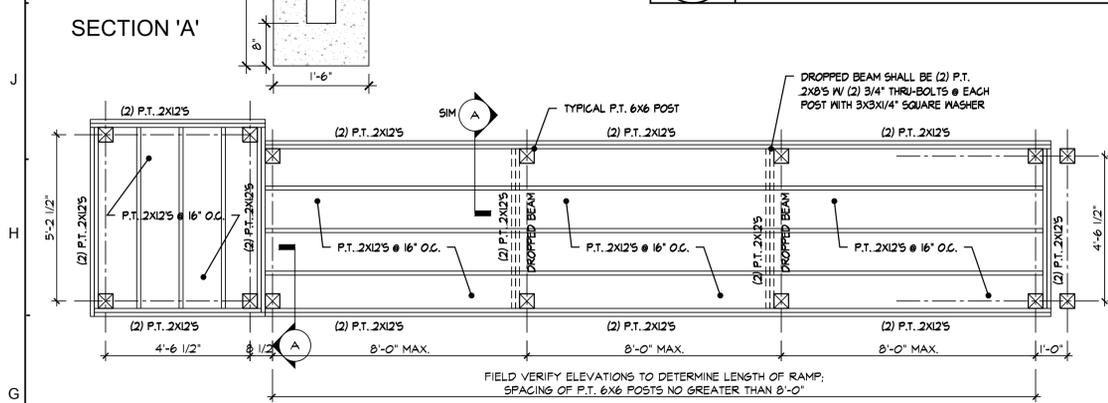
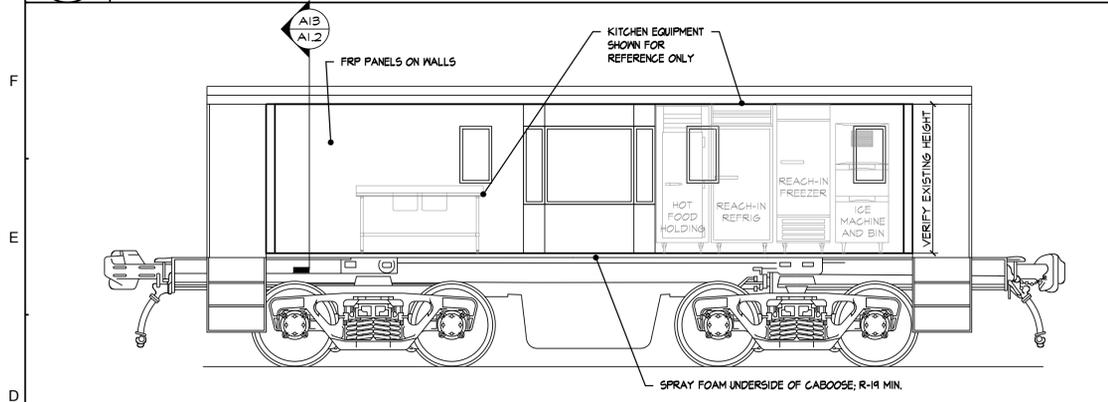


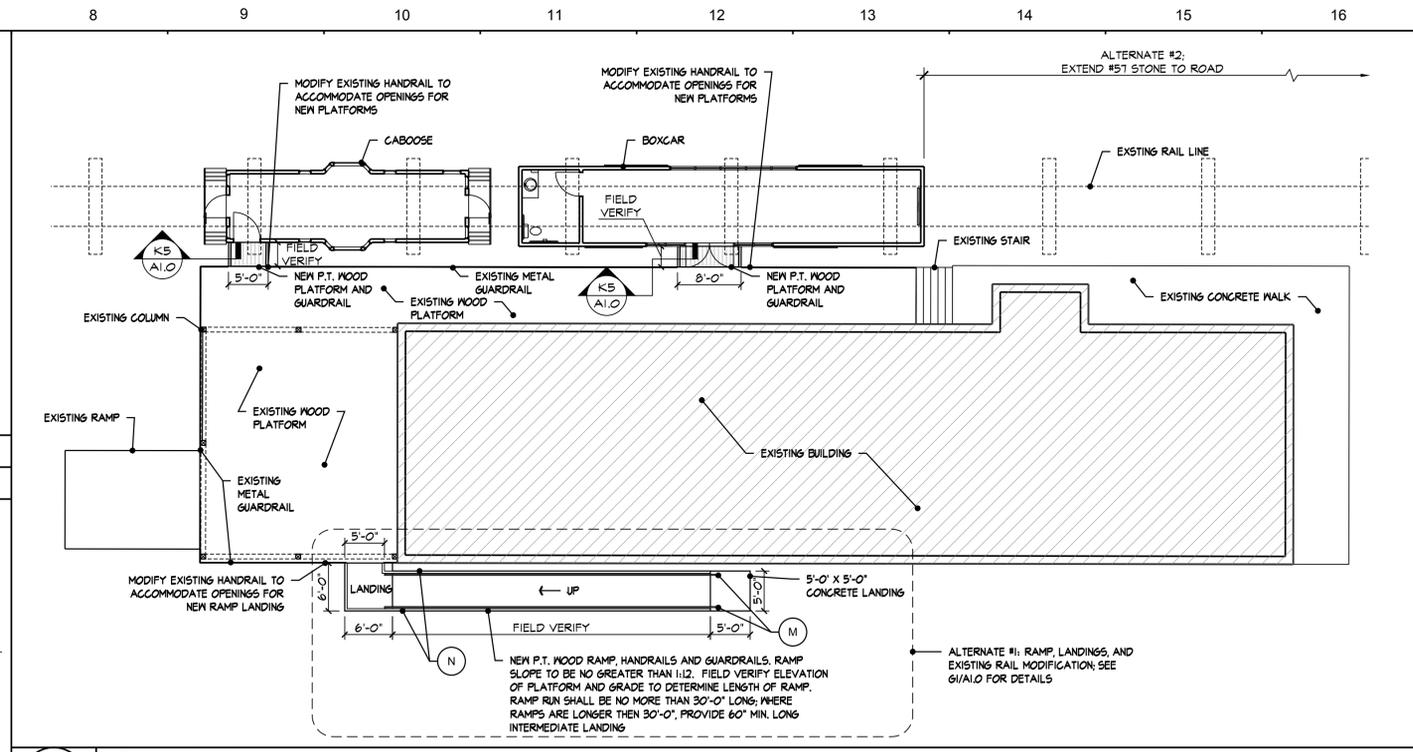
PLATFORM HANDRAIL DETAIL
 SCALE: 3/4"=1'-0"



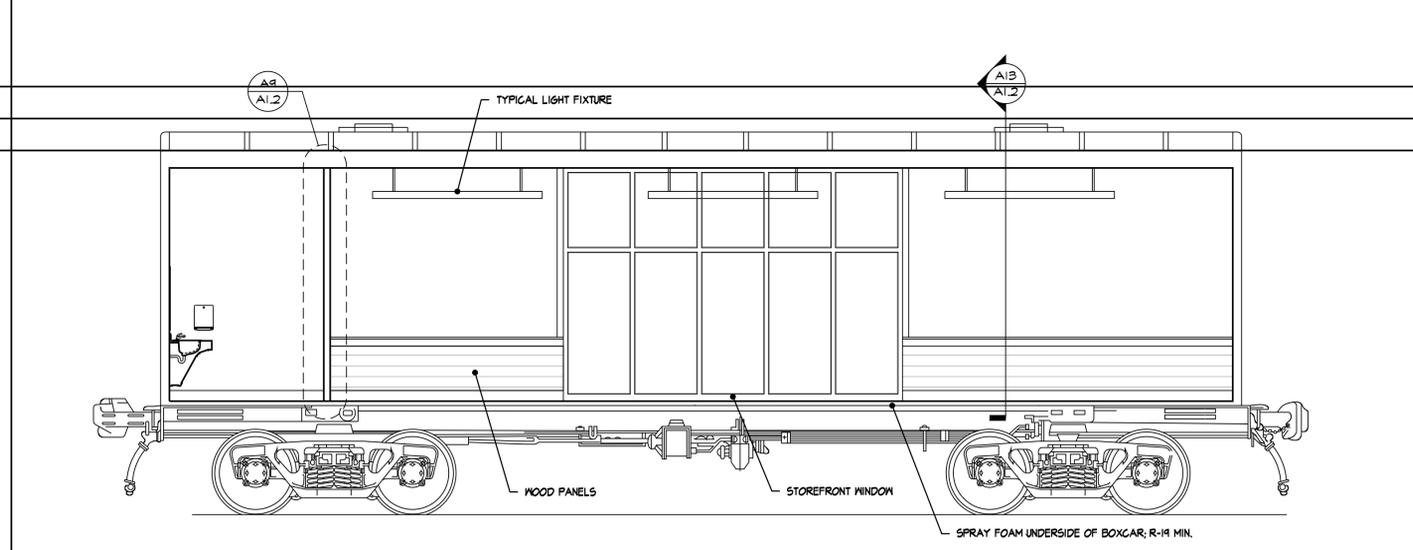
RAMP DETAILS
 PLAN: SCALE: 3/8"=1'-0" / DETAIL: SCALE: 3/4"=1'-0"



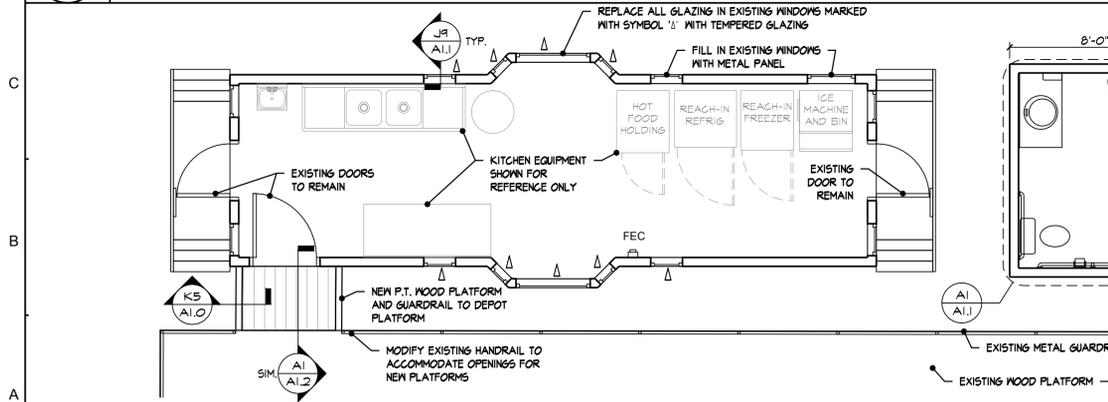
CABOOSE INTERIOR ELEVATION - CORE AND WEST WING
 SCALE: 1/4"=1'-0"



SITE PLAN
 SCALE: 3/32"=1'-0"



BOX CAR INTERIOR ELEVATION
 SCALE: 1/4"=1'-0"



CABOOSE AND BOX CAR FLOOR PLANS
 SCALE: 1/4"=1'-0"

GENERAL NOTES

- A. DIMENSIONS ARE TO FACE OF METAL STUDS, CENTERLINE OF DOORS, OR CENTERLINE OF WINDOWS, UNLESS NOTED OTHERWISE.
- B. NOTIFY ARCHITECT IMMEDIATELY UPON DISCOVERY OF ANY CONDITIONS THAT ARE CONTRARY TO THOSE REPRESENTED WITHIN THE DRAWINGS.
- C. PROVIDE BLOCKING AT ALL WALL HUNG EQUIPMENT TO INCLUDE, BUT NOT LIMITED TO, GRAB BARS, CASEWORK AND TOILET ACCESSORIES.
- D. ALL HEIGHTS FOR HANDICAP ELEMENTS ARE TO BE IN ACCORDANCE WITH THE ADA FOR MAKING FACILITIES ACCESSIBLE AND USABLE FOR PHYSICALLY HANDICAPPED PEOPLE. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND PROPER INSTALLATION OF ALL RELATED ELEMENTS.
- E. THE PLAN CUT IS TAKEN AT 4'-6" AFF.
- F. PROVIDE MINIMUM OF 18" CLEAR ON THE FULL SIDE PROVIDE MINIMUM OF 18" CLEAR ON THE FULL SIDE AND 12" CLEAR ON THE PUSH SIDE OF ALL ACCESSIBLE DOORS.
- G. COORDINATE AND ALIGN STUD FRAMING WITH THE THICKNESS OF FINISH WALL MATERIAL SO THAT THE FINISH WALL IS IN A CONTINUOUS SMOOTH PLANE.
- H. FEC = FIRE EXTINGUISHER; SURFACE MOUNTED. FINAL LOCATION TO BE APPROVED BY BOTH ARCHITECT AND LOCAL FIRE INSPECTOR.
- I. PROVIDE 4" CONCRETE PAD ON COMPACTED SOIL FOR ALL MECHANICAL UNITS. THE PAD SHOULD EXTEND 6" BEYOND EACH EDGE OF THE OVERALL CONFIGURATION. THE PAD SHOULD BE 12" MIN. OFF EDGE OF BUILDING.
- J. INSULATE ALL PIPE IN UNCONDITIONED SPACES.
- K. INSULATE CEILINGS, ALL EXTERIOR WALLS. ALL INTERIOR WALLS TO RECEIVE SOUND ATTENUATION BATT.
- L. THE TYPICAL LOCATION OF ALL INTERIOR DOORS IS 6" FROM THE ADJACENT WALL UNLESS OTHERWISE NOTED.
- M. PROVIDE HANDRAILS ON BOTH SIDES OF ALL RAMPS. HANDRAIL HEIGHTS SHALL BE NO LESS THAN 34" AND NO GREATER THAN 38" AFF. HANDRAILS SHALL BE CONTINUOUS. HANDRAILS SHALL EXTEND 12" BEYOND THE TOP AND BOTTOM OF THE RAMP RUN. EXTENSIONS SHALL RETURN TO A WALL, GUARD, OR THE LANDING SURFACE, OR SHALL BE CONTINUOUS TO THE HANDRAIL OF AN ADJACENT STAIR FLIGHT OR RAMP. CLEAR SPACE BETWEEN A HANDRAIL AND A WALL OR OTHER SURFACE SHALL BE A MINIMUM OF 1 1/2 INCHES.
- N. GUARDS SHALL BE LOCATED ALONG OPEN-SIDED WALKING SURFACES, INCLUDING MEZZANINES, PLATFORMS, STAIRS, RAMPS AND LANDINGS THAT ARE LOCATED MORE THAN 30 INCHES MEASURED VERTICALLY TO THE FLOOR OR GRADE BELOW AT ANY POINT WITHIN 36 INCHES HORIZONTALLY TO THE EDGE OF THE OPEN SIDE. GUARDRAIL HEIGHT SHALL BE 42" HIGH MIN. AFF. GUARDS SHALL NOT HAVE OPENINGS WHICH ALLOW PASSAGE OF A SPHERE 4 INCHES IN DIAMETER FROM THE WALKING SURFACE TO THE REQUIRED GUARD HEIGHT. ON RAMPS, A BOTTOM RAIL OR CURB SHALL BE PROVIDED THAT WILL REJECT THE PASSAGE OF A 2-INCH-DIAMETER SPHERE.

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AN ADDITION FOR
MYRTLE BEACH TRAIN DEPOT
 CITY OF MYRTLE BEACH
 HORRY COUNTY, SOUTH CAROLINA

2018
 09/26/18
 ELEVATIONS

A1.0

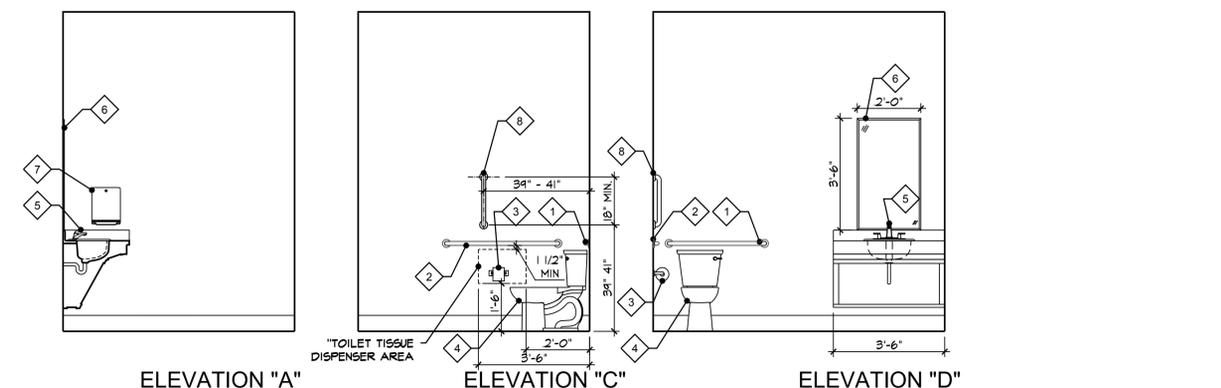
DOOR AND FRAME SCHEDULE

NO.	MATERIAL	ELEV.	DOOR			FRAME MATL	DETAIL			REMARKS	NO.
			WIDTH	HEIGHT	THK		HEAD	JAMB	SILL		
101	HM	FULL GLAZING	6'-0"	7'-0"	1 3/4"	HM	J14/A1.1	E14/A1.1	A14/A1.1	--	101
102	WOOD	FLUSH	3'-0"	7'-0"	1 3/4"	HM	E9/A1.1	A9/A1.1	--	--	102

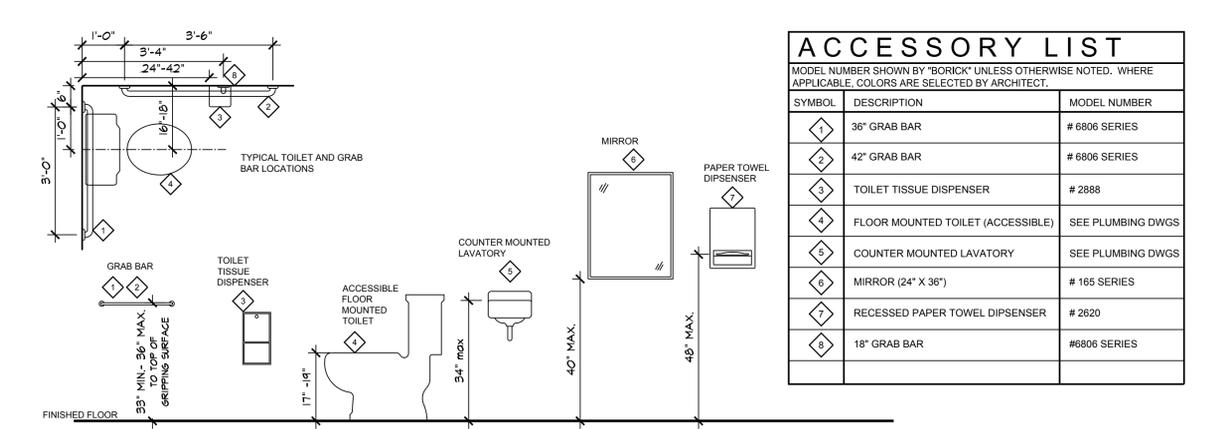
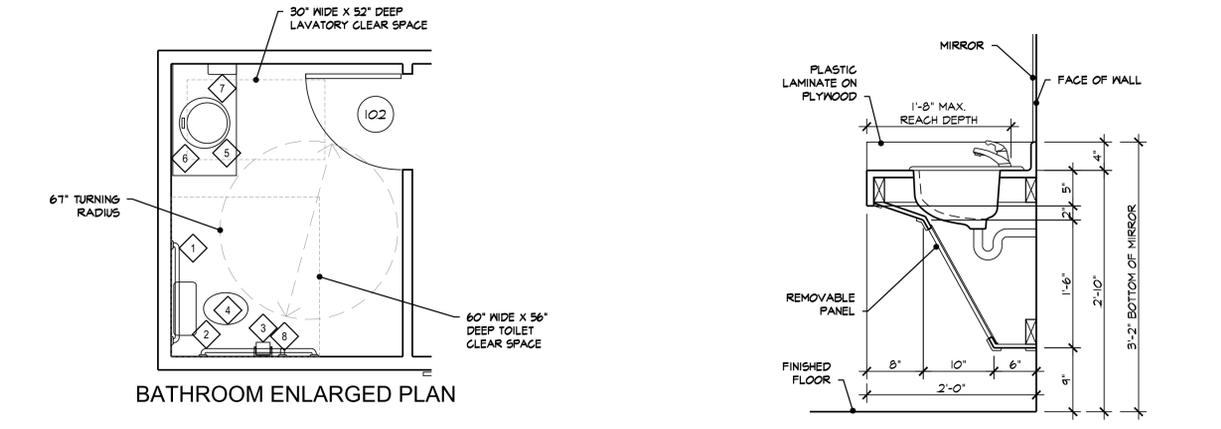
NOTES FOR INTERIOR DOORS

- ALL FRAMES TO BE 16 GAUGE GALVANIZED HOLLOW METAL TO ACCOMMODATE 3 HINGES.
- ALL DOORS TO BE TIGER DOORS, HEAVY DUTY SERIES, STANDARD COLOR TO BE FIELD PAINTED, STANDARD CORE OF 3/8" TRIANGULAR CELL PHENOLIC IMPREGNATED KRAFT HONEYCOMB AND STRUCTURE TYPE OF PERIMETER STILE AND RAIL.
- ALL DOORS SHALL HAVE THREE (3) BALL BEARING HINGES.
- ALL LOCKS MANUFACTURED BY BALDWIN OR SCHLAGE, ALL HARDWARE TO BE KEYED ALIKE TO MATCH OWNERS REQUIREMENTS.
- FIELD VERIFY ALL DOOR SIZES PRIOR TO ORDERING.

K1 DOOR SCHEDULE
SCALE: 3/8" = 1'-0"

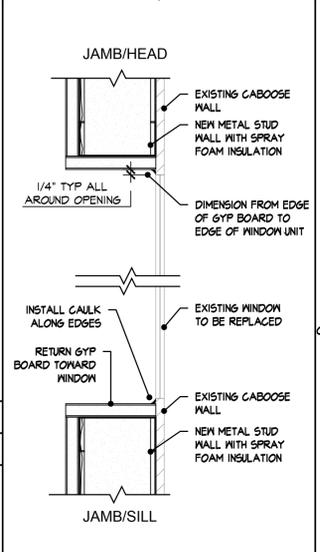


G1 BATHROOM ELEVATIONS
SCALE: 3/8" = 1'-0"

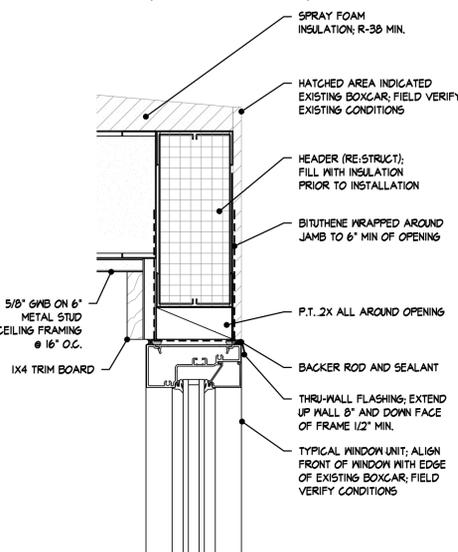


ACCESSORY LIST		
SYMBOL	DESCRIPTION	MODEL NUMBER
1	36" GRAB BAR	# 6806 SERIES
2	42" GRAB BAR	# 6806 SERIES
3	TOILET TISSUE DISPENSER	# 2888
4	FLOOR MOUNTED TOILET (ACCESSIBLE)	SEE PLUMBING DWGS
5	COUNTER MOUNTED LAVATORY	SEE PLUMBING DWGS
6	MIRROR (24" X 36")	# 165 SERIES
7	RECESSED PAPER TOWEL DISPENSER	# 2620
8	18" GRAB BAR	#6806 SERIES

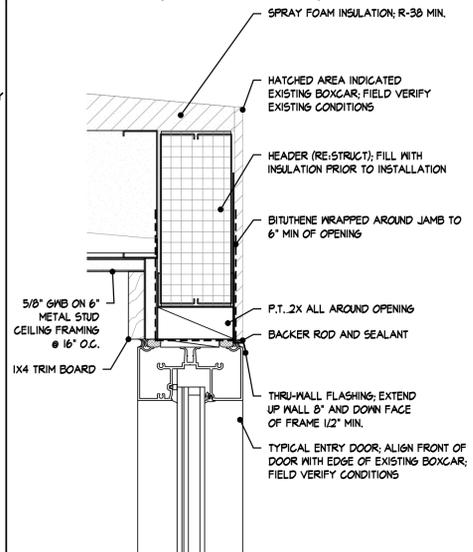
A1 ACCESSIBLE LAVATORY DETAIL/MOUNTING DETAILS/ACCESSORY LIST
SCALE: NO SCALE



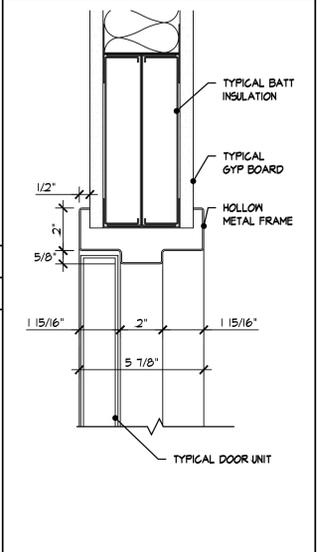
J9 EXISTING WINDOW
SCALE: 3" = 1'-0"



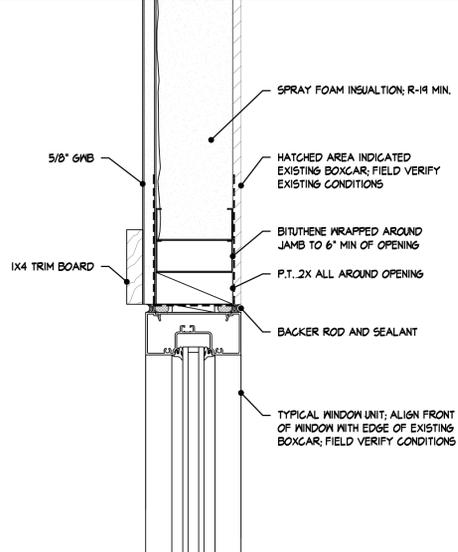
J11 STOREFRONT WINDOW HEAD
SCALE: 3" = 1'-0"



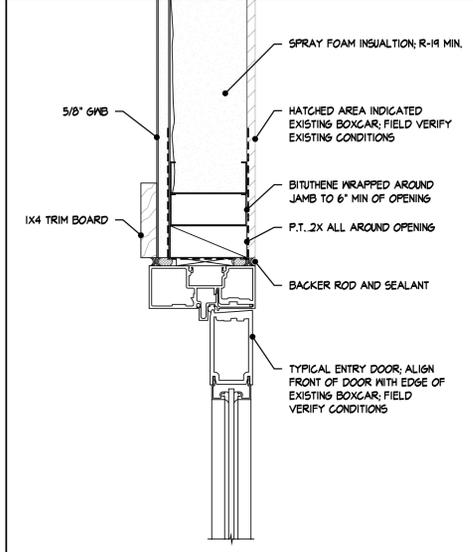
J14 STOREFRONT DOOR HEAD
SCALE: 3" = 1'-0"



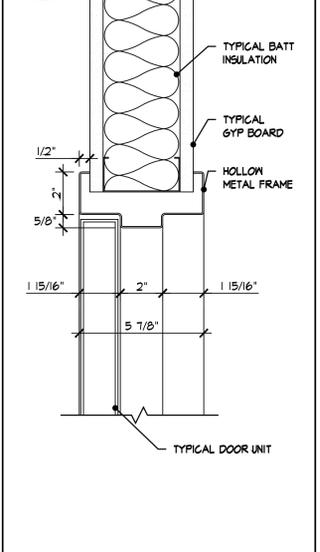
E9 INTERIOR HEAD
SCALE: 3" = 1'-0"



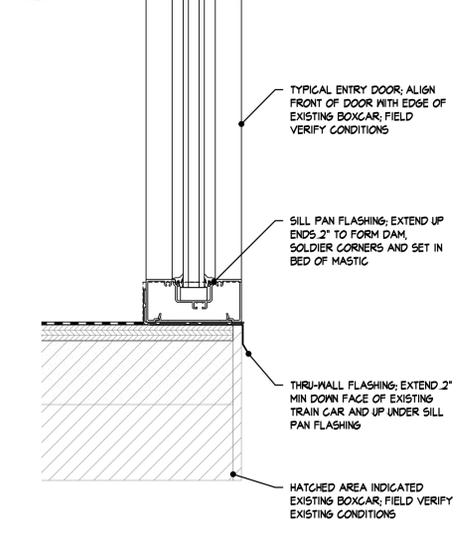
E11 STOREFRONT WINDOW JAMB
SCALE: 3" = 1'-0"



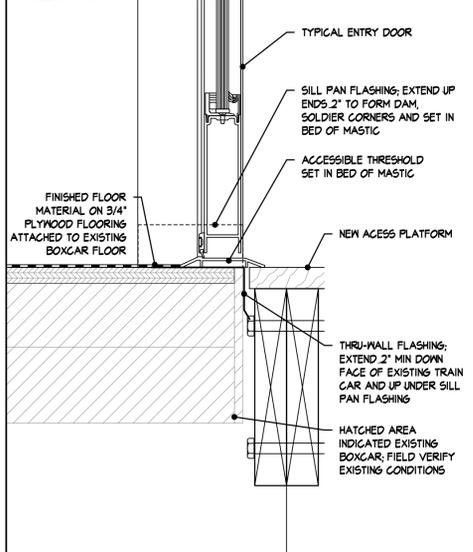
E14 STOREFRONT DOOR JAMB
SCALE: 3" = 1'-0"



A9 INTERIOR JAMB
SCALE: 3" = 1'-0"



A11 STOREFRONT WINDOW SILL
SCALE: 3" = 1'-0"



A14 STOREFRONT DOOR SILL
SCALE: 3" = 1'-0"

GENERAL NOTES

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- PROVIDE BLOCKING AT ALL WALL HUNG EQUIPMENT TO INCLUDE, BUT NOT LIMITED TO, GRAB BARS, CASEWORK AND TOILET ACCESSORIES.
- ALL HEIGHTS FOR HANDICAP ELEMENTS ARE TO BE IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) FOR MAKING FACILITIES ACCESSIBLE AND USABLE FOR PHYSICALLY HANDICAPPED PEOPLE. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND PROPER INSTALLATION OF ALL RELATED ELEMENTS. GENERAL CONTRACTOR AND ALL SUB-CONTRACTORS SHALL COMPLY WITH ADA REGARDING ANY AND ALL ELEMENTS OF THE PROJECT. FAILURE TO COMPLY WITH THESE REGULATIONS WILL RESULT IN THE REMOVAL OF NON-COMPLYING WORK AT THE COST OF THE GENERAL CONTRACTOR.

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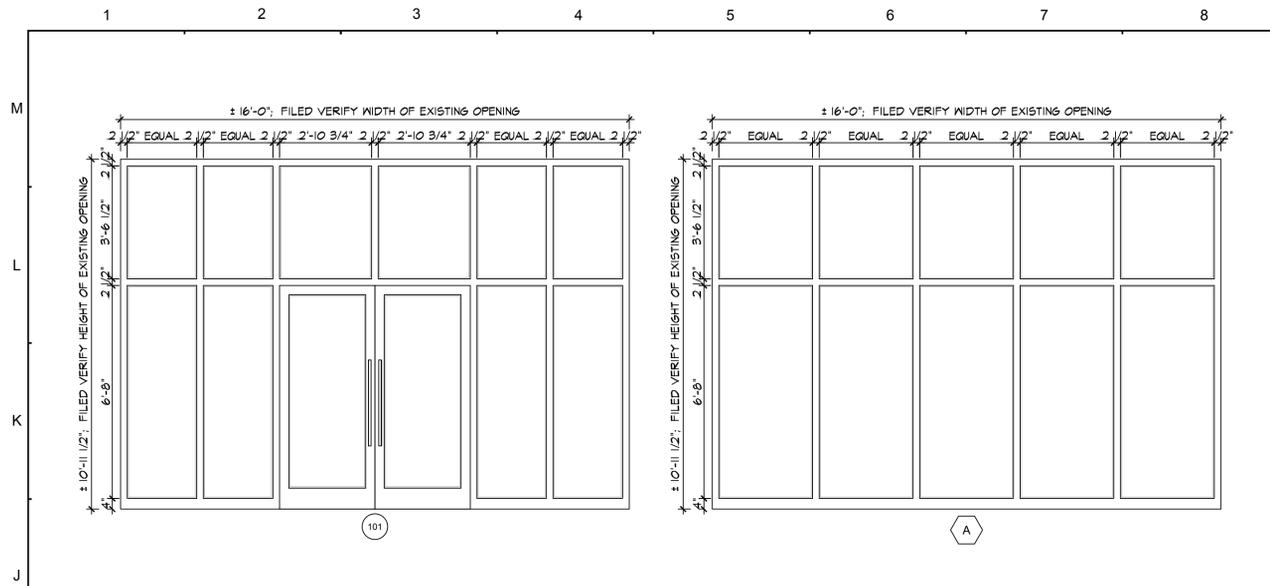
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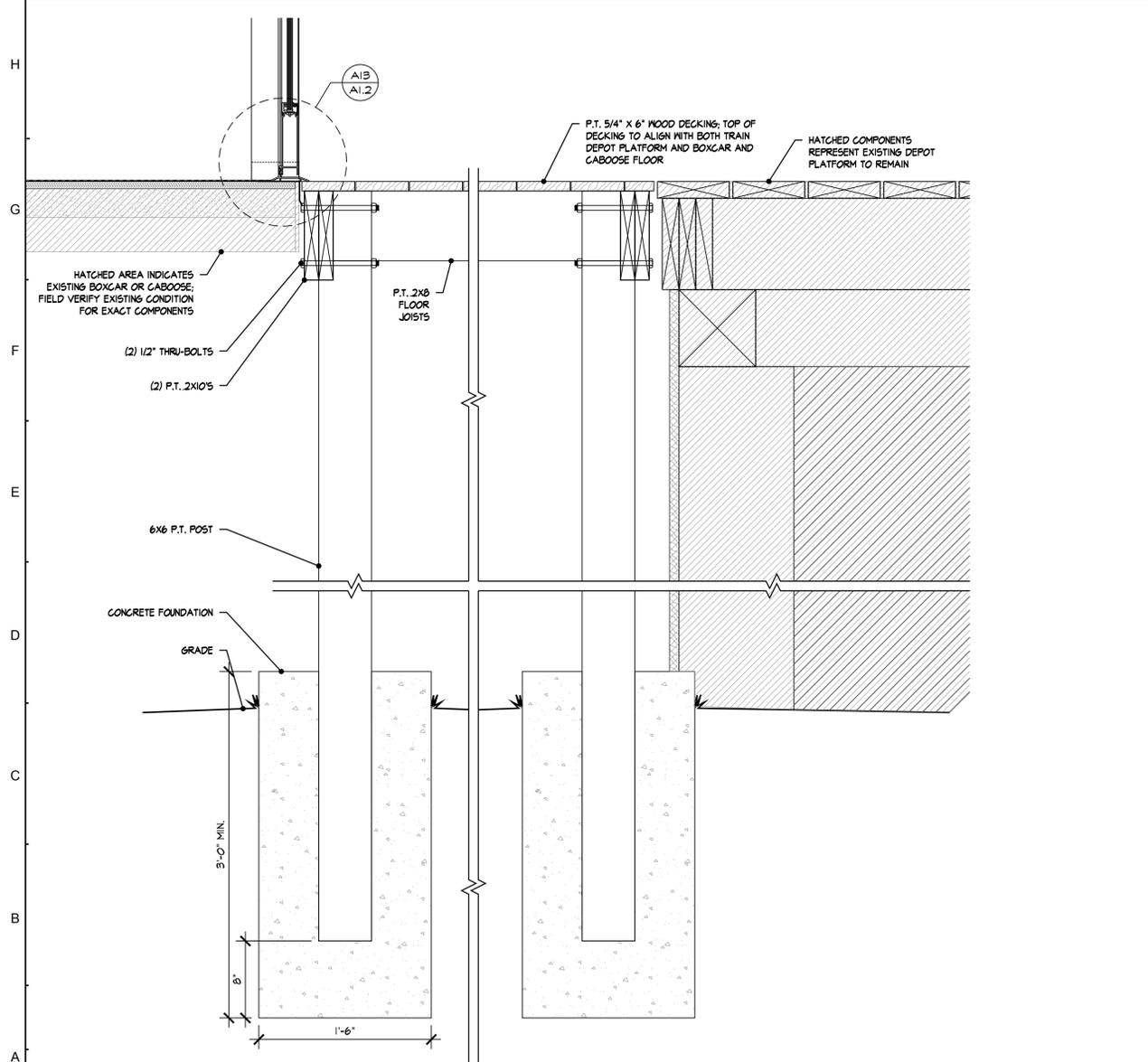
AN ADDITION FOR
MYRTLE BEACH TRAIN DEPOT
CITY OF MYRTLE BEACH
HORRY COUNTY, SOUTH CAROLINA

REVISION	DATE

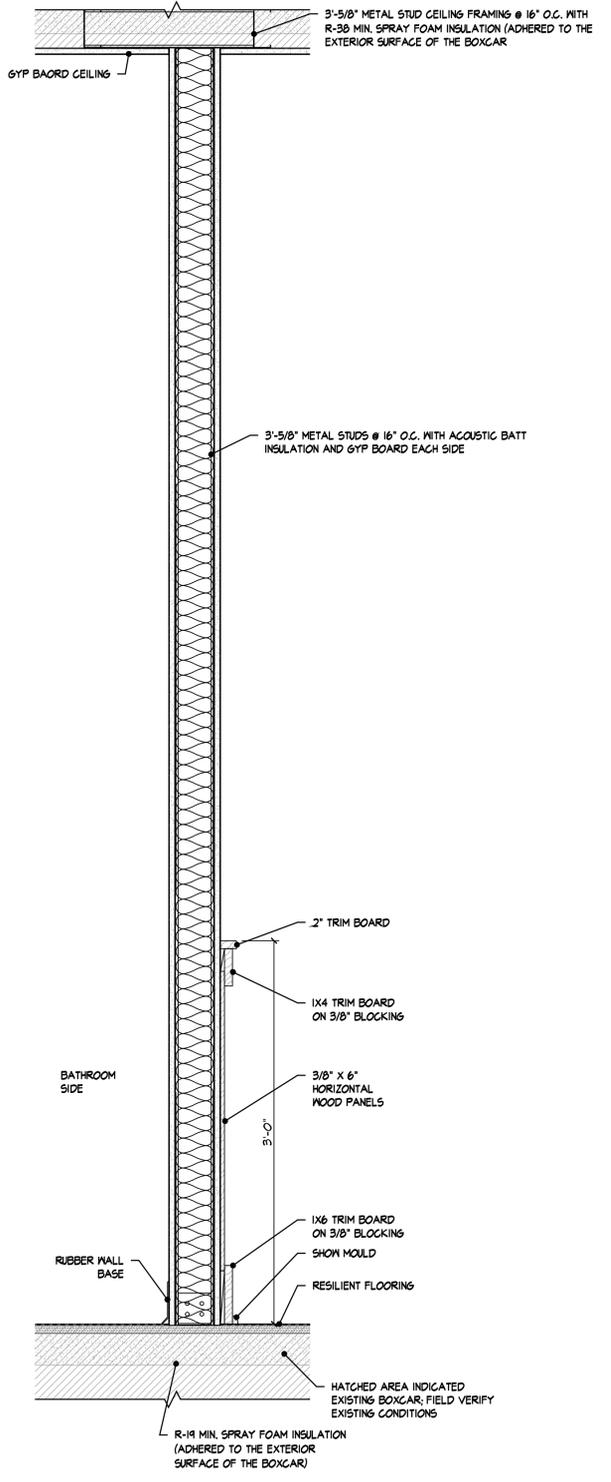
A1.1



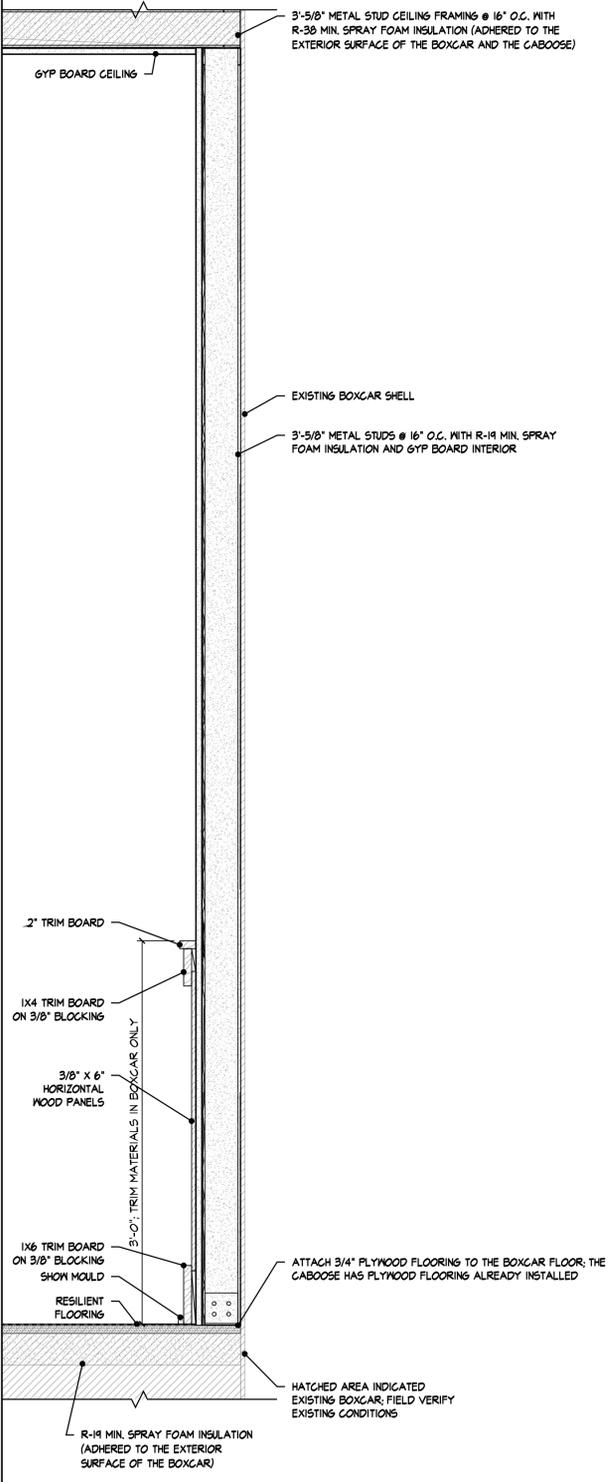
J1 STOREFRONT ELEVATIONS
A1.2 SCALE: 3/8" = 1'-0"



A1 ACCESSPLATFORM BETWEEN TRAIN CARS AN DEPOT PLATFORM
A1.2 SCALE: 1-1/2" = 1'-0"



A9 TYPICAL INTERIOR WALL
A1.2 SCALE: 1-1/2" = 1'-0"



A13 TYPICAL EXTERIOR WALL SECTION
A1.2 SCALE: 1-1/2" = 1'-0"

GENERAL NOTES
A. NOTIFY ARCHITECT IMMEDIATELY UPON DISCOVERY OF ANY CONDITIONS THAT ARE CONTRARY TO THOSE REPRESENTED WITHIN THE DRAWINGS.

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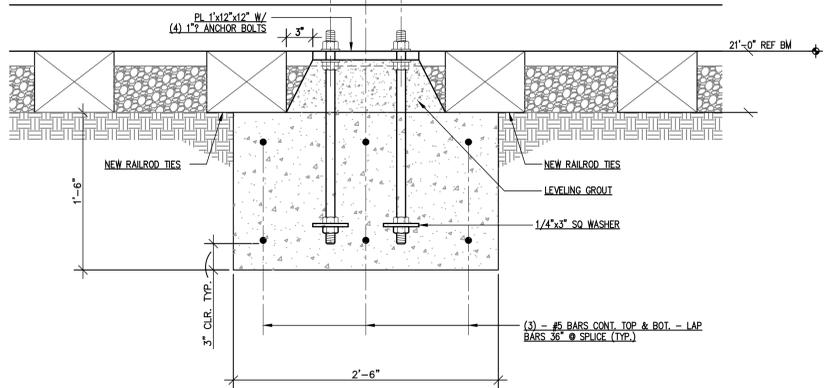
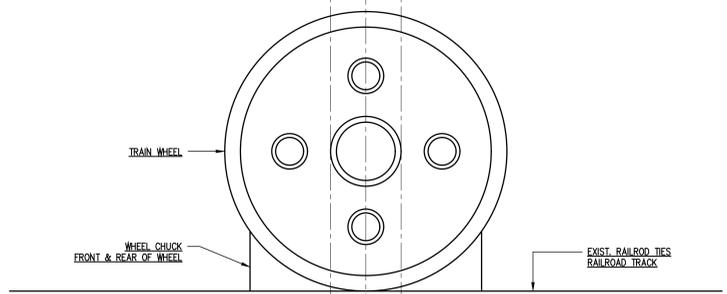
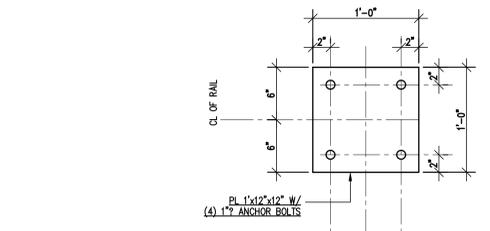
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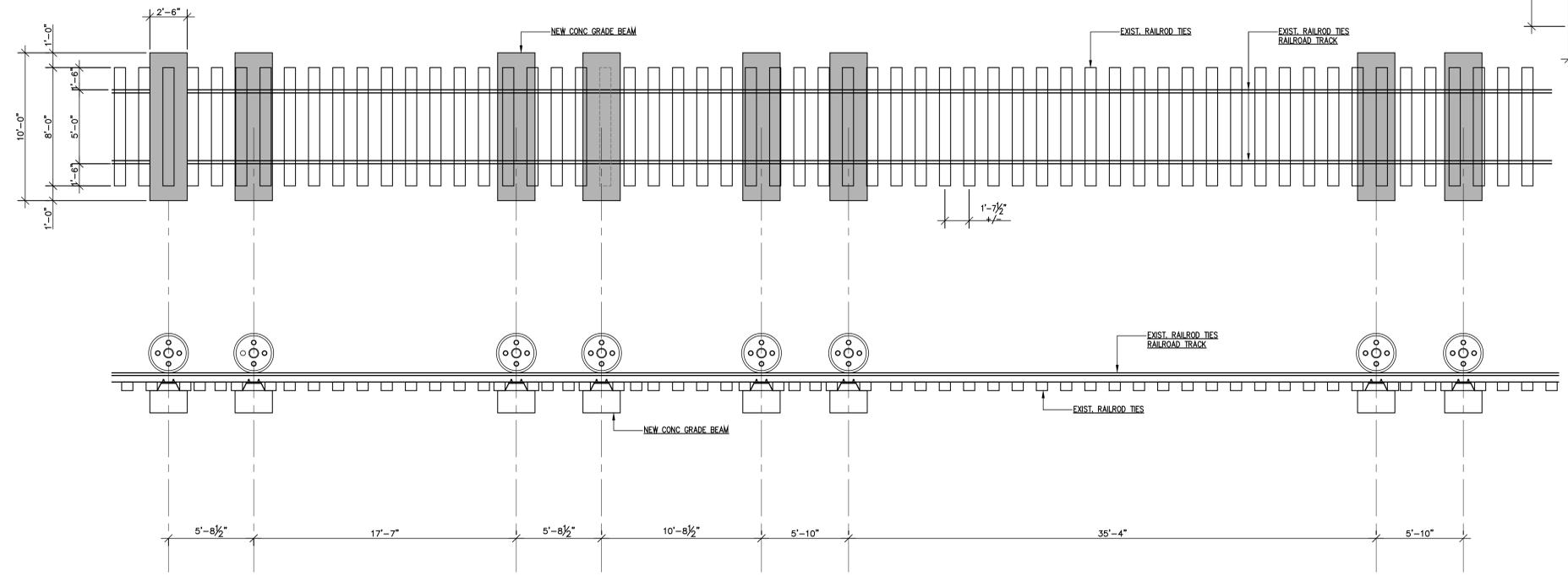
REVISION	DATE

2018
09/26/18
TOILET DETAILS

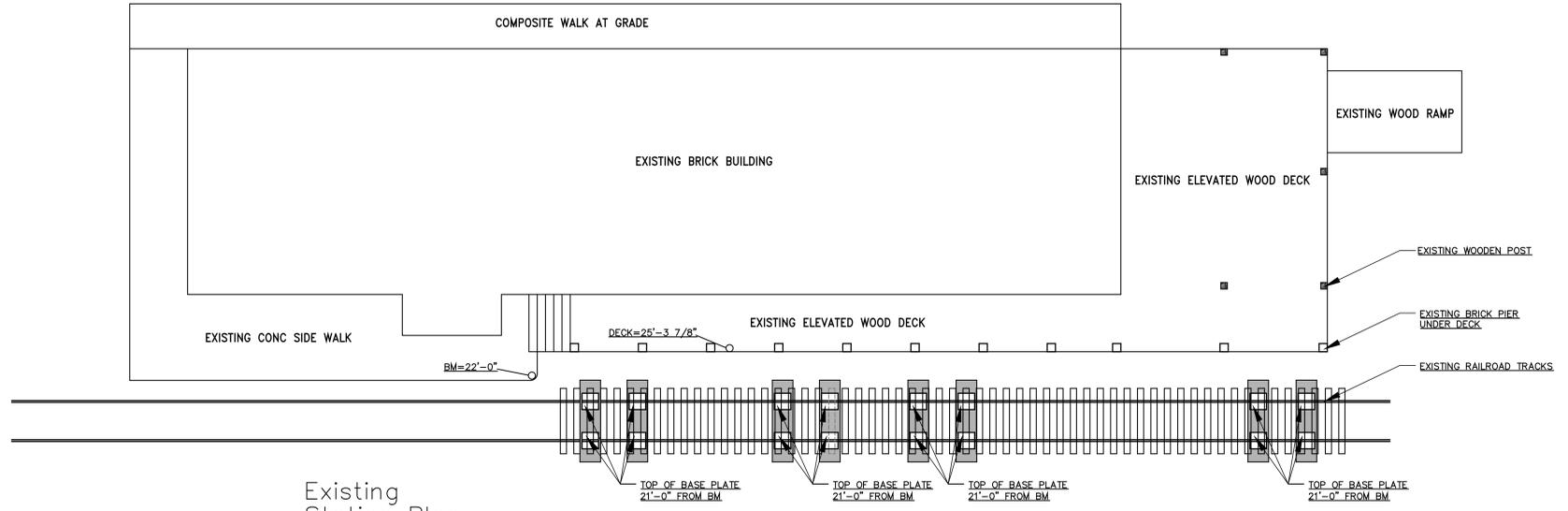
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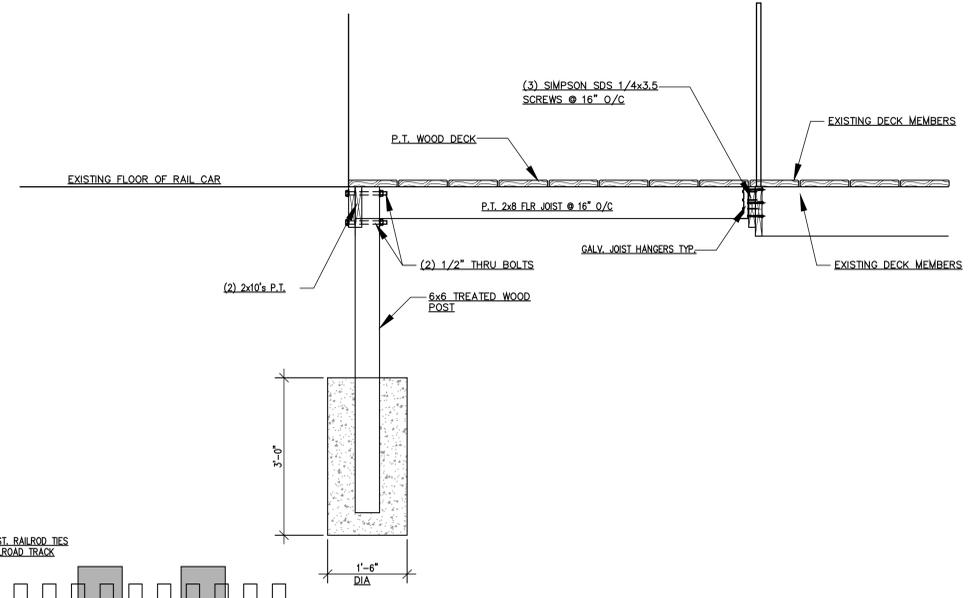
Section Through Grade Beam
SCALE: 1 1/2" = 1'-0"



Grade Beam Location Plan
SCALE: 1/4" = 1'-0"

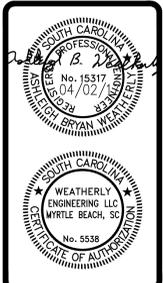


Existing Station Plan
SCALE: 1/8" = 1'-0"



Partner In Charge
ABW
Project Engineer
DWS
Drawn By
CMW
Date Drawn
5/09/17

Revisions
No. _____ Date _____
No. _____ Date _____
No. _____ Date _____
No. _____ Date _____
Issue Date _____



MB TRAIN DEPOT
Myrtle Beach, South Carolina

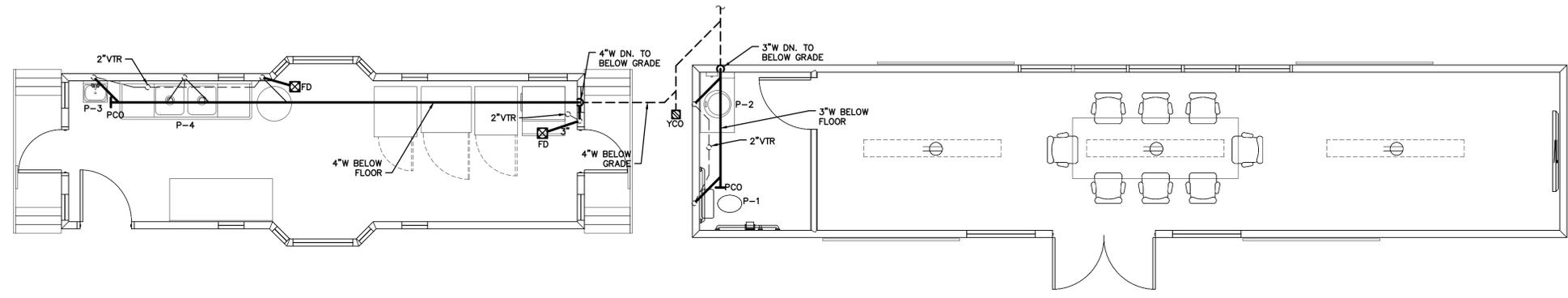
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Project Number
WE-18-100

Sheet
S1

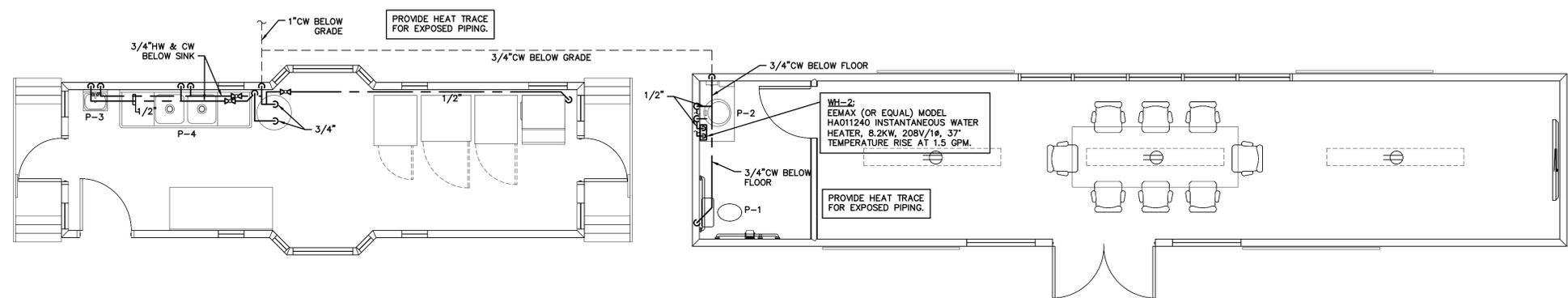
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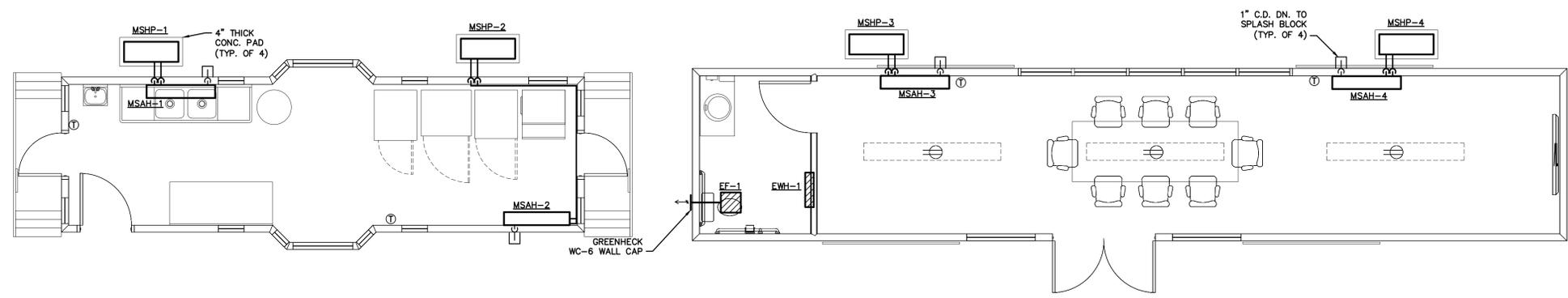
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3 PLUMBING WASTE PLAN
MP1.0 SCALE: 1/4" = 1'-0"



2 PLUMBING WATER PLAN
MP1.0 SCALE: 1/4" = 1'-0"



1 MECHANICAL PLAN
MP1.0 SCALE: 1/4" = 1'-0"

GENERAL NOTES

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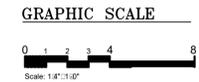
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HORRY COUNTY, SOUTH CAROLINA



2018
09/26/18

FLOOR PLANS

MP1.0



PLUMBING SPECIFICATIONS

(1) TEST

(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 ALL WATER PIPING AT 125 PSI.

(C) TEST ALL WASTE AND VENT PIPING WITH A 10 FOOT HEAD.

(2) PIPING

(A) SOIL, WASTE, VENT AND DRAIN PIPING SHALL BE SOLID WALL PVC PLASTIC PIPE AND FITTINGS CONFORMING TO ASTM D 2665.

(B) WATER PIPING SHALL BE HARD DRAWN COPPER TUBING ASTM B 88 TYPE "L" 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.

(3) 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 1/4" SIZE AND SMALLER SHALL BE SUPPORTED ON 8" 0" CENTERS.

(B) PIPE HANGERS SHALL BE SUPPORTED BY MEANS OF IRON HANGER 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.

(4) 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.

HVAC SPECIFICATIONS

(1) REFRIGERANT PIPING

(A) CONNECT SPLIT SYSTEM AIR HANDLING UNITS TO HEAT PUMPS WITH REFRIGERANT PIPING, TYPE "K" HARD DRAWN COPPER "ACR" TUBING WITH WROUGHT COPPER SWEAT FITTINGS. ALL JOINTS ARE TO BE MADE WITH HARD SOLDER SUCH AS "SIL-FOS" OR "SILVER SOLDER."

(B) PIPE INSULATION - REFRIGERANT SUCTION PIPING - FLEXIBLE FOAMED ELASTOMERIC PLASTIC TUBING WITH A DENSITY OF 8 LBS./CF, K OF 0.27 @ 70 DEGREES F., SELF-EXTINGUISHING, AND A WATER VAPOR TRANSMISSION OF LESS THAN 0.05 PERM IN., FLAME SPREAD RATING 25 OR LESS, SMOKE DEVELOPED RATING OF 50 OR LESS (ASTM E84-75).

(2) CONTROLS

(A) UNITS WILL BE EQUIPPED WITH FACTORY SUPPLIED CONTROLS.

(3) CONDENSATE DRAIN PIPING

(A) ALL DRAIN LINES SHALL BE SOLID WALL PVC DRAIN PIPE CONFORMING TO ASTM D 2665. DRAINS SHALL BE RUN IN A NEAT MANNER AND DISCHARGED TO FLOOR DRAINS (IF UNIT IN MECHANICAL ROOM) OR EXTENDED FIVE FEET FROM BUILDING FOR CONNECTION TO STORM DRAIN PIPING.

(4) TESTING AND BALANCING

(A) 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.

(B) 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.

(C) 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.

(D) 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 QUANTITIES.

(E) ALL CONTROLS SHALL BE CALIBRATED BY QUALIFIED 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.

(F) 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.

MINI-SPLIT SYSTEM SCHEDULE																									
Unit Tag	CFM High	CFM Low	Fan Motor			Cooling Performance			Heating Performance			Unit Electrical		Outdoor Unit							Model (Indoor Unit)	Remarks			
			FLA	Volts	Phase	EAT	MBH Total	Efficiency SEER	EAT	Capacity MBH	MCA	MOCP	Unit Tag		Compressor			MCA	MOCP	Volts			Phase	Model (Outdoor Unit)	
													No.	FLA(ea)	No.	LRA	RLA								
MSAH-1 THRU MSAH-4	380	290	0.33	208/230	1	80/67	18	18.5	70	19	1	15	MSHP-1 THRU MSHP-4	1	0.5	1	12	7	11	15	208230	1	PUZ-A18NKA7	PKA-A18HA7	1-5

1. MODELS BY MITSUBISHI, EQUALS BY LG, DAIKIN, PANASONIC.
2. MOUNT INDOOR SECTION TIGHT TO BOTTOM OF CEILING AND WALL.
3. INDOOR UNIT IS POWERED FROM OUTDOOR UNIT. M.C. SHALL COORDINATE POWER REQUIREMENTS FOR ALL SUBSTITUTIONS.
4. REFRIGERANT LINES AND ACCESSORIES PER SPECS AND AS RECOMMENDED BY UNIT MFG.
5. PROVIDE FACTORY CONDENSATE PUMP.

FAN SCHEDULE											
Unit Tag	CFM	ESP (in.)	Fan RPM	Sones (dBA)	Drive	HP (W)	Volts	Phs	Type	Model No.	Rmks.
EF-1	75	0.3	765	1.5	DIRECT	(80)	115	1	C	SP-B110	1-6

1. MODELS BY GREENHECK. EQUALS BY PENN, ILG, LOREN COOK.
2. TYPES: C = CEILING.
3. SOLID STATE SPEED CONTROL SW. ON FAN OR NEARBY.
4. VERIFY FAN INLET/OUTLET SIZE, TRANSITION TO FIRST DUCT SIZE IF NECESSARY.
5. DISCONNECT SWITCH (OR PLUG) BY MFG. FOR ALL SINGLE PHASE MOTORS (U.N.O.).
6. INTERLOCK WITH LIGHT SWITCH.

ELECTRIC HEATER SCHEDULE						
Unit Tag	Type	Watts	Volts	Phase	Model	Remarks
EW-H-1	WALL HEATER	1000	120	1	MARKEL E3322TD-RP	1-3

1. EQUALS BY SINGER AND CHROMALOX.
2. UNIT MTD. TSTAT.
3. DISCONNECT BY M.C.

PLUMBING LEGEND		
SYMBOL	ABBREVIATION	DESCRIPTION
	CW	COLD WATER
	HW (110F)	HOT WATER
	W	WASTE
	V	VENT
	RL	ROOF LEADER
	SD	STORM DRAIN
	VTR	VENT THRU ROOF
		BALL VALVE
		UNION
		PRESSURE REDUCING VALVE
	FPH	FROST PROOF HYDRANT
	HB	HOSE BIBB
		SHOCK ABSORBER
	PCO	PLUG CLEANOUT
	YCO	YARD CLEANOUT
	FD	SQUARE FL. DRAIN
		VACUUM BREAKER

PLUMBING SPECIALTIES SCHEDULE				
SYM	DESCRIPTION	MODEL NUMBER	REMARKS	
FD	FLOOR DRAIN	ZURN ZN-415-S	1,5	
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	
FPH	FROST-PROOF HYDRANT	WOODFORD #67 WITH VACUUM BREAKER (ASSE 1052)	2,3	
HB	HOSE BIBB	WOODFORD #26 WITH LOOSE KEY, CHROME PLATED, VACUUM BREAKER (ASSE 1052).	2,3	
WCO	WALL CLEANOUT	ZURN Z-1446 W/STAINLESS STEEL COVER	1, 6	
	SHOCK ABSORBER	SIoux CHIEF, A=652-A, B=653-B, C=654-C, D=655-D	4	
WH	WALL HYDRANT	WOODFORD MODEL HC67 SERIES (ASSE 1052)	2,3	

1. EQUALS BY JOSAM, JAY R. SMITH, ZURN, MIFAB, WATTS.
2. EQUALS BY JOSAM, JAY R. SMITH, WADE & PRIER.
3. PROVIDE INTEGRAL CHECK STOPS AT ALL WALL FAUCETS.
4. EQUALS BY JOSAM, JAY R. SMITH, WATTS - ASSE 1010 APPROVED. PROVIDE AT QUICK-CLOSING FIXTURES PER IPC 604.9.
5. AT EACH FLOOR DRAIN & FLOOR SINK, PROVIDE WITH TRAP PRIMER CONNECTION (SUFFIX -P) AND INCLUDE PRIMER OPTION "TP" NOTED ABOVE.
6. PROVIDE WCO AT BASE OF EACH WASTE STACK PER IPC 708.3.4.

PLUMBING FIXTURE SCHEDULE							
SYM	DESCRIPTION	CW	HW	W	V	MODEL NUMBER	REMARKS
P-1	WATER CLOSET (HDCP.)	1/2"	-	3"	2"	KOHLER "HIGHLINE" K-3979; BENEKE 5275S SEAT; K-7637 ANGLE SUPPLY	1,4,5,8
P-2	LAVATORY (COUNTER GRID)	1/2"	1/2"	2"	2"	KOHLER "FARMINGTON" K-2905-4; DELTA 501LF-HGMHDF FAUCET; K-7607 SUPPLY; K-8998 TRAP, K-7129-A DRAIN.	1,2,9,15,17
P-3	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.	1,2,3,9, 15,17
P-4	DBL. COMPT. SINK (ADA)	1/2"	1/2"	2"	2"	ELKAY LRAD-3319-55 W/LK-232-S FAUCET, LK-335 STRAINER & K-7607 SUPPLY; LK-53 TRAP	1,2,10,16

1. 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 PWB8902 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. SINGLE SINKS = RIGID SPOUT; DOUBLE SINKS = RESTRICTED SPOUT.
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.

BLDG. ADDITION SUMMARY	
WATER FU	12
WATER GPM	16
WASTE FU	9
HW GPH (110F)	20

ELECTRIC WATER HEATER SCHEDULE											
Unit Tag	Input (KW)	Volt/Phase	Capacity			Recirc Pump	Expansion Tank	Location	Model	Remarks	Detail
			Recovery (CFH)	Tank Volume (Gallons)	Temp Rise (F)						
WH-1	4.5	208/1	23	40	80	No	Yes	See Plans	A.O. SMITH DEN-40	1,2,3	--

1. EQUALS BY STATE, RHEEM.
2. EXPANSION TANKS ARE AMTROL ST-12 OR EQUALS BY STATE, TACO
3. NON-SIMULTANEOUS ELEMENTS.

GENERAL NOTES

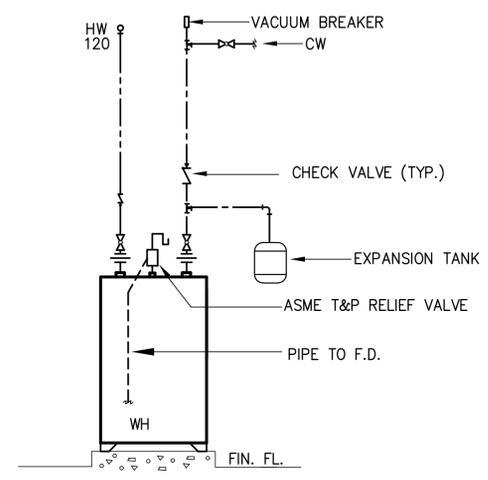
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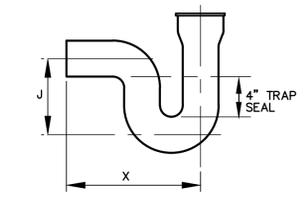
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 CITY OF MYRTLE BEACH
 HORRY COUNTY, SOUTH CAROLINA

2018
 09/26/18
 SCHEDULES & SPECS.

MP2.0

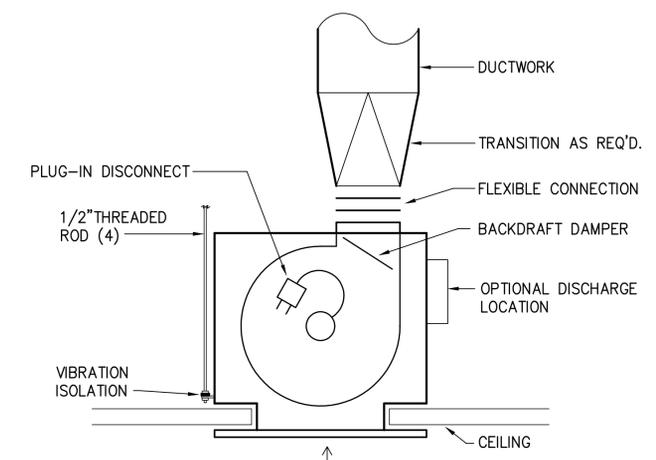


3 WATER HEATER DETAIL
MP3.0 NTS
NOTE: PIPING ARRANGEMENT SHALL BE PER MFR'S RECOMMENDATIONS

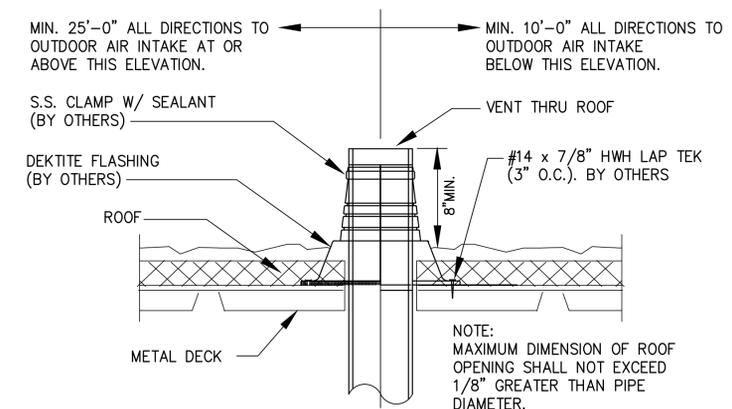


DEEP SEAL "P" TRAP		
SIZE	X	J
2	9 1/2	6
3	12	7
4	14	8

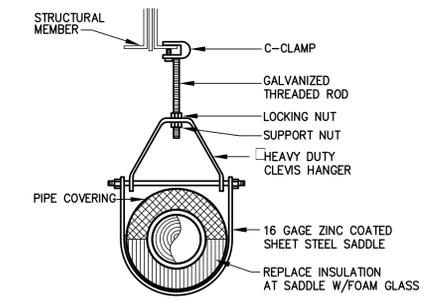
4 MINIMUM TRAP DIMENSIONS
MP3.0 NTS



5 CEILING EXHAUST FAN DETAIL
MP3.0 NTS



1 VENT THRU ROOF DETAIL
MP3.0 NTS



2 PIPE HANGER DETAIL
MP3.0 NTS
CONTRACTOR OPTION: MICHIGAN HANGER #403

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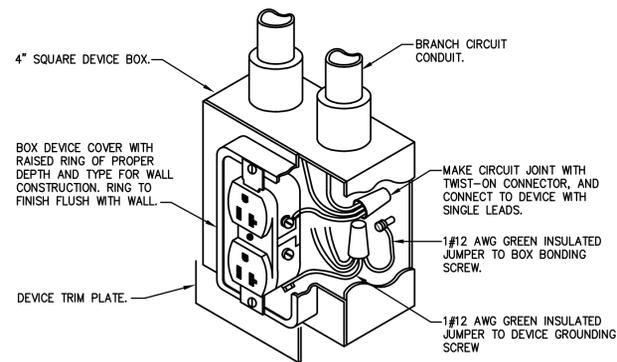
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DETAILS

MP3.0

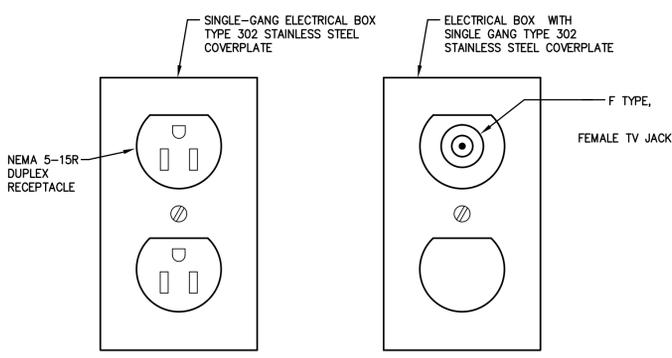
SYMBOL SCHEDULE	
GENERAL SYMBOLS	
SYMBOL	DESCRIPTION
	CONDUIT RUN CONCEALED ABOVE CEILINGS OR IN WALLS.
	CONDUIT RUN CONCEALED IN OR BELOW FLOORS OR UNDERGROUND.
	CONDUIT RUN EXPOSED.
	CONDUIT TURNING UP
	CONDUIT TURNING DOWN
	SQUARE ON CONDUIT SYMBOL INDICATES THAT CIRCUIT CONTINUES BUT NOT SWITCHED.
	HOMERUN TO PANEL AND CIRCUIT(S) DESIGNATED. ARROW(S) INDICATE QUANTITY OF CIRCUITS.
	JUNCTION BOX PER N.E.C.
	SPECIAL NOTE, NUMERALS IDENTIFY, SEE SCHEDULE.
	SPECIAL CONNECTION TO A SPECIFIC ITEM OF EQUIPMENT. SEE CONNECTION SCHEDULE.
	MOTOR CONNECTION. RATING AS NOTED.
LIGHTING	
SYMBOL	DESCRIPTION
	LED LIGHTING FIXTURE, DRAWN TO SCALE.
	LED LIGHTING FIXTURE, WALL MOUNTED.
	LED LIGHTING FIXTURE, WALL MOUNTED, CONNECTED TO AN EMERGENCY CIRCUIT OR EMERGENCY BALLAST.
	EXIT SIGN, CEILING MOUNTED. SHADING INDICATES FACE ORIENTATION. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.
	EXIT SIGN, WALL MOUNTED. SHADING INDICATES FACE ORIENTATION. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.
	EMERGENCY BATTERY PACK FIXTURE, WALL MOUNTED. CONNECT TO UNSWITCHED LEG OF THE CIRCUIT.
	PHOTOCELL CONTROL DEVICE. MOUNT ON ROOF FACING NORTH.
DISTRIBUTION	
SYMBOL	DESCRIPTION
	ELECTRICAL PANELBOARD, SURFACE MOUNTED.
	CONTROL CABINET, FLUSH OR SURFACE MOUNTED.
	DISCONNECT SWITCH, NON-FUSIBLE.
	DISCONNECT SWITCH, FUSIBLE.
	DISCONNECT SWITCH PROVIDED WITH EQUIPMENT.
	GROUND CONNECTION.
WIRING DEVICES	
SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE, 125V, 3-WIRE GROUNDING TYPE.
	DUPLEX RECEPTACLE, GROUND FAULT CIRCUIT INTERRUPTING.
	DUPLEX GFCI RECEPTACLE. PROVIDE WITH OPERABLE, IN-USE WEATHERPROOF COVER.
	SPECIAL PURPOSE RECEPTACLE, WITH SPECIAL NEMA CONFIGURATION AS NOTED.
	WALL OUTLET FOR TELECOMMUNICATIONS. PROVIDE 1" EC UP TO ABOVE CEILING. TERMINATE WITH PLASTIC BUSHING.
	DOT ABOVE OUTLETS INDICATES THAT THE DEVICE IS TO BE INSTALLED ABOVE CASEWORK OR OTHER OBSTACLE. COORDINATE.
	S LIGHT SWITCH, SINGLE-POLE,
	S3 LIGHT SWITCH, 3-WAY,
	S0 DIMMER LIGHT SWITCH.
	OCCUPANCY SENSOR, CEILING MOUNTED. PROVIDE WITH 10 FEET WHIP TO ALLOW FIELD ADJUSTMENT OF LOCATION. COORDINATE EXACT LOCATION WITH MANUFACTURER'S RECOMMENDATION.
TELEVISION SYSTEM	
SYMBOL	DESCRIPTION
	TV SIGNAL JACK. REFER TO DETAIL FOR ADDITIONAL INFORMATION.

ABBREVIATIONS			
A	AMPERES	KW	KILOWATTS
ACC	ARMORED CLAD CABLE	LFNC	LIQUIDTIGHT FLEXIBLE NON-METALLIC CONDUIT
AFB	ABOVE FINISHED FLOOR	LFMC	LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT
AFG	ABOVE FINISHED GRADE	LVC	LOW VOLTAGE CONTROL CABINET
ANN	FIRE ALARM ANNUNCIATOR CABINET	MCB	MAIN CIRCUIT BREAKER
C	CONDUIT	MCC	METAL CLAD CABLE
CB	CIRCUIT BREAKER	MLO	MAIN LUGS ONLY
CKT	CIRCUIT	MTD	MOUNTED
CLG	CEILING	NMC	NON-METALLIC CLAD CABLE
DN	DOWN	PB	PULLBOX
DW	DISHWASHER	PNL	PANELBOARD
EC	EMPTY CONDUIT	PRS	PROGRAM RAPID START
EMT	ELECTRICAL METALLIC TUBING	PS	PROGRAM START
ENT	ELECTRICAL NON-METALLIC TUBING	PWR	POWER
EWC	ELECTRIC WATER COOLER	REC	RECEPTACLE
FACP	FIRE ALARM CONTROL PANEL	RMC	RIGID METAL CONDUIT
FMC	FLEXIBLE METAL CONDUIT	RS	RAPID START
G	GROUND	SW	SWITCH
GFI	GROUND FAULT INTERRUPTER	SWBD	SWITCHBOARD
HOA	HAND OFF AUTOMATIC	TIB	TELEPHONE TERMINAL BOARD
HP	HORSEPOWER	TEL	TELEPHONE
HPF	HIGH POWER FACTOR	TV	TELEVISION
HX	HIGH REACTANCE	V	VOLTS
IG	ISOLATED GROUND	VP	VAPOR PROOF
IMC	INTERMEDIATE METAL CONDUIT	W	WALL MOUNTED
IS	INSTANT START	WG	WIRE GUARD
JB	JUNCTION BOX	WP	WEATHER PROOF
KVA	KILOVOLT-AMPERES	XFMR	TRANSFORMER
FPN	FUSE PRE NAMEPLATE		

MOUNTING HEIGHTS	
(DISTANCE FROM FINISHED FLOOR TO CENTER OF DEVICE UNLESS OTHERWISE NOTED)	
RECEPTACLE	
GENERAL	18" AFF. (UNLESS OTHERWISE NOTED)
ABOVE COUNTER TOP	46" AFF. (UNLESS OTHERWISE NOTED)
LIGHT SWITCH	46" AFF. (UNLESS OTHERWISE NOTED)
TELECOMMUNICATIONS	
GENERAL	18" AFF. (UNLESS OTHERWISE NOTED)
ABOVE COUNTER TOP	46" AFF. (UNLESS OTHERWISE NOTED)
WALL	46" AFF.
TELEVISION	18" AFF. (UNLESS OTHERWISE NOTED)
FIRE ALARM	
PULL STATION	46" AFF.
AUDIBLE/STROBE COMBINATION OR STROBE DEVICE ONLY	80" ABOVE THE FINISHED FLOOR.

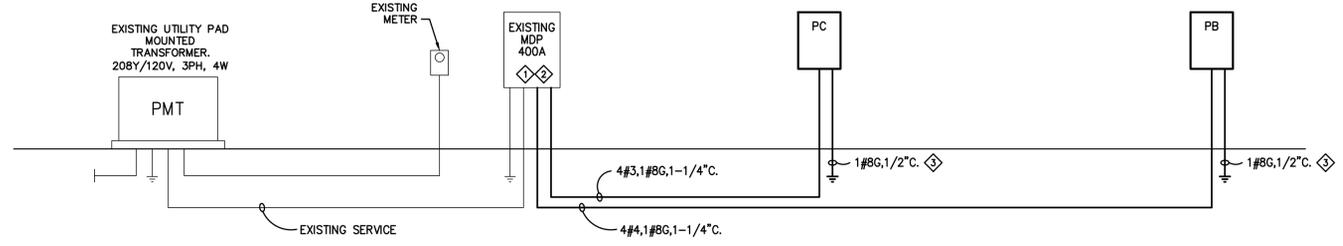


2 DETAIL - TYPICAL DUPLEX RECEPTACLE INSTALLATION
E1.0 NOT TO SCALE



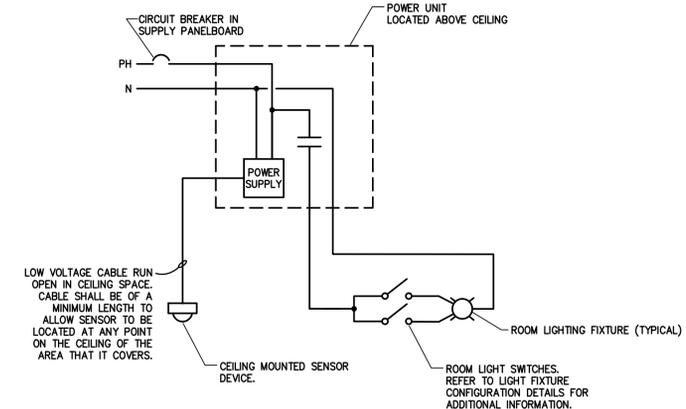
3 DETAIL - TV SIGNAL OUTLET
E1.0 NOT TO SCALE

LIGHTING FIXTURE SCHEDULE														
TYPE	DESCRIPTION	VOLT.	LAMPS						BALLASTS		WATTS	MOUNTING	MANUF. CATALOG NO.	
			QTY	TYPE	BULB	BASE	TEMP	CR1	LUMENS	QTY				TYPE
P1	LED DIRECT/INDIRECT SUSPENDED FIXTURE, 20 GAUGE DIE-FORMED STEEL BODY, FLAT END CAPS, DIFFUSE CENTER OPTIC SHELDING, HIGH OUTPUT LUMEN PACKAGE, 3 LIGHT ENGINES, SINGLE CIRCUIT, OPEN OPTICS, 8 FOOT NOMINAL LENGTHS, 67% INDIRECT / 33% DIRECT, WHITE STANDARD FINISH.	120	-	LED	LED	-	3500 K	80	10356	-	ELECTRONIC DRIVER 0/1-10 VOLT DIMMING TO 10%	87.2	CEILING, SUSPEND 18" BELOW CEILING	FINELITE #S16 LED ID 8' 3E H SERIES OR APPROVED EQUAL
S1	4 FOOT SURFACE LOW PROFILE CURVED BASKET LED WRAPAROUND, DIE FORMED CODE-GAUGE STEEL HOUSING, CURVED PRISMATIC DIFFUSER WITH LINEAR SIDE PRISMS, END PLATE, NOMINAL SIZE: 48"LX10"WX2,75"H. 4800 LUMEN PACKAGE.	120	-	LED	-	-	3500 K	80	4799	1	FIXED DRIVER	40.5	CEILING, SURFACE	LITHONIA #LBL4-LED ELITE #OW-LED SERIES COLUMBIA #LWC SERIES OR APPROVED EQUAL
WF2	LED WALL BRACKET, 2 FOOT NOMINAL LENGTH, ROLL FORMED CODE GAUGE STEEL HOUSING, HIGH IMPACT ACRYLIC DIFFUSER, WHITE POLYESTER POWDER COAT FINISH.	120	-	LED	-	-	3500 K	82	1249	1	FIXED OUTPUT DRIVER	12.2	WALL, SURFACE	LITHONIA #WL2-12L SERIES OR APPROVED EQUAL
WLE	DECORATIVE EXTERIOR WALL MOUNTED LED FIXTURE, TRAPEZOID 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 INTEGRAL BATTERY PACK FOR 90 MINUTE MINIMUM ILLUMINATION.	MVOLT	-	LED	LED	-	4000 K	70	3944	-	FIXED DRIVER	47	WALL, SURFACE MTG HT AS DIRECTED BY ARCHITECT	LITHONIA #WST LED SERIES OR APPROVED EQUAL
	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 #LE SURE-LITES #CX7 HIGH-LITES #ZCLED EXITRONIX #400U LIGHTALARMS #XLD/XLED SERIES
	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	WALL, 1 FT. BELOW CEILING EXCEPT 8 FT. AFF. MAX.	LITHONIA #ELM2 LED SERIES EXITRONIX #LED-90 SERIES LSI #LTEM LED SERIES WILLIAMS #EMER/LED SERIES



1 POWER RISER DIAGRAM
E1.0 NO SCALE

- NOTES:
- ◆ IN SPACE AVAILABLE IN EXISTING 400A MDP PANEL, PROVIDE NEW 100/3 CIRCUIT BREAKER FOR PANEL PC.
 - ◆ IN SPACE AVAILABLE IN EXISTING 400A MDP PANEL, PROVIDE NEW 70/3 CIRCUIT BREAKER FOR PANEL PB.
 - ◆ CONNECT GROUNDING ELECTRODE CONDUCTOR TO EQUIPMENT GROUND SYSTEM ONLY. DO NOT CONNECT TO SYSTEM NEUTRAL AT THIS POINT.



4 DETAIL - OCCUPANCY SENSOR CONTROL
E1.0 NOT TO SCALE

SYMBOLS AND SCHEDULES	
A1 E1.0	NO SCALE

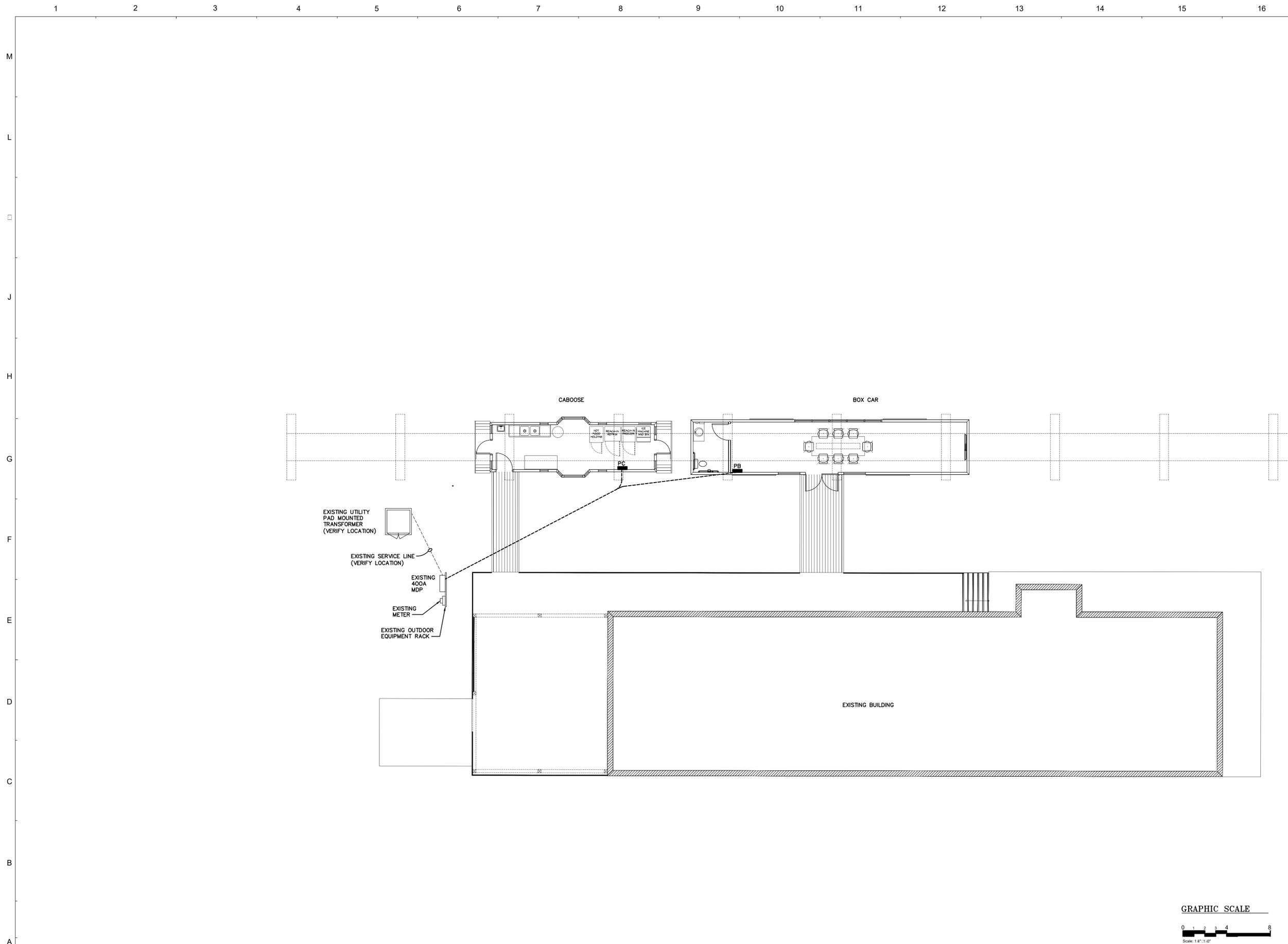
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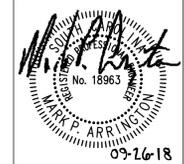
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SYMBOLS AND SCHEDULES

E1.0



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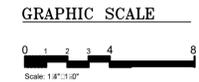
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SITE PLAN

E1.1



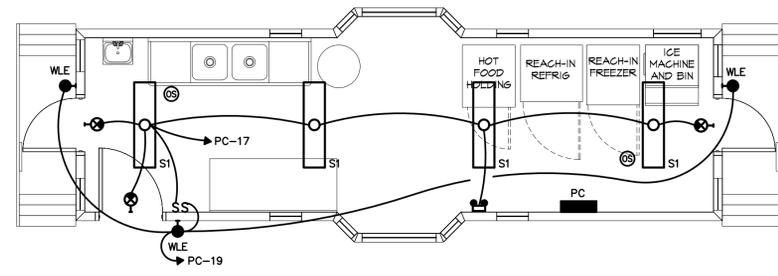
A1 CABOOSE AND BOX CAR - SITE PLAN
 E1.1 SCALE: 1/8"=1'-0"

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

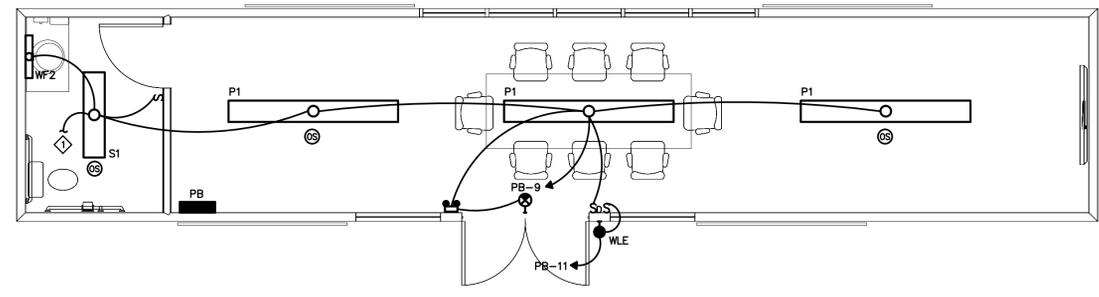
M
L
J
H
G
F
E
D
C
B
A

GENERAL NOTES

- NOTES:**
- ◇ INTERLOCK LIGHT SWITCH WITH EXHAUST FAN SERVING THIS AREA. FAN SHALL COME ON WITH LIGHTS.
 - ◇ PROVIDE JUNCTION BOX FOR HEAT TAPE. HEAT TAPE PROVIDED BY OTHERS.



CABOOSE

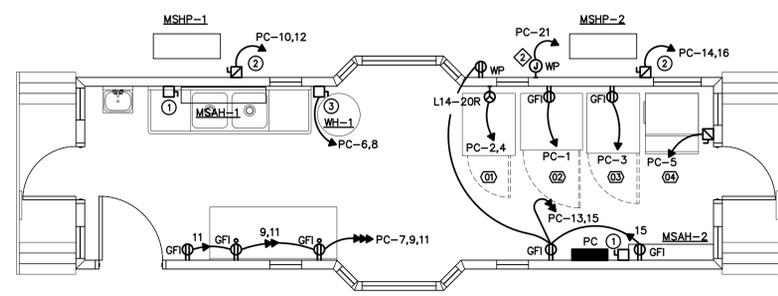


BOX CAR

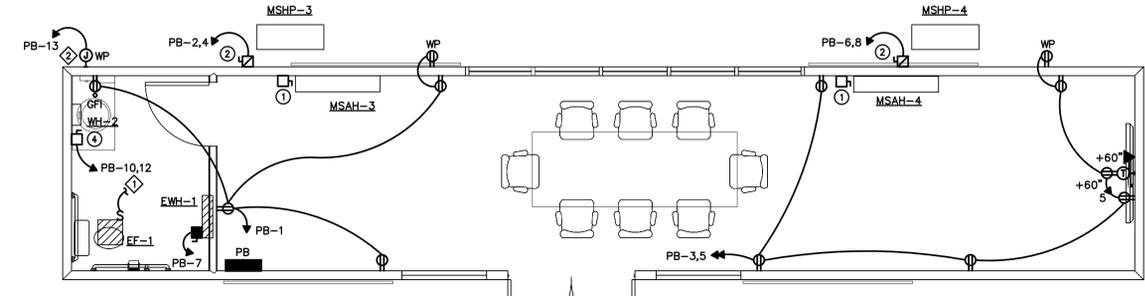
H1
E2.0

CABOOSE AND BOX CAR FLOOR PLANS - LIGHTING

SCALE: 1/4"=1'-0"



CABOOSE

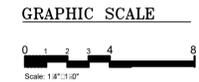


BOX CAR

A1
E2.0

CABOOSE AND BOX CAR FLOOR PLANS - POWER

SCALE: 1/4"=1'-0"



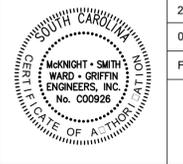
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2018
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FLOOR PLAN - LIGHTING

E2.0

ELECTRICAL GENERAL REQUIREMENTS

1.1 SCOPE:

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

b. Work covered by this Division consists of providing all labor, equipment, supplies, and materials; and performing all operations, including trenching, backfilling, cutting, patching, and chasing necessary for the installation of complete electrical systems in strict accordance with these specifications and the applicable drawings.

c. 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.

d. This Contractor is referred to the General and Special Conditions of the contract which shall form a part and be included in this section of the specification and shall be binding on this Contractor.

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

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.

b. This Contractor shall secure and pay for all permits, fees, inspections and licenses required. It is the responsibility of the Contractor to notify the Local Electrical Inspector to schedule the required inspections. Upon completion of the project and prior to his request for final payment he shall present to the Architect/Engineer a certificate of inspection and approval from the inspection authorities.

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

2.1 GENERAL:

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 Underwriter's Laboratories, Inc. In every instance where such a standard has been established for the item involved.

b. Materials shall be inspected by the Contractor upon their arrival at the site to be sure they are correct. Material and equipment stored on the site shall be protected against physical damage, dirt and damage caused by precipitation, wind, condensation, excessive humidity, and extremes of temperature. Materials shall be stored in their original cartons within substantial, clean and dry storage facilities provided under this Contract. Conduit, large galvanized boxes, and lighting poles may be stored outdoors on suitable blocks or racks clear of the earth and undergrowth, and pitched to drain. Large electrical equipment intended for ultimate installation outdoors may be stored in the weather on suitable blocks or platforms clear of the earth and undergrowth, and with interior lamps or space heaters continuously energized to prevent condensation. Alternate storage provisions may be submitted to the Architect/Engineer for approval prior to the arrival of the material. Under no circumstances shall equipment be stored in the weather under a cover of polyethylene or tarpaulin. The Architect/Engineer will be the sole judge as to the acceptability of storage facilities, and when directed by the Architect/Engineer, improperly stored or damaged material shall be removed from the site and replaced with new material.

c. 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 excavation, backfill, concrete, 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.

d. 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. Where the work will be installed in close proximity to, or may interfere with the work of other trades, the Contractor shall assist in working out space conditions to make a satisfactory adjustment. If so directed by the Engineer, the Contractor shall prepare composite working drawings and sections at a suitable scale not less than 3/8" = 1'-0", clearly showing how his work is to be installed in relation to the work of other trades. If the Contractor installs his work before coordination, or so as to cause any interference with the work of any subs, he shall make the necessary changes in his work to correct the condition without extra charge.

c. 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.

3.2 EXCAVATION:

a. Required excavation for installation of all electrical work shall be provided by the Electrical Contractor. Particular care shall be taken not to disturb or damage work of other trades.

b. Trenching and shoring shall comply with requirements of North Carolina State Department of Labor's regulations entitled "Safeguards During Construction", and "Trenching and Shoring".

c. In backfilling pipe trenches, approved fill shall first be compacted firmly and evenly on both sides of pipe in 6" layers to a depth of 12" over the top of the pipe. Remainder of trench shall be backfilled to established grade in 6" layers. Compact between each layer with a high-frequency vibrator tamper such as Dart Soil Compactor (as manufactured by Dart Manufacturing Company, Denver, Colorado). Fill shall be compacted to density specified in Earthwork Section for the area through which trench is cut. Where compaction requirements are not established for an area, compact fill to 95% maximum density at optimum moisture content.

d. Excess earth shall be deposited on the site as directed by the Architect/Engineer.

e. Where ditches occur outside of building, the surface shall be finished to match existing surfaces. Any existing work, or work of other trades, which is damaged or disturbed shall be repaired or replaced, and left in good order.

3.3 SLEEVES, CUTTING, AND PATCHING:

a. Contractor shall place his own sleeves and advise other trades of required chases and openings so they can be properly built in. Where any raceway supports installed under this Contract pierce the roof, suitable pitch pockets shall be provided and coordinated with the roofing contractor as necessary to be acceptable to the Architect. Provide suitable fittings where any raceways or equipment cross expansion joints.

b. Permitted cutting or patching necessary shall be done by Contractor. Structural members shall not be cut except by written permission of Architect/Engineer.

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, cones, 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. standard gray enamel finish for panelboards, etc.).

3.6 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.

EQUIPMENT CONNECTIONS AND COORDINATION

1.1 GENERAL:

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; and Motor Control Centers indicated, complete as scheduled and specified.

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, Rigid Nonmetallic Conduit, 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 "PVC" indicates Rigid Nonmetallic Conduit.

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

g. 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-corroding 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 including Switchboards, Panelboards, Motor Control Centers, Motor Starters, Safety Switches, and Circuit Breakers.

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. For 277/480 volt systems, nameplates shall have white letters on red background.

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.

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 in 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 underground or in poured concrete. EMT of 2" maximum size may be used for exposed work in lieu of Rigid Metal Conduit except outdoors, or above a roof, or where supporting lighting fixtures, or where exposed to severe impact or injury, or in hazardous locations, or less than 10 feet above a floor or platform in other than in electrical, mechanical, or communications closets or equipment rooms.

d. Rigid PVC Conduit shall be Schedule 40, UL listed for use with 900c. Conduit run underground or run in or under a poured concrete slab shall be rigid PVC. Vertical elbows and vertical extensions from underground or concrete embedded PVC conduits smaller than 3" trade size may also be of PVC provided that they remain concealed or otherwise protected, but shall be of Rigid Steel Conduit (or IMC where permitted) where they stub up into exposed locations or trade size is 3" or larger. An insulating bushing or end bell shall be provided at each termination. Conduit run underground and not under a poured concrete slab shall have installed continuously above it a warning tape. Tape shall be 12 inches wide, centered on conduit and located 12 inches below finished grade.

e. 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.

f. 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 150c. Bonding bushings shall be steel or malleable iron with non-removable plastic throats rated 150c. EMT fittings shall be of the compression type. Set-screw, indenter, 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.

g. 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.

h. 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:

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 threaded conduit hubs of zinc coated malleable iron.

b. Except where run under a concrete slab on grade, underground conduits shall be installed a minimum of 24" below grade.

c. Underground steel conduits, including conduits in gravel or earth under a concrete slab on grade, shall be protected from corrosion by one of the following means:

1. Concrete encasement with a minimum cover of 3" in all directions.
2. PVC coating of .015" minimum thickness, factory bonded to the steel conduit, Robroy Industries "Rob-Kote" or approved equal. Provide equal protection at joints and where the coating is damaged in accordance with the manufacturer's recommendations.
3. Conduits painted with two coats of heavy asphaltum or bitumastic. Apply coating to clean, dry, full length conduits, each with a coupling on one end, and allow to dry between coats and before installation. Support conduits on saw-horses or racks, clear of earth and moisture, during painting and drying. Touch-up joints and abrasions after assembling, and protect completed conduit runs by backfilling, or by covering conduits with suitable protective material approved by the Architect/Engineer.

d. Installation of PVC conduit shall be in accordance with the manufacturer's recommendations using solvent welded couplings and fittings. Field bends shall be made with approved heating equipment. Open flames are not permitted. An insulating bushing or end-bell shall be provided at each termination.

e. 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.

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

g. 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.

h. 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.

CONDUCTORS

1.1 MATERIALS:

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

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 or 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.

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

d. 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.

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

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 smaller than #12 AWG.

2.1 SPLICES, TAPS, AND CONNECTIONS:

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 75c 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 75c at 600 volts.

2.2 COLOR CODING:

a. All wiring shall be color coded.

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 White (Neutral). On 277/480V, 3 phase, 4 wire systems, conductors shall be color coded Brown (Phase A), Orange (Phase B), Yellow (Phase C), and Gray (Neutral).

c. Insulation for grounding conductors on all systems shall be Green.

d. 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.

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

2.3 BRANCH CIRCUIT RACEWAY WIRING:

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

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

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.

2.4 SERVICE & FEEDER CONDUCTORS:

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

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

c. Where service or feeder conductors are so installed that the conductor markings cannot be read without moving or twisting conductors, they shall be provided with suitable tags indicating the conductor size and insulation.

GROUNDING AND BONDING

1.1 SCOPE:

a. The electric system neutral, 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.

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

1. Voltage exceeds 250 volts to ground.
2. Branch circuit conduit exceeds 1" in size.
3. Feeder conduit regardless of voltage and size.

3.2 GROUNDING ELECTRODE SYSTEM:

a. The grounding electrode system for the service neutral and service equipment shall include connections to the following:

1. The water main at the nearest accessible point to where it enters the building and on the street side of the main valve. This connection shall remain accessible after construction is complete.
2. A ground rod using #4 AWG copper conductor. Provide additional ground rods not less than 6 feet apart where needed to comply with NEC ground resistance limitations, and resistance limitations specified herein.
3. Structural metal building frame, where applicable.

b. Grounding electrode conductors shall be made with galvanized steel and shall be bonded to the raceway at both ends. Raceway may be omitted only where specifically indicated on the drawings.

c. The Contractor shall test the ground resistance of the completed grounding electrode system. If test indicates a resistance to ground in excess of 15 ohms it shall be reduced to 15 ohms or less by providing additional ground rods.

d. Prior to making the final main bond jumper connection from the grounding electrode conductor to the system neutral, the contractor shall demonstrate by megger test adequate isolation from ground of the system neutral. This test will require that the system neutral be suitably isolated from utility neutral if it has been grounded in any way by the utility.

BOXES

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, Roca, Crouse-Hinds, Apleton, or approved equal.

b. For exposed work on the exterior of the building, and in damp or wet interior locations, 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 conduit 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 6" square and larger shall be NEC gauge and size of zinc coated sheet steel, 4" octagonal, 4" square and 4-1/16" 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 ribbed surface type. "Handy" boxes are not permitted.

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.

c. Pilot lights shall be neon.

d. Weatherproof switches shall be equipped with stainless steel covers UL listed for wet locations with cover closed, Pass and Seymour WP-1.

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 QF5262 and QF5362 series for 5-15R and 5-20R respectively.

d. Where indicated on the drawings provide Weatherproof receptacles consisting of Ground Fault Circuit Interrupter receptacles as specified above with stainless steel covers UL listed for wet locations with cover closed, Pass and Seymour WP-26.

GENERAL NOTES

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REVISION	DATE

AN ADDITION FOR
MYRTLE BEACH TRAIN DEPOT
 CITY OF MYRTLE BEACH
 Horry County, South Carolina

2018
 09/26/18
 SPECIFICATIONS

E4.0

A1
 E4.0
SPECIFICATIONS
 NO SCALE



MISCELLANEOUS MATERIALS

1.1 CONTROL RELAYS:

a. The relay coil shall operate satisfactorily with coil voltages within 85% to 110% of its voltage rating. Unless otherwise noted, contact rating shall be 10 amps, continuous for the applied voltage level.

b. Control relays shall be GE CR120 Series, or approved equal.

c. Time delay relays shall be electromechanical Agastat Series 7000, or approved equal with on-delay or off-delay as required, potted coil for protection against moisture, and repetitive accuracy of plus or minus 5% on range of 5 to 200 seconds and 10% on range above 200 seconds.

d. Relays shall be installed in a suitable enclosure to fit the environment of their location.

1.2 CONTACTORS:

a. Contactors shall be "electrically held" or "mechanically held" type, as indicated on drawings.

b. Electrically held contactors shall include auxiliary contacts as indicated and line and load terminal connectors.

c. Mechanically held contactors shall be industrial type, single or dual solenoid operator, with mechanism capable of withstanding reduction or loss of control voltage without change of position. Contactor shall incorporate control power cut-out contacts so that the magnetic solenoid operator is only momentarily energized during the instant the switch changes position.

d. Contactor core and coil assembly, or operators, shall operate satisfactorily with coil voltage within 85% or 110% of its voltage rating.

e. All contacts shall be of non-welding, non-corroding silver alloy.

f. Rating of contactors shall be as indicated on drawings. Auxiliary relays shall be provided as applicable. Contactors shall be contained in a suitable enclosure for the environment of their location. Contactors shall be suitable for a continuous load not less than 100% of their electrical rating.

g. Contactors shall be Square D Type L or LX Series, or approved equal.

1.3 INDIVIDUAL PUSHBUTTONS, SELECTOR SWITCHES AND INDICATING LIGHTS:

a. Pushbuttons shall be heavy-duty, oil-tight, momentary or maintained contact, as applicable, devices rated 600 volts with the number of buttons and the marking of nameplates in accordance with NEMA Publication No. ICS.

b. Pushbuttons shall be designed with the indicated number of normally open circuit closing contacts, normally closed circuit opening contacts, or combination thereof. Pushbuttons shall have positive make and break non-welding, non-corroding silver alloy contacts.

c. Selector switches for control circuits shall be heavy-duty, oil-tight maintained contact devices with the number of positions and the marking of nameplates as indicated on drawings or otherwise specified.

d. Indicating lights for control circuits shall be oil-tight, instrument type devices with threaded base and collar for flush mounting and translucent convex lens. Indicating lights shall be long life type, rated 7500 hours, minimum. Provide Owner with two spare indicating lights of each size and type used.

e. Pushbuttons, selector switches and indicating lights shall be contained in an enclosure suitable for the environment of their location, and shall be Square D Class 9001, Type T Series, or equivalent as accepted by the A-E, and shall be Square D Class 9001, Type T Series, or approved equal.

1.4 CONTROL CIRCUIT TRANSFORMERS:

a. Control circuit transformers shall be provided within the enclosure of magnetic contactors when indicated on drawings or specified otherwise and the line voltage is in excess of 120 volts. The transformer shall be dry type single phase, 60 hertz alternating current with a 120 volt isolated secondary winding in accordance with NEMA Publication No. STL "Specialty Transformers".

b. The rated primary voltage of the transformer shall be not less than the rated voltage of the controller. The rated secondary current of the transformer shall be not less than continuous duty current of the control circuit.

c. The voltage regulation of the transformer shall be such that with rated primary voltage and frequency the secondary voltage will not be less than 95% or more than 105% of rated secondary voltage.

d. The source of supply for control circuit transformers shall be taken from the load side of the main disconnecting device. The primary and secondary windings of the transformer and control circuit wiring shall be protected against overloads and short circuits with properly selected fuses. The secondary winding of the control circuit transformer shall be grounded.

1.5 TIME SWITCHES:

a. Time switches for the control of tungsten-lamp 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.

1.6 PHOTOCELL CONTROL DEVICES:

a. Photo cell 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.

b. Fixture mounted photo cell 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.

c. 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 30 foot-candles, have a capacity of up to 2000 watts of incandescent load, be outlet box mounted, and not require surge protection.

d. Photo control devices shall be as manufactured by Tork, Sangamo, General Electric, or approved equal.

1.7 WALL BOX DIMMERS:

a. Wall box dimmers shall be flush mounted, with built-in push-push switch and rotary dimming control, or sliding knob, as applicable. Dimmers shall be continuously rated for AC (60 Hz) loads of wattage as shown on drawing, except that no single dimmer rating shall be less than 1000 watts. Dimmers required at the same location shall be ganged. The Contractor shall provide dimmers that once ganged shall be capable of handling the rating in watts indicated on drawings.

b. Incandescent dimmers shall be suitable for dimming 120 volt incandescent and resistive loads and shall be single pole or 3-way type as indicated on drawing. Dimmers shall be Lutron N series or equivalent.

c. Fluorescent dimmers shall be suitable for dimming 120 volt or 277 volt magnetic or electronic ballasted fluorescent lighting loads as indicated on the drawings. Provide single pole or 3-way type as indicated. When a fluorescent dimmer is required, suitable dimming ballasts, compatible with dimmer unit, shall be provided even if not specifically called for in the fixture schedule. Dimmers shall be Lutron NF series or equivalent.

1.8 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; 1/8 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.

j. 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.

l. 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 mode.

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

1.9 SPECIAL ENCLOSURES:

a. Special enclosures designed in accordance with UL and NEMA Standards shall be provided as required to protect devices and equipment from wet, dusty, corrosive, hazardous or flammable atmospheres. Enclosures shall be NEMA Type 3R, 3S, 4X, 7, 9, 12, or 13 in accordance with the environment present in the specific location.

b. Enclosures shall be made of metal unless otherwise specifically noted.

c. NEMA Type 4X enclosure shall be made of corrosion-resistant, chromium nickel stainless steel conforming with UL Standard No. 50 "Cabinet and Boxes".

d. NEMA Type 7 and 9 enclosures shall be made of cast iron, bolted-type UL listed for the use intended. Cast metal enclosures shall be not less than 1/8" thick at every point, except that it shall be not less than 1/4" thick at tapped holes for conduits.

1.10 OCCUPANCY SENSORS:

a. Occupancy sensors shall be provided where indicated on the drawings. Sensors shall be the dual technology type suitable for sensing both passive infrared and ultrasonic waves type, complete with a self-contained power/switch unit to avoid the need for low-voltage wiring to a remote sensor. Each sensor shall have a time delay circuit adjustable from 5 - 15 minutes with a shortened 30 second time delay feature for set-up purposes and a manual time delay bypass feature. In addition, each sensor shall have a LED walk test indicator for set-up purposes.

b. The power/switch pack shall consist of a control transformer and rectifier circuit and a relay with contacts rated 277 VAC, 20 Amp, 4800 Watts.

c. The sensor shall be sensitive to 9 - 10 micron/meter wave length infrared heatwaves.

d. Upon detection of the heatwaves or motion, the relay contacts shall instantly close to activate the room lighting. The contacts shall remain closed until no motion or presence of waves is sensed for the full length of time set by the adjustable time delay circuit.

e. The sensor shall be ceiling mounted and located as recommended by the manufacturer. The sensor shall be provided complete with all necessary hardware, brackets, special boxes and covers.

f. Unless otherwise indicated, all fluorescent lighting within the room where the occupancy sensor is located shall be controlled by the occupancy sensor.

g. Occupancy sensors shall provide 95% coverage of space where shown. Provide additional sensors as required to achieve this coverage.

h. Submit layout of all occupancy sensors specific for this project as developed by the sensor manufacturer prior to installation of sensors.

SECONDARY DISTRIBUTION EQUIPMENT

1.1 OVERCURRENT PROTECTION DEVICES:

a. Unless otherwise indicated, circuit breakers shall be provided as the overcurrent 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. Multipole breakers shall be common trip. Circuit breakers shall be bolted in place where possible. Thermal-magnetic breakers shall be calibrated at 40c, 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 Switchboards, Panelboards, and Motor Control Centers as hereinafter 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, Panelboards, Switchboards, and/or Motor Control Centers as hereinafter specified.

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 SECTION 16150 WRING DEVICES.

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 SECTION 16100 BASIC MATERIALS AND METHODS.

c. Floor mounted equipment such as Switchboards, Motor Control Centers, and Dry-Type 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. Exterior Safety Switches that are readily accessible to unauthorized persons shall have their covers padlocked closed by the Contractor. Keys shall be identified and delivered to the Owner.

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

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

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 Amps.

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.

j. 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.

l. Hybrid design utilizing:

1. Thermally Protected Metal Oxide Varistors

2. 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 MODULAR SURGE PROTECTION FOR SERVICE ENTRANCE/MAIN DISTRIBUTION AND CRITICAL EQUIPMENT APPLICATIONS:

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

Ampacity @ SPD Install Point/Surge Protection (kA)Per ModePer Phase400 - 800A150300125 - 225A10020015 - 100A50100

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

c. Modes of Protection: The SPD system shall provide surge protection in all possible modes (L-N, L-G, L-L, and N-G). Each replaceable module shall provide the uncompromising ability to deliver full surge current rating per mode.

d. SPD modules shall be configured to isolate individual suppression component failures without causing total loss of surge protection in that mode.

e. Opening of supplementary protective devices, internal or external, shall not be permissible during UL 1449 3rd Edition Nominal Discharge testing.

f. Connection Method: Terminal Block, 60A #6AWG.

g. Each individual module shall feature a green LED indicating the individual module has all surge protection devices active. If any module is taken off-line, the green LED will turn off and a red LED will illuminate, providing individual module as well as total system status indication.

h. Monitoring: Solid State Status Indication Lights.

i. The modular SPD shall be provided in a NEMA 12 or 4X enclosure.

j. Voltage Protection Ratings: The UL 1449 3rd Edition Voltage Protection Ratings "VPR" (6kV, 3000 Amps, 8/20µs waveform) shall not exceed the UL assigned values listed below.

6kV, 3000A, 8/20µs WaveformVoltage Rating208/120V480/277VLine to Neutral900V1200VLine to Ground800V1200VNeutral to Ground700V1200VLine to Line1200V2000V

k. Approved Manufacturers: The following SPD manufacturers and respective models shall be deemed acceptable, subject to conformance with indicated requirements:

Surge Suppression, Inc. STMD Series
Current Technologies SL2 Product Series
Liebert Interceptor II Series

2.2 NON-MODULAR SURGE PROTECTION FOR DISTRIBUTION, 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.

Ampacity @ SPD Install Point/Surge Protection (kA)Per ModePer Phase400 - 800A150300125 - 225A10020015 - 100A50100

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.

6kV, 3000A, 8/20µs WaveformVoltage Rating208/120V480/277VLine to Neutral700V1200VLine to Ground700V1200VNeutral to Ground800V1200VLine to Line1000V2000V

e. Approved Manufacturers: The following NON-MODULAR SPD manufacturers and respective models shall be deemed acceptable, subject to conformance with indicated requirements:

Surge Suppression, Inc. STMD Series (50 to 150kA/Mode)
Current Technologies TG Product Series (50 to 150kA/Mode)
Liebert Accuvac All Product Series (up to 80kA/Mode)
LM Product Series (100 to 150kA/Mode)

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 nipped to the distribution panel and shall be supplied by a 60 Amp circuit breaker. (Where possible, a bottom feed modular SPD is preferred, close nipped to top of distribution cabinet.)

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

PANELBOARDS

1.1 SUBMITTALS:

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

1. Cabinet dimensions.
2. Mounting requirements.
3. Bussing arrangement.
4. Circuit breaker arrangement.
5. Accessories.

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.

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.

2. A flush latch and turnbuckle 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.

3. 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 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 removable blank covers.

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

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

2.2 DISTRIBUTION PANELBOARDS

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 be bonded to enclosure.

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 drawings.

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

GENERAL NOTES

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REVISION DATE

2018
09/26/18

SPECIFICATIONS

E4.1

AN ADDITION FOR
MYRTLE BEACH TRAIN DEPOT
CITY OF MYRTLE BEACH
HORRY COUNTY, SOUTH CAROLINA

McKNIGHT · SMITH · WARD · GRIFFIN
ENGINEERS, INC.
No. C00928

SOUTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
No. 18963
DATE OF EXPIRATION: 12/31/2018

LIGHTING FIXTURES AND ACCESSORIES

1.1 SCOPE:

- 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 charge.

1.2 SUBMITTALS:

- 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.
- 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.

2.1 LIGHTING FIXTURES:

- a. All fixtures shall be labeled by Underwriters' Laboratories, Inc.
- b. It is the Contractor's responsibility to properly determine and provide correct components, accessories, and hardware required for the installation.
- c. Plastic materials indicated to be "acrylic" shall be of 100% virgin methyl methacrylate produced by Rohm and Haas, DuPont, or Cyanimid.
- d. Recessed Fixtures (Troffers) shall conform to the following minimum requirements unless modified by notes and schedules on the Drawings:
 - 1. Housings shall be of 4-3/8" minimum, 5" maximum depth, and of 22 gauge minimum steel, with deeply formed transverse ribs for rigidity, primed, and finished in baked white enamel. The use of pre-painted steel is acceptable.
 - 2. Lenses shall be of flat clear K-12 type acrylic of .125" nominal (.115" minimum) thickness in rigid hinged steel or extruded aluminum door frames finished in baked white enamel and secured with inconspicuous spring-loaded or rotary cam type steel latches. Lenses shall be maintained in a flat position with invisible clips, and shall be removable from the door frames using a screwdriver without damaging the lens or the frame.
 - 3. Joints between housings and door frames shall be totally free of light leaks. Gaskets, if used, shall be invisible and in compression when the door is closed. Gasketing material subjected to rubbing when the door is opened or closed will not be accepted. Flexible and/or removable black baffles will not be accepted.
 - 4. Top access plates to facilitate wiring are optional with the Contractor. Each fixture shall be individually connected to a concealed junction box with #16 TFN conductors in 6 feet of 3/8" flexible metal conduit.
 - 5. Troffers for inverted tee exposed grid ceilings shall be designed to be raised through the ceiling opening, and be supported and framed by the ceiling tees. They shall be secured to the ceiling grid with four "earthquake clips" furnished by the fixture manufacturer.
 - 6. Troffers for plaster and gypsum board ceilings shall be furnished with plaster frames.
 - 7. Troffers for ceilings with concealed suspension systems including plaster, gypsum board, and acoustical tile shall be equipped with suitable adjustable yokes or brackets designed to hook onto the plaster frame or ceiling channels, prevent the channels from spreading, and support the fixture.
 - 8. Fixtures shall be a regularly cataloged and commonly manufactured product of an established, recognized lighting fixture manufacturer, with published photometric data and Zonal Cavity Coefficients of Utilization based on tests conducted by an independent photometric testing laboratory. Tests and calculations shall be in accordance with current IES standards.

2.2 LED DRIVERS:

- a. General
 - 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 fully-loaded conditions and under maximum case temperature.
 - 4. Maximum inrush current of 2 amperes for 120V and 277V drives.
 - 5. Withstand up to a 4,000 volt surge without impairment of performance as defined by ANSI C82.41 Category A.
 - 6. 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. Drivers 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.
- c. Digitally Addressable Control
 - 1. Continuous dimming from 100 percent to 1 percent relative light output.
 - 2. Ability to operate with installed or specified building control system.
 - 3. Lights automatically return to the setting prior to power interruption.
 - 4. Each driver responds independently to:
 - a. Up to 32 occupant sensors.
 - b. Up to 16 daylight sensors.
 - 5. Responds to digital load shed command.
 - a. Sets high end trim.
 - b. Automatically scales light output proportional to load shed command.
- d. Forward Phase Control (Neutral Wire Required)
 - 1. Continuous dimming from 100 percent to 1 percent relative light output.

3.1 COORDINATION:

- 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 wiring.

3.2 INSTALLATION:

- a. Lighting fixtures shall be installed in accordance with the manufacturer's instructions.
- b. Lighting fixtures shall be supported from the building structure using corrosion resistant steel hardware. 10 gauge minimum steel wire may be used for support from the structure where concealed above suspended ceilings.
- c. In addition to the supports from the structure, fixtures shall also be secured to suspended ceilings on which they are mounted, or in which they are recessed. Where fixtures are secured to suspended ceilings, the primary supports from the building structure shall be slack.
- d. A minimum of two supports from the structure shall be provided for each lighting fixture unless otherwise indicated or approved by the Architect/Engineer. The supports shall be located at diagonal corners of rectangular fixtures.
- e. Where installed recessed in grid type ceilings, attach each fluorescent fixture to the grid with a minimum of four "earthquake clips" furnished by the Lighting Fixture manufacturer.
- f. Conductors in fixture tops shall be #16 AWG minimum, type TFN, in 3/8" flexible metal conduit of 72" maximum length. A green insulated equipment grounding conductor shall be included.
- g. Mount fixtures plumb and square. Keep rows in perfect line.
- h. At time of project completion, fixtures and lamps shall be clean and fully operational.

GENERAL NOTES

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AN ADDITION FOR
MYRTLE BEACH TRAIN DEPOT
CITY OF MYRTLE BEACH
HORRY COUNTY, SOUTH CAROLINA

2018
09/26/18
SPECIFICATIONS



E4.2

A1
E4.2
SPECIFICATIONS
NO SCALE

