### PROJECT DESCRIPTION



WASILLA, ALASKA

### **DRAWING INDEX**

### <u>GENERAL</u>

- G1 COVER SHEET
- G2 SYMBOLS & ABBREVIATIONS

### **<u>CIVIL DRAWINGS</u>**

- C0.0 OVERALL SITE PLAN
- C1.0 SITE PLAN C2.0 CIVIL DETAILS

### ARCHITECTURAL DRAWINGS

- A1 FLOOR PLAN
- A2 ELEVATIONS A3 BUILDING SECTION
- A4 SCHEDULES AND DETAILS
- A5 STAIR AND RAILING DETAIL

### STRUCTURAL DRAWINGS

- S0 DESIGN CRITERIA
- S1 FOUNDATION PLAN
- S2 FOUNDATION SECTION DETAILS
- S3 STRUCTURAL DETAILS
- S4 CANOPY FOUNDATION PLAN
- S5 ANTENNA DETAILS

### **MECHANICAL DRAWINGS**

- M2 SPECIFICATIONS AND SEQUENCE OF OPERATION
- M1 SCHEDULED, LEGEND, AND ABBREVIATIONS
- M3 PLUMBING PLANS AND DETAILS
- M4 HVAC PLAN, DETAILS AND GAS PIPING DIAGRAM

### **ELECTRICAL DRAWINGS**

- E1 ELECTRICAL LEGEND, FIXTURE SCHEDULE, AND RISER DIAGRAM
- E2 LIGHTING PLAN
- E3 POWER AND SIGNAL PLAN
- E4 ELECTRICAL SPECIFICATIONS

### CODE CONDITIONS

CODE ANALYSIS BASED ON 2009 EDITION, INTERNATIONAL BUILDING CODE

OCCUPANCY CLASSIFICATION: S-1 (STORAGE) TYPE OF CONSTRUCTION: V-B (NON-RATED)

### **BUILDING HEIGHTS AND AREA (S-1 OCCUPANCY)**

BASIC ALLOWABLE AREA: 9,000 SF INCREASE FOR SEPERATION: 6,750 SF INCREASE FOR SPRINKLER: N/A TOTAL ALLOWABLE AREA: 15,750 SF

ACTUAL AREA (GROUND FLOOR)4,800 SF OK

MEZZANINE AREA: 1,600 SF OK (LESS THAN 1/3 GROUND FLOOR) CANOPY AREA: 1,584 SF *OK* 

### FIRE EXTINGUISHERS

1. FIRE EXTINGUISHERS TO COMPLY WITH PRODUCT REQUIREMENTS OF NFPA 10 AND APPLICABLE CODES, WHICHEVER IS MORE STRINGENT.

- 2. PROVIDE EXTINGUISHERS CLASSIFIED AND LABELED BY UNDERWRITERS LABORATORIES, INC. (UL) FOR THE PURPOSE SPECIFIED AND INDICATED.
- 3. PROVIDE PRODUCT DATA, SHOP DRAWINGS, INSTALLATION INSTRUCTIONS AND MAINTENANCE DATA. SHOP DRAWINGS TO INDICATE WALL BRACKET MOUNTING MEASUREMENTS. MAINTENANCE DATA TO INCLUDE TEST, REFILL OR RECHARGE SCHEDULES AND RE-
- CERTIFICATION REQUIREMENTS. 4. GENERAL:

A) UL RATED 2A:10B:C B) MOUNTING: BRACKETS, FORMED STEEL, CHROME PLATED.

INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AT LOCATIONS SHOWN ON DRAWINGS.

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Σ 4/2 G2 By: me:

<u>A</u>	B	<u> 3R</u>	E	V

"	INCH	C CSK.	COUNTERSUNK	FLR.	FLOOR	MECH.	MECHANICAL	S.S.	SANITARY SEWER
#	NUMBER	CSMT.	CASEMENT	FLSH.	FLASHING	MEMB.	MEMBRANE	SAN.	SANITARY
&	AND	CTD.	COATED	FLUOR.	FLUORESCENT	MFG.	MANUFACTURE	SCHED.	SCHEDULED
@	AT	CTR.	CENTER	FRMG	FRAMING	MFGR	MANUFACTURER		
<	ANGLE	CU.	CUBIC	FRPF.	FIREPROOFING	MH.	MANHOLE	SD.	SIDE
Ø(DIA)*	DIAMETER	CVR'G	COVERING	FRT.	FIRE RETARDANT TREATED	MIN.*	MINIMUM OR MINUTE	SDG.	SIDING
				FT.	FOOT	MIR.	MIRROR	SECT.	SECTION
				FIG.	FOOTING	MISC.	MISCELLANEOUS	SHEATH.	SHEATHING
		D.B.		FUI.	FUTURE	MIL.	METAL		SHEET
A.B.	ANCHOR BOLT	D.F. DE*						SHVK.	
A.C.T.	ACOUSTICAL CEILING TILE					MI	MALLEARLE IRON	SPEC	SPECIFICATIONS
A.F.F.	ABOVE FINISH FLOOR	DRI	DOUBLE	GΑ	GYPSUM ASSOCIATION			SPI	SPECIAL
ACOUS.	ACOUSTICAL	DEMO	DEMOLITION	GA	GAUGE	(n)	NEW	SQ	SQUARE
ACT.		DEPT.	DEPARTMENT	G.B.	GRAB BAR	N.	NORTH	SQ. FT.	SQUARE FEET
ADD.		DIA.	DIAMETER	G.I.	GALVANIZED IRON	N.A.	NOT APPLICABLE	SST.	STAINLESS STEEL
ADDN.		DIAG.	DIAGONAL	G.W.B.	GYPSUM WALL BOARD	N.I.C.	NOT IN CONTRACT	ST.S	STORM SEWER
		DIFF.	DIFFUSER OR DIFFERENCE	GAL.	GALLON	N.T.S.	NOT TO SCALE	STA.	STATION
		do	DITTO	GALV.	GALVANIZED	NO.	NUMBER	STD.	STANDARD
		DIM.	DIMENSION	GL.	GLASS	NOM.	NOMINAL	STL.	STEEL
		DISP.	DISPENSER	GLB.	GLUE LAMINATED BEAM			STOR.	STORAGE
ASB	ASBESTOS	DK.	DECK	GOV'T	GOVERNMENT	O.C.	ON CENTER	STRUCT.	STRUCTURE
ASPH	ASPHALT	DN.	DOWN	GR.	GRADE	O.H.	OVER HEAD (OPPOSITE HAND)*	SUR.	SURFACE
AUTO, DR.	AUTOMATIC DOOR	DR.	DOOR	GSP.	GALVANIZED STEEL PIPE	OFF.	OFFICE	SUSP.	SUSPENDED
AVG.	AVERAGE	DS.	DOWN SPOUT	GYM.	GYMNASIUM	OHD.	OVER HEAD DOOR	SV.	SHEET VINYL
		DIL.	DETAIL	GYP	GYPSUM	OPNG.	OPENING	SYM.	SYMMETRICAL
		DWG.	DRAWING			OPP.	OPPOSITE		
						URIG.	ORIGINAL		
B.C.	BASE CABINET			п.в. Н С		nc	DIECES	TRC	
B.M.	BENCH MARK	F	FAST	H M	HOLLOW METAL	PP	PARTIAL PENETRATION	TR	TOWEL BAR
BTWN	BETWEEN	ELES	EXTERIOR INSULATION & FINISH SYSTEM	H M F	HOLLOW METAL FRAME	PLAM	PLASTIC LAMINATE	T BD	
B.O.	BOTTOM OF	E.S.	EACH SIDE	H.P.	HIGH POINT	P.T.D.	PAPER TOWEL DISPENSER	T.I.	TENANT IMPROVEMENT
B.S.	BOTH SIDES	E.W.	FACH WAY	H.W.	HOT WATER	PART.	PARTITION	T.O.	TOP OF
B.I.U.		EA.	EACH	HD.	HAND	PL.	PLATE	T.O.C.	TOP OF CURB
B.U.R.		EN	EDGE NAIL	HDR	HEADER	PLAST.	PLASTER	T.O.S.	TOP OF STEEL
BN	BAUK	ELECT.	ELECTRICAL	HGR	HANGER	PLYWD.	PLYWOOD	TEL.	TELPHONE
DLN.		ELEV.	ELEVATION	HDWD.	HARDWOOD	PR.	PAIR	TEMP.	TEMPORARY
BLKG.		ENCL.	ENCLOSURE	HDWR.	HARDWARE	PRE. ENG	PREVIOUSLY ENGINEERED*	TERR.	TERRAZZO
BN		EQ.	EQUAL	HORIZ.	HORIZONTAL	PREFAB.	PRE- FABRICATED*	THK.	THICK
BTM (BOTT)	BOTTOM	EQUIP.	EQUIPMENT	HR.	HOUR	PROJ.	PROJECT	THRU.	THROUGH
Brini (BOTT)	Borrom	EXIST. (E) *	EXISTING	HSB	HIGH STRENGTH BOLT	PSF.	POUNDS PER SQUARE FOOT	TRANSV.	TRANSVERSE
		EXP.	EXPANSION	HT.	HEIGHT	PT.	POINT	TS.	TUBE STEEL
		EXP. AGG.	EXPOSED AGGREGATE	HWY.	HIGHWAY	PI	PRESSURE TREATED	IV.	TELEVISION
C TO C (CC)	CENTER TO CENTER	EXP. JI. (EJ)				<u>от</u>		TYP.	TYPICAL
C.B.	CATCH BASIN	EXI.				Q.1.	QUARRY TILE		
C.I.	CAST IRON	EATR.	EXTRODED	I.D.		D	DIGED		
C.I.P.	CAST IRON PIPE								
C.J.	CONTROL JOINT OR CONSTRUCTION JOINT					RCP	REFLECTED CEILING PLAN		UNI ESS OTHERWISE NOTED
C.M.P.	CORRUGATED METAL PIPE	F TO F	FACE TO FACE	INT	INTERIOR	RD	ROOF DRAIN	UNFIN	UNFINISHED
C.M.U.	CONCRETE MASONRY UNITS	F.B.	FLAT BAR			R.H.	RIGHT HAND		
C.R.		FB	FACE OF BLOCK*	JAN.	JANITOR	R.L.	RAIL LEADER		
C.R.C.		FC	FACE OF CONCRETE	JH	JOIST HANGER	R.O.	ROUGH OPENING		
		F.D.	FLOOR DRAIN	JT.	JOINT	R.O.W.	RIGHT OF WAY	V.B.	VAPOR BARRIER
CAB. CEM	CEMENT	F.E.	FIRE EXTINGUISHER			RAD.	RADIUS	V.C.T.	VINYL COMPOSITION TILE
	CERAMIC	F.E.C.	FIRE EXTINGUISHER CABINET			REF.	REFERENCE	V.I.F.	VERIFY IN FIELD
CH B		F.F.	FACTORY FINISH*	KIT.	KITCHEN	REFR.	REFRIGERATOR	V.T.	VINYL TILE
CIRC		FF	FINISH FLOOR*			REINF.	REINFORCING, REINFORCEMENT, REINFORCED	VAC.	VACUUM
CL.	CENTER LINE	F.F.E. *	FINISHED FLOOR ELEVATION	LS	LAG SCREW	REQ., REQ'D	REQUIRED	VERT.	VERTICAL
CLG.	CEILING	F.H.C.	FIRE HOSE CABINET	LTWT		RESIL.	RESILIENT	VEST.	VESTIBULE
CLKG.	CAULKING	F.L.	FLOOR LINE	L.L.	LIVE LOAD	REV.	REVERSED	VEY.	VERIFY
CLOS.	CLOSET								
CLR.	CLEAR								
COL.	COLUMN								
COMM.	COMMUMICATION								
COMP.	COMPOSITION								
CP	COMPLETE PENETRATION								
CONC.	CONCRETE								
CONN.	CONNECTION								
CONST.	CONSTRUCTION								

# /IATIONS (ARCH/STRUCT)



Drawing Symbols 1 1/2" = 1'-0"





WALL ASSEMBLY TYPE

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250 H Street 250 H Street Anchorage, AK 99501 P: (907) 243-8985 F: (907) 243-5629 W: LCGAK.com	DMVA
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# **GENERAL NOTES**

- CONTRACTOR RECORD DRAWINGS.
- EXISTING SITE IMPROVEMENTS.
- SITE AS SPECIFIED PER PLAN.
- 2012 AERIAL.
- THE STATE OF ALASKA SSFHC 2015.
- ABOVE FINISHED GRADE.

BUILDING COORDINATES				
	NORTHING	EASTING		
1	2778373.43	1751248.89		
2	2778437.85	1751296.33		

RAF	PHI	C S	CA	LE	
)	1	0	2	0	2

### EXISTING CHAINLINK FENCE

### CLEARING LIMITS

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE STATE OF ALASKA DOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (SSFHC) 2015.

2. NO FIELD SURVEYS OR UTILITY LOCATES WERE PERFORMED FOR THIS PROJECT.ALL EXISTING TOPOGRAPHIC AND PLANIMETRIC DATA SHOWN IN THE SITE PLAN ARE BASED ON DATABASE INFORMATION OBTAINED FROM THE STATE OF ALASKA AND THE MAT-SU BOROUGH.

3. LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE. CONTRACTOR SHALL OBTAIN UTILITY FIELD LOCATIONS PRIOR TO EXCAVATIONS OR GRADING ACTIVITIES AND VERIFY THE EXACT HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES ENCOUNTERED IN THE FIELD AND SHALL RECORD SAME ON

4. ASPHALT PAVING IS NOT INCLUDED IN THIS PROJECT.

5. ALL EXISTING SITE IMPROVEMENTS SHALL BE LEFT IN PLACE. DO NOT DISTURB

6. SITE SHALL BE GRADED WITHIN CLEARING LIMITS TO DRAIN AWAY FROM PROPOSED BUILDING AT 3% MIN AS NOTED. DRAINAGE SHALL NOT DISTURB EXISTING SITE IMPROVEMENTS. MATCH EXISTING SITE ELEVATIONS AT EDGE OF

7. ELEVATIONS OF EXISTING CONTOURS ARE APPROXIMATE AND NOT BASED ON ACTUAL SURVEY DATA. CONTOURS ARE FROM AEROMETRIC LIDAR DATA, JUNE

8. SEWER SERVICE SHALL BE PVC PIPE IN ACCORDANCE WITH SECTION 706 OF

9. SEWER SERVICE PIPE SHALL EXTEND 5' MINIMUM BEYOND THE FUTURE GENERATOR SHED FOUNDATION AT A 2% MINIMUM SLOPE. INSTALL A 2"X4" WOOD POST PAINTED GREEN AND STENCILED WITH THE WORD "SEWER" 3'

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		REVISION
		B
		NO. DATE
250 H Street Anchorage, AK 99501 P (907) 243-8985	F (907) 243-5629 www.lcgak.com	
	architecture • engineering • surveying	DMVA
ALCANTRA MEOC VEHICLE GARAGE, WASILLA, AK	SITE PLAN	
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	DOOR (REFERENCE DOOR SCHEDULE)				REVISION
	DOOR FRAME, TYP. SEE WALL TYPES		2	6	NO DATE BY
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	<ul> <li>SEE WALL TYPES ON SHEET A1</li> <li>DOUBLE 2x6 HEADER W/ PLYWOOD SHIM</li> <li>DRYWALL SCREW, 1 NEXT TO EACH RETAINER CLIP</li> <li>HEAT TREATED CASING RETAINER CLIP</li> <li>TIMELY PREFINISHED KNOCK DOWN (KD) FRAME</li> <li>DOOR (REFERENCE DOOR (REFERENCE</li> </ul>			ture · engineering · surveying	DMVA
(INTERIOR DOOR JAMB S	IMILAR)		00	archited	
RIOR DOOR DETA	AIL DOOR, FRAME & THRESHOLD (REFERENCE DOOR SCHEDULE) SET THRESHOLD IN SEALANT FINISH FLOOR CONCRETE STOOP COLD JOINT CONCRETE SLAB		ALCANTRA MEOC VEHICLE GARAGE WASILLA, ALASKA		
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![](_page_9_Figure_2.jpeg)

![](_page_9_Picture_3.jpeg)

![](_page_9_Figure_4.jpeg)

![](_page_9_Picture_5.jpeg)

![](_page_9_Figure_6.jpeg)

# MEZZANINE FRAMING, STAIRS, GUARDRAILS & HANDRAILS BY METAL BUILDING MANUFACTURER

![](_page_9_Figure_9.jpeg)

# DESIGN CRITERIA

CODES AND STANDARDS PER INTERNATIONAL BUILDING CODE (IBC) 2009 IN ADDITION TO DEAD LOADS, THE FOLLOWING MINIMUM LIVE LOADS APPLY TO THE CONSTRUCTION OF ALL BUILDINGS AND FACILITIES SHOWN UNLESS OTHER- WISE NOTED.

OCCUPANCY CATAGORY: FLOOR LOADINGS:

ROOF LIVE LOAD:

WIND LOADS: BASIC WIND SPEED IMPORTANCE FACTOR EXPOSURE

SEISMIC DESIGN GROUP IMPORTANCE FACTOR SPECTRAL RESPONSE COEFFICIENT

SITE CLASS BASIC FORCE SYSTEM

250 PSF GARAGE 50 PSF OFFICE 250 PSF MEZZANINE 20,000 LB POINT LOAD 50 PSF SNOW

100 MPH, 3 SECOND GUST 1.0 "C" "D" 1.25

Sds=1.52 Sd1=0.55 STEEL MOMENT FRAME, R = 3.5

# **GENERAL NOTES**

1. INTERPRETATION OF DRAWINGS & SPECIFICATIONS

A) FOR CONVENIENCE, SPECIFICATIONS HAVE BEEN PREPARED FOR THIS PROJECT AND ARE ARRANGED IN SEVERAL SECTIONS, BUT SEPARATION SHALL NOT BE CONSIDERED AS THE LIMITS OF THE WORK REQUIRED BY ANY SEPARATE TRADE. THE TERMS AND CONDITIONS OF SUCH LIMITATIONS ARE WHOLLY BETWEEN THE CONTRACTOR AND HIS SUBCONTRACTORS.

B) IN GENERAL, THE WORKING DETAILS WILL INDICATE DIMENSIONS, POSITIONS AND KIND OF CONSTRUCTION, AND THE SPECIFICATIONS, QUALITIES AND METHODS. ANY WORK INDICATED ON THE WORKING DETAILS MENTIONED IN THE SPECIFICATIONS, OR VICE VERSA, SHALL BE FURNISHED AS THOUGH FULLY SET FORTH IN BOTH. WORK NOT PARTICULAR DETAILED, MARKED OR SPECIFIED, SHALL BE THE SAME AS SIMILAR PARTS THAT ARE DETAILED, MARKED OR SPECIFIED. IF CONFLICTS OCCUR BETWEEN DRAWINGS AND SPECIFICATIONS, THE MOST EXPENSIVE MATERIALS OR METHODS WILL PREVAIL

C) SHOULD AN ERROR APPEAR IN THE WORKING DETAILS OR SPECIFICATIONS OR IN WORK DONE BY OTHERS AFFECTING THIS WORK, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AT ONCE AND IN WRITING. IF THE CONTRACTOR PROCEEDS WITH THE WORK SO AFFECTED WITHOUT HAVING GIVEN SUCH WRITTEN NOTICE AND WITHOUT RECEIVING THE NECESSARY APPROVAL, DECISIONS OR INSTRUCTION IN WRITING FROM THE OWNER, THEN HE SHALL HAVE NO VALID CLAIM AGAINST THE OWNER, FOR THE COST OF SO PROCEEDING AND SHALL MAKE GOOD ANY RESULTING DAMAGE OR DEFECT. NO VERBAL APPROVAL, DECISION, OR INSTRUCTION SHALL BE VALID OR BE THE BASIS FOR ANY CLAIM AGAINST THE OWNER, ITS OFFICERS EMPLOY'S OR AGENTS. THE FOREGOING INCLUDES TYPICAL ERRORS IN THE SPECIFICATIONS OR NOTATIONAL ERRORS IN THE WORKING DETAILS WHERE THE INTERPRETATIONS IS DOUBTFUL OR WHERE THE ERROR IS SUFFICIENTLY APPARENT AS TO PLACE A REASONABLY PRUDENT CONTRACTOR ON NOTICE THAT SHOULD HE ELECT TO PROCEED, HE IS DOING SO AT HIS OWN RISK.

2. CONSTRUCTION SHALL CONFORM TO ALL APPLICABLE CODES AND REGULATIONS.

3. SHOP DRAWING NOTES:

A) SHOP DRAWINGS SHALL BE SUBMITTED IN THE FORM OF THREE BLUE LINE PRINT OF EACH SHEET

B) THE PURPOSE OF SHOP DRAWINGS SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE STRUCTURAL ÉNGINEER THAT HE UNDERSTANDS THE DESIGN CONCEPT BY INDICATING WHICH MATERIALS HE INTENDS TO FURNISH AND INSTALL, AND BY DETAILING THE FABRICATION AND INSTALLATION METHODS HE INTENDS TO USE.

C) PRIOR TO FABRICATION, SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW TO THE STRUCTURAL ENGINEER. SHOP DRAWINGS SUBMITTALS SHALL INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO STRUCTURAL STEEL, REINFORCED STEEL, PRE-FABRICATED WALL PANELS.

D) PRIOR TO SUBMISSION THE CONTRACTOR SHALL REVIEW ALL SUBMITTALS FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS AND SHALL STAMP SUBMITTALS AS BEING "REVIEWED FOR CONFORMANCE".

E) SHOP DRAWINGS SUBMITTALS PROCESSED BY THE STRUCTURAL ENGINEER ARE NOT CHANGE ORDERS.

F) ANY DETAIL ON THE SHOP DRAWING THAT DEVIATES FROM THE CONTRACT DOCUMENTS SHALL CLEARLY BE MARKED WITH THE NOTE "THIS IS A CHANGE".

G) SHOP DRAWINGS OR CALCULATIONS SUBMITTED FOR REVIEW THAT REQUIRE RESUBMITAL FOR RE-REVIEW SHALL BE BILLED HOURLY FOR SUCH TIME TO THE GENERAL CONTRACTOR. RE-REVIEW WILL NOT PROCEED WITHOUT WRITTEN APPROVAL FROM THE GENERAL CONTRACTOR FOR ADDITIONAL ENGINEERING REVIEW SERVICES.

4. SAFETY NOTES:

A) IT IS THE CONTRACTORS RESPONSIBILITY TO COMPLY WITH THE PERTINENT SECTIONS, AS THEY APPLY TO THIS PROJECT, OF THE "CONSTRUCTION SAFETY ORDERS" ISSUED BY THE STATE OF ALASKA LATEST EDITION, AND ALL OSHA REQUIREMENTS.

B) THE OWNER AND THE STRUCTURAL ENGINEER DO NOT ACCEPT ANY RESPONSIBILITY FOR THE CONTRACTOR'S FAILURE TO COMPLY WITH THESE REQUIREMENTS.

C) THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATE DESIGN AND CONSTRUCTION OF ALL FORMS AND SHORING REQUIRED.

5. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND STRUCTURAL ENGINEER WHERE A CONFLICT OR A DISCREPANCY OCCURS BETWEEN THE STRUCTURAL DRAWINGS AND ANY OTHER PORTION OF THE CONTRACT DOCUMENTS OR EXISTING FIELD CONDITIONS. SUCH NOTIFICATION SHALL BE GIVEN IN DUE TIME SO AS NOT TO AFFECT THE CONSTRUCTION SCHEDULE. IN CASE OF A CONFLICT BETWEEN STRUCTURAL DRAWINGS AND SPECIFICATIONS, THE MORE RESTRICTIVE CONDITION SHALL TAKE PRECEDENCE UNLESS WRITTEN APPROVAL HAS BEEN GIVEN FOR THE LEAST RESTRICTIVE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS WITH ARCHITECTURAL AND STRUCTURAL DRAWINGS PRIOR TO COMMENCING ANY WORK.

6. WHERE NO SPECIFIC DETAILS IS SHOWN, THE CONSTRUCTION SHALL BE IDENTICAL OR SIMILAR TO THAT INDICATED FOR LIKE CASES OF CONSTRUCTION ON THIS PROJECT. SHOULD THERE BE ANY QUESTIONS, CONTACT THE ARCHITECT AND THE ENGINEER PRIOR TO PROCEEDING.

7. ANY SUBSTITUTIONS FOR STRUCTURAL MEMBERS, HARDWARE, OR DETAILS SHALL BE REVIEWED BY THE ARCHITECT AND STRUCTURAL ENGINEER. SUCH REVIEW WILL BE BILLED ON A TIME AND MATERIALS BASIS TO THE GENERAL CONTRACTOR WITH NO GUARANTEE THAT THE SUBSTITUTION WILL BE ALLOWED.

8. DO NOT SCALE DRAWINGS. CONTACT THE ARCHITECT OR STRUCTURAL ENGINEER FOR ANY DIMENSIONS NOT SHOWN.

9. THESE DRAWINGS ARE NOT COMPLETE UNTIL REVIEWED AND ACCEPTED BY THE LOCAL BUILDING OFFICIALS AND SIGNED BY THE OWNER AND THE STRUCTURAL ENGINEER.

10. ALL DRAWINGS AND WRITTEN MATERIAL APPEARING HEREIN CONSTITUTES THE ORIGINAL AND UNPUBLISHED WORK OF THE STRUCTURAL ENGINEER AND ARE THE PROPERTY OF THE OWNER AND THE SAME MAY NOT BE DUPLICATED, USED OR DISCLOSED WITHOUT WRITTEN CONSENT OF THE STRUCTURAL ENGINEER AND COMPENSATION.

11. THE STRUCTURE SHOWN ON THESE DRAWINGS IS STRUCTURALLY SOUND ONLY IN ITS COMPLETED FORM. THE STABILITY OF THIS STRUCTURE DEPENDS ON THE DIAPHRAGM AND BRACING MEMBERS SHOWN. THE CONTRACTOR IS TO PROVIDE FOR THE DESIGN AND CONSTRUCTION OF SHORING FOR ALL EARTH, FORMS, CONCRETE, STEEL, WOOD, AND MASONRY TO RESIST GRAVITY, EARTH, WIND, AND CONSTRUCTION LOADS. SHORING SHALL REMAIN IN PLACE UNTIL ALL DIAPHRAGM AND LATERAL RESISTING ELEMENTS ARE IN PLACE IN THEIR ENTIRETY.

# CONCRETE

1905.3 OR 1905.4.

1. STRUCTURAL CONCRETE SHALL ATTAIN A 28 DAY COMPRESSIVE STRENGTH AS REQUIRED IN NOTE #19. 2. CONCRETE MIX DESIGN SHALL BE PREPARED BY AN INDEPENDANT LABORATORY APPROVED BY THE STRUCTURAL ENGINEER. SELECTION OF CONCRETE MIX PROPORTIONS SHALL BE PER IBC SECTION

3. CEMENT SHALL CONFORM TO ASTM C-150 TYPE I OR II.

4. CONCRETE AGGREGATES SHALL CONFORM TO ASTM C-33.

5. REINFORCING STEEL SHALL CONFORM TO ASTM A615- GRADE 60 FOR #4 AND LARGER, ASTM A615-GRADE 40 FOR #3 AND SMALLER, EXCEPT REINFORCING STEEL TO BE WELDED SHALL CONFORM TO ASTM A706.

6. ALL PREHEATING AND WELDING OF REINFORCING BARS SHALL BE DONE IN ACCORDANCE WITH AWS D1.4 LATEST EDITION AND SHALL BE CONTINUOUSLY INSPECTED BY A QUALIFIED LABORATORY. CONTRACTOR SHALL FURNISH TO THE LABORATORY REBAR MILL CERTIFICATES.

7. REINFORCING STEEL SHALL BE FABRICATED ACCORDING TO "MANUAL OF STANDARD PRACTICE FOR REINFORCED CONCRETE CONSTRUCTION".

8. DIMENSIONS SHOWN FOR LOCATION OF REINFORCING ARE TO THE FACE OF MAIN BARS AND DENOTE CLEAR COVERAGE. CONCRETE COVERAGE SHALL BE AS FOLLOWS: CONCRETE DEPOSITED AGAINST GROUND (EXCEPT SLABS) -3". CONCRETE EXPOSED TO GROUND BUT PLACED IN FORMS -2". SLABS (ON GROUND) -2" CLEAR FROM TOP U.N.O.

9. SPLICES IN CONTINUOUS REINFORCEMENT SHALL BE 48 BAR DIAMETERS AND IN SPLICES AND ADJACENT BARS SHALL BE NOT LESS THAN 5'-0" APART. SPLICE CONTINUOUS BARS IN SPANDRELS, GRADE BEAMS, ETC., AS FOLLOWS: TOP BARS AT MID-SPAN;, BOTTOM BARS AT CENTERLINE AT SUPPORT, UNLESS NOTED OTHERWISE. SPLICES IN WWF SHALL BE 1-1/2 MESHES WIDE.

10. CONSTRUCTION JOINTS SHALL BE MADE ROUGH AND ALL LAITANCE REMOVED FROM THE SURFACE. CONCRETE MAY BE ROUGHENED BY CHIPPING THE ENTIRE SURFACE, SAND BLASTING OR RAKING THE SURFACE TO PRODUCE 1/4" DEEP DEFORMATIONS.

11. REMOVE ALL DEBRIS FROM FORMS BEFORE CASTING ANY CONCRETE.

12. REINFORCING, DOWELS, BOLTS, ANCHORS, SLEEVES, ETC., TO BE EMBEDDED IN CONCRETE SHALL BE TIED SECURELY IN POSITION BEFORE PLACING CONCRETE.

13. MAXIMUM FREE FALL OF CONCRETE SHALL BE 8'-0".

14. CONSOLIDATE CONCRETE PLACED IN FORMS BY MECHANICAL VIBRATING EQUIPMENT SUPPLEMENTED BY HAND-SPADING, RODDING OR TAMPING. USE EQUIPMENT AND PROCEDURES FOR CONSOLIDATION OF CONCRETE IN ACCORDANCE WITH THE RECOMMENDED PRACTICES OF ACI 309 TO SUIT THE TYPE OF CONCRETE AND PROJECT CONDITIONS.

15. NO WOOD SPREADERS ALLOWED. NO WOOD STACES ALLOWED IN AREAS TO BE CONCRETED.

16. ALL SAW CUTTING SHALL BE DONE AFTER INITIAL SET HAS OCCURED TO AVOID TEARING OR DAMAGE BY THE SAW BLADE, BUT BEFORE INITIAL SHRINKAGE HAS OCCURED.

17. DRILL THROUGH STEEL COLUMNS, BEAMS AND PLATES TO PASS CONTINUOUS REINFORCING.

MIN

18. PROVIDE 2-#5x4'-0" DIAGONAL REINFORCING AT MID-DEPTH OF SLAB AT ALL REENTRANT CORNERS TYPICAL.

19. CONCRETE STRENGTHS: (MAX SLUMP = 4")

MAX AGGREGATE CLASS ITEM fc'd @ 28 DAYS SIZE WEIGHT GENERAL USE 4000 PSI 145

MAX W/C <u>RATIO</u> <u>AIR</u> 0.55 0%

# ABBREVIATIONS

AB BLKG BN BTM	ANCHOR BOLT BLOCKING BOUNDARY NAIL BOTTOM
BTWN	BETWEEN
CC	CENTER TO CENTER
CJ	CONSTRUCTION JOINT
CLR	CLEAR
COL	COLUMN
CONC	
CP	COMPLETE PENETRATION
CSK	CONTERSINK
CTJ	CONTROL JOINT
DF	DOUGLAS FIR
DIA	DIAMETER
DL	DEAD LOAD
do	DITTO
(e)	
	EACH EXPANSION IOINT
FN	EDGE NAII
EXIST	EXISTING
FB	FACE OF BLOCK
FC	FACE OF CONCRETE
FF	FINISH FLOOR
FLR	FLOOR
FRMG	
FS FTC	FACE OF STUD
GALV	GALVANIZED
GLB	GLU-LAM BEAM
HDR	HEADER
HGR	HANGER
HORIZ	HORIZONTAL
HSB	HIGH STRENGTH BOLT
HI	
JH	JUIST HANGER (SIMPSON)
LTWT	
MB	MACHINE BOLT
MFR	MANUFACTURER
MI	MALLEABLE IRON

MIN	MINIMUM
MTL	METAL
(n)	NEW
ŇŤS	NOT TO SCALE
OC	ON CENTER
ОН	OPPOSITE HAND
nc	PIECES
PP	PARTIAL PENETRATION
PEMB	PRE-ENGINEERED METAL BUILDING
DT	
REINF	
SU	
50515	SELF DRILLING SELF TAPPING SCREW
SHIG	SHEATHING
SIM	SIMILAR
SP	STRUCTURAL PLYWOOD
SPAC	
SPEN	STRUCTURAL PLYWOOD EDGE NAILING
STENR	STIFFENER
STGGRD	STAGGERED
STL	STEEL
STRUCT	STRUCTURAL
Т&В	TOP AND BOTTOM
T & G	TONGUE AND GROVE
TN	TOE NAIL
TOF	TOP OF FRAMING
TOS	TOP OF STEEL
TYP	TYPICAL
UNO	UNLESS OTHERWISE NOTED
VERT	VERTICAL
VIF	VERIFY IN FIELD
W/	WITH
W/O	WITHOUT
WD	WOOD
WP	WORK POINT
WS	WOOD SCREW
WWF	WELDED WIRE FABRIC
G	CENTERLINE
#	NUMBER OR POUNDS
R	PLATE
ø	ROUND OR DIAMETER

![](_page_10_Picture_61.jpeg)

![](_page_10_Figure_62.jpeg)

![](_page_10_Picture_63.jpeg)

![](_page_10_Picture_64.jpeg)

![](_page_10_Picture_65.jpeg)

![](_page_10_Picture_66.jpeg)

![](_page_10_Picture_67.jpeg)

![](_page_10_Picture_68.jpeg)

![](_page_11_Figure_0.jpeg)

![](_page_12_Figure_0.jpeg)

	FOUNDATION SCHEDULE					
Туре	Description	Pedestal Size	Anchor Bolt	Reinforcing	Comments	
A	7' - 3" SQ x 14" THICK	1' - 4" x 2' - 0"	1 1/4" DIA x 36"	(9) #5 EW T&B		
В	6' - 6" SQ x 14" THICK	1' - 4" x 2' - 0"	1 1/4" DIA x 36"	(7) #5 EW T&B		
С	5' - 6" SQ x 12" THICK	2' - 0" x 2' - 0"	1 1/4" DIA x 36"	(5) #5 EW T&B		
D	3' - 6" SQ x 12" THICK	2' - 0" x 2' - 0"	3/4" DIA x 36"	(4) #5 EW T&B		
E	4' - 0" SQ x 12" THICK	1' - 4" x 2' - 0"	3/4" DIA x 36"	(4) #5 EW T&B		
F	PEDESTAL SIZE	1' 4" x 2' - 0"	3/4" DIA x 36"	N/A		
G	3' - 6" SQ x 12" THICK	NONE	3/4" DIA x 18"	(4) #5 EW T&B	TOP OF FOOTING ELEVATION @ BOTTOM OF SLAB	
Η	PEIR SIZE	24" Ø	3/4" DIA x 36"	N/A		

![](_page_12_Figure_2.jpeg)

S2 1/2" = 1'-0"

![](_page_12_Figure_4.jpeg)

![](_page_12_Picture_5.jpeg)

![](_page_12_Figure_6.jpeg)

T PATTERN AND FOOTING
MEZZANINE COLUMN (PER PEMB MFR) #4 TIES @ 24" OC EA SIDE ANCHOR BOLTS (SEE DETAIL) 4 / S3 REINFORCEMENT EW (SEE SCHEDULE) FINISH FLOOR
(PER PEMB MFR) #4 TIES @ 24" OC EA SIDE ANCHOR BOLTS (SEE DETAIL) 4 / S3 REINFORCEMENT EW (SEE SCHEDULE) FINISH FLOOR

![](_page_12_Figure_10.jpeg)

![](_page_13_Figure_0.jpeg)

![](_page_13_Picture_1.jpeg)

![](_page_13_Figure_2.jpeg)

![](_page_13_Picture_3.jpeg)

![](_page_13_Picture_4.jpeg)

![](_page_13_Figure_5.jpeg)

![](_page_13_Figure_6.jpeg)

1' - 6"

1' - 6"

	GTATE OF ALAST
	49th
	Danny C Ganam
	SE14022
	PROFESSION PROFESSION
2" BAR GRATE SET FLUSH W/ FINISH FLOOR	
L2x2x1/4 W/ 1/2" DIA "J" STUDS @ 8" OC MAX ALL SIDES	
1	BY
	DA
#4 HOOK @ 12" OC MAX #4 CONT @ 12" OC MAX	92
	ы 0 1 29 29
	995( 43-89 ak.coi
	t AK 07) 2: w.lcg
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	) H S chor
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TION	
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	「山 立 S]
	> \$   <u>4</u>
	SCALE: 1" = 1'-0"
	DESIGNED BY: DG
	CHECKED BY:
	DATE: 3/20/15
	FILE NO. 859.09
	SHEET NUMBER

# 3 MECHANICAL SUMP SECTIC **S3** 1" = 1'-0"

![](_page_14_Figure_0.jpeg)

![](_page_15_Figure_0.jpeg)

![](_page_15_Figure_1.jpeg)

		OF SE140 OF ES			
					REVISION
					NO DATE BY
	COCONSTRUCT ZOUR Street Anchorage, AK 99501	P (907) 243-8985	architecture · engineering · surveying www.lcgak.com		DMVA
ALCANTRA MEOC VEHICLE		DARAGE	WASHIA, AI ASKA		ANTENNA DETAILS
SCAL DESIG DRAV CHEC DATE	E: GNED E VN BY: : KED B : NO.	А: зү: Ү: Г Р	s inc 3 3	dic 8/2 85	ated DG DM DG 0/15 9.09

## MECHANICAL LEGEND

	WASTE
	VENT PIPING
	COLD WATER
	HOT WATER
	HOT WATER RECIRCULATED
XXX	SEE ABBREVIATIONS FOR MEDIA
O	PIPE UP
	PIPE DOWN
O	TEE UP
	TEE DOWN
]	CAP
	UNION
	DIRECTION OF FLOW
	ISOLATION VALVE
₩	2-WAY CONTROL VALVE
®	3-WAY CONTROL VALVE
4 	
	CHECK VALVE
	BALANCE/SHUI-OFF VALVE
——K	PRESSURE REDUCING VALVE
	FLEXIBLE PIPING CONNECTOR
<b>≱</b> —	PRESSURE/TEMPERATURE RELIEF VALVE
۱ ــــــــــــــــــــــــــــــــــــ	HOSE BIBB
1'	
~	
	FILE ANOTOK
<u> </u>	THERMOMETER
Ŷ	PRESSURE GAUGE WITH ISOLATION COCK
	STRAINER WITH BLOWDOWN
×*	WATER HAMMER ARRESTOR
<u></u>	LETTER INDICATES PDI SIZE
Y	
⊗ 	FLOOR CLEANOUT OR CAP
	SUPPLY AIR UP & DOWN (SQUARE) SUPPLY AIR DIFFUSER / GRILLE
	RETURN AIR UP & DOWN (SQUARE)
	RETURN AIR GRILLE
	EXHAUST AIR OP & DOWN (SQUARE) EXHAUST AIR GRILLE
$\bigcirc$	ROUND DUCT UP & DOWN
	VOLUME DAMPER
	MOTORIZED CONTROL DAMPER
<u>پ</u>	
/	JUUNU LINEU DUGIWUKK
< 24/12 <	DUCT SIZE
//	(SECOND NUMBER - SIDE NOT SHOWN)
[ <del>]</del> ]	INSULATED DUCTWUKK
	TURNING VANES
	FLEXIBLE DUCT CONNECTION
	DIFFUSER WITH FLEXIBLE DUCT
	THERMOSTAT OR SENSOR
$\bigcirc$	THERMOSTAT OR SENSOR WITH LOCKING COVER
SP	STATIC PRESSURE SENSOR
$\bigcirc 1$	SHEET NOTES
	- SERVICE: S-SUPPLY. R-RETURN. F-FXHAUST
<u>\$X</u> :CFM	-CFM
L	- DIFFUSER OR GRILLE TAG
	DETAIL NUMBER
M1	SHEET LOCATED ON
<u>_</u>	BASEBOARD DESIGNATION
BB-1	
1.0 12'	ACTIVE LENGTH
	GPM

GPM

# PLUMBING FIXTURE SCH

SYMBOL	FIXTURE
-D-1	FLOOR DRAIN
D-1	TRENCH DRAIN

r									
FUE	L FIRED UNIT	HEATE	R SC	HEDU	JLE				
			INPUT	OUTPUT		МО	FOR DATA		
SYMBOL	MFGR / MODEL	FUEL	(MBH)	(MBH)	CFM	HP	VOLTS/PH	REMARKS	
GUH-1	MODINE / PTC-215	GAS	215	199.95	3,865	1/2	120/1	93% HIGH EFFICIENCY UNITS, VERTICAL DEFLECTOR BLADES, FINGERPROOF FAN GUARD, HORIZONTAL CO	NCENTRIC
GUH-2	MODINE / PTC-215	GAS	215	199.95	3,865	1/2	120/1	93% HIGH EFFICIENCY UNITS, VERTICAL DEFLECTOR BLADES, FINGERPROOF FAN GUARD, HORIZONTAL CO	ONCENTRIC

ELEC	TRIC UNIT HEAT	TER SCI	HEDU	JLE				
SYMBOL	MFGR / MODEL	CAPACITY (MBH)	CFM	ELEME KW	NT ELEC. DATA VOLTS/PH	MOTO HP	VOLTS/PH	REMARKS
EUH-1	BRASCH / BTU-2.5-2041	8,550	350	2.5	240/1	1/20	240/1	HORIZONTAL MOUNTED ELECTRIC UNIT HEATER

## FAN SCHEDULE

				TSP		MOTOR D	ATA			
MFGR / MODEL	SERVICE	TYPE	CFM	(IN. WG)	HP	WATTS	VOLTS/PH	DRIVE	SONES	REMARKS
GREENHECK / SE1-18-429-A7	EMERGENCY GARAGE EXHAUST	SIDEWALL	3,600	0.5"	3/4		120/1	DIRECT	<16	UL LISTED, FIELD MOUNTED DISCONNECT, OSHA M
GREENHECK / SP-A290	CONTINUOUS GARAGE EXHAUST	CENTRIFUGAL	250	0.25"		80.7	120/1	DIRECT	<4	UNIT MOUNTED SPEED CONTROLLER
LEADING EDGE / 56001	GARAGE DESTRATIFICATION	CEILING	27,500			110	120/1	DIRECT		REMOTE MOTOR SPEED CONTROLLER, QUANTITY OF
-	MFGR / MODEL GREENHECK / SE1-18-429-A7 GREENHECK / SP-A290 LEADING EDGE / 56001	MFGR / MODEL SERVICE GREENHECK / SE1–18–429–A7 EMERGENCY GARAGE EXHAUST GREENHECK / SP–A290 CONTINUOUS GARAGE EXHAUST LEADING EDGE / 56001 GARAGE DESTRATIFICATION	MFGR / MODEL       SERVICE       TYPE         GREENHECK / SE1-18-429-A7       EMERGENCY GARAGE EXHAUST       SIDEWALL         GREENHECK / SP-A290       CONTINUOUS GARAGE EXHAUST       CENTRIFUGAL         LEADING EDGE / 56001       GARAGE DESTRATIFICATION       CEILING	MFGR / MODEL       SERVICE       TYPE       CFM         GREENHECK / SE1-18-429-A7       EMERGENCY GARAGE EXHAUST       SIDEWALL       3,600         GREENHECK / SP-A290       CONTINUOUS GARAGE EXHAUST       CENTRIFUGAL       250         LEADING EDGE / 56001       GARAGE DESTRATIFICATION       CEILING       27,500	MFGR / MODEL       SERVICE       TYPE       CFM       TSP (IN. WG)         GREENHECK / SE1-18-429-A7       EMERGENCY GARAGE EXHAUST       SIDEWALL       3,600       0.5"         GREENHECK / SP-A290       CONTINUOUS GARAGE EXHAUST       CENTRIFUGAL       250       0.25"         LEADING EDGE / 56001       GARAGE DESTRATIFICATION       CEILING       27,500	MFGR / MODEL       SERVICE       TYPE       CFM       TSP (IN. WG)       HP         GREENHECK / SE1-18-429-A7       EMERGENCY GARAGE EXHAUST       SIDEWALL       3,600       0.5"       3/4         GREENHECK / SP-A290       CONTINUOUS GARAGE EXHAUST       CENTRIFUGAL       250       0.25"          LEADING EDGE / 56001       GARAGE DESTRATIFICATION       CEILING       27,500	MFGR / MODEL       SERVICE       TYPE       CFM       TSP (IN. WG)       MOTOR D         GREENHECK / SE1-18-429-A7       EMERGENCY GARAGE EXHAUST       SIDEWALL       3,600       0.5"       3/4          GREENHECK / SP-A290       CONTINUOUS GARAGE EXHAUST       CENTRIFUGAL       250       0.25"        80.7         LEADING EDGE / 56001       GARAGE DESTRATIFICATION       CEILING       27,500        110	MFGR / MODELSERVICETYPECFMTSP (IN. WG)MOTOR DATAGREENHECK / SE1-18-429-A7EMERGENCY GARAGE EXHAUSTSIDEWALL3,6000.5"3/4120/1GREENHECK / SP-A290CONTINUOUS GARAGE EXHAUSTCENTRIFUGAL2500.25"80.7120/1LEADING EDGE / 56001GARAGE DESTRATIFICATIONCEILING27,500110120/1	MFGR / MODELMFGR / MODELMERGENCY GARAGE EXHAUSTTYPECFMTSP (IN. WG)MOTOR DATADRIVEGREENHECK / SE1-18-429-A7EMERGENCY GARAGE EXHAUSTSIDEWALL3,6000.5"3/4120/1DIRECTGREENHECK / SP-A290CONTINUOUS GARAGE EXHAUSTCENTRIFUGAL2500.25"80.7120/1DIRECTLEADING EDGE / 56001GARAGE DESTRATIFICATIONCEILING27,500110120/1DIRECT	MFGR / MODELSERVICETYPECFMTSP (IN. WG)HPWATTSVOLTS/PHDRIVESONESGREENHECK / SE1-18-429-A7EMERGENCY GARAGE EXHAUSTSIDEWALL3,6000.5"3/4120/1DIRECT<16

# LOUVER SCHEDULE

	VER SCHEDULE						
SYMBOL	MFGR / MODEL	SERVICE	MATERIAL	FINISH	FACE SIZE (INCHES)	FREE AREA	REMARKS
L-1	GREENHECK / ESD-435	GARAGE EXHAUST AIR	ALUMINUM	PER ARCH	30"W X 30"H	49%	DRAINABLE BLADE, COLOR AND FINISH PER ARCHITECT
L-2	GREENHECK / ESD-435	GARAGE MAKE-UP AIR	ALUMINUM	PER ARCH	60"W X 30"H	50%	DRAINABLE BLADE, COLOR AND FINISH PER ARCHITECT

### ABBREVIATIONS

ADD.	NEVIATIONS										
A AAV AF AFF AHU ALT AMPS APD ARCH AWT BDD BHD BLDG BUD BLDG BUD BLDG C/A CFM CLG	COMPRESSED AIR AUTOMATIC AIR VENT ACCESS DOOR AIR FOIL ABOVE FINISHED FLOOR AIR HANDLING UNIT ALTERNATE AMPERES AIR PRESSURE DROP ARCHITECTURAL AVERAGE WATER TEMPERATURE BACKDRAFT DAMPER BOTTOM HORIZONTAL DISCHARGE BACKWARD INCLINE BUILDING BOTTOM OF DUCT BRITISH THERMAL UNIT PER HOUR COMBUSTION AIR CUBIC FEET PER MINUTE CEILING	CONT CO CONN CP CUH CW Ø DCGR DCGS DEG DN DWG E/A EAT EF EG ET ESP	CONTINUED CLEANOUT CONNECTION CIRCULATION PUMP CABINET UNIT HEATER COLD WATER DIAMETER DRY COOLER GLYCOL RETURN DRY COOLER GLYCOL SUPPLY DEGREE DOWN DRAWING EXHAUST AIR ENTERING AIR TEMPERATURE EXHAUST FAN ETHYLENE GLYCOL EXPANSION TANK EXHAUST ENTERING WATER TEMPERATURE EXTERNAL STATIC PRESSURE	EGT EXIST FT FPM FPF FC FC FC FD FSD GPH GI GT HB HC HD HGR HGS	ENTERING GLYCOL TEMPERATURE EXISTING FEET FEET PER MINUTE FINS PER FOOT FORWARD CURVE FAHRENHEIT FLOOR CLEAN OUT FIRE DAMPER, FLOOR DRAIN FIRE SMOKE DAMPER NATURAL GAS GALLONS PER HOUR GALLONS PER HOUR GALLONS PER MINUTE GREASE INTERCEPTOR GLYCOL TANK HOSE BIBB HEATING COIL HEAD HEATING GLYCOL RETURN HEATING GLYCOL SUPPLY	HW HWC HP ID IN LAT LF LGT LWT MAU MAX MBH MFGR M/A MIN NC N.C. N.O.	HOT WATER HOT WATER CIRCULATED HORSEPOWER INSIDE DIAMETER INCHES LEAVING AIR TEMPERATURE LINEAL FEET LEAVING GLYCOL TEMPERATURE LIQUID PROPANE GAS LEAVING WATER TEMPERATURE MAKE UP AIR UNIT MAXIMUM THOUSAND BTU PER HOUR MANUFACTURER MAKEUP AIR MINIMUM MOUNTED NOISE CRITERIA NORMALLY CLOSED NORMALLY OPEN	NSF NTS O/A PC PD PG PH PSI R/A RP RL SD SP TEMP TOD TSP TSTAT	NATIONAL SANITARY FOUNDATION NOT TO SCALE OUTSIDE AIR PUMPED CONDENSATE PRESSURE DROP PROPYLENE GLYCOL PHASE POUNDS PER INCH RETURN AIR RADIANT PANEL REVOLUTIONS PER MINUTE RAIN LEADER SUPPLY AIR STORM DRAIN STATIC PRESSURE TEMPERATURE TOP HORIZONTAL DISCHARGE TOP OF DUCT TOTAL STATIC PRESSURE THERMOSTAT	TW TWC TYP UBD UH VEL VF VFD VTR WC WG WCO WHA WH W/ W/O WPD YCO	TEMPERED WATER TEMPERED WATER CIRCULATED TYPICAL UP BLAST DISCHARGE UNIT HEATER VENT VELOCITY VELOCITY VENTILATION FAN VARIABLE FREQUENCY DRIVE VENT THROUGH ROOF WATER COLUMN WATER GAGE WALL CLEAN OUT WATER HAMMER ARRESTOR WATER HEATER WASTE WITH WITHOUT WATER PRESSURE DROP YARD CLEAN OUT

HED	ULE								
		MINIMU	M CONNE	CTION SIZE	-				
	CW	HW	WASTE	VENT	TRAP	MANUFACTURER	MODEL	COLOR	TRIM / REMARKS
			2"	1-1/2"	2"	J.R. SMITH	2005-A		ROUND TOP, TRAP PRIMER CONNECTION
						ZURN	Z882		DUCTILE IRON SLOTTED GRATE - CLASS F, PROVIDE CLOSED END CAPS AT BOTH ENDS, NO PLUMBED CONNECTIONS

C VENT KIT, CONDENSATE pH NEUTRALIZING KIT VENT KIT, CONDENSATE pH NEUTRALIZING KIT

MOTOR SIDE GUARD, FIELD MOUNTED SPEED CONTROLLER

OF CONTROLLERS AS SHOWN ON PLANS

	HE OF HE OF H	ALAS Victoria Hickman 14669 24/15 ESSIONAL
		ONE INCH (1"
		REVISIO
		B
		DATE
	COCONCISENTIAL PAY, ZIETLOW & ASSOCIATES, LLC	architecture · engineering · surveying Tel. (907) 562-1012 Fax (907) 562-1013 Part (907) 562-1013 Part (907) 562-1013 Pax (907) 562-1013 Pax (907) 562-1013 Pax (907) 562-1013 Part (907)
	ALCANTRA MEOC VEHICLE GARAGE WASILLA, ALASKA	SCHEDULES, LEGEND, AND ABBREVIATIONS
ONE INCH (1")	SHEET SIZE: DESIGNED BY: DRAWN BY: CHECKED BY: DATE: FILE NO. SHEFT N	AS NOTED TCH TCH/CCH 04/24/15 2015.005 NUMBER
	M1	of <b>4</b>

### SPECIFICATIONS

PLANS THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR NECESSARY FOR A COMPLETE AND OPERABLE SYSTEM. THE DRAWINGS ARE PARTLY DIAGRAMMATIC, NOT NECESSARILY SHOWING ALL OFFSETS OR EXACT LOCATIONS OF PIPING AND DUCTS UNLESS SPECIFICALLY DIMENSIONED.

ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE LATEST ADOPTED EDITION OF THE INTERNATIONAL BUILDING CODE (IBC), 2009 EDITION, INTERNATIONAL MECHANICAL CODE (IMC), 2009 EDITION, UNIFORM PLUMBING CODE (UPC), 2009 EDITION, INTERNATIONAL FUEL GAS CODE (IFGC), 2009 EDITION AND NATIONAL ELECTRICAL CODE (NEC), 2011 EDITION. SHEET METAL WORK SHALL BE DONE IN ACCORDANCE WITH SMACNA STANDARDS.

### PERMITS

THE CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY PERMITS AND FEES.

#### WARRANTY

ALL WORK PERFORMED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM ACCEPTANCE. ANY FAULTY MATERIALS OR WORKMANSHIP SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER DURING THE GUARANTEE PERIOD.

#### MATERIALS

ALL MATERIALS SHALL BE NEW AND UNUSED, INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS AND IN THE BEST PRACTICE OF THE CRAFT. OBTAIN OWNER'S APPROVAL OF ALL PRODUCTS PRIOR TO ORDERING OR INSTALLING ANY PART OF ANY SYSTEM.

#### EQUIPMENT SUBSTITUTIONS

ALL EQUIPMENT LISTED IS REPRESENTATIVE OF THE STANDARD OF QUALITY AND PERFORMANCE REQUIRED. "OR EQUAL" SUBSTITUTIONS WILL BE CONSIDERED IF THE SUBSTITUTES ARE SHOWN TO BE EQUAL OR BETTER QUALITY, INCLUDING EFFICIENCY OF PERFORMANCE, SIZE AND WEIGHT.

#### SUBMITTALS

THE CONTRACTOR SHALL SUBMIT PRODUCT DATA COMPILED IN A BOUND NOTEBOOK FOR MECHANICAL SYSTEMS. PRODUCT DATA SHALL BE APPROPRIATELY MARKED TO INDICATE PROPOSED PRODUCT.

#### OPERATION AND MAINTENANCE MANUAL

PROVIDE THE OWNER WITH AN OPERATING AND MAINTENANCE MANUAL, TO INCLUDE MANUFACTURER'S SPECIFICATIONS, OPERATING AND MAINTENANCE INSTRUCTIONS, WARRANTY INFORMATION ON EACH PIECE OF EQUIPMENT, START-UP REPORTS, BALANCE REPORT AND A SOURCE OF SUPPLY FOR SPARE PARTS AND SERVICE.

#### ACCESS

PROVIDE WORKABLE ACCESS TO ALL SERVICEABLE AND/OR OPERABLE EQUIPMENT. PROVIDE ACCESS DOOR OF REQUIRED RATING FOR ACCESS TO ALL SERVICEABLE AND/OR OPERABLE EQUIPMENT LOCATED ABOVE HARD CEILINGS OR IN WALLS.

#### SLEEVES

PIPING SLEEVES THROUGH FIRE RATED ASSEMBLIES SHALL BE PREMANUFACTURED, UL LISTED ASSEMBLIES. PIPING SLEEVES THROUGH NON FIRE RATED ASSEMBLIES SHALL BE 18 GAUGE GALVANIZED STEEL.

SUPPORTS AND ANCHORS PIPING, DUCTWORK AND EQUIPMENT SHALL BE ADEQUATELY SUPPORTED IN ACCORDANCE WITH CODE REQUIREMENTS AND GOOD PRACTICE. PIPING SUPPORTS SHALL BE CARBON STEEL, ADJUSTABLE SWIVEL HANGERS WITH THREADED ROD SUPPORT. INSULATED PIPING SHALL BE ROUTED THROUGH HANGERS AND PROVIDED WITH SHEETMETAL INSULATION PROTECTION SADDLES. ALL SUPPORTS SHALL BE SECURED TO BUILDING STRUCTURAL ELEMENTS. PIPE ANCHORS SHALL BE CONTRACTOR FABRICATED AND SECURED TO BUILDING STRUCTURE TO RESIST PIPING MOVEMENT.

#### SEISMIC RESTRAINT

PIPING AND DUCTWORK SYSTEMS SHALL BE SEISMICALLY RESTRAINED IN ACCORDANCE WITH SMACNA GUIDELINES FOR SEISMIC RESTRAINT - THIRD EDITION (2008). EQUIPMENT, PIPING AND DUCTWORK SYSTEMS SHALL BE SEISMICALLY RESTRAINED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE AND ASCE 7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEISMIC RESTRAINT DESIGN FOR ALL PIPING, DUCTWORK AND EQUIPMENT USING PREMANUFACTURED SYSTEMS. AMBER BOOTH OR EQUAL, OR BY RETAINING THE SERVICES OF A PROFESSIONAL STRUCTURAL ENGINEER LICENSED BY THE STATE OF ALASKA. IF REQUIRED, THE CONTRACTOR SHALL PROVIDE STRUCTURAL ENGINEERING CALCULATIONS FOR REVIEW AND APPROVAL BASED ON ACTUAL PIPING LAYOUT, ACTUAL DUCT LAYOUT AND ACTUAL EQUIPMENT TO BE USED ON THE PROJECT TO THE AUTHORITY HAVING JURISDICTION.

#### MECHANICAL IDENTIFICATION

PIPING AND EQUIPMENT SHALL BE PROVIDED WITH IDENTIFICATION. PIPING, CONCEALED OR EXPOSED, SHALL BE LABELED WITH PREFABRICATED, EMI-RIGID PLASTIC, WRAP AROUND PIPE MARKERS OR PAINTED STENCIL, INDICATING SERVICE AND FLOW DIRECTION, AT NOT LESS THAN 20 FEET ON CENTER AND AT EACH SIDE OF WALL, FLOOR, OR CEILING PENETRATIONS. EQUIPMENT SHALL BE LABELED WITH PLASTIC NAMEPLATES.

### INSULATION

ABOVEGROUND COLD WATER AND HOT WATER PIPING SHALL BE INSULATED WITH 1" PRE-FORMED FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER JACKET AND PREMANUFACTURED PLASTIC FITTING COVERS. UNDERGROUND COLD WATER PIPING SHALL BE INSULATED WITH 1" CLOSED CELL FOAM INSULATION. PLUMBING VTR'S SHALL BE INSULATED WITH 1" PRE-FORMED FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER JACKET DOWN TO 3' WITHIN THE BUILDING. EXHAUST DUCTWORK AND MAKE-UP AIR DUCTWORK SHALL BE INSULATED WITH 2" RIGID FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER WITH CANVAS COVERING FINISH.

SANITARY WASTE AND VENT PIPING SHALL BE ABS DWV. UNDERGROUND TRAP PRIMER PIPING SHALL BE PEX PIPING OR COPPER TUBING LISTED FOR POTABLE WATER APPLICATIONS. WATER PIPING SHALL BE TYPE L COPPER, ASTM B88. SOLDER SHALL BE LEAD-FREE, APPROVED FOR POTABLE WATER APPLICATIONS. CONDENSATE PIPING SHALL BE CORROSION RESISTANT PVC PIPING WITH CORROSION RESISTANT FITTINGS OR MATERIAL APPROVED BY THE CONDENSATE PRODUCING APPLIANCE MANUFACTURER. GAS PIPING SHALL BE ASTM A53 SCHEDULE 40 BLACK STEEL. GAS PIPING FITTINGS SHALL BE ASME B16.3 MALLEABLE IRON THREADED FOR LOW PRESSURE OR ASTM A234/A234M FORGED STEEL WELDING TYPE FOR MEDIUM PRESSURE. GAS PIPING JOINTS SHALL BE PER NFPA 54, SCREWED FOR PIPE TWO INCHES AND UNDER AND LOW PRESSURE, OR IF MEDIUM PRESSURE OUTSIDE THE BUILDING. ROUTE PIPES PARALLEL WITH BUILDING LINES UNLESS OTHERWISE INDICATED. CONCEAL ALL PIPING IN FINISHED AREAS UNLESS AUTHORIZED BY OWNER.

#### VALVES

BALL VALVES OR BUTTERFLY VALVES. GATE VALVES AND GLOBE VALVES ARE NOT ACCEPTABLE. VALVES FOR GAS SERVICE SHALL BE AGA APPROVED. PROVIDE ISOLATION VALVES AT EACH PLUMBING FIXTURE. PROVIDE GAS ISOLATION VALVES AT EACH GAS APPLIANCE.

PLUMBING FIXTURES SHALL BE COMMERCIAL GRADE, MANUFACTURER AND MODEL AS INDICATED ON THE PLUMBING FIXTURE SCHEDULE, OR APPROVED EQUAL. PROVIDE SHOCK-TROL DEVICES AT ALL FIXTURES.

HEATING EQUIPMENT SHALL BE COMMERCIAL GRADE, MANUFACTURER AND MODEL AS INDICATED ON THE EQUIPMENT SCHEDULES, OR APPROVED EQUAL GAS FIRED APPLIANCE VENT AND COMBUSTION AIR MATERIAL SHALL BE SCHEDULE 40 PVC OR MATERIAL APPROVED BY THE GAS FIRED APPLIANCE MANUFACTURER.

#### VENTILATION

VENTILATION EQUIPMENT SHALL BE COMMERCIAL GRADE, MANUFACTURER AND MODEL AS INDICATED ON THE EQUIPMENT SCHEDULES, OR APPROVED EQUAL. DUCTWORK SHALL BE GALVANIZED SHEET METAL. RECTANGULAR OR ROUND AS INDICATED ON PLANS. DUCTWORK SHALL BE CONSTRUCTED, INSTALLED, AND TESTED IN ACCORDANCE WITH SMACNA STANDARDS. CONTROL DAMPERS SHALL BE ALUMINUM AIR FOIL BLADES INJECTED WITH FOAM INSULATION FOR A MINIMUM R-VALUE OF 4.9. PROVIDE CONTROL DAMPERS WITH BLADE AND EDGE SEALS RATED TO -40°F WITH LEAKAGE LESS THAN 3 CFM/FT<sup>2</sup> AT 1" WATER COLUMN PRESSURE.

#### CONTROLS SYSTEMS

THE CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERATIONAL CONTROL SYSTEM AS REQUIRED TO PROVIDE EQUIPMENT CONTROL AS SPECIFIED UNDER THE SEQUENCE OF OPERATIONS. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, POWER, WIRING, CONDUIT, CONTROLLERS, ACTUATORS, AND ASSOCIATED CONTROL COMPONENTS FOR A COMPLETE AND OPERATIONAL SYSTEM. MOUNT THERMOSTATS AND SPEED CONTROLLERS AT 48" ABOVE FINISH FLOOR.

#### TEST AND START-UP

TEST ALL PLUMBING PIPING SYSTEMS IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE. TEST ALL GAS PIPING SYSTEMS IN ACCORDANCE WITH THE INTERNATIONAL FUEL GAS CODE. FLUSH, DRAIN AND STERILIZE DOMESTIC WATER PIPING SYSTEMS IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE.

#### BALANCE

THE CONTRACTOR SHALL BALANCE THE AIR SYSTEMS TO WITHIN +-10% OF INDICATED AIRFLOWS, PER AABC RECOMMENDED METHODS. SUBMIT BALANCE REPORT FOR REVIEW.

# SEQUENCE OF OPERATION

GAS FIRED UNIT HEATER ( $\underline{GUH} - 1$  AND  $\underline{GUH} - 2$ ) SPACE THERMOSTAT MAINTAINS SET POINT BY CYCLING UNIT'S FAN MOTOR AND GAS BURNER. THERMOSTAT SHALL BE LOW VOLTAGE ELECTRIC SWITCH ACTION WITH THERMISTOR SENSOR, DIGITAL DISPLAY, AND ADJUSTABLE SET POINT. INITIALLY SET THERMOSTAT TO 70°F (ADJUSTABLE).

ELECTRIC UNIT HEATER (EUH-1) LOW VOLTAGE SPACE THERMOSTAT MAINTAINS THERMOSTAT SET POINT BY CYCLING UNIT'S FAN MOTOR AND HEATING ELEMENT. INITIALLY SET THERMOSTAT TO 55°F (ADJUSTABLE).

EXHAUST FAN (EF-1) UPON DETECTION OF CARBON MONOXIDE (CO) FROM THE CO SENSOR OR ACTIVATION VIA LOCAL ON-OFF TIMER WALL SWITCH, THE EXHAUST FAN SHALL OPERATE AND THE EXHAUST FAN CONTROL DAMPER AND MAKE-UP AIR CONTROL DAMPER SHALL BOTH OPEN. TIMER WALL SWITCH SHALL BE LOW VOLTAGE WITH LCD DISPLAY, VARIOUS RUN TIME SELECTIONS, AND MANUAL OFF FEATURE. TIMER WALL SWITCH SHALL NOT BE ABLE TO OVERRIDE FAN OPERATION IF FAN IS OPERATING UPON CO DETECTION.

EXHAUST FAN (EF-2) FAN SHALL OPERATE CONTINUOUSLY. PROVIDE UNIT MOUNTED ON-OFF CONTROL SWITCH FOR MAINTENANCE.

DESTRATIFICATION FAN (DF-1 AND DF-2) UPON ACTIVATION FROM DIAL ON-OFF WALL SWITCH, VARIABLE SPEED FAN MOTOR SHALL OPERATE AT THE DIAL SPEED SELECTED.

	S. 49 TH 	ALASA ALASA Necesiana Hickman Hickman Hickman Hickman ONE INCH (1'
	LATES, LLC	1. Šuite 240 5503 77) 562-1013 NO DATE BΥ
	Activity of the second	architecture engineering surveying Tel. (907) 562-1012 Fax (9 DMVA
	ALCANTRA MEOC VEHICLE GARAGE WASILLA, ALASKA	SPECIFICATIONS AND SEQUENCE OF OPERATION
ONE INCH (1")	SHEET SIZE: DESIGNED BY: DRAWN BY: CHECKED BY: DATE: FILE NO.	AS NOTED TCH TCH/CCH 04/24/15 2015.005

![](_page_18_Figure_0.jpeg)

![](_page_18_Figure_1.jpeg)

![](_page_18_Figure_14.jpeg)

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FILE NO. 2015.005 SHEET NUMBER	SHEET SIZE: DESIGNED BY:	AS NOTED TCH	
	SHEET SIZE: DESIGNED BY: DRAWN BY: CHECKED BY: DATE:	AS NOTED TCH TCH/CCH 04/24/15	

	ELECTRICAL SYMBOLS LEGEND							
Ю	LIGHT FIXTURE – SURFACE WALL MOUNTED	Δ	PANEL					
	4' PENDANT/FLUORESCENT FIXTURE - SURFACE MOUNTED	Ð	DUPLEX RECEPTACLE					
	PENDANT/FLUORESCENT FIXTURE - SURFACE MOUNTED 1'x4'	⇔	GROUND FAULT CURRE					
	FIXTURE WITH EMERGENCY BACK-UP	۲	SPECIAL PURPOSE REC					
•	EXIT LIGHT – CEILING MOUNTED	O	JUNCTION BOX					
HÐ	EXIT LIGHT – WALL MOUNTED	C	DISCONNECT SWITCH					
4	SELF-CONTAINED EMERGENCY LIGHT	\$-	FRACTIONAL HP MOTOF					
$\langle x \rangle$	FIXTURE IDENTIFICATION (LETTER INDICATES TYPE)	\$	MOTOR					
\$	SINGLE POLE SWITCH	WP	WEATHERPROOF					
<b>\$</b> 3 <b>\$</b> 4	THREE WAY SWITCH AND FOUR WAY SWITCH	GF	GROUND FAULT CIRCU					
\$TMR	ON-OFF TIMER WALL SWITCH	D®	REMOTE HEAD ASSOCI					
\$sc	SPEED CONTROL SWITCH	₽	QUADRAPLEX RECEPTA					
	CONDUIT, CONCEALED	EM	FIXTURE WITH EMERGE					
#10 <sub>\\\\</sub>	NUMBER AND SIZE OF WIRES (NO SLASHES = $3#12$ )							
A-2	HOMERUN TO PANEL (PANEL AND CIRCUIT No.)							
	NOTE TAG (No. INDICATES NOTE)							
Ю	PHOTOCELL							

PANEL A SCHEDULE 20								200A	MLC	)	
		1	<b>I</b>	1	20/240V	,1PH,3W	/				
Т Х	MP	OLE		PHAS	SE A	PHAS	E B		OLE	MP	ТХ
	20	1		360	1200	V	1			50	$\frac{1}{2}$
3	20	1	REC - MECH/ELEC	500	4200	360	4200		$\frac{1}{2}$	$\sim$	
5	20	1	REC - MECH/ELEC	360	4200	000	4200	REC-50A VEHICLE SHORE POWER	<u> </u>	50	
	20	1	REC - MECH/ELEC	000	4200	360	4200		$\frac{1}{2}$	$\overline{}$	8
	20	1		720	1250	500	7200	FUH-1	<u> </u>	20	10
$\left  \frac{1}{11} \right $	20	1	REC-GARAGE	120	1200	540	1250		$\frac{1}{2}$	$\overline{}$	12
13	20	1	REC-GARAGE	540	1180	010	1200	GUH-1	$\frac{1}{1}$	20	14
15	20	1	REC-GARAGE			540	1180	GUH-2	1	20	16
17	20	1	OVERHEAD DOOR	1660	305	0.0		DF-1 (2). EF-2	1	20	18
19	20	1	OVERHEAD DOOR	<u>-</u>		1660	1660	EF-1	1	25	20
21	20	1	LTG-GARAGE	1210	500			CO DETECTOR	1	20	22
23	20	1	LTG-GARAGE			970		SPARE	1	20	24
25	20	1	LTG-MEZZ, ELEC, BELOW MEZZ	1115		•		SPARE	1	20	26
27	20	1	LTG-EXTERIOR	· · · ·		435		SPARE	1	20	28
29	20	1	REC-EXTERIOR	360				SPARE	1	20	30
31	20	1	REC-EXTERIOR			360		SPARE	1	25	32
33	20	1	SPARE					SPARE	1	25	34
35	20	1	SPARE					SPACE	1	-	36
37	-	1	SPACE					SPACE	1	-	38
39	-	1	SPACE					SPACE	1	-	40
41	-	1	SPACE					SPACE	1	-	42
CON	INEC	TED	LOAD (VA)		17,960		17,715	35,67	'5 VA		
CON	INEC	TED	LOAD (AMPERES)		150		148	14	9 A		
DEM	1AND	LOA	AD (VA)		19,149		18,685	37,83	4 VA		
DEN	1AND	LOA	D (AMPERES)		160		156	15	8 A		
AMF	PERE	INTE	ERUPT RATING				AS IND	ICATED BY THE FAULT CURRENT ANA	LYSIS	; 	
E - E	EXIST	'ING	LOAD TO REMAIN.								

![](_page_20_Figure_2.jpeg)

### **DETAIL NOTES:**

- 1. IMMEDIATELY UPON PROJECT INCEPTION THE CONTRACTOR SHALL COORDINATE WITH MEA FOR THE INSTALLATION OF A NEW ELECTRICAL SERVICE TO THE NEW BUILDING AS SHOWN. ALL EQUIPMENT AND INSTALLATION SHALL COMPLY WITH MEA STANDARDS AND THE LATEST ADOPTED NEC. THE CONTRACTOR SHALL SUBMIT DETAILED INFORMATION REGARDING THE PROPOSED SERVICE ENTRANCE EQUIPMENT AND LOCATION ON THE BUILDING TO THE UTILITY COMPANY FOR APPROVAL PRIOR TO ORDERING ANY EQUIPMENT.
- 2 PROVIDE GROUNDING ELECTRODE SYSTEM AS FOLLOWS: #4 CU. TO WATER MAIN, #4 CU. TO BUILDING STEEL, 20' OF #4 CU. ENCASED IN FOOTING CONCRETE AND BONDED TO REBAR. AND #4 CU. TO DRIVEN ROD ELECTRODES.
- (3) INTERSYSTEM BONDING TERMINATION PER NEC 250.94 FOR CONNECTION TO COMMUNICATIONS BONDING AND GROUNDING CONDUCTORS.

# **ELECTRICAL DISTRIBUTION SYSTEM - SINGLE LINE DIAGRAM**

SCALE: NONE

E1

ENT INTERRUPTER RECEPTACLE
CEPTACLE
R SWITCH
JIT INTERRUPTER
IATED W/ EMERGENCY LIGHT
ACLE
ENCY BATTERY BACK-UP

		LIGHTING FIXTURE SCHEDULE				
	MANUFACTURER AND		LAN	<b>I</b> P	MOUNT	ING
TIPE	MODEL NUMBER	DESCRIPTION	TYPE	QUANTITY	TYPE	HEIGHT
$\langle A \rangle$	LITHONIA #IBZ-454L- GEB10PS90-(EL14)	4' FLUORESCENT HIGHBAY WITH NARROW DISTRIBUTION, MULTI-VOLT BALLAST, EMERGENCY BATTERY (120V) WHERE INDICATED AND MOUNTING AND ACCESSORIES AS REQUIRED	54W/T5HO	4	SURFACE/ PENDANT	CEILING
$\langle B \rangle$	LITHONIA #Z-2-54T5HO-MVOLT- GEB10-WGZ46-(EL65)	4' LOW-PROFILE FLUORESCENT STRIPLIGHT, WITH MULTI-VOLT BALLAST, WIREGUARD, AND EMERGENCY BATTERY (120V) WHERE INDICATED.	54W/T5HO	2	SURFACE/ PENDANT	CEILING
$\langle C \rangle$	LITHONIA #Z-2-28T5-MVOLT- GEB10-WGZ46-EL65	4' LOW-PROFILE FLUORESCENT STRIPLIGHT, WITH MULTI-VOLT BALLAST, WIREGUARD, AND EMERGENCY BATTERY (120V) WHERE INDICATED.	28W/T5	2	SURFACE	CEILING UNDER MEZZANINE
$\langle D \rangle$	LITHONIA #TWR1-LED-2-40K- MVOLT	LED WALLPACK WITH 3500 LUMENS, 4000K, MULTI-VOLT DRIVER, AND TEXTURED DARK BRONZE FINISH.	39W LED	_	WALL	(VERIFY WITH ARCH.)
E	LITHONIA #OLW14-FCOSM24	OUTDOOR GENERAL PURPOSE LED WALLPACK FIXTURE WITH PHOTOCELL, BRONZE FINISH, 120V INPUT, FULL CUTOFF SHIELD.	18W LED	_	SURFACE/ WALL	ABOVE DOOR/BELOW CANOPY
	LITHONIA #LQM-S-W-3-R- 120/277-ELN	SELF CONTAINED EMERGENCY EXIT SIGN WITH MAINTENANCE FREE NICKEL CADMIUM BATTERY. PROVIDE WITH MOUNTING, QUANTITY OF FACES, & DIRECTIONAL ARROWS AS INDICATED ON DRAWINGS	LED	N/A	WALL	ABOVE DOOR
	LITHONIA #LHQM-S-W-3-R- 120/277-HO-RO	SELF CONTAINED EMERGENCY EXIT SIGN WITH HIGH OUTPUT BATTERY, W/ OUT EMERGENCY HEADS, CAPABLE OF PROVIDING ADDITIONAL 90 MINUTES OF CAPACITY (24W) FOR REMOTE HEAD.	LED	N/A	WALL	ABOVE DOOR
$\mathbb{R}$	LITHONIA #ELA—TNX—H0606	COMPACT REMOTE EMERGENCY EXTERIOR FLOODLIGHT (6V) WITH WET LOCATION LISTING	6W 6V	2	WALL	8' (VERIFY) SEE ARCH. ELEVATIONS
NOTES	TO LIGHTING FIXTURE	SCHEDULE:				

1. VERIFY AND COORDINATE EXACT LOCATIONS AND HEIGHTS TO AVOID CONFLICTS WITH BEAMS, OVERHEAD DOORS, MECHANICAL DUCTWORK, ETC. PROVIDE MOUNTING HARDWARE AND SEISMIC BRACING AS REQUIRED.

### **GENERAL NOTES:**

- 1. ALL WORK SHALL BE PERFORMED IN A NEAT AND PROFESSIONAL MANNER USING GOOD ENGINEERING PRACTICES AND SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE, INTERNATIONAL BUILDING CODE, AND INTERNATIONAL FIRE CODE INCLUDING ALL STATE AND LOCAL AMENDMENTS.
- 2. COORDINATE EXACT LOCATIONS AND REQUIREMENTS OF MECHANICAL ITEMS PRIOR TO ROUGH-IN. PROVIDE ALL REQUIRED CONTROLS AND CONNECTIONS AS NEEDED FOR FULLY OPERATIONAL SYSTEMS, AND THE INTENDED OPERATION AS INDICATED BY MECHANICAL SEQUENCE OF OPERATIONS.
- 3. COORDINATE WITH MECHANICAL AND OTHER TRADES TO ENSURE THAT THE ELECTRICAL PANELS AND DISTRIBUTION EQUIPMENT ARE PROVIDED WITH THE NEC REQUIRED WORKING CLEARANCES.
- 4. COORDINATE EXACT HEIGHTS AND LOCATIONS OF ELECTRICAL DEVICES WITH ARCHITECTURAL, FURNITURE, AND EQUIPMENT DRAWINGS PRIOR TO ROUGH-IN.
- 5. GFCI RECEPTACLES SHALL BE LOCATED IN A READILY ACCESSIBLE LOCATION PER NEC 210.8. IF NOT POSSIBLE, PROVIDE CIRCUITS SUPPLIED BY A 5mA GFCI CIRCUIT BREAKER.
- 6. ALTHOUGH NOT SHOWN, AND UNLESS CONDUCTORS ENTER THE BOX THROUGH A RACEWAY, SWITCH BOXES SHALL INCLUDE A "GROUNDED CONDUCTOR" (NEUTRAL) OF THE CONTROLLED LIGHTING CIRCUIT AS REQUIRED BY NEC 404.2(C).
- 7. SIZE CONDUCTORS TO PROVIDE MAXIMUM VOLTAGE DROP NOT TO EXCEED 2% IN BRANCH CIRCUITS AND A MAXIMUM OF 3% IN FEEDERS. IN GENERAL, FOR A 20 AMP 120 VOLT CIRCUIT, MINIMUM WIRE SIZE SHALL BE #12 (CU.) FOR BRANCH CIRCUITS LESS THAN 70', #10 (CU.) FOR CIRCUITS 70' TO 125' AND #8 (CU.) FOR CIRCUITS 125' TO 200'.
- 8. PROVIDE SEISMIC BRACING AND SUPPORT FOR ALL ELECTRICAL EQUIPMENT AS REQUIRED BY THE IBC AND OTHER APPLICABLE CODES. EQUIPMENT TO BE BRACED AND SUPPORTED MAY INCLUDE BUT IS NOT LIMITED TO LIGHTS, PANELS, CONDUIT, ETC.

FAULT CURR
BASIS OF CALCULATIONS: DA <u>VARIABLE</u> PRIMARY BUS UTILITY TRANSFORMER RATING VOLTAGE (LINE TO LINE) UTILITY TRANSFORMER IMPEDA SERVICE LATERAL LENGTH SERVICE LATERAL CONDUCTOR CONDUCTORS PER PHASE
LOCATION
$\langle xx, xxx \rangle$
CONTRACTOR TO CONFIRM ACTUAL CALCULATION VARIABLES WITH SER EQUIPMENT. IF ELECTRICAL UTILITY DEVIATES FROM THE BASIS ITEMIZE CONSULT WITH THE ENGINEER OF RATING REQUIRED FOR ELECTRICAL EQUIPMENT SHALL BE RATED FOR LABELED PER NEC 110.24 WITH T CURRENT WITH THE DATE THE CAL

FEEDER SCHEDULE								
TAG ID	QUANTITY	CONDUIT	CONDUCTORS					
200	1 RUN	2"	2 <b>#¾,1#¾,1#6</b> G					
	NOTES	TO FEE	DER SCHEDULE:					
1. CONDUCT CONDUIT CIRCUITS GREATER INSULATE	TOR SIZING PER NEC T LESS THAN THAN 100 D CONDUCT	BASED ON ( ABLE 310.1 100 AMPS AMPS. CONI ORS IN EMT	COPPER CONDUCTORS IN METALLIC 5(B)(16) USING 60°C RATING FOR AND 75°C RATING FOR CIRCUITS DUIT SIZING BASED ON TYPE XHH CONDUIT PER NEC TABLE C1.					
2. UNLESS FOR MOT	NOTED OTHE	ERWISE NEU <sup>-</sup> S AND TRAN	TRAL CONDUCTOR NOT REQUIRED SFORMER PRIMARY FEEDERS.					

### RENT ANALYSIS

DATE OF	CALCULATION: 03/16/2015
	VALUE
	INFINITE MVA
TING	50 KVA
	120/240 VOLIS, 1Ø
	1.2% 30 FT
CTOR SIZE	4/0 kcmil Al
5	1
	NON-MAGNETIC

SHORT CIRCUIT CURRENT SEE DRAWINGS FOR CURRENT

VALUES OF ABOVE LISTED VING UTILITY PRIOR TO ORDERING EQUIPMENT AND INSTALLATION ZED ABOVE, THE CONTRACTOR SHALL RECORD TO CONFIRM THE AIC DISTRIBUTION EQUIPMENT. ALL AVAILABLE FAULT CURRENT AND THE MAXIMUM AVAILABLE FAULT LCULATIONS WERE PERFORMED.

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	BCC BRE Roje	ETT A. B EE-104 • <b>4-24</b>			
]		PROFES	ONE II	NCH	(1")
					REVISION
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					DATE
					NO
		HAY, ZIETLOW & ASSOCIATES, Mechanical & Electrical Consulting Engl	architecture engineering surveying Tel. (907) 562-1012 Fax (907) 562-1		
	ALCANTRA MEOC VEHICLE GARAGE	WASILLA, ALASKA	ELECTRICAL LEGEND, FIXTURE		SUREDULE, AND RISER DIAGRAM
ONE INCH (1")	SHEET SI DESIGNE DRAWN E CHECKEE DATE: FILE NO. SHE	ZE: D BY: SY: D BY: ET N	AS 04, 20 UMBI	NO1 B B /24, 115.0 ER	ED AB AB (15) 005

![](_page_21_Figure_0.jpeg)

![](_page_22_Figure_0.jpeg)

/8

-3

WF

### SHEET NOTES:

- COORDINATE WITH GENERAL CONTRACTOR TO ENSURE NEC REQUIRED WORKING CLEARANCES AND SPACES ARE MAINTAINED AROUND ELECTRICAL EQUIPMENT SUCH AS DISTRIBUTION EQUIPMENT, PANELS, DISCONNECTS, MOTOR STARTERS, ETC. PER NEC 110.26. WHERE NECESSARY, PROVIDE STRUCTURAL CHANNEL (UNISTRUT) SUPPORT FOR INSTALLATION.
- 2. COORDINATE EXACT LOCATIONS AND REQUIREMENTS OF MECHANICAL ITEMS PRIOR TO ROUGH-IN. PROVIDE ALL REQUIRED APPURTENANCES AND POWER AND CONTROL CONNECTIONS AS NEEDED FOR EQUIPMENT TO OPERATE AS COMPLETE AND FULLY OPERATIONAL SYSTEMS AS INTENDED AND INDICATED IN THE DRAWINGS, SPECIFICATIONS, AND IN THE SEQUENCE OF OPERATIONS. ALL REQUIRED LINE AND LOW VOLTAGE CONNECTIONS INCLUDING INTERCONNECTING CONTROL WIRING, MAY NOT BE SHOWN IN THESE DRAWINGS, BUT MAY BE REQUIRED, AND IF SO ARE TO BE PROVIDED. REFERENCE MECHANICAL DOCUMENTS FOR LOCATIONS AND REQUIREMENTS.
- 3 50A, 120/240V RECEPTACLES FOR VEHICLE SHORE POWER. COORDINATE FINAL OUTLET CONFIGURATION AND LOCATION WITH OWNER PRIOR TO ROUGH-IN.
- 4 PROVIDE CONDUIT STUBBED FROM ELECTRICAL ROOM TO ACCESSIBLE AREA UNDER MEZZANINE AND IN MAIN GARAGE FOR FUTURE TELECOMMUNICATION SYSTEMS.
- 5 PROVIDE 4" CONDUIT STUB TO OUTSIDE BUILDING FOR FUTURE TELECOMMUNICATION FEEDERS INTO THE BUILDING.
- 6 4'X8'X<sup>3</sup>/<sub>4</sub>" FIRE RETARDANT AC PLYWOOD, FINISHED WITH FIRE RETARDANT PAINT.
- 7 PROVIDE CONTROL CONNECTIONS BETWEEN CARBON MONOXIDE DETECTOR AND EF-1 AS REQUIRED BY MECHANICAL SEQUENCE OF OPERATIONS.
- 8 3/4" CONDUIT, 2#6,1#10.

(9) COORDINATE WITH MECHANICAL FOR THE PROVIDING, INSTALLATION, AND ANY REQUIRED CONNECTIONS BETWEEN THE ON-OFF TIMER WALL SWITCH AND EF-1. SEE MECHANICAL DRAWINGS 1/M4 AND MECHANICAL SEQUENCE OF OPERATIONS.

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		HAY, ZIETLOW & ASSOCIATES,	Mechanical Generating Engineerical Consulting Engineerical Consultance and Con	architecture • engineering • surveying Tel. (907) 562-1012 Fax (907) 562-1		DMVA
	ALCANTRA MEOC VEHICLE GARAGE	WASILLA, ALASKA		POWER AND SIGNAL PLAN		
ONE INCH (1")	SHEET S DESIGNI DRAWN CHECKE DATE: FILE NO.	BY: D BY: D BY: EET	/: : : NU	AS 04, 20 MBI	N0 <sup>-</sup> E (24, 115.( ER	TED 3AB 3AB 3AB /15 005

### **ELECTRICAL SPECIFICATIONS:**

GENERAL CONDITIONS – PROVIDE AND INSTALL ALL LABOR, MATERIAL, AND EQUIPMENT FOR A COMPLETE AND PROPERLY OPERABLE ELECTRICAL SYSTEM AS DESCRIBED ON THE DRAWINGS AND IN THESE SPECIFICATIONS. ALL WORK SHALL BE PERFORMED IN A NEAT AND PROFESSIONAL MANNER USING GOOD ENGINEERING PRACTICES. ALL NEW WORK AND EXISTING WORK MODIFIED BY THIS PROJECT SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE, NFPA, INTERNATIONAL BUILDING CODE, AND INTERNATIONAL FIRE CODE INCLUDING ALL STATE AND LOCAL CODES AND AMENDMENTS. THIS CONTRACTOR SHALL INQUIRE INTO AND COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS.

THE CONSTRUCTION DRAWINGS ARE DIAGRAMMATIC, NOT NECESSARILY SHOWING ALL FEATURES OR EXACT LOCATIONS OF FIXTURES, EQUIPMENT, ETC. UNLESS SPECIFICALLY NOTED OTHERWISE. THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS FOR EQUIPMENT TO BE PROVIDED BY OTHER DIVISIONS AND REQUIRING INSTALLATION AND/OR CONNECTION IN ACCORDANCE WITH THIS SECTION. APPARENT CONFLICTS BETWEEN PLANS AND SPECIFICATIONS, GOVERNING CODES OR UTILITIES REGULATIONS AS WELL AS UNCLEAR DIRECTIVES SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. CODES, ORDINANCES, REGULATIONS, MANUFACTURER'S INSTRUCTIONS OR OTHER ESTABLISHED STANDARDS SHALL TAKE PRECEDENCE WHEN THEY ARE MORE STRINGENT OR CONFLICT WITH THE DRAWINGS AND SPECIFICATIONS.

INSTALLATION OF ALL WORK SHALL BE PROVIDED SO THAT ALL COMPONENT PARTS SHALL FUNCTION AS AN INTEGRATED SYSTEM COMPLETE WITH ALL ASSOCIATED EQUIPMENT NECESSARY FOR PROPER OPERATION. ALL MATERIAL AND EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS. MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BE LISTED TO ENSURE CONFORMANCE WITH APPLICABLE INDUSTRY STANDARDS, NEMA STANDARDS AND UNDERWRITERS LABORATORIES STANDARDS WHERE APPLICABLE.

MARK UP A CLEAN SET OF RECORD DRAWINGS AS THE WORK PROGRESSES TO SHOW THE DIMENSIONED LOCATION OF ALL ELECTRICAL WORK WHICH WILL BECOME PERMANENTLY CONCEALED. SHOW ROUTING OF WORK IN PERMANENTLY CONCEALED BLIND SPACES WITHIN THE BUILDING. SHOW COMPLETE ROUTING AND SIZING OF ANY REVISIONS TO THE SYSTEMS SHOWN ON THE CONSTRUCTION DRAWINGS.

PROVIDE MATERIAL AND EQUIPMENT SUBMITTALS CONTAINING A COMPLETE LISTING OF MATERIAL AND EQUIPMENT SHOWN ON THE DRAWINGS. INCLUDE CATALOG NUMBERS, WIRING DIAGRAMS, DIMENSIONS AND PERFORMANCE DATA FOR ALL MATERIAL AND EQUIPMENT. SUBMITTALS SHALL BE BOUND IN A HARD COVER, LOOSE-LEAF BINDER, SEPARATED FROM SUBMITTAL INFORMATION PROVIDED UNDER OTHER DIVISIONS. INDEX AND CLEARLY IDENTIFY ALL MATERIAL AND EQUIPMENT BY PART NUMBER, NAME OR DESIGNATION REFERENCED ON THE DRAWINGS. SUBMITTAL REVIEW IS FOR GENERAL DESIGN AND ARRANGEMENT ONLY AND DOES NOT RELIEVE THE CONTRACTOR FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE SUBMITTALS ARE NOT REVIEWED FOR MATERIAL QUANTITIES, DIMENSION, OR FOR PROPER OPERATION. WHERE DEVIATIONS OF A SUBSTITUTE PRODUCT OR SYSTEM PERFORMANCE HAVE NOT BEEN SPECIFICALLY NOTED AND FULLY DESCRIBED IN THE SUBMITTAL BY THE CONTRACTOR, PROVISIONS OF A COMPLETE AND SATISFACTORY OPERABLE INSTALLATION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

PROVIDE A COMPLETE ELECTRICAL DISTRIBUTION SYSTEM INCLUDING SERVICE, MAIN DISTRIBUTION EQUIPMENT, FEEDERS, BRANCH CIRCUIT PANELS, BRANCH CIRCUITS, JUNCTION BOXES, OUTLET BOXES, WIRING DEVICES, COVERPLATES, CONDUIT, ETC. PROVIDE EQUIPMENT THAT IS RATED FOR AVAILABLE FAULT CURRENT LEVELS.

OPERATION AND MAINTENANCE MANUALS – PROVIDE OPERATION AND MAINTENANCE MANUALS SUITABLE FOR TRAINING OF THE OWNER'S PERSONNEL. PROVIDE INSTRUCTIONS AND AN ITEMIZED SCHEDULE OF PREVENTIVE MAINTENANCE IN TABULAR FORM FOR ALL ROUTINE CLEANING, INSPECTION AND OTHER MANUFACTURER RECOMMENDED MAINTENANCE. PROVIDE INSTRUCTIONS FOR MINOR REPAIR OR ADJUSTMENTS REQUIRED FOR PREVENTIVE MAINTENANCE. PROVIDE MANUFACTURER'S DESCRIPTIVE LITERATURE INCLUDING APPROVED SHOP DRAWINGS COVERING DEVICES USED IN ANY CONTRACTOR—PROVIDED EQUIPMENT OR SYSTEMS WITH DRAWINGS, WIRING DIAGRAMS, PARTS LIST, ETC.

WARRANTY - THE CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS PROVIDED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS IN MATERIALS, PROPER OPERATION AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM OWNER OCCUPANCY. FAULTY MATERIALS OR WORKMANSHIP SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER DURING THE GUARANTEE PERIOD.

PERMITS – PROCURE AND PAY FOR ALL FEES, PERMITS, REVIEWS, ETC. REQUIRED BY LOCAL AND STATE AGENCIES AND ALL LOCAL UTILITY COMPANIES. COSTS OF COMMERCIAL UTILITY LINE EXTENSIONS TO THE SYSTEM METER ARE TO BE PAID BY THE OWNER.

REFERENCE SYMBOLS – THE ELECTRICAL "LEGEND" ON THE DRAWINGS IS A STANDARDIZED VERSION, AND ALL SYMBOLS SHOWN MAY NOT BE USED FOR THIS PROJECT. USE THE ELECTRICAL "LEGEND" AS A REFERENCE FOR THE SYMBOLS USED ON THE PROJECT DRAWINGS.

IDENTIFICATION – PROVIDE ENGRAVED LAMINATED PLASTIC NAMEPLATES WITH WHITE LETTERS ON A BLACK BACKGROUND WHERE REQURIED BY THE NEC AND TO IDENTIFY ALL ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT AND LOADS SERVED. LETTER HEIGHTS SHALL BE 1/8 INCH MINIMUM FOR INDIVIDUAL SWITCHES, MOTOR STARTERS AND LOADS SERVED. LETTER HEIGHTS SHALL BE 1/4 INCH MINIMUM FOR PANELBOARDS. SECURE NAMEPLATES TO EQUIPMENT FRONTS USING SCREWS, RIVETS OR ADHESIVES. SECURE NAMEPLATE TO INSIDE FACE OF RECESSED PANELBOARD DOORS IN FINISHED LOCATIONS.

WIRING DEVICES: PROVIDE MACHINE PRINTED AND LAMINATED ADHESIVE LABELS, WITH 3/16" BLACK LETTERS ON CLEAR BACKGROUND TO IDENTIFY WIRING DEVICES SUCH AS SWITCHES, FRACTIONAL HORSEPOWER MOTOR STARTER SWITCHES, AND RECEPTACLES. LABEL SHALL INCLUDE SUPPLY PANEL AND CIRCUIT.

CONDUITS: CONDUITS MEANS.

JUNCTION BOXES: IDENTIFY THE CIRCUIT NUMBERS OF THE BRANCH CIRCUIT CONDUCTORS CONTAINED INSIDE EACH JUNCTION BOX WITH INDELIBLE BLACK MARKING PEN OR OTHER PERMANENT MEANS. ON EXPOSED JUNCTION BOXES IN PUBLIC AREAS, MARK ON INSIDE OF COVER. APPROPRIATELY IDENTIFY ALL OTHER SPECIAL SYSTEM JUNCTION BOXES WITH SHEET STEEL COVERS.

CONDUIT – RACEWAY AND WIRING SHALL BE APPROPRIATE FOR THE LOCATION AND INSTALLATION. ALL WIRING SHALL BE INSTALLED IN METALLIC RACEWAY. RACEWAY SHALL BE INSTALLED CONCEALED EXCEPT AT SURFACE MOUNTED CABINETS, MOTORS AND EQUIPMENT CONNECTIONS. GALVANIZED RIGID STEEL OR INTERMEDIATE METAL CONDUIT SHALL BE USED FOR SERVICE ENTRANCE, WET LOCATIONS, IN DIRECT CONTACT WITH CONCRETE OR UNDERGROUND INSTALLATIONS. ELECTRICAL METALLIC TUBING MAY BE USED IN ALL CONCEALED, DRY, INTERIOR LOCATIONS. UTILIZE SHORT EXTENSIONS OF FLEXIBLE CONDUIT, PROPERLY SUPPORTED, FOR CONNECTION OF ALL MOTORS AND OTHER EQUIPMENT SUBJECT TO VIBRATION. UTILIZE LIQUID—TIGHT FLEXIBLE CONDUIT FOR MOTOR AND EQUIPMENT CONNECTIONS IN WET LOCATIONS. INSTALL FITTINGS TO ACCOMMODATE EXPANSION AND CONTRACTION WHERE RACEWAY CROSSES CONTROL AND EXPANSION JOINTS. PAINT ALL EXPOSED RACEWAYS IN FINISHED LOCATIONS, TO MATCH THE SURFACE TO WHICH IT IS ATTACHED OR CROSSES.

CONDUCTORS – ALL CONDUCTORS SHALL BE COPPER WITH TYPE XHHW, THWN, THW OR THHN INSULATION. WIRING IN LIGHTING FIXTURE CHANNELS SHALL BE COPPER WITH TYPE THHN OR OTHER INSULATION RATED 90 DEGREES C OR HIGHER, 600 VOLT. PULL ALL CONDUCTORS INTO THE RACEWAY AT THE SAME TIME. COLOR CODE CONDUCTORS AS FOLLOWS: 120/240 VOLT SYSTEMS: BLACK, RED, AND WHITE; USE PROPERLY SIZED INSULATED SPRING WIRE CONNECTORS WITH INSULATING CAPS FOR ALL CONDUCTORS #8 AWG AND SMALLER. TERMINATE #6 AWG AND LARGER CONDUCTORS WITH CRIMP OR COMPRESSION TYPE AND INSULATE WITH PROPERLY SIZED 600 VOLT RATED HEAT SHRINK TUBING TO EQUAL OR EXCEED THE INSULATION QUALITY OF THE TERMINATED CONDUCTOR.

CONDUITS: IDENTIFY THE CIRCUIT NUMBERS OF THE BRANCH CIRCUIT CONDUCTORS CONTAINED INSIDE ALL CONDUITS ENTERING OR LEAVING PANELBOARDS WITH INDELIBLE BLACK MARKING PEN OR OTHER PERMANENT

OUTLET BOXES – PROVIDE OUTLET AND JUNCTION BOXES OF A TYPE SUITABLE FOR CONDITIONS WHERE INSTALLED AND AS PERMITTED BY THE NEC. PROVIDE OUTLET AND JUNCTION BOXES AS SHOWN ON THE DRAWINGS, AND AS REQUIRED FOR SPLICES, TAPS, WIRE PULLING, EQUIPMENT CONNECTIONS, DEVICE INSTALLATION AND CODE COMPLIANCE. DO NOT INSTALL BOXES BACK-TO-BACK IN WALLS. PROVIDE WALL STUD SEPARATION FOR MINIMUM SOUND TRANSMISSION. USE MULTIPLE-GANG BOXES WHERE MORE THAN ONE DEVICE ARE MOUNTED TOGETHER. ADEQUATELY SUPPORT BOXES INDEPENDENTLY OF CONDUIT. COORDINATE MOUNTING HEIGHTS AND LOCATIONS OF ALL DEVICES.

PANELBOARDS - PROVIDE DEAD-FRONT CIRCUIT BREAKER PANELBOARDS WITH COPPER BUS SIZE, MAIN CIRCUIT BREAKER, MAXIMUM INTERRUPT RATING, AND NUMBER AND SIZE OF BRANCH CIRCUITS AS SHOWN ON THE DRAWINGS. CABINETS SHALL BE 5 3/4 INCHES DEEP BY 20 INCHES WIDE MINIMUM. PROVIDE FLUSH OR SURFACE COVERS, AS NOTED ON THE DRAWINGS, WITH CONCEALED TRIM CLAMPS, CONCEALED HINGE AND LOCK. PANELBOARD SHALL BE FACTORY FINISHED IN MANUFACTURER'S STANDARD GRAY ENAMEL. MOLDED CASE CIRCUIT BREAKERS SHALL BE BOLT-ON THERMAL MAGNETIC TRIP TYPE WITH COMMON TRIP HANDLE FOR ALL POLES. PROVIDE CIRCUIT BREAKERS UL LISTED AS TYPE HCAR FOR AIR HANDLING/CONDITIONING CIRCUITS. PROVIDE UL LISTED BREAKERS AS SWD FOR LIGHTING CIRCUITS SWITCHED AT THE PANEL. PROVIDE CIRCUIT BREAKERS SUPPLYING MULTIWIRE CIRCUITS WITH COMMON TRIP HANDLES OR AN APPROVED MEANS OF SIMULTANEOUSLY DISCONNECTING ALL UNGROUNDED CONDUCTORS. PROVIDE UL CLASS A GROUND FAULT INTERRUPTER CIRCUIT BREAKERS FOR GFCI CIRCUITS AS INDICATED ON THE DRAWINGS. GROUP UNGROUNDED AND GROUNDED CONDUCTORS OF EACH MULTIWIRE BRANCH CIRCUIT WITHIN THE PANEL WITH AN APPROVED MEANS. INSTALL PANELBOARDS PLUMB WITH TOP OF CABINET NO MORE THAN 6'-6" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED ON THE DRAWINGS. PROVIDE TYPED OR NEATLY HANDWRITTEN CIRCUIT DIRECTORIES FOR EACH PANELBOARD. MEASURE LOAD CURRENTS OF EACH PANELBOARD FEEDER UNDER NORMAL OPERATING CONDITIONS, AND REARRANGE BRANCH CIRCUITS AS REQUIRED TO MAINTAIN A MAXIMUM 20 PERCENT CURRENT DIFFERENCE BETWEEN PHASE CONDUCTORS. REVISE CIRCUIT DIRECTORY TO REFLECT CIRCUITING CHANGES REQUIRED TO BALANCE PHASE LOADS.

RECEPTACLES – PROVIDE NEMA 5–20R DUPLEX GROUNDING TYPE RECEPTACLES WITH IVORY FINISH. UL NO. 498 APPROVED, SELF-GROUNDING, CERTIFIED TO COMPLY WITH NEMA WD–1. SCREW TERMINAL OR SCREW CLAMP TYPE ONLY. PROVIDE DUPLEX CONVENIENCE RECEPTACLES WITH CLASS "A" INTEGRAL GROUND FAULT CURRENT INTERRUPTER AND SPECIFIC-USE RECEPTACLES WHERE INDICATED ON THE DRAWINGS AND AS REQUIRED BY CODES. PROVIDE LISTED WEATHER RESISTANT TYPE RECEPTACLES WHERE LOCATED IN DAMP OR WET LOCATIONS. UNLESS OTHERWISE NOTED ON THE DRAWINGS, INSTALL RECEPTACLES 18 INCHES ABOVE FINISH FLOOR, 4 INCHES ABOVE COUNTERS AND BACKSPLASHES WITH GROUNDING POLE ON BOTTOM. UNLESS OTHERWISE NOTED DIMENSIONS ARE TO CENTERLINE OF OUTLET. LOCATE GROUND FAULT CURRENT INTERRUPTER TYPE RECEPTACLES SO THAT THEY ARE READILY ACCESSIBLE AS REQUIRED BY THE NEC.

SWITCHES – PROVIDE NEMA WD-1 20, UL NO. 20 LISTED, 20 AMPERE, 120/277 VOLT AC GENERAL USE SNAP SWITCH, WITH GROUNDING SCREW AND SELF GROUNDING CLIP, WITH IVORY TOGGLE, SINGLE POLE, DOUBLE POLE, THREE WAY OR FOUR WAY AS INDICATED ON THE DRAWINGS. PROVIDE LINE VOLTAGE RED LIGHTED NEON TOGGLE PILOT LIGHT SWITCHES AS INDICATED ON THE DRAWINGS. INSTALL SWITCHES 48 INCHES ABOVE FINISHED FLOOR, 'OFF' POSITION DOWN. SWITCH BOXES SHALL INCLUDE A "GROUNDED CONDUCTOR" (NEUTRAL) OF THE CONTROLLED LIGHTING CIRCUIT AS REQUIRED BY NEC 404.2(C).

DEVICE PLATES – PROVIDE UL LISTED ONE PIECE ROUNDED EDGE FLUSH "STREAMLINE" DESIGN FLUSH DEVICE PLATES OF SATIN FINISH 430 OR 302 STAINLESS STEEL WITH METAL, COUNTER SUNK SCREWS TO MATCH DEVICE PLATE. PROVIDE GALVANIZED DEVICE PLATES WHERE EXPOSED WIRING IS PERMITTED. PROVIDE WEATHERPROOF GASKETED STAINLESS STEEL WITH HINGED GASKETED DEVICE COVERS FOR ALL OUTLETS IN WET LOCATIONS OR ON THE EXTERIOR OF THE BUILDING. PROVIDE 'WET WHILE IN USE' METALLIC EXTRA DUTY WEATHERPROOF COVERS WHEN MANDATED BY THE AUTHORITY HAVING JURISDICTION.

LIGHTING EQUIPMENT – PROVIDE AND INSTALL ALL LIGHTING EQUIPMENT OR APPROVED EQUAL AS SHOWN ON THE DRAWINGS AND DESCRIBED IN THE DRAWINGS. PROVIDE LIGHTING EQUIPMENT AS A COMPLETE SYSTEM, WIRED, ASSEMBLED, WITH PROPER FLANGES, MOUNTING SUPPORTS, HARDWARE, ETC. PROVIDE ENERGY SAVING LAMPS AND ELECTRONIC BALLASTS WITH A MAXIMUM THD OF 10% AND A MINIMUM BALLAST FACTOR OF .88 FOR ALL FLUORESCENT FIXTURES. UNLESS OTHERWISE NOTED ON THE DRAWINGS, FLUORESCENT LAMPS SHALL BE 4100 DEGREE K, TRI-PHOSPHOR TYPE WITH A MINIMUM CRI OF 85, AND A RATED LIFE OF 24,000 HOURS. PROVIDE BALLAST DISCONNECTING MEANS FOR FLUORESCENT LUMINARIES REQUIRING DOUBLE ENDED LAMPS AS REQUIRED BY NEC 410.130.

EQUIPMENT CONNECTIONS – PROVIDE AND INSTALL WIRING AND CONNECTIONS OF EQUIPMENT REQUIRING ELECTRICAL POWER BUT SPECIFIED UNDER OTHER DIVISIONS OF THE PROJECT. EQUIPMENT SHALL INCLUDE BUT IS NOT LIMITED TO OVERHEAD DOORS, MOTORS, PUMPS, WATER HEATERS, HVAC EQUIPMENT, ETC. REVIEW EQUIPMENT SUBMITTALS PRIOR TO INSTALLATION AND ELECTRICAL ROUGH—IN AND VERIFY THE LOCATION, SIZE, TYPE OF CONNECTIONS, AND THAT THE EQUIPMENT IS READY FOR ELECTRICAL CONNECTION. MAKE WIRING CONNECTIONS IN THE CONTROL PANEL OR IN THE WIRING COMPARTMENT OF THE EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. PROVIDE INTERCONNECTING WIRING AND LOCAL DISCONNECTS WHERE REQUIRED.

DISCONNECT SWITCHES/MOTOR STARTERS – PROVIDE DISCONNECTS AND MOTOR STARTERS WHERE APPROPRIATE AND AS REQUIRED. SWITCHES AND STARTERS SHALL BE SIZED AND RATED FOR LOADS CONTROLLED AND WHERE LOCATED.

FRACTIONAL HORSEPOWER MANUAL STARTER - NEMA ICS 2; AC GENERAL-PURPOSE CLASS A MANUALLY OPERATED FULL-VOLTAGE CONTROLLER FOR FRACTIONAL HORSEPOWER INDUCTION MOTORS WITH THE NUMBER OF POLES AS REQUIRED BY THE LOAD SERVED, THERMAL OVERLOAD UNIT(S), RED PILOT LIGHT, AND TOGGLE OPERATOR.

SEISMIC RESTRAINTS – PROVIDE SEISMIC BRACING AND SUPPORT OF ALL ELECTRICAL EQUIPMENT AS REQUIRED BY THE IBC AND OTHER APPLICABLE CODES. EQUIPMENT TO BE BRACED AND SUPPORTED SHALL INCLUDE BUT IS NOT LIMITED TO LIGHTS, PANELS, CONDUIT, ETC. WHEN REQUIRED BY THE LOCAL JURISDICTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING STRUCTURAL RESTRAINTS DESIGNED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED BY THE STATE OF ALASKA.

PENETRATIONS OF FIRE BARRIERS – ALL ELECTRICAL PENETRATIONS THROUGH FIRE RATED BARRIERS SHALL BE SEALED IN ACCORDANCE WITH NEC ARTICLE 300.21 AND THE FOLLOWING:

ALL HOLES OR VOIDS CREATED TO EXTEND ELECTRICAL SYSTEMS THROUGH FIRE RATED FLOORS, WALLS OR CEILING SHALL BE SEALED WITH AN ASBESTOS-FREE INTUMESCENT FIRE STOPPING MATERIAL CAPABLE OF EXPANDING 8 TO 10 TIMES WHEN EXPOSED TO TEMPERATURES 250 DEGREES F OR HIGHER. MATERIALS SHALL BE SUITABLE FOR THE FIRE STOPPING OF PENETRATIONS MADE BY STEEL, GLASS, PLASTIC AND SHALL BE CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME, SMOKE AND GASES IN COMPLIANCE WITH THE REQUIREMENTS OF ASTM E814, UL 1479 AND THE UL FIRE RESISTANCE DIRECTORY REQUIREMENTS FOR THROUGH-PENETRATION FIRESTOP DEVICES (XHCR). THE RATING OF THE FIRE STOPS SHALL BE THE SAME AS THE TIME-RATED FLOOR, WALL OR CEILING ASSEMBLY. INSTALL FIRE STOPPING MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. UNLESS PROTECTED FROM POSSIBLE LOADING OR TRAFFIC, INSTALL FIRE STOPPING MATERIALS IN FLOORS HAVING VOID OPENINGS OF FOUR (4) INCHES OR MORE TO SUPPORT THE SAME FLOOR LOAD REQUIREMENTS AS THE SURROUNDING FLOOR."

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