INTERIOR UPFIT USPS SPOUT SPRINGS, NC CAX

H M CAGLE DRIVE SPOUT SPRINGS, NC

MAY 17, 2018 100% CONSTRUCTION SET USPS PROJECT NUMBER: C97932

ARCHITECT WALKER GROUP ARCHITECTURE, INC.

409 BROAD STREET NEW BERN, NC 28560 (252) 636-8778

PLUMBING/MECHANICAL/ELECTRICAL ENGINEERING

MCKNIGHT SMITH WARD GRIFFIN 4223 SOUTH BOULEVARD CHARLOTTE, NC 28209 (704) 527-2112

ABBREVIATONS GENERAL NOTES ACOUSTICAL PANEL CEILING EXT. FXTERIOR 0C ON CENTER LOCAL GOVERNING ORDINANCES, CODES, AND REGULATIONS. FLOOR DRAIN OVERHANG OVERHEAD ADJACENT ADJ ABOVE FINISHED FLOOR FOUNDATION OHD. AFF FDN. FIRE EXTINGUISHER OPNG. OPENING FIRE EXTINGUISHER OPNG. OPENING FINISHED FLOOR ELEVATION PART. PARTITION FLOOR P.E.M.B. PRE-ENGINEI FIRE RETARDANT TREATED PC PLUMBING CI ALUMINUM ALTERNATE ATTENUATION BOARD BITUMINOUS AND REGULATIONS. P.E.M.B. PRE-ENGINEERED METAL BLDG. PC PLUMBING CONTRACTOR ATTN. COORDINATION: THE PLUMBING, MECHANICAL, AND ELECTRICAL DRAWINGS FOOTING FURRING GAUGE PLATE BLOCKING BLANKET BEAM FUR PAINTED REFRIGERATOR REQUIRED BLKT. RFF GALVANIZED REQD. BM. GALV. BOTTOM OF PLATE GRAB BAR ROOM ROUGH OPENING BOP RM. CABINET GENERAL CONTRACTOR RO. CAB. OF ANY DISCREPANCIES OR ERRORS. CATCH BASIN GLASS SQUARE FEET * CENTERLINE CLG.HT. CEILING HEIGHT CJ CONTROL JOINT ^LR. CLEAR ^. CEILING CONCRETE MASONRY UNIT CONCRETE , CONSTRUCTION , SIM. SIMILAR SPECS. SPECIFICATIONS CENTERLINE GYP.BD. GYPSUM BOARD 4. PRIOR TO BID, COTRACTOR SHALL VISIT AND BECOME FAMILIAR WITH THE SITE HARDWARE HDW STAINLESS STEEL STANDARD S.S. HOLLOW METAL AND EXISTING BUILDING. INCLUDE THE COST OF ALL WORK DESCRIBED IN THE HM HIGH POINT HP HEIGHT STRUCT. STRUCTURE/STRUCTURAL ACHIEVE THE DESIGN INTENT OF THE CONTRACT DOCUMENTS. HVAC HEATING, VENTILATION, AIR CONDITIONING SUSPENDED TOP CURB TOP GRATE TEMPERED THICK SUSP. INT. INSUL. INTERIOR LEGEND: ALL SYMBOLS AND ABBREVIATIONS USED ON THE DRAWINGS ARE CONSTR. CONT. CONTR. CONSTRUCTION INSULATION CONTINUOUS CONTRACTOR CERAMIC TILE DRAWING EACH CONSIDERED CONSTRUCTION STANDARDS. IF THE CONTRACTOR HAS ANY INVERT JOINT TEMP. INV. THK. TOP OF JOIST TOP OF MASONRY LAVATORY LAV. L P OFFICER SHALL BE NOTIFIED FOR CLARIFICATION. тј том LOW POINT TOP OF PLATE TOP OF PLATE TOP OF SLAB TOP OF WALL TYPICAL TOP OF STEEL TUBE STEEL VERTICAL VERIFY IN FIELD WOOD EACH MANUF. MANUFACTURER ELECTRICAL CONTRACTOR MC MECHANICAL CONTRACTOR TOP MH. MANHOLE MECH. MECHANICAL EXHAUST FAN SCALE DRAWINGS HAVE PRECEDENCE OVER SMALLER SCALE DRAWINGS. ELECTRICAL ENCL.ENCLOSUREMECH.MECHANICALENCL.ENCLOSUREMIN.MINIMUMEOSEDGE OF SLABMO.MASONRY OPENINEQ.C.EQUIPMENT CONTRACTORMTD.MOUNTEDEWCELECTRIC WATER COOLERMTL.METALEXIST.EXISTINGNICNOT IN CONTRACTEXPD.EXPOSEDN.T.S.NOT TO SCALEEXP.JT.EXPANSION JOINTEXPOSEDN.T.S. SPECIFICATIONS AND GENERAL NOTES TAKE PRECEDENCE OVER DRAWINGS. TS VERT. WD. FRAMING, HANGERS, OR OTHER SUPPORT AS NECESSARY FOR ALL WDW. WINDOW WWF W/ WELDED WIRE FABRIC WITH



PERFORM WORK IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND ALL MATERIALS SHALL COMPLY WITH APPLICABLE CODES, ORDINANCES,

ARE SUPPLEMENTARY TO THE ARCHITECTURAL DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CHECK AND COORDINATE ALL THE DRAWINGS BEFORE FABRICATION AND/OR INSTALLATION OF ANY WORK. CONTRACTOR SHALL IMMEDIATELY NOTIFY CONTRACTING OFFICER

CONTRACT DOCUMENTS AND THAT IS REQUIRED OR REASONABLY IMPLIED TO

QUESTIONS REGARDING THE SAME OR THEIR EXACT MEANING, CONTRACTING PRECEDENCE: DIMENSIONS SHALL HAVE PRECEDENCE OVER SCALE. LARGER

FRAMING: CONTRACTOR SHALL PROVIDE ALL REQUIRED BLOCKING, BACKING, FIXTURES, EQUIPMENT, CABINETRY, FURNISHINGS, AND ALL OTHER ITEMS REQUIRING THE SAME. IT IS THE CONTRACTORS RESPONSIBILITY TO COORDINATE WITH FURNITURE MFGR. AND INSTALLER AND REVIEW SHOP DRAWINGS FOR BACKING, UTILITIES CONNECTION, ETC.

8. ACCESS PANELS: ALL EQUIPMENT SWITCHES, AND VALVES THAT ARE CONCEALED MUST BE PROVIDED WITH ACCESS PANELS. . NOTIFY THE ARCHITECT OF ANY CONFLICTS BETWEEN EXISTING CONDITIONS AND THE NEW WORK, OF ANY OMISSIONS OR CONFLICTS IN THE DRAWINGS AND ANY RESTRICTIONS RELATED TO THE EXECUTION OF THE WORK INCLUDING THE COORDINATION WITH OTHER TRADES.

10. ALL WOOD BLOCKING SHALL BE FIRE RETARDANT TREATED. 1. FIELD VERIFICATION: PRIOR TO SCHEDULING AND COMMENCING OF WORK, CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN, VERIFY ALL DIMENSION AND CONDITIONS SHOWN, AND NOTIFY THE ARCHITECT OF ANY VARIATION PRIOR TO THE PURCHASING OF MATERIALS, FABRICATION OR CONSTRUCTION OF ANY ITEM. CONTRACTOR SHALL NOTIFY CONTRACTING OFFICER OF ANY OMISSIONS OF EQUIPMENT OR MATERIALS ON DRAWINGS.

SYMBOLS	\$)			VICIN
	LARGE SCALE PLAN OR DETAIL REFERENCE: — INDICATES AREA DETAILED OR EN — LETTER INDICATES DETAIL — SHEET WHERE DETAIL IS DRAWN	LARGED		
	BUILDING SECTION OR SECTIONAL DETAIL REFER ARROW INDICATES DIRECTION OF LETTER INDICATES SECTION SHEET WHERE SECTION IS DRAWN FLAG INDICATES DIRECTION OF VI	ENCE: VIEW N		
◆11'-5"	CEILING HEIGHT AT DESIGNATED LOCATION			
X - X	COLUMN REFERENCE GRI	D		
MATERIAL	S			
CONCRET	CONCRETE		BRICK	LOCA
EARTH			FINISHED WOOD	
GYPSUM	BOARD/PLASTER		ROUGH WOOD, CONTINUOUS	
GRAVEL			RIGID INSULATION	
BATT INS	SULATION		FIRE RATED WALL	
STEEL			MATCH LINE	/



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PLAN SCHEDULES DETAILS SPECIFICATIONS

PLAN & SCHEMATICS – WATER PLAN & SCHEMATICS - WASTE SCHEDULES & DETAILS SPECIFICATIONS

SYMBOLS AND ABBREVIATIONS LIGHTING PLAN POWER PLAN SITE PLAN DETAILS DETAILS SPECIFICATIONS SPECIFICATIONS

E5.1

E5.2



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	382.43, E	
	20'	
24.		
	20. 20. 20. 20. 20. 20. 20. 20. 20. 20.	
	SITE PLAN NOTES	GRAPHIC SC
	2. CONTRACTOR TO PROTECT EXISTING ASPHALT BASE AND	1/16" = 1'-0"
	EXISTING LANDSCAPING DURING CONSTRUCTION. CONTRACTOR WILL REPLACE ANY DAMAGED ASPHALT BASE AND LANDSCAPING AT HIS EXPENSE.	N



Columbia FSO, 10500 Little Patuxent Parkway, Second Floor, Columbia, MD



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PROVIDE 4" REINFORCED CONCRETE SLAB ON GRADE, ON 15 MIL VAPOR BARRIER OVER EXISTING FILL MATERIAL. REINFORCE SLAB WITH 6X6–W2.9XW2.9 WELDED WIRE FABRIC PLACED 1" FROM TOP OF SLAB. PROVIDE CONTROL JOINTS BETWEEN SLAB AND EXISTING CMU WALLS. SEE DETAILS 1/A1.0.





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URE PLAN LEGEND	FLOOF	R PLAN LEGEND	GENERAL NOTES
CASEWORK TYPE: REFER TO SPECIFICATION SECTION 123504 FOR ADDITIONAL INFORMATION ITEM NUMBER: THIS IS A PLAN REFERENCE NUMBER UTILIZED IN LOCATING A SPECIFIC FIXTURE NIC = NOT IN CONTRACT, USPS FURNISHED AND INSTALLED. EQUIPMENT TYPE: REFER TO SPECIFIATION SECTION 011000 FOR ADDITIONAL INFORMATION ITEM NUMBER: THIS IS A PLAN REFERENCE NUMBER UTILIZED IN LOCATING A SPECIFIC FIXTURE NIC = NOT IN CONTRACT, USPS FURNISHED AND INSTALLED.	$ \begin{array}{c} \\ \\ \\ $	4" PARTITION – SEE SHEET A6.4 FOR WALL TYPES 4" RATED PARTITION – SEE SHEET A6.4 FOR WALL TYPES 6" PARTITION – SEE SHEET A6.4 FOR WALL TYPES 6" RATED PARTITION – SEE SHEET A6.4 FOR WALL TYPES CHASE WALL – SEE SHEET A6.4 FOR WALL TYPES SECURITY PARTITION – SEE SHEET A6.4 FOR WALL TYPES SECURITY PARTITION – SEE SHEET A6.4 FOR WALL TYPES INTERIOR ELEVATION – SEE SHEET 7.3 DOOR NUMBER – SEE SHEET A2.1 FOR DOOR SCHEDULE WINDOW TYPE – SEE SHEET A2.1 FOR WINDOW TYPES	 1. SEE PLUMBING, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL NOTES. 2. UNLESS OTHERWISE NOTED, INTERIOR DOOR ROUGH OPENING SHALL BE 4" FROM A 3. CONTRACTOR TO VERIFY ALL EXISTING DIMENSIONS BEFORE COMMENCING WORK. 4. CONTRACTOR TO PROTECT EXISTING BUILDING SHELL ITEMS INCLUDING WALLS, COLL ROOF. TYPICAL. 5. SEE SCHEDULES SHEET A2.1 FOR FLOOR AND WALL FINISHES, DOORS, AND WINDO 6. ALL NEW CONSTRUCTION SHALL BE PER USPS STANDARDS. KEYED NOTES Ý PROVIDE NEW MOP BASIN AND 8'Hx4'W FRP WAINSCOT ON BOTH ADJACENT WALL 2 PROVIDE NEW FIRE EXTINGUISHER PER USPS STANDARDS. INSTALL PER NFPA 72 3 PROVIDE NEW TANK WATER HEATER. CONTRACTOR TO PROVIDE 4" CONCRETE PAGE WATER HEATER. SEE PLUMBING. 4 PROVIDE 8 NEW DOUBLE LOCKERS, SEE DETAIL 11/A6.4.
	OFFICE	ROOM NAME & NUMBER – SEE SHEET A2.1 FOR FINISH SCHEDULE	VOX HYDRAULIC LIFT PUMP LOCATION, SEE MECHANICAL.

ADJOINING WALL PARTITION.

LUMNS, STAIRS, FRAMING, AN OWS.

ALLS. SEE DETAIL 15/A5.1. 72. SEE DETAIL 5/A7.3. AD ON TOP OF SLAB FOR





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		CONFERENCE TYP.			
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		→ 3 → 8'-0"			
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(c)

REFLECTED CEILING PLAN LEGEND

4' SURFACE MOUNTED LIGHTING FIXTURE

2'x4' FLUORESCENT LIGHTING FIXTURE

1'x4' FLUORESCENT LIGHTING FIXTURE

 \square SUPPLY DIFFUSER

RETURN REGISTER

EXHAUST FAN

2'x4' SUSPENDED ACOUSTICAL CEILING

SUSPENDED PLYWOOD

GYPSUM BOARD CEILING

ightarrow9'-0" ceiling or soffit height

GENERAL NOTES

- 1. SEE PLUMBING, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL NOTES.
- 2. CONTRACTOR TO VERIFY ALL EXISTING DIMENSIONS BEFORE COMMENCING WORK.
- 3. CONTRACTOR TO PROTECT EXISTING BUILDING SHELL ITEMS INCLUDING WALLS, COLUMNS, STAIRS, FRAMING, AND ROOF. TYPICAL.
- 4. SEE SCHEDULES SHEET A2.1 CEILING FINISHES.
- 5. ALL NEW CONSTRUCTION SHALL BE PER USPS STANDARDS.

KEYED NOTES

- T PROVIDE NEW HVAC DIFFUSERS, SEE MECHANICAL.
- 2 PROVIDE NEW LIGHTING, SEE ELECTRICAL.
- 3 PROVIDE NEW SUSPENDED GYPSUM BOARD CEILING. PAINT. SEE DETAIL8/A7.3.
- 4 PROVIDE NEW SUSPENDED PLYWOOD CEILING. PAINT. SEE DETAIL 9/A7.3.
- 5 PROVIDE NEW 2'X4' ACOUSTICAL CEILING TILE, GRID, AND HANGARS.

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TYP.	
0	0
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0	
	WILL CALL 109
€9'	2-0"

REFLECTED CEILING PLAN SCALE: 1/4" = 1'-0"



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NOTE:



USPS SHALL PROVIDE AND INSTALL PAPER TOWEL DISPENSERS, WASTE RECEPTACLES, SOAP DISPENSERS, AND TOILET TISSUE DISPENSERS.



GENERAL NOTES

- 1. SEE PLUMBING, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL NOTES.
- 2. UNLESS OTHERWISE NOTED, INTERIOR DOOR ROUGH OPENING SHALL BE 4" FROM ADJOINING WALL PARTITION.
- 3. CONTRACTOR TO VERIFY ALL EXISTING DIMENSIONS BEFORE COMMENCING WORK.
- 4. CONTRACTOR TO PROTECT EXISTING BUILDING SHELL ITEMS INCLUDING WALLS, COLUMNS, STAIRS, FRAMING, AND ROOF. TYPICAL.
- 5. SEE SCHEDULES SHEET A2.1 FOR FLOOR AND WALL FINISHES, DOORS, AND WINDOWS.
- 6. ALL NEW CONSTRUCTION SHALL BE PER USPS STANDARDS.

KEYED NOTES

- $\langle 1 \rangle$ provide plastic laminate clad cabinets per usps standards. See sheet A6.4. $\langle 2 \rangle$ HI-LOW ADA ACCESSIBLE WATER FOUNTAIN, SEE DETAIL 16/A5.1.
- $\sqrt{3}$ wall mounted sink. See detail 11/A5.1.
- PROVIDE 1" THICK WATER/GRAFFITI RESISTANT, NON-ABSORBENT PLASTIC FACED TOILET/URINAL PARTITIONSPER USPS STANDARDS. CLEAR WIDTH AS SHOWN.
- $\langle 5 \rangle$ provide New RIM Mounted Sink. See detail 11/A5.1.
- $\langle 6 \rangle$ wall mounted urinal. Centerline of urinal shall be min. See detail 11/A5.1.
- $\langle 7 \rangle$ 24" X 36" ADA TILT MIRROR W/ STAINLESS STEEL FRAME. SEE DETAIL 11/A5.1.
- 8 FLOOR MOUNTED FLUSH VALVE ADA TOILET. SEE DETAIL 11/A5.1.
- 9 36" GRAB BAR. SEE DETAIL 11/A5.1.
- 10 18" GRAB BAR. SEE DETAIL 11/A5.1.
- (1) 42" GRAB BAR. SEE DETAIL 11/A5.1.
- $\langle 12 \rangle$ FLOOR MOUNTED FLUSH VALVE TOILET. SEE PLUMBING. SEE DETAIL 11/A5.1.

FIXTURE PLAN LEGEND



CASEWORK TYPE: REFER TO SPECIFICATION SECTION 123504 FOR ADDITIONAL INFORMATION <u>ITEM NUMBER:</u> THIS IS A PLAN REFERENCE NUMBER UTILIZED IN LOCATING A SPECIFIC FIXTURE NIC = NOT IN CONTRACT, USPS FURNISHED AND INSTALLED. <u>EQUIPMENT TYPE:</u> REFER TO SPECIFIATION SECTION 011000 FOR ADDITIONAL INFORMATION

- <u>ITEM NUMBER:</u> THIS IS A PLAN REFERENCE NUMBER UTILIZED IN LOCATING A SPECIFIC FIXTURE NIC = NOT IN CONTRACT, USPS FURNISHED AND INSTALLED.

FLOOR PLAN LEGEND

H3	6" PARTITION – SEE SHEET A6.4 FOR WALL TYPES
⟨F2⟩	CHASE WALL – SEE SHEET A6.4 FOR WALL TYPES
	INTERIOR ELEVATION – SEE SHEET A5.1
1	DOOR NUMBER – SEE SHEET A2.1 FOR DOOR SCHEDULE
OFFICE 101	ROOM NAME & NUMBER – SEE SHEET A2.1 FOR FINISH SCHEDULE

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DETAIL			FRAME			DOOR			SIZE		
JAM	HEAD	FINISH	MATERIAL	TYPE	FINISH	MATERIAL	TYPE	THICK.	HEIGHT	WIDTH	NO.
6//	6/A6.3	PAINT	HM	A	PAINT	SCW	A	1 3/4"	7'-0"	3'-0"	1
6//	6/A6.3	PAINT	HM	A	PAINT	SCW	A	1 3/4"	7'-0"	3'-0"	2
7//	7/A6.3	PAINT	НМ	В	PAINT	HM	A	1 3/4"	7'-0"	3'-0"	3
8//	8/A6.3	PAINT	НМ	D	PAINT	НМ	E	1 3/4"	7'-0"	(2) 3'-0"	4
6//	6/A6.3	PAINT	HM	A	PAINT	SCW	A	1 3/4"	7'-0"	3'-0"	5
6//	6/A6.3	PAINT	НМ	A	PAINT	SCW	A	1 3/4"	7'-0"	3'-0"	6
6//	6/A6.3	PAINT	HM	A	PAINT	SCW	A	1 3/4"	7'-0"	3'-0"	7
6//	6/A6.3	PAINT	НМ	A	PAINT	SCW	F	1 3/4"	7'-0"	3'-0"	8
7//	7/A6.3	PAINT	НМ	В	PAINT	HM	A	1 3/4"	7'-0"	3'-0"	9
7//	7/A6.3	PAINT	НМ	С	PAINT	HM	A	1 3/4"	7'-0"	3'-6"	10
7//	7/A6.3	PAINT	НМ	В	PAINT	HM	A	1 3/4"	7'-0"	3'-0"	11
8//	8/A6.3	PAINT	HM	D	PAINT	HM	E	1 3/4"	7'-0"	(2) 3'-0"	12
7//	7/A6.3	PAINT	HM	В	PAINT	НМ	A	1 3/4"	7'-0"	3'-0"	13

B. DOORS AND FRAMES ARE TO BE PAINTED TO MATCH THEIR ADJACENT WALLS UNLESS NOTED OTHERWISE. C. ROOM OR EXIT DOOR SIGNAGE REQUIRED. SEE DETAILS 9/A7.3, 11/A7.3 AND 12/A7.3. D. EXTERIOR DOORS, FRAMES, AND HARDWARE SHALL BE CONTRACTOR PURCHASED AND INSTALLED BY OWNER. VERIFY OPENING SIZE PRIOR TO ORDERING. E. PROVIDE DOOR BELL, SEE ELECTRICAL.

F. IMPACT BUMPERS ON TRAFFIC SIDE OF DOOR ONLY. PROVIDE 36" KICKPLATE ON BACK SIDE OF DOOR, TYP. IMPACT DOORS ARE 180 DEGREE SWING. PROVIDE OVERHEAD DOOR STOPS. SEE DETAIL 11/A2.1. G. FOR THE USPS WICKET DOOR, SEE DETAIL 8/A2.1.

H. FOR HM FRAMES, SEE DETAIL 2/A6.3 FOR ADDITIONAL USPS SPECIFIC INFORMATION. I. CONTRACTOR TO REFER TO CSF HARDWARE GUIDE FOR HARDWARE REQUIREMENTS OF EACH DOOR PRIOR TO ORDERING DOORS AND HARDWARE. COORDINATE WITH USPS SPECIFICATIONS.

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DETAILS . OVERHEAD DOOR STOPS USPS SDL Issued: 10/1/201 Last Revised: 9/17/200 "e: ..\usps\library\details\G2-7-4d.dwg

MECHANICAL, 60 MINUTE FIRE RATED

REMARKS

		WINDO	W SC	\mathbf{C}
GL/	ZING			
THICK.	INSULATED	SECURITY FILM	TYPE	

1	6'-0"	1'-8"	1 "	YES	YES
NOT	Ē.				

A. WINDOW SHALL BE CONTRACTOR PURCHASED AND INSTALLED BY OWNER. VERIFY ALL WINDOW ROUGH OPENING DIMENSIONS IN FIELD PRIOR TO ORDERING UNITS. B. GLASS: ALL GLASS TO CONFORM TO CONSUMER SAFETY COMMISSION, PRODUCT

SAFETY ACT 16 CFR 1201. C. FRAME/JAMB: SEE DETAIL 3/A6.3.

WIDTH

ACCESSIBILITY REQUIREMENTS:

FFRENC

THRESH.

1/A6.3

1/A6.3

1/A6.3

1/A6.3

1/A6.3

1/A6.3

SIGNAGE

X STORAGE

X MEN'S

X WOMEN'S

X CONFERENCE

X MAIL VESTIBULE

X MAIL VESTIBULE, SEE NOTE F

X WILL CALL, SEE NOTES E AND G

X EXTERIOR TO WORKROOM, SEE NOTE D

X LOADING DOCK TO MAIL VESTIBULE, SEE NOTE D

X LOADING DOCK TO MAIL VESTIBULE, SEE NOTES D AND F

X EXTERIOR TO WORKROOM, SEE NOTE D

A. DOORS SHALL PROVIDE A MINIMUM CLEAR OPENING OF 32" WIDE BY 6'-8" HIGH WHEN AT A 90 DEGREE ANGLE TO THE CLOSED POSITION.

1/A6.3 X EXTERIOR TO WILL CALL, SEE NOTE D

B. THE BOTTOM 10" OF THE DOORS ARE TO HAVE A SMOOTH UNINTERUPTED SURFACE TO ACCOMODATE OPENING BY WHEEL CHAIR FOOT REST.

C. MAXIMUM EFFORT TO OPERATE DOORS SHALL NOT EXCEED 8.5 POUNDS FOR EXTERIOR DOORS, AND 5 POUNDS FOR INTERIOR DOORS, SUCH PULL OR

PUSH EFFORT BEING APPLIED AT RIGHT ANGLES TO HINGED DOORS. WHEN FIRE DOORS ARE REQUIRED, COMPENSATING DEVICES OR AUTOMATIC DOOR OPERATORS MAY BE UTILIZED TO MEET THE REQUIREMENTS.



	ROOM FINISH SCHEDULE																			
QUANTITY	ROOM NUMBER FLOOR / BASE								WA	VALLS C			CLG. MATL.				CLG. HGT.			NOTES
		SEALED CONCRETE	EPOXY-LIGHT GRAY	RFT-1	RFT-2	VB-1	P-1	P-2	P-4	P-5	PL-2	FRP	ACT-1	GYP. BD. (P-1)	PLYWOOD (P-1)	8'-0"	.0-'9	10'-0"	UNDERSIDE OF TRUSS	
NOT USED																				
LOADING DOCK	101																			
STORAGE	102	0												0				0		
MECHANICAL	103	0												•				٥		
MAIL VESTIBULE	104	٢													0			۲		
MEN'S	105		٢			٢		۲					٢				0			
WOMEN'S	106		٢			0		٥					0				0			
WORKROOM	107	٢										0	0					0		
CONFERENCE	108	•				0	0							•		•				
WILL CALL	109	٥				٢	۲						٢				0			NOTE B

NOTE:

A. SEE DOOR SCHEDULE FOR ADDITIONAL FINISH INFORMATION B. PLYWOOD SECURITY CEILING @ 2'-0" ABOVE ACOUSTICAL CEILING TILE IN WILL CALL, SEE 1/A3.1.

D. ALL GYPSUM BOARD WALLS IN WORKROOM 107 SHALL HAVE 4'-0" HIGH FIBERGLASS REINFORCED PLASTIC WAINSCOT. SEE DETAIL 15/A5.1. E. GYPSUM BOARD: ALL GYP. BD. TO BE 5/8" TYPE "X" UNLESS NOTED OTHERWISE. INSTALL MOISTURE RESISTANT GYP. BD. BEHIND SINKS,



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- 1. SEE PLUMBING, MECHANICAL, AND ELECTRICAL DRAWINGS FOR ADDITIONAL NOTES.
- 2. UNLESS OTHERWISE NOTED, INTERIOR DOOR ROUGH OPENING SHALL BE 4" FROM ADJOINING WALL PARTITION.
- 3. CONTRACTOR TO VERIFY ALL EXISTING DIMENSIONS BEFORE COMMENCING WORK.

- $\langle 2
 angle$ provide NeW 20GA 3–5/8" Metal Stud Walls with Finishes. See A6.4 For Wall Types.
- 4 provide New Suspended Gypsum Board Ceiling. Paint. See detail 6/A7.3.
- $\langle 5 \rangle$ provide New SUSPENDED PLYWOOD CEILING. PAINT. SEE DETAIL 9/A7.3.

- $\langle 8 \rangle$ provide New HI-LOW ADA ACCESSIBLE WATER FOUNTAIN, SEE DETAIL 16/A5.1.

	DOOR NUMBER – SEE SHEET A2.1 FOR DOOR SCHEDULE
1	WINDOW TYPE — SEE SHEET A2.1 FOR WINDOW TYPES
OFFICE	ROOM NAME & NUMBER – SEE SHEET A2.1 FOR FINISH SCHEDULE



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 \mathbf{X}



BI-LEVEL E.W.C ____<u>[PL-4]</u> APPLIED TO WALL SURFACE

INTERIOR ELEVATION 17 SCALE: $1/2^{"} = 1'-0^{"}$

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SEALANT, TYP. PROVIDE METAL BEAD WEATHERSTRIPPING AT EXTERIOR –





JAMB





USPS IMPACT DOOR DETAIL

3" = 1'-0"

8

SCALE:











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EXTINGUISHER IDENTIFICATION

..\usps\library\details\G2-8-2a.dwg

PROTECTIVE BARRIERS -	Fac.	сн.	^{Sect.}	Para. Detai	/
DETAIL @ PROTECTIVE RAILS	G	2 -	- 7 -	- 4 b2	
$\frac{F_{ile:}}{ usps library details G2-7-4b2.dwg} = 1'-0" \qquad 0 \qquad 1/2" \qquad 1"$	USPS : Last R	SDL I evised	'ssued: d:	10/1/201 3/17/199	— 7 7









ac. Ch. Sect. Para. Detail G2-8-2 a USPS SDL Issued: 10/1/2017 Last Revised: 9/17/2000

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		MECHANICAL EQU	PMENT LE	GEND	
SYMI SINGLE LINE	BOL DOUBLE LINE	DESCRIPTION	SYM SINGLE LINE	BOL DOUBLE LINE	DESCRIPTION
LOW OR	MEDIUM F	PRESSURE DUCTWORK	MEDI	UM PRESS	SURE DUCTWORK
10 X 12	10 X 12	DUCT SECTION-1ST FIGURE WDTH, 2ND DEPTH			DUCT TAKE-OFF: CONICAL
		SQUARE TO ROUND TRANS.			DUCT TAKE-OFF: RECTANGULAR
~~~~		FLEX DUCTWORK	$\frown$		TEE: LONG RADIUS
L		ELBOW W/TURNING VANES	4		TEE: W/TURNING VANES
	フ	LONG RADIUS ELBOW			
EXH		EXHAUST DUCT SECTION		MISCELL	ANEOUS
SA	$\boxtimes$	SUPPLY DUCT SECTION	T	1	THERMOSTAT
OA		OUTSIDE AIR DUCT SECTION	Э	H	HUMIDISTAT
RA		RETURN/RELIEF AIR DUCT SECTION	S	S	TEMPERATURE SENSOR
ТА		TRANSFER AIR DUCT SECTION	<u>CO2</u>	C02	CARBON DIOXIDE SENSOR
L	IJ	SHORT RADIUS VANED ELBOW			COMBINATION FIRE/SMOKE DAMPER
					FIRE DAMPER
LO	W PRESSU	RE DUCTWORK	(SD)	(SD)	SMOKE DAMPER
<u> </u>	<u></u> 月	DUCT TAKE-OFF: CONICAL	<u>(S)</u>	<u>(S)</u>	SMOKE DETECTOR
k		DUCT TAKE-OFF: RECTANGULAR	CD	CD	CONDENSATE DRAIN
Ŧ		TEE: LONG RADIUS	<u> </u>	B.D.	BACKDRAFT DAMPER
<u> </u>		TEE: W/TURNING VANES			MOTOR OPERATED DAMPER
<b>+/</b>		"Y" TAKE-OFF WITH SPLITTER DAMPER			DAMPER
		2-SIDED DUCT	\$	\$	MANUAL SWITCH
		FIRE DAMPER "A" OR "B"	\$ s/w	\$ S/W	SUMMER/WINTER SWITCH
		COMB. FIRE/SMOKE DAMPER	T.O.P.	Т.О.Р.	TOP OF PIPE
-** <u>-</u>		VOLUME EXTRACTOR	B.O.P.	B.O.P.	BOTTOM OF PIPE
		LINED DUCT	T.O.D.	T.O.D.	TOP OF DUCT
		EXPOSED DUCT	B.O.D.	B.O.D.	BOTTOM OF DUCT
			A.F.F.	A.F.F.	ABOVE FINISHED FLOOR

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![](_page_12_Figure_2.jpeg)

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![](_page_12_Figure_3.jpeg)

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	FAN SCHEDULE													
Unit	Area Served	CFM	ESP	Fan	Sones	Drive	Amps	Volts	Phase	Туре	Model	Detail	Remarks	
Tag			(IN.)	RPM										
EF-1	SEE PLANS	150	0.3	890	2.8	DIRECT	3.4	115	1	CEILING	SP-A510-VG	6/M-1	1,2,4	
EF-2	SEE PLANS	150	0.3	<mark>890</mark>	2.8	DIRECT	3.4	115	1	CEILING	SP-A510-VG	6/M-1	1,2,4	
EF-3	SEE PLANS	100	0.3	940	0.5	DIRECT	0.2	115	1	CEILING	SP-110-VG	6/M-1	1,2,3	
1 MODE	I NIMBERS BASE	ED ON GRI	FENHE	K FOU	AISBV	CARNES (	COOK							

2. DISCONNECT BY MFG.

3. FAN CONTROLLED BY WALL SWITCH. CONNECTION BY E.C. SWITCH BY M.C. 4. FAN CONTROLLED BY LIGHT SWITCH. CONNECTION AND SWITCH BY E.C.

## SPLIT SYSTEM COOLING UNIT SCHEDULE-R410a (W ELECTRIC HEATER)

Unit Tag	Area Served	Nom. SE	$CER \mid C$	CFM	0.A.	ESP		Elec	ctric Heating	Coil						Air Ha	ndling Unit		DXCa	oil Perfe	ormance					E	Clectrica	l Data	(Outdoo	r Unit)		Ren
H-XX/SSAC-XX		Tons (E	ER)				MBH	kW	Volts/	EAT	LAT	F	an Mote	r	MCA	MOCP	Approx. Weight	Model	EAT	MBH	I MBH		Fan	Compr	essor	Volts	Phase	MCA	МОСР	Approx. Weight	Model	
OOR/OUTDOOR)							Max		Phase			HP	Volts	Phase			(lbs.)			Total	l Sens.	No.	FLA	No. LRA	RLA					(lbs.)		
AH-1/SSHP-1	SEE PLANS	3 1	5 1	200	170	0.8	32.6	7.2	208/3	55	95	1/2	208	1	30	30	150	TEM6A0C36H31	80/67	35.2	25.9	1	0.8	1 70	9.9	208	3	13.0	20	250	4TWA4036A3	1-5
AH-2/SSHP-2	SEE PLANS	4 1	5 1	600	175	0.8	42.5	10.8	208/3	55	95	3/4	208	1	45	45	200	TEM6A0C48H41	80/67	48.3	33.7	1	1.1	1 82.1	13.7	208	3	18.0	30	315	4TWA4048A3	1-5
AH-3/SSHP-3	SEE PLANS	3 1	5 1	200	115	0.8	32.6	7.2	208/3	55	95	1/2	208	1	30	30	150	TEM6A0C36H31	80/67	35.2	25.9	1	0.8	1 70	9.0	208	3	13.0	20	250	4TWA4036A3	1-
				· · ·																												

1. MODEL NUMBERS BASED ON TRANE. EQUALS BY CARRIER AND YORK.

2. CONTRACTOR SHALL VERIFY SERVICE CLEARANCES FOR ALL SUBSTITUTIONS. 3. REFRIGERANT LINES AND ACCESSORIES PER UNIT MFG. RECOMMENDATIONS.

4. PROVIDE OVERFLOW DRAIN PAN BELOW UNIT WITH MICROSWITCH TO SHUT OFF UNIT PRIOR TO PAN OVERFLOW. 5. MFG. SUPPLIED WALL MOUNTED T-STAT.

1. MODEL NUMBERS BASED ON GREENHECK. EQUALS BY CARNES, COOK.

8. UNIT ON ANGLE IRON STAND.

MECHANICAL SYSTEMS, SERVICE SYSTEMS				GRILL	Е & I	DIFFU	SER SC	HEDUL	LE	
AND EQUIPMENT METHOD OF COMPLIANCE	SYM	TYPE	USE	CFM RANGE	NECK SIZE	OVER- ALL SIZE	FINISH	FRAME	PRICE MODEL NO	REMA
Prescriptive Energy Cost Budget	A	LOUVER	SUPPLY	SEE PLANS	RMK 5	RMK 4	OFF	RMK 3	SMDA	1-
Thermal Zone: 4A		FACE	4-WAY	& RMK 5			WHITE			
	B	PERF.	RETURN/	SEE PLANS	RMK 7	RMK 4	OFF	RMK 3	PDDR	1-4, 7
Exterior Design Conditions			EXHAUST	& RMK 7			WHITE			
	C-	SIDEWALL	SUPPLY	SEE PLANS	SEE	RMK 4	RMK 12	SEE	520D	1-4, 9,
Winter Dry Bulb: 22		CIDEWALL		CEE DI ANG	PLANS		DMIZ 10	PLANS	520	14.0
Summer Dry Bulb: 94	D-	SIDEWALL	EXHAUST	SEE PLANS	SEE PLANS	KIVIK 4	KMK 12	SEE PLANS	530	1-4, 9,
Interior Design Conditions			LATINOUT		1 12 11 15			112110		
interior Design Conditions	REMAR	<u>RKS</u>		VDUECED T			T A TT			CO NON
Winter Dry Bulb: 65	I. EQUA	ALS: METAL	AIRE, ITTUS, EDUI E IS GE	KRUEGER, I	UTILE & IE MAVN	BAILEY, N OT BE	AIL-	8. NO NECK	SIZE INDICATI	ES NON-
Summer Dry Bulb: 78	USED	PAINT ALL	INSIDE VISI	RECAL, SON	ES FLAT F	RLACK		9 OBD IF U	SED AS SUPPLY	7 or exhal
Relative Humidity: 55%	2. SYM	BOL EXPLAN	JATION:					10. ALL ALU	JM. CONSTRUC	TION (INCL)
	XXX/	CFM = SYME	BOL, FRAME	(RMK 3), NEC	CK (RMK :	5,7)/CFM		BACKPA	N) IF SHOWN O	N PLANS.
Building Heating Load: 60.8 MBH	3. FRAN	ME TYPES:		T = T-BAR				11. VOLUM	EEXTRACTOR	WHERE
	S = FI	LUSH SURF. N	MTD	E = DUCT	MOUNTE	D: V-BEVE	LED	SHOWN (	ON PLANS.	
Building Cooling Load: 8.2 Tons	PLAS	TER FRAME	FOR	DROP SUR	F. (TYPE	"A" DIFFU	SER)	12. PAINT T	O MATCH WAL	L.
Mechanical Space Conditioning System	CEILI	NG MOUNTI	NG.	D = DROPI	PED FRAN	Æ		13. VERTICA	AL FRONT BLAI	DES.
internament space contracting system	NOTE 4 OVE	2: VERIFYFR	AME/CEILIN		SILП Ү. ПТЕС — МІ	CV + 2"+/				
Unitary:		VER EACE SI	$\frac{1}{100} = 2 XZ$	SIZES	LLES - MI	CCCC+2+/				
Description of Unit: Split System Heat Pumps	<u>5. E00</u> NO.	ROUND	CFM	NO.	SOUARE		CFM			
Heating Efficiency: Refer to HVAC Equipment Schedules	<u></u>	NK SIZE		<u></u>	NK SIZE					
Cooling Efficiency: Refer to HVAC Equipment Schedules	А	6"	100	Н	6x6		125			
Heat Output of Unit: Refer to HVAC Equipment Schedules	В	8"	175	Ι	9x9		280			
Cooling Output of Unit: Refer to HVAC Equipment Schedules	С	10"	275	J	12x12		500			
List Fauinment Efficiencies: Refer to HVAC Fauinment Schedules	D	12"	400	K	15x15		780			
List Equipment Emercicles. Refer to HVICe Equipment Schedules	E	14"	535	L	18x18		1125			
Equipment Schedules with Motors (Mechanical Systems)	F G	16" 18"	/00	M	21x21 24x24		2000			
Motor Horsepower: Comply w/ 2012 NCECC	NOTE	VERIEV CEM	005 / NECK SIZE		24824		2000			
Number of Phases: Comply w/ 2012 NCECC	6. ADЛ	JSTABLE: HO	ORIZONTAL/	 VERTICAL - "	PIANO HI	NGE" DEV	ICE.			
Minimum Efficiency: Comply w/ 2012 NCECC	<u>7. "B" &amp;</u>	z "E" <u>EXH/RE</u>	TURN NECK	SIZES ("E" =	<u>SQ. NK. C</u>	DNLY)				
Motor Type: Comply w/ 2012 NCECC	<u>NO.</u>	ROUND	<u>CFM</u>	<u>NO.</u>	<b>SQUARE</b>		<u>CFM</u>			
Number of Poles: Comply W/ 2012 NCECC		NK SIZE			<u>NK SIZE</u>					
Designer Statement	А	6"	100	G	8x8		220			
To the best of my knowledge and belief, the design of this building complies with the	В	8"	175	H	10x10		345			
mechanical systems, service systems and equipment requirements of the		10" 12"	275 400	I T	12X12 14x14		500			
2012 NC Energy Conservation Code. Section 506 is met by subsecion	E	12	535	J K	14x14 16x16		885			
506.2.2: Reduced Lighting Power Density.	F	16"	700	L	18x18		1125			
	NOTE:	VERIFY		M	22x22		1680			
	CFM / N	NECK SIZE.		Ν	22x46		2600			

PE $USE$ $VER$ $SUPPL$ $CE$ $4-WA$ $CE$ $4-WA$ $RF$ . $RETUR$ $EXHAU$ $VALL$ $SUPPL$ $VALL$ $RETUR$ $EXHAU$ $VALL$ $RETUR$ $EXHAU$ $VALL$ $RETUR$ $EXHAU$ $VALL$ $RETUR$ $SCHEDULE$ $SCHEDULE$ $SCHEDULE$ $SCHEDULE$ $SYMBOL$ , $FRAM$ $ES$ : $JRF$ . $MTD$ $AME$ $FOR$ $JNTING$ . $Y$ $Y$ $PRAME/CEII$ $ZE$ : $LAY-IN = 2$ $CE$ $SUPPLY$ $D$ $CFM$ $E$ $100$ $175$	CFM RANGEYSEE PLANS & RMK 5YSEE PLANSST& RMK 7YSEE PLANSST& RMK 7YSEE PLANSN/SEE PLANSSTSEE PLANSUS, KRUEGER, T GENERAL, SOM ISIBLE SURFACI// E (RMK 3), NEG T = T-BAR E = DUCT DROP SUR D = DROPILING COMPATIE 'x2', OTHER GRI CK SIZES NO.	NECK SIZE RMK 5 RMK 7 SEE PLANS SEE PLANS UTTLE & TE MAY N ES FLAT B CK (RMK 5 MOUNTEI CK (RMK 5 CK (RMK 5	OVER- ALL SIZE RMK 4 RMK 4 RMK 4 RMK 4 RMK 4 RMK 4 BAILEY, 1 OT BE BLACK. 5,7)/CFM D: V-BEVE "A" DIFFU ME ECK + 2"+/	FINISH OFF WHITE OFF WHITE RMK 12 RMK 12 NAIL-	FRAMERMK 3RMK 3RMK 3SEEPLANSSEEPLANS8. NO NECHDUCTED9. OBD IF U10. ALL ALBACKPA11. VOLUMSHOWN12. PAINT 713. VERTIC	PRICE MODEL NO SMDA PDDR 520D 530 K SIZE INDICAT D, LAY-IN PANEL JSED AS SUPPL UM. CONSTRUC AN) IF SHOWN C IE EXTRACTOR ON PLANS. TO MATCH WAI CAL FRONT BLA	REMA         1-4, 7         1-4, 9,         1-4, 9,         1-4, 9,         2         7 OR EXHAU         TION (INCLUNE)         N PLANS.         WHERE         L.         DES.
VERSUPPL $\SigmaE$ 4-WAY $\SigmaE$ RETUR $EXHAU$ EXHAUVALLSUPPLVALLRETUREXHAUEXHAUVALLRETUREXHAUEXHAUCTALAIRE, TITTSCHEDULE ISALL INSIDE VPLANATION:SYMBOL, FRAMES:JRF. MTDAME FORJNTING.Y FRAME/CEIIZE: LAY-IN = 2CE SUPPLY NEDCFME100175	Y SEE PLANS X & RMK 5 N/ SEE PLANS ST & RMK 7 Y SEE PLANS N/ SEE PLANS ST US, KRUEGER, T GENERAL, SOM ISIBLE SURFACE AE (RMK 3), NEC T = T-BAR E = DUCT DROP SUR D = DROP LING COMPATIE 'x2', OTHER GRI CK SIZES NO.	RMK 5 RMK 7 SEE PLANS SEE PLANS UTTLE & TE MAY N ES FLAT B CK (RMK 5 MOUNTEI CK (RMK 5 CK (RMK 5	SIZE         RMK 4         BAILEY, 1         IOT BE         BLACK.         5,7)/CFM         D: V-BEVE         "A" DIFFU         //E         ECK + 2"+/	OFF WHITE OFF WHITE RMK 12 RMK 12 RMK 12	RMK 3 RMK 3 RMK 3 SEE PLANS SEE PLANS 8. NO NECH DUCTED 9. OBD IF U 10. ALL AL BACKPA 11. VOLUM SHOWN 12. PAINT 7 13. VERTIC	NO SMDA PDDR 520D 530 K SIZE INDICAT 0, LAY-IN PANEI JSED AS SUPPL' JM. CONSTRUC AN) IF SHOWN C IE EXTRACTOR ON PLANS. TO MATCH WAI CAL FRONT BLA	1-4, 7 1-4, 7 1-4, 9, 1-4, 9, 1-4, 9, COR EXHAU TION (INCLUNN) N PLANS. WHERE L. DES.
ZE       4-WA         ZE       4-WA         RF.       RETUR         EXHAU       SUPPL         VALL       SUPPL         VALL       RETUR         EXHAU       SUPPL         VALL       RETUR         EXHAU       EXHAU         VALL       RETUR         EXHAU       EXHAU         VALL       RETUR         EXHAU       EXHAU         VALL       RETUR         E       INSIDE         VALL       RETUR         E       100         175       175	X& RMK 5 $X'$ & RMK 5 $N/$ SEE PLANS $ST$ & RMK 7 $Y$ SEE PLANS $N/$ SEE PLANS $ST$ SEE PLANS<	RMK 7 SEE PLANS SEE PLANS UTTLE & TE MAY N ES FLAT B CK (RMK 5 MOUNTEI F. (TYPE PED FRAM BILITY. LLES = NE SQUARE NK SIZE	RMK 4 RMK 4 RMK 4 RMK 4 RMK 4 BAILEY, 1 OT BE BLACK. 5,7)/CFM D: V-BEVE "A" DIFFU ME ECK + 2"+/	WHITE OFF WHITE RMK 12 RMK 12 NAIL-	RMK 3 RMK 3 SEE PLANS SEE PLANS 8. NO NECH DUCTED 9. OBD IF U 10. ALL AL BACKPA 11. VOLUM SHOWN 12. PAINT 7 13. VERTIC	PDDR 520D 530 K SIZE INDICAT D, LAY-IN PANEI JSED AS SUPPLY JUM. CONSTRUC AN) IF SHOWN C IE EXTRACTOR ON PLANS. TO MATCH WAI CAL FRONT BLA	1-4, 7 1-4, 9, 1-4, 9, 1-4, 9, COR EXHAU TION (INCLUNN) N PLANS. WHERE L. DES.
RF.       RETUR         EXHAU         VALL       SUPPL         VALL       RETUR         VALL       RETUR         EXHAU       EXHAU         VALL       RETUR         VALL       RETUR         EXHAU       EXHAU         CTALAIRE, TIT       SCHEDULE IS         ALL INSIDE V       PLANATION:         SYMBOL, FRAM       ES:         JRF. MTD       AME FOR         JNTING.       Y FRAME/CEII         ZE: LAY-IN = 2       2         CE SUPPLY NE       2         CFM       E         100       175	N/ SEE PLANS ST & RMK 7 Y SEE PLANS N/ SEE PLANS ST US, KRUEGER, T GENERAL, SOM ISIBLE SURFAC ME (RMK 3), NEC T = T-BAR E = DUCT DROP SUR D = DROP LING COMPATIE 'x2', OTHER GRI CK SIZES <u>NO.</u>	RMK 7 SEE PLANS SEE PLANS UTTLE & 1 TE MAY N ES FLAT B CK (RMK 5 MOUNTER F. (TYPE PED FRAM BILITY. LLES = NE SQUARE NK SIZE	RMK 4 RMK 4 RMK 4 RMK 4 BAILEY, 1 OT BE BLACK. 5,7)/CFM D: V-BEVE "A" DIFFU ME ECK + 2"+/	OFF WHITE RMK 12 RMK 12 NAIL-	RMK 3 SEE PLANS SEE PLANS 8. NO NECH DUCTED 9. OBD IF U 10. ALL AL BACKPA 11. VOLUM SHOWN 12. PAINT T 13. VERTIC	PDDR 520D 530 K SIZE INDICAT D, LAY-IN PANEI JSED AS SUPPL JUM. CONSTRUC AN) IF SHOWN C IE EXTRACTOR ON PLANS. TO MATCH WAI CAL FRONT BLA	1-4, 7 1-4, 9, 1-4, 9, 1-4, 9, 2. 7 OR EXHAU TION (INCLUNE) N PLANS. WHERE L. DES.
EXHAU         VALL       SUPPL         VALL       RETUR         EXHAU         VALL       RETUR         EXHAU         VALL       RETUR         EXHAU         VALL       RETUR         EXHAU         VALL       RETUR         EXHAU       EXHAU         VALL       RETUR         EXHAU       EXHAU         VALL       RETUR         SCHEDULE IS       ALL INSIDE V         PLANATION:       SYMBOL, FRAM         ES:       INTING.         Y FRAME/CEII       ZE:         LAY-IN = 2       CE         SUPPLY NE       D         CFM       E         100       175	SI& RMK /YSEE PLANSN/SEE PLANSSTJS, KRUEGER, TUS, KRUEGER, TGENERAL, SOMISIBLE SURFACIME (RMK 3), NEGT = T-BARE = DUCTDROP SURD = DROPILING COMPATIE'x2', OTHER GRICK SIZESNO.	SEE PLANS SEE PLANS UTTLE & T MEMAY N ES FLAT B CK (RMK S MOUNTER F. (TYPE PED FRAM BILITY. LLES = NE SQUARE NK SIZE	RMK 4 RMK 4 RMK 4 BAILEY, 1 IOT BE BLACK. 5,7)/CFM D: V-BEVE "A" DIFFU ME ECK + 2"+/	RMK 12 RMK 12 RMK 12 NAIL- ELED JSER) / <u>CFM</u>	SEE PLANS SEE PLANS 8. NO NECH DUCTED 9. OBD IF U 10. ALL AL BACKPA 11. VOLUM SHOWN 12. PAINT T 13. VERTIC	520D 530 K SIZE INDICAT O, LAY-IN PANEI JSED AS SUPPL' JUM. CONSTRUC AN) IF SHOWN C IE EXTRACTOR ON PLANS. TO MATCH WAI CAL FRONT BLA	I-4, 9, I-4, 9, I-4, 9, I-4, 9, Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant Constant
VALL RETUR EXHAU CTALAIRE, TIT SCHEDULE IS ALL INSIDE V PLANATION: SYMBOL, FRAM ES: JRF. MTD AME FOR JNTING. Y FRAME/CEIJ ZE: LAY-IN = 2 CE SUPPLY NE D CFM E 100 175	<ul> <li>I SEETEARS</li> <li>N/ SEE PLANS</li> <li>ST</li> <li>US, KRUEGER, T</li> <li>GENERAL, SOM</li> <li>ISIBLE SURFACION</li> <li>(SIBLE SURFACION</li> <li>(E (RMK 3), NEON</li> <li>(E (RMK 3), NEON</li> <li>(E (RMK 3), NEON</li> <li>(SIBLE SURFACION</li> <li>(E (RMK 3), NEON</li> <li>(SIBLE SURFACION</li> <li>(E (RMK 3), NEON</li> <li>(E (RMK 3), NEON</li> <li>(SIBLE SURFACION</li> <li>(E (RMK 3), NEON</li> <li>(E (RMK 3), NEON</li> <li>(SIBLE SURFACION</li> <li>(E (RMK 3), NEON</li> <li>(E (RMK 3), NEON</li> <li>(SIBLE SURFACION</li> <li>(E (RMK 3), NEON</li> <li>(E (RMK 3), N</li></ul>	PLANS SEE PLANS UTTLE & T TE MAY N ES FLAT B CK (RMK S MOUNTEI CK (RMK S FLAT B CK (RMK S CK (RM	RMK 4 RMK 4 BAILEY, 1 IOT BE BLACK. 5,7)/CFM D: V-BEVE "A" DIFFU ME ECK + 2"+/	RMK 12 RMK 12 NAIL- ELED JSER) / <u>CFM</u>	PLANS SEE PLANS 8. NO NECH DUCTED 9. OBD IF U 10. ALL AL BACKPA 11. VOLUM SHOWN 12. PAINT T 13. VERTIC	530 530 K SIZE INDICAT O, LAY-IN PANEI JSED AS SUPPL' JUM. CONSTRUC AN) IF SHOWN C IE EXTRACTOR ON PLANS. TO MATCH WAI CAL FRONT BLA	I-4, 9, I-4, 9, I-4
VALL RETUR EXHAU EXHAU CTALAIRE, TIT SCHEDULE IS ALL INSIDE V PLANATION: SYMBOL, FRAM ES: JRF. MTD AME FOR JNTING. Y FRAME/CEIJ ZE: LAY-IN = 2 CE SUPPLY NE D CFM E 100 175	N/ SEE PLANS ST US, KRUEGER, T GENERAL, SOM ISIBLE SURFAC ME (RMK 3), NEG T = T-BAR E = DUCT DROP SUR D = DROP LING COMPATIE 'x2', OTHER GRI CK SIZES <u>NO.</u>	SEE PLANS UTTLE & 1 ME MAY N ES FLAT B CK (RMK 5 MOUNTEI F. (TYPE 1 PED FRAM BILITY. LLES = NE SQUARE NK SIZE	RMK 4 BAILEY, 1 IOT BE BLACK. 5,7)/CFM D: V-BEVE "A" DIFFU ME ECK + 2"+/	RMK 12 NAIL- ELED JSER) / <u>CFM</u>	SEE PLANS 8. NO NECH DUCTED 9. OBD IF U 10. ALL AL BACKPA 11. VOLUM SHOWN 12. PAINT T 13. VERTIC	530 K SIZE INDICAT O, LAY-IN PANEI JSED AS SUPPLY JUM. CONSTRUC AN) IF SHOWN C IE EXTRACTOR ON PLANS. TO MATCH WAI CAL FRONT BLA	1-4, 9, ES NON- Z OR EXHAU TION (INCLU N PLANS. WHERE L. DES.
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<u>E</u> 100 175		NK SIZE					
100 175	TT						
175	H	6x6		125			
	Ι	9x9		280			
275	J	12x12		500			
400	K	15x15		780			
535	L	18x18		1125			
700	Μ	21x21		1530			
885	Ν	24x24		2000			
CFM / NECK S	IZE.						
E: HORIZONTA	L/VERTICAL - "	PIANO HII	NGE" DEV	/ICE.			
H/KETURN NE	$\frac{CK SIZES ("E" =}{NO}$	SQ. NK. U	<u>JNLY)</u>	CEM			
$\underline{\underline{D}}$ $\underline{\underline{CPM}}$	<u>NO.</u>	<u>SQUARE</u> <u>NK SIZE</u>					
100	G	8x8		220			
175	Η	10x10		345			
275	Ι	12x12		500			
400	J	14x14		680			
535	K	16x16		885			
700	L	18x18		1125			
	M	22x22		1680			
ZE.	Ν	22x46		2600			
	535 700 885 CFM / NECK S E: HORIZONTA <u>H/RETURN NE</u> D <u>CFM</u> <u>TE</u> 100 175 275 400 535 700	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	400       K       13x13         535       L       18x18         700       M       21x21         885       N       24x24         CFM / NECK SIZE.       E       HORIZONTAL/VERTICAL - "PIANO HI         H/RETURN NECK SIZES ("E" = SQ. NK. C       D       CFM       NO.       SQUARE         D       CFM       NO.       SQUARE         E       100       G       8x8         175       H       10x10         275       I       12x12         400       J       14x14         535       K       16x16         700       L       18x18         M       22x22       ZE.         N       22x46	400       K       13x13         535       L       18x18         700       M       21x21         885       N       24x24         CFM / NECK SIZE.       E         E: HORIZONTAL/VERTICAL - "PIANO HINGE" DEW         H/RETURN NECK SIZES ("E" = SQ. NK. ONLY)         D       CFM         NO.       SQUARE         TE       NK SIZE         100       G         275       I         100       J         275       I         100       J         275       I         100       J         101       275         I       12x12         400       J         14x14         535       K         16x16         700       L         18x18         M       22x22         ZE.       N         22x46	400K15X15780535L18x181125700M21x211530885N24x242000CFM / NECK SIZE.E: HORIZONTAL/VERTICAL - "PIANO HINGE" DEVICE.H/RETURN NECK SIZES ("E" = SQ. NK. ONLY)DCFMNO.SQUARECFMNO.SQUARECFM $E$ NK SIZE100G8x8220175H100G8x8220175H10x10345275I12x12500400J14x14680535K16x16885700L18x181125VM22x221680ZE.N22x462600	400K13X13780535L18x181125700M21x211530885N24x242000CFM / NECK SIZE.E: HORIZONTAL/VERTICAL - "PIANO HINGE" DEVICE.H/RETURN NECK SIZES ("E" = SQ. NK. ONLY)DCFMNO.SQUARECFMCFMK SIZE100G8x8220175H10x10345275I12x12500400J14x14680535K16x16885700L18x181125M22x221680ZE.N22x462600	400K13X13780535L18x181125700M21x211530885N24x242000'CFM / NECK SIZE.E: HORIZONTAL/VERTICAL - "PIANO HINGE" DEVICE.H/RETURN NECK SIZES ("E" = SQ. NK. ONLY)DCFMNO.SQUARECFMCFMCFMENK SIZE100G8x8220175H10x10345275I12x12500400J14x14680535K16x16885700L18x181125ZE.N22x221680ZE.N22x462600

6. AIR HANDLER HAS HORIZONTAL CONFIGURATION.

7. AIR HANDLER HAS VERTICAL CONFIGURATION.

9. PROVIDE CONDENSATE PUMP PER MFG. RECOMMENDATIONS.

![](_page_13_Figure_31.jpeg)

![](_page_14_Figure_0.jpeg)

S.A. DUCT

REFRIGERANT LINES

OUTSIDE AIR

____

____

— ____

![](_page_14_Figure_2.jpeg)

USPS GENERAL SPECIFICATIONS

## (1) Scope

(a) This specification covers work done by the HVAC Contractor. It is the contractor's responsibility to determine which portion is applicable to his trade.

(b) The Contractor shall coordinate the work and equipment of this Division with the work and equipment specified elsewhere in order to assure a complete and satisfactory installation. Work such as flashing, wiring, etc., which is required by the work of this Section shall be performed in accordance with the requirements of the applicable Section of the

specifications.

(c) It is the intention of these specifications and drawings to call for finished work, tested and ready for operation. Whenever the word "provide" is used, it shall mean "furnish and install complete and ready for

(d) Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.

(e) This Contractor is referred to the General Conditions Of The Contract For Construction. This document shall form a part of this specification and shall be binding on this Contractor by reference.

(f) Some items of equipment are specified in the singular; however, the Contractor shall provide and install the number of items of equipment as indicated on the drawings, and as required for complete systems.

(2) Contractor's Qualifications

(a) It is assumed that the Contractor has had sufficient general knowledge and experience to anticipate the needs of a construction of this nature. The Contractor shall furnish all items required to complete the construction in accordance with reasonable interpretation of the intent of the drawings and specifications. Any minor items required by code, law or regulations shall be provided whether or not specified or not specifically shown where it is a part of a major item of equipment, or of the control system specified or shown on the plans.

(3) Duties of Contractor

____

(a) Contractor shall furnish and install all materials called for in these specifications and accompanying drawings, and must furnish the apparatus complete in every respect. Anything called for in the specifications and not shown on the drawings or shown on the drawings and not called for in the specifications, must be furnished by the Contractor.

(b) Contractor is responsible for familiarizing himself with the details of the construction of the building. Work under these specifications installed improperly or which requires changing due to improper readings or interpretation of building plans shall be corrected and changed as directed by the Architect without additional cost to the Owner.

(c) The Contractor shall follow drawings in laving out work, check drawings of other trades to verify spaces in which work will be installed and maintain maximum headroom and space conditions at all points. Where headroom or space conditions appear inadequate, Architect shall be notified before proceeding with installation.

(d) The plans are diagrammatic and are not intended to show each and every fitting or a complete detail of all the work to be done; but are for the purpose of illustrating the type of system, showing duct sizes, etc., and special conditions considered necessary for the experienced mechanic to take off his materials and lay out his work. This Contractor shall be responsible for taking such measurements as may be necessary at he job and adapting his work to local conditions.

(e) Contractor shall determine the schedule of work as determined by the General Contractor and must schedule his work to maintain the building construction schedule so as not to interfere with or hold up any other Contractors.

(4) Codes, Rules, Permits and Fees

(a) The Contractor shall give all necessary notices, obtain all permits and pay all sales taxes, fees and other costs, including utility connections or extensions, in connection with his work; file all necessary plans, prepare all documents and obtain all necessary approvals of all authorities having jurisdiction, obtain all required certificates of inspection for his work and deliver same to the Architect before request for acceptance and final payment of the work.

(b) The Contractor shall include in his work, without extra cost to the Owner, any labor, materials. service. apparatus, drawings, in order to comply with all applicable laws, ordinances, rules and regulations whether or not shown on drawings and/or specified.

(c) All materials furnished and all work installed shall comply with the National Fire Codes of the National Fire Protection Association, and with the requirements of all governmental departments having jurisdiction.

(d) All work shall be done in accordance with the North Carolina State Building Code, and requirements of governmental agencies having jurisdiction.

## HVAC SPECIFICATIONS

Low Pressure Ductwork:

Round duct: 2" w.G. Pressure class - table 3-2.

## flexible, 1985.

## Round Ductwork:

## Double Wall Spiral Duct:

inc. Or equal.

Fittings shall be manufactured to published standards for dimensions and construction details. Installation manuals shall be supplied to the contractor to provide detailed instructions on methods and procedures for assembly.

All seams in the pressure shell of all fittings are to be continuously welded. Galvanized areas that have been damaged by welding shall be coated with corrosion resistant aluminum paint.

and concentricity.

ioints.

All exposed duct shall be mill phosphatized so as to accept painting by the general contractor.

## Ductwork Installation:

All ductwork shall be provided in a neat workmanlike manner. The ducts shall be properly braced and reinforced. All slip joints shall be made in the direction of flow. All ducts shall be true to the dimension indicated and shall be straight and smooth on the inside with neatly finished airtight joints. The ducts shall be securely anchored into the building construction in an approved manner and shall be completely free from vibration under all conditions of operation. All supply, return fresh-air and exhaust systems shall be completely balanced.

No duct transformation shall be of a ratio less than four to one and where possible, shall be of a ratio of six to one. No less than three vertical splitters shall be provided where these ratios cannot be met. No elbow shall have a throat center line radius of less that one and one-half times the duct width at the turn. All turns of less than this amount in rectangular duct shall be provided with duct turning vanes of standard design. Splitters or multi-blade volume dampers, where indicated, shall be provided in all branch.

Turning vanes shall be provided at all tees and square elbows. Turning vanes shall be factory fabricated and designed in accordance with the smacna or ashrae guide for formed vanes. The first set of turning vanes on the leaving side of fans shall be of the acoustical type to aid in the elimination of unit noise with the exception of room fan coil units.

Splitter dampers and volume extractors shall be provided in all low velocity ductwork for proper air distribution. Each damper shall be provided, lubricated bearings at both ends of the shafts, adjustments guadrant, and locking devices and shall be constructed of galvanized iron or steel sheet one gauge heavier than the duct in which they are installed. Access doors shall be located at all splitter dampers.

Handholes of not less than 6" x 6" shall be provided at all points where access is required. Manholes of not less than 18" x 24" shall be provided at all points where it is necessary to clean or remove parts of eauipment. All access doors and handholes shall be rubber gasketed insulated type with frame and latches.

Label all access doors.

flexible, 1995.

## (5) Guarantee

(a) The Contractor shall guarantee the complete mechanical system against defect due to faulty materials, faulty workmanship or failure due to negligence of the Contractor. This guarantee will exclude normal wear and tear, maintenance lubrication, replacement of expendable components, or abuse. The guarantee period shall begin on the date of the final acceptance and shall continue for a period of 12 months during which time the Contractor shall make good such defective workmanship and materials and any damage resulting therefrom, within a reasonable time of notice given by the Owner. Refrigeration compressor shall have a five year warranty.

(6) Record Drawings

(a) The Contractor shall furnish record drawings indicating any and all changes in locations of ductwork or equipment from that shown on the Contract Drawings. The drawings shall consist of clean, legible prints of the Contract Drawings, available from the Architect on which the Contractor shall mark all notes, dimensions, sizes and information required. The prints shall be kept for this purpose only. Before final inspection the Contractor shall submit the Record Drawings to the Architect.

## (7) Safety Requirements

(a) Comply with all O.S.H.A. requirements.

## (8) Materials and Workmanship

(a) All materials and apparatus required for the work, except as specified otherwise, shall be new, of firstclass guality, and shall be furnished, delivered, erected, connected and finished in every detail, and shall be so selected and arranged as to fit properly into the building space. Where no specific kind or quality of material is given, a first-class standard article as approved by the Architect shall be furnished.

(b) All work must be done by first-class and experienced mechanics properly supervised and it is understood that the Architect has the right to stop any work that is not being properly done and has the right to demand that any workman deemed incompetent by the Architect be removed from the job and a competent workman substituted therefor.

## (9) Equipment Deviations

(a) The Contractor must use the equipment specified in the plans and specifications or equal equipment as supplied by those manufacturers specifically named as equa

## (10) Shop Drawings

(a) The Contractor shall submit for approval four (4) sets of detailed shop drawings of all equipment and all material required to complete the project, and no materials or equipment may be delivered to the job site or installed until the Contractor has in his possession the approved shop drawings for the particular material or equipment. The shop drawings shall be complete as described herein. The Contractor shall furnish the number of copies required by the General and Special Conditions of the Contract, but in no case less than six (6) copies. Shop drawings shall bear approval of Contractor.

(b) Approval rendered on shop drawings shall not be considered as a guarantee of guantities, measurements, or building conditions. Where drawings are approved. said approval does not in anyway relieve the Contractor from his responsibilities or necessity of furnishing material or performing work as required by the Contract Drawings and specifications.

## (11) Observation

(a) The project will be observed periodically as construction progresses. The contractor will be responsible for notifying the Architect at least 72 hours in advance when any work to be covered up is ready for inspection. No work will be covered up until after observation has been completed on such items as piping and insulation, etc.

## (12) Accessibility

(a) Contractor shall be responsible for the adequate clearance in hung ceilings for the proper installation of his work. He shall cooperate with the General Contractor and all other Contractors whose work is in the same space, and shall advise the General Contractor of his requirements. Such spaces and clearances shall;, however, be kept to the minimum size required.

(b) The Contractor shall locate all equipment which must be serviced, operated or maintained in fully accessible positions. If required for better accessibility, furnish access doors for this purpose. Minor deviations from drawings may be allowed for better accessibility and any change shall be submitted for approval.

## (13) Protection

(a) The Contractor shall protect all work and material from damage, and shall be liable for all damage during construction.

(14) Foundations, Supports, Piers, Attachments.

(a) All equipment, unless otherwise shown, shall be securely attached to the building structure in an approved manner by this contractor. Attachments shall be of a strong and durable nature and any attachments that are, in the opinion of the architect/engineer not strong enough shall be replaced as directed.

![](_page_15_Picture_78.jpeg)

Ductwork shall be constructed of zinc coated sheet steel and shall conform to the 1st edition of SMACNA HVAC duct construction standards —metal and flexible, 1985 as follows:

Rectangular duct: 1" w.G. Pressure class - table 1-4.

All ductwork must be sealed in accordance with seal class c as defined in SMACNA HVAC duct construction standards-metal and

Duct hangers and supports shall conform to those shown in tables 4-1 and 4-2 of SMACNA HVAC ductwork 1985. 1st edition.

Round ductwork shall be prefabricated spiral lock seam conduit with prefabricated fittings as manufactured by united sheet metal co., inc. Or equal. Construction shall be airtight and shall be manufactured from galvanized steel meeting astm a-517-67. Fittings shall be manufactured to published standards for dimensions and construction details. Installation manuals shall be supplied to the contractor to provide detailed instructions on

methods and procedures for assembly. All seams in all fittings are to be continuously welded. Galvanized areas that have been damaged by welding shall be coated with corrosion resistant aluminum paint. Openings for grille mounting shall be factory cut and framed for the grille mounting bracket and the framing shall not have excessive welding that will be noticeable beyond the grille frame. All joints shall be sealed using Benjamin Foster 30–02 sealed between screwed metal seams banded with fiberglass tape.

Duct shall be prefabricated spiral lock seam conduit with prefabricated fittings as manufactured by United Sheet Metal co.,

Construction shall be an airtight, outer pressure shell, a 1" insulation layer, and a perforated metal inner liner that completely covers the insulation throughout the system. The outer shell shall be manufactured from galvanized steel meeting ASTM a-517-67.

Inner liners of both duct and fittings are to be adequately supported by metal spacers welded in position to maintain spacing

Provide an inner coupling to alian the inner lining to maintain good air flow conditions equivalent to standard round high pressure duct

Openings shall be factory cut and framed for the grille mounting bracket and the framing shall not have excessive welding that will be noticeable beyond the grille frame.

90 degrees elbows shall be 5 piece gored elbows.

All joints shall be sealed using benjamin foster 30-02 sealed between screwed metal seams banded with fiberglass tape.

Install access doors at each fire damper and smoke detector.

All ductwork must be sealed in accordance with seal class c as defined in smacna hvac duct construction standards - metal and Duct Hangers and Supports:

Duct hangers and supports shall conform to those shown in tables 4-1 and 4-2 of smacna hvac ductwork 1985, 1st edition. <u>Duct Leakage Test:</u>

After installation and prior to insulating, the contractor shall perform in the presence of the engineer a duct leakage test on all rigid medium pressure duct. Contractor shall notify the engineer 72 hours in advance when this test shall be applied. The contractor may at his option test portions of the duct system in lieu of testing the entire system at once.

The installed medium pressure duct system shall be tested to 3" wg.

The air leakage at the test pressure shall be measured by a calibrated office type flow meter. Total allowable leakage of the system shall not exceed 1/2 of 1% of the air handling capacity of the system.

If the system is tested in sections, the leakage rates shall be added to give the performance of the whole system.

Leakage concentrated at one point may result in objectionable noise even if the system passes the leakage rate criteria. Noise sources must be corrected to the satisfaction of the engineer.

The orifice flow measurement device must have individually calibrated against a primary standard, and this calibrated curve permanently attached to the orifice tube assembly.

## <u>Duct Insulation:</u>

Insulation shall be owens-corning, certain-teed/st. Gobain, manville or approved equivalent. Adhesives shall be as manufactured by 3-m foster or insulation manufacturer. Insulation shall have composite (insulation, jacket and adhesive) fire and smoke hazard rating as tested by astm e-84, not exceeding flame spread -25and smoke developed -50.

All vapor barriers and joints shall be sealed to prevent condensation. Clean and dry all ductwork before installing insulation. All weld joints shall be wire brushed and give one (1) coat of red lead before insulating. Staples will not be permitted in insulation.

All supply duct shall be shall be externally insulated with fiberglass ductwrap insulation, 2" thick, 1.5# density. Ductwrap shall be provided by manufacturer with a white exterior jacket to match existing ductwrap, mechanical contractor to field verify existing ductwrap. Duct insulation system shall meet requirements of nfpa 90a and shall have ul fire hazard classification not to exceed the following: flame spread - 25; fuel contributed - 50; smoke generated -50. Insulation shall be applied to the sheet metal with 100% coverage. On horizontal runs, tops of ducts over 12" in width and sides of 16" in height shall be additionally secured with mechanical fasteners. On spans over 30", fasteners are to be placed at midpoints. On vertical runs, fasteners shall be placed on a maximum of 15" centers on all width dimensions over 12". Fasteners shall be flush with the surface. All ductwork shall be covered with an 8 oz. Canvas jacket or an embossed paint grip metal jacket to accept final painting by the g.C.

<u>Controls:</u>

Provide 7 day programmable thermostat for each system.

Testing and Balancing:

Work shall be performed by technicians competent in the trade of testing and balancing environmental systems and shall be done in an organized manner utilizing appropriate test and balance forms. All equipment shall be balanced to within +/-10% of the scheduled value.

Instruments for use in the test and balancing procedures shall be of first quality and be accurately calibrated at the time of use. All field instruments used in the balance should have been calibrated at least within the previous three months.

Starting date for mechanical system shall be scheduled well in advance of expected completion date and shall be established a minimum of two weeks prior to acceptance date. The system shall be in full operation with all equipment functional prior to acceptance date.

Performance readings shall be taken and recorded on all air distribution devices and the system shall be balanced out prior to acceptance. Balancing of the system shall be accomplished with duct dampers and only minor adjustments made with grille dampers. Record and submit results in table form along side of scheduled augntities.

All controls shall be calibrated by gualified personnel prior to acceptance date. Thermostats shall be in close calibration with one another and shall operate their respective units without interference from adjacent units.

All units shall be checked out thoroughly and the information recorded on each machine. Check sheets shall be included in operating and maintenance instructional manual

![](_page_15_Picture_120.jpeg)

![](_page_16_Figure_0.jpeg)

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# NO PIPING ABOVE ELECTRICAL PANELS $\sim$

![](_page_16_Figure_5.jpeg)

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![](_page_16_Figure_12.jpeg)

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![](_page_16_Figure_13.jpeg)

![](_page_17_Figure_0.jpeg)

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![](_page_17_Picture_7.jpeg)

![](_page_17_Figure_8.jpeg)

![](_page_18_Picture_0.jpeg)

	PLUMBIN	G LEGEND
SYMBOL	ABBREVIATION	DESCRIPTION
	CW	COLD WATER
	HW (110°F)	HOT WATER
	HW (140°F)	HOT WATER
	HWR (110°F)	HOT WATER RETURN
	HWR (140°F)	HOT WATER RETURN
	W	WASTE
	GW	GREASE LADEN WASTE LINE
	V	VENT
	RL	ROOF LEADER
	SD	STORM DRAIN
G	G	GAS
	VTR	VENT THRU ROOF
		GLOBE VALVE
DX4		BALL VALVE
<b>\</b>		CHECK VALVE
—I  <b>-</b>		UNION
		PRESSURE REDUCING VALVE
<del>  +</del>	FPH	FROST PROOF HYDRANT
++	HB	HOSE BIBB
		SHOCK ABSORBER
0	RD	ROOF DRAIN
$\bigotimes$	FCO	FLOOR CLEANOUT
$\square$	FC0/YC0	FLOOR OR YARD CLEANOUT
$\boxtimes$	FS/FD	FLOOR SINK OR SQUARE FL. DRAIN
$\square$	SFD	SHOWER FLOOR DRAIN
占 下		VACUUM BREAKER
		AQUASTAT
0	HD	HUB DRAIN
F	F	FIRE PROTECTION
		CONNECT TO EXISTING

	PLUM	BING SPECIALTIES SCHEDULE	
SYM	DESCRIPTION	MODEL NUMBER	REMARKS
FD	FLOOR DRAIN	ZURN ZN-415-S	1,7
FCO	FLOOR CLEANOUT	ZURN ZN-1400-T WITH NIKALOY TOP, CARPET MARKERS AS REQUIRED, SEE ARCHITECTURAL FINISH SCHEDULE FOR CARPETED AREAS.	1
YCO	YARD CLEANOUT	ZURN Z-1406-HD WITH CAST IRON TOP ZURN Z-1474-HD WITH CAST IRON TOP (TRAFFIC AREAS)	1
wco	WALL CLEANOUT	ZURN Z-1446 W/STAINLESS STEEL COVER	1, 8
$\bigcirc$	SHOCK ABSORBER	SIOUX CHIEF, A=652-A, B=653-B, C=654-C, D=655-D	6
TP	TRAP PRIMER	PRECISION PRODUCTS MODEL PR-500 W/SS-X & DU-X.	1,7
TP	TRAP PRIMER	ZURN Z-1022 @ TRAP TO Z-1023 @ FLOOR DRAIN.	1,7

1. EQUALS BY JOSAM, JAY R. SMITH, ZURN, MIFAB, WATTS. 2. EQUALS BY JOSAM, JAY R. SMITH. 3. PROVIDE INTEGRAL CHECK STOPS AT ALL WALL FAUCETS.

4. EQUALS BY OATEY, SIOUX CHIEF. 5. PROVIDE WITH NB FRAMING GRATE

6. EQUALS BY JOSAM, JAY R. SMITH, WATTS - ASSE 1010 APPROVED. PROVIDE AT QUICK-CLOSING FIXTURES PER IPC 604.9. 7. AT EACH FLOOR DRAIN & FLOOR SINK, PROVIDE WITH TRAP PRIMER CONNECTION (SUFFIX -P) AND INCLUDE PRIMER OPTION "TP" NOTED ABOVE. 8. PROVIDE WCO AT BASE OF EACH WASTE STACK PER IPC 708.3.4.

![](_page_18_Figure_8.jpeg)

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			F	PLUM	BING	FIXTURE SCHEDULE	
SYM	DESCRIPTION	CW	HW	W	V	MODEL NUMBER	R
P-1	WATER CLOSET	1 1/4"	_	3"	2"	KOHLER "WELLCOMME" K–4350; BENEKE 527SS SEAT; SLOAN ROYAL 115–1.6–YK FLUSH VALVE	1,
P-2	WATER CLOSET (HDCP.)	1 1/4"	_	3"	2"	KOHLER "HIGHCLIFF" K–4368; BENEKE 527SS SEAT; SLOAN ROYAL 111 FLUSH VALVE	1, 8
P-3	URINAL	3/4"	_	2"	2"	KOHLER "DEXTER" K–5016–ET W/SLOAN ROYAL 186–1 FLUSH VALVE	1,
P-4	LAVATORY (WALL,GRID)	1/2"	1/2"	2"	2"	KOHLER "HUDSON" K–2861; DELTA 501LF–HGMHDF FAUCET; K–7607 SUPPLY; K–8998 TRAP, K–7129–A DRAIN.	1, 15
P-5	SINGLE CMPT. SINK (ADA)	1/2"	1/2"	2"	2"	ELKAY LRAD-2219-65 W/LK-335 STRAINER; CHICAGO 201-AGN8AE2805-5-317ABCP FAUCET; KOHLER K-7607 SUPPLY, K-9000 TRAP	1
P-6	WATER COOLER (HI/LO)	1/2"	_	2"	2"	OASIS MODEL P8ACSL, PROVIDE ACCESSORY APRON ON UPPER UNIT. PROVIDE STOP & TRAP. COLOR SELECTED BY ARCHITECT	₹ 1 Г.
P-7	MOP BASIN	1/2"	1/2"	3"	2"	FIAT MSB-2424 W/ 830-AA FAUCET, 832-AA HOSE BRACKET, 889-CC MOP HANGER & SEALANT AS REQUIRED. INCLUDE SS WALL GUARDS.	1

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I. SEE ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF ALL FIXTURES. 2. PROVIDE TRUEBRO MODEL 102 INSULATION KIT, PLUMBEREX MODEL PRO-2000 OR McGUIRE PWV8902 PREWRAPPED CAST P-TRAP ASSEMBLY KIT ON ALL HANDICAP ACCESSIBLE LAVATORIES AND/OR SINKS.

3. PROVIDE CARRIERS FOR ALL WALL MOUNTED FIXTURES. FOR LAVATORIES: SINGLE HANGER FOR BLOCK WALLS; FOR GYPBOARD WALL, PROVIDE FLOOR-MOUNT ARM CARRIERS (CONCEALED OR EXPOSED PER MFR'S REQUIREMENTS).

4. EQUAL CHINA FIXTURE BY AMERICAN STANDARD, ZURN & SLOAN. 5. EQUAL TOILET SEAT BY BEMIS, OLSONITE & BENEKE.

6. EQUAL FLUSH VALVES BY ZURN & TOTO.

7. TOP OF FLUSH VALVE SHALL BE LOCATED MINIMUM 3" BELOW BOTTOM OF GRAB BAR. P.C. TO CUT OUTLET TUBE AS REQUIRED.

8. FLUSH VALVE MECHANISM SHALL BE LOCATED OPPOSITE OF HAND RAIL AS PER ADA REQUIREMENT. 9. EQUAL FAUCETS BY SYMMONS, CHICAGO FAUCETS, DELTA, MOEN & AMERICAN STANDARD.

10. EQUAL STAINLESS STEEL SINK BY FRANKE & JUST.

11. EQUAL SHOWER STALL BY AMERICAN STANDARD, CRANE, AQUATIC, MAAX, AQUA GLASS & AQUARIUS. 12. EQUAL SHOWER TRIM BY LEONARD & SPEAKMAN (PROVIDE SHOWER PAN AS REQ'D PER CODE SECTION

417.4 & 417.5; SEE ARCH DWGS/SPECS FOR DETAILS). 13. EQUAL WATER COOLER/DRINKING FOUNTAIN BY HALSEY TAYLOR, SUNROC, HAWS & ELKAY.

14. EQUAL MOP BASIN BY SWANSTONE, E.L.MUSTEE. 15. WHEN ASTERISK ("*") PREFIX IS USED, PROVIDE TRAP PRIMER AND PIPE 1/2" LINE

BELOW SLAB TO FLOOR DRAIN.

16. EQUAL FAUCETS BY CHICAGO FAUCETS, T&S, ELKAY, ZURN & AMERICAN STANDARD. SINGLE SINK = RIGID SPOUT; DOUBLE SINK = RESTRICTED SPOUT.

17. EQUAL CAST IRON LAVATORIES BY CECO & ZURN. 18. ACCESSORY APRON MAY BE OMITTED IF WATER COOLER IS RECESSED.

19. PROVIDE INTEGRAL CHECK STOPS AT ALL WALL FAUCETS. 20. EQUAL SPECIALTY FIXTURE BY OATEY, SIOUX CHIEF.

PLUMBING L SUMMARY	0
WATER FU	
WATER GPM	4
WASTE FU	
HW GPH (110°F)	

![](_page_18_Figure_31.jpeg)

![](_page_18_Figure_32.jpeg)

![](_page_18_Figure_33.jpeg)

![](_page_19_Picture_0.jpeg)

### SPECIFICATIONS

### (1) Scope

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(a) This specification covers work done by the Plumbing Contractor. It is the contractor's responsibility to determine which portion is applicable to his trade

(b) The Contractor shall coordinate the work and equipment of this Division with the work and equipment specified elsewhere in order to assure a complete and satisfactory installation. Work such as flashing, wiring, etc., which is required by the work of this Section shall be performed in accordance with the requirements of the applicable Section of the

specifications.

(c) It is the intention of these specifications and drawings to call for finished work, tested and ready for operation. Whenever the word "provide" is used, it shall mean "furnish and install complete and ready for

(d) Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.

(e) This Contractor is referred to the General Conditions Of The Contract For Construction. This document shall form a part of this specification and shall be binding on this Contractor by reference.

(f) Some items of equipment are specified in the singular; however, the Contractor shall provide and install the number of items of equipment as indicated on the drawings, and as required for complete systems.

(2) Contractor's Qualifications

(a) It is assumed that the Contractor has had sufficient general knowledge and experience to anticipate the needs of a construction of this nature. The Contractor shall furnish all items required to complete the construction in accordance with reasonable interpretation of the intent of the drawings and specifications. Any minor items required by code, law or regulations shall be provided whether or not specified or not specifically shown where it is a part of a major item of equipment, or of the control system specified or shown on the plans.

(3) Duties of Contractor

(a) Contractor shall furnish and install all materials called for in these specifications and accompanying drawings, and must furnish the apparatus complete in every respect. Anything called for in the specifications and not shown on the drawings or shown on the drawings and not called for in the specifications, must be furnished by the Contractor

(b) Contractor is responsible for familiarizing himself with the details of the construction of the building. Work under these specifications installed improperly or which requires changing due to improper readings or interpretation of building plans shall be corrected and changed as directed by the Architect without additional cost to the Owner.

(c) The Contractor shall follow drawings in laying out work, check drawings of other trades to verify spaces in which work will be installed and maintain maximum headroom and space conditions at all points. Where headroom or space conditions appear inadequate. Architect shall be notified before proceeding with installation.

(d) The plans are diagrammatic and are not intended to show each and every fitting or a complete detail of all the work to be done; but are for the purpose of illustrating the type of system, showing duct sizes, etc., and special conditions considered necessary for the experienced mechanic to take off his materials and lay out his work. This Contractor shall be responsible for taking such measurements as may be necessary at he job and adapting his work to local conditions.

(e) Contractor shall determine the schedule of work as determined by the General Contractor and must schedule his work to maintain the building construction schedule so as not to interfere with or hold up any other Contractors.

(4) Codes, Rules, Permits and Fees

• •

(a) The Contractor shall give all necessary notices, obtain all permits and pay all sales taxes, fees and other costs, including utility connections or extensions, in connection with his work; file all necessary plans, prepare all documents and obtain all necessary approvals of all authorities having jurisdiction, obtain all required certificates of inspection for his work and deliver same to the Architect before request for acceptance and final payment of the work.

(b) The Contractor shall include in his work, without extra cost to the Owner, any labor, materials, service, apparatus, drawings, in order to comply with all applicable laws, ordinances, rules and regulations whether or not shown on drawings and/or specified.

(c) All materials furnished and all work installed shall comply with the National Fire Codes of the National Fire Protection Association, and with the requirements of all governmental departments having jurisdiction.

(d) All work shall be done in accordance with the North Carolina State Building Code, and requirements of governmental agencies having jurisdiction.

## (5) Guarantee

. .

(a) The Contractor shall guarantee the complete mechanical system against defect due to faulty materials, faulty workmanship or failure due to negligence of the Contractor. This guarantee will exclude normal wear and tear, maintenance lubrication, replacement of expendable components, or abuse. The guarantee period shall begin on the date of the final acceptance and shall continue for a period of 12 months during which time the Contractor shall make good such defective workmanship and materials and any damage resulting therefrom, within a reasonable time of notice given by the Owner. Refrigeration compressor shall have a five year warranty.

### (6) Record Drawings

(a) The Contractor shall furnish record drawings indicating any and all changes in locations of ductwork or equipment from that shown on the Contract Drawings. The drawings shall consist of clean, legible prints of the Contract Drawings, available from the Architect on which the Contractor shall mark all notes, dimensions, sizes and information required. The prints shall be kept for this purpose only. Before final inspection the Contractor shall submit the Record Drawings to the Architect.

### (7) Safety Requirements

(a) Comply with all O.S.H.A. requirements.

### (8) Materials and Workmanship

(a) All materials and apparatus required for the work, except as specified otherwise, shall be new, of firstclass quality, and shall be furnished, delivered, erected, connected and finished in every detail, and shall be so selected and arranged as to fit properly into the building space. Where no specific kind or quality of material is given, a first-class standard article as approved by the Architect shall be furnished.

(b) All work must be done by first-class and experienced mechanics properly supervised and it is understood that the Architect has the right to stop any work that is not being properly done and has the right to demand that any workman deemed incompetent by the Architect be removed from the job and a competent workman substituted therefor.

## (9) Equipment Deviations

(a) The Contractor must use the equipment specified in the plans and specifications or equal equipment as supplied by those manufacturers specifically named as equal.

## (10) Shop Drawings

(a) The Contractor shall submit for approval four (4) sets of detailed shop drawings of all equipment and all material required to complete the project, and no materials or equipment may be delivered to the job site or installed until the Contractor has in his possession the approved shop drawings for the particular material or equipment. The shop drawings shall be complete as described herein. The Contractor shall furnish the number of copies required by the General and Special Conditions of the Contract, but in no case less than six (6) copies. Shop drawings shall bear approval of Contractor.

(b) Approval rendered on shop drawings shall not be considered as a guarantee of guantities, measurements, or building conditions. Where drawings are approved, said approval does not in anyway relieve the Contractor from his responsibilities or necessity of furnishing material or performing work as required by the Contract Drawings and specifications.

### (11) Observation

(a) The project will be observed periodically as construction progresses. The contractor will be responsible for notifying the Architect at least 72 hours in advance when any work to be covered up is ready for inspection. No work will be covered up until after observation has been completed on such items as piping and insulation, etc.

### (12) Accessibility

(a) Contractor shall be responsible for the adequate clearance in hung ceilings for the proper installation of his work. He shall cooperate with the General Contractor and all other Contractors whose work is in the same space, and shall advise the General Contractor of his requirements. Such spaces and clearances shall;, however, be kept to the minimum size required.

(b) The Contractor shall locate all equipment which must be serviced, operated or maintained in fully accessible positions. If required for better accessibility, furnish access doors for this purpose. Minor deviations from drawings may be allowed for better accessibility and any change shall be submitted for approval.

## (13) Protection

(a) The Contractor shall protect all work and material from damage, and shall be liable for all damage during construction.

## (14) Concealed Pipe.

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(a) In general, all pipe in finished spaces shall be run concealed in floors, walls, partitions and above ceilings under the insulation unless specifically noted otherwise. (15) Foundations, Supports, Piers, Attachments.

(a) All equipment, unless otherwise shown, shall be securely attached to the building structure in an approved manner by this contractor. Attachments shall be of a strong and durable nature and any attachments that are, in the opinion of the architect/engineer not strong enough shall be replaced as directed.

### (16) Test.

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(a) All piping shall be tested before covering is applied or work concealed, and all leaks corrected by removal of defective material and/or making up new joints. Equipment shall be protected from test pressure by capping lines or with valves during test. Caulking of piping will not be permitted and where evident of caulking is noted, the joints shall be removed from the piping system regardless of whether or not it is leaking.

(b) Test on all pipe work shall be subject to observation by the Architect/Engineer. He shall be given 72 hours notice when a section of pipe is to be tested and the test shall not be removed, weather permitting, until permission is given by the architect.

(c) Test all water piping at 125 psi.

(d) Test all waste and vent piping with a 10 foot head. (17) Piping.

(a) Soil, waste, vent and drain piping shall be cast iron soil pipe. All pipe shall be service weight ASTM A-74-69 bell and spigot, bearing the label of the Cast Iron Soil Pipe Institute and shall be listed by NSF International. The casings shall be gray iron of good quality made by Cupola, Air Furnace, or Electric Furnace process. The resultant pipe shall be compact, close grained metal, soft enough to permit cutting and drilling. Pipe shall have been hydrostatically tested at not less than 50 pounds per square inch gauge. Factory coated by heating to 300°F and dripping in a bath of coal tar pitch and oil.

(b) Water piping shall be hard drawn copper tubing ASTM B 88 type "L" above grade, type "K" below grade. Fittings for copper tubing shall be ANSI B16.18 or B16.22 solder joint fittings. Ends of pipe shall be reamed, pipe and fittings cleaned. Use only 95-5 (95% tin and 5% antimony) solder with non-corrosive flux on 1-1/4" and smaller and on 1-1/2" and larger use silver solder (minimum 12% silver), with a melting point greater than 1000°F. Submit solder for approval

## (18) Ball Valves..

Ball valves shall be bronze, two piece construction rated for 125 SWP/ 400 WOG. Valves shall have conventional port with Teflon seats. Stem shall be silicone bronze. Sizes 1/4" - 2". All ball valves installed in insulated piping shall have extended tee handles.

MANUFACTURER	THREADED 125#	<u>SOLDER 125#</u>
NIBCO	T580	S580
APOLLO	70–100	70-200
STOCKHAM	S214–BR–T–T	S214-BR-T-

## (19) Hangers.

(a) All piping shall be supported on not less than 10' centers and within 30" of each change of direction except that piping  $1 \frac{1}{4}$  size and smaller shall be supported on 8'0" centers.

(b) Pipe hangers shall be supported by means of iron hanaer rods from the building construction or from structural steel members, and in an approved manner. Where require, piping shall be hung from angle iron clips or suitable brackets attached to sides of masonry construction.

## (20) Pipe Insulation.

(a) All water piping shall be insulated with heavy density fiberglass with an all-service jacket composed of an outer layer of vinyl, fiberglass scrim cloth, aluminum foil, and kraft paper, in that order, from outside to inside of pipe covering. Insulation thickness shall be 1" for all piping.

## (21) Cleaning.

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- (a) Clean and disinfect potable water piping as follows: 1. Purge all piping before using. 2. Use purging and disinfecting procedures prescribed
- by authorities having jurisdiction: if methods are not prescribed, use procedures n either AWWA C651
- or AWWA C652 or follow procedures described below: A. Flush with clean, potable water until dirty water does not appear at outlets.
- B. Fill and isolate system according to either of the following: 1. Fill system with water / chlorine solution with
- at least 50 ppm of chlorine. Isolate with valves and allow to stand 24 hours. 2. Fill system with water / chlorine solution with
- at least 200 ppm of chlorine. Isolate with valves and allow to stand 3 hours. C. Flush system with clean, potable water until no chlorine is in water coming from system after
- the standing time. D. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological
- examination shows contamination. (b) Prepare and submit reports of purging and disinfecting activities (c) Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

![](_page_19_Figure_75.jpeg)

	SYMBOL	SCHEDU	E
GENERAL	SYMBOLS	WIRING D	DEVICES
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	CONDUIT RUN CONCEALED ABOVE CEILINGS OR IN WALLS.	<del>+</del>	DUPLEX RECEPTACLE, 125V, 3-WIRE GROUNDING TYPE.
	CONDUIT RUN CONCEALED IN OR BELOW FLOORS OR UNDERGROUND.	€ _{EWC}	DUPLEX RECEPTACLE, 125V, GROUND FAULT CIRCUIT INTERRUPTING, 3-WIRE GROUNDING TYPE. LOCATE WITHIN OR BEHIND AN ELECTRIC WATER COOLER. COORDINATE WITH PLUMBER FOR
<b>_</b> · <b>_</b> · <b>_</b>	CONDUIT RUN EXPOSED.		EXACT LOCATION.
<b></b>	CONDUIT TURNING UP	€GFI	DUPLEX RECEPTACLE, GROUND FAULT CIRCUIT INTERRUPTING.
•	CONDUIT TURNING DOWN	€₩₽	DUPLEX GFCI RECEPTACLE. PROVIDE WITH OPERABLE, IN-USE WEATHERPROOF COVER.
<b>_</b>	SQUARE ON CONDUIT SYMBOL INDICATES THAT CIRCUIT CONTINUES BUT NOT SWITCHLEG.	€sw	DUPLEX RECEPTACLE, SWITCHED.
	HOMERUN TO PANEL AND CIRCUIT(S) DESIGNATED. ARROW(S) INDICATE QUANTITY OF CIRCUITS.		TWO DUPLEX RECEPTACLES, 125V, 3-WIRE GROUNDING TYPE, IN A TWO-GANG BOX WITH TWO-GANG FACEPLATE.
	ODECIAL NOTE NUMERALO DENTEX OFF CONFRUE	Ф	SPECIAL PURPOSE RECEPTACLE, WITH SPECIAL NEMA CONFIGURATION AS NOTED.
	SPECIAL NOTE, NUMERALS IDENTIFY, SEE SCHEDULE. SPECIAL CONNECTION TO A SPECIFIC ITEM OF EQUIPMENT. SEE CONNECTION SCHEDULE.	<b>P Y</b>	HEAVY-WALL METAL CONDUIT STUB-UP FROM FLOOR, AT HEIGHT INDICATED, WITH CAST FS-TYPE BOX AND WIRING DEVICE AS INDICATED.
Ø	MOTOR CONNECTION. RATING AS NOTED.	▼	WALL OUTLET FOR TELECOMMUNICATIONS. SEE SPECIFICATIONS AND/OR DRAWINGS FOR CONDUIT AND CABLING REQUIREMENTS.
		∲ 🗳	DOT ABOVE OUTLETS INDICATES THAT THE DEVICE IS TO BE INSTALLED ABOVE CASEWORK OR OTHER OBSTACLE. COORDINATE.
SYMBOL	DESCRIPTION	s	LIGHT SWITCH, SINGLE-POLE,
		S3	LIGHT SWITCH. 3-WAY.
	FLUORESCENT LIGHTING FIXTURE, DRAWN TO SCALE.	Swp	LIGHT SWITCH, WEATHERPROOF
	FLUORESCENT LIGHTING FIXTURE, CONNECTED TO AN EMERGENCY CIRCUIT (SWITCHED)	ST.	PROGRAMMABLE LIGHT SWITCH, WALL MOUNTED.
<b>//</b> 9//	FLUORESCENT LIGHTING FIXTURE, UTILIZED AS A NIGHT-LIGHT. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.	SS	WHERE TWO SWITCHES ARE SHOWN CONTROLLING A SINGLE OR COMMON GROUP OF FLUORESCENT LIGHTING FIXTURES, EACH WITH 3 OR MORE LAMPS, THE SWITCH CLOSEST TO
	FLUORESCENT LIGHTING FIXTURE, CONNECTED TO AN EMERGENCY CIRCUIT, CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.		THE DOOR SHALL CONTROL THE INNER LAMP(S) IN EACH FIXTURE, AND THE OTHER SWITCH SHALL CONTROL THE OUTER LAMPS IN EACH FIXTURE. WHERE INDICATED, MASTER-SLAVE BALLAST WRING SHALL BE UTILIZED TO ACHIEVE THIS CONTROL.
	BARE FLUORESCENT STRIP FIXTURE.		FQUIPMENT CONTROL STATION, MOUNT 48" ABOVE FINISHED FLOOR
	BARE FLUORESCENT STRIP FIXTURE CONNECTED TO AN EMERGENCY CIRCUIT. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.	6	DUAL TECHNOLOGY OCCUPANCY SENSOR, CEILING MOUNTED. PROVIDE WITH 10 FEET WHIP TO ALLOW FIELD ADJUSTMENT OF LOCATION. COORDINATE EXACT LOCATION WITH
0	COMPACT FLUORESCENT LIGHTING FIXTURE, CEILING MOUNTED.		MANUFACTURERS RECOMMENDATION.
•	COMPACT FLUORESCENT LIGHTING FIXTURE, CONNECTED TO AN EMERGENCY CIRCUIT OR EMERGENCY BALLAST.		
¤	COMPACT FLUORESCENT LIGHTING FIXTURE. UTILIZED AS A NIGHT-LIGHT. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.		
×	COMPACT FLUORESCENT LIGHTING FIXTURE. CONNECTED TO AN EMERGENCY CIRCUIT OR EMERGENCY BALLAST. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.		
ю	COMPACT FLUORESCENT LIGHTING FIXTURE, WALL MOUNTED.		
••	COMPACT FLUORESCENT CONNECTED TO AN EMERGENCY CIRCUIT OR EMERGENCY		
8	BALLAST.		
-39	CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT. EXIT SIGN, WALL MOUNTED. SHADING INDICATES FACE ORIENTATION.		
•=•	CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT. J EMERGENCY BATTERY PACK FIXTURE, CEILING MOUNTED. CONNECT TO UNSWITCHED LEG OF		
-	THE CIRCUIT. EMERGENCY BATTERY PACK FIXTURE, WALL MOUNTED. CONNECT TO UNSWITCHED LEG OF THE		
P	PHOTOCELL CONTROL DEVICE. MOUNT ON ROOF FACING NORTH.		
	TION		
SYMBOL	DESCRIPTION		ABRKE VIA HONZ
	ELECTRICAL PANELBOARD, FLUSH MOUNTED.		A AMPERES ACC ARMORED CLAD CABLE
	ELECTRICAL PANELBOARD, SURFACE MOUNTED.		AFF ABOVE FINISHED FLOOR
	CONTROL CABINET, FLUSH OR SURFACE MOUNTED.		ANN FIRE ALARM ANNUNCIATOR CAI
 	DISCONNECT SWITCH, NON-FUSIBLE.		C CONDULT CB CIRCUIT BREAKER
	DISCONNECT SWITCH, FUSIBLE.		CKT CIRCUIT CLG CEILING
	DISCONNECT SWITCH PROVIDED WITH FOUIPMENT		DN DOWN
••••	GROUND CONNECTION.		EC EMPTY CONDUIT EMT ELECTRICAL METALLIC TUBING ENT ELECTRICAL NON-METALLIC TU

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	LIGHTING FIXTURE SCHEDULE													
TYPE	DESCRIPTION	VOLT.	ΟΤΥ	TYPE	BULB	LAN BASE	IPS TEMP	CRI	LUMENS	DRIV QTY	ER/BALLASTS	WATTS	MOUNTING	MANUF. CATALOG NO.
A1	2'X4' FLUORESCENT TROFFER. GRID TYPE FOR LAY-IN CEILING. 0.125" ACRYLIC PRISMATIC DIFFUSER. FLAT STEEL DOOR FRAME. WHITE FINISH.	120	2	F32	T8	G13	3500 K	75	2850	1	ELECTRONIC HPF, IS PARALLEL	70	CEILING, RECESSED	LITHONIA #2SP8G H.E. WILLIAMS 50GS24 SERIES. METALUX 2GC8 SERIES.
A2	2'X4' FLUORESCENT TROFFER. FLANGE TYPE FOR GYPSUMBOARD CEILING. 0.125" ACRYLIC PRISMATIC DIFFUSER. FLAT STEEL DOOR FRAME. WHITE FINISH.	120	2	F32	T8	G13	3500 K	75	2850	1	ELECTRONIC HPF, IS PARALLEL	70	CEILING, RECESSED	LITHONIA #2SP8F H.E. WILLIAMS 50FS24 SERIES. METALUX 2FC8 SERIES.
A3	2'X4' FLUORESCENT TROFFER. GRID TYPE FOR LAY-IN CEILING. 0.125" ACRYLIC PRISMATIC DIFFUSER. FLAT STEEL DOOR FRAME. WHITE FINISH. TANDEM WIRED FIXTURE. REFER TO MASTER/SATELLITE CONFIGURATION DETAIL.	120	3	F32	Т8	G13	3500 K	75	2850	♦	electronic HPF, RS Series	105	CEILING, RECESSED	LITHONIA #2SP8G H.E. WILLIAMS 50GS24 SERIES. METALUX 2GC8 SERIES.
BS	4' LONG BARE FLUORESCENT STRIP FIXTURE. STEEL HOUSING WITH WHITE ENAMEL FINISH AND ENDPLATES. PROVIDE WITH PROTECTIVE TUBE GUARDS.	120	2	F32	Т8	G13	3500 K	75	2850	1	ELECTRONIC HPF, IS PARALLEL	70	SUSPENDED 10'-0" AFF OR SURFACE MOUNT IF CEILING IS PROVIDED OR UNLESS OTHERWISE NOTED	LITHONIA #C METALUX #SS H. E. WILLIAMS #76 SERIES
V1	4 FT. LONG ENCLOSED AND GASKETED INDUSTRIAL FLUORESCENT LUMINAIRE. UL LISTED FOR DAMP LOCATION. DEEP HIGH IMPACT ACRYLIC DIFFUSER.	120	2	F32	Т8	G13	3500 K	75	2850	1	ELECTRONIC HPF, IS PARALLEL	58	CEILING, SURFACE	LITHONIA DMS-ARDP KENNALL #ES848/232 SERIES NULITE DM SERIES
WLE	DECORATIVE EXTERIOR WALL MOUNTED LED FIXTURE, HALF ROUND SHAPE DIE-CAST, ALUMINUM HOUSING, ACRYLIC LENS, TWO LIGHT ENGINES (10 LED'S EACH), ELECTRONIC DRIVERS, WIDE DISTRIBUTION (SR2), UL, LISTED FOR WET LOCATION. FINISH AS SELECTED BY ARCHITECT. PROVIDE WITH EMERGENCY BATTERY PACK FOR 90 MINUTE ILLUMINATION.	120	-	LED	-	_	4000 K	70	3944	-	FMFRGENCY	47	WALL, SURFACE MTG HT AS DIRECTED BY ARCHITECT (MINIMUM 10'-0") (MAXIMUM 16'-0")	LITHONIA #WSR LED SERIES OR APPROVED EQUAL
원 	LED EMERGENCY LIGHTING UNIT, WITH SELF-CONTAINED NI-CAD BATTERY RESERVE, WHITE THERMOPLASTIC HOUSING, FOR WALL OR CEILING MOUNTING, CONNECT FIXTURE AHEAD OF ALL LOCAL AREA SWITCHING. FIXTURE SHALL NOT BE SWITCHED.	120	2	LED	LED	_	-	-	-	_	_	3	CEILING, SURFACE CEILING EXCEPT 8 FT. AFF. MAX.	LITHONIA #ELM2-LED-SD SERIES BEGHELLI #XLPLED-HO SERIES DUAL-LITE #LZ20 SERIES LIGHTALARMS #LCA-2LEDR SERIES
⊗ 🎗	EXIT SIGN, WHITE METAL HOUSING, UNIVERSAL MOUNTING, RED STENCIL FACE, QUANTITY OF FACES INDICATED BY SHADING ON SYMBOL, DIRECTIONAL ARROWS AS INDICATED, WITH SELF-CONTAINED BATTERY RESERVE, CONNECT FIXTURE AHEAD OF ALL LOCAL AREA SWITCHING, FIXTURE SHALL NOT BE SWITCHED.	120	-	LED DIFFUSE	-	-	-	-	-	-	-	5	WALL OR CEILING AS INDICATED BY SYMBOL	LITHONIA #LQM-S-W-3R-120/277-ELN-SD SURE-LITES #LPX7 LIGHTALARMS

Α	AMPERES
ACC	ARMORED CLAD CABLE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ANN	FIRE ALARM ANNUNCIATOR CABINET
C	CONDUIT
ČB	
CKT	CIRCUIT
	CEILING
EC.	
	ELECTRICAL METALLIC TUDING
ENI	ELECTRICAL NON-METALLIC TUBING
EWC	ELECTRIC WATER COULER
FACP	FIRE ALARM CONTROL PANEL
FMC	FLEXIBLE METAL CONDUIT
G	GROUND
GFI	GROUND FAULT INTERRUPTER
HOA	HAND OFF AUTOMATIC
HP	HORSEPOWER
HPF	HIGH POWER FACTOR
НΧ	HIGH REACTANCE
HD	HAND DRYER
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
IS	INSTANT START
JB	JUNCTION BOX
KVA	KILOVOLT-AMPERES
FPN	FUSE PER NAMEPIATE

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ĸw	KILOWATTS
LFMC	
LVC	LOW VOLTAGE CONTROL CABINET
MCB	MAIN CIRCUIT BREAKER
MCC	METAL CLAD CABLE
MLO	MAIN LUGS ONLY
MTD	MOUNTED
NMC	NON-METALLIC CLAD CABLE
PB	PULLBOX
PNL	PANELBOARD
PRS	PROGRAM RAPID START
PS	PROGRAM START
PWR	POWER
REC	RECEPTACLE
RMC	RIGID METAL CONDUIT
RS	RAPID START
SC	FIRE ALARM PULL STATION

FIRE ALARM PULL STATION SWITCH SWITCHBOARD TELEPHONE TERMINAL BOARD TELEPHONE TELEVISION TYPICAL VOLTS VAPOR PROOF WALL MOUNTED

WALL MOUNTED

SC

sw Swbd Ttb Tel

TV TYP

v

VP

W

WP

WIRE GUARD WEATHER PROOF TRANSFORMER WG XFMR

MOUNTING HEIGHTS <u>RECEPTACLE</u> GENERAL ABOVE COUNTER T LIGHT SWITCH

TELECOMMUNICATIO GENERAL ABOVE COUNTER TO WALL TELEVISION

<u>FIRE_ALARM</u> PULL_STATION AUDIBLE/STROBE_CO STROBE_DEVICE

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ELECTRICAL SYSTEM AND EQUIPMENT (2012 NC ENERGY CODE)
Method of Compliance:
Energy Code: 🛛 Prescriptive 🗌 Performance
ASHRAE 90.1: Prescriptive Performance
Lighting schedule lamp type required in fixture: REFER TO LIGHTING FIXTURE SCHEDULE number of lamps in fixture: REFER TO LIGHTING FIXTURE SCHEDULE ballast type used in the fixture: REFER TO LIGHTING FIXTURE SCHEDULE number of ballasts in fixture: REFER TO LIGHTING FIXTURE SCHEDULE total interior wattage per fixture: REFER TO LIGHTING FIXTURE SCHEDULE total interior wattage specified vs allowed: 3285W SPECIFIED / 4513W ALLOWED lowest source efficacy for all exterior lamps: 83.9 LUMENS/WATT Additional Prescriptive Compliance
506.2.1 More Efficient Mechanical Equipment
X 506.2.2 Reduced Lighting Power Density
506.2.4 Higher Efficiency Service Water Heating
506.2.5 On-Site Supply of Renewable Energy
506.2.6 Automatic Daylighting Control Systems
DESIGNER STATEMENT: To the best of my knowledge and belief, the design of this building complies with the electrical system and equipment requirements of the North Carolina State Building Code, NC 2012 Energy Code.
SIGNED: MILL KAJA~
INAME: MARK P. ARRINGTON

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(DISTANCE FROM FINISHED FLOOR TO CENTER OF DEVICE UNLESS OTHERWISE NOTED)

TOP	18" AFF. (UNLESS OTHERWISE NOTED) 46" AFF. (UNLESS OTHERWISE NOTED)
	46" AFF. (UNLESS OTHERWISE NOTED)
<u>DNS</u> TOP	18" AFF. (UNLESS OTHERWISE NOTED) 46" AFF. (UNLESS OTHERWISE NOTED) 46" AFF.
	18" AFF. (UNLESS OTHERWISE NOTED)
COMBINATION OR E ONLY	46" AFF. THE BOTTOM OF THE APPLIANCE SHALL BE: 80" ABOVE THE FINISHED FLOOR.

![](_page_20_Figure_18.jpeg)

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![](_page_21_Figure_0.jpeg)

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![](_page_21_Picture_2.jpeg)

NOTES: ROUTE VIA EXTERIOR LIGHTING CONTROL CABINET "ELC". REFER TO DETAIL FOR ADDITIONAL INFORMATION.

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GRAPHIC SCALE	
0 2'	۸' 8'
1/4" = 1'-0"	4 0

![](_page_21_Picture_10.jpeg)

![](_page_22_Figure_0.jpeg)

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	EQUIPMENT CONNECTION SCHEDULE											
SYM.	EQUIPMENT	LOAD	LOAD VOLT/ DISCONNECT									NOTES
			FRASE		RATING	PULES	TRIP/FUSE	ENCLU.			SIZE	
(1)	SSAH-1, SSAH-2, SSAH-3	10.8KW + 4.2FLA	208/3	NFDS	60	3		1	3#8,1#10G	FMC	3/4"	
2	SSHP-1, SSHP-3	11.6RLA+.74FLA	208/3	NFDS	30	3		3R	3#10,1#10G	LFMC	1/2"	
3	SSHP-2	14RLA+.93FLA	208/3	NFDS	30	3		3R	3#10,1#10G	LFMC	1/2"	
4	WH#1	(2)2.5KW (NON. SIM)	208/1	NFDS	30	2		1	2#12,1#12G	FMC	1/2"	
5	SCISSOR LIFT	~17A	208/3	NFDS	30	3		3R	3#10,1#10G	LFMC	1/2"	
Li I S	LEGENDDISCONNECT TYPESDISCONNECT ENCLOSURE TYPESRACEWAY TYPESCFVNR = COMBINATION FULL VOLTAGE, NONREVERSINGETCB = ELECTRONIC-TRIP CIRCUIT BREAKER1 = NEMA 1 ENCLOSUREEMT = ELECTRIC METALLIC TUBINGCONTROL DEVICESFDS = FUSIBLE DISCONNECT SWITCH3R = NEMA 3R ENCLOSUREFMC = FLEXIBLE METAL CONDUITCONTROL DEVICESMCP = MOTOR CIRCUIT PROTECTOR4 = NEMA 4 ENCLOSUREFMC = FLEXIBLE METAL CONDUITHOA = HAND-OFF-AUTONFDS = NON-FUSIBLE DISCONNECT SWITCH4X = NEMA 4X ENCLOSUREIMC = INTERMEDIATE METAL CONDUITHOA = HAND-OFF-AUTOST/DS = COMBINATION STARTER/DISCONNECT SWITCH4X = NEMA 4X ENCLOSURELFMC = LIQUID-TIGHT FLEXIBLE METAL CONDUITRPL = RED PILOT LIGHTST/DS = COMBINATION STARTER/DISCONNECT SWITCHFPN = FUSE PER NAMEPLATERMC = RIGID METAL CONDUITAUX = AUXILIARY CONTACTS (2 N.O., 1 N.C.)TMCB = THERMAL-MAGNETIC CIRCUIT BREAKERFPN = FUSE PER NAMEPLATERMC = RIGID METAL CONDUITCT50 = 50 VA CONTROL TRANSFORMERTOG = HP RATED TOGGLE SWITCHFPN = FUSE PER NAMEPLATERMC = RIGID METAL CONDUITCT50 = 50 VA CONTROL TRANSFORMER											
N A G A C E C	NOTES ALL ELECTRICAL CHARACTERISTICS SCHEDULED ABOVE ARE BASED ON INFORMATION AVAILABLE AT THE TIME OF DESIGN. ELECTRICAL CONTRACTOR SHALL VERIFY ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT WITH EQUIPMENT SUPPLIER(S) PRIOR TO ROUGHING, AND SHALL VERIFY EXACT LOCATION AND EXACT TYPE OF CONNECTION. ALL EQUIPMENT SHALL BE PROPERLY AND SECURELY GROUNDED. ANY SIGNIFICANT CHANGES IN LOCATION, ELECTRICAL REQUIREMENTS, OR TYPE OF CONNECTION REQUIRED FOR ANY EQUIPMENT SCHEDULED ABOVE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING PRIOR TO PROCEEDING. CONDUCTORS AND RACEWAY SPECIFIED IN THE ABOVE SCHEDULE ARE FOR FINAL CONNECTION TO UNIT AND SHALL BE EXTENDED FROM THE DISCONNECT SHOWN ON THE FLOOR PLANS TO THE EQUIPMENT TERMINATION BOX. CONDUIT AND BOXES REQUIRED FOR EQUIPMENT CONNECTIONS SHALL BE INSTALLED IN SUCH A WAY AS TO NOT COVER UP EQUIPMENT NAMEPLATES, SERVICE AREAS, AIR FLOW AREAS, ETC.											

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![](_page_23_Picture_0.jpeg)

![](_page_24_Figure_0.jpeg)

E4.1 / NO SCALE

PANELBOARD:	MDP				GROUN	d BUS			SC RAT	'ING:	22 KAMPS RMS SYMM.
SERVICE:	208Y/	120V 3P	H 4W						MOUNTI	NG:	SURFACE
MAINS:	400	AMP	мсв		TYPE:	DISTRIBU	JTION		ENCLOS	SURE:	NEMA 1
LOAD DESCRIPTION	WIRE	BKR	CKT			TED LOAD	) (KVA)	CKT	BKR	WIRE	LOAD DESCRIPTION
SSAH-1	8	45/3	1A	NEOT	4.1 1.8		•	2A	25/3	10	SSHP-1
	8	/	3B			4.1 1.8		4B	/	10	
	8	7	5C				4.1 1.8	6C	/	10	
SSAH-2	8	45/3	7A		4.1 2.2			8A	30/3	10	SSHP-2
	8	/	9B			4.1 2.2		10B	/	10	
	8	7	11C				4.1 2.2	120	/	10	
SSAH-3	8	45/3	13A		4.1 1.8			14A	25/3	10	SSHP-3
	8	/	15B			4.1 1.8		16B		10	
	8	/	17C				4.1 1.8	18C	/	10	
PANEL P1	1	125/3	19A	10.0	10.0 2.1			20A	30/3	10	SCISSOR LIFT
	1	/	21B	10.7		10.7 2.1		22B	/	10	
	1	/	23C	8.7			8.7 2.1	24C	/	10	
SPACE ONLY		/3	25A		0.0 1.3			26A	20/2	12	WH#1
		7	27B			0.0 1.3		28B		12	"
		/	29C				0.0 0.0	30C	/1		SPACE ONLY
SPACE ONLY		/3	31A		0.0 0.0			32A	/3		SPACE ONLY
		/	33B			0.0 0.0		34B	/		
		7	35C				0.0 0.0	36C	/		
SPD	6	60/3	37A		0.0 0.0			38A	/3		SPACE ONLY
	6	/	39B			0.0 0.0		40B			
	6	/	41C				0.0 0.0	42C			
				29.4	31.4	32.2	28.9				•
NOTES: PROVIDE WITH SERVICE EN	TRANCE L	ABEL.						LIGHT RECE MOTC HEAT KITCH CMPT OTHE TOTAI	'S PTS IRS IEN R R -	5.6 13.5 30.4 34.9 0.0 0.3 7.8 92.5	KVA KVA KVA KVA KVA KVA

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PANCLBOARD:	P1				GROUN	ID BUS			SC RAT	ING:	22 KAMPS RMS SYMM.
SERVICE:	208Y/ [.]	120V 3F	′Н 4W						MOUNTI	NG:	SURFACE
MAINS:	225	AMP	MLO		TYPE:	BRANCH	I		ENCLOS	URE:	NEMA 1
LOAD DESCRIPTION	WIRE	BKR					) (KVA)	OKT	BKR	WIRE	LOAD DESCRIPTION
πв	12	20/1	14	1.5	1.5	<mark>┼</mark> ╹┤				10	
πв	12	20/1	3B	1.3 1.5	1.3	1.5		2A	20/1	12	LTG: WURKKUUM
REC: MECH.	12	20/1	5C	1.2 0.9	├──	1.2	0.9	4B	20/1	12	LTG: WORKROOM
REC: GENERAL	12	20/1		0.8	0.7	+	0.8	6C	20/1	12	LTG: GENERAL
		20/1		0.3	0.3	$\left  \begin{array}{c} 1 \\ 1 \\ 0 \end{array} \right $		8A	20/1	12	LTG: EXTERIOR
		20/1	30	0.2		0.2		10B	20/1	12	LTG: SIGN
CEILING REC: WORKROOM	12	20/1	110	0.6 1.5			0.6 1.5	12C	20/1		FUTURE LIGHTING
CEILING REC: WORKROOM	12	20/1	13A	0.6 0.9	0.6 0.9			14A	20/1		FUTURE RECEPTACLES
CEILING REC: WORKROOM	12	20/1	15B	0.6 0.9		0.6		16B	20/1		FUTURE RECEPTACLES
REC: COLUMNS	12	20/1	17C	0.5			0.5	180	20/1		
REC: COLUMNS	12	20/1	19A	0.9	0.4	+	0.9		20/1		
REC: WORKROOM	12	20/1	21B	0.9	0.9	0.6		20a	20/1		FUTURE RECEPTACLES
REC: WORKROOM	12	20/1	23C	0.9	—	0.9	0.6	22B	20/1		FUTURE RECEPTACLES
RFC: WORKROOM	$\frac{1}{12}$	20/1	25A	0.9	0.6	+	0.9	24C	20/1		FUTURE RECEPTACLES
		20/1		0.9	0.9			26A	20/1		FUTURE RECEPTACLES
		20/1	2/0	0.8		0.0		28B	20/1		FUTURE RECEPTACLES
REC: WORKROOM	12	20/1	29C	0.6 <u>0.9</u>			0.6 0.9	30C	20/1		FUTURE RECEPTACLES
REC: SWITCHED	12	20/1	31A	0.9 0.9	0.9 0.9			32A	20/1		FUTURE RECEPTACLES
EF-1,EF-2,EF-3	12	20/1	33B	1.0 1.0		1.0		34B	20/1	12	FACP
REC: BREAK	12	20/1	35C	0.2			0.2	360	20/1		CDADE
REC: BREAK	12	20/1	37A	0.0	0.2	+	0.0	- 300	20/1		JFARE
EWC	12	20/1	39B	1.2	0.0	1.2		38A	20/1		SPARE
SPARE	┼──	20/1	41C	0.0	├──	0.0	0.0	40B	20/1		SPARE
SPARE	—	20/1	4.3A	0.0		+	0.0	42C	20/1		SPARE
	<b> </b>	20/1			0.0			44A	/3		SPACE ONLY
	$\square$	20/ 1	400	0.0	$\square$	0.0		46B			
SPARE		20/1	4/0	0.0			0.0 0.0	48C			
SPACE ONLY		/3	49A		0.0 0.0			50A	/3		SPACE ONLY
			51B			0.0		52B			
	<u> </u>		53C				0.0	540	<b></b>		
	<u> </u>	<u> </u>		30.1	10.1	1 11.6	8.4	5-0			
NOTES:								LIGHT RECE MOTO HEAT KITCH CMPT OTHE TOTAL	s Pts rs ien r r r -	5.3 13.5 2.2 0.0 0.0 0.3 8.8 30.1	KVA KVA KVA KVA KVA KVA KVA

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![](_page_24_Figure_4.jpeg)

(7)	POWER	RISER
E4.1	SCALE: NOT	TO SCALE

![](_page_24_Figure_6.jpeg)

![](_page_25_Figure_0.jpeg)

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![](_page_25_Picture_6.jpeg)

1.1 <u>SCOPE:</u>

a. Applicable requirements of the General Conditions of the Contract, Amendments, Supplementary General Conditions, and Special Conditions govern work under this Division.

b. Minor details not usually shown or specified, but necessary for the proper installation and operation, shall be included in the work, the same as if herein specified or shown.

1.2 RECORD DRAWINGS:

a. During construction of this project, the Contractor shall maintain one complete set of electrical contract drawings, on which shall be recorded all significant changes. This set of drawings shall be used for no other purpose. Upon completion of the work, the Contractor shall submit these drawings to the Architect/Engineer for approval and presentation to the Owner.

1.3 REGULATIONS AND COMPLIANCE:

a. The requirements of the North Carolina State Building Code which includes the National Electrical Code, and of all other State and Local codes, ordinances, regulations and interpretations by authorities having jurisdiction are binding upon this Contractor, and nothing contained in, or inferred by, these specifications or the applicable drawings may be construed as waiving those requirements. The latest edition of the National Electrical Code, referred to herein and on the drawings as "N.E.C.", forms a part of these specifications; and under no circumstances may the installation fail to meet the minimum requirements therein.

A. All materials and equipment shall bear the approval label, and shall be listed by the Underwriters' Laboratories, Inc.

2.1 <u>GENERAL:</u>

a. Except where reuse of existing items are specifically indicated or permitted, all materials and equipment shall be new and shall conform with the standards of the National Electrical Manufacturer's Association and Underwriters' Laboratories, Inc. in every instance where such a standard has been established for the item involved.

b. It is the intention of these specifications and drawings to call for finished work, tested and ready for operation. Whenever the work "provide" is used, it shall mean "furnish and install complete and ready for use".

3.1 COORDINATION:

a. This Contractor coordinate the work of all subs and shall furnish any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.

b. The Contractor shall furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.

3.4 PROTECTION AND CLEAN-UP:

a. Protect all material and work from damage during construction. Equipment installed in the building prior to its being closed in and dried out shall be protected from the elements in the same manner as previously specified for stored materials. Protect finished surfaces from splattering of mortar, paint, dirt, plaster, etc.. Do not install device plates, face plates, canopies, flush cabinet trims, or fixtures on walls or ceilings until after painting or cleaning of the surface has been completed, and arrange for such items that are required to be field painted to be painted before being mounted. Repair, clean and touch-up, or replace, all damaged material. At the completion of the project, remove all dust from finished surfaces, including lighting fixtures, lenses and lamps.

b. The Contractor shall keep premises free of debris resulting from his work.

3.5 PAINTING AND FINISHING:

a. Suitable finishes shall be provided on all items of electrical equipment and materials which are exposed. This shall consist of either an acceptable finish as manufactured and supplied to the job or application of suitable finishes after installation.

b. Where installed in finished areas, exposed equipment and materials shall be supplied with prime coat, and shall be professionally painted or enameled as directed to match or blend with adjacent surfaces.

c. In unfinished areas such as equipment rooms, exposed equipment shall be furnished with suitable factory applied finishes (e.g.

16030-EQUIPMENT CONNECTIONS AND COORDINATION

standard gray enamel finish for panelboards, etc.).

1.1 <u>SCOPE:</u>

a. The connection of all equipment provided under any Division of these specifications or by the owner requiring electrical connection shall be provided as part of this Division, unless otherwise indicated or specified. Special outlets, where indicated, are considered to be electrical connection to the equipment.

b. Drawings indicate approximate equipment capacity (including motor horsepower) and approximate location of connection. It is the responsibility of this Contractor to determine the exact characteristics of equipment actually being supplied; and to provide proper branch circuit connections, conductors protection, and grounding.

2.1 <u>GENERAL:</u>

a. Heating, Ventilating, Air Conditioning, Refrigeration and Plumbing Equipment: Unless otherwise indicated, provide all power wiring, including feeders and branch circuits, to the terminals of the equipment, including mounting of motor starters; feeder and branch circuit over-current protection; disconnecting means within sight of each motor and each starter, whether or not specifically indicated on drawings.

b. Individually mounted motor starters: Unless otherwise indicated, individually mounted motor starters will be furnished as part of the Division furnishing the driven equipment. Unless otherwise indicated, remote control wiring for Heating, Ventilating, Air Conditioning, and

16100-BASIC MATERIALS AND METHODS

1.1 WIRING METHOD:

a. Unless otherwise indicated or specified, the Wiring Method for this project shall consist of copper conductors with 600 volt insulation installed in metal raceways.

b. The word "Raceway" and the word "Conduit" (or abbreviation "C") used herein or on the drawings indicate Rigid Metal Conduit, and where permitted, Intermediate Metal Conduit, Electrical Metallic Tubing, Flexible Metal Conduit, or Liquidtight Flexible Metal Conduit.

c. Reference to "Rigid Conduit" or "RMC" indicates heavy-wall Rigid Metal Conduit only.

d. Reference to "IMC" indicates Intermediate Metal Conduit.

e. Reference to "EMT" or "Tubing" indicates Electrical Metallic Tubing.

Plumbing equipment will be provided as part of those respective Divisions.

f. Reference to "Flex" or "Flexible Conduit" indicates Flexible Metal Conduit, or, where required, Liquidtight Flexible Metal Conduit.

1.2 FASTENINGS METHODS:

a. Acceptable fastening methods include wood screws and nails on wood construction, toggle bolts on hollow masonry, expansion bolts and lead anchors on brick and concrete, and machine screws on metal surfaces.

b. Explosive fasteners may be used in steel and concrete in accordance with the manufacturer's recommendations.

c. Wire, perforated metal strap, and wooden plugs are not acceptable as fastening material.

d. Materials used shall be good quality, made of zinc or cadmium coated steel or other non-corroding material.

e. Materials, whether exposed or concealed, shall be firmly and adequately held in place. Fastening and support shall afford safety factor of three or higher, and shall be in full compliance with the seismic protection requirements of the N.C. State Building Code.

f. Fixtures, raceways, and equipment shall be supported from the structure. Nothing may be supported on suspended ceiling unless definitely noted so on the Drawings or specifically permitted by the Architect/Engineer.

g. Equipment and raceways attached to outside walls, or interior walls subject to permanent moisture, shall be shimmed out with non-corrodible material so as to provide 1/4" air space between wall and equipment or raceway.

1.3 NAMEPLATES

a. Suitable nameplates shall be provided for the identification of electrical equipment.

b. Nameplates shall be of engraved white core plastic laminate, not less than 1/16" thick. For 120/208 volt systems, nameplates shall have white letters on black backgrounds.

c. Engraving shall be of professional quality, with block style letters, minimum 1/4" high.

d. Nameplates shall be attached with sheet metal screws. They shall be sized to allow for installation of screws without obscuring text

16110-RACEWAYS AND FITTINGS

1.1 MATERIALS AND APPLICATIONS:

a. Rigid Metal Conduit shall be zinc coated steel or alloy 6063-T42 aluminum with threaded couplings and fittings. Termination at sheet metal enclosures shall consist of double locknuts and insulating bushings. Rigid Steel conduit shall be used for all exposed and concealed work except where other raceways are indicated or permitted. Aluminum conduit complete with aluminum fittings may be used in lieu of steel conduit except in wet locations, underground, or in poured concrete. Steel and aluminum shall not be mixed in the same run of conduit.

b. Intermediate Metal Conduit (IMC) with threaded couplings and fittings may be used for exposed and concealed work in lieu of rigid metal conduit except underground outside the building foundation, or where supporting lighting fixtures, or in hazardous locations, or where exposed to severe impact or injury. Termination at sheet metal enclosures shall consist of double locknuts and insulating bushings.

c. Electrical Metallic Tubing (EMT) of 2" maximum size may be used for concealed work in lieu of Rigid Metal Conduit except

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d. Flexible Metal Conduit shall be of zinc coated steel of minimum length, and shall be used in lieu of Rigid Metal Conduit for connections to moving or vibrating apparatus, recessed lighting fixtures, dry-type transformers, and motors. Flexible Metal Conduit may be used where rigid connections are impractical due to obstructions or space limitations. Flexible Metal Conduit used in wet, damp, or corrosive location shall be PVC jacketed liquid-tight complete with liquid-tight connectors.

e. Fittings for steel conduit and tubing shall be of zinc coated steel or malleable iron. Insulating bushings of plastic provided for Rigid and Intermediate Metal Conduits shall be rated for 150oC. Bonding bushings shall be steel or malleable iron with non-removable plastic throats rated 150oC. EMT fittings shall be of the compression type. Set-screw, indentor, pressure cast, and die cast fittings are not acceptable. Connectors for EMT, Flexible Metal Conduit and Liquid-tight Flexible Metal Conduit shall be the insulated throat type. Connectors for Flexible Metal Conduits shall be of the "Tite-Bite" design.

f. Conduit expansion fittings shall be of zinc coated cast or malleable iron and steel conduit, complete with flexible bonding straps. Expansion fittings shall allow longitudinal conduit movement of 4 inches.

g. Minimum raceway size shall be 1/2". Other raceway sizes, unless indicated on the drawings, shall be determined by the Contractor in accordance with NEC requirements for type THW insulated conductors, or the actual insulation used if it is thicker than type THW.

2.1 INSTALLATION:

threaded conduit hubs of zinc coated malleable iron.

b. Conduits shall be rigidly supported not more than 8 feet on center and shall be concealed within walls, ceilings, and floors, except as indicated or specifically approved by the Architect/Engineer; kept at least 6" from flues and steam or hot water pipes; and protected against the entry of dirt, plaster, or trash. Raceways shall be supported independently of suspended ceiling members and suspension wires.

connectors.

d. Exposed conduits, where permitted, shall be run parallel or perpendicular to walls, structural members and ceilings; with right-angle turns consisting of symmetrical bends or cast metal fittings with threaded hubs. Offsets may be used where necessary provided that they are of minimum length.

e. Conduits crossing expansion and contraction joints shall cross perpendicular to the joint and shall be provided with expansion fittings. Conduits shall not be embedded in the concrete slabs at the expansion and contraction joints.

16120-CONDUCTORS

1.1 MATERIALS

b. Conductors shall be not smaller than #12 AWG except that #10 AWG minimum is required for the entire length of 120 volt branch circuits whose distance to the center of the load exceeds 75 feet. #14 AWG may be used for signal and remote control circuits. #16 AWG may be used for taps to individual recessed lighting fixtures on circuits protected by over-current devices rated at 20 amperes or less and contained within flexible metal conduits that do not exceed 6 feet in length. Other conductors smaller than #14 AWG may be used only where specifically indicated on the drawings or specified herein.

. Conductors in any location subject to abnormal temperature shall be furnished with an insulation type suitable for temperature

encountered.

smaller than #12 AWG.

a. Splices in conductors #10 AWG and smaller shall be made with twist-on spring steel devices UL listed as Pressure Cable Connectors, with integral insulating covers rated 75oC. at 600 volts.

b. Splices in copper conductors #8 AWG and larger shall be made with mechanical devices UL listed as Pressure Cable Connectors and insulated with thermoplastic tape UL listed for use as sole insulation. Tape may be omitted from connectors supplied with securely fastened insulating covers which completely enclose the connector and the conductors. Insulating covers shall be rated 75oC at 600 volts.

2.2 COLOR CODING:

White (Neutral).

All wiring shall be color coded.

c. Conductors #8 AWG and larger may be identified with two or more bands of proper color plastic tape applied near each splice and termination. Painting of wire will not be acceptable.

2.3 BRANCH CIRCUIT RACEWAY WIRING:

where required.

b. A neutral shall not serve more than one circuit. The neutral carrying all or any part of the current of any specific load shall be contained in the same raceway or enclosure with the phase wire or wires also carrying that current.

d. Under the above requirements and with required color coding system no raceway shall contain more than one wire of the same color, except for switch legs and control conduits.

e. Conductors supplying lighting outlets may be combined in the same raceways with conductors supplying receptacles; but lighting outlets and receptacle outlets shall not be connected to the same circuits unless specifically indicated on the drawings.

be provided with suitable tags indicating the conductor size and insulation.

1.1 <u>SCOPE:</u>

b. Types AC cable is not permitted.

1.2 APPLICATIONS:

within stud partitions.

1.3 SUBMITTALS:

2.1 MATERIALS:

3.1 INSTALLATION:

tops and ceilings.

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AWG.

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a. Rigid and Intermediate Metal Conduits shall be made up with full threads, to which a conductive pipe compound (T & B Kopr-Shield or equal) has been applied, and butted in coupling. Terminations at sheet metal enclosures in indoor dry locations shall be made with double locknuts and an insulating bushing. Terminations at sheet metal enclosures in outdoor, damp, and wet locations shall be made with

c. Suspended EMT shall be provided with additional hangers at elbows and bends, and where necessary to avoid strain at couplings and

a. Unless otherwise indicated, all wire and cable conductors shall be copper.

c. Conductors #10 AWG and smaller shall be solid, dual rated type THWN/THHN.

Conductors #8 AWG and larger shall be stranded, dual rated type THWN\THHN.

e. Each conductor shall bear easily readable markings along entire length, indicating size and insulation type.

f. Insulation on conductors #10 AWG and smaller shall be suitably colored in manufacture.

h. Where no indication is made of wire size, the conductor shall be of N.E.C. size to match its overcurrent protective device, but in no case

### 2.1 SPLICES, TAPS, AND CONNECTIONS:

b. On 120/208V, 3 phase, 4 wire power systems, conductors shall be color coded Black (Phase A), Red (Phase B), Blue (Phase C), and

d. Phase sequence shall be "A", "B" and "C" from left to right, top to bottom or front to back when facing equipment.

a. Three-phase circuits shall be limited to one such circuit per raceway. They shall consist of three different phase wires, and a neutral

c. Circuits shall be connected to panels as shown in the panel schedules.

### 2.4 FEEDER CONDUCTORS:

a. Unless specifically shown otherwise, each set of feeder conductors shall be installed in a separate raceway.

b. Where paralleling of conductors is shown for feeders, it is absolutely required they be exactly the same length between terminations.

c. Where feeder conductors are so installed that the conductor markings cannot be read without moving or twisting conductors, they shall

16122-METAL-CLAD CABLE SYSTEMS

a. Furnish and install a complete system of Metal-Clad Cable for branch circuit, signal, and remote control wiring as specified herein. Comply with Section 16100 BASIC MATERIALS AND METHODS.

a. Metal-Clad Cables may be used in lieu of wire in metal raceway only for concealed work in dry locations above suspended ceilings and

b. Cables may not be run in, or through, concrete or masonry, fire-rated partitions, smoke partitions, or floors.

a. Submit for approval manufacturer's data sheets for metal-clad cable systems.

a. Metal-Clad Cables shall be UL listed as type MC with copper conductors, THHN insulated; with full size green insulated grounding conductors. Minimum sizes shall be #12 AWG for branch circuits, #14 AWG for signal and remote control. Maximum size shall be #10

b. Cable connectors shall be UL listed for grounding the metal sheath. Connectors shall be of steel or malleable iron with insulated throats. c. Cables shall be color-coded in manufacture. Color-code shall comply with Section 16120 CONDUCTORS.

a. Cables shall not be run exposed. Conduit skirts may be provided on surface mounted panelboards to conceal cables between panel

b. Except where installed in continuous rows, lighting fixtures shall be individually connected to a concealed outlet box. Cables may not be

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looped from fixture to fixture.

c. Cables above ceilings shall be supported from overhead structure clear of ductwork, suspended ceilings, and ceiling hanger wires.

16130-GROUNDING AND BONDING

### 1.1 <u>SCOPE:</u>

a. The neutral of each separately derived system, and all non-current-carrying metal parts, raceways, and enclosures shall be permanently and effectively grounded.

b. Grounding and bonding shall be provided in strict accordance with the National Electrical Code, and as specified herein and on the drawings.

c. The Contractor shall note that required grounding conductors and connections are not all shown on the drawings. NEC requirements apply.

2.1 MATERIALS AND APPLICATIONS:

a. Grounding conductors shall be of THWN insulated copper, unless otherwise indicated.

b. Grounding bus bars in distribution equipment shall be bare copper.

c. Clamps for attaching conductors to water pipes and ground rods shall be of bronze. Ground rod clamps shall be U.L. listed for direct burial

d. Clamps for attaching conductors to building steel shall be of steel, bronze, or malleable iron. e. Threaded hubs for bonding metal raceways to the contained grounding electrode conductors and to the water pipe clamps shall be of bronze or malleable iron. Similar hubs shall be used to bond the same raceways to the conductors and to sheet metal equipment

enclosures.

indicated.

g. Bonding bushings shall be of steel or malleable iron with non-removable plastic throats rated 1500C.

h. Bonding locknuts and wedges for service conduits shall be of zinc coated steel.

3.1 EQUIPMENT GROUNDING:

a. All non-current-carrying metal parts, raceways, and enclosures of the electrical system and of equipment supplied through the electrical system shall be permanently and effectively grounded.

b. Equipment grounding conductors shall be provided for each feeder and for each branch circuit and shall be contained within the same raceways as the feeder and branch circuit conductors. The equipment grounding conductor shall be THWN insulated copper, not smaller than #12 AWG.

c. Copper bonding strips normally included in small sizes of liquid-tight flexible metal conduit and dependent upon the terminal connectors for bonding continuity will not be accepted in lieu of the equipment grounding conductors specified herein.

d. Where metal raceways enter sheet metal enclosures through knockouts provide bonding bushings and jumpers to the enclosure under

1. Branch circuit conduit exceeds 1" in size.

any of the following conditions:

2. Feeder conduit regardless of size.

<u>16140-BOXES</u>

1.1 MATERIALS AND APPLICATIONS:

a. Unless specifically noted or approved otherwise, boxes shall be of zinc coated steel or cast ferrous alloy as manufactured by Steel City, Raco, Crouse-Hinds, Appleton, or approved equal.

b. Unless otherwise indicated, for exposed work on the interior of the building boxes shall be of cast metal with threaded conduit hubs and gasketed covers; or of zinc coated sheet steel of NEC gauge and size with screw fastened gasketed covers and threaded conduits hubs of zinc coated malleable iron and no knockouts or extraneous openings. Cover screws shall be stainless steel.

c. For exposed work Equipment Rooms; or, in other dry areas, 8 feet or more above a floor or platform, boxes 5" square and larger shall be NEC gauge and size of zinc coated sheet steel. 4" octagonal, 4" square and 4-11/16" square "knockout" boxes shall be of zinc coated steel, NEC gauge and size. Box extensions are not permitted on exposed "knockout" boxes, and covers shall be of the raised surface type. "Handy" boxes are not permitted.

16150-WIRING DEVICES

1.1 MANUFACTURERS

a. Wiring devices and device plates shall be manufactured by General Electric, Hubbell, Bryant, Arrow Hart, Pass and Seymour, Leviton or Eagle.

1.2 DEVICES AND PLATES - GENERAL:

a. Unless otherwise indicated or directed, devices shall be gray in color.

b. Unless otherwise indicated, plates for flush outlets shall be of #302 stainless steel. Those for surface cast boxes shall be of steel, of shape and finish to match the box. Screws shall be steel to match the plate.

c. Each device (including each switch) shall be equipped with a Hex-Head green grounding screw for grounding the device and plate to the outlet box and to the equipment grounding conductor run with the circuit conductors. "Self-Grounding" type mounting screws will not be accepted as the device grounding method.

1.3 SWITCHES:

a. Switches used for lighting control shall be rated 20 amps, 120-277 VAC, side wired, Pass and Seymour 521-G series.

b. Switches used for disconnecting small single-phase motors and appliances shall be rated 20 or 30 amps to match the branch circuit rating and comply with their horsepower ratings, 120-277 VAC, side wired, Pass and Seymour 521-G series and 30 ACI series.

1.4 RECEPTACLES:

a. Unless otherwise indicated or required, receptacles shall be the duplex type, side and back wired, with nylon face. On circuits supplying two or more such receptacles, they shall be rated 15 amps, 125 volts, NEMA 5-15R. Duplex receptacles on individual circuits shall be rated 20 amps, 125 volts, NEMA 5-20R.

b. Where no other features are indicated on the drawings provide Hubbell 5262 and 5362 series for 5-15R and 5-20R respectively. c. Where indicated on the drawings provide Ground Fault Circuit Interrupter receptacles, Hubbell GF5262 and GF5362 series for 5-15R

and 5-20R respectively.

16160-RACEWAY AND OUTLET SYSTEMS

## 1.1 <u>SCOPE:</u>

a. Contractor shall furnish and install systems of raceways, outlet boxes, equipment boards, and cabinets, as indicated on the drawings and as herein specified to accommodate the installation by others of wiring and equipment.

## 2.1 MATERIALS:

a. Raceways, and boxes, shall be in compliance with the relevant sections of these specifications.

b. Wall outlets shall consist of standard 4" x 4" x 2-1/2" outlet boxes with single device rings. Trim plates shall be blank to match wiring device trim plates, unless otherwise indicated.

c. Special outlets including floor outlets shall be as noted on the drawings.

d. Equipment boards shall be of size noted or shown on the drawings, and shall be constructed of 3/4" plywood, with finish grade on front. Paint board with gray fire-retardant paint.

3.1 COORDINATION:

a. Contractor shall fully coordinate with the telephone and system installer, and shall install service entrance raceways, backboards, and grounding conductors in accordance with their requirements.

b. Contractor shall fully coordinate with other installers of wiring and equipment and shall install raceways, outlets, cabinets, and backboards in accordance with their requirements.

3.2 INSTALLATION:

a. Install pull boxes as necessary to limit runs between pull points to two 90 degree bends (or equivalent) and to 100 feet in length, unless other arrangements are approved by the wiring installers.

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f. Driven grounding electrodes shall consist of copper clad steel rods. Rods shall be 8 feet long and 5/8" diameter unless otherwise

b. Leave all raceways with 100 lb. test nylon pull cord.

704/527-2112 c. Install raceways and boxes in accordance with relevant sections of these specifications.

Charlotte, NC

d. Unless specifically noted otherwise, provide an individual 1" conduit from each indicated outlet to the nearest cable tray, equipment cable tray, cabinet or terminal board for the system involved.

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e. Provide all conduits not terminating on boxes with plastic bushings.

f. At the equipment terminal board, terminate all conduits with plastic bushings.

16190-MISCELLANEOUS MATERIALS

2.1 TIME SWITCHES:

a. Time switches for the control of tungsten-lamps loads, fluorescent -lamp loads, resistive heating loads, motors and magnetically operated devices shall consist of a digital programmable timer and switch assembly in a suitable enclosure, as indicated and herein specified.

b. Timer shall operate from either 120, 208, 240 or 277.

c. Battery reserve power shall be provided which will automatically operate the timer in case of electric power failure for a period of not less than 30 days.

d. The switch mechanism shall include a heavy-duty, general purpose, precision snap-action switch. Provision shall be made for manual "OFF" and "ON" operation of the switch.

e. Time switches shall be manufactured by Tork, Sangamo, General Electric, or approved equal.

2.2 TIME SWITCH AND PHOTOCELL CONTROL DEVICES:

a. Time Switch/Photo Control: 7 day calendar dial type, with 16 hour reserve power, Tork 7200ZL, mounted in general purpose NEMA Type 1 enclosure.

b. Photocell control devices for control of outdoor fixtures and natural daylight utilization for indoor spaces shall be fixture mounted or individually mounted as indicated on drawings, or otherwise specified.

c. Fixture mounted photocell control devices shall include a snap-action switch with a rating of not less than 1000 watts incandescent load and 1200 volt-amp reactive or HID load at rated voltage and frequency. Device also shall have an inherent time delay in excess of 5 seconds, built-in surge protection, and the appropriate lock type receptacle base. The device shall be enclosed in a weatherproof enclosure. Device rating shall be 120 or 277 volts, as applicable, 60 hertz. The device shall be factory preset to turn "ON" lights at approximately 3 foot-candles with a ratio of "ON" to "OFF" of about 1 to 2.

d. Individually mounted photo control devices shall have the same characteristics as fixture mounted devices, except that they shall be field adjustable for "ON" "OFF" operation from 2 to 50 foot-candles, have a capacity of up to 2000 watts of incandescent load, be outlet box mounted, and not require surge protection.

e. Flush mounted in weatherproof stainless steel cover with full neoprene gasket, Tork Model #3010. Outlet box: Flush mounted on exterior of building sized 2 1/2" x 4 1/4" of weatherproof construction.

2.3 PROGRAMMABLE LIGHT SWITCHES:

a. The digital time switch shall be programmable to turn lights off after a preset time.

b. Time switch shall be a completely self-contained control system. It shall have a ground wire and ground strap for safety. Switching mechanism shall be a latching air gap relay.

c. Time switch shall be compatible with all electronic ballasts, motor loads, compact fluorescent and inductive loads.

d. Time switch shall operate at universal voltages of 100-300 VAC; 50/60 Hz.

e. Time switch shall have no minimum load requirement and shall be capable of controlling 0 to 800 watt incandescent, fluorescent @ 100/120 VAC, 50/60 Hz; 0 to 1200 watts fluorescent @ 230/277 VAC, 50/60 Hz; 1/6 hp @ 125 VAC.

f. Time scroll feature shall allow manual overriding of the preset time-out period.

g. Time switch shall have the option for a one second light flash warning at five minutes before the timer runs out and twice when the countdown reaches one minute (when used to control lighting loads).

h. Time switch shall have the option for a beep warning that shall sound every five seconds once the time switch countdown reaches one minute.

i. Time switch shall have manual feature for timer reset where pressing the ON/OFF switch for more than 2 seconds resets the timer to the programmed time-out period.

Time switch shall have an electroluminescent backlit Liquid Crystal Display that shows the timer's countdown.

k. Time-out period shall be adjustable increments of 5 minutes from 5 minutes to 1 hour, and in increments of 15 minutes from 1 hour to 12 hours

I. Time switch shall be capable of operating as an ON/OFF switch.

m. The time switch shall have a 100% OFF override switch with no leakage current to the load.

n. In the event there is an open circuit in the AC line such as a ballast or lamp failure, the time switch shall automatically switch to OFF

o. Time switch shall have 5 year warranty and shall be UL and CUL listed.

2.4 OCCUPANCY SENSORS:

A. Provide ceiling mounted, 360 degree, dual technology occupancy sensor with the following features. 1. The Dual Technology sensor shall be capable of detecting presence in the control area by detecting doppler shifts in transmitted ultrasound and passive infrared heat changes.

2. Sensor shall utilize Dual Sensing Verification Principle for coordination between ultrasonic and PIR technologies. Detection verification of both technologies must occur in order to activate lighting systems. Upon verification, detection by either shall hold lighting on.

3. Sensor shall have a retrigger feature in which detection by either technology shall retrigger the lighting system on within 5 seconds of being switched off.

4. Ultrasonic sensing shall be volumetric in coverage with a frequency of 40 KHz. It shall utilize Advanced Signal Processing that automatically adjusts the detection threshold dynamically to compensate for changing levels of activity and airflow throughout controlled space.

5. The PIR technology shall utilize a temperature compensated, dual element sensor and a multi-element Fresnel lens. The lens shall be Poly IR4 material to offer superior performance in the infrared wavelengths and filter short wavelength IR, such as those emitted by the sun and other visible light sources. The lens shall have grooves facing in to avoid dust and residue build up which affects IR reception.

6. Each sensing technology shall have an LED indicator that remains active at all times in order to verify detection within the area to be controlled. The LED can be disabled for applications that require less sensor visibility.

7. Sensor shall be manufactured by an ISO 9002 certified manufacturing facility and shall have a defect rate of less than 1/3 of 1%. Sensors shall have standard 5 year warranty and shall be UL and CUL listed.

8. Basis of Design: Wattstopper #DT-305. Substitutions permitted.

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16400-SECONDARY DISTRIBUTION EQUIPMENT

1.1 OVERCURRENT PROTECTION DEVICES:

a. Unless otherwise indicated, circuit breakers shall be provided as the over-current protection devices for services, separately derived systems, feeders, and branch circuits. Fuses may be used only where indicated on the drawings, or required by the nameplate for equipment connected, or specified herein.

b. Molded-case and insulated-case circuit breakers shall be the static or thermal-magnetic type, quick-make and quick-break for manual and automatic operation. Multi-pole breakers shall be common trip. Circuit breakers shall be bolted in place where possible. Thermal-magnetic breakers shall be calibrated at 40oC. or ambient compensated. Ampere ratings, frame sizes, and short circuit ratings shall be as indicated on the drawings. Series ratings may be applied only where specifically indicated on the drawings. Individual enclosures shall be NEMA 1 indoors, 3R outdoors, unless otherwise indicated. Other circuit breakers shall be suitable for installation in Panelboards as here-in-after specified.

c. Single-pole 15 and 20 amp circuit breakers shall be SWD rated.

d. Fuses shall be the non-renewable, time delay, cartridge type, UL Class RK5 unless otherwise indicated; for installation in Safety Switches.

1.2 SWITCHING EQUIPMENT

a. Fusible switches shall be incorporated into Safety Switches, as hereinafter specified. Manual operation shall be quick-make and quick-break. Fuse holders shall be the Class R rejection type unless otherwise indicated.

b. Safety Switches shall be the NEMA heavy duty type, horsepower rated, with interlocked covers, non-fusible except where fused switches are indicated or fuses are required. Switch mechanisms shall be quick-make and quick-break. Enclosures shall be NEMA 1 indoors, NEMA 3R outdoors unless otherwise indicated. Fuse holders, where required, shall be as specified above for fusible switches.

c. Switches for disconnecting small single-phase motors and appliances shall comply with <u>SECTION 16150 WIRING DEVICES</u>.

2.1 INSTALLATION:

a. Distribution Equipment shall be installed in strict accordance with the manufacturer's instructions for handling, support, connections, assembly, protection, energization, adjustment, and similar procedures.

b. Fastening methods shall comply with <u>SECTION 16100 BASIC MATERIALS AND METHODS</u>.

c. Floor mounted equipment such as Transformers shall be provided with 4" high concrete pads and shall be secured to the concrete pad. Pads shall have a 3/4 inch chamber on each accessible side.

d. Equipment interiors shall be thoroughly cleaned of dust, dirt, trash, and other foreign material prior to energization of the equipment.

e. Upon completion or the project, furnish to the Owner one complete set of replacement fuses, consisting of three fuses of each type and rating

f. Directory cards for Panelboards shall be neatly filled-in with a typewriter to indicate the type and location of the load on each circuit or feeder.

16401 - SURGE PROTECTION DEVICE SYSTEM

1.1 SCOPE:

a. These specifications describe the electrical and mechanical requirements for a high energy Surge Protection Device System (SPD). The specified system shall provide effective high energy surge current diversion, sine wave tracking as required for electrical line noise filtering and be suitable for application in ANSI/IEEE C62.41 Category A, B, and C environments, as tested by ANSI/IEEE C62.11, C62.45 and MIL STD 220A. The system shall be connected in parallel with the protected system; no series connected elements shall be used which limit load current or kVA capability.

1.2 SYSTEM DESCRIPTION:

a. Operating Temperature range shall be _40 to +50 C (_40 to +122 F)

b. Operation shall be reliable in an environment with 0% to 95% non condensing relative humidity.

c. The SPD maximum continuous operating voltage shall be greater than 115% of the nominal system operating voltage to ensure the ability of the system to withstand temporary RMS overvoltage (swell) conditions.

d. Protection Modes

- 1. All Modes. L N, L L, L G, (N G where applicable)
- Note: L = Line, N = Neutral, G = Ground

e. The SPD shall have a minimum UL 1449 3rd Edition Nominal Discharge Current Rating (In) of 10,000 Amps. When used in conjunction with a UL 96A certified Lightning Protection System the (In) rating shall be 20,000

f. UL 1449 3rd Edition Listed, bearing the official UL 3rd Edition gold hologram label.

g. UL 1283 5th Edition Listed.

h. The Surge Protective Device (SPD) shall be a stand alone configuration. Systems that must be integral to the switchgear will not be considered.

i. All SPD systems shall be permanently connected, parallel designs. Series suppression elements shall not be acceptable.

. The SPD shall be marked with a Short Circuit Current Rating (SCCR) and shall not be installed at a point on the system where the available fault current is in excess of that rating per the National Electric Code, Article 285, Section 6.

k. SPD designs that limit the 100% rated surge protection shall not be acceptable.

Hybrid design utilizing:

1. Thermally Protected Metal Oxide Varistors

Filter capacitors to suppress EMI/RFI electrical noise.

1.3 DOCUMENTATION:

a. Electrical and mechanical drawings shall be provided by the manufacturer which show unit dimensions, weights, component and connection locations, mounting provisions, connection details and wiring diagram.

b. Documentation of specified system's UL 1449 3rd Edition Listing and voltage protection ratings of all protection modes shall be included as required product data submittal information.

c. The manufacturer shall provide a full five year warranty from date of shipment against any part failure when installed in compliance with manufacturer's written instructions, UL listing requirements, and any applicable national or local electrical codes. Manufacturer shall make available local field engineering service support. Where direct factory employed service engineers are not locally available, travel time from the factory or nearest dispatch center shall be stated.

2.1 NON-MODULAR SURGE PROTECTION FOR DISTRIBUTON, SUB-DISTRIBUTION AND BRANCH CIRCUIT PANELS (LOWER AMPACITY, 15A TO 800A, APPLICATIONS):

a. The SPD surge current ratings shall be based on the electrical system ampacity listed in the table below.

Electrical System

15-100A

Ampacity @ SPD Install Po	oint Su	Surge Protection	
	Per Mode	;	Per Phase
400 - 800A	150		300
125 - 225A	100		200

50

100

b. The SPD shall be rated for 480/277Vac 3 Phase, 4 Wire + Ground, Wye or 208/120Vac 3 Phase, 4 Wire + Ground, Wye, as required.

c. All non-modular units shall be factory wired using color coded #10AWG Rope Lay ultra-low resistance wire (with 413 strands/36AWG, seven (7) groups of 59 strands each): two feet (2') for each phase conductor and three feet (3') for Neutral and Ground conductors to be fed by 30 Amp circuit breaker.

d. Voltage Protection Ratings: The let-through voltage test results used to obtain the UL 1449 3rd Edition Voltage Performance Ratings "VPR" (6kV, 3000 Amps, 8/20µs waveform) shall not exceed the UL assigned values listed below.

Voltage Protection Ratings (VPR) 6kV, 3000A, 8/20µs Waveform Voltage Rating @ 208/120V Line to Neutral 700 700\ Line to Ground 800\ Neutral to Ground 1000V Line to Line

3.1 INSTALLATION:

a. The installing contractor shall connect the SPD in parallel to the power source, keeping conductors as short and straight as practically possible. The contractor shall twist the SPD input conductors together to reduce input conductor impedance.

b. A modular SPD shall be close nippled to the distribution panel and shall be supplied by a 60 Amp

4. Maximum inrush current of 2 amperes for 120V and 277V drives.

1.2 SUBMITTALS:

charge.

drawings.

PART 1: GENERAL

1.1 <u>SCOPE:</u>

c. Submit for approval Lighting Fixture samples as requested by the Architect/Engineer. Samples shall be equipped with lamps, cords, plugs, and

ballasts for 120 volt operation.

PART 2: PRODUCTS

2.1 LIGHTING FIXTURES

a. All fixtures shall be labeled by Underwriters' Laboratories, Inc.

b. Fixture designations on the drawings generally consist of a letter indicating the fixture type. Fixture types are identified in the Lighting Fixture Schedule or Symbol Schedule, however, the Schedule does not necessarily list all accessories and hardware necessary for the complete installation, nor does it detail the construction to be encountered at the fixture locations. It is the Contractor's responsibility to properly determine and provide correct components, accessories, and hardware required for the installation.

c. Pendant Fixtures shall be equipped with swivel hangers; twin stem for individual fluorescent fixtures and single stem for continuous row fluorescent fixtures, spaced according to the manufacturer's recommendations but not less than one per fixture unit plus one per row.

d. Recessed fixtures in plaster and gypsum board ceilings shall be equipped with plaster frames. In other ceilings they shall be equipped with plaster frames and/or other devices as approved by the Architect/Engineer, to facilitate removal of fixture and access to the concealed junction box.

e. Plastic materials indicated to be "acrylic" shall be of 100% virgin methyl methacrylate produced by Rohm and Haas, Dupont, or Cyanamid. f. Eight-foot chassis with lamps in tandem may be used in lieu of four-foot fluorescent units in continuous rows, except where recessed into ceiling construction which incorporates exposed support members at four-foot intervals.

2.2 <u>LED DRIVES</u>

a. General.

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fully-loaded conditions and under maximum case temperature.

c. A non-modular SPD shall be close nippled to the panelboard and shall be supplied by a 30 Amp

a. Submit for approval panelboard shop drawings which include as a minimum the following information:

Circuit breaker arrangement.

distribution cabinet.)

16420-PANELBOARDS

1.1 SUBMITTALS:

1. Cabinet dimensions.

2. Mounting requirements.

Bussing arrangement.

removable blank covers.

be bonded to enclosure.

connected to the phases as shown.

Accessories.

circuit breaker.

2.1 BRANCH CIRCUIT PANELBOARDS:

a. Equipment shall be built to NEMA Standard PB-1, UL Standards UL50 and UL67, and NEC requirements.

b. Panelboard backboxes shall be constructed of galvanized sheet steel and shall be securely fabricated with screws, bolts, rivets, or by welding. Backboxes shall be a minimum 20" wide and 5-3/4" deep, unless noted otherwise, and heights shall not exceed 72" overall. Top or bottom gutter space shall be increased 6" where feeder loops through panel. End plates shall be supplied without knockouts.

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c. Covers shall be constructed of high grade flat sheet steel with:

1. Door-in-door construction shall be provided. The inside hinge door shall allow access to device handles only. Door shall close flush with cover and against a full inside trim stop. Hinges shall be inside type. The outer hinged door shall allow access to wiring gutter.

A flush latch and tumbler type lock, so panel door may be held closed without being locked. All such locks shall be keyed alike. Furnish to the Owner two keys with each lock, or a total of 10 keys for the project. Four or more cover fasteners of a type which will permit mounting plumb on box. Cover shall also have inside support studs to rest on lower edge of backbox while being fastened. For flush mounted panelboards, cover fastening hardware shall be concealed behind the hinged door.

d. Panelboard phase and neutral bus buswork shall be of copper. A copper ground bus shall be provided in each panel.

e. Minimum short circuit rating of any panelboard assembly shall be 10,000A. Furnish panelboards with higher rating where so noted or where evidently intended by specification of circuit breakers with higher interrupting capacity.

f. Ampacity of mains shall be equal to, or greater than, the ampacity of the feeder unless otherwise indicated.

g. Where drawings schedules indicate spaces for addition of future circuit breakers, furnish all necessary buswork, strap, brackets, hardware, and

h. Breakers in panelboards shall be physically arranged in locations shown in panel schedules on the drawings where possible. They shall be

i. Unless otherwise indicated and where available for the panelboard type specified, circuit breakers shall be of the bolt-on type.

2.2 <u>DISTRIBUTION PANELBOARDS</u>

a. Panelboards required to have two or more subfeed breakers rated 100 amperes or greater shall be Distribution Type.

b. Description: NEMA PB 1, circuit breaker type.

c. Panelboard Bus: Copper. One continuous fully rated bus bar per phase with ratings as indicated. Provide copper ground bus and aluminum neutral in each panelboard equipped with lugs to accommodate all conductors to be connected. Unless otherwise noted, neutral bus shall be sized 100% of phase bus rating and the ground bus shall be sized a minimum of 25% of the phase bus rating. Where more than one ground bar is furnished, each ground bar will be interconnected with a conductor sized not less than the panelboard feeder ground conductor. Ground bar shall

d. Interior trim shall be dead front construction. Main lugs shall be mounted in the mains compartment.

e. Main circuit breaker and main lug interiors shall be field convertible for top or bottom incoming feed.

f. Enclosure: NEMA PB 1, Type 1 unless otherwise indicated on drawings. In compliance with UL 50.

1. Panelboard backbox shall be constructed without pre-punched knockouts.

2. Cabinet front shall be a four piece surface trim for surface mount standard. Where specifically indicated on the drawings, either a single hinged door or door-in-door construction shall be provided. For door-in-door construction, the inner hinged door shall allow access to the device handles only and the outer hinged door shall allow access to wiring gutter.

3. Enclosure and front shall be either galvanized steel or stainless steel and shall be finished in manufacturer's standard gray enamel.

4. The enclosure shall be minimum 26 inches wide.

g. Minimum fully rated short circuit rating: RMS symmetrical amperage shall be minimum 22,000 amperes unless otherwise indicated on

h. Molded Case Circuit Breakers: NEMA AB 1, UL 489 listed circuit breakers.

16500-LIGHTING FIXTURES AND ACCESSORIES

a. The Contractor shall furnish and completely install Lighting Fixtures and Accessories as indicated on the drawings and as herein specified.

b. All fixtures shall be equipped with lamps.

c. A lighting fixture shall be provided for each lighting outlet indicated. Outlets lacking fixture designations shall be brought to the attention of the Architect/Engineer before submitting proposal; otherwise units selected by the Architect/Engineer shall be furnished and installed at no additional

a. Submit for approval complete manufacturer's data sheets for all fixtures. Indicate all components, characteristics, and options.

b. Submit for approval manufacturer's data sheets for all lamps to be furnished.

1. Ten-year operational life while operating at maximum case temperature and 90 percent non-condensing relative humidity. 2. Designed and tested to withstand electrostatic discharges up to 15,000 V without impairment per IEC801-2. 3. Electrolytic capacitors to operate at least 20 degrees C below the capacitor's maximum temperature rating when the driver is under

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Withstand up to a 4,000 volt surge without impairment of performance as defined by ANSI C62.41 Category A Manufactured in a facility that employ ESD reduction practices in compliance with ANSI/ESD S20.20.

7. Class A Sound Rating - Inaudible in a 27 dBA ambient. 8. No visible change in light output with a variation of plus/minus 10 percent line voltage input. 9. Total Harmonic Distortion less than 20 percent and meet ANSI C82.11 maximum allowable THD requirements.

10. Drives to track evenly across: (a) Multiple fixtures.

(b) All light levels.

11. Constant current drives must provide models to:

(a) Support from 200mA to 2.1 Amps (in 10mA steps) to ensure a compatible driver exists. (b) Support LED arrays up to 40W or 50W (710mA to 1.05A in 10mA steps).

12. Constant voltage drives must provide models to: (a) Support from 10V to 40V (in 0.5V steps) to ensure a compatible driver exists.

(b) Support LED arrays up to 40W.

13. Configuration tool must be available to optimize the following for LED fixtures:

(a) Light level. (b) Efficacy.

(c) Thermal performance.

14. Driver must be capable of operating from a supply voltage of 120 through 277VAC at 60Hz for digitally addressable and 3-wire models.

b. 3-Wire Control.

1. Continuous dimming from 100 percent to 1 percent relative light output. 2. Provide integral fault protection to prevent driver failure in the event of an input mis-wire.

d. Forward Phase Control (Neutral Wire Required).

Continuous dimming from 100 percent to 1 percent relative light output.

2.3 LED 0-10V DIMMING DRIVERS

a. Physical Characteristics.

1. LED Driver shall be installed inside an electrical enclosure. 2. Wiring inside electrical enclosure shall comply with 600V/105°C rating or higher.

b. Performance.

1. LED Driver is certified by UL Class 2 for use in a dry or damp location.

2. Led Driver has Class A sound rating.

3. LED Driver has a minimum operating ambient temperature of -40°C.

LED Driver has a life expectancy of 50,000 hours at Tcase of ≤70°C.

5. LED Driver has a lilfe expectancy of 100,000 hours at Tcase of ≤62°C.

6. LED Driver has a maximum self rise of 25°C in open air without heat sink.

 LED Driver maximum allowable case temperature is 75°C - see product label for measurement location. 8. LED Driver reduces output power to LEDs if maximum allowable case temperature is exceeded.

9. LED Driver has a failure rat ≤ 0.01% per 1,000 hours at Tcase≤ 70°C.

10. LED Driver has a failure rate of 0.01% - 0.02% per 1,000 hours at Tcase of 70°C - 80°C. 11. LED Driver tolerates sustained open circuit and short circuit output conditions without damage. 12. LED Driver complies with FCC rules and regulations, as per Title 47 CFR Part 15 Non-Consumer (Class A).

c. UL Conditions of Acceptability

1. The maximum available output parameters of the driver met the Class 2 Inherently limited parameters. The Driver is suitable for use in "Dry" and "Damp" locations. When the driver is installed in the end-use application, the measured case temperature at the (Tc) location specified on the marking label

must not exceed 77.6°C. 4. The driver shall be installed in compliance with the requirements of the end-product standard.

5. The case of the driver must be connected to Earth ground when installed in the end-use application. 2.4 EMERGENCY EXIT LUMINARE:

a. It shall be completely self-contained, provided with maintenance-free battery, automatic charger, and other features. Luminaire must be third-party listed as emergency lighting equipment, and meet or exceed the following standards; NEC, N.C. Building Code, Volume X Energy Code, NFPA-101, and NEMA Standards.

b. Battery shall be sealed, maintenance-free type, with minimum of 90 minutes operating endurance. Battery shall have a normal life expectancy of 10 years. Batteries shall be high temperature type with an operating range of 0 degree C to 60 degrees C and contain a re-sealable pressure vent, a sintered + positive terminal and - negative terminal.

c. Charger shall be full automatic solid state type, full wave rectifying, with current limiting. Charger shall restore the battery to its full charge within 24 hours after a discharge of 90 minutes under full rated load. The unit shall be activated with the voltage drops below 80 percent. A low voltage disconnect switch shall be included if LEAD Battery is used, to disconnect the battery from the load and prevent damage from a deep discharge during extended power outage.

d. Pilot light shall indicate the unit is connected to AC power. The battery shall have high rate charge pilot light, unless self-diagnostic type. Tests switch shall simulate the operation of the unit upon loss of A.C. power by energizing the lamps from the battery. This simulation must also exercise the transfer relay.

e. The entire unit shall be warranted for three years. The battery must have an additional two more years' pro-rated warranty. Warranty shall start from the date of project final acceptance. Warranty shall be included in the contract document.

from the date of project final acceptance. Warranty shall be included in the contract document.

a. Lighting fixtures shall be installed in accordance with the manufacturer's instructions.

f. The use of LED is required due to their reliable performance, low power consumption, and limited maintenance requirements. Maximum LED failure rate shall be 25% within a seven (7) year period; otherwise, if exceeded, manufacturer shall replace the complete unit at no charge to the owner.

g. Contractor shall perform a test on each unit after it is permanently installed and charged for a minimum of 24 hours. Battery shall be tested for 90 minutes. The battery test shall be done 10 days prior to final inspection. Any unit which fails the test must be repaired or replaced, and tested again. The test shall demonstrate that the batteries conform to the requirements of NEC 700.12 (F).

2.5 EMERGENCY EGRESS LUMINARE:

during extended power outage.

PART 3: EXECUTION

3.1 COORDINATION:

3.2 INSTALLATION:

Basic Materials and Methods.

wiring.

a. Shall be completely self-contained, provided with maintenance-free 12 volt battery, automatic charger, two lamps, and other features. Luminaire shall be third-party listed as emergency lighting equipment, and meet or exceed the following standards: NEC, N.C. Building Code, Volume X Energy Code, NFPA-101, and NEMA Standards.

b. Pilot light shall indicate the unit is connected to A.C. power. The battery shall have high rate charge pilot light, unless self-diagnostic type. A test switch shall simulate the operation of the unit upon loss of A.C. power by energizing the lamps from the battery. This simulation must also exercise the transfer relay. If fluorescent emergency unit is used, an LED charging indicator light must be easily visible after installation and a remote test switch shall be installed adjacent to the fixture.

c. Battery shall be sealed, maintenance free type, with minimum of 90 minutes operating endurance. Battery shall have a normal life expectancy of 10 years. Batteries shall be a high temperature type with an operating range of 0 degree C to 60 degrees C and contain a resealable pressure vent, a sintered + positive terminal and - negative terminal.

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d. Charges shall be fully automatic solid state type, full wave rectifying, with current limiting. Charger shall restore the battery to its full charge within 24 hours after a discharge of 90 minutes under full rated load. The unit shall be activated when the voltage drops below 80%. A low voltage disconnect switch shall be included if LEAD battery is used, to disconnect the battery from the load and prevent damage from a deep discharge

e. The entire unit shall be warranted for three years. The battery must have an additional two more years' pro-rated warranty. Warranty shall start

f. Contractor shall perform a test on each unit after it is permanently installed and charged for a minimum of 24 hours. Battery shall be tested for 90 minutes. The battery test shall be done 10 days prior to final inspection. Any unit which fails the test must be repaired or replaced, and tested again. The test shall demonstrate that the batteries conform to the requirements of NEC 700.12 (F).

approved by the Architect/Engineer. The supports shall be located at diagonal corners of rectangular fixtures and angled away from fixture. A minimum of three full twists shall be made at each end to secure wire.

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Charlotte, NC d. In addition to the supports from the structure, fixtures shall also be secured to suspended ceilings on which they are 704/527-2112 mounted, or in which they are recessed. Where fixtures are secured to suspended ceilings, the primary supports from the building structure shall be

e. Where installed recessed in grid type ceilings, the fixtures shall be attached to the main runners of the suspended ceiling at all four corners using sheet metal screws.

- f. Mount fixtures plumb and square. Keep rows in perfect line.
- g. At time of project completion, fixtures and lamps shall be clean and fully operational.

260500 - COMMON WORK RESULTS FOR ELECTRICAL

Part 1 - GENERAL

1.01 DESCRIPTION

- A. Furnish of all labor, materials and services necessary for complete installation, testing, and adjusting of electrical lighting, power, and signal systems as specified and indicated.
- B. Connections and Services: Provide, procure and pay for all permits, licenses, and fees required to complete work. Check and coordinate with the local utility companies. Pay all reimbursements for work performed by local utility companies. 1.02 RELATED DOCUMENTS
- A. Refer to other sections of these specifications for related work, which is not work of this section.
- B. Related sections: 1. Section 260503 - Basic Electrical Materials and Methods.
- 2. Section 265000 Lighting / Electrical Work.
- 1.03 CODES
- A. Work herein shall conform to all applicable laws, ordinances, and to regulations of the local utility companies. Work shall be in accordance with the latest applicable requirements of: 1. National Fire Protection Association (Fire Code)
- National Electrical Code 2011
- 3. Underwriter's Laboratories, Inc.
- 1.04 QUALITY ASSURANCE
- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Provide only materials that are new, and of the type and quality specified. Where Underwriters' Laboratories, Inc. have established standards for such materials, provide only materials bearing the UL label. 1.05 SUBMITTALS
- A. Submittals shall identify all items and all technical data shall be included. All submittals shall be submitted at one time.
- B. Submittals are required for the following:
- 1. Lighting Fixtures, Lamps and Ballasts 2. Wiring Devices
- 3. Meter Sockets
- 4. Branch Circuit Panel 5. Safety Switches
- 6. Smoke Detectors
- 7. Occupancy Sensors, Time Switch and Photo-Electric Control
- 1.06 HANDLING OF MATERIALS
- A. Properly handle, house and protect, from damage and the weather, all materials, equipment and apparatus furnished under this section of the specifications.
- 1.07 EXAMINATION OF SITE

A. Where exact locations are required for conduit entries, request shop drawings, equipment location drawings, foundation drawings, and any other data required to locate the concealed conduit before the foundation is poured. 1.08 COORDINATION OF THE WORK

- A. Examine architectural drawings for location of suitable openings and chases for the passage of equipment to be installed under this section.
- 1.09 ELECTRICAL COORDINATION
- A. Coordinate with all other trades to avoid interferences and conditions which will not allow the installation of equipment, piping, fixtures, etc., as indicated.
- B. Provide power wiring, conduit and connections to all electrically operated equipment and provide disconnecting means, unless specifically indicated otherwise, or furnished as part of factory packaged equipment.
- C. Ensure that motors and equipment have proper voltage to operate on this system and that each motor has thermal overload protection, properly sized to nameplate data.
- D. Verify exact equipment locations with architectural and mechanical drawings.
- 1.10 ACCESS TO ELECTRICAL WORK
- A. Provide access panels for concealed junction boxes, ballasts, disconnect switches, or other electrical devices where concealed, or in areas not otherwise accessible.
- 1.11 SYMBOLS
- A. Symbols for outlets and equipment are scheduled on the plans. Some symbols may not be used, others may not be scheduled. 1.12 ELECTRICAL IDENTIFICATION
- A. Provide typewritten directory in branch circuit panel. Directory shall be in two columns with odd on left and even on right, to match numbers on breakers.
- 1.13 EXCAVATION
- A. Provide excavation, backfill and compaction in conformance with other divisions of the specification.
- 1.14 BASIS FOR WIRING DESIGN
- A. The drawings and specifications describe specific sizes of switches, breakers, fuses, conduits, conductors and other electrical equipment. These sizes are based on specific items of power-consuming equipment, i.e., heaters, lights, motors for fans, compressors, pumps, etc. Whenever power-consuming equipment differs from the drawings and specifications, electrical equipment for such installation shall be changed to proper sizes to match.

PART 2 - PRODUCTS (NOT USED) PART 3 - EXECUTION (NOT USED)

a. Contractor shall verify ceiling or wall type in or on which each fixture is to be mounted, and shall furnish unit with appropriate trim type, mounting hardware, and accessories to fit the construction; and feed through junction boxes as required to maintain proper access to system

b. Lighting fixtures shall be supported from the building structure using corrosion resistant steel hardware in compliance with Section 26 10 00,

c. A minimum of two No. 12 gauge wire supports attached to the structure shall be provided for each lighting fixture unless otherwise indicated or

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