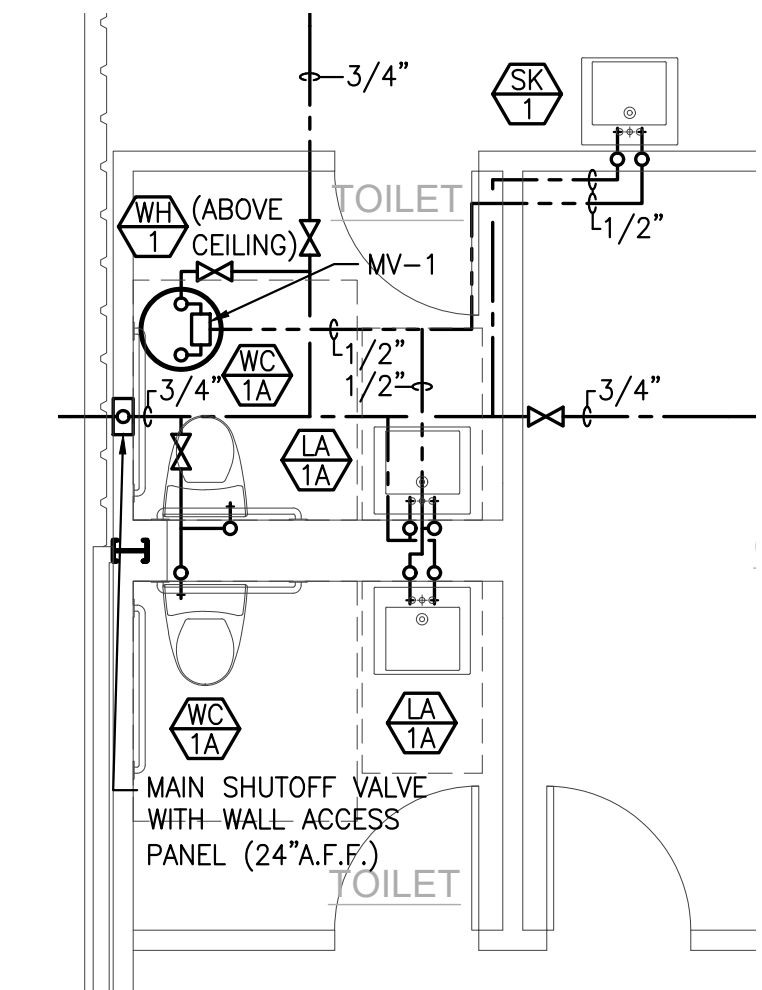
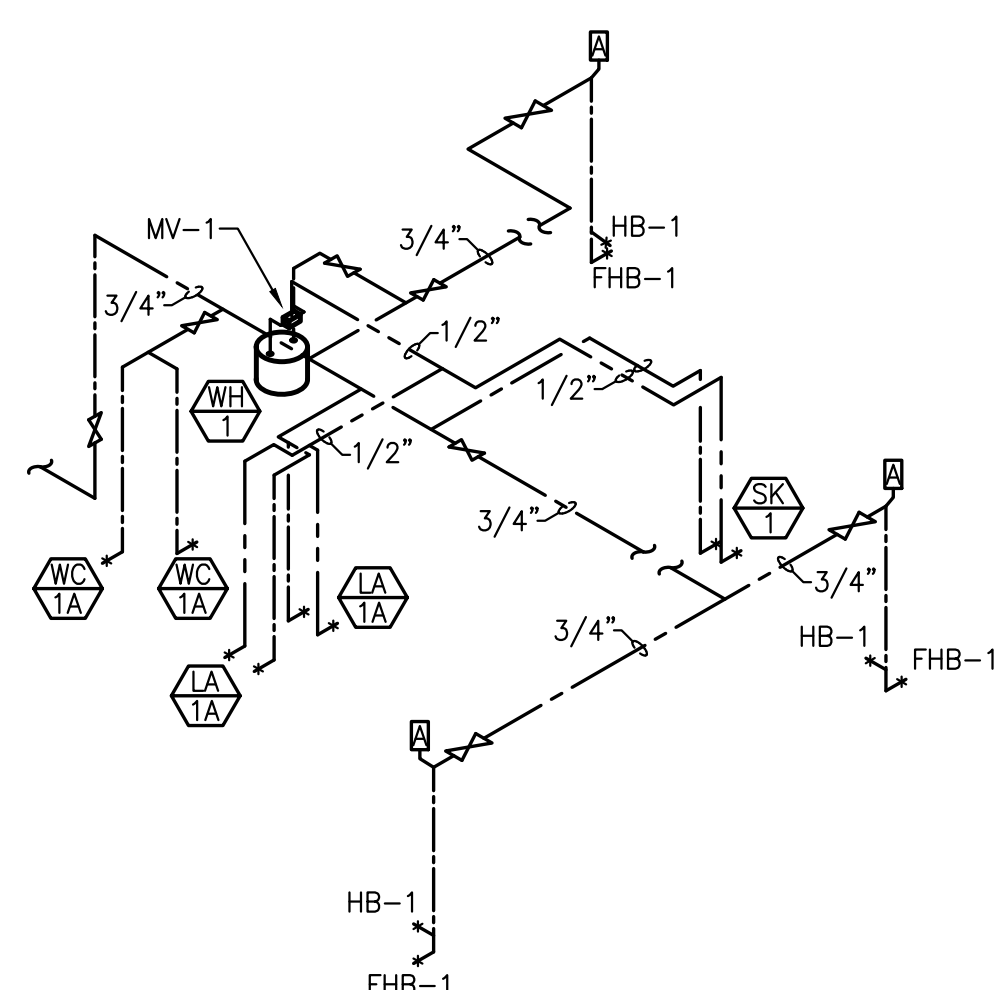


② PLUMBING DWV PIPING ENLARGED PLAN
SCALE: 1/4" = 1'-0"

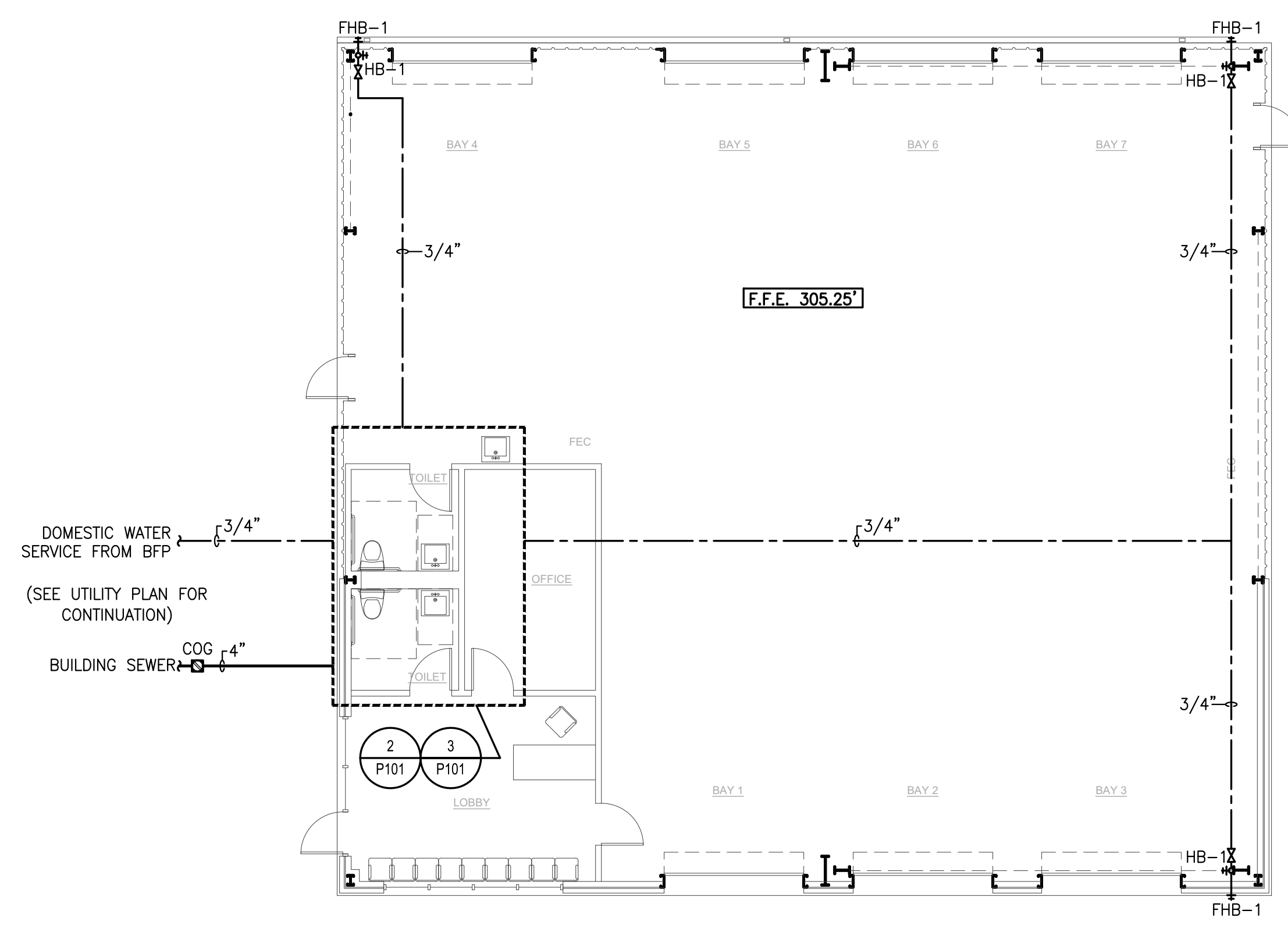
PLUMBING DWV PIPING RISER
SCALE: N.T.S.



③ PLUMBING WATER PIPING ENLARGED PLAN
SCALE: 1/4" = 1'-0"



PLUMBING WATER PIPING RISER
SCALE: N.T.S.



① PLUMBING PLAN
SCALE: 1/8" = 1'-0"

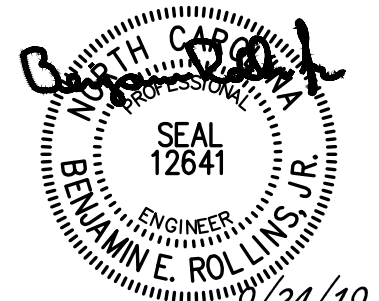
PLUMBING LEGEND		
SYMBOL	ABBR	DESCRIPTION
	CW	COLD WATER LINE
	HW	HOT WATER LINE
	W	SOIL OR WASTE LINE
	VT	VENT LINE
	VTR	VENT THRU ROOF
	WCO	WALL CLEANOUT
	FCO	FLOOR CLEANOUT
	COG	CLEANOUT ON GRADE
	HB	HOSE BIB/HYDRANT
	FHB	FROSTPROOF HOSE BIB/HYDRANT
	WA	WATER ARRESTOR (PDI SIZE "A")
	-	CHECK VALVE
	-	SHUTOFF VALVE
	BFP	BACKFLOW PREVENTER
	BWV	BACKWATER VALVE
	RV	PRESSURE RELIEF VALVE
	STR	STRAINER
	STR	STRAINER WITH BLOW OFF
	-	UNION
	-	THERMOMETER
	-	CONCENTRIC REDUCER
	-	FLOW DIRECTION ARROW
	-	FIXTURE MARK (SEE SCHEDULE)
	G.C.	GENERAL CONTRACTOR
	P.C.	PLUMBING CONTRACTOR
	M.C.	MECHANICAL CONTRACTOR
	E.C.	ELECTRICAL CONTRACTOR
	AFF	ABOVE FINISHED FLOOR
	AFG	ABOVE FINISHED GRADE
	BFG	BELOW FINISHED GRADE

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PLUMBING PLAN

P101



PLUMBING NOTES:

- PLUMBING PLANS ARE INTENDED TO PROVIDE INFORMATION FOR INSTALLATION OF A COMPLETE PLUMBING SYSTEM. PROVIDE ALL ESSENTIAL LABOR, MATERIALS & DEVICES REQUIRED TO PRODUCE A QUALITY END PRODUCT.
- CONTRACTOR SHALL REVIEW & BECOME FAMILIAR WITH THE WORK OF ALL TRADES FOR PURPOSES OF COORDINATION AND ROUTING. CONTRACTOR SHALL PROVIDE REQUIRED PLANNING, COORDINATION AND SEQUENCING OF PLUMBING INSTALLATION WITH BUILDING COMPONENTS AND OTHER TRADES.
- COORDINATE CONNECTION OF PLUMBING SYSTEMS WITH EXISTING SITE UTILITIES AND SERVICES.
- COORDINATE VENT THRU ROOF (VTR) LOCATIONS WITH OUTSIDE AIR INTAKES OF HVAC UNITS TO MAINTAIN A MINIMUM CLEARANCE OF 10 FEET.
- CONTRACTOR SHALL COORDINATE LOCATION & TYPE OF VTR BOOTS WITH G.C.. CONTRACTOR SHALL FURNISH & INSTALL THE REQUIRED BOOTS. G.C. SHALL ENGAGE ROOFING CONTRACTOR TO ASSURE WEATHER-TIGHTNESS OF INSTALLATION.
- ALL WORK SHALL COMPLY WITH LOCAL, STATE & ADA CODES. WORKMANSHIP SHALL MEET OR EXCEED INDUSTRY STANDARDS.
- PROTECT ALL NEW MATERIALS FROM THE WEATHER IN STORAGE TRAILERS OR PROVIDE SUITABLE COVERING.
- DRAIN, WASTE & VENT (DWV) PIPING SHALL BE ASTM D 2665, SOLID-WALL, SCHEDULE 40 PVC WITH SOLVENT-WELDED SOCKET TYPE FITTINGS (FOAM CORE PIPING IS NOT ACCEPTABLE).
- BELOW GRADE/SLAB WATER PIPING (INSIDE OF BUILDING) SHALL BE ASTM B 88, SOFT ANNEALED, TYPE K COPPER WITH SOLDERED OR BRAZED WROUGHT-COPPER FITTINGS. MINIMIZE JOINTS BELOW SLAB.
- WATER PIPE & FITTINGS AND LEAD FREE SOLDER & FLUX SHALL BE IN ACCORDANCE WITH NC PLUMBING CODE SECTION 605.
- INDIVIDUAL SUPPLY AND DRAIN CONNECTIONS SIZES ARE NOT INDICATED ON PLANS FOR CLARITY. SIZE EACH TO SUIT RESPECTIVE FIXTURE.
- WATER PIPING ON OUTSIDE WALLS AND IN CEILING SHALL BE LOCATED BETWEEN BUILDING INSULATION AND CONDITIONED SPACE.
- PROVIDE SHUTOFF VALVES AT EACH MAIN BRANCH LINE. VALVES SHALL BE INSTALLED IN A READILY ACCESSIBLE LOCATION.
- UNLESS NOTED OTHERWISE ALL VALVES SHALL BE FULL PORT BRONZE OR BRASS BALL VALVES WITH CONNECTIONS AS APPLICABLE TO THE CONNECTING PIPING.
- PROTECT COPPER PIPING FROM DIRECT CONTACT WITH MASONRY OR DISSIMILAR METAL.
- HANGERS, SUPPORTS, ANCHORS AND CLIPS SHALL BE COPPER PLATED OR PROVIDED WITH ELECTROLYTIC ISOLATION MATERIAL ON COPPER PIPING. ALL OTHER HANGERS AND SUPPORTS SHALL BE PAINTED OR GALVANIZED.
- PIPING PASSING THROUGH CONCRETE/MASONRY WALLS OR FLOORS SHALL BE PROTECTED AGAINST EXTERNAL CORROSION BY PROTECTIVE SHEATHING OR WRAPPING.
- INSTALL SCHEDULE 80 PVC PIPE SLEEVE TWO SIZES LARGER AT PENETRATIONS THROUGH FOUNDATION WALLS. SEAL SLEEVE TIGHT TO FOUNDATION WALL.
- INSTALL UL LISTED FIRE-RATED ASSEMBLY AT PENETRATIONS THROUGH FIRE-RATED WALLS, FLOORS AND CEILINGS.
- PROVIDE MECHANICAL WATER HAMMER ARRESTORS AS SHOWN ON PLANS OR WATER RISER.
- PROVIDE INSULATION EQUAL TO MCCUIRE PROWRAP ON P-TRAP ASSEMBLIES AND HOT & COLD WATER PIPING FOR LAVATORIES WITH EXPOSED PIPING.
- VERIFY FINAL LOCATIONS FOR ROUGH-INS WITH FIELD MEASUREMENTS AND WITH THE REQUIREMENTS OF THE ACTUAL EQUIPMENT TO BE CONNECTED.
- INSTALL PLUMBING FIXTURES AND EQUIPMENT LEVEL & PLUMB. ROUTE PIPING PARALLEL & PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS.
- INSTALL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE & REPAIR IN ACCORDANCE WITH MFG'S WRITTEN INSTALLATION INSTRUCTIONS AS WELL AS SPECIFIC INSTRUCTIONS ON PLANS.
- ALL FIXTURES & EXPOSED SURFACES SHALL BE WASHED & CLEANED AND PAINTED SURFACES SHALL BE TOUCHED UP TO MATCH FACTORY APPLIED FINISHES.
- DWV AND WATER DISTRIBUTION PIPING SHALL BE TESTED IN ACCORDANCE WITH NC PLUMBING CODE SECTION 312.
- POTABLE WATER PIPING SHALL BE PURGED AND DISINFECTED. FLUSH SYSTEM WITH CLEAN, POTABLE WATER. ISOLATE AND FILL SYSTEM WITH WATER/CHLORINE SOLUTION WITH AT LEAST 200 PPM OF CHLORINE. ALLOW TO STAND FOR THREE HOURS. FLUSH SYSTEM WITH CLEAN, POTABLE WATER UNTIL CHLORINE SOLUTION IS REMOVED. SUBMIT WATER SAMPLE REPORT TO AUTHORITY HAVING JURISDICTION.
- GUARANTEE ALL EQUIPMENT, MATERIALS AND INSTALLATION FREE OF DEFECTS FOR A PERIOD OF 1-YEAR AFTER RECEIVING CERTIFICATE OF OCCUPANCY.

PLUMBING FIXTURE SCHEDULE						
FIX. NO.	DESCRIPTION	CW	HW	DRAIN	FAUCETS, VALVES & ACCESSORIES	NOTES
WC-1A	WATER CLOSET TANK TYPE, FLOOR MOUNTED, ELONGATED ULTRA LOW-CONSUMPTION (1.6 GPF) FULLY GLAZED 2 1/8" BALL PASS TRAPWAY MEETS ASME A112.19.2M & 19.6M ADA (+/-17" RIM HEIGHT)	1/2"		3"	FIXTURE BY: AMERICAN STANDARD, SLOAN OR KOHLER SEAT: EQUAL TO CHURCH 9500C (OPEN FRONT LESS COVER) MATERIAL: VITREOUS CHINA COLOR: WHITE	TANK SHALL HAVE RIGHT HAND TRIP LEVER AS REQUIRED TO MEET ADA (SEE DETAIL)
LA-1A	WALL HUNG LAVATORY 21 1/4"x22" CHROME SINGLE LEVER FAUCET (0.5 GPM AERATOR) MEETS ASME A112.19.2M ADA APPLICATIONS	3/8"	3/8"	1 1/4"	FIXTURE: AMERICAN STANDARD 0954.000EC MURRO UNIVERSAL DESIGN FAUCET: EQUAL TO DELTA 5011F-HGMHDF (4" CENTERSET) STRAINER: EQUAL TO MCCUIRE 155A MATERIAL: VITREOUS CHINA COLOR: WHITE SHROUD: AMERICAN STANDARD 0059020	REFER TO ARCHITECTURAL DWGS FOR SPECIFIC MOUNTING HEIGHTS
SK-1	FLOOR MOUNTED LAUNDRY SINK (24"Wx20"Lx16"D) WHITE POLYETHYLENE WITH LEVEL ADJUSTMENT METAL LEGS	1/2"	1/2"	1 1/2"	EQUAL TO FIAT P1 FAUCET: A-1 (DECK TYPE)	

PLUMBING SPECIALTIES SCHEDULE						
MARK	DESCRIPTION	MANF.	REFERENCE MODEL NO.	NOTES		
COG	TRAFFIC RATED CLEANOUT ON GRADE WITH BRONZE PLUG	MIFAB	C1220-XR-1-34B-P	SEE PLANS FOR SIZES		
UB-1	UTILITY BOX - ICE MAKER	OATEY	3860B	INCLUDES WATER HAMMER ARRESTOR		
HB-1	WALL FAUCET WITH BACKFLOW PROTECTION	WOODFORD	26-BR (ROUGH BRASS)	PROVIDE WITH METAL HANDLE OPTION		
FHB-1	FREEZELESS WALL FAUCET WITH BACKFLOW PROTECTION	WOODFORD	30	PROVIDE WITH METAL HANDLE		
WCO	WALL CLEANOUT WITH BRONZE PLUG & S.S. COVER	MIFAB	C1430-RD	SEE PLANS FOR SIZES		
MV-1	THERMOSTATIC MIXING VALVE (SETPOINT: 110°F)	LEONARD	270-LF	6.5 GPM @ 15 PSI PRESSURE DROP		

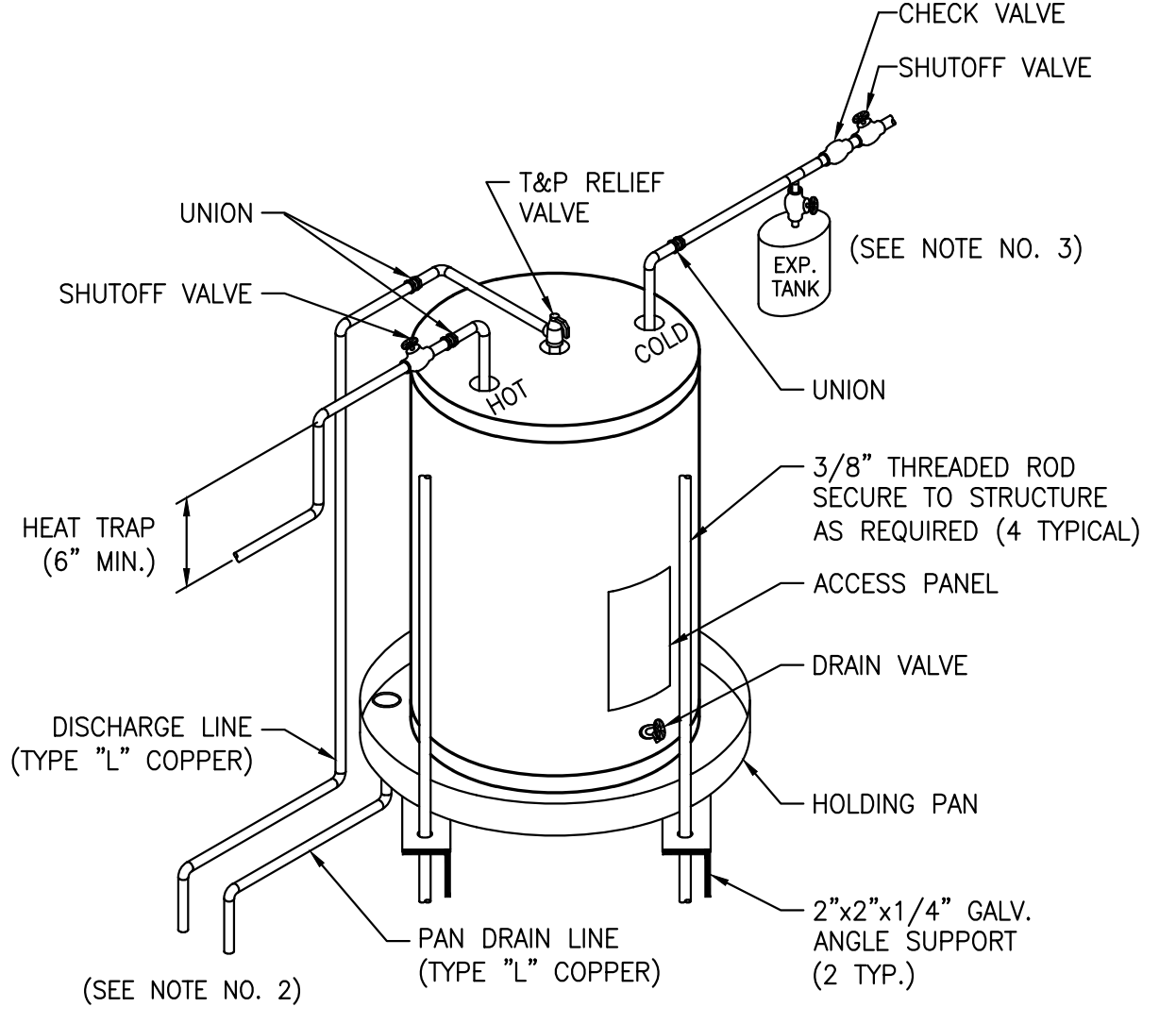
ELECTRIC WATER HEATER SCHEDULE												
MARK	SIZE	GPH	TEMP. RISE	KW	VOLT/PH	FLA	CW CONN.	HW CONN.	MANF.	REF. MODEL	OPERATING WEIGHT	SIZE HTxDIA
WH-1	10 GAL	8.0	80°F	1.5	120V/1Ø	13.0	3/4"	3/4"	A.O. SMITH	DEL-10	130 LBS	18"x18"

- NOTES:**
- SET OUTLET WATER TEMPERATURE AT 125°F.
 - PROVIDE WITH 3-YEAR TANK WARRANTY AND 1-YEAR PARTS WARRANTY.

PLUMBING PIPING INSULATION TABLE						
SERVICE	LOCATION	MATERIAL TYPE	JACKET TYPE	PIPE SIZE	THICKNESS	REMARKS
DOMESTIC WATER	BUILDING ENVELOPE	PERFORMED GLASS FIBER	ASJ	COLD 1/2" OR LESS COLD 3/4" - 1"	1/2" 1"	-
	UNCONDITIONED SPACE	PERFORMED GLASS FIBER	ASJ	ALL	1 1/2"	

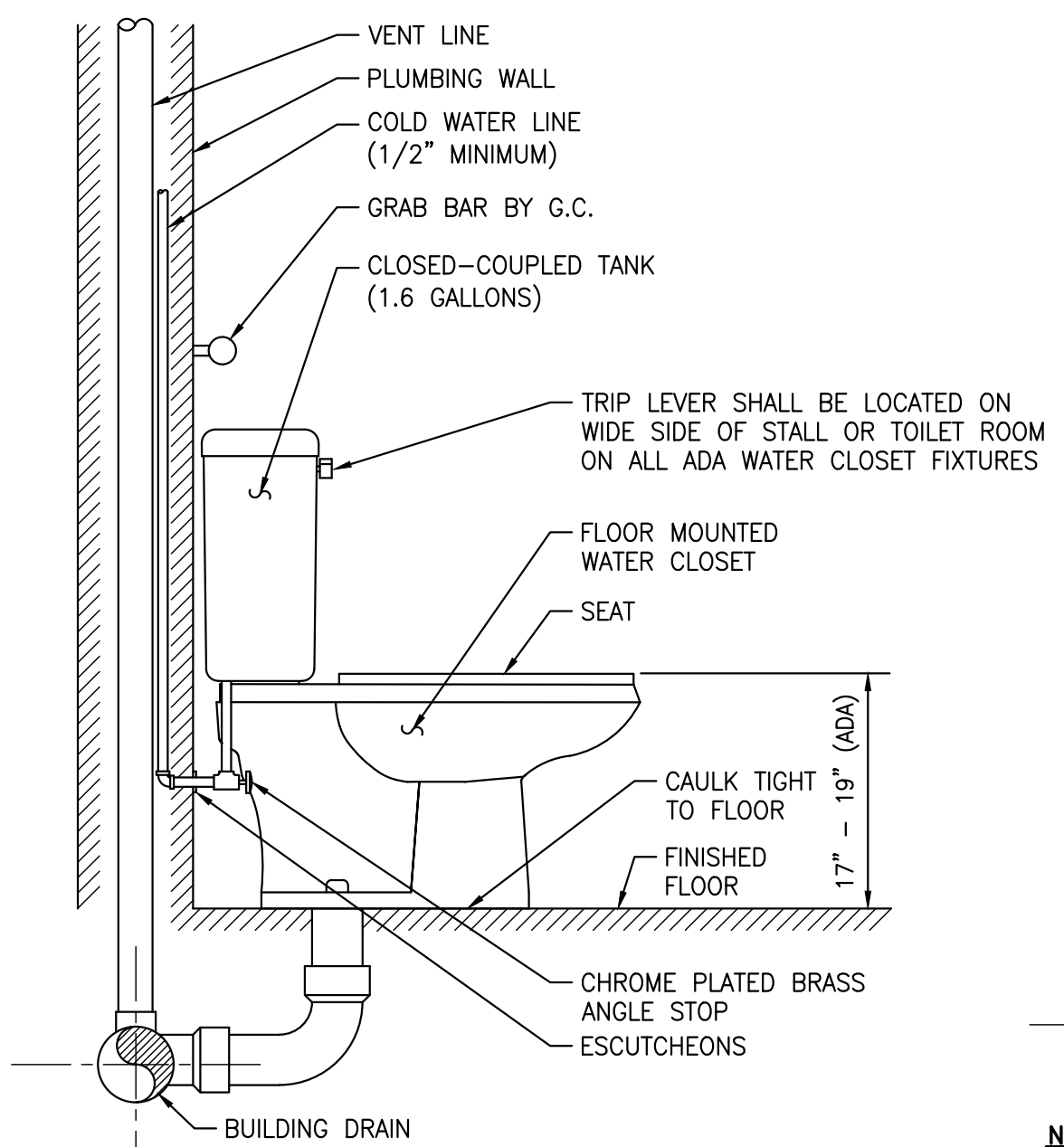
- NOTES:**
- ALL PIPE HANGERS AND SUPPORTS ON COLD PIPING SHALL BE OF CLEVIS TYPE ON OUTSIDE OF INSULATION TO MAINTAIN VAPOR BARRIER.

LOAD/DEMAND TABLE								
FIXTURE TYPE	QTY.	DRAIN FIXTURE UNITS		WATER SUPPLY FIXTURE UNITS				
		DRAIN	TOTAL	COLD	HOT	CW & HW	SUPPLY TOTAL	
WATER CLOSET (TANK)	2	4.0	8.0	5.0		5.0	10.0	
LAVATORY (SMALL P.O.)	2	1.0	2.0	1.5	1.5	2.0	4.00	
SINK	1	2.0	2.0	1.5	1.5	2.0	2.00	
TOTAL LOAD (FIXTURE UNITS)				12.00	TOTAL LOAD (FIXTURE UNITS)			16.00
				TOTAL DEMAND (GPM)				14
MINIMUM LINE SIZE				MINIMUM LINE SIZE				3/4"
APPLIED LINE SIZE				APPLIED LINE SIZE				3/4"

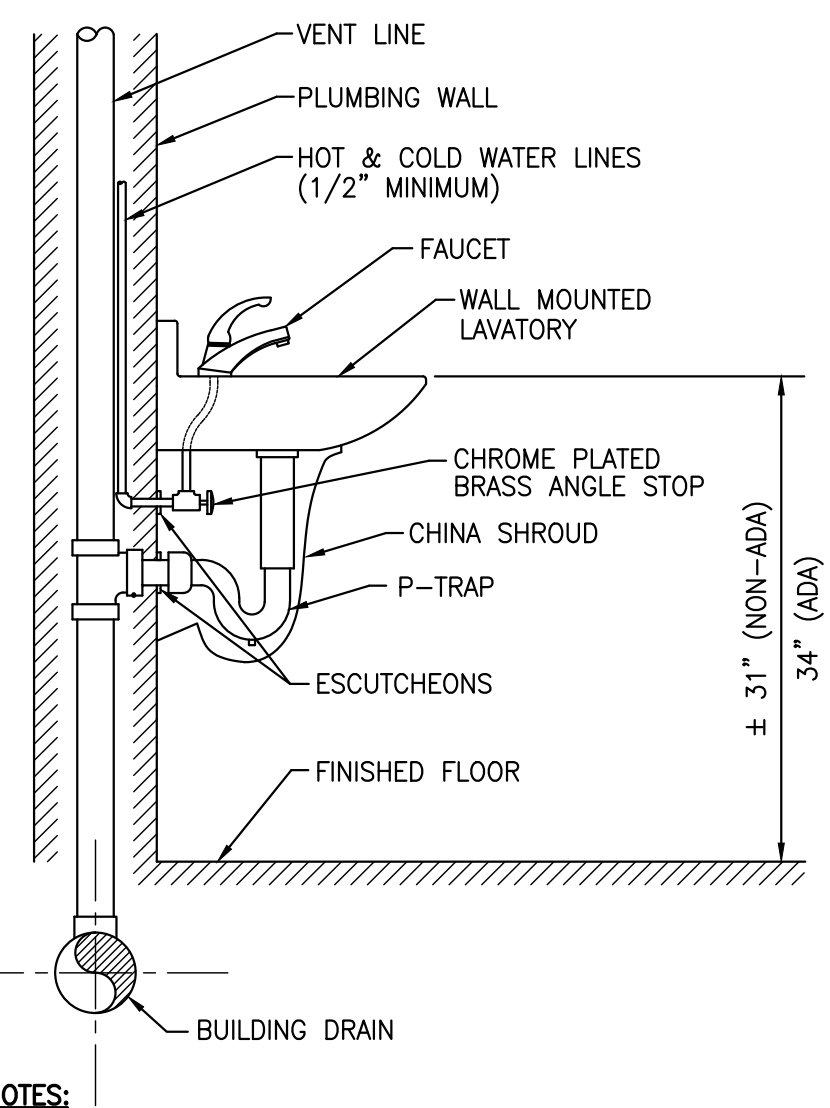


- NOTES:**
- PAN SHALL BE CONSTRUCTED OF A MIN. OF 24 GA. GALV. METAL OR 1/16 INCH HIGH IMPACT PLASTIC AND SUFFICIENT SIZE & SHAPE TO RECEIVE ALL DRIPPINGS.
 - DISCHARGE & PAN DRAIN SHALL BE FULL-SIZE OF RELIEF VALVE BUT NOT LESS THAN 1 INCH, TERMINATING OVER A SUITABLY LOCATED DRAIN OR EXTERIOR OF BUILDING 6 INCHES ABOVE DRAIN/GRADE.
 - PROVIDE PRE-CHARGED DIAPHRAGM EXPANSION TANK ON SYSTEMS HAVING CHECK VALVES OR BACKFLOW PREVENTERS ON SUPPLY WATER LINE. TANK SHALL BE 2 GALLON CAPACITY U.N.O. AND APPROVED FOR POTABLE WATER SYSTEMS.

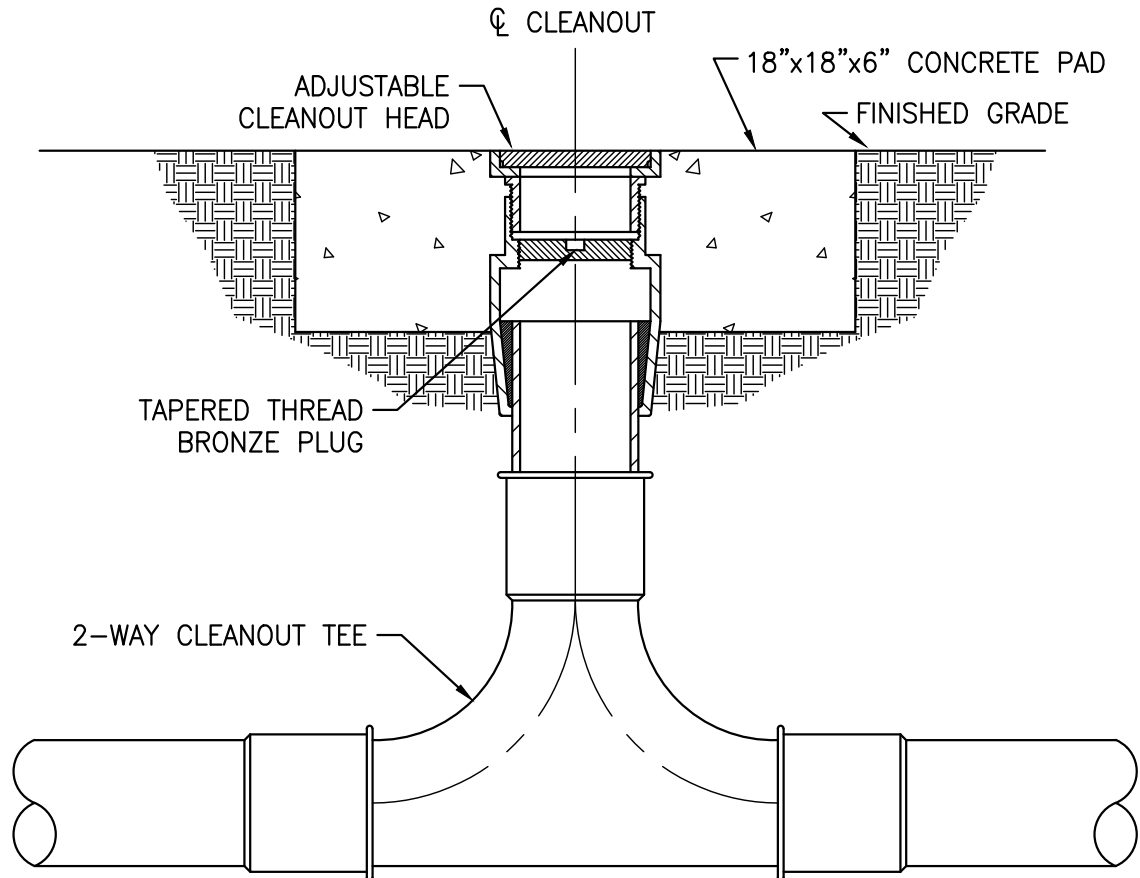
1 CEILING MOUNTED ELECTRIC WATER HEATER DETAIL
SCALE: N.T.S.



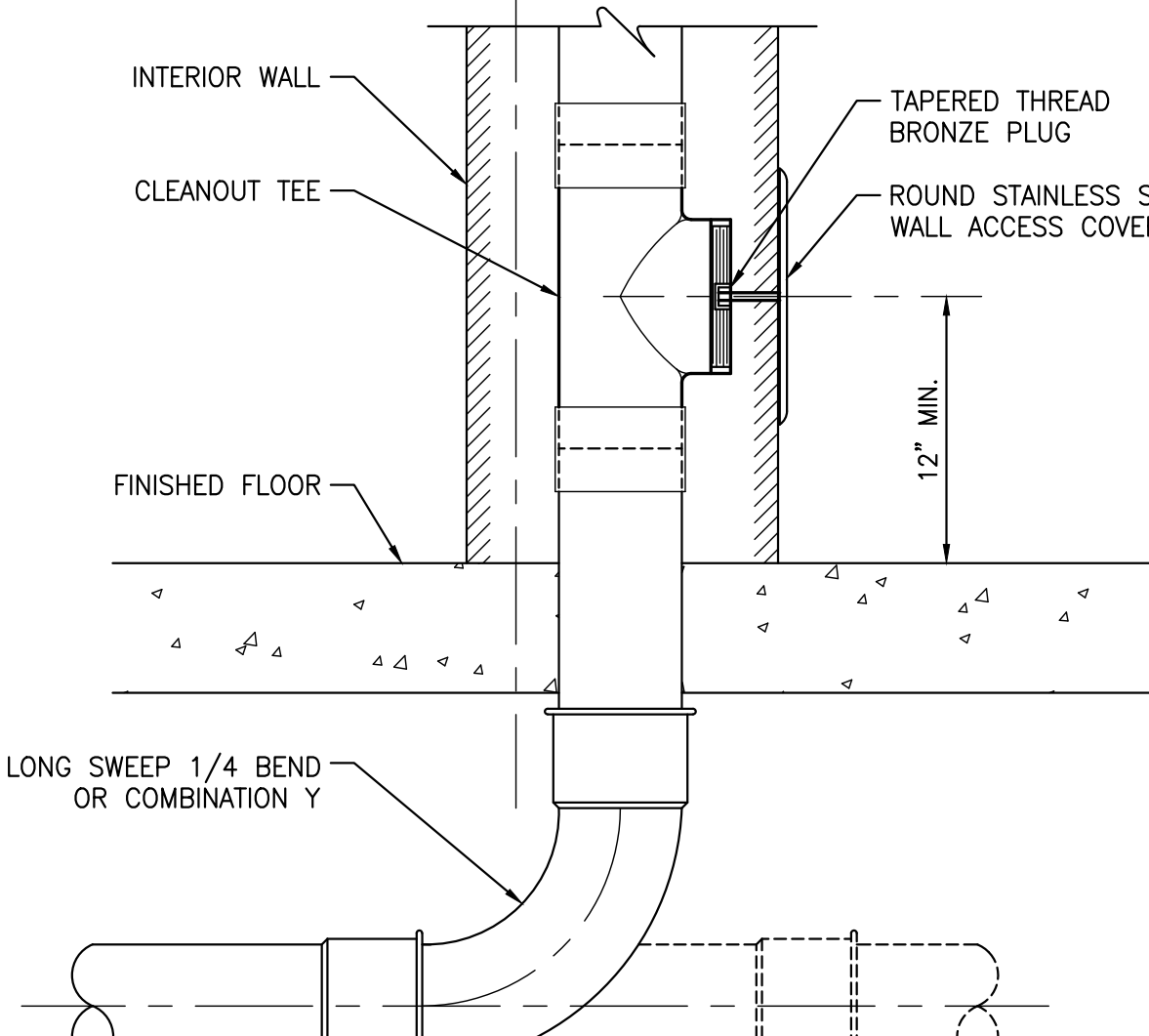
2 FLOOR MOUNTED WATER CLOSET WITH FLUSH TANK DETAIL
SCALE: N.T.S.



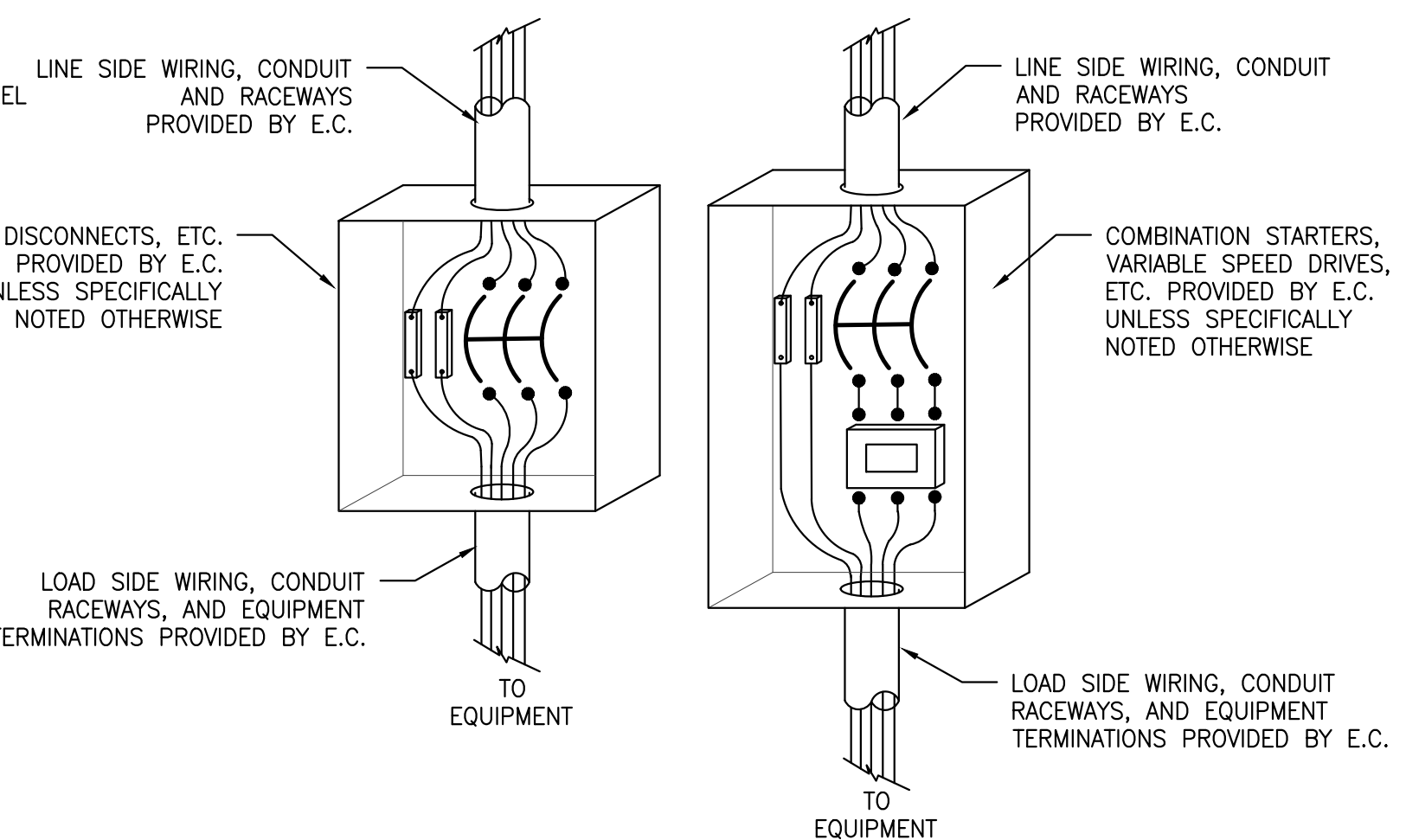
3 WALL MOUNTED LAVATORY DETAIL
SCALE: N.T.S.



4 CLEANOUT ON GRADE WITH 2-WAY TEE DETAIL
SCALE: N.T.S.



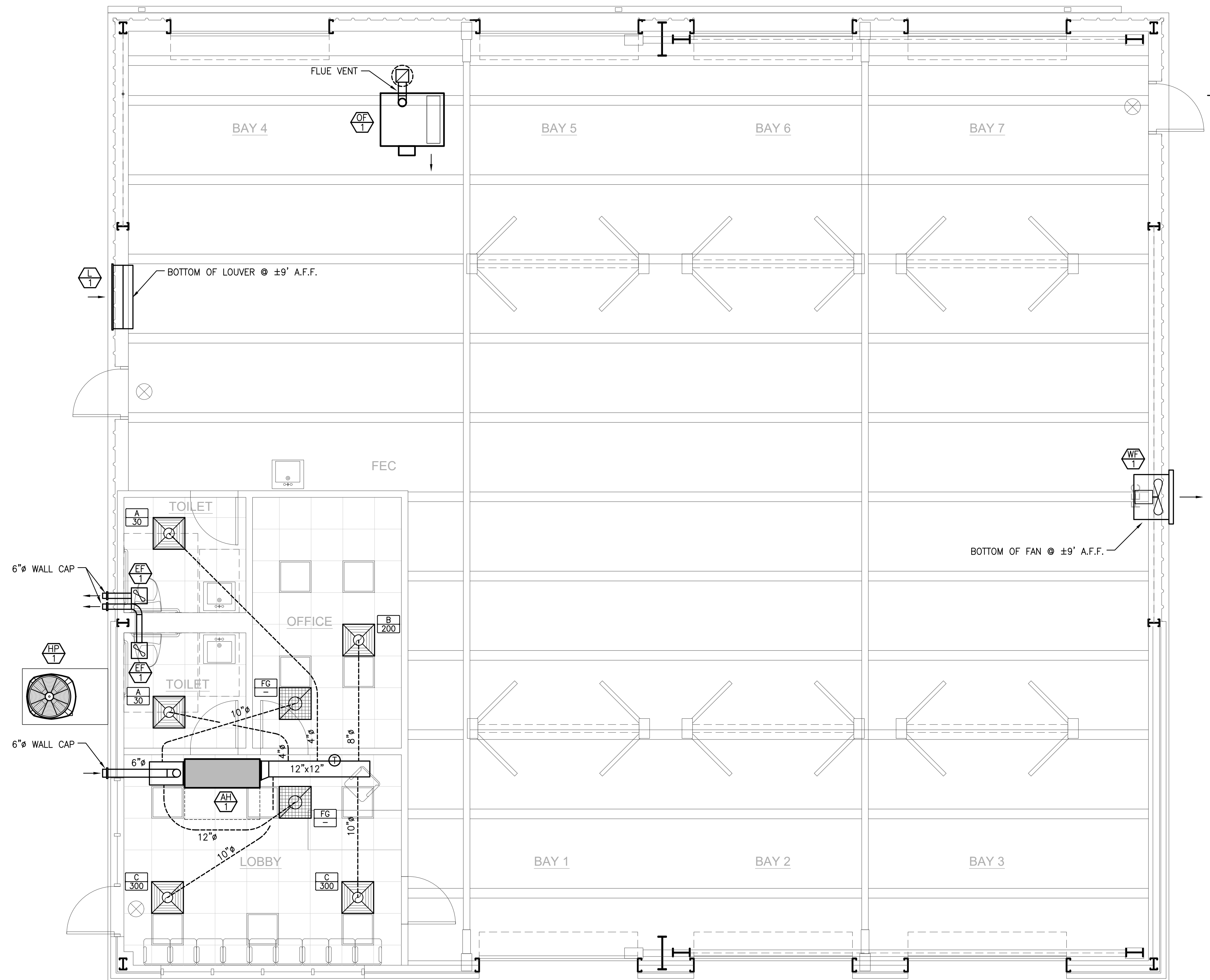
5 WALL CLEANOUT WITH SWEEP BEND OR COMBINATION Y DETAIL
SCALE: N.T.S.



6 ELECTRICAL CONNECTION COORDINATION
SCALE: N.T.S.

MECHANICAL NOTES:

1. MECHANICAL PLANS ARE INTENDED TO PROVIDE INFORMATION FOR INSTALLATION OF A COMPLETE OPERATING MECHANICAL SYSTEM. PROVIDE ALL ESSENTIAL LABOR, MATERIALS & DEVICES REQUIRED TO PRODUCE A QUALITY END PRODUCT.
2. CONTRACTOR SHALL REVIEW & BECOME FAMILIAR WITH THE WORK OF ALL TRADES FOR PURPOSES OF COORDINATION AND ROUTING. CONTRACTOR SHALL PROVIDE REQUIRED PLANNING, COORDINATION AND SEQUENCING OF HVAC INSTALLATION WITH BUILDING COMPONENTS AND OTHER TRADES.
3. ALL WORK SHALL COMPLY WITH LOCAL, STATE & NATIONAL CODES. WORKMANSHIP SHALL MEET OR EXCEED INDUSTRY STANDARDS.
4. PROTECT ALL NEW MATERIALS FROM THE WEATHER IN STORAGE TRAILERS OR PROVIDE SUITABLE COVERING.
5. FABRICATE AND INSTALL DUCT PER SMACNA STANDARDS FOR 2-INCH WC WITH GALVANIZED METAL (26 GAUGE MINIMUM). ALL RADIUS ELBOWS & TEES SHALL HAVE CENTERLINE RADIUS OF 1.5 X DUCT WIDTH. ALL SQUARE ELBOWS & TEES SHALL HAVE TURNING VANES. PRIOR TO FABRICATION, MECHANICAL CONTRACTOR SHALL FIELD VERIFY STRUCTURAL OBSTRUCTIONS & CEILING SPACE LIMITATIONS AND MAKE NECESSARY DUCT MODIFICATIONS INCLUDING CHANGING OF ASPECT RATIOS, ADDING OFFSETS, AND SHIFTING LOCATIONS. PROTECT DUCT BY STORING IN A CLEAN AND DRY ENVIRONMENT PRIOR TO INSTALLATION. COVER ENDS OF EXPOSED WORK AT THE END OF EVERY SHIFT.
6. ALL DUCT JOINTS, SEAMS & BRANCH TAKEOFFS SHALL BE SEALED AIR-TIGHT WITH DUCT SEALANT EQUAL TO HARDCAST IRON-GRIP.
7. ROUND RUNOUTS SHALL HAVE SIDE TAKEOFFS WITH GASKET & DAMPER. RECTANGULAR BRANCH DUCTS SHALL HAVE 45 DEGREE TAPS WITH AIR EXTRACTOR AND ALL TEES SHALL HAVE SPLITTER DAMPERS. PROVIDE ANY OTHER DEVICES REQUIRED TO BALANCE AIR SYSTEM.
8. FLEX DUCT SHALL BE R-8 FACTORY INSULATED, HAVE ACOUSTICAL INNER CORE AND HAVE METALIZED VAPOR BARRIER. BOTH ENDS SHALL BE SECURED WITH NYLON BANDS AND METALIZED DUCT TAPE PER MFG'S RECOMMENDATIONS AND IN ACCORDANCE WITH U.L. 181B.
9. RIGID ROUND AND RECTANGULAR DUCT SHALL BE EXTERNALLY INSULATED WITH R-8 3/4 LB. DENSITY FIBERGLASS BLANKET WITH FSK VAPOR BARRIER. STAPLE AND SEAL ALL JOINTS WITH 3-INCH WIDE METALIZED DUCT TAPE EQUAL TO SHURFLEX SF-683.
10. INSULATE & SEAL ALL GRILLE & DIFFUSER NECKS TO MAINTAIN VAPOR BARRIER AND ELIMINATE CONDENSATION.
11. CONDENSATE TRAPS FOR ALL AC UNITS SHALL BE SIZED AS RECOMMENDED BY UNIT MFG. CONDENSATE PIPING SHALL BE SCHEDULE 40 PVC ROUTED TO OUTSIDE. INSULATE WITH FLEXIBLE ELASTOMERIC INSULATION. SEAL ALL JOINTS AND SEAMS TO PREVENT CONDENSATION.
12. REFRIGERANT PIPING SHALL BE TYPE ACR COPPER WITH SILVER SOLDERED JOINTS. INSTALL PER EQUIPMENT INSTALLATION INSTRUCTIONS. INSULATION SHALL BE FLEXIBLE ELASTOMERIC INSULATION. SEAL ALL JOINTS AND SEAMS TO PREVENT CONDENSATION. PROTECT EXTERIOR INSULATION FROM SOLAR DETERIORATION WITH UV COATING.
13. POWER WIRING, DISCONNECTS & STARTERS NOT FURNISHED WITH HVAC EQUIPMENT AND FINAL CONNECTIONS SHALL BE BY THE E.C.
14. CONTROL WIRING, RELAYS AND INTERLOCKING DEVICES SHALL BE PROVIDED BY THE M.C.
15. TEMPERATURE CONTROLS FOR THE SPLIT AIR CONDITION SHALL CONSIST OF AN ELECTRONIC PROGRAMMABLE HEATING-COOLING THERMOSTAT WITH HEAT-OFF-COOL-AUTO SYSTEM SWITCH & AUTO-ON FAN SWITCH. MOUNT THERMOSTATS 48-INCHES A.F.F.
16. INSTALL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE & REPAIR IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AS WELL AS SPECIFIC INSTRUCTIONS ON PLANS.
17. PROVIDE CONCRETE HOUSEKEEPING PADS FOR ALL GROUND & FLOOR MOUNTED EQUIPMENT. UNLESS NOTED OTHERWISE ALL PADS SHALL BE 4" THICK & 4" LARGER THAN EQUIPMENT ON ALL SIDES. PADS SHALL BE 3000 PSI CONCRETE.
18. CONTRACTOR SHALL BALANCE AIR SYSTEM TO QUANTITIES INDICATED ON PLANS AND PROVIDE TYPE WRITTEN REPORT WITH O&M MANUALS.
19. ALL EQUIPMENT & SYSTEMS SHALL BE WASHED, MECHANICAL AREAS CLEANED AND PAINTED SURFACES TOUCHED UP TO MATCH FACTORY APPLIED FINISHES. ALL DUCT SYSTEMS AND AIR HANDLERS SHALL BE VACUUMED AND WIPE CLEAN ON THE INSIDE PRIOR TO TURNING THE PROJECT OVER TO THE OWNER. SYSTEMS THAT HAVE NOT BEEN ADEQUATELY PROTECTED DURING INSTALLATION WILL REQUIRE CLEANING AGAIN AT THE END OF THE PROJECT.
20. CONTRACTOR SHALL INSTALL A NEW SET OF MERV 8 PLEATED FILTERS BEFORE TURNING BUILDING OVER TO OWNER.
21. CONTRACTOR SHALL PROVIDE BUILDING OWNER WITH A COMPLETE OPERATING & MAINTENANCE MANUAL INCLUDING EQUIPMENT BASIC DATA, CONTROL INFORMATION, ROUTINE MAINTENANCE ACTIONS AND SERVICE AGENCIES NAME, PHONE NUMBER & ADDRESS.
22. GUARANTEE ALL EQUIPMENT, MATERIALS AND INSTALLATION FREE OF DEFECTS FOR A PERIOD OF 1-YEAR AFTER RECEIVING CERTIFICATE OF OCCUPANCY. EXTENDED GUARANTEES ON EQUIPMENT SHALL BE AS PUBLISHED ON MANUFACTURE'S EXTENDED WARRANTIES.



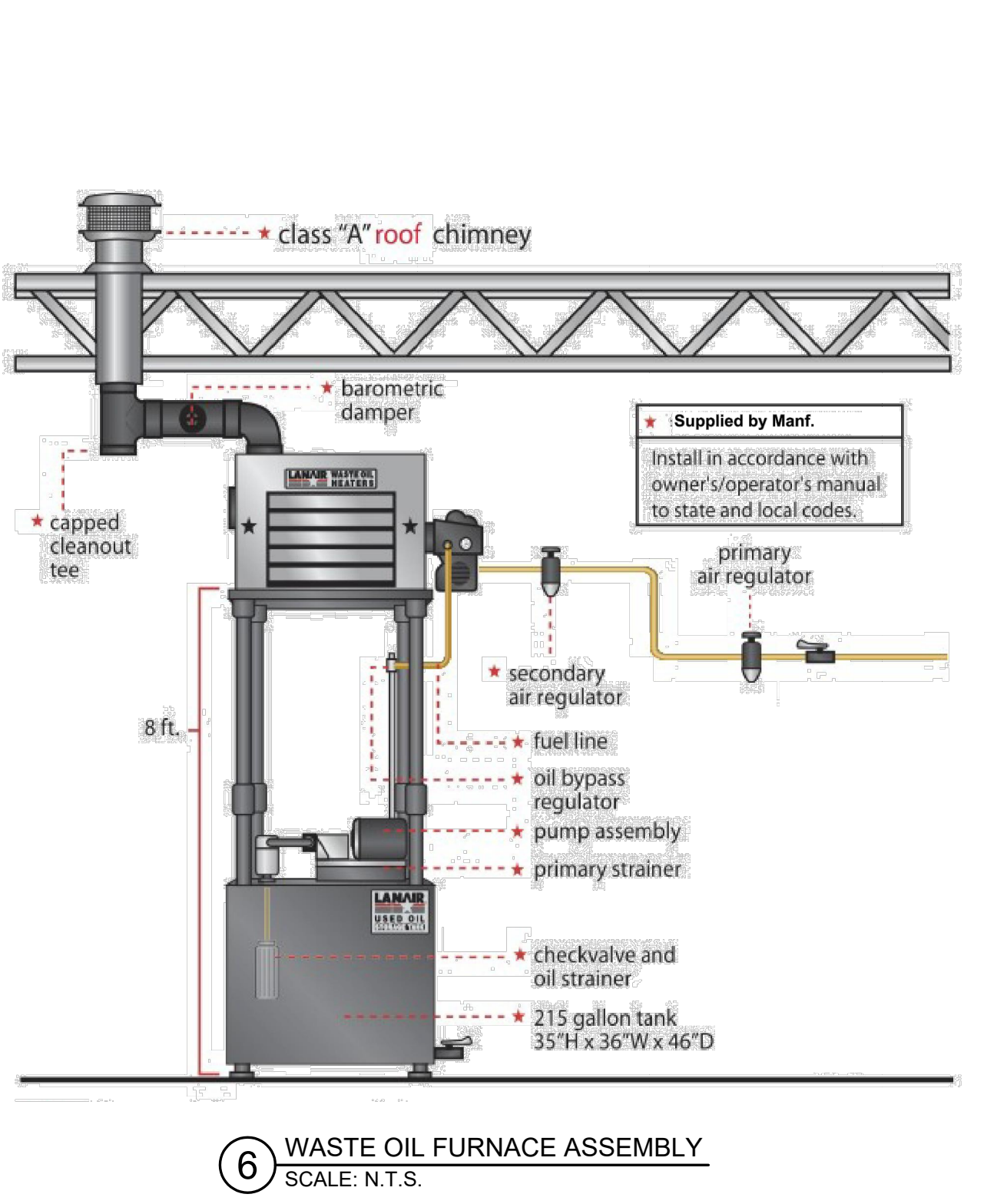
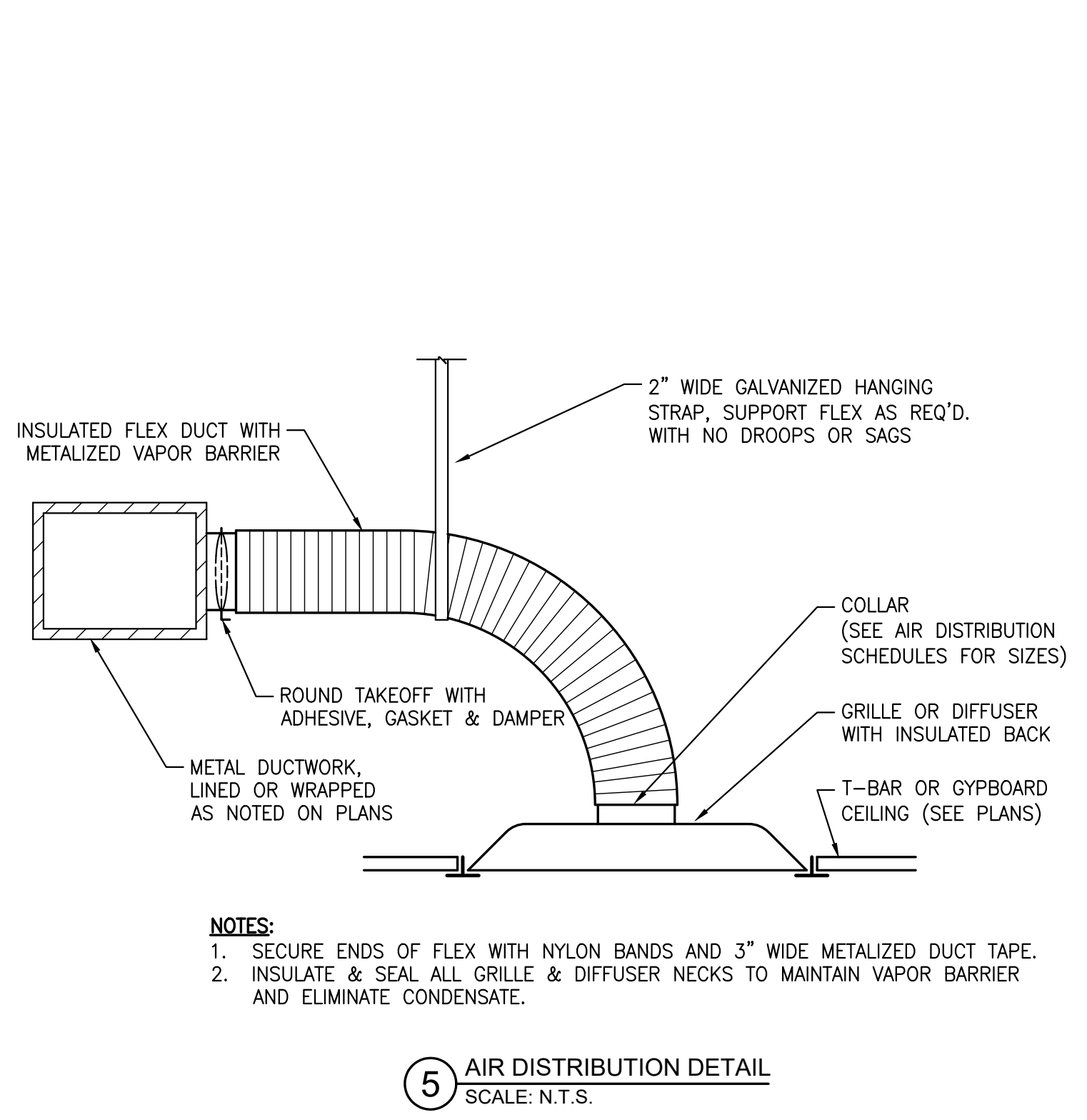
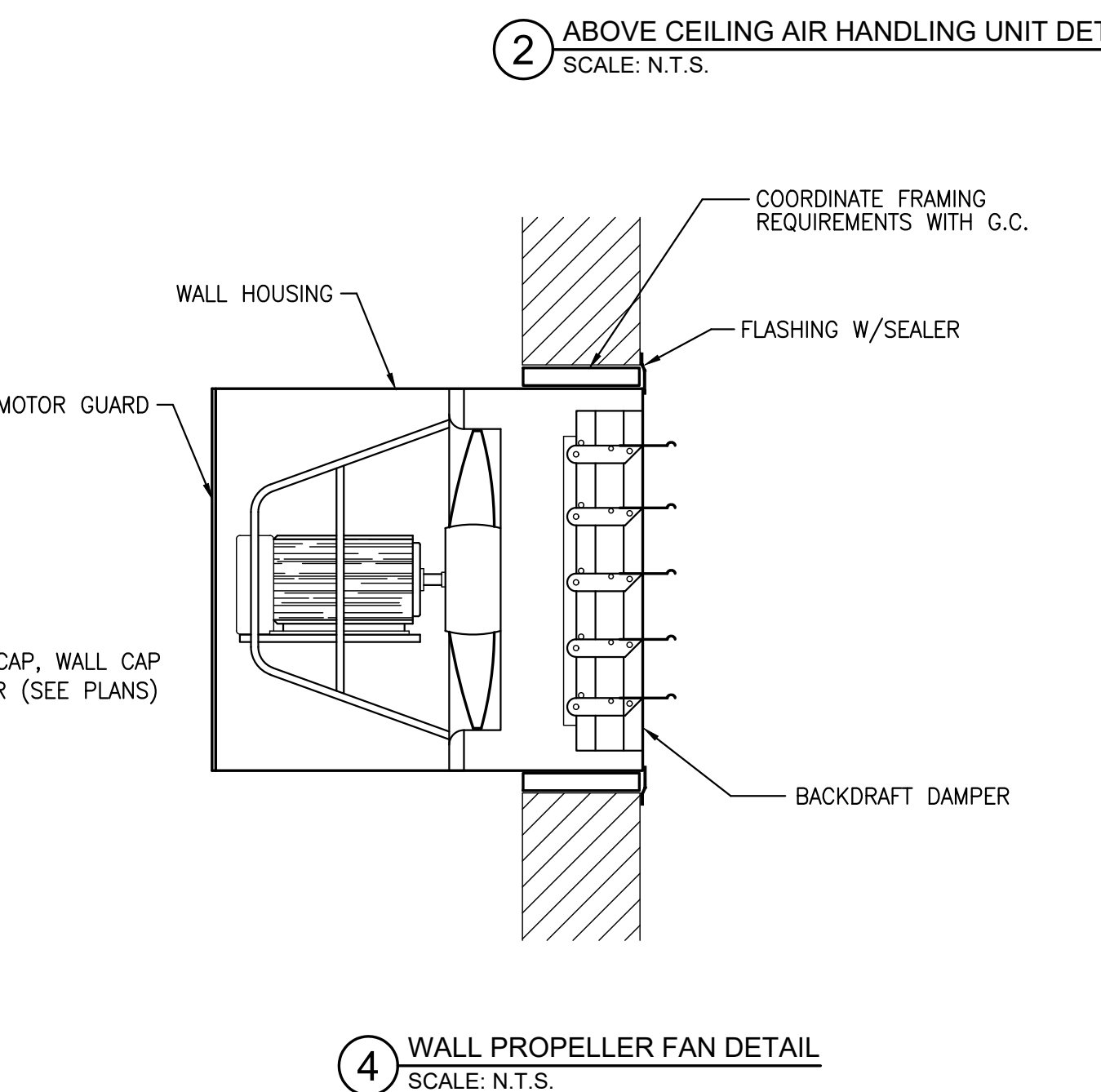
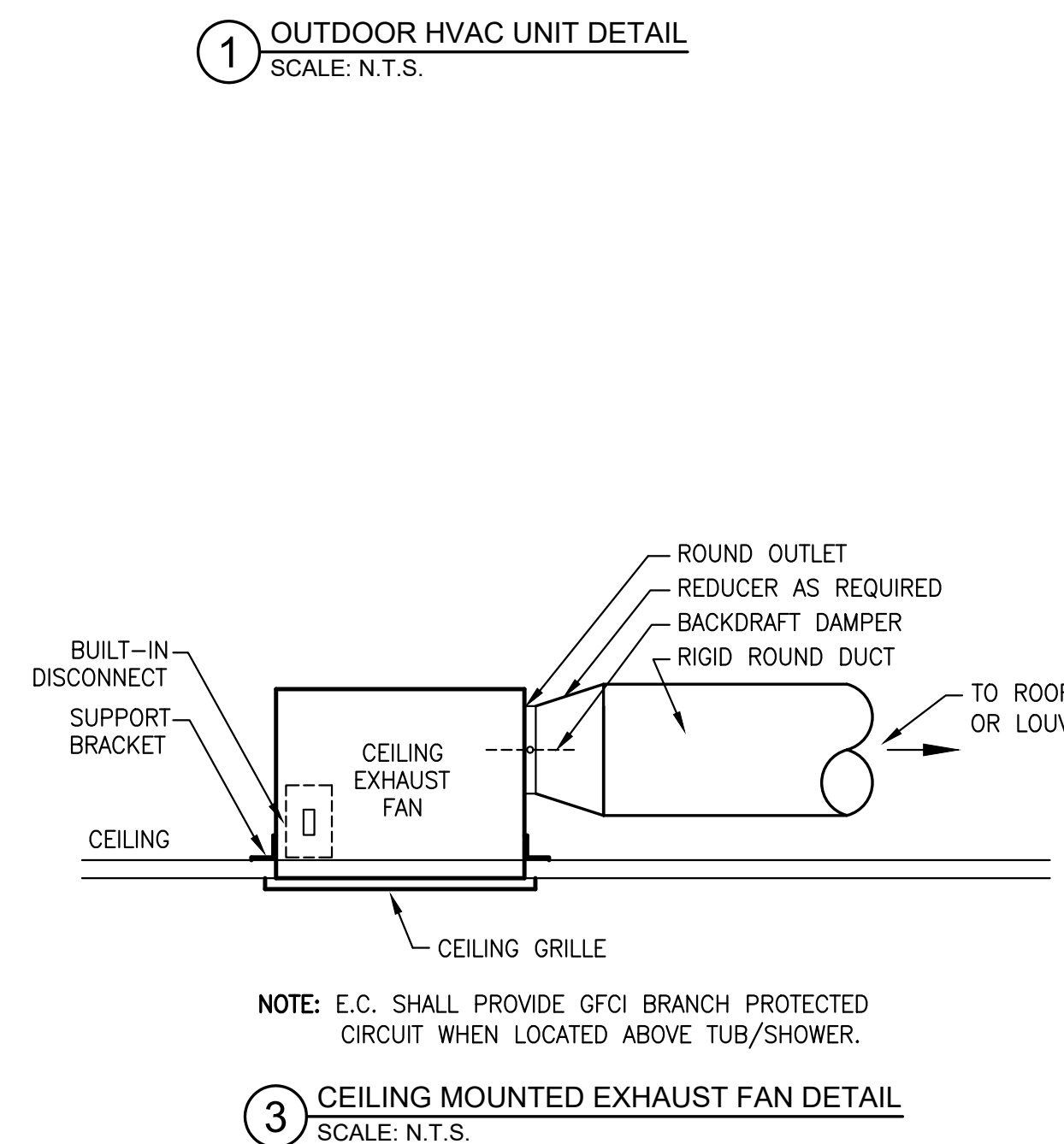
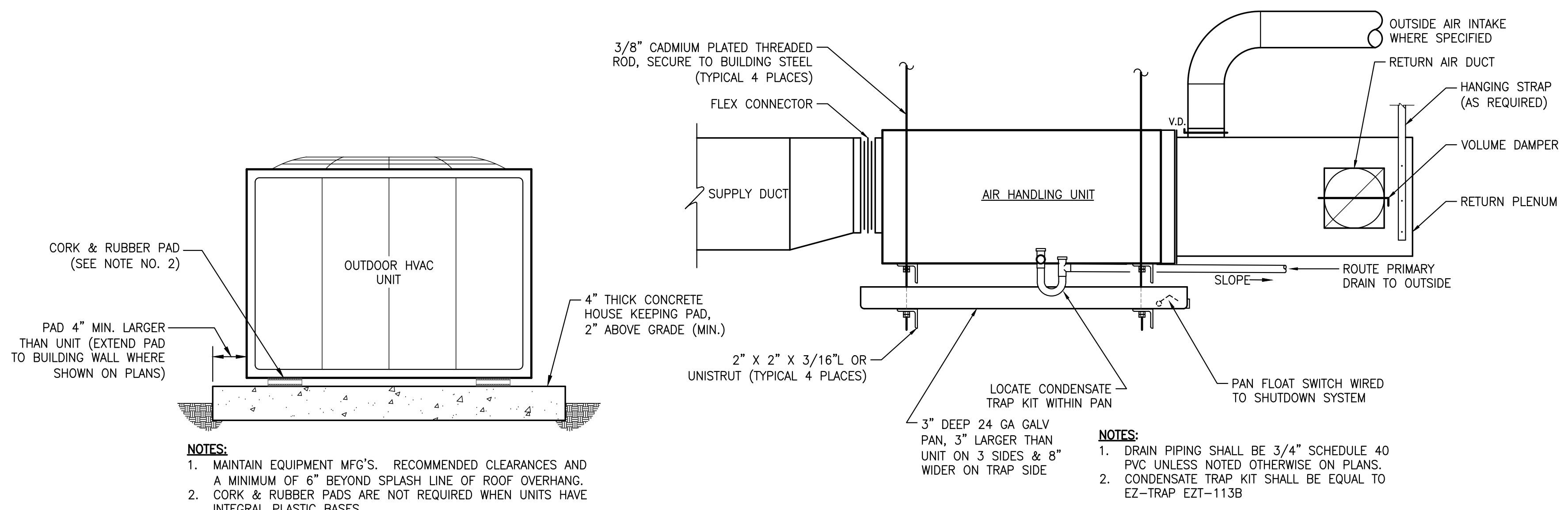
1 MECHANICAL DUCT & EQUIPMENT PLAN
 SCALE: 1/4" = 1'-0"

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MECHANICAL PLAN

M101



WASTE OIL FURNACE SCHEDULE																			
MARK	FURNACE DATA						TANK ASSEMBLY		COMP. AIR		VOLT/PH	FLA	MCA	MOCP	REF. MANF.	REF. MODEL	WEIGHT (EMPTY)		
	SA	CFM	MTR	HP	CAP (INPUT)	CAP (OUTPUT)	FUEL	RATE	SIZE	PUMP								FLOW	PRESSURE
OF-1	2600	1/4			200 MBH	160 MBH	WASTE OIL	1.4 GPH	215 GAL	1/2 HP	2 CFM	30 PSI	120/1Ø	10	12	20A	LANAIR	9964-MX200	800 LBS

NOTES:
1. PROVIDE PACKAGED FLOOR MOUNTED SYSTEM INCLUDING FURNACE ASSEMBLY, TANK, BURNER, OIL PUMP, FILTERS, ETC.
2. PROVIDE WITH SINGLE POINT ELECTRICAL POWER SOURCE AND CONTROLS, ALONG WITH WALL MOUNTED THERMOSTAT, INTERCONNECTING WIRING AND PIPING BETWEEN TANK ASSEMBLY AND FURNACE SHALL BE COMPLETED BY INSTALLING CONTRACTOR.
3. PROVIDE CLASS A VENTING FROM FURNACE TO ABOVE ROOF VENT TERMINATION. UTILIZE VENT CONNECTOR KIT WITH BAROMETRIC DAMPER ASSEMBLY FROM UNIT MANUFACTURER.

EXHAUST FAN SCHEDULE														
MARK	TYPE	CFM	ESP	TSP	RPM	HP	VOLT/PH	REF. MANF.	REF. MODEL	*SONES	WEIGHT	WALL OPEN	NOTES	CONTROL
WF-1	WALL	6000	0.2"	0.4"	1403	1	230/1Ø	GREENHECK	SBE-3H24-10	26	210 LBS	34x34	1	A
EF-1	CEILING	70	0.1"	0.25"	700	21W	120/1Ø	GREENHECK	SP-B90	1.5	10 LBS		2	B

NOTES:
1. PROVIDE WITH WALL COLLAR, GRAVITY DAMPER AND OSHA MOTOR GUARD.
* SONE LEVELS SHALL NOT EXCEED LEVELS LISTED IN SCHEDULE.
ESP - STATIC PRESSURE EXTERNAL TO THE FAN ASSEMBLY
TSP - TOTAL STATIC PRESSURE INCLUDING FAN ACCESSORIES
2. PROVIDE WITH BACKDRAFT DAMPER AND WALL CAP.
CONTROL TYPE DESCRIPTION:
A. SEPARATE WALL MOUNTED FAN/DISCONNECT SWITCH BY EC.
B. INTERLOCK WITH LIGHTS

LOUVER SCHEDULE									
MARK	SERVICE	SIZE	CFM	FREE AREA	MATERIAL	REF. MANF.	REF. MODEL	NOTES	
L-1	INTAKE	48" W x 48" H	6000	6.3 SQ FT	ALUMINUM	RUSKIN	EME420DD	1,2,3	

NOTES:
1. PROVIDE WITH BIRD SCREEN, EXTENDED SILL & BAKED FINISH.
2. SUBMIT LOUVER TYPE & COLOR PALLET TO ARCHITECT FOR COLOR SELECTION.
3. PROVIDE WITH BACKDRAFT DAMPER.

HEAT PUMP (INDOOR UNIT) SCHEDULE																	
MARK	SUPPLY FAN				NOMINAL COOLING CAPACITY				AUX. HEAT	VOLT/PH	FLA	MCA	MOCP	REF. MANF.	REF. MODEL	WEIGHT	
	SA	CFM	OA	EXT SP	MTR	HP	EAT(DB/WB)	TOT CAP	SEN CAP								Ø 230V
AH-1	860	100	0.5"	1/3	77/764"	27	MBH	21	MBH	7.7 KW	230/1Ø	34	42	45A	TRANE	TAM40A30	120 LBS.

NOTES:
1. PROVIDE THE FOLLOWING OPTIONS AND ACCESSORIES:
- SINGLE POINT WIRING CONNECTION
- TXV MATCHING CONDENSER CAPACITY
- 7-DAY PROGRAMMABLE THERMOSTAT WITH LOCKOUT FUNCTION
- ECM FAN MOTORS

HEAT PUMP (OUTDOOR UNIT) SCHEDULE													
MARK	EAT(DB)	NOM CAP	VOLT/PH	FLA	MCA	MOCP	MIN. SEER	HSPF	REF. MANF.	REF. MODEL	WEIGHT		
HP-1	95"	2.5 TONS	230/1Ø	14	17	25A	14 SEER	8.5	TRANE	4TR4030	140 LBS.		

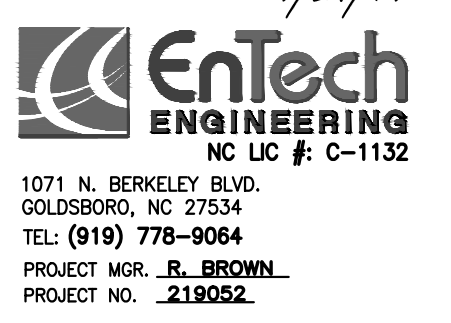
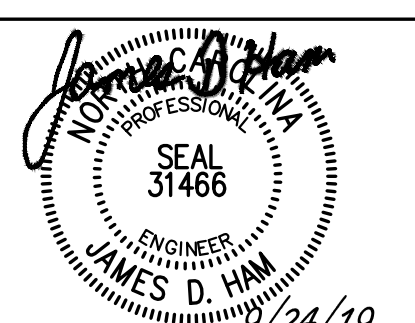
NOTES:
1. PROVIDE THE FOLLOWING OPTIONS AND ACCESSORIES:
- 5 YEAR COMPRESSOR WARRANTY
- COMPRESSOR ANTI SHORT CYCLE DELAY
- CRANKCASE HEATERS
- HIGH AND LOW PRESSURE SWITCHES
- OUTDOOR THERMOSTAT
- EXTREME CONDITION MOUNT KIT
2. M.C. SHALL COORDINATE PRODUCT SPECIFIC ELECTRICAL REQUIREMENTS WITH E.C..

AIR DISTRIBUTION SCHEDULE										
MARK	CFM RANGE	TYPE	FACE	NECK	PATTERN	MAT'L	FINISH	MANF.	MODEL	NOTES
A	0-100	T-BAR - LOUVERED SUPPLY	24x24	6"Ø	4-WAY	ALUM.	WHITE ENAMEL	H&C	AFD RC	1,2
B	105-230	T-BAR - LOUVERED SUPPLY	24x24	8"Ø	4-WAY	ALUM.	WHITE ENAMEL	H&C	AFD RC	1,2
C	200-300	T-BAR - LOUVERED SUPPLY	24x24	10"Ø	4-WAY	ALUM.	WHITE ENAMEL	H&C	AFD RC	1,2
FG	0-800	T-BAR - FILTER GRILLE	24x24 (SEE PLANS)			STEEL	WHITE ENAMEL	H&C	659TI	1,2,3

NOTES:
1. VERIFY AIR DISTRIBUTION TYPE WITH ARCHITECTURAL REFLECTED CEILING PLAN.
2. PROVIDE WITH MOLDED FIBERGLASS BACK.
3. PROVIDE WITH 1" THICK DISPOSABLE FIBERGLASS FILTERS.

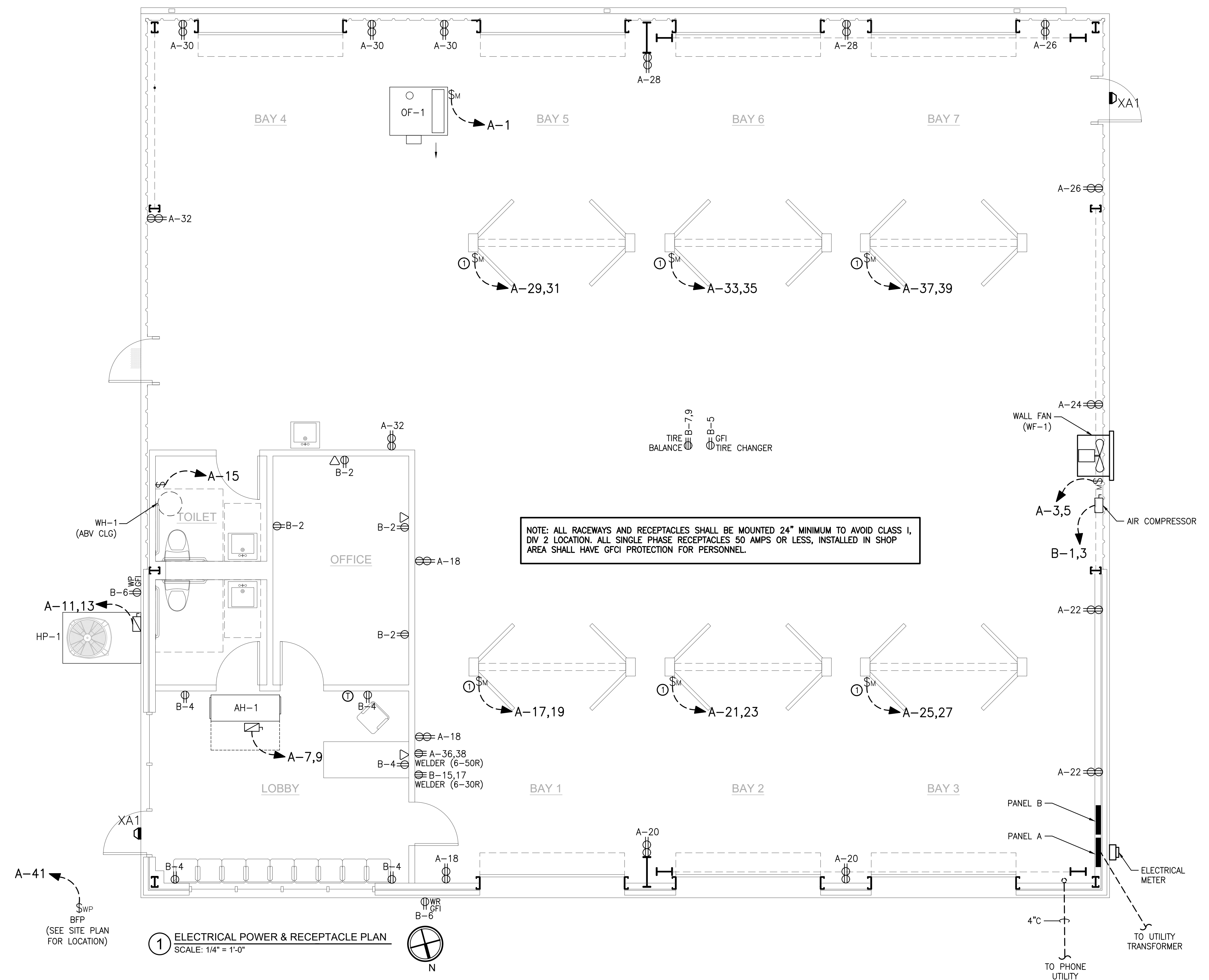
MECHANICAL ENERGY SUMMARY			
MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT			
METHOD OF COMPLIANCE:			
ENERGY CODE	PREScriptive <input checked="" type="checkbox"/>	PERFORMANCE <input type="checkbox"/>	
ASHRAE 90.1	PREScriptive <input type="checkbox"/>	PERFORMANCE <input type="checkbox"/>	
THERMAL ZONE	4A		
EXTERIOR DESIGN CONDITIONS			
WINTER DRY BULB	74°F	70°F	45°F
SUMMER DRY BULB	93°F		
INTERIOR DESIGN CONDITIONS			
WINTER DRY BULB	74°F	70°F	45°F
SUMMER DRY BULB	75°F	74°F	AMBIENT
RELATIVE HUMIDITY	50%	50%	-
BUILDING HEATING LOAD	20 MBH	150 MBH	
BUILDING COOLING LOAD	2.3 TONS		
MECHANICAL CONDITIONING SYSTEM			
UNITARY	SPLIT SYSTEM OIL FURNACE		
DESCRIPTION OF UNIT	8.5 HSPF	80%	
HEATING EFFICIENCY	14 SEER	-	
COOLING EFFICIENCY	30 MBH	160 MBH	
HEAT OUTPUT OF UNIT	2.5 TONS	-	
COOLING OUTPUT OF UNIT	-		
LIST EQUIPMENT EFFICIENCIES SEE MECHANICAL SCHEDULES			

HVAC LEGEND	
	RIGID RECTANGULAR DUCT
	RIGID ROUND DUCT
	FLEXIBLE DUCT
	LAY-IN SUPPLY DIFFUSER
	LAY-IN RETURN GRILLE
	CEILING EXHAUST FAN
	WALL THERMOSTAT FOR SYSTEM NO. 3
	AIR DISTRIBUTION MARK "B", 200 CFM
	EQUIPMENT MARK (SEE SCHEDULES)
	FLOW DIRECTION ARROW
	CONDENSATE PIPING
	REFRIGERANT PIPING
ABBREVIATIONS:	
G.C.	GENERAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
ECM	ELECTRONICALLY COMMUTATED MICROPROCESSOR
AFB	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
UNO	UNLESS NOTED OTHERWISE
BOD	BOTTOM OF DUCT
TOD	TOP OF DUCT



INSTALLATION KEYED NOTES "A":

1. PROVIDE 2 POLE MANUAL MOTOR STARTER WITH OVERLOAD PROTECTION AND NEMA 1 ENCLOSURE WITH ABILITY TO LOCK TOGGLE IN THE "OFF" POSITION. STARTER SHALL BE SQUARE D CLASS 2510, OR EQUAL. COORDINATE NEMA SIZE WITH LIFT MOTOR HORSEPOWER.



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FISH DRIVE
ANGIER, NC

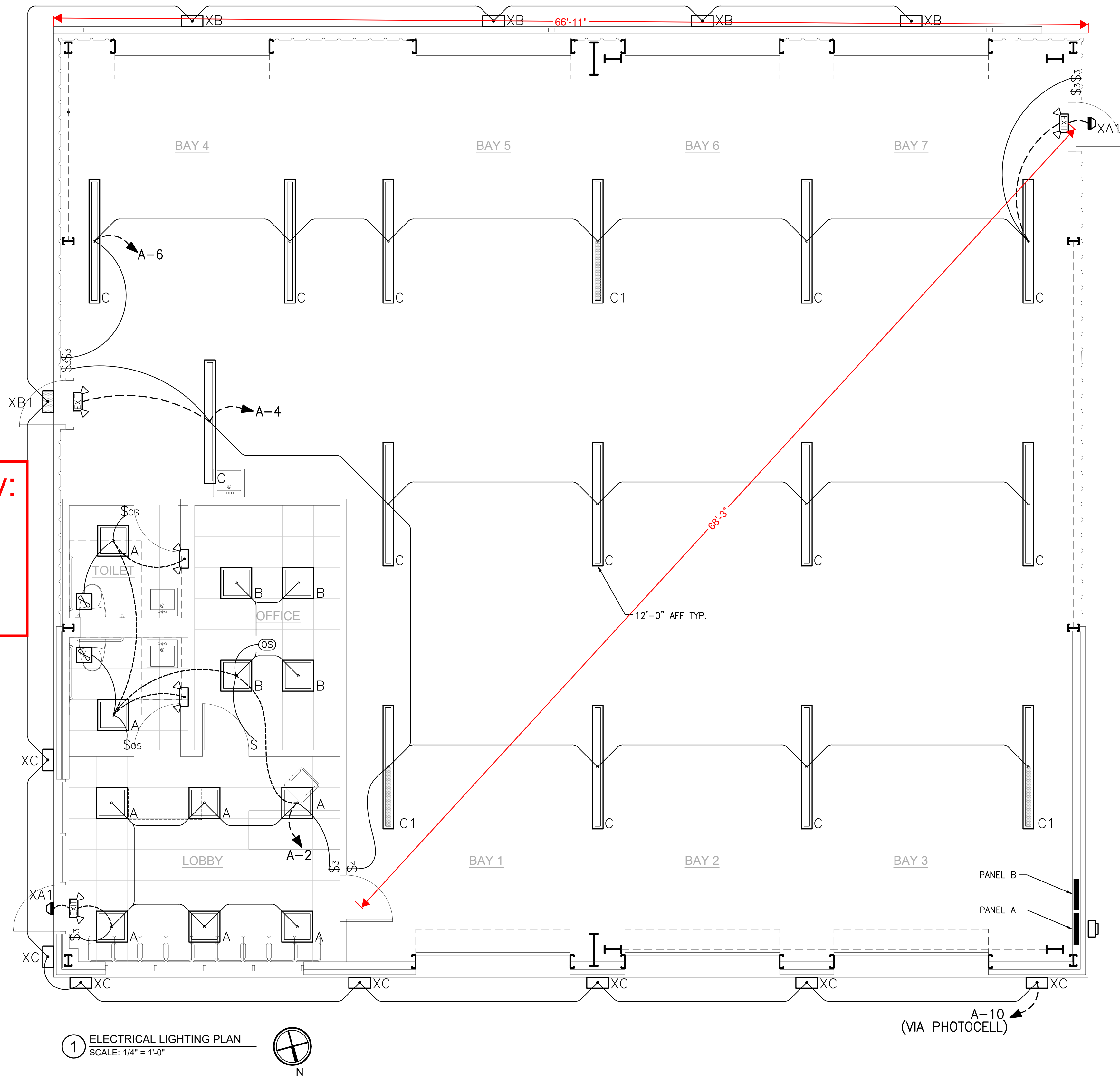
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(919) 602-4180

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ELECTRICAL
PLAN

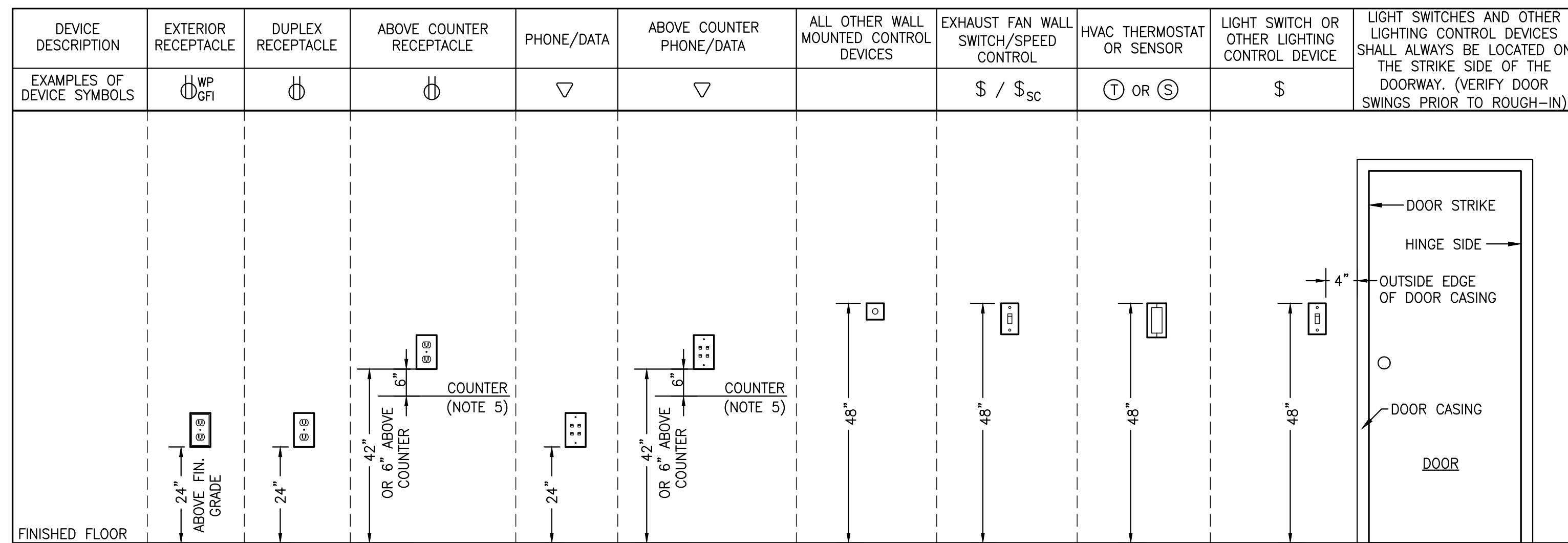
E101

Reviewed For Code Compliance By:
D. Banks Wallace
Chief Deputy Fire Marshal
11/18/2019 7:51:08 AM



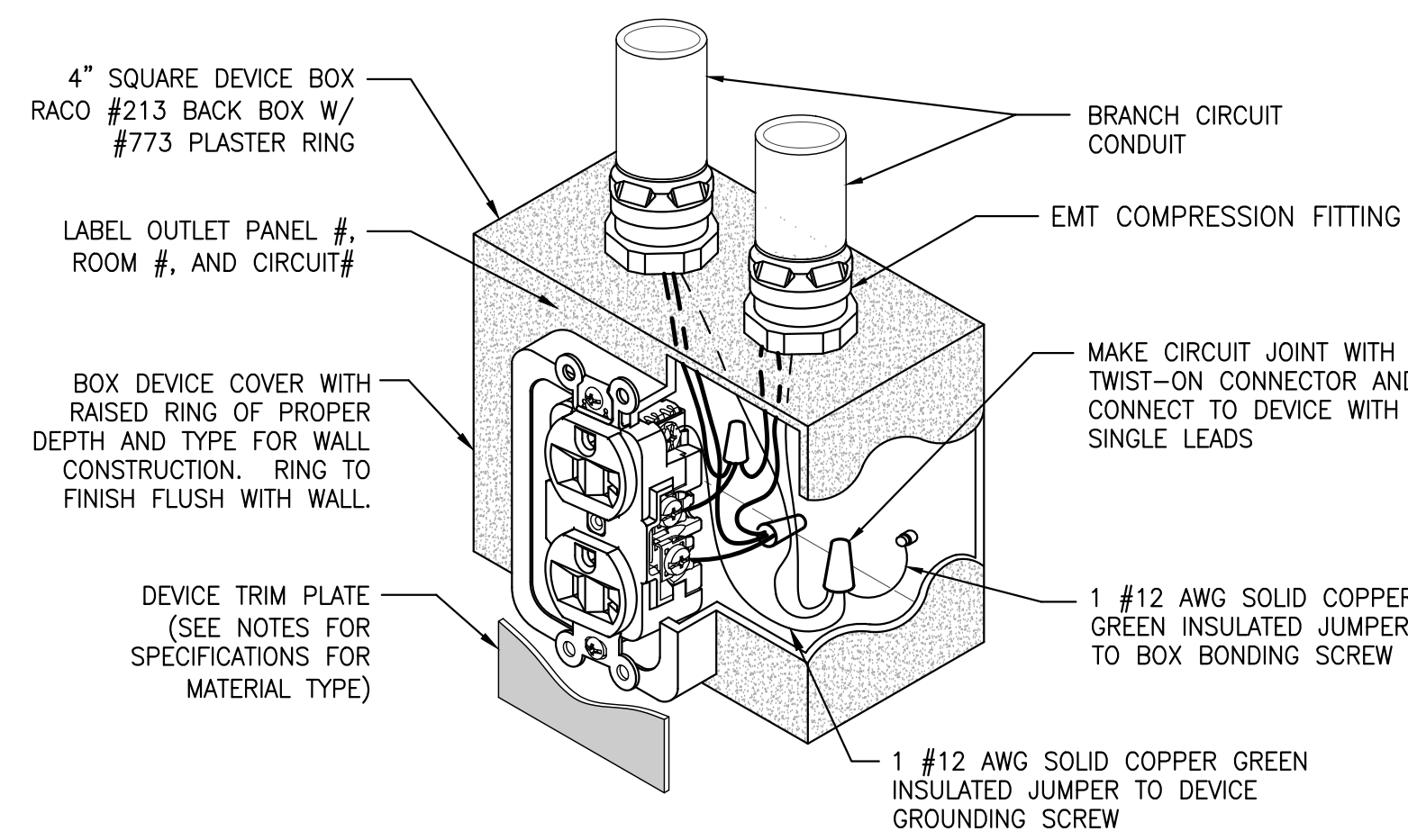
1 ELECTRICAL LIGHTING PLAN
SCALE: 1/4" = 1'-0"





- NOTES:**
1. THIS DETAIL IS GENERIC TO ADDRESS MOUNTING HEIGHTS OF WALL MOUNTED DEVICES.
 2. ALL DEVICES MAY NOT APPLY TO THIS PROJECT.
 3. ALL MOUNTING HEIGHTS ARE TYPICAL UNLESS OTHERWISE NOTED ON PLANS.
 4. REFERENCE ELECTRICAL LEGEND FOR MORE SPECIFIC DEVICES TYPES.
 5. VERIFY COUNTER AND BACKSPLASH HEIGHTS PRIOR TO ROUGH-IN.

1 DEVICE MOUNTING HEIGHTS
SCALE: N.T.S.



3 RECEPTACLE GROUNDING DIAGRAM
SCALE: N.T.S.

VOLTAGE TO GROUND (NOMINAL)	CONDITION: 1	2	3
	(MINIMUM CLEAR DISTANCE)		
0-150	3'	3'	3'
151-600	3'	3 1/2'	4'

WHERE THE "CONDITIONS" ARE AS FOLLOWS:

1. EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS. INSULATED WIRE OR INSULATED BUSBARS OPERATING AT NOT OVER 300 VOLTS SHALL NOT BE CONSIDERED LIVE PARTS.
2. EXPOSED LIVE PARTS ON ONE SIDE AND GROUNDED PARTS ON THE OTHER SIDE.
3. EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.

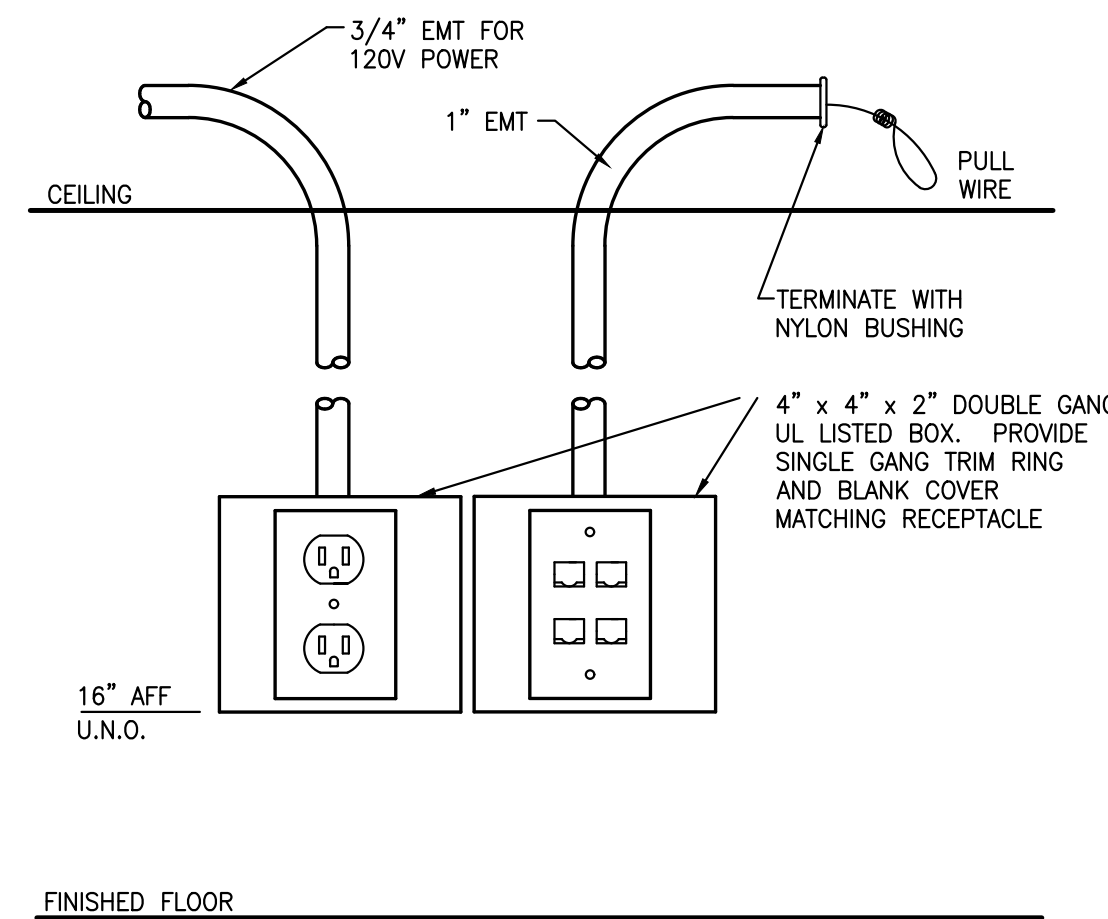
6 1/2" MINIMUM OR HEIGHT OF EQUIPMENT

NOTES:

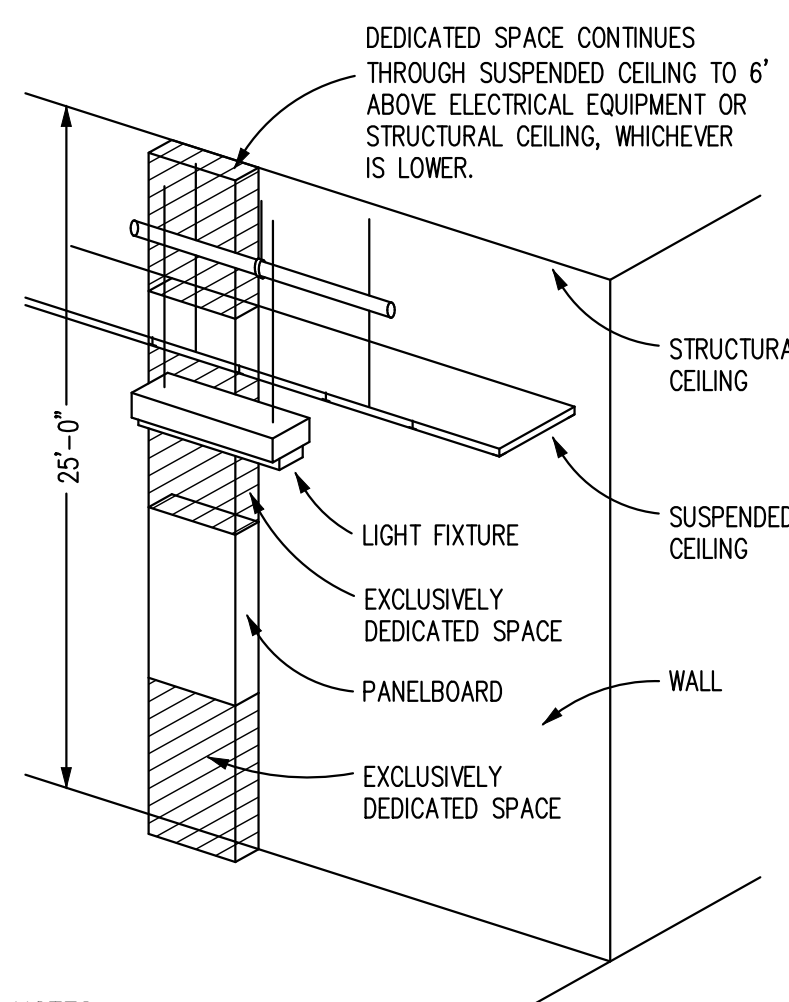
1. THIS FIGURE ILLUSTRATES THE WORKING SPACE IN FRONT OF ELECTRICAL EQUIPMENT REQUIRED BY NEC SECTION 110-26.
2. THIS INCLUDES BUT IS NOT LIMITED TO PANELBOARDS, SAFETY SWITCHES, MOTOR STARTERS, JUNCTION BOXES AND OTHER ELECTRICAL EQUIPMENT.

ALL ELECTRIC EQUIPMENT

6 DEDICATED WORKING SPACE REQUIREMENTS
SCALE: N.T.S.



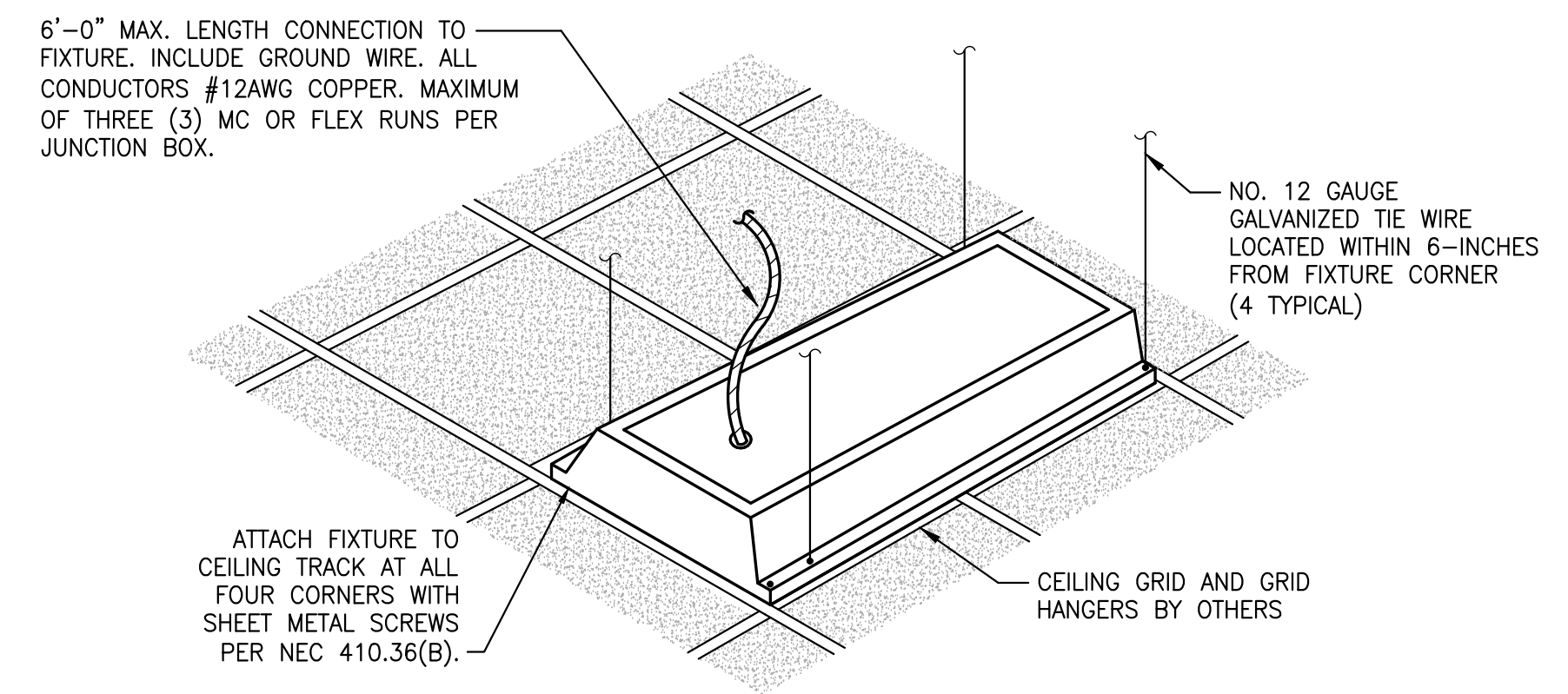
4 POWER/DATA/PHONE OUTLET DETAIL
SCALE: N.T.S.



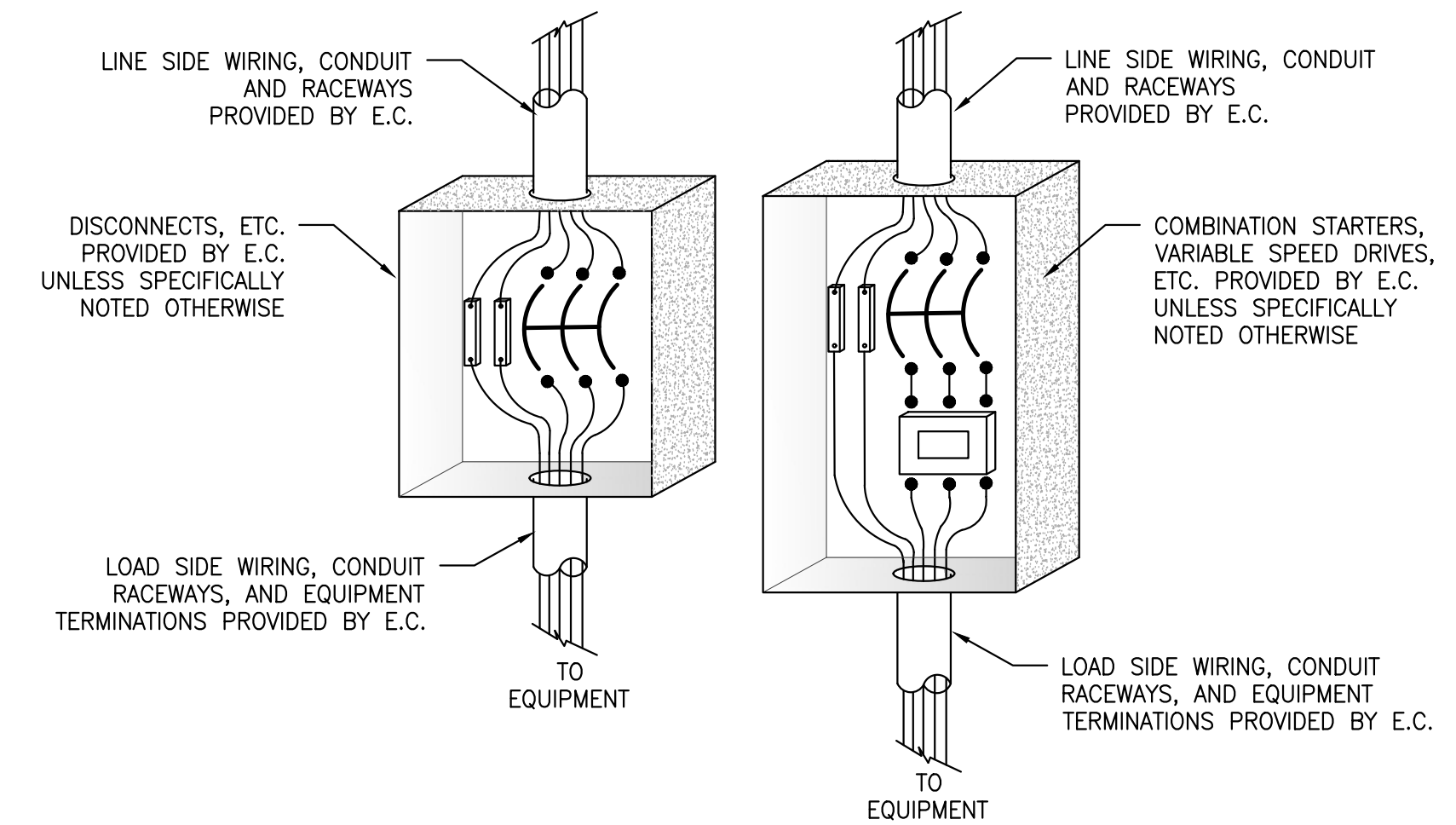
NOTES:

1. THIS FIGURE ILLUSTRATES THE ADDITIONAL EXCLUSIVELY DEDICATED SPACE REQUIRED OVER AND UNDER PANELBOARDS FOR CABLES, RACEWAYS, ETC. TO AND FROM PANELBOARDS REQUIRED BY NEC SECTION 110-26.
2. NO PIPING DUCTWORK OR EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT OR ARCHITECTURAL APPURTENANCES SHALL BE PERMITTED TO BE INSTALLED IN, ENTER OR PASS THROUGH THE DEDICATED SPACES SHOWN. FOR EXCEPTIONS SEE NEC SECTION 110-26f.

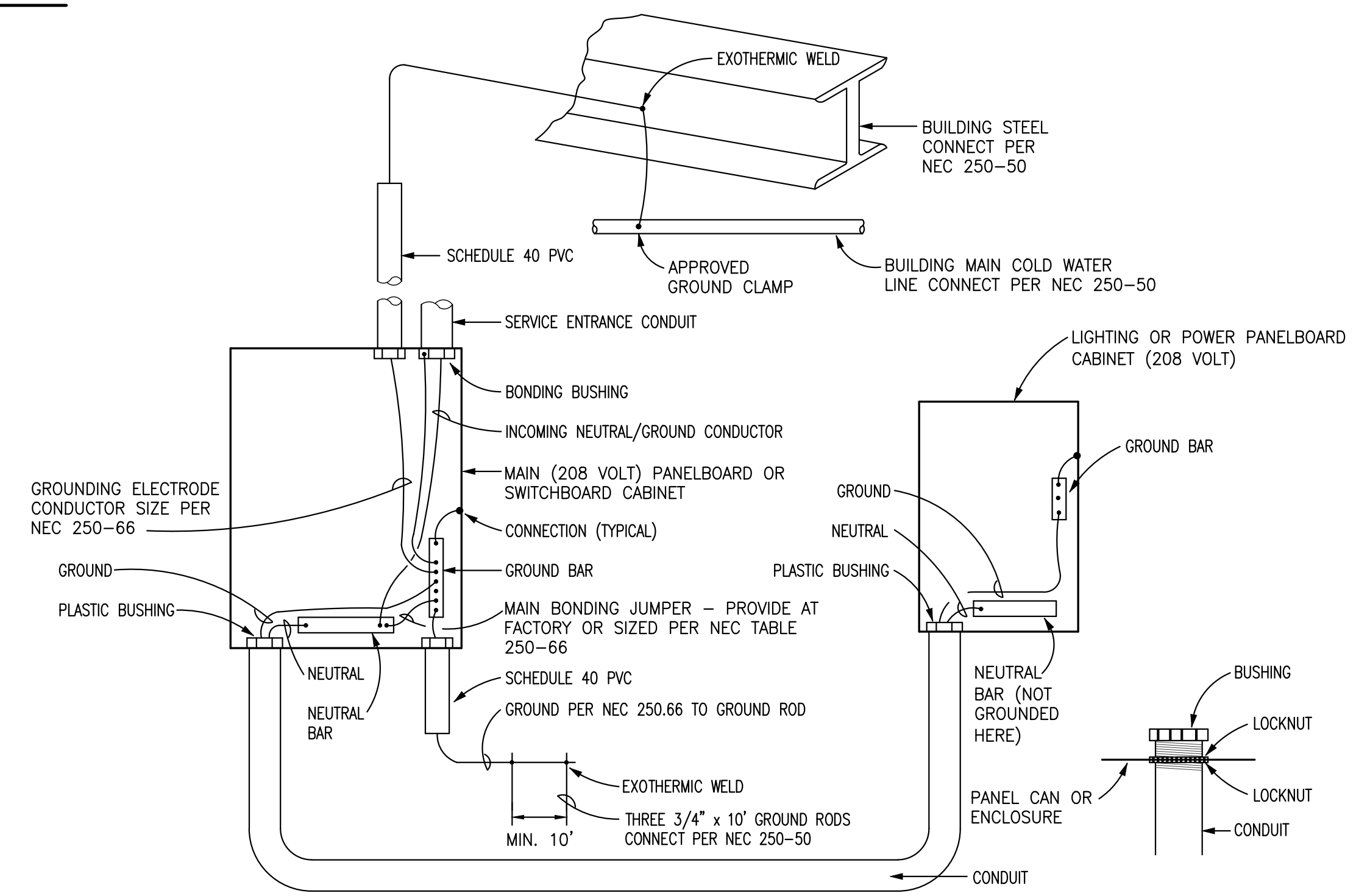
PANELBOARDS



2 TYPICAL RECESSED FIXTURE SUPPORT
SCALE: N.T.S.

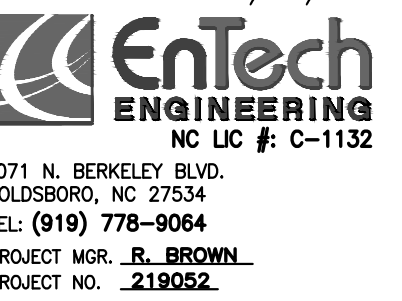
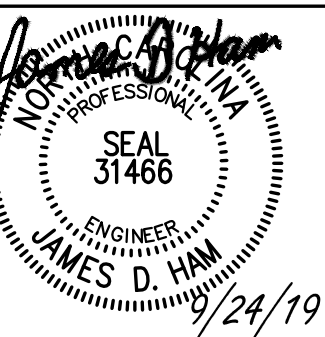


5 ELECTRICAL CONNECTION COORDINATION
SCALE: N.T.S.



- NOTES:**
1. GROUNDING ELECTRODE CONDUCTOR SHALL BE RUN CONTINUOUSLY (UNBROKEN) FROM COLD WATER LINE AND/OR BUILDING STEEL AND GROUND ROD TO GROUND BAR BEFORE BONDING TO ANY CONDUIT BUSHING.
 2. ALL THE FOLLOWING GROUNDING ELECTRODES THAT ARE PRESENT SHALL BE BONDED TOGETHER TO FORM THE GROUNDING ELECTRODE SYSTEM PER NEC 250.52:
 - 2.1. METAL UNDERGROUND WATER PIPE IN DIRECT CONTACT WITH EARTH FOR 10 FT OR MORE
 - 2.2. METAL FRAME OF THE BUILDING.
 - 2.3. ANY ELECTRODE ENCASED BY AT LEAST 2 IN. OF CONCRETE, CONSISTING OF 20 FT OR MORE BARE OR ZINC GALVANIZED OR OTHER ELECTRICALLY CONDUCTIVE COATED STEEL REINFORCING BARS OR RODS NOT LESS THAN 1/2" IN DIAMETER.
 - 2.4. GROUND RING ENCIrcLING THE BUILDING
 - 2.5. ROD AND PIPE ELECTRODES NOT LESS THAN 8 FT.
 - 2.6. PLATE ELECTRODES

7 TYPICAL BONDING & GROUNDING DIAGRAM
SCALE: N.T.S.



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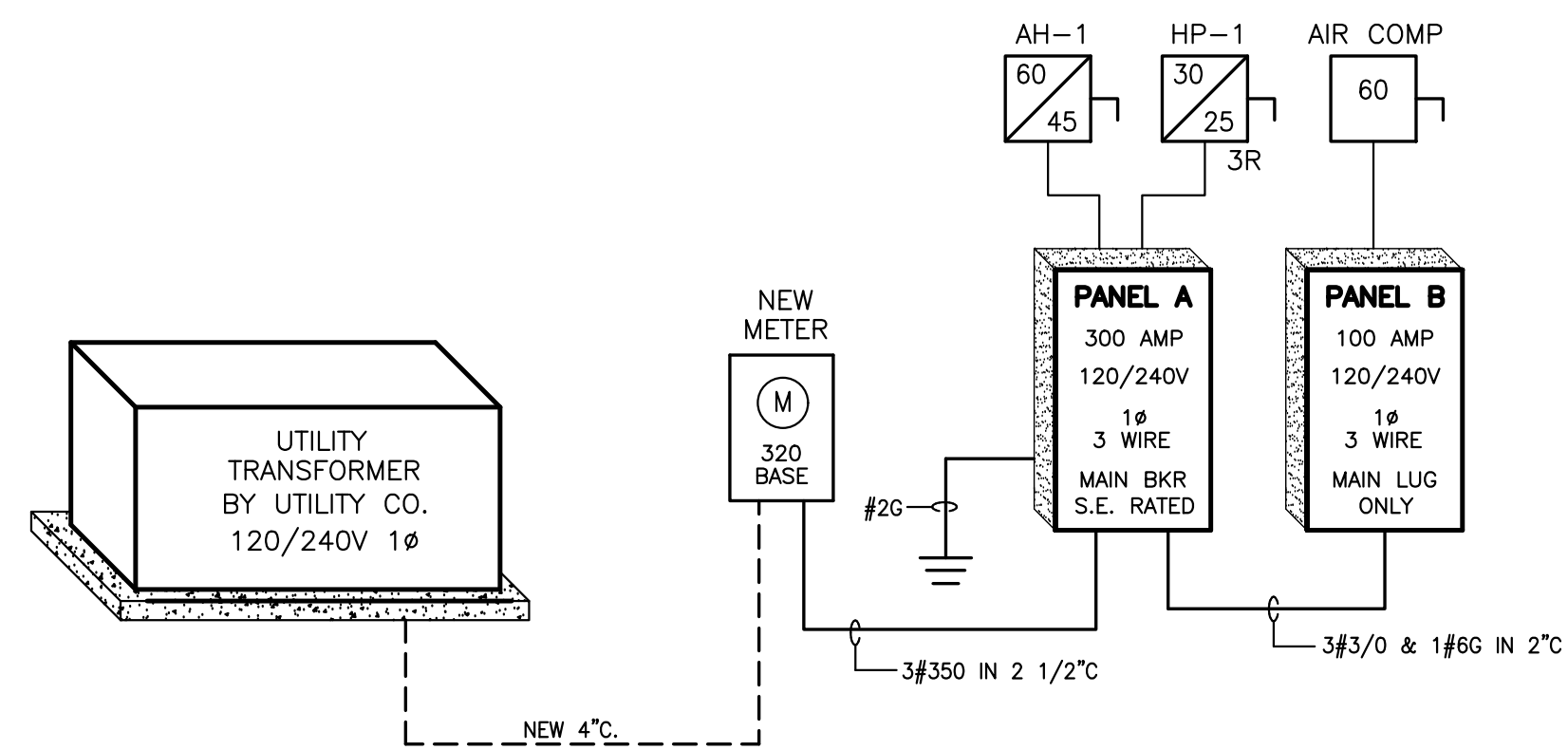
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ELECTRICAL DETAILS

E201

SERVICE LOAD SUMMARY					
OCCUPANCY TYPE - BUSINESS			BUILDING AREA - 4,000 SQUARE FEET		
CONTINUOUS LOAD DESCRIPTION	LOAD (KVA)	NEC REFERENCE	DEMAND FACTOR	NEC REFERENCE	LOAD (KVA)
INDOOR LIGHTING (2W/SF)	8.0	TABLE 220.12	100%	TABLE 220.42	8.0
OUTDOOR LIGHTING	1	--	100%	--	1.0
SIGN LIGHTING	1.2	220.14 F	100%	--	1.2
EXHAUST FANS	1.7	220.43	100%	--	1.7
FUEL OIL HEATER	1.2	ARTICLE 430	100%	--	1.2
AIR HANDLER FANS (SPLIT SYSTEMS)	0.7	ARTICLE 440	100%	--	0.7
AIR HANDLER ELECTRIC HEAT	7.7	422.12	100%	--	7.7
HVAC OUTDOOR UNIT (2.5 TON)	3.3	ARTICLE 440	100%	--	3.3
WATER HEATERS	1.5	422.13	100%	--	1.5
SUBTOTAL CONTINUOUS LOADS					26.3
					230.42 A 1 x 125%
CONT. LOAD TOTAL					32.9
NON CONTINUOUS LOAD DESCRIPTION					
RECEPTACLES UP TO 10 KVA	8.8	220.14 1	100% OF 1st 10 KVA		8.8
RECEPTACLES OVER 10 KVA	0.0	220.14 1	50% ABOVE 10 KVA		0.0
WELDER	2.4	--	DUTY CYCLE OF 50%		1.2
VEHICLE LIFTS	9.0	--	NONCONTINUOUS LOAD x 50%		4.5
AIR COMPRESSOR	8.6	--	NONCONTINUOUS LOAD x 100%		8.6
MISC. EQUIPMENT LOADS	5.2	--	NONCONTINUOUS LOAD x 100%		5.2
SUBTOTAL NON-CONTINUOUS LOADS					28.3
TOTAL CONTINUOUS AND NON CONTINUOUS LOADS					61
FAULT CURRENT @ TRANSFORMER SECONDARY TERMINALS			SERVICE LOAD		
$\frac{75 \text{ KVA (X-FORMER)}}{0.240 \times 1.5\%Z} = 20,800 \text{ AMPS}$			$\frac{71 \text{ KVA}}{0.240} = 296 \text{ AMPS}$		



1 ELECTRICAL RISER DIAGRAM
SCALE: N.T.S.

PANELBOARD SCHEDULE											
PANEL A	SURFACE MOUNTED	SERVICE ENTRANCE RATED			300 AMP (FEEDER SIZE)			1Ø, 3 WIRE			
MAIN BREAKER	BOTTOM FEED	10K AIC			120/240 VOLT			BOLT ON BREAKER			
NEMA 1	COPPER BUS			100 AMP (BUS RATING)							
LOAD SERVED	WIRE SIZE	CONDUIT SIZE	LOAD (AMPS) A B	CKT NO.	PHASE A B	CONDUIT SIZE	LOAD (AMPS) A B	WIRE SIZE	LOAD SERVED		
OIL FURNANCE OF-1	2#12 & 1#12G	3/4"	10	1	20	20	2	3/4"	2#12 & 1#12G	LIGHTS	
WALL FAN (WF-1)	2#12 & 1#12G	3/4"	8	3	20	20	4	3/4"	2#12 & 1#12G	LIGHTS	
			8	5	20	20	6	3/4"	2#12 & 1#12G	LIGHTS	
AH-1	2#8 & 1#10G	3/4"	34	7	45	20	8	3/4"	2#12 & 1#12G	EXT LIGHTS	
			34	9	20	20	10	--	--	SPARE	
HP-1	2#12 & 1#12G	3/4"	14	11	25	20	12	--	--	SPARE	
			14	13	20	25	14	10	3/4"	2#12 & 1#12G	SPARE
WATER HTR WH-1	2#12 & 1#12G	3/4"	13	15	25	20	16	10	3/4"	2#12 & 1#12G	SHOP RECEP
LIFT BAY #1	2#12 & 1#12G	3/4"	10	17	20	20	18	9	3/4"	2#12 & 1#12G	SHOP RECEP
			10	19	25	20	20	6	3/4"	2#12 & 1#12G	SHOP RECEP
LIFT BAY #2	2#12 & 1#12G	3/4"	10	21	20	20	22	6	3/4"	2#12 & 1#12G	SHOP RECEP
			10	23	20	20	24	6	3/4"	2#12 & 1#12G	SHOP RECEP
LIFT BAY #3	2#12 & 1#12G	3/4"	10	25	25	20	26	6	3/4"	2#12 & 1#12G	SHOP RECEP
			10	27	25	20	28	6	3/4"	2#12 & 1#12G	SHOP RECEP
LIFT BAY #5	2#12 & 1#12G	3/4"	10	29	25	20	30	9	3/4"	2#12 & 1#12G	SHOP RECEP
			10	31	25	20	32	6	3/4"	2#12 & 1#12G	SHOP RECEP
LIFT BAY #6	2#12 & 1#12G	3/4"	10	33	25	20	34	--	--	SPARE	
			10	35	80	20	36	43	3/4"	3#8 & 1#10G	WELDER
LIFT BAY #7	2#12 & 1#12G	3/4"	10	37	25	20	38	43	3/4"	3#8 & 1#10G	WELDER
			10	39	100	20	40	82	2"	3#3/0 & 1#6G	PANEL B
BFP	2#12 & 1#12G	1"	10	41	20	20	42	69	2"	3#3/0 & 1#6G	PANEL B

COORDINATE HVAC BREAKERS AND WIRE SIZES WITH HVAC SUBMITTALS
COORDINATE BREAKERS AND WIRE SIZES FOR OWNER FURNISHED EQUIPMENT WITH SUBMITTALS
PROVIDE SEPARATE NEUTRALS FOR ALL CIRCUITS.

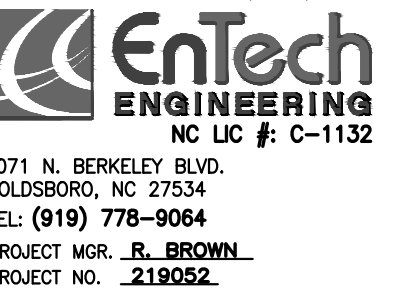
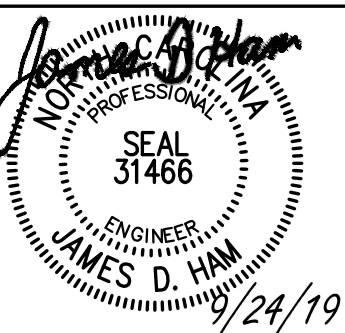
* PROVIDE WITH LOCKING BREAKER & A RED MARKING
PER NFPA 72-105.5.2.3 (2010).

PROVIDE WITH CLASS "A" (6mA) GFCI BREAKER IN ACCORDANCE WITH UL 489

PANELBOARD SCHEDULE											
PANEL B	SURFACE MOUNTED	SERVICE ENTRANCE RATED			100 AMP (FEEDER SIZE)			1Ø, 3 WIRE			
MAIN LUG ONLY	BOTTOM FEED	10K AIC			120/240 VOLT			BOLT ON BREAKER			
NEMA 1	COPPER BUS			100 AMP (BUS RATING)							
LOAD SERVED	WIRE SIZE	CONDUIT SIZE	LOAD (AMPS) A B	CKT NO.	PHASE A B	CONDUIT SIZE	LOAD (AMPS) A B	WIRE SIZE	LOAD SERVED		
AIR COMP #1 (5hp)	2#8 & 1#10G	3/4"	28	1	60	20	2	6	3/4"	2#12 & 1#12G	OFFICE RECEP
			28	3	20	20	4	8	3/4"	2#12 & 1#12G	LOBBY RECEP
TIRE CHANGER	2#12 & 1#12G	3/4"	12	5	20	20	6	3	3/4"	2#12 & 1#12G	OUTDOOR RECEP
TIRE BALLANCER (3hp)	2#12 & 1#12G	3/4"	17	7	35	20	8	--	--	SPARE	
			17	9	20	20	10	--	--	SPARE	
WELDER	2#10 & 1#10G	3/4"	16	11	30	20	12	--	--	SPARE	
			16	13	20	20	14	--	--	SPARE	
			--	15	20	20	16	--	--	SPARE	
			--	17	20	20	18	--	--	SPARE	
			--	19	20	20	20	--	--	SPARE	
			--	21	20	20	22	--	--	SPARE	
			--	23	20	20	24	--	--	SPARE	
			--	25	20	20	26	--	--	SPARE	
			--	27	20	20	28	--	--	SPARE	
			--	29	20	20	30	--	--	SPARE	

COORDINATE BREAKERS AND WIRE SIZES FOR OWNER FURNISHED EQUIPMENT WITH SUBMITTALS
PROVIDE SEPARATE NEUTRALS FOR ALL CIRCUITS.

	CONNECTED LOAD (KVA)	DEMAND FACTOR	DEMAND LOAD (KVA)
RECEPTACLES (1ST 10 KVA)	= 2.0	100%	= 2.0
RECEPTACLES (ABV 10 KVA)	= --	50%	= --
DEDICATED EQUIP	= 16	100%	= 16
TOTALS:	= 18 KVA		= 18 KVA
MINIMUM PANEL SIZE:	18 KVA X 125% = 22.5 KVA (94 AMPS)		
GRAND PHASE TOTALS (AMPS)	A = 82	B = 69	



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E301

