATE FINAL LOCATIONS OF EQUIPMENT AND POWER CONNECTIONS WITH GENERAL CONTRACTOR AND OTHER DIVISIONS/CONTRACTORS PRIOR TO ROUGH-IN. PROVIDE READILY ACCESSIBLE GROUND-FAULT CIRCUIT-INTERRUPTER (GFCI) PROTECTION FOR RECEPTACLES FOR APPLIANCES LISTED AND IN LOCATIONS REQUIRED IN NEC 210.8.
- FLAG NOTES: (#) 1 PROVIDE CEILING RECEPTACLE AND CEILING MOUNTED DATA PORT (RJ-45). FIELD VERIFY EXACT LOCATION WITH OWNER'S REP PRIOR TO ROUGH-IN. PROVIDE CAT 6E PLENUM RATED CABLE FROM CEILING DATA PORT TO TELECOM RACK IN SERVER ROOM.
- 2 PROVIDE DEDICATED 20 AMP, 120 VOLT GFCI CIRCUIT TO WATER FOUNTAIN/BOTTLE FILLER. VERIFY EXACT CONNECTION TYPE, RECEPTACLE OR HARD WIRED WITH PRODUCT DATA SUBMITTAL.
- 3 CONNECT NEW RECEPTACLE TO PRESERVED CIRCUIT SERVING EXISTING KITCHEN DISPOSAL. 4 PROVIDE 4-SQUARE JUNCTION BOX FOR NEW DOOR ACCESS SYSTEM. PROVIDE 1" CONDUIT FROM THE
- EXACT LOCATION AND REQUIREMENTS WITH SCHOOL DISTRICT PRIOR TO ROUGH-IN. 5 POWER FOR ADA DOOR OPENER PROVIDE 20 AMP, 120 VOLT CIRCUIT. UTILIZE SPACE IN PANEL L1B MADE VACANT BY REMOVAL OF THE RANGE/OVEN
- DETAILS WITH MANUFACTURER'S INSTALLATION LITERATURE PRIOR TO ROUGH-IN. 6 JUNCTION BOX FOR ADA DOOR OPENER PUSH-BUTTON. PROVIDE RACEWAY AS REQUIRED TO DOOR ACTUATOR. VERIFY EXACT LOCATION AND
- LITERATURE AND INSTALLER. 7 CIRCUIT NEW RECEPTACLES TO SPACE VACATED BY THE REMOVAL OF THE MICROWAVE ABOVE RANGE/OVEN.
- 8 CIRCUIT RESTROOM EXHAUST FAN WITH RESTROOM LIGHTING. EXHAUST FAN TO BE CONTROLLED VIA AN OCCUPANCY SENSOR SEPARATE FROM LIGHTING AND TIED TO BAS SYSTEM. MECHANICAL TO PROVIDE EXHAUST FAN OCCUPANCY SENSOR.
- 9 DISCONNECT POWER EXISTING EXHAUST FAN IN JANITORS CLOSET AND RE-CONNECT REPLACEMENT EXHAUST FAN.

THE ROUTING OF FEEDERS, AND BRANCH CIRCUITS.

JUNCTION BOX TO SERVER ROOM. COORDINATE

REMOVAL. COORDINATE CONNECTION AND CONTROL

REQUIREMENTS WITH DOOR OPENER INSTALLATION

LIGHTING NOTES:

- 1. REFER TO ARCHITECTURAL (RCP) AND MECHANICAL PLANS FOR CEILING COORDINATION. COORDINATE WITH MECHANICAL, FIRE ALARM, TECHNOLOGY AND
- OTHER TRADES TO AVOID CEILING CONFLICTS WITH OTHER DEVICES, LIGHTS AND HVAC DIFFUSERS.
- 2. WHENEVER POSSIBLE CIRCUIT EXISTING AND NEW LIGHTING TO EXISTING LIGHTING CIRCUITS, U.N.O.
- 3. CIRCUIT ALL EMERGENCY LIGHTING AND EXIT SIGNS TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF LOCAL SWITCHLEG
- 4. CONTRACTOR IS RESPONSIBLE FOR PROVIDING MOUNTING HARDWARE REQUIRED FOR INSTALLING ALL LIGHT FIXTURES. VERIFY ALL CEILING FINISHES, CEILING TYPES, AND CEILING THICKNESS PRIOR TO
- FINAL FIXTURE PURCHASE AND PROCUREMENT. 5. ELECTRICAL CONTRACTOR SHALL SIZE BRANCH CIRCUIT WIRING TO ACCOMMODATE FOR VOLTAGE DROP.
- 6. ALL DIMMED LIGHTING CIRCUITS ARE TO RECEIVE DEDICATED NEUTRALS. DO NO SHARE NEUTRALS ON DIMMED LIGHTING CIRCUITS.
- 7. ALL LIGHT SWITCHES SHALL BE SPECIFICATION GRADE, QUIET OPERATION RATED 120/277VOLT, 20 AMPS, UNLESS OTHERWISE NOTED.
- 8. EXIT SIGNS SHALL HAVE INTEGRAL EMERGENCY BATTERY BACK-UP.
- 9. CIRCUIT NEW AND EXISTING RELOCATED LIGHTING FIXTURES TO THE EXISTING CIRCUITS SERVING LIGHTING IN THE AREA.

FLAG NOTES:

- CONTROL LIGHTING.
- 2 COMBO WALL SWITCH/OCCUPANCY SENSOR PIR.
- 3 DAYLIGHT ZONE, LIGHTING IN ZONE IS LESS THAN 150 WATTS OF LIGHTING FIXTURE LOAD, THEREFORE DAYLIGHT-RESPONSIVE CONTROLS ARE NOT REQUIRED PER IECC C405.

				LU	MINAIR		EDULE				
TVDE	DESCRIPTION	MOUNTING				1	INPUT				SPECIFI
1176	DESCRIPTION	MODITING	TYPE	LUMENS	CRI	ССТ	WATTS	VOLTAGE	MANUFACTURER	CATALOG NUMBER	NOTES
R1	EXISTING 2X2 LED LUMINOUS PANEL	RECESSED	LED				25				1
R2	EXISTING 2X2 VOLUMETRIC TROFFER	RECESSED					25				
R3	2X2 RECESSED LED LUMINOUS PANEL - LOW LUMEN	RECESSED	LED	2664	80	3500	20.5	120	LITHONIA	CPX 2X2 ALO7 80CRI SWW7 SWL 120	2
R4	6" LED RECESSED DOWNLIGHT WITH SEMI-SPECULAR REFLECTOR	RECESSED	LED	1500	80	3000	17.5	120	LITHONIA	LDN6 30 15 LO6 AR LSS TRW 120	
W1	24" LED WALL MOUNTED VANITY LIGHT BRUSHED NICKEL FINISH	SURFACE	LED	1300	90	3000	18	120	LITHONIA	FMVCSL 24IN MVOLT 30K 90CRI BN M6	
W2	LED EXTERIOR WALL PACK WITH PHOTOCELL AND COLD EMERGENCY BATTERY BACKUP, MOUNT 12' AFG	SURFACE	LED	1200	80	3000	18	120	LITHONIA	WDGED LED P1SW 30K 80CRI VW MVOLT SRM E20WC PE DDBXD	
X2	COMBO GREEN LED EXIT EMERGENCY LIGHT WITH INTEGRAL BATTERY	SURFACE	LED				3.5	120	LITHONIA	ECRG SQ M6	
Х3	DUAL HEAD LED EMERGENCY LIGHT WITH INTEGRAL BATTERY	SURFACE	LED				0.56	120	LITHONIA	EU2C M6	
GENE	RAL NOTES:										•
А.	THE LUMINAIRE SCHEDULE CAN NOT BE USED IND PRICING WITHOUT FIRST SEEING APPLICABLE ELE SPECIFICATIONS TO THE INDIVIDUAL QUOTING LUI	EPENDENTLY CTRICAL DRA' MINAIRE PRIC	of the df Wings Ani Ing.	RAWINGS AND DELECTRICA	D SPECIFICA L DIVISION S	TIONS TO OB PECIFICATIO	TAIN LUMINA NS. THE COI	IRE COSTS. TH	E INDIVIDUAL ESTABLISH EPONSIBLE FOR PROVID	HING LUMINAIRE COSTS SHALL NOT (IING NECESSARY DRAWINGS AND	QUOTE
В.	REFER TO DRAWINGS FOR FIXTURES REQUIRING E OPERATE FOR A MINIMUM OF 90 MINUTES.	EMERGENCY E	BATTERY B	ACKUP OPTIC	ON (SHOWN I	BY HATCH IN	OVER SYMB	OL). MINIMUM LI	GHT OUTPUT FOR EM BA	ALLAST SHALL BE 600 LUMENS. BATT	ERY SHAL
SPECI											

(2) CONTRACTOR TO MATCH COLOR TEMPERATURE OF TYPE R3 FIXTURES WITH THE EXISITING TYPE R2 FIXTURES FOR CONSISTENTENCY IN SPACE.

1 DUAL TECHNOLOGY CEILING VACANCY SENSOR TO

Sheet No:

EL2.²

Construction Documents Narrative

Roaring Fork School District

Glenwood Springs High Annex - Renovations

4/5/2024

TAB Associates, Inc.

ARCHITECTURAL DESIGN NARRATIVE

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Signage Example

Separate Documents Drawings

SEE DRAWING INDEX.

Structural Structural Calculations

Mechanical, Plumbing, Electrical

See Drawings

DESIGN NARRATIVE

GENERAL INFORMATION

SUMMARY

The architectural portion of the project consists of the following:

- The existing facility is approximately 8,100 sqft with 2 floors. Approximately 3,400 sqft is being renovated with a mix of light and heavy renovation.
- The interior space is currently used for classrooms and office space.
- Site work is limited to new accessible access on the south side of the building.

Site Images:

CODE SUMMARY

See Code sheet A.02.

Climate Zone 5B

Existing structure does not have a Fire Suppression System. Existing Fire Alarm is fully Addressable.

Permitting will be through the State of Colorado.

ARCHITECTURE

EXTERIOR ENCLOSURE

Exterior Walls:

Existing Brick Veneer and wall framing.

Exterior Doors:

Hollow Metal Doors:

- Thickness: 1 ³/₄"
- Flush Panel
- U-Value: 0.37 maximum
- Paint.

Hollow Metal Door Frames:

- New: all frames to be galvanized.
 - Frames up to 36" wide: 16 ga
 - Fully welded.
 - Thermally broken.
 - Glazed Units: Min. ³/₄" insulated glazing.

INTERIOR CONSTRUCTION

Interior Partitions: Walls should have a minimum STC-45 design criteria, and shall have a maximum spacing of 16" o.c.. Alternate wall types that incorporate heavier stud gauges will be implemented as the design progresses. For the purposes of this schematic design submission, it is assume all interior partitions will extend to 18" above ceilings in the Office space. Other walls will go the deck as noted in the plans.

Interior Doors

Typical Interior Wood Doors:

- 1 ¾" Solid
- Flush Panel
- Stain

Interior Hollow Metal Door Frames: Typical all locations.

- New:
 - o Frames up to 36" wide: 16 ga
 - Frames over 36" wide: 14 ga
 - o Face welded.

TAB Associates, Inc.

o Paint.

Door hardware:

Match existing Roaring Fork School District hardware specifications: See drawings.

Fittings

Toilet Accessories: the following list represents the typical toilet accessories anticipated for the project, along with a Basis of Design model number. Basis of Design products are manufactured by Bobrick.

- Contactor Furnished- Contractor Installed
 - o 24"x36" mirror Bobrick or sim- B-165 2436
 - o Grab Bar Bobrick Peened Grip. Sizes on the drawings.
 - Paper towel dispenser District supplied Contractor Installed.
 - Toilet paper dispenser District supplied Contractor Installed.
 - Soap dispenser District supplied Contractor Installed.

Interior Signage: Interior signage shall be provided throughout the building, and shall be ADA compliant. Material and font to be per District standards. Signage will include English and Spanish text. See attached cut sheet and spec.

Visual Display Boards: Porcelain enamel markerboards shall be provided. Similar to Claridge Aspire.

• All Teaching Spaces: (1) 4'-0"x8'-0" boards

Tackboards – Claridge Aluminum Framed, Colored cork tackboards.

Finishes: The following are general finishes anticipated in the project.

Interior Paint:

- Concrete: Satin Acrylic Enamel
- Typical Gypsum Board: Satin Arylic Enamel
- Restroom Gypsum Board: Semi-gloss Epoxy- SW super paint
- Wood: Semi-gloss Acrylic Enamel, Transparent Stain Finish
- Ferrous Metal: Semi-gloss Acrylic Enamel, industrial SW DTM Acrylic
- Exposed Ceiling Structure: Painted..

Tiling Products:

- Porcelain Floor and Wall Tile Large Format Wall and Floor
- Portland Cement Mortar
- Latex Portland Cement Grout
- Epoxy Grout (shower areas and kitchen)
- Schluter System Stainless Steel transitions

Flooring Products:

- Carpeting: General: Roll.
- Rubber Base

Ceiling Products

- Suspended Acoustical Tile:
 - General Typical Ceiling Tile: 2x4 SAT, Armstrong 769A.

Finish Schedule by Room Type

- Restrooms
 - Wall tile and cove base

- Epoxy Painted Gypsum Drywall, painted. Skip trowel finish.
- Floor tile.
- Classrooms
 - Carpet
 - Rubber Base 4" with Cove
 - Existing walls with brick rubber base.
 - Existing or new Drywall painted
 - Acoustical Tile Grid Ceilings
- Offices

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- o Carpet
- Rubber Base 4" with Cove
- Existing walls with brick rubber base.
- Existing or new Drywall painted
- Acoustical Tile Grid Ceilings

Water Fountain: Similar to ELKAY with water bottle filler. See plumbing.

END OF ARCHITECTURAL NARRATIVE

STRUCTURE

The existing building is two stories and is a combination of CMU, structural steel, steel joists and wood trusses with steel webs. No structural drawings are available for the original eastern part of the building. Structural drawings are available for the newer western portion of the building. A site visit was performed on 3/4/24 to confirm the construction of the eastern portion of the building. Please see photos below for documentation of this construction.

The proposed renovation has been evaluated against the requirements of the 2021 IEBC and the following structural requirements have been determined.

- 1. The total occupant load for the building will be under 250 which will keep this a structural category II building.
- 2. The design load in the classrooms of the upper level has decreased from 50 psf for office to 40 psf for classrooms. No gravity upgrades are required.
- 3. The design load in the corridors has increased from 70 psf for office to 80 psf for classroom hallways above the 1st floor. The existing structure has been checked for the increased loads and no gravity upgrades are required.
- 4. There is a new exterior door on the south side of the building that will require a new lintel. A structural steel channel bolted to the CMU will be provided.
- 5. New exterior concrete ramps will be provided to access the new door. Structural details for these elements will be provided in future sets.
- 6. The alteration will be a level 2 alteration as defined by 2021 IEBC section 603 as less than 50% of the building will be included in the work area. The alteration shall comply with the requirements of IEBC chapter 8. However, since we will not need any significant floor upgrades we will not qualify as a "substantial structural alteration" as defined by section 202. This means we will NOT need to perform a seismic evaluation of the building and the building need NOT meet the requirements of the current code for increased seismic loads.

East Side 2nd floor framing:

18" Open Web trusses with 2x4 top and bottom chords @ 16" o.c.

Approximately 12" deep steel beam support trusses. Beam is located roughly 19'-6" from the east wall in approximately the middle of the original building. The trusses appear to be supported on the exterior CMU as bearing walls

Structural Calculations – End of Document.

MECHANICAL AND PLUMBING SYSTEMS NARRATIVE

See Drawings.

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Coordination drawings.
 - 2. Requests for Information (RFIs).
 - 3. Project meetings.

1.2 DEFINITIONS

A. RFI: Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
- 4. Delivery and processing of submittals.
- 5. Progress meetings.
- 6. Preinstallation conferences.
- 7. Project closeout activities.
- 8. Startup and adjustment of systems.

1.4 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification Section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.

- 10. Field dimensions and conditions, as appropriate.
- 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
- 12. Contractor's signature.
- 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
- C. RFI Forms: Similar to AIA Document G716.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 - 1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
 - 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 - 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

1.6 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Construction Manager, and Architect, within three number days of the meeting.

- 4. Anticipate weekly meeting (onsite and online).
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than [15] <Insert number> days after execution of the Agreement.
 - 1. Attendees: Authorized representatives of Owner[, Owner's Commissioning Authority, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Critical work sequencing and long-lead items.
 - c. Designation of key personnel and their duties.
 - d. Procedures for processing field decisions and Change Orders.
 - e. Procedures for RFIs.
 - f. Procedures for testing and inspecting.
 - g. Procedures for processing Applications for Payment.
 - h. Distribution of the Contract Documents.
 - i. Submittal procedure.
 - j. Preparation of record documents.
 - k. Use of the premises and existing building.
 - I. Work restrictions.
 - m. Working hours.
 - n. Owner's occupancy requirements.
 - o. Responsibility for temporary facilities and controls.
 - p. Procedures for moisture and mold control.
 - q. Procedures for disruptions and shutdowns.
 - r. Construction waste management and recycling.
 - s. Parking availability.
 - t. Office, work, and storage areas.
 - u. Equipment deliveries and priorities.
 - v. First aid.
 - w. Security.
 - x. Progress cleaning.
 - 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- PART 2 PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

1.2 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.
- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. [rchitect reserves]the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 5 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 - 3. Resubmittal Review: Allow 5 days for review of each resubmittal.
- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

- 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
- 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
- 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
- 4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Construction Manager.
 - e. Name of Contractor.
 - f. Name of firm or entity that prepared submittal.
 - g. Names of subcontractor, manufacturer, and supplier.
 - h. Category and type of submittal.
 - i. Submittal purpose and description.
 - j. Specification Section number and title.
 - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - I. Drawing number and detail references, as appropriate.
 - m. Location(s) where product is to be installed, as appropriate.
 - n. Related physical samples submitted directly.
 - o. Indication of full or partial submittal.
 - p. Transmittal number[, numbered consecutively.
 - q. Submittal and transmittal distribution record.
 - r. Other necessary identification.
 - s. Remarks.
- F. Options: Identify options requiring selection by Architect.
- G. Deviations: Identify deviations from the Contract Documents on submittals.
- H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from Architect's Action stamp.

- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

- 2.1 SUBMITTAL PROCEDURES
 - A. General Submittal Procedure Requirements:
 - 1. Submit electronic submittals via email as PDF electronic files.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 - 5. Submit Product Data before or concurrent with Samples.
 - 6. Submit Product Data in the following format:

- a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect's digital data drawing files is otherwise permitted.
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 - 2. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 - 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 - 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

- 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit 1 Sample to Architect.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Submit product schedule in the following format:
 - a. PDF electronic file.
- F. Coordination Drawings Submittals:
- G. Contractor's Construction Schedule:
- H. Application for Payment and Schedule of Values:
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals:
- J. Closeout Submittals and Maintenance Material Submittals:
- K. Maintenance Data:
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- U. Schedule of Tests and Inspections: Comply with requirements specified in Section 014000 "Quality Requirements."
- V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- W. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- X. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals.

Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, C. name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.
 - 3. Specific test and inspection requirements are not specified in this Section.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- E. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

- G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

1.3 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.
- B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.

- 2. Project title and number.
- 3. Name, address, and telephone number of testing agency.
- 4. Dates and locations of samples and tests or inspections.
- 5. Names of individuals making tests and inspections.
- 6. Description of the Work and test and inspection method.
- 7. Identification of product and Specification Section.
- 8. Complete test or inspection data.
- 9. Test and inspection results and an interpretation of test results.
- 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
- 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
- 12. Name and signature of laboratory inspector.
- 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - d. When testing is complete, remove test specimens, assemblies, [and]mockups[, and laboratory mockups]; do not reuse products on Project.
 - 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect[, through Construction Manager], with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 - 1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 - 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 - 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

- 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
- 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
- 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
 - 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Delivery of samples to testing agencies.
 - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required qualityassurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.8 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.
- PART 2 PRODUCTS (Not Used)
- PART 3 EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.2 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

1.3 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

- 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 6. Protect stored products from damage and liquids from freezing.

1.5 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. Refer to other Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
 - 1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered.
 - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
 - 4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will be considered.
 - b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements.

Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.

- 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
 - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 3. Evidence that proposed product provides specified warranty.
 - 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 - 5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the Work.

1.2 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety
 - 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 - 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's

aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish limits on use of Project site.
 - 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 4. Inform installers of lines and levels to which they must comply.
 - 5. Check the location, level and plumb, of every major element as the Work progresses.
 - 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- F. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage

elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

- 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
- 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
- 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
- 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
- 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
- 6. Proceed with patching after construction operations requiring cutting are complete.
- H. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

- 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
- 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements"

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Predemolition Photographs or Video: Submit before Work begins.
- C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.4 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the Work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- F. Storage or sale of removed items or materials on-site is not permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PEFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off indicated utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debrisremoval operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations.
 - 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 5. Dispose of demolished items and materials promptly.
- B. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items:
 - 1. Clean and repair items to functional condition adequate for intended reuse.
 - 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 - 3. Protect items from damage during transport and storage.

- 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition[and cleaned] and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.






Exhibit A

STRUCTURAL ENGINEERING CALCULATIONS





DELIVERING COLLECTIVE INGENUITY

STRUCTURAL ENGINEERS

Prepared For: TAB and Associates Date: 4/5/2024

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FO BOX 1438		Calc By	Date
Eagle, CO 81631		MOH	4/5/2024

STRUCTURAL NARATIVE

The existing building is two stories and is a combination of CMU, structural steel, steel joists and wood trusses with steel webs. No structural drawings are available for the original eastern part of the building. Structural drawings are available for the newer western portion of the building. A site visit was performed on 3/4/24 to confirm the construction of the eastern portion of the building. Please see photos below for documentation of this construction.

The proposed renovation has been evaluated against the requirements of the 2021 IEBC and the following structural requirements have been determined.

- 1. The total occupant load for the building will be under 250 which will keep this a structural category II building.
- 2. The design load in the classrooms of the upper level has decreased from 50 psf for office to 40 psf for classrooms. No gravity upgrades are required.
- The design load in the corridors has increased from 70 psf for office to 80 psf for classroom hallways above the 1st floor. The existing structure has been checked for the increased loads and no gravity upgrades are required.
- 4. There is a new exterior door on the south side of the building that requires a new lintel. Structural steel angles bolted to the brick will be provided. Please see design calculations below.
- 5. New exterior concrete ramps will be provided to access the new door. Structural details for these elements have been provided.
- 6. The alteration will be a level 2 alteration as defined by 2021 IEBC section 603 as less than 50% of the building will be included in the work area. The alteration shall comply with the requirements of IEBC chapter 8. However, since we will not need any significant floor upgrades we will not qualify as a "substantial structural alteration" as defined by section 202. This means we will NOT need to perform a seismic evaluation of the building and the building need NOT meet the requirements of the current code for increased seismic loads.

East Side 2nd floor framing:



18" Open Web trusses with 2x4 top and bottom chords @ 16" o.c.

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Approximately 12" deep steel beam support trusses. Beam is located roughly 19'-6" from the east wall in approximately the middle of the original building. The trusses appear to be supported on the exterior CMU as bearing walls

LINTEL DESIGN

The exterior wall is non-load bearing as the trusses run parallel to the wall. In addition, the door is quite a bit lower than the top of the wall so the brick will arch over the door. The lintel will be design to support the triangular portion of brick directly above it, but no other load.

Weight of Brick	w = 40 psf
Max height of supported brick above angle	h = 2 ft
Load to angle	w _u = 1.4*w*h = 112.0 plf
Length of door opening	l = 4 ft
Shear	V _u = w _u *l/2 = 0.224 kips
Moment	$M_u = w_u * l^2 / 8 = 0.224 \text{ kip_ft}$

STEEL MEMBER DESIGN (AISC 360)

In accordance with AISC360 15th Edition published 2016 using the LRFD method

Tedds calculation version 4.5.00

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Resistance factors					
Shear		$\phi_v = 0.90$			
Flexure		ϕ_{b} = 0.90			
Tensile yielding		$\varphi_{t,y}=\textbf{0.90}$			
Tensile rupture		$\phi_{t,r} = 0.75$			
Compression		$\phi_c = 0.90$			
Design section 1					
Section details					
Section type		L 4x3x3/8 (A	AISC 15th Edn (v15.0))		
ASTM steel designation		A36			
Steel yield stress		F _y = 36 ksi			
Steel tensile stress		F _u = 58 ksi			
Modulus of elasticity		E = 29000 ks	i		
	0.38" ←	_3"	L 4x3x3/8 (AISC 15th Edn (v15.0)) Section depth, L ₁ , 4 in Section breadth, L ₂ , 3 in Weight of section, Weight, 8.5 lbf/ft Section thickness, t, 0.375 in Area of section, A, 2.5 in ² Radius of gyration about y-axis, r _y , 1.26 in Radius of gyration about y-axis, r _y , 0.873 in Elastic section modulus about y-axis, S _y , 0.851 Second moment of area about y-axis, I _y , 3.94 ir Second moment of area about y-axis, I _y , 1.89 ir	1 ³ A A	
Analysis results					
Required flexural strength - Ma	jor axis	M _{r,x} = 0.224	kips_ft		
Required shear strength - Majo	r axis	V _{r,x} = 0.224 k	ips		
Restraint spacing					
Maior axis lateral restraint		l ₂ = 1 ft			

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Classification of sections for loc	al buckling -	Section B4			
Classification of flanges in flexu	re - Table B4	l.1b (case 12)			
Width to thickness ratio		L ₁ / t = 10.67			
Limiting ratio for compact section	'n	λ_{pff} = 0.54 $ imes$ $\sqrt{[\text{E}$ / F _y]} = 15.33			
Limiting ratio for non-compact s	ection	λ_{rff} = 0.91 $ imes \sqrt{[E / F_y]}$ = 25.83	Compact		
			Sect	ion is compo	act in flexure
Design of members for shear - C	hapter G				
Required shear strength		V _{r,x} = 0.2 kips			
Web area		$A_w = L_1 \times t = 1.5 \text{ in}^2$			
Web plate buckling coefficient		k _v = 1.2			
		$L_1 / t \le 1.10 \times \sqrt{(k_v \times E / F_y)}$			
Web shear coefficient - eq G2-9		C _{v2} = 1.000			
Nominal shear strength - eq G3-	1	$V_{n,x} = 0.6 \times F_y \times L_1 \times t \times C_{v2} = 32$	2.4 kips		
Resistance factor		φ _v = 0.90			
Design shear strength		$V_{c,x} = \phi_v \times V_{n,x} = 29.2 \text{ kips}$			
		V _{r,x} / V _{c,x} = 0.008			
		PASS - Design shear strer	ngth exceeds	required sh	ear strengtl
Design principal moments					
Required flexural strength about	: w-w axis	$M_{r,w} = M_{r,x} \times Cos(\theta_{eff}) = 0.2 kips$	s_ft		
Required flexural strength about	: z-z axis	$M_{r,z} = abs(-M_{r,x} \times Sin(\theta_{eff})) = 0.4$	1 kips_ft		
Design of members for flexure -	Chapter F				
Required flexural strength		M _{r,w} = 0.2 kips_ft			
Yielding - Section F10.1					
Nominal flexural strength for yie	lding - eq F1	0-1 $M_{n,yld,w} = 1.5 \times 0.8 \times F_y \times$	S _w = 6.6 kips	_ft	
Lateral-torsional buckling - Section	n F10.2				
Unbraced length		$L_{\rm b} = 1 {\rm ft}$			
Width of compression leg	- -	$D = L_2 = 3 \text{ III}$	C +		
Yield moment for lateral-torsion	al buckling	$M_y = 0.8 \times F_y \times S_w = 4.367 \text{ kips}_{-}$	_tt		
LIB INODIFICATION FACTOR		$C_{\rm b} = 1.000$			
Article and the second second second					

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		$M_{cr} = 9 \times E \times A \times r_z \times t$	\times C _b \times ($\sqrt{1 + (4.4)}$	$\times \beta_{\rm w} \times r_z / (L_b >$	×t)) ²) + 4.4		
		$eta_{w} imes$ rz / (L $_{b} imes$ t)) / (8 $ imes$	L _b) = 330.8 kips_ft				
Nominal flexural strength for lat	eral-torsiona	l buckling - eq F10-2					
		M _{n,ltb,w} = min((1.92 - 1.1	17×√(M _y / M _{cr})) :	imes M _y , 1.5 $ imes$ M _y) = 6.6 kips		
Design flexural strength - F1							
Nominal flexural strength		$M_{n,w} = min(M_{n,yld,w}, M_{n,yld,w})$	_{ltb,w}) = 6.6 kips_ft				
Design flexural strength		$M_{c,w} = \phi_b \times M_{n,w} = 5.9 \text{ k}$	ips_ft				
		M _{r,w} / M _{c,w} = 0.033					
		PASS - Design flexural strength exceeds required flexural streng					
Design of members for flexure	- Chapter F						
Required flexural strength		M _{r,z} = 0.1 kips_ft					
Yielding - Section F10.1							
Nominal flexural strength for yie	elding - eq F1	0-1 $M_{n,yld,z} = 1.5 \times 0.8$	$B \times F_y \times S_z = 2.5$ kip	os_ft			
Design flexural strength - F1							
Nominal flexural strength		$M_{n,z} = M_{n,yld,z} = 2.5 \text{ kips_ft}$					
Design flexural strength		$M_{c,z} = \phi_b \times M_{n,z} = 2.3 \text{ kips_ft}$					
		M _{r,z} / M _{c,z} = 0.048					
		PASS - Design flexural strength exceeds required flexural streng					
Design of members for combine	ed forces - Cl	apter H					
Combined flexure and axial forc	e - eq H2-1	M _{r,w} / M _{c,w} + M _{r,z} / M _{c,z}	= 0.081				
		PASS - Combined flexu	re and axial force	e is within acco	eptable lin		