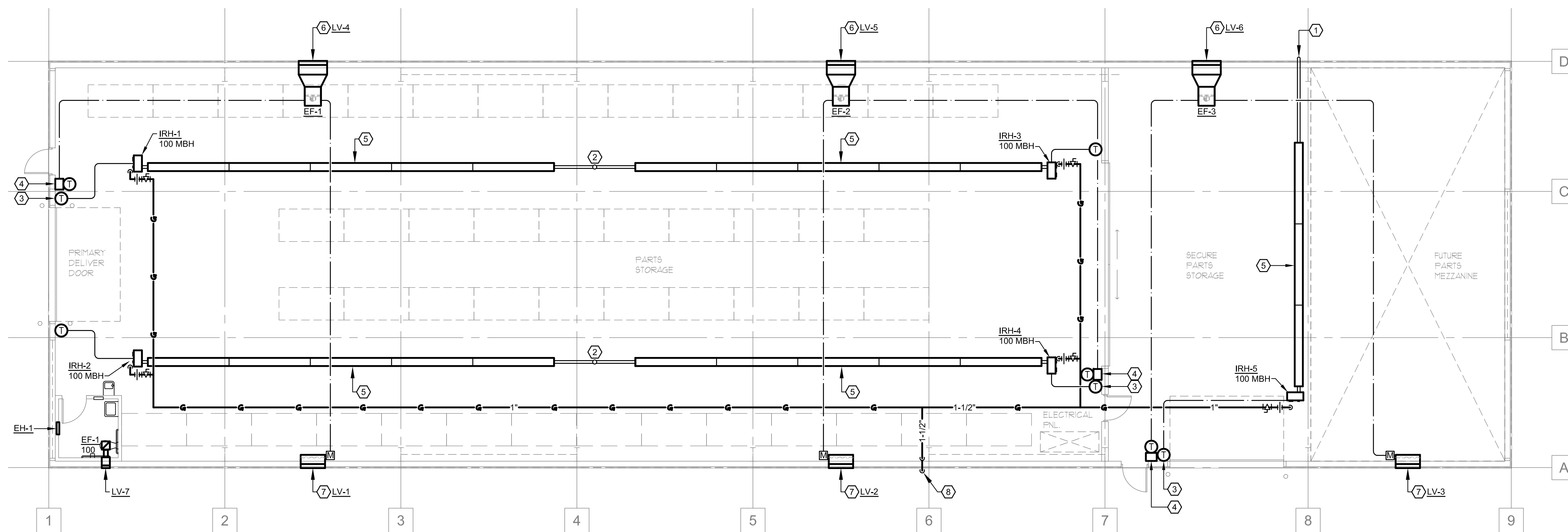
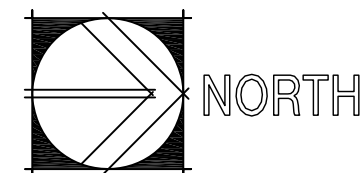


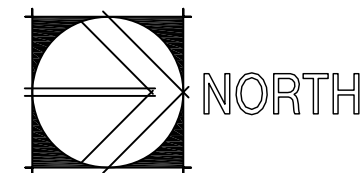
1 FLOOR PLAN - PLUMBING

1/8"=1'-0"



1 FLOOR PLAN - MECHANICAL

1/8"=1'-0"



KEYED NOTES:

1. 4"Ø RADIANT HEATER FLUE THROUGH SIDEWALL.
2. 6"Ø RADIANT HEATER FLUE THROUGH ROOF.
3. 24 V RADIANT TUBE HEATER THERMOSTAT. MOUNT @ 48" A.F.F. SET @ 50°F (ADJUSTABLE).
4. EXHAUST FAN HAND/OFF/AUTO FAN STARTER AND LINE VOLTAGE THERMOSTAT TO OPERATE EXHAUST FAN AND OPEN INTAKE AIR LOUVER WHENEVER THE ROOM TEMPERATURE IS OVER 85°F (ADJUSTABLE). MOUNT @ 48" A.F.F. (STARTER AND LINE VOLTAGE INTERLOCK WIRING BY ELECTRICAL TRADES)
5. MOUNT RADIANT HEATER AT 18'-0" ABOVE FINISHED FLOOR. COORDINATE FINAL LOCATION WITH ADJACENT LIGHT FIXTURES.
6. MOUNT EXHAUST AIR LOUVER ATO 16'-0" TO BOTTOM OF LOUVER. COORDINATE LOUVER FRAMING WITH ARCHITECTURAL AND STRUCTURAL TRADES.
7. MOUNT INTAKE AIR LOUVER AT 3'-0" TO BOTTOM OF LOUVER. COORDINATE LOUVER FRAMING WITH ARCHITECTURAL AND STRUCTURAL TRADES.
8. ROUTE 1-1/2" NATURAL GAS UNDERGROUND TO EXISTING NATURAL GAS METER LOCATED ON THE ADJACENT QUICKLUBE BUILDING. (NEW PIPING SIZED BASED ON 350 CFH AND A MAXIMUM DEVELOPED PIPE LENGTH OF 250 FEET.
9. 3" SANITARY, 1-1/2" VENT AND 1/2" COLD WATER TO WATER CLOSET.
10. 1-1/2" SANITARY AND VENT AND 1/2" HOT AND COLD WATER TO LAVATORY.
11. 1-1/2" SANITARY AND VENT AND 1/2" COLD WATER TO ELECTRIC WATER COOLER.
12. 2" VENT UP TO 3" VENT THROUGH ROOF.
13. 3" SANITARY AT 48" BELOW FINISHED GRADE. REFER TO CIVIL PLANS FOR CONTINUATION.
14. 3/4" DOMESTIC CITY WATER AT 48" BELOW FINISHED GRADE. REFER TO CIVIL PLANS FOR CONTINUATION.
15. ELECTRIC WATER HEATER. MOUNT WITH DRAIN PAN AND ROUTE 3/4" DRAIN DOWN IN WALL AND SPILL TO FLOOR UNDER THE LAVATORY.

SYMBOLS

SYMBOL	DESCRIPTION
	BALL VALVE
	PLUG VALVE
	UNION
	PIPE TURNED UP
	PIPE TURNED DOWN
	PIPE OUT TOP
	PIPE OUT BOTTOM
	COLD WATER PIPING
	HOT WATER PIPING
	VENT PIPING
	NATURAL GAS PIPING
	SANITARY PIPING
	THERMOSTAT

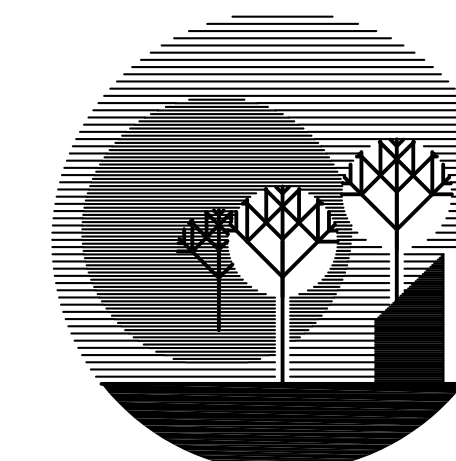
ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
CO	SANITARY CLEAN OUT
DIA / Ø	DIAMETER
EF-#	EXHAUST FAN
EWC-#	ELECTRIC WATER COOLER
FD-#	FLOOR DRAIN
L-#	LAVATORY
LV-#	LOUVER
IRH-#	INFARED TUBE HEATER
WC-#	WATER CLOSET
WH-#	WATER HEATER

prepared for:



prepared by:



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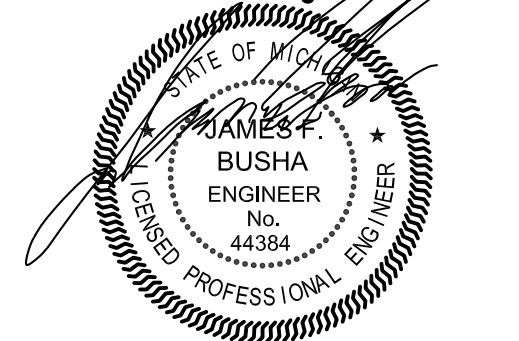
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**FLOOR & ROOF
HVAC PLANS**

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project number

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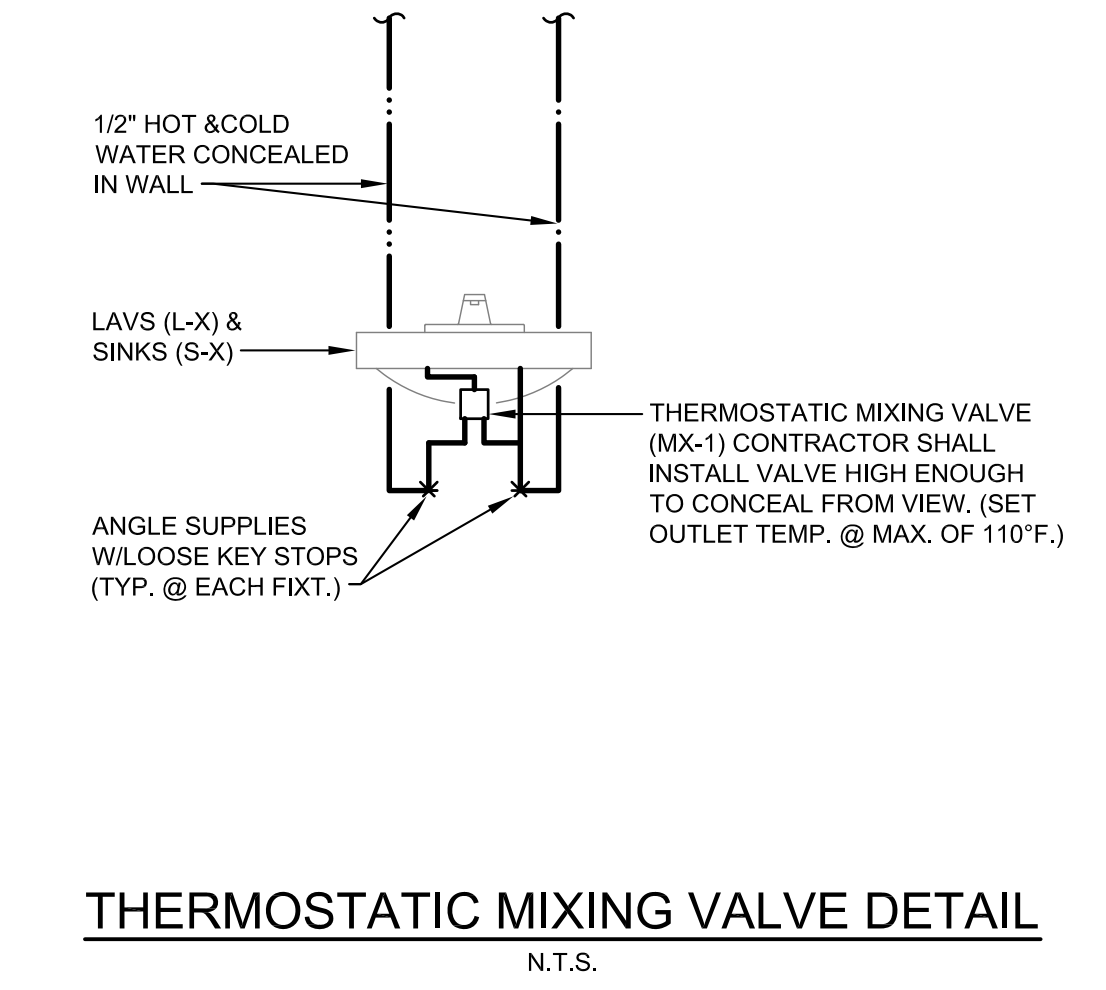
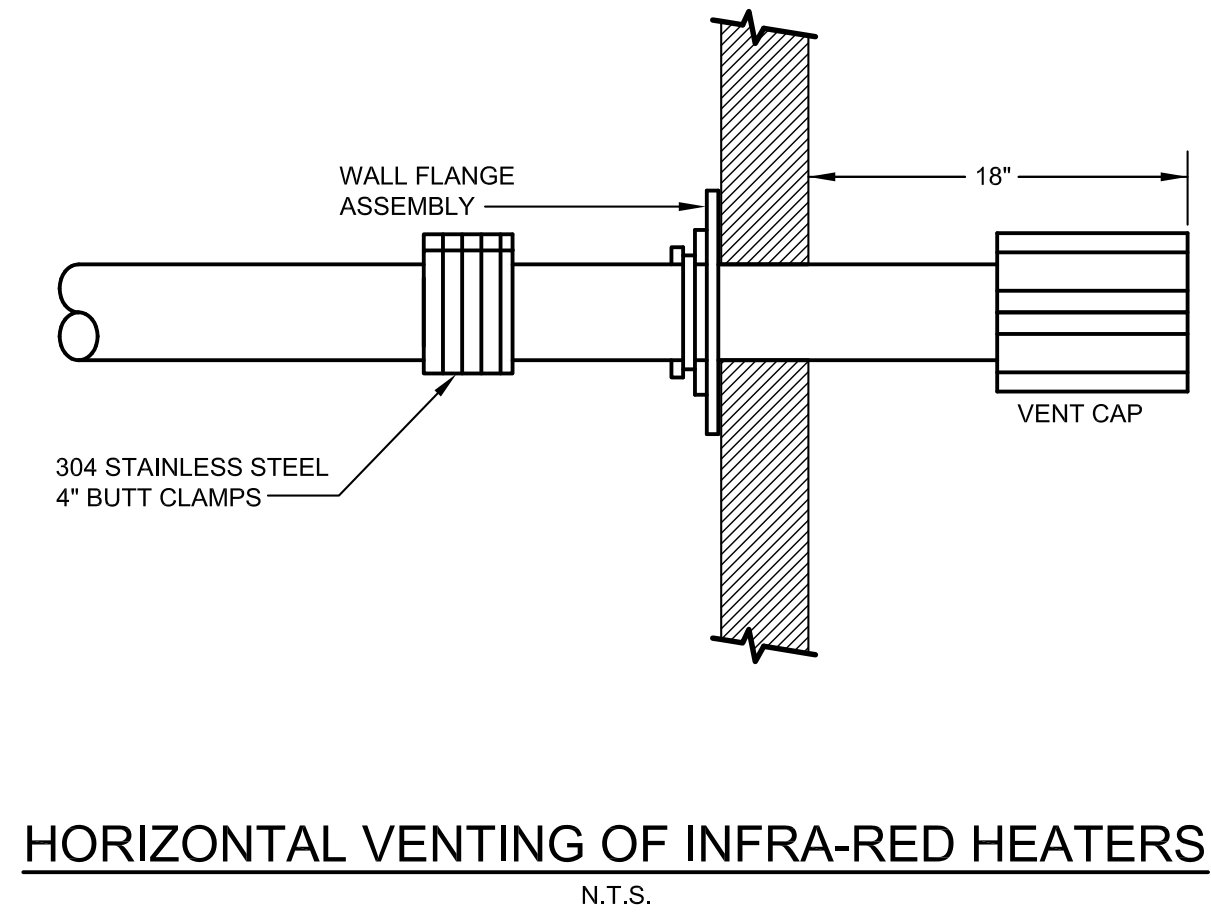
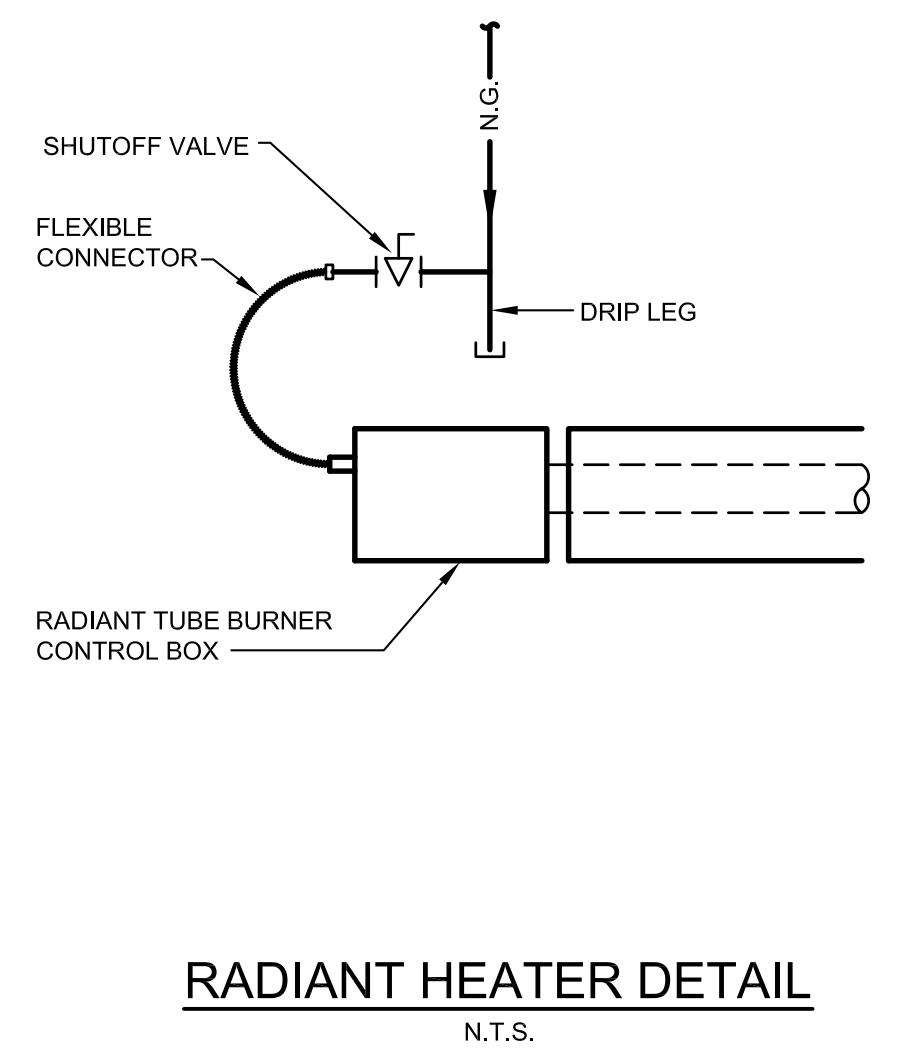
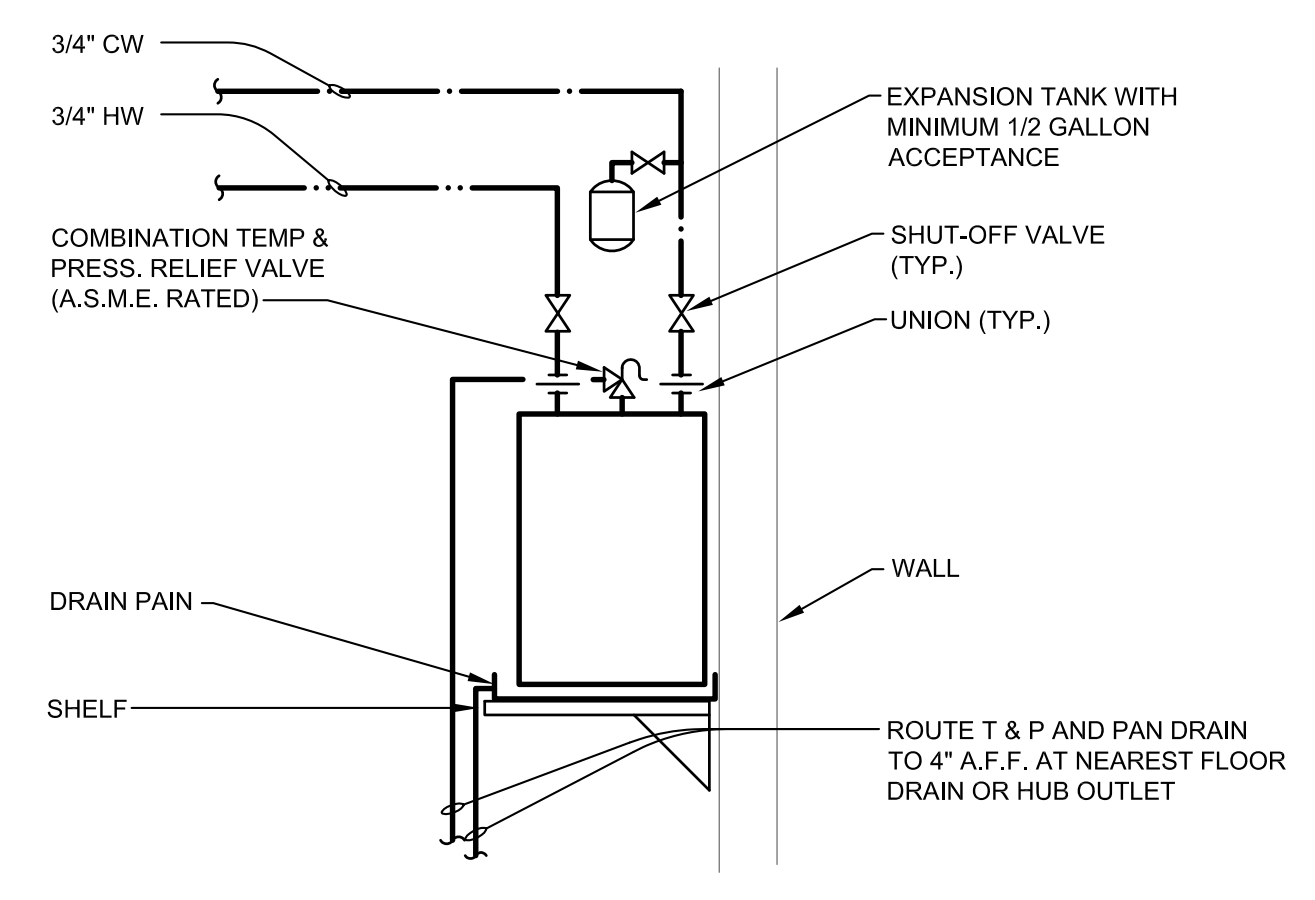
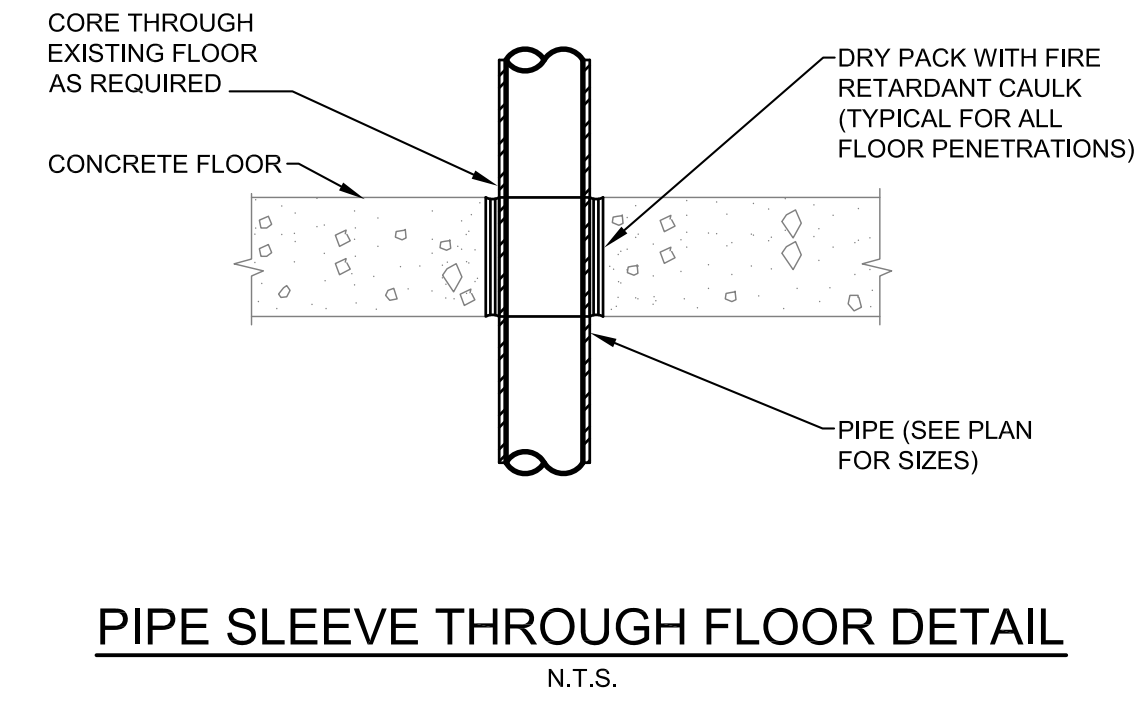
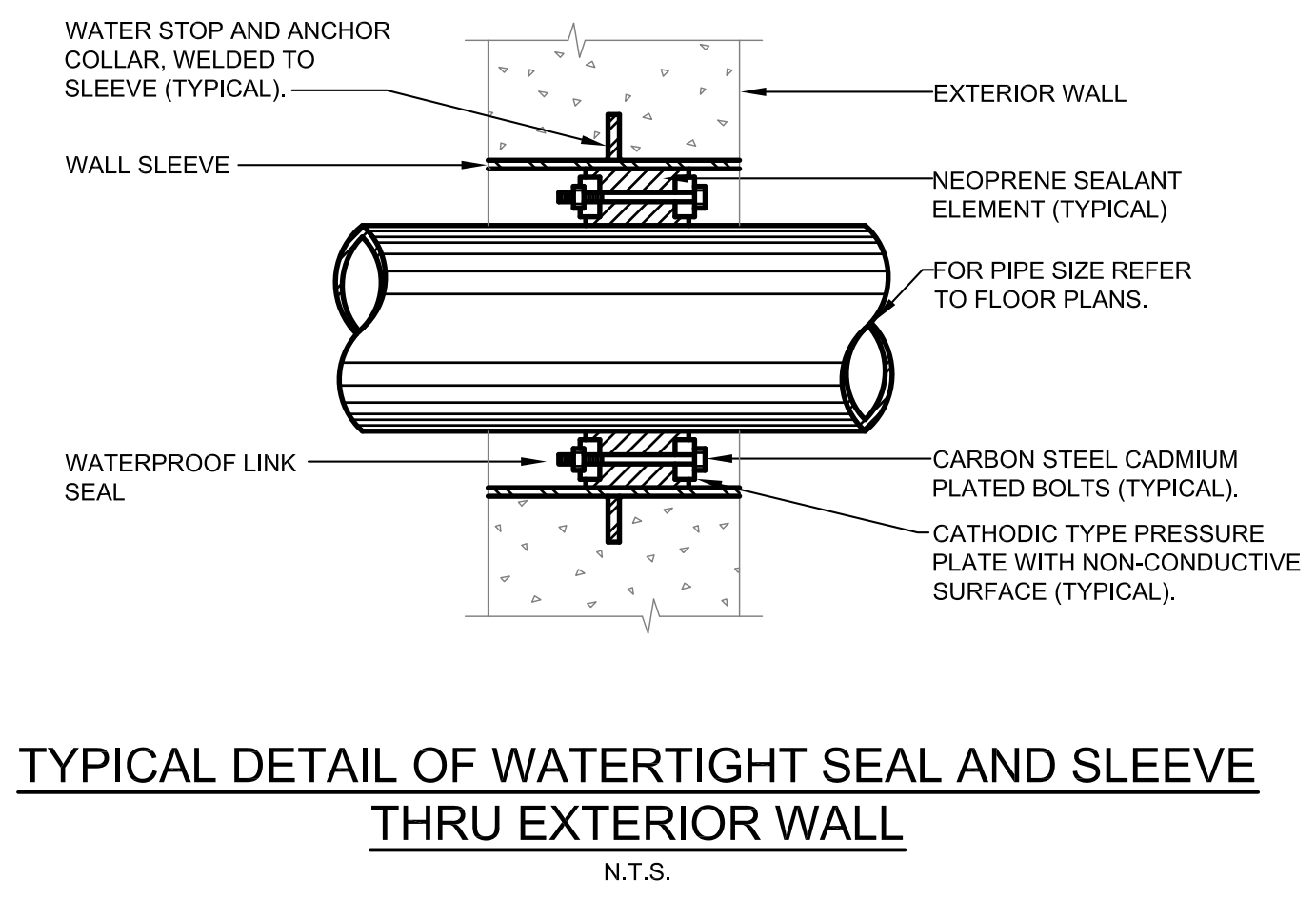


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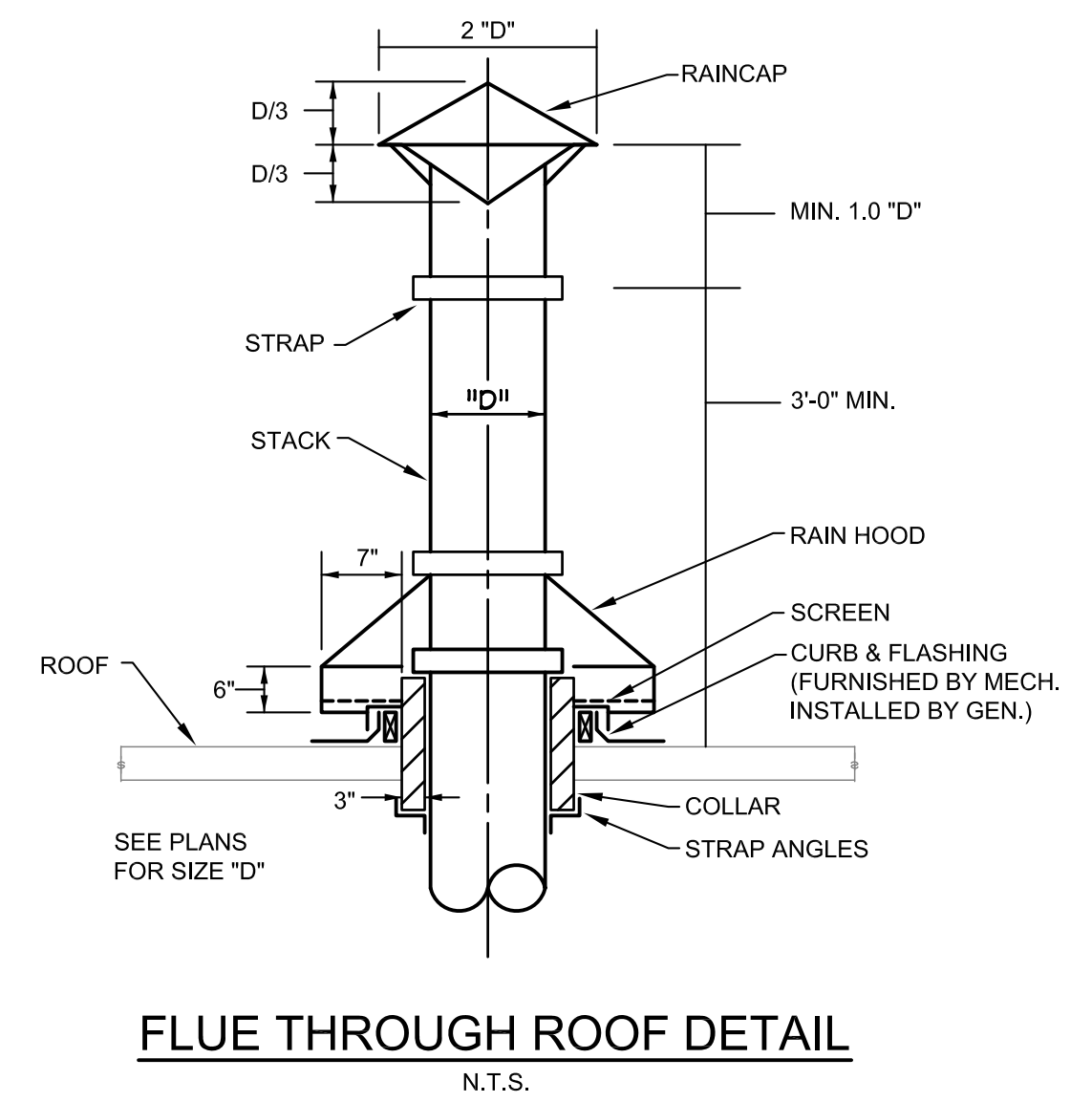
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SHEET

M-101



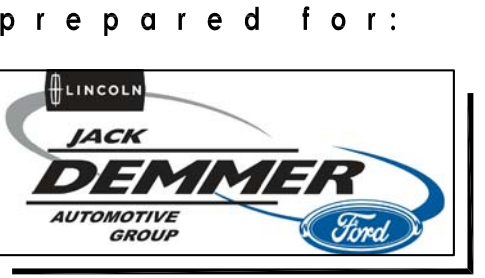
THERMOSTATIC MIXING VALVE DETAIL
N.T.S.



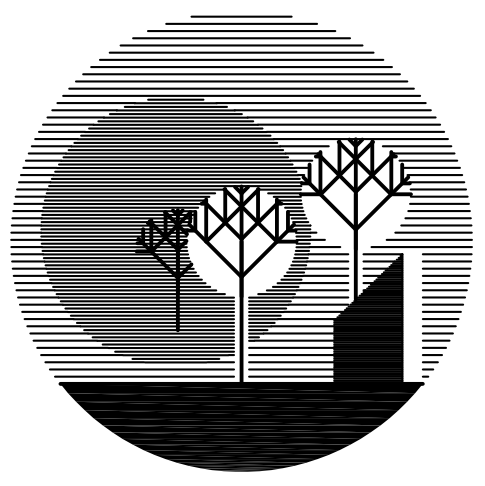
FLUE THROUGH ROOF DETAIL
N.T.S.

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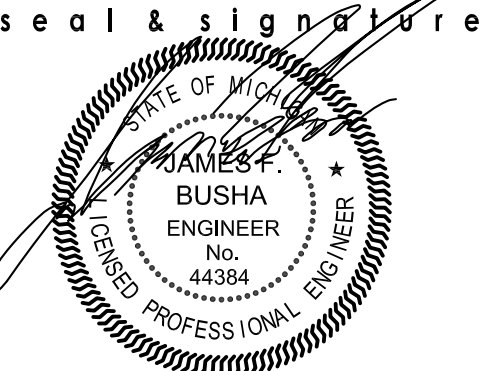
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37458 MICHIGAN AVE. WAYNE, MI

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PLUMBING FIXTURE SCHEDULE									
MARK	ITEM	ADA	DESCRIPTION	ACCESSORIES	PIPE CONNECTION SIZES				NOTES
					W	V	CW	HW	
WC-2	FLOOR MOUNTED TANK TYPE WATER CLOSET	X	American Standard CHAMPION 4 Elongated Right Height 16-1/2" high Low Consumption Two Piece Tank Toilet #2002.014	Seat: American Standard #5905.110 Supply: McGuire #H172BV Flange 1/4 turn angle valve	4"	2"	1/2"	---	2
L-1	WALL MOUNTED LAVATORY		American Standard #0355.012 'LUCERNE' Basin	Faucet: American Standard #7385.004VA.002 Aerator: American Standard #V05 Drain: McGuire #155A Supply: McGuire #H170BV-LR 1/4 turn p-Trap: McGuire #6872C-1TT 1-1/2" Chrome Plated Brass Carrier: Jay R. Smith #0700-Z	1-1/2"	1-1/2"	1/2"	1/2"	1
MX-1	THERMOSTATIC MIXING VALVE		WATTS LFUSG-B-M2	ASSE 1070 Thermostatic Mixing Valve	---	---	1/2"	1/2"	

APPROVED PLUMBING FIXTURE MANUFACTURERS: AMERICAN STANDARD, MANSFIELD, CRANE, TOTO, ELKAY, KOHLER, ZURN, FIAT, FLORESTONE, MUSTEE.
APPROVED PLUMBING HARDWARE MANUFACTURERS: AMERICAN STANDARD, DELTA, KOHLER, CHICAGO, SLOAN, ZURN, TOTO.
(FIXTURES TO BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF "THE BARRIER FREE DESIGN REQUIREMENTS OF THE MICHIGAN CONSTRUCTION CODE".)

NOTES:
1. PROVIDE PLASTIC TYPE PIPE COVERS EQUAL TO TRUEBRO "LAV GUARD" ON ALL ACCESSIBLE LAVATORIES AND SINKS.
2. ALL TANK TYPE WATER CLOSETS SHALL BE ORDERED WITH HANDLES ON THE OPEN SIDE (ADJACENT TO THE LAVATORY) PER CODE.

ELECTRIC WATER COOLER SCHEDULE										
MARK	MANUFACTURER	MODEL NUMBER	FINISH	TYPE	ADA	CAPACITY G.P.H.	ELECTRICAL			NOTES:
							WATTS	F.L.A.	VOLT / PHASE	
EWC-1	ELKAY	EZS8	STAINLESS	WALL MOUNT	ADULT & CHILD	8	370	4.0	120 / 1	1, 2

(APPROVED EQUAL: SUNROC, HALSEY-TAYLOR, ACORN AQUA)

NOTES:
1. PROVIDE OPTIONAL STAINLESS STEEL CABINET
2. NO LEAD DESIGN

ELECTRIC DOMESTIC WATER HEATER SCHEDULE										
MARK	MANUFACTURER	MODEL NUMBER	LOCATION	CAPACITIES			ELECTRICAL DATA		NOTES	
				RECOVERY GPH	STORAGE GALLONS	TEMP. RISE DEG. F	KW INPUT	VOLT/PHASE		
EWH-1	LOCHINVAR	JRC006DS	ABOVE CEILING	6.8	6	100	1.65	120/1	1, 2, 3	

(APPROVED EQUAL: A.O. SMITH, BRADFORD WHITE)

NOTES:
1. TEMPERATURE AND PRESSURE RELIEF VALVE
2. MAGNESIUM TANK SAVER ANODE ROD
3. U.L. LISTED

FLOOR DRAIN SCHEDULE									
MARK	MANUFACTURER	MODEL NUMBER	LOCATION	BODY MATERIAL	GRATE		STRAINER	PIPE SIZE (IN.)	NOTES:
					TYPE	FINISH			
FD-1	J.R. SMITH	2005	SEE PLAN	DUCCO CAST IRON	6" DIA.	NICKEL BRONZE	NONE	3"	2

(APPROVED EQUAL: JOSAM, ZURN, SIOUX CHIEF, MIFAB)

NOTES:
1. MOUNTED 1" A.F.F.
2. PROVIDE "SURESEAL" IN LINE TRAP SEAL.

LOUVER SCHEDULE													
MARK	MANUFACTURER	MODEL NUMBER	AIRFLOW	SIZE (W x H x D)	FREE AREA (FT2)	AIRFLOW (CFM)	DESIGN AIR VELOCITY	COLOR	INSULATED	DRAINABLE	MATERIAL	BIRD SCREEN	NOTES
LV-1	RUSKIN	ELF6375DX	INTAKE	36"x36"x6"	4.8	3,200	667 FPS	SELECTED BY ARCHITECT	NO	YES	ALUMINUM	YES	1
LV-2	RUSKIN	ELF6375DX	INTAKE	36"x36"x6"	4.8	3,200	667 FPS	SELECTED BY ARCHITECT	NO	YES	ALUMINUM	YES	1
LV-3	RUSKIN	ELF6375DX	INTAKE	36"x36"x6"	4.8	2,400	500 FPS	SELECTED BY ARCHITECT	NO	YES	ALUMINUM	YES	1
LV-4	RUSKIN	ELF6375DX	EXHAUST	42"x24"x6"	3.43	3,200	933 FPS	SELECTED BY ARCHITECT	NO	YES	ALUMINUM	YES	1
LV-5	RUSKIN	ELF6375DX	EXHAUST	36"x36"x6"	3.43	3,200	933 FPS	SELECTED BY ARCHITECT	NO	YES	ALUMINUM	YES	1
LV-6	RUSKIN	ELF6375DX	EXHAUST	36"x36"x6"	4.8	2,400	700 FPS	SELECTED BY ARCHITECT	NO	YES	ALUMINUM	YES	1
LV-7	RUSKIN	ELF375DX	EXHAUST	12"x12"x4"	0.26	384	385 FPS	SELECTED BY ARCHITECT	NO	YES	ALUMINUM	YES	1

(APPROVED EQUAL: GREENHECK, AMERICAN WARMING & VENTILATING)

NOTES:
1. COORDINATE FINAL LOUVER MOUNTING FRAME TYPE AND LOCATION WITH ARCHITECTURAL TRADES.

EXHAUST FAN SCHEDULE											
MARK	MANUFACTURER	MODEL NUMBER	AREA SERVED	LOCATION	AIRFLOW (CFM)	EXTERNAL S.P.	FAN (RPM)	FAN (BHP)	FAN (HP)	ELECTRICAL	NOTES
EF-1	GREENHECK	SE1-18-424-VG	PARTS STORAGE	SEAWALL	3,200	0.35	1,606	0.5	3/4	115/1/60	1,2,3,5,6
EF-2	GREENHECK	SE1-18-424-VG	PARTS STORAGE	SEAWALL	3,200	0.35	1,606	0.5	3/4	115/1/60	1,2,3,5,6
EF-3	GREENHECK	SE1-18-424-VG	SECURED PARTS STORAGE	SEAWALL	2,400	0.25	1,272	0.25	3/4	115/1/60	1,2,3,5,6
EF-4	GREENHECK			CEILING	75	0.25				115/1/60	1,3,4,5

(APPROVED EQUAL: ACME, COOK, PENN VENTILATOR)

NOTES:
1. FAN SHALL HAVE AMCA SEAL & BE U.L.-705 LISTED.
2. FAN SHALL HAVE GALVANIZED BIRD SCREEN.
3. SAFETY DISCONNECT SWITCH (BY ELECTRICAL).
4. PROVIDE DUCT MOUNTED GRAVITY BACKDRAFT DAMPER.
5. PROVIDE HIGH EFFICIENCY BRUSHLESS (EC) MOTOR WITH MOUNTED POTENTIOMETER DIAL.
6. PROVIDE SHORT WALL HOUSING AND GRAVITY BACKDRAFT DAMPER.

INFRARED TUBE HEATER SCHEDULE										
MARK	MANUFACTURER	MODEL NUMBER	LOCATION	TYPE	UNIT LENGTH	MOUNTING HEIGHT	GAS DATA			NOTES:
							TYPE	MBH (HIGH FIRE)	MBH (LOW FIRE)	
IRH-1	RE-VERBA-RAY	HL-3-50-100	SEE PLANS	VENTED	50'-7"	18'-0"	NATURAL	100	65	1, 2, 3, 4, 5
IRH-2	RE-VERBA-RAY	HL-3-50-100	SEE PLANS	VENTED	50'-8"	18'-0"	NATURAL	100	65	1, 2, 3, 4, 5
IRH-3	RE-VERBA-RAY	HL-3-50-100	SEE PLANS	VENTED	50'-9"	18'-0"	NATURAL	100	65	1, 2, 3, 4, 5
IRH-4	RE-VERBA-RAY	HL-3-50-100	SEE PLANS	VENTED	50'-10"	18'-0"	NATURAL	100	65	1, 2, 3, 4, 5
IRH-5	RE-VERBA-RAY	HL-3-30-100	SEE PLANS	VENTED	31'-3"	18'-0"	NATURAL	100	65	1, 2, 3, 4, 5

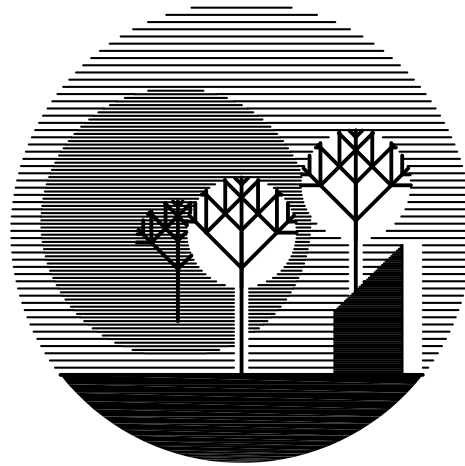
(APPROVED EQUAL: ROBERTS GORDON, SOLARONICS, SPACERAY)

NOTES:
1. DIRECT SPARK IGNITION
2. 24V HEATING THERMOSTAT
3. WEATHERPROOF ROOF EXHAUST CAP
4. A.G.A. CERTIFIED
5. 12 GA. HEAT EXCHANGER TUBE

ELECTRIC HEATER SCHEDULE										
MARK	MANUFACTURER	MODEL NUMBER	AREA SERVED	°F AIR RISE	KW OUTPUT	HEAT OUTPUT (BTUH)	VOLTAGE	PHASE	AMPS	NOTES
EH-1	MARKEL	3422	SEE PLANS	27	2.0	6,826	208	1	9.6	1, 2, 3

(APPROVED EQUAL: INDEECO, BRASCH, Q MARK)

NOTES:
1. BUILT-IN THERMOSTAT.
2. FACTORY MOUNTED DISCONNECT SWITCH.
3. U.L. LISTED



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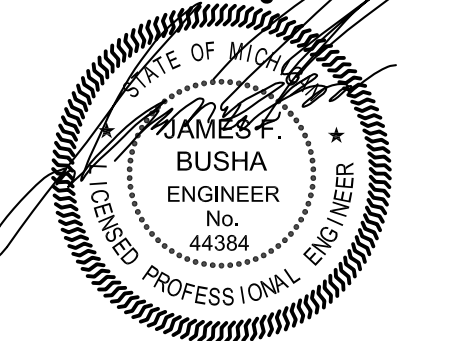
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MECHANICAL & PLUMBING SCHEDULES

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PLUMBING SPECIFICATIONS:

PLUMBING GENERAL REQUIREMENTS:

- PROVIDE MATERIALS AND EQUIPMENT AND EXECUTE THE WORK, INCLUDING ALL TESTING AND INSPECTIONS, IN COMPLIANCE WITH THE APPLICABLE PROVISIONS OF FEDERAL, STATE AND LOCAL GOVERNMENT LAWS, ORDINANCES, REFERENCED CODES AND STANDARDS CURRENT AS OF THE ISSUE DATE OF THESE DRAWINGS. ALL MORE STRINGENT REQUIREMENTS OF THE CONTRACT DOCUMENTS SHALL MODIFY, SUPPLEMENT AND SUPERSEDE APPLICABLE PORTIONS OF GOVERNING LAWS, ORDINANCES, CODES AND STANDARDS.
- CONTRACTOR SHALL PRESENT CERTIFICATE TO THE OWNER THAT ALL APPLICABLE BUILDING PERMITS HAVE BEEN SECURED PRIOR TO STARTING ANY WORK, AND PROVIDE THE OWNER WITH ALL REQUIRED CERTIFICATES OF FINAL APPROVAL FROM THE GOVERNING JURISDICTIONS AT COMPLETION OF THE WORK. PROVIDE ALL SHOP DRAWINGS AS REQUIRED IN FOLLOWING SECTIONS.
- COORDINATE EXACT LOCATION OF CONSTRUCTION TO PRECLUDE ANY INTERFERENCES BETWEEN WIRING, LIGHTING FIXTURES, DUCTWORK, BUILDING EQUIPMENT AND OTHER CONSTRUCTION.
- PROVIDE LABOR, INCLUDING FIELD ERECTION AND SUPERVISION, MATERIALS, EQUIPMENT AND ANCILLARIES, AND COORDINATE, PROCURE, FABRICATE, DELIVER, ERECT OR INSTALL, INTERFACE WITH EXISTING WORK, START, DEBUG AND TEST ALL SYSTEMS AS NECESSARY TO PROVIDE THE OWNER WITH A COMPLETE, OPERATING FACILITY IN CONFORMANCE WITH THE CONSTRUCTION BID DOCUMENTS.
- ALL CUTTING AND PATCHING THAT MAY BE NECESSARY FOR THE INSTALLATION OF THE PLUMBING CONTRACTOR'S WORK SHALL BE PERFORMED AND REPAIRED BY THE TRADE WHOM NORMALLY PERFORMS THAT WORK AND PAID FOR BY THE MECHANICAL CONTRACTOR. NO CUTTING / ALTERATION OF THE BUILDING STRUCTURAL SYSTEM SHALL BE PERFORMED WITHOUT THE WRITTEN CONSENT OF THE LANDLORD AFTER ARCHITECT HAS APPROVED AND SIGNED OFF.
- THE DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL LOCATIONS AND ARRANGEMENTS OF ALL THE EQUIPMENT AND PLUMBING. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS BUILDING CONSTRUCTION AND ALL OTHER WORK WILL PERMIT. DO NOT SCALE DRAWINGS FOR EXACT MEASUREMENTS.

GENERAL NOTES: PLUMBING

- ALL PLUMBING SHALL BE CONCEALED UNLESS OTHERWISE NOTED. EXPOSING OF ANY PLUMBING MUST HAVE APPROVAL OF THE ARCHITECT.
- THE PLUMBING SYSTEMS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL STATE AND LOCAL PLUMBING CODES. THE PLUMBING CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY FOR ALL FEES, AND ARRANGE FOR ALL INSPECTIONS FOR HIS WORK. AT THE COMPLETION OF THE PROJECT, THE PLUMBING CONTRACTOR SHALL FURNISH THE OWNER WITH CERTIFICATES OF FINAL INSPECTIONS AND APPROVALS.
- PLUMBING SHALL BE AS FOLLOWS:
 - A. SANITARY AND VENT PIPING:
 - ALL 1-1/2" AND LARGER WASTE AND VENT PIPING ABOVE GROUND SHALL BE STANDARD WEIGHT CAST IRON SOIL PIPE WITH NO-HUB FITTINGS AND HEAVY DUTY BANDS.
 - ALL WASTE PIPING BELOW GRADE SHALL BE SERVICE WEIGHT CAST IRON SOIL PIPE WITH COMPRESSION TYPE FITTINGS, OR SCHEDULE 40 PVC WHERE LOCAL CODE PERMITS.
 - B. DOMESTIC WATER PIPING:
 - ALL ABOVE GROUND DOMESTIC WATER PIPING SHALL BE TYPE "L" HARD DRAWN COPPER TUBING WITH WROUGHT COPPER OR CAST RED BRONZE FITTINGS OR CROSS LINKED POLYETHYLENE PIPING (PEX). ALL SOLDERED FITTINGS SHALL BE MADE WITH SIL-FOS SOLDER OR AN APPROVED NON-TOXIC SOLDER. MECHANICAL TYPE FITTINGS EQUAL TO "PROPRESS SYSTEMS" ARE APPROVED IN LIEU OF SOLDERED FITTINGS.
 - ALL UNDERGROUND PIPING SHALL BE TYPE "K" COPPER OR PEX. PIPE FITTINGS ARE NOT ALLOWED BELOW FLOOR SLAB.
 - C. VALVES:
 - BALL VALVES SHALL BE TWO PIECE FULL PORT BRONZE BALL VALVES WITH STAINLESS STEEL TRIM, TFE SEATS WITH 316 STAINLESS STEEL BALL AND STEM. THREADED BODY PACK NUT DESIGN WITH ADJUSTABLE STEM PACKING WITH THREADED OR SOLDERED ENDS, RATED FOR 150 PSIG SWP AND 600 PSIG CWP.
 - CHECK VALVES SHALL BE SWING CHECK WITH BRONZE DISC, CLASS 150, ASTM B62. Y-PATTERN DESIGN WITH THREADED OR SOLDERED ENDS, RATED FOR 300 PSIG CWP.
 - D. PIPING INSULATION:
 - DOMESTIC HOT & COLD WATER RETURN PIPING SHALL BE INSULATED WITH MINIMUM 1" THICK FIBERGLASS INSULATION, WITH A FIRE RETARDANT JACKET, HAVING AN AVERAGE R VALUE OF 3.45. COLD WATER PIPING INSULATION SHALL BE PROVIDED WITH A VAPOR BARRIER. PROVIDE PREFORMED SECTIONS WITH PVC COVERS AT ALL FITTINGS.
 - PIPE INSULATION SHALL HAVE A FLAME SPREAD AND SMOKE DENSITY RATING NOT EXCEEDING 25/50, AS TESTED PER ASTM STANDARD E-84.
 - DOMESTIC HOT WATER PEX PIPING MUST BE INSULATED.
- PIPING SHALL BE SUPPORTED FROM HANGERS OR TRAYS AT AN ADEQUATE DISTANCE WITH SUPPORTING HANGER RODS FASTENED TO THE BUILDING FRAMING. HANGERS FASTENED DIRECTLY TO THE ROOF DECK ARE NOT ALLOWED.
- ISOLATE PIPING AND EQUIPMENT FROM THE BUILDING STRUCTURE WITH INSULATING HANGERS AND FITTINGS AS REQUIRED TO PREVENT GALVANIC CORROSION OF THE BUILDING PIPING SYSTEMS.
- DOMESTIC WATER HEATERS SHALL BE EQUIPPED WITH A.S.M.E. RATED TEMPERATURE AND PRESSURE RELIEF VALVES PIPED TO FLOOR, ROUTE DRAIN LINE TO NEAREST FLOOR DRAIN.
- ALL SERVICES SHALL BE PROPERLY SLEEVED WHEN ROUTED THROUGH FLOORS AND WALLS. CONTRACTOR TO PROVIDE FIRE RESISTANT ROPE PACKING FOR ALL PIPES PENETRATING FIRE RATED WALLS. CONTRACTOR SHALL OBTAIN A COPY OF THE ARCHITECTURAL DRAWINGS TO IDENTIFY FIRE RATED WALLS. CONTRACTOR SHALL PROVIDE A WEATHERPROOF SEAL FOR PIPING PENETRATING EXTERIOR WALLS.
- FURNISH AND INSTALL ISOLATION VALVES AT ALL SERVICE POINTS OR EQUIPMENT CONNECTIONS. PROVIDE VACUUM BREAKERS AND ANTI-SIPHON FITTINGS ON WATER PIPING SYSTEMS BEFORE EQUIPMENT CONNECTIONS, AND AT ALL HOSE END SPIGOTS AND HOSE CONNECTIONS, ETC. INSTALL REDUCED PRESSURE BACKFLOW PREVENTERS ON ALL MAKE-UP WATER LINES TO FOOD SERVICE EQUIPMENT AND ON BUILDING DOMESTIC WATER SERVICE WHERE LOCAL CODE REQUIRES. THE INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH LOCAL CODES AND/OR AUTHORITIES FOR THE PROTECTION OF THE WATER SUPPLY SYSTEM. INSTALL STRAINER UP STREAM OF REDUCED PRESSURE BACKFLOW PREVENTER.
- IDENTIFICATION:
 - A. LABEL ALL PIPING SYSTEMS WITH MANUFACTURED SELF ADHESIVE OR PRE-TENSIONED PIPE MARKERS, MARKERS SHALL INDICATE SERVICE AND DIRECTION OF FLOW. MARK PIPE NEAR VALVES, BRANCH CONNECTIONS, PENETRATIONS, ACCESS DOORS AND NEAR MAJOR PIECES OF EQUIPMENT. MARKER SPACING SHALL NOT EXCEED 50'.
- THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER PITCH OF PIPE FOR DRAINAGE AND AIR VENTING OF PIPING SYSTEMS AND SHALL PROVIDE DRAINS TO RECEIVE THE PIPING SYSTEMS CONTENTS OF INDIRECT WASTE AND CONDENSATE DRAINAGE FROM ALL MECHANICAL DRAINS.
- THE PLUMBING CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND PROVIDE ROUGH-INS FOR ALL EQUIPMENT FURNISHED BY OTHER CONTRACTORS. AFTER ALL EQUIPMENT HAS BEEN INSTALLED BY OTHER CONTRACTORS, THE PLUMBING CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS AND SHALL INCLUDE IN HIS BASE BID ALL VALVES, UNIONS, COUPLINGS, VACUUM BREAKERS, ETC., THAT ARE REQUIRED TO MAKE FINAL CONNECTIONS.
- FURNISH AND INSTALL AN INDIVIDUAL COMBINATION PRESSURE BALANCING AND THERMOSTATIC CONTROL VALVE THAT CONFORMS TO A.S.S.E. # 1070 WITH TEMPERED WATER PIPING CONNECTIONS FOR ALL ACCESSIBLE PLUMBING FIXTURES. SET VALVE FOR A MAXIMUM OF 110°F.
- THE CONTRACTOR SHALL SUBMIT EQUIPMENT SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION OF ANY OF THE FOLLOWING EQUIPMENT:
 - A. PLUMBING FIXTURES
 - B. PLUMBING PIPE, FITTINGS AND HANGERS
 - C. DOMESTIC WATER HEATER
 - D. FLOOR DRAINS, CLEANOUTS, ETC.
- THE CONTRACTOR SHALL GUARANTEE ALL WORK INSTALLED UNDER THIS CONTRACT TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER THE ACCEPTANCE OF THE BUILDING BY THE OWNER, AND SHOULD DEFECTS OCCUR WITHIN THIS PERIOD, REPAIR AND/OR REPLACE DEFECTIVE ITEMS AND ANY DAMAGE RESULTING FROM FAILURE OF THESE ITEMS, AT NO EXPENSE TO THE OWNER.
- THE CONTRACTOR SHALL COORDINATE LOCATIONS OF HIS EQUIPMENT AND WORK WITH OTHER BUILDING TRADES TO AVOID ANY INTERFERENCES BETWEEN HIS WORK AND THE WORK OF OTHER TRADES.
- ANY CUTTING AND/OR PATCHING, THAT MAY BE REQUIRED FOR THE INSTALLATION OF THE PLUMBING AND PIPING SYSTEMS, SHALL BE PERFORMED BY THE ARCHITECTURAL TRADES AND PAID FOR BY THIS CONTRACTOR. NO CUTTING OF THE BUILDING STRUCTURAL SYSTEM SHALL BE PERFORMED WITHOUT WRITTEN APPROVAL OF THE ARCHITECT BEING OBTAINED.
- WATER HAMMER ARRESTORS SHALL BE INSTALLED ON BOTH COLD AND HOT WATER LINES. INSTALL IN AN UPRIGHT POSITION AT ALL QUICK CLOSING VALVES, SOLENOIDS, AND PLUMBING FIXTURES. MANUFACTURED WATER HAMMER ARRESTORS SHALL BE SMITH NO. 3000 SERIES "HYDROTROLS", JOSAM, ZURN, OR AS APPROVED BY THE ARCHITECT, LOCATED, SIZED, AND INSTALLED IN ACCORDANCE WITH PLUMBING AND DRAINAGE INSTITUTE STANDARD NO.WH201.

MECHANICAL SPECIFICATIONS:

HVAC GENERAL REQUIREMENTS:

- PROVIDE MATERIALS AND EQUIPMENT AND EXECUTE THE WORK, INCLUDING ALL TESTING AND INSPECTIONS, IN COMPLIANCE WITH THE APPLICABLE PROVISIONS OF FEDERAL, STATE AND LOCAL GOVERNMENT LAWS, ORDINANCES, REFERENCED CODES AND STANDARDS CURRENT AS OF THE ISSUE DATE OF THESE DRAWINGS. ALL MORE STRINGENT REQUIREMENTS OF THE CONTRACT DOCUMENTS SHALL MODIFY, SUPPLEMENT AND SUPERSEDE APPLICABLE PORTIONS OF GOVERNING LAWS, ORDINANCES, CODES AND STANDARDS.
- CONTRACTOR SHALL PRESENT CERTIFICATE TO THE OWNER THAT ALL APPLICABLE BUILDING PERMITS HAVE BEEN SECURED PRIOR TO STARTING ANY WORK, AND PROVIDE THE OWNER WITH ALL REQUIRED CERTIFICATES OF FINAL APPROVAL FROM THE GOVERNING JURISDICTIONS AT COMPLETION OF THE WORK. PROVIDE ALL SHOP DRAWINGS AS REQUIRED IN FOLLOWING SECTIONS.
- COORDINATE EXACT LOCATION OF CONSTRUCTION TO PRECLUDE ANY INTERFERENCES BETWEEN PIPING, WIRING, LIGHTING FIXTURES, BUILDING EQUIPMENT AND ANY OTHER CONSTRUCTION.
- PROVIDE LABOR, INCLUDING FIELD ERECTION AND SUPERVISION, MATERIALS, EQUIPMENT AND ANCILLARIES.
- ALL CUTTING AND PATCHING THAT MAY BE NECESSARY FOR THE INSTALLATION OF THE MECHANICAL CONTRACTOR'S WORK SHALL BE PERFORMED AND REPAIRED BY THE TRADE WHOM NORMALLY PERFORMS THAT WORK AND PAID FOR BY THE MECHANICAL CONTRACTOR. NO CUTTING / ALTERATION OF THE BUILDING STRUCTURAL SYSTEM SHALL BE PERFORMED WITHOUT THE WRITTEN CONSENT OF THE OWNER AFTER ARCHITECT HAS APPROVED AND SIGNED OFF.
- THE MECHANICAL CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING HIS BID TO FAMILIARIZE HIMSELF WITH THE ACTUAL PROJECT CONDITIONS AND TO CHECK FOR ANY INTERFERENCES BETWEEN HIS WORK AND THAT OF THE OTHER TRADES, AND/OR ANY APPARENT VIOLATIONS OF LOCAL OR STATE CODES, LAWS, ORDINANCES AND REGULATIONS. SHOULD ANY VIOLATIONS OR INTERFERENCES APPEAR AND DEPARTURE FROM THE DESIGN INTENT OF THE CONTRACT DOCUMENTS IS REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO ENTERING INTO A CONTRACT WITH THE OWNER. FAILURE TO PROVIDE THE ARCHITECT WITH THE AFOREMENTIONED NOTIFICATION SHALL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE INTENT OF THE CONTRACT DOCUMENTS WITH NO ADDITIONAL EXPENSES BEING INCURRED BY THE OWNER.
- THE DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL LOCATIONS AND ARRANGEMENTS OF ALL THE EQUIPMENT AND PIPING. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS BUILDING CONSTRUCTION AND ALL OTHER WORK WILL PERMIT. DO NOT SCALE DRAWINGS FOR EXACT MEASUREMENTS.
- SHOULD THE CONTRACTOR SUBMIT ANY SHOP DRAWINGS FOR REVIEW THAT VARY FROM WHAT THE CONSTRUCTION BID DOCUMENTS INDICATE, THE CONTRACTOR SHALL PAY THE ENGINEER FOR REVIEWING HIS SUBMISSION.

GENERAL NOTES: PIPING

- THE PIPING SYSTEMS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL STATE AND LOCAL CODES. THE PIPING CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY FOR ALL FEES, AND ARRANGE FOR ALL INSPECTIONS FOR HIS WORK. AT THE COMPLETION OF THE PROJECT, THE PLUMBING CONTRACTOR SHALL FURNISH THE OWNER WITH CERTIFICATES OF FINAL INSPECTIONS AND APPROVALS.
- PIPING SHALL BE AS FOLLOWS:
 - A. GAS PIPING:
 - GAS PIPING SHALL BE SCHEDULE 40, BLACK STEEL WITH THREADED OR WELDED FITTINGS AS REQUIRED. PROVIDE SHUT-OFF COCKS ON ALL OUTLETS WHERE SHOWN.
 - PAINT ALL NATURAL GAS PIPING ON ROOF YELLOW. PAINT ALL VERTICAL PIPING ON EXTERIOR WALL TO MATCH BUILDING COLOR.
 - B. VALVES:
 - GAS VALVE SHALL BE LUBRICATED TYPE CAST IRON OR U.L. LISTED TWO PIECE BRONZE BALL VALVE WITH RPTFE SEALS AND SEAT.
- PIPING SHALL BE SUPPORTED FROM HANGERS AT AN ADEQUATE DISTANCE WITH SUPPORTING HANGER RODS FASTENED TO THE BUILDING FRAMING WHENEVER POSSIBLE.
- ISOLATE PIPING AND EQUIPMENT FROM THE BUILDING STRUCTURE WITH INSULATING HANGERS AND FITTINGS AS REQUIRED TO PREVENT GALVANIC CORROSION OF THE BUILDING PIPING SYSTEMS.
- ALL SERVICES SHALL BE PROPERLY SLEEVED WHEN ROUTED THROUGH WALLS. CONTRACTOR TO PROVIDE FIRE RESISTANT ROPE PACKING FOR ALL PIPES PENETRATING FIRE RATED WALLS.
- THE PIPING CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND PROVIDE ROUGH-INS FOR ALL EQUIPMENT FURNISHED BY OTHER CONTRACTORS. AFTER ALL EQUIPMENT HAS BEEN INSTALLED BY OTHER CONTRACTORS, THE PIPING CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS AND SHALL INCLUDE IN HIS BASE BID ALL VALVES, UNIONS, COUPLINGS, ETC., THAT ARE REQUIRED TO MAKE FINAL CONNECTIONS.
- THE CONTRACTOR SHALL SUBMIT EQUIPMENT SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION OF ANY OF THE FOLLOWING EQUIPMENT:
 - A. GAS PIPING AND FITTINGS
- THE CONTRACTOR SHALL GUARANTEE ALL WORK INSTALLED UNDER THIS CONTRACT TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER THE ACCEPTANCE OF THE BUILDING BY THE OWNER, AND SHOULD DEFECTS OCCUR WITHIN THIS PERIOD, REPAIR AND/OR REPLACE DEFECTIVE ITEMS AND ANY DAMAGE RESULTING FROM FAILURE OF THESE ITEMS, AT NO EXPENSE TO THE OWNER.
- THE CONTRACTOR SHALL COORDINATE LOCATIONS OF HIS EQUIPMENT AND WORK WITH OTHER BUILDING TRADES TO AVOID ANY INTERFERENCES BETWEEN HIS WORK AND THE WORK OF OTHER TRADES.

HVAC SYSTEM SPECIFICATIONS:

- VIBRATION ABSORBING SUPPORTS SHALL BE INSTALLED ON ALL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION AND NOISE TO THE STRUCTURE. PROVIDE VIBRATION ISOLATION PER ASHRAE STANDARDS.
- HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS ARE DESIGNED ON THE FOLLOWING CONDITIONS:
 - WINTER: INSIDE TEMP: 50.0°F
OUTSIDE TEMP: - 1.4°F
 - SUMMER: INSIDE TEMP: VENTILATED ONLY,
OUTSIDE TEMP: 90.3°F D.B. & 73.8°F W.B.
- THE CONTRACTOR SHALL SUBMIT EQUIPMENT SHOP DRAWINGS TO THE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION OF ANY OF THE FOLLOWING:
 - A. EXHAUST FANS
 - B. INTAKE AIR LOUVERS
 - C. RADIANT HEATERS

APPROVAL OF SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY TO CONFORM TO THE DESIGN INTENT OF THE BID DOCUMENTS.

APPROVAL OF SHOP DRAWINGS IS INTENDED TO BE FOR GENERAL CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS ONLY. ANY EQUIPMENT THAT IS INSTALLED THAT WILL INVOLVE THE WORK OF OTHER TRADES SHALL BE COORDINATED WITH THOSE TRADES. REFER TO OTHER TRADE'S BID DOCUMENTS.

- THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONTROL AND INTERLOCK WIRING UNLESS OTHERWISE NOTED ON THE DRAWINGS. MECHANICAL CONTRACTOR SHALL PAY AND COORDINATE WITH THE ELECTRICAL CONTRACTOR ALL HIGH VOLTAGE WIRING THAT IS REQUIRED FOR INTERLOCKING OF CONTROLS.
- CONTRACTOR SHALL PROVIDE BUILDING OWNER WITH OPERATING AND MAINTENANCE MANUALS FOR ALL H.V.A.C. EQUIPMENT UPON COMPLETION OF PROJECT.
- MECHANICAL CONTRACTOR SHALL TEST ALL CONTROL ELEMENTS, VERIFY CALIBRATION OF ALL CONTROL DEVICES AND MAKE ADJUSTMENTS AS REQUIRED AT COMPLETION OF PROJECT.


PLUMBING GENERAL NOTES:

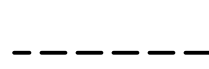
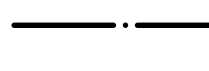
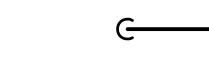
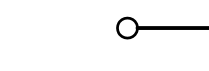
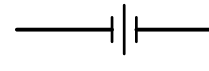
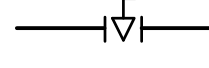
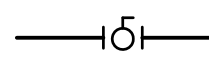
- SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF ALL NEW PLUMBING FIXTURES.
- ALL PLUMBING RELATED CORING THROUGH FLOORS SHALL BE BY PLUMBING CONTRACTOR.
- COORDINATE ALL NEW LOCATIONS, SIZES AND ELEVATIONS OF SLEEVES THROUGH WALLS, SLABS AND FOUNDATIONS WITH STRUCTURAL DRAWINGS AND EXISTING FIELD CONDITIONS.
- ALL DOMESTIC WATER PIPING SHALL BE INSULATED AND LABELED IN ACCORDANCE WITH THE SPECIFICATION REQUIREMENTS.
- ALL PIPING SHALL BE CONCEALED IN WALLS, CEILING SPACES OR ARCHITECTURAL SOFFITS.
- SEAL ALL PENETRATIONS THROUGH WALLS AND FLOORS AIR AND WATERTIGHT. COORDINATE LOCATIONS AND ELEVATIONS OF ALL NEW UNDERGROUND UTILITIES WITH CIVIL SITE PLANS PRIOR TO START OF CONSTRUCTION.
- FAUCETS AND PLUMBING FIXTURES SHALL BE OF WATER CONSERVATION TYPE AND COMPLY WITH THE STATE ENERGY STANDARDS.
- RUN ALL UNDERGROUND SANITARY AND STORM PIPING LARGER THAN 2" AT 1/8" PER FOOT MINIMUM PITCH UNLESS NOTED OTHERWISE. SANITARY PIPING LESS THAN 2" SHALL BE PITCHED AT 1/4" PER FOOT MINIMUM, UNLESS NOTED OTHERWISE.

MECHANICAL GENERAL NOTES:

- COORDINATE NEW MECHANICAL EQUIPMENT WITH BUILDING STRUCTURAL CONDITIONS, EQUIPMENT MANUFACTURER RECOMMENDATIONS AND ALL OTHER TRADES TO AVOID INTERFERENCES.
- PROVIDE ACCESS AROUND ALL NEW EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.
- COORDINATE ALL T-STAT AND REMOTE SENSOR HEIGHTS ABOVE FINISHED FLOOR WITH ARCHITECTURAL TRADES.

PLUMBING SYMBOLS

SYMBOL	DESCRIPTION
	BALL VALVE
	PLUG VALVE
	UNION
	PIPE TURNED UP
	PIPE TURNED DOWN
	DOMESTIC COLD WATER PIPING
	DOMESTIC HOT WATER PIPING
	VENT PIPING
	NATURAL GAS PIPING
	SANITARY PIPING



ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AFF	ABOVE FINISHED FLOOR
C.O. CW	CLEAN OUT COLD WATER
DIAMØ	DIAMETER
EW-1	ELECTRIC WATER COOLER
EW-1	ELECTRIC WATER HEATER
FD-#	FLOOR DRAIN
HW	HOT WATER
I.E.	INVERT ELEVATION
L#	LAVATORY
PVC	POLYVINYL CHLORIDE
(TYP)	TYPICAL
V	VENT
V.T.R.	VENT THROUGH ROOF
WC-#	WATER CLOSET



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PARTS

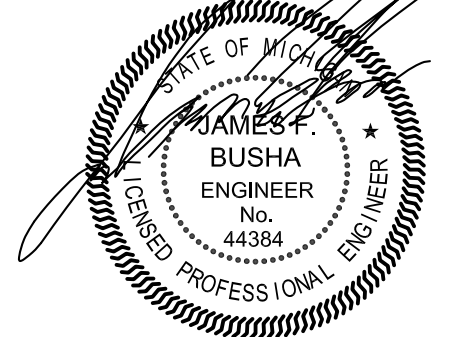
37458
MICHIGAN AVE.
WAYNE, MI

sheet title

MECHANICAL &
PLUMBING NOTES &
SPECIFICATIONS

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project number

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drawn WEV

approved JFB

issued date

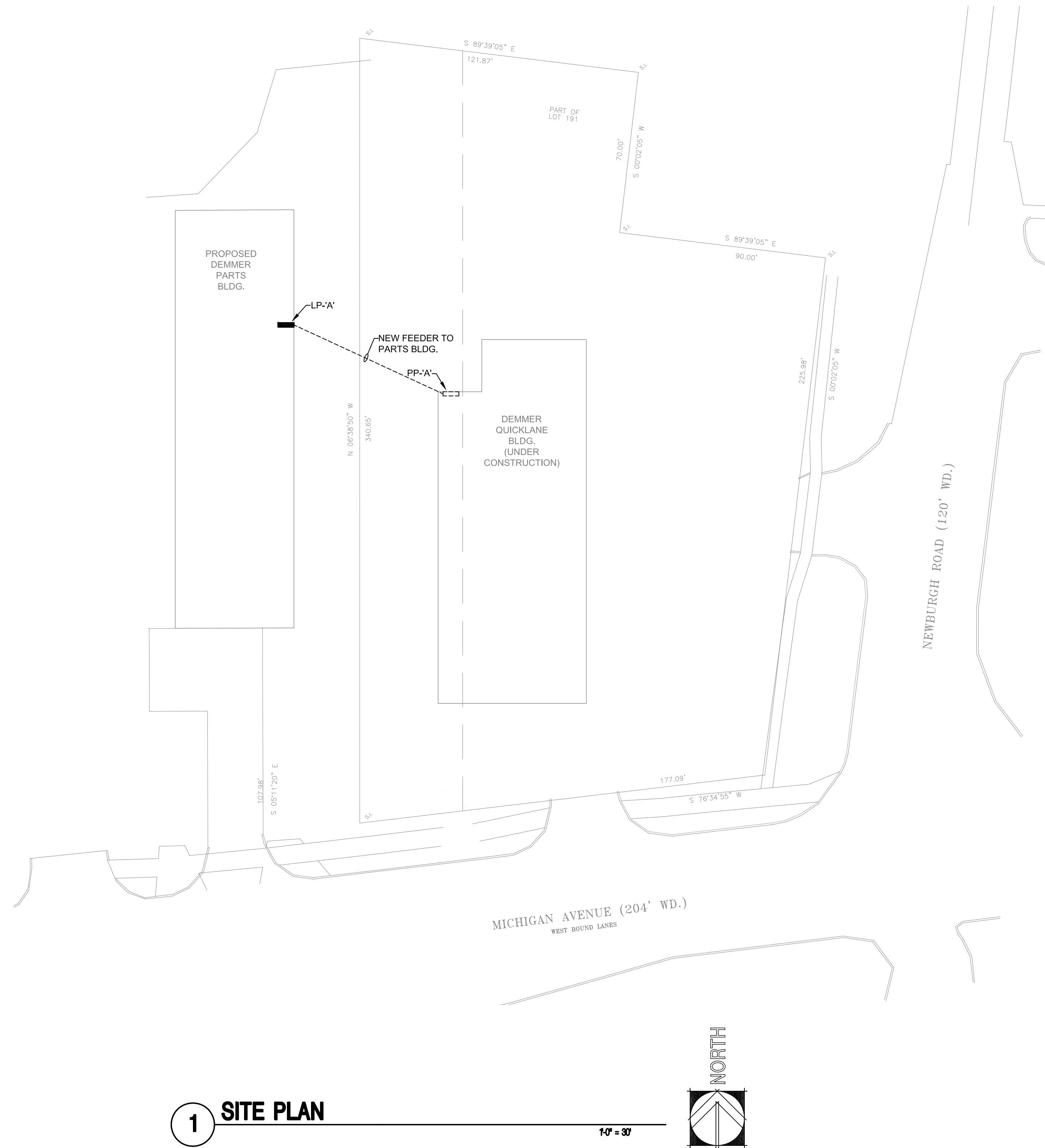
Bids/Permits 1-14-15

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MEEC JOB # 20413-230

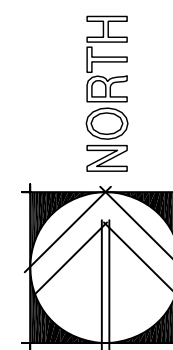
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1 SITE PLAN

1" = 30'



GENERAL NOTES

1. THE CONTRACTOR SHALL ABIDE BY ALL FEDERAL, STATE, AND/OR LOCAL CODES. IF A DISCREPANCY BETWEEN CODES OCCURS, THE MOST STRINGENT SHALL PREVAIL.
2. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO THE COMMENCEMENT OF ANY WORK. SHOULD DISCREPANCIES BE DISCOVERED, THE CONTRACTOR SHALL VERIFY INTENT WITH THE ENGINEER/OWNER BEFORE PROCEEDING.
3. COORDINATE LOCATIONS OF ALL CEILING MOUNTED DEVICES WITH OTHER TRADES PRIOR TO INSTALLATION.
4. COORDINATE ALL ROUGH-IN REQUIREMENTS FOR OWNER FURNISHED EQUIPMENT WITH THE OWNER PRIOR TO BEGINNING WORK. THESE DRAWINGS ARE BASED ON THE BEST INFORMATION AVAILABLE DURING THE DESIGN PHASE OF THE PROJECT.
5. COORDINATE WITH MILLWORK CONTRACTOR TO DETERMINE THE EXACT LOCATION OF OUTLETS BEING PLACED IN MILLWORK.
6. ALL DEVICES ARE TO BE FLUSH MOUNTED UNLESS NOTED OTHERWISE.
7. DEVICES NOTED "GF" SHALL INCLUDE GROUND FAULT INTERRUPTING DEVICES.
8. DEVICES NOTED "WP" SHALL BE WEATHERPROOF, "WHILE-IN-USE" TYPE WHERE APPLICABLE.
9. DEVICES NOTED "NL" SHALL BE NIGHT LIGHTS. PROVIDE UN-SWITCHED BRANCH CIRCUIT CONDUCTORS TO EACH FIXTURE.
10. CONNECT ALL EXIT AND EMERGENCY LIGHTING FIXTURES TO LOCAL LIGHTING CIRCUIT, AHEAD OF ALL SWITCHES, PER NEC.
11. ELECTRICAL CONTRACTOR SHALL PROVIDE SAFETY DISCONNECT SWITCHES FOR ALL MECHANICAL AND PLUMBING EQUIPMENT.
12. MULTI-WIRE BRANCH CIRCUITS SHALL BE PROVIDED WITH THE MEANS TO SIMULTANEOUSLY DISCONNECT ALL UNDERGROUND CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES. REFER TO 2011 NEC 210.4 (B). THIS APPLIES TO ALL MULTI-WIRE BRANCH CIRCUITS SUPPLYING ANY LOAD.
13. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT-CARRYING CONDUCTORS. HOMERUNS CONTAINING MORE THAN THREE CURRENT-CARRYING CONDUCTORS SHALL BE DERATED IN ACCORDANCE WITH THE 2011 NEC.
14. BRANCH CIRCUIT HOMERUN CONDUCTORS SHALL BE SIZED IN ACCORDANCE WITH THE 2011 NEC. THE MAXIMUM ALLOWABLE VOLTAGE DROP ON A FEEDER IS 2% AND THE MAXIMUM ALLOWABLE VOLTAGE DROP ON A BRANCH CIRCUIT IS 3%. PROVIDE BRANCH CIRCUIT CONDUCTORS SIZED TO ENSURE THE TOTAL VOLTAGE DROP FROM THE SOURCE TO THE POINT OF UTILIZATION IS LESS THAN OR EQUAL TO 5%.

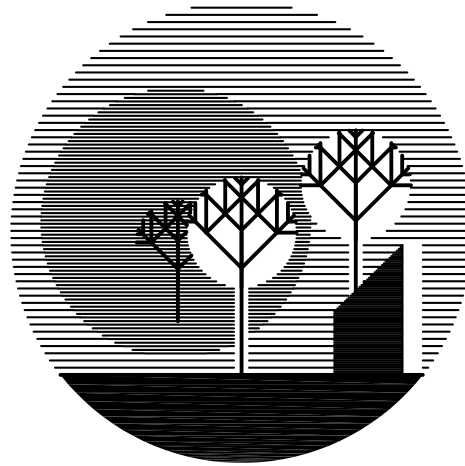
ELECTRICAL SYMBOL LIST

- 24" x 48" FLUORESCENT LUMINAIRE
- WALL MOUNTED LUMINAIRE, HEIGHT AS NOTED
- SINGLE FACE EXIT SIGN, ARROWS AS INDICATED
- DOUBLE FACE EXIT SIGN, ARROWS AS INDICATED
- BATTERY OPERATED EMERGENCY LIGHT
- SURFACE MOUNTED LIGHT FIXTURE
- WALL MOUNTED LIGHT FIXTURE
- RECESSED DOWNLIGHT
- FLUORESCENT STRIP LIGHT
- EMERGENCY LIGHT
- SINGLE POLE TOGGLE SWITCH, +48" A.F.F.
- DUPLEX RECEPTACLE, 120V, 20A, GROUNDING TYPE, +18" A.F.F. OR AS NOTED
- DUPLEX RECEPTACLE, GFCI TYPE, 120V, 20A, GROUNDING TYPE, +48" A.F.F. OR 9" ABOVE COUNTER
- DOUBLE DUPLEX RECEPTACLE, 120V, 20A, GROUNDING TYPE +18" A.F.F. OR AS NOTED
- DOUBLE DUPLEX RECEPTACLE 120V, 20A, GROUNDING TYPE +48" A.F.F. OR 9" ABOVE COUNTER
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- SINGLE RECEPTACLE, 120V, 20A, GROUNDING TYPE +48" A.F.F. OR 9" ABOVE COUNTER
- WEATHERPROOF RECEPTACLE, +24" A.F.F.
- JUNCTION BOX - CEILING MOUNTED
- JUNCTION BOX - WALL MOUNTED, HEIGHT AS NOTED
- FUSIBLE DISCONNECT SWITCH - UPPER NUMERAL DENOTES SWITCH SIZE, LOWER NUMERAL DENOTES FUSE SIZE
- NON-FUSED DISCONNECT SWITCH - NUMERAL DENOTES SWITCH SIZE, SIZE AT 30A 3P, UNLESS OTHERWISE NOTED.
- MOTOR CONTROL SWITCH WITH PILOT LIGHT, +48" A.F.F.
- MAGNETIC MOTOR STARTER
- MANUAL MOTOR STARTER, +48" A.F.F., OR ON MOTORIZED EQUIP.
- COMBINATION MOTOR STARTER
- MOTOR CONNECTION
- LIGHTING PANELBOARD
- POWER PANELBOARD
- TRANSFORMER
- CONTROL PANEL
- CONDUIT RUN IN WALL OR ABOVE CEILING
- CONDUIT RUN BELOW GRADE OR CONCRETE SLAB
- BRANCH CIRCUIT HOMERUN
- LOW VOLTAGE WIRING FOR LIGHTING CONTROL

prepared for:



prepared by:



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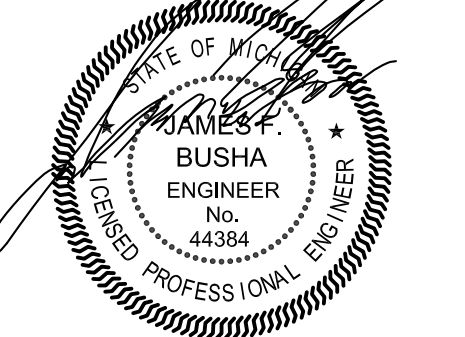
**DEMMER
PARTS**
37458
MICHIGAN AVE.
WAYNE, MI

sheet title

**SITE PLAN
& SYMBOL LIST**

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seal & signature



project number

14004

drawn SL

approved JFB

issued date

Bids/Permits 1-14-15



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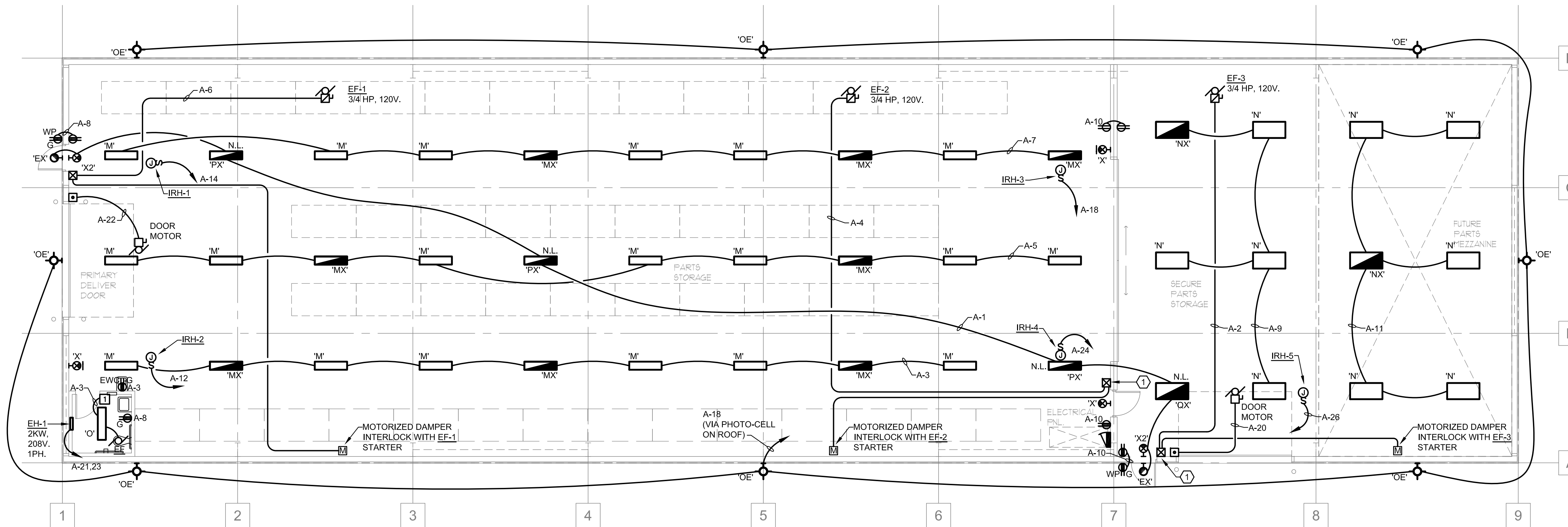


LIGHTING FIXTURE SCHEDULE

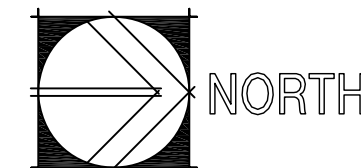
TYPE	DESCRIPTION	LAMP QUANTITY	LAMP TYPE	CCT	CRI	VOLTAGE	BALLAST TYPE	BASIS OF DESIGN	NOTES
M	SUSPENDED AISLE LIGHTER 43" LONG	2	LED	4000K	75	120V	N.A.	FLEXTRONICS #ES2-UL-2M-40-AISLE-CA-CRM-120-0CC20-CORDN	AISLE LIGHTER LUMINAIRE WITH CLEAR ACRYLIC LENS, AND OCCUPANCY SENSOR. MOUNTED AT +19'-0" AFF.
MX	SUSPENDED AISLE LIGHTER WITH BATTERY BACK-UP AND 20" OCC. SENSOR, 43" LONG	2	LED	4000K	75	120V	N.A.	FLEXTRONICS #ES2-UL-2M-40-AISLE-CA-CRM-120-CORDN-0CC20-EMB	AISLE LIGHTER LUMINAIRE WITH CLEAR ACRYLIC LENS, OCCUPANCY SENSOR AND EMERGENCY BATTERY BACK-UP. MOUNTED AT +19'-0" AFF.
N	SUSPENDED HIGH BAY LUMINAIRE 23" LONG	6	LED	4000K	75	120V	N.A.	FLEXTRONICS #ES2-UL-6MS-40-WIDE-CA-CRM-120-CORDN-0CC20-CORDN	HIGH BAY WIDE DISTRIBUTION LUMINAIRE WITH ACRYLIC LENS AND OCCUPANCY SENSOR. MOUNTED AT +19'-0" AFF.
NX	SUSPENDED HIGH BAY LUMINAIRE WITH BATTERY BACK-UP AND OCC. SENSOR, 23" LONG	6	LED	4000K	75	120V	N.A.	FLEXTRONICS #ES2-UL-6MS-40-WIDE-CA-CRM-120-CORDN-0CC20-EMB	HIGH BAY WIDE DISTRIBUTION LUMINAIRE WITH ACRYLIC LENS, OCCUPANCY SENSOR AND EMERGENCY BATTERY BACK-UP. MOUNTED AT +19'-0" AFF.
O	SURFACE CEILING MOUNTED LUMINAIRE WITH WRAP AROUND LENS, 48" LONG	2	32W T8	4100K	85	120V	ELECTRONIC	LITHONIA #LB 232 GEB10 MVOLT	SURFACE MOUNTED FLUORESCENT WRAP AROUND.
PX	SUSPENDED AISLE LIGHTER WITH BATTERY BACK-UP 43" LONG	2	LED	4000K	75	120V	N.A.	FLEXTRONICS #ES2-UL-2M-40-AISLE-CA-CRM-120-CORDN-EMB	AISLE LIGHTER LUMINAIRE WITH CLEAR ACRYLIC LENS AND EMERGENCY BATTERY BACK-UP. MOUNTED AT +19'-0" AFF.
QX	SUSPENDED HIGH BAY LUMINAIRE WITH BATTERY BACK-UP 23" LONG	6	LED	4000K	75	120V	N.A.	FLEXTRONICS #ES2-UL-6MS-40-WIDE-CA-CRM-120-CORDN-EMB	HIGH BAY WIDE DISTRIBUTION LUMINAIRE WITH ACRYLIC LENS AND EMERGENCY BATTERY BACK-UP. MOUNTED AT +19'-0" AFF.
OE	WALL MOUNTED EXTERIOR FLOOD LIGHT	2	LED	4000K	75	120V	N.A.	CREE #XSPWAX3MC-U	WALL MOUNTED FLOOD LIGHT WITH 4504 LUMEN, 43 WATT MODULE. MOUNTED AT +16'-6" AFF.
X	SELF-POWERED EXIT SIGN	1	LED	-	-	120V	-	ROYAL PACIFIC #RXL5	SINGLE OR DOUBLE FACE UNIVERSAL MOUNT WITH 6" RED LETTERS ON STENCIL FACE. MAINTENANCE FREE NI-CAD BATTERY. CONNECT TO NEAREST GENERAL LIGHTING CIRCUIT AHEAD OF ALL SWITCHES.
X2	SELF-POWERED EXIT SIGN	1	LED	-	-	120V	-	ROYAL PACIFIC #RXL20	SINGLE FACE UNIVERSAL MOUNT WITH 6" RED LETTERS ON STENCIL FACE. MAINTENANCE FREE NI-CAD BATTERY WITH CAPACITY TO POWER REMOTE HEAD. FIELD WIRE TO FIXTURE TYPE "EX" WHERE INDICATED ON PLANS. CONNECT TO NEAREST GENERAL LIGHTING CIRCUIT AHEAD OF ALL SWITCHES.
EX	DUAL HEAD REMOTE WEATHERPROOF EMERGENCY LIGHT 6V.	2	8W PAR36	-	-	6V	-	LIGHTALARMS #ELF847D H7551 M6	CONNECT TO LOCAL EXIT SIGN TYPE X2. MOUNT AT +96" AFF ABOVE DOOR WAY FOR OUTDOOR LOCATIONS.

LIGHTING FIXTURE NOTES

- ALTERNATE LIGHTING MANUFACTURERS EQUIPMENT SHALL BE SIMILAR IN PERFORMANCE, PHYSICAL APPEARANCE AND CONSTRUCTION TO BE CONSIDERED AS EQUAL TO UNITS SPECIFIED.
- ALTERNATE LIGHTING FIXTURE TYPES PROPOSED TO BE SUBSTITUTED BY BIDDING CONTRACTOR MUST BE PRE-APPROVED DURING BIDDING. CONTRACTOR, OR LIGHTING REPRESENTATIVE SHALL EMAIL ALL SUCH REQUESTS WITH FIXTURE CUTS TO ENGINEER AT LEAST ONE WEEK PRIOR TO SUBMITTING BIDS. ENGINEER SHALL REVIEW THE PROPOSED ALTERNATE LIGHTING FIXTURES AND ISSUE A WRITTEN ACCEPTANCE OR DENIAL BY RETURN EMAIL. VERBAL APPROVAL WILL NOT BE ACCEPTABLE.
- ALL SHOP DRAWINGS SUBMITTED AFTER AWARD OF CONTRACT FOR LIGHTING FIXTURES WHICH WERE NOT PRE-APPROVED WILL BE REJECTED.
- FIXTURES SIMILAR IN DESIGN, CONSTRUCTION AND PHOTOMETRIC CHARACTERISTICS MANUFACTURED BY LITHONIA, LSI INDUSTRIES, COOPER, LIGHTOLIER, HUBBELL, OR PHILIPS ARE ACCEPTABLE ALTERNATES TO THOSE FIXTURES SPECIFIED.
- ALL FLUORESCENT FIXTURES TO INCLUDE A BALLAST DISCONNECT PLUG PER NEC REQUIREMENTS.
- REMOTE TEST SWITCHES FOR EMERGENCY LIGHTS TO BE MOUNTED FLUSH IN WALL ADJACENT TO LIGHT FIXTURE. CONTRACTOR TO COORDINATE EXACT LOCATIONS FOR ALL SUCH REMOTE SWITCHES WITH ARCHITECT REPRESENTATIVE. ALL DIRECTIONS SHALL BE IN WRITING. VERBAL ORDERS ARE NOT ACCEPTABLE.



1 FLOOR PLAN - ELECTRICAL



KEYED NOTES

- 120V, 1P, MAGNETIC MOTOR STARTER WITH H.O.A. SELECTOR SWITCH AND ON-OFF PILOT LIGHTS. INTERLOCK WITH MOTORIZED DAMPER MOTOR TO OPEN DAMPER WHEN E.F. IS ACTIVATED.

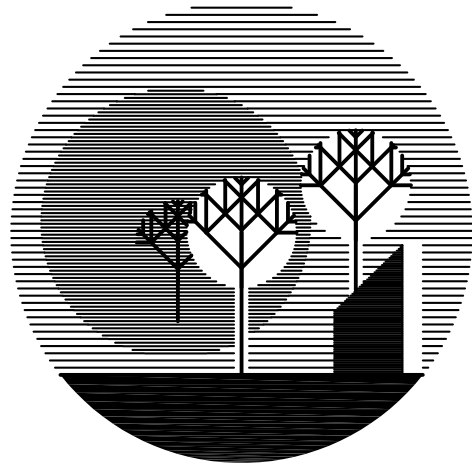


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prepared for:



prepared by:



UNDER THE SUN ARCHITECTURAL LLC

11022 Mourning Dove Lane
South Lyon, MI 48178

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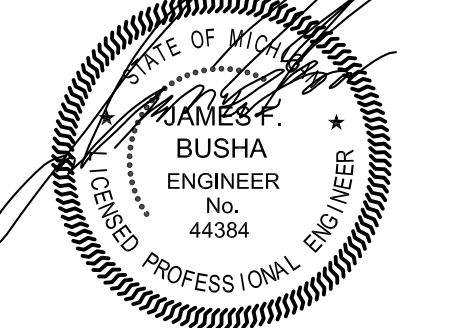
37458
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FLOOR PLANS ELECTRICAL

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project number

14004

drawn SL

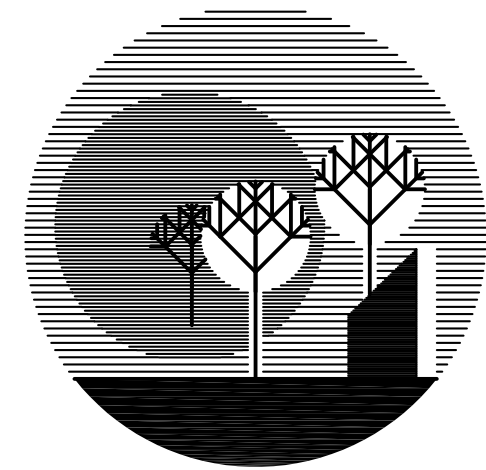
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Bids/Permits 1-14-15

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E-101



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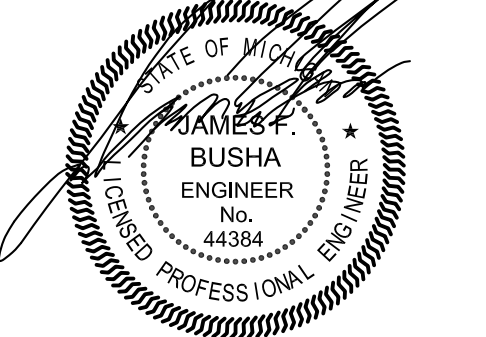
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WAYNE, MI**

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**RISER DIAGRAM &
PANEL SCHEDULES**

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14004

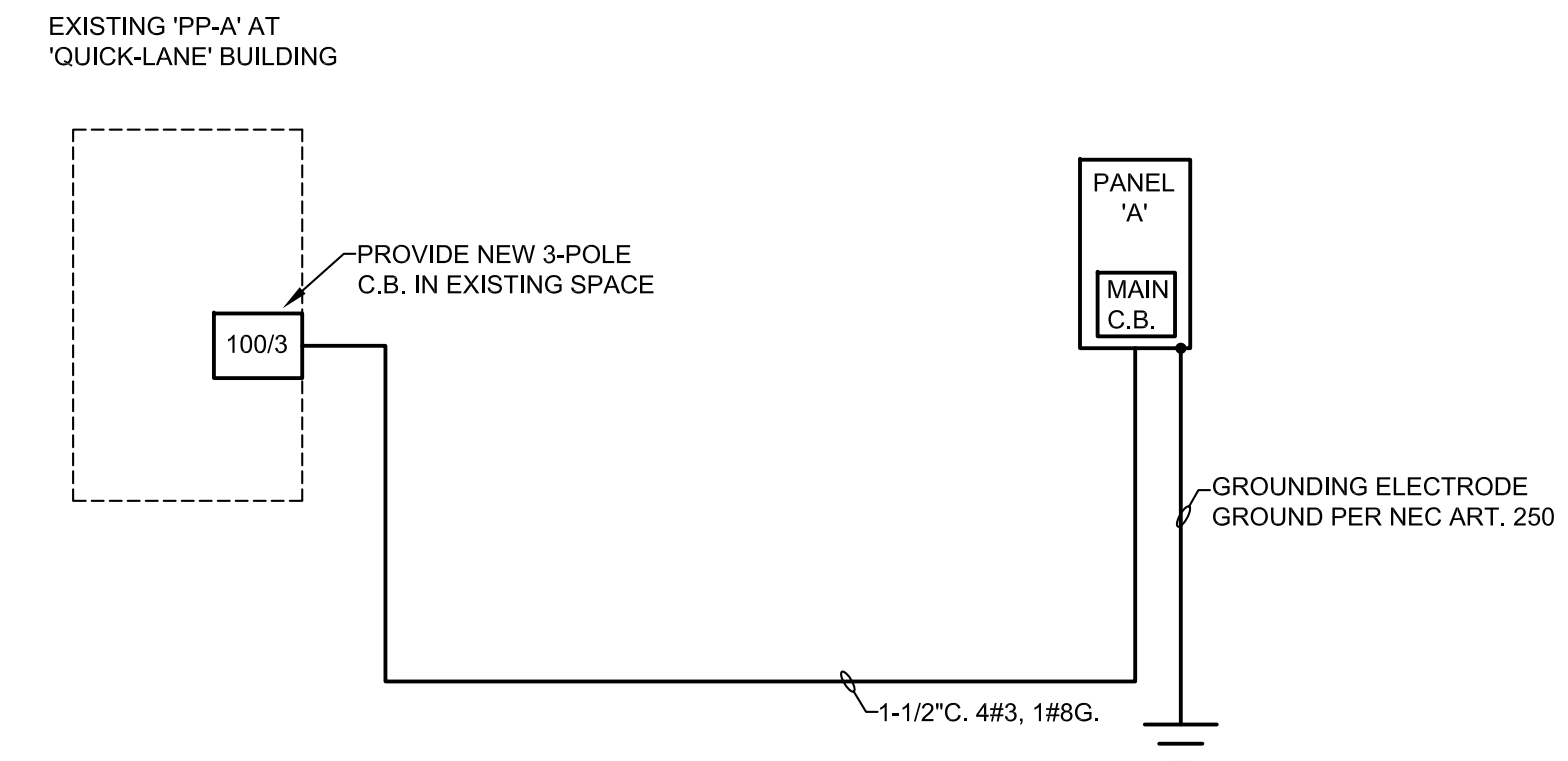
drawn SL

approved JFB

issued date

Bids/Permits 1-14-15

PANEL BOARD MAIN BREAKER	LOAD - V.A.			VOLTAGE MAIN LUGS						SYM. A.I.C. MIN.			MOUNTING SURFACE
	A	B	C	BRKR	#	BRKR	#	BRKR	A	B	C		
NIGHT LIGHTS & EXITS	550			20	1	2	25	1656				LOAD SERVED	EF-3
LIGHTS		1017		20	3	4	25		1656				EF-2
LIGHTS			904	20	5	6	25				1625		EF-1
LIGHTS	1017			20	7	8	20	720					4 RECEPT.
LIGHTS		875		20	9	10	20		900				5 RECEPT.
LIGHTS			1050	20	11	12	20				500		IRH-2
SPARE				20	13	14	20	500					IRH-1
SPARE				20	15	16	20		500				IRH-3
SPARE				20	17	18	20			344			8 TYPE OE
S.O.					19	20	20	1200					DOOR MOTOR
EH-1		1000		20	21	22	20		1200				DOOR MOTOR
S.O.			1000	2	23	24	20				500		IRH-4
S.O.					25	26	20	500					IRH-5
S.O.					27	28							S.O.
S.O.					29	30							S.O.
LOAD DESCRIPTION	DEMAND FACTOR D.F.	VOLT-AMPS				18796	TOTAL DEMAND LOAD						
		CONNECTED	DEMAND										
LIGHTING	1.0	5817	5817	1455	25% LIGHTING LOAD								
RECEPTACLES	NEC	1620	1620	4438	25% SPARE								
SMALL MOTORS	1.0	7359	7359										
MISC. EQUIPMENT	1.0	2000	2000	24689	DESIGN LOAD								
ELEC. HEATER	1.0	2000	2000	68	DESIGN AMPS								
	TOTAL	18796	18796										



POWER RISER DIAGRAM

N.T.S.



MEEC JOB # 20413-231
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ELECTRICAL SPECIFICATONS

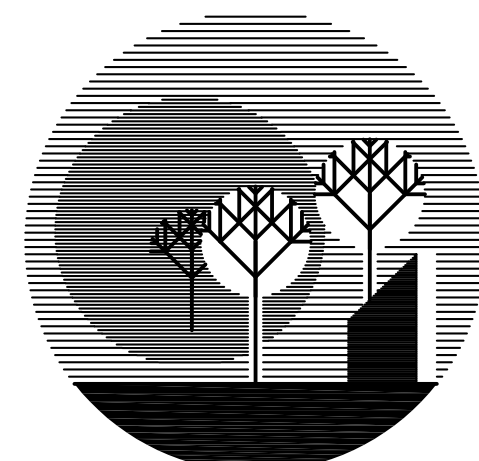
- 1. GENERAL CONDITIONS:**
- A. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATION SECTIONS, APPLY TO WORK OF THIS SECTION. THE ELECTRICAL CONTRACTOR SHALL ASSUME ALL OBLIGATIONS CONTAINED THEREIN THAT AFFECT HIS WORK. THE ELECTRICAL ENGINEER SHALL BE CONSULTED IN CASE OF ANY DISPUTES AND HIS DECISION SHALL BE FINAL.
- B. THE ELECTRICAL CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, PLUMBING AND MECHANICAL DRAWINGS AND SPECIFICATIONS AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS OF WORK AFFECTING THE CONTRACT. SIZE AND CAPACITY OF ALL EQUIPMENT SHALL BE AS ON PLANS OR AS INDICATED HEREIN.
- C. FURNISH LABOR AND MATERIALS TO PROVIDE A COMPLETE ELECTRICAL SYSTEM AS REQUIRED BY THE PLANS AND SPECIFICATIONS.
- D. ANY ITEM APPEARING ON THE DRAWINGS AND NOT IN THE SPECIFICATION OR VICE VERSA, AND ANY ITEMS APPEARING IN NEITHER BUT NECESSARY TO ACCOMPLISH THE INTENT OF THESE SPECIFICATIONS, SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR.
- E. WHERE EQUIPMENT SPECIFICATIONS OR DESCRIPTIONS INCLUDE A SPECIFIC MANUFACTURER AND CATALOG NUMBER, ANY SUBSTITUTED EQUIPMENT OR EQUIPMENT PROPOSED TO BE PROVIDED BY AN ALTERNATIVE MANUFACTURER SHALL FUNCTIONALLY MEET, OR EXCEED, THE REQUIREMENTS OF THE SPECIFIED EQUIPMENT IN ALL RESPECTS. ALTERNATE MANUFACTURERS SHALL REFER TO PRODUCT LITERATURE PUBLISHED BY THE MANUFACTURER OF THE EQUIPMENT SPECIFIED TO DETERMINE EQUIVALENCY OF THEIR PROPOSED ALTERNATE PRODUCT.
- 2. SCOPE OF WORK:**
- THIS SPECIFICATION CONTEMPLATES THE PROVISION BY THE ELECTRICAL CONTRACTOR OF ALL LABOR AND MATERIALS REQUIRED TO INSTALL A COMPLETE SYSTEM OF ELECTRICAL WORK AS HEREBY SPECIFIED AND AS SHOWN ON THE DRAWINGS. WITHOUT RESTRICTING THE GENERALITY OF THE FOREGOING, THE FOLLOWING SHALL BE INCLUDED:
- A. INSTALLATION OF NEW SECONDARY FEEDERS, AND PANELBOARDS, COMPLETE WITH ALL REQUIRED GROUNDING PER THE REQUIREMENTS OF LOCAL ELECTRICAL CO. AND NATIONAL ELECTRICAL CODE.
- B. POWER AND LIGHTING PANELBOARDS AND FEEDERS, SAFETY SWITCHES, BRANCH CIRCUIT WIRING, OUTLETS AND CONNECTIONS COMPLETE.
- C. GROUNDING OF COMPLETE ELECTRICAL SYSTEM PER ARTICLE 250 OF N.E.C. AND SPECIFICATIONS.
- D. EMERGENCY EGRESS AND EXIT LIGHTING SYSTEMS COMPLETE.
- E. SERVICES AND FINAL CONNECTIONS TO ALL ITEMS OF MECHANICAL EQUIPMENT AS REQUIRED.
- F. DISCONNECT SWITCHES WHICH ARE NOT AN INTEGRAL PART OF EQUIPMENT.
- G. INSTALLATION OF LIGHTING FIXTURES BY COMPLETE WITH LAMPS, HANGERS, SUPPORTS, AUXILIARIES AND FOUNDATIONS.
- 3. CHARACTER OF EQUIPMENT:** ALL EQUIPMENT SHALL BE NEW AND SHALL CONFORM IN ALL RESPECTS TO THE LATEST APPROVED STANDARDS OF THE IEEE, ANSI AND THE "UL" LABEL OR LISTING.
- 4. CODES AND ORDINANCES:** ALL ELECTRICAL WORK SHALL COMPLY WITH THE 2011 EDITION OF THE NATIONAL ELECTRICAL CODE, LOCAL CODES AND THE LATEST EDITION OF THE MICHIGAN BUILDING CODE, ALL ORDINANCES AND REGULATIONS, AND THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).
- 5. PERMITS AND FEES:** THE ELECTRICAL CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY ALL FEES, INCLUDING ALL COSTS ACCESSED BY THE UTILITY COMPANY, AND ARRANGE FOR ALL INSPECTIONS FOR HIS WORK. BEFORE SUBMITTING HIS BID, THE ELECTRICAL CONTRACTOR SHALL CHECK WITH EACH UTILITY COMPANY SUPPLYING SERVICE TO THE PROJECT AND DETERMINE FROM THEM ALL OF THEIR REQUIREMENTS AND CHARGES. ALL SUCH REQUIREMENTS AND CHARGES SHALL BE INCLUDED IN THE BASE BID PROPOSAL. AT THE COMPLETION OF ELECTRICAL WORK, THE ELECTRICAL CONTRACTOR SHALL FURNISH THE OWNER WITH ALL CERTIFICATES OF FINAL INSPECTION AND APPROVALS.
- 6. UTILITIES POINTS OF SERVICE:** ELECTRICAL CONTRACTOR SHALL VERIFY THE EXISTING ELECTRICAL SERVICE AND ELECTRIC SERVICE POINT, AND COORDINATE ANY NEW REQUIREMENTS WITH THE UTILITY COMPANY SERVICE PLANNER. ELECTRICAL CONTRACTOR SHALL INSTALL COMMUNICATIONS CONDUITS FROM SERVICE CONNECTION POINT AS INDICATED ON THE DRAWINGS.
- 7. SITE VISIT BY CONTRACTOR:** THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE CONDITIONS UNDER WHICH HIS WORK MUST BE CONDUCTED BEFORE SUBMITTING HIS PROPOSAL. THE SUBMITTING OF A PROPOSAL IMPLIES THAT THE CONTRACTOR HAS VISITED THE SITE, IS CONVERSANT WITH ALL SITE CONDITIONS, INCLUDING EXISTING SERVICES AND EQUIPMENT, OBSTRUCTIONS AND ALL CONDITIONS, WHICH WILL BE ENCOUNTERED IN THE REMOVAL AND/OR RELOCATION OF PRESENT MATERIALS AND EQUIPMENT, INSTALLATION OF NEW MATERIALS AND CUTTING AND PATCHING, ETC., FOR A COMPLETE ELECTRICAL INSTALLATION. IF ANY INTERFERENCES OR VIOLATIONS APPEAR AND DEPARTURE FROM THE DESIGN INTENT OF THE BID DOCUMENTS IS REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT PRIOR TO ENTERING INTO CONTRACT WITH THE OWNER. FAILURE TO PROVIDE THE ARCHITECT WITH THE AFOREMENTIONED NOTIFICATION WILL RESULT IN THE CONTRACTOR BEING HELD RESPONSIBLE TO COMPLETE ALL WORK TO MEET THE DESIGN INTENT OF THE BID DOCUMENTS WITH NO ADDITIONAL EXPENSES ("EXTRAS") BEING INCURRED BY THE OWNER, ARCHITECT, OR ENGINEER.
- 8. SUBSTITUTIONS:**
- A. ANY EQUIPMENT PROPOSED AS EQUAL TO THAT SPECIFIED SHALL BE SO PROVEN BY THE CONTRACTOR WHO SHALL, PRIOR TO BIDDING, SUBMIT THE MANUFACTURER'S NAME, MODEL NUMBERS, VERIFICATION DATA SHEETS AND APPLICABLE WORKING DRAWINGS. THE ENGINEER SHALL REVIEW AND APPROVE OR DISAPPROVE SUCH PROPOSED SUBSTITUTIONS PRIOR TO BIDDING TIME. IF THIS PROCEDURE IS NOT FOLLOWED BY THE CONTRACTOR PRIOR TO BIDDING, IT IS UNDERSTOOD THAT THE CONTRACTOR IS BIDDING EQUIPMENT AND MAKE AS SPECIFIED.
- B. IN THE EVENT SUBSTITUTIONS ARE PROPOSED TO THE ENGINEER AFTER THE CONTRACT HAS BEEN AWARDED, THE CONTRACTOR SHALL ISSUE A PURCHASE ORDER NUMBER TO THE ENGINEER ALONG WITH THE SHOP DRAWING SUBMITTAL FOR USE BY THE ENGINEER IN OBTAINING PAYMENT FROM THE CONTRACTOR FOR THE ENGINEERS TIME IN EVALUATING THE PROPOSED SUBSTITUTION.
- C. WHETHER OR NOT THE ENGINEER APPROVED THE PROPOSED SUBSTITUTION, THE CONTRACTOR SHALL PROMPTLY UPON RECEIPT OF THE ENGINEERS BILLING, REIMBURSE THE ENGINEER AT THE RATE OF TWO AND THREE-QUARTER TIMES THE DIRECT COST TO THE ENGINEER FOR ALL TIME SPENT BY HIM IN EVALUATION OF THE PROPOSED SUBSTITUTION.
- 9. COOPERATION WITH OTHER CONTRACTORS:**
- A. ELECTRICAL CONTRACTOR SHALL ARRANGE ALL PARTS OF HIS WORK IN PROPER RELATION TO THE WORK OF OTHERS AND TO THE ARCHITECTURAL FINISH. WHERE INTERFERENCES OCCUR, THE ELECTRICAL CONTRACTOR SHALL, BEFORE INSTALLING THE WORK INVOLVED, CONSULT WITH THE ARCHITECT AS TO THE EXACT LOCATION AND LEVEL OF HIS WORK. THE ARCHITECT'S DECISION SHALL BE FINAL.
- B. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE ARRANGEMENT OF HIS WORK AND EQUIPMENT, AND SHALL MAINTAIN PROPER HEADROOM UNDER HIS WORK. SHOULD WORK INSTALLED BY HIM REQUIRE MODIFICATION TO AVOID INTERFERENCE WITH OTHER WORK, AS DETERMINED BY THE ARCHITECT, SUCH CHANGES SHALL BE MADE WITHOUT ADDITIONAL COST.
- 10. STANDARDS OF MATERIAL AND WORKMANSHIP:**
- A. ALL WORK SHALL BE DONE AT SUCH TIMES AND IN SUCH A MANNER AS WILL LEAST INTERFERE WITH THE MAINTENANCE AND OPERATION OF ALL RELATED OR AFFECTED SYSTEMS.
- B. ALL MATERIALS AND EQUIPMENT SHALL BEAR THE LABEL OF APPROVAL OF THE NATIONAL BOARD OF FIRE UNDERWRITER'S LABORATORIES.
- C. THE ELECTRICAL CONTRACTOR SHALL EFFECTIVELY PROTECT, AT HIS OWN EXPENSE, SUCH OF HIS WORK, MATERIALS OR EQUIPMENT AS IS LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD.
- D. ALL OPENINGS INTO ANY PART OF THE CONDUIT SYSTEM AS WELL AS ASSOCIATED FIXTURES, EQUIPMENT, ETC., BOTH BEFORE AND AFTER BEING SET IN PLACE, MUST BE SECURELY COVERED OR OTHERWISE PROTECTED TO PREVENT OBSTRUCTION OF THE CONDUIT, OR INJURY DUE TO CARELESSNESS OR MALICIOUSLY DROPPED TOOLS OR MATERIALS. GRIT, DIRT OR ANY FOREIGN MATTER. THE ELECTRICAL CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ALL DAMAGE SO DONE UNTIL HIS WORK IS FULLY AND FINALLY ACCEPTED. CONDUIT ENDS SHALL BE COVERED WITH CAPPED BUSHINGS. ALL ELECTRICAL EQUIPMENT SHALL BE GROUNDIED.
- E. IT IS NOT INTENDED THAT THE DRAWINGS OR THIS SPECIFICATION INDICATE OR SPECIFY EACH PIECE OF CONDUIT, FITTINGS, ETC., REQUIRED FOR THE INSTALLATION. WHERE ITEMS ARE REQUIRED FOR THE SATISFACTORY OPERATION OF THE INSTALLATION AND ARE NOT INDICATED ON THE DRAWINGS, THEY SHALL BE CONSIDERED TO BE BOTH SPECIFIED AND INDICATED.
- F. GENERAL REQUIREMENTS AND DETAILS OF EQUIPMENT ARE SHOWN. DIMENSIONS OR SCALES SHOWN ARE APPROXIMATE AND MUST BE CHECKED AT JOB PRIOR TO INSTALLATION OF EQUIPMENT OR ANY ORDER GIVEN FOR FABRICATION.
- G. ELECTRICAL CONTRACTORS SHALL HAVE COMPETENT FOREMAN ON THE PREMISES AT ALL TIMES TO SUPERINTEND AND CHECK AND LAY OUT ALL WORK, GIVE INFORMATION TO GENERAL CONTRACTOR REGARDING CHASES AND OPENINGS, AND BE RESPONSIBLE FOR SUCH LOCATIONS. THIS CONTRACTOR SHALL COOPERATE WITH OTHER CONTRACTORS WHERE CHASES, OPENINGS, PIPES, FOUNDATIONS, ETC., ARE IN PROXIMITY TO THE WORK OF OTHER TRADES AND ARRANGE THE WORK TO FIT. THIS CONTRACTOR SHALL STUDY WHERE OTHER TRADES LEAVE CONNECTIONS AND OUTLETS TO BE CONNECTED, SO THAT ALL WORK AND APPLIANCES SHALL BE PROPERLY ARRANGED FOR AND CONNECTED READY FOR USE.
- 11. CUTTING AND PATCHING:**
- CUTTING AND PATCHING OF WALLS, FLOORS, CEILINGS, ROOFS, ETC., SHALL BE DONE BY ARCHITECTURAL TRADES CONTRACTOR BUT PAID FOR BY THE ELECTRICAL CONTRACTOR. STRUCTURAL MEMBERS SHALL NOT BE CUT WITHOUT OBTAINING WRITTEN PERMISSION FROM THE ARCHITECT. CONDUITS PASSING THROUGH ROOFS OR OUTSIDE WALLS EXPOSED TO WEATHER SHALL BE CAREFULLY FLASHED. FIRE PROOFING OF HOLES SHALL BE PROVIDED AND SHALL BE A UL LISTED MATERIAL, AND APPROVED BY AUTHORITY HAVING JURISDICTION.
- 12. OBSTRUCTIONS:**
- SHOULD ANY STRUCTURAL DIFFICULTIES PREVENT SETTING OF CABINETS, RUNNING CONDUCTORS, ETC., AT POINTS SHOWN ON PLANS, THE NECESSARY MINOR DEVIATIONS THEREFROM, AS DETERMINED BY THE ARCHITECT, MAY BE PERMITTED AND MUST BE MADE WITHOUT ADDITIONAL COST.
- 13. DRAWINGS AND SPECIFICATIONS:**
- ANY ITEM APPEARING ON THE DRAWINGS AND NOT IN THE SPECIFICATION OR VICE VERSA, AND ANY ITEMS APPEARING IN NEITHER BUT NECESSARY TO ACCOMPLISH THE INTENT OF THESE SPECIFICATIONS, SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR.
- 14. TEMPORARY SERVICE:**
- A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY CONSTRUCTION LIGHTING AND POWER IN ACCORDANCE WITH THE PROGRESS SCHEDULE OF THE GENERAL CONTRACTOR.
- 15. PENETRATIONS AND FIRE PROOFING:**
- A. ALL PENETRATIONS OF RATED FIRE AND SMOKE WALLS SHALL BE BY CONDUIT.
- B. ALL PENETRATIONS OF FLOORS SHALL BE BY CONDUIT OR METAL SLEEVES.
- C. ALL PENETRATION SLEEVES INCLUDING OPEN ENDED CONDUITS NOT TERMINATED IN JUNCTION BOXES SHALL BE FILLED WITH FIRE SAFING MATERIAL AS MANUFACTURED BY U. S. GYPSUM CO., OR ARCHITECT APPROVED EQUAL FOR 2" IN LENGTH FROM CONDUIT END.
- D. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR COMPLETE FIRE STOPPING REQUIREMENTS AND LOCATIONS OF FIRE RATED WALLS, FLOORS AND PARTITIONS.
- 16. GROUNDING:**
- A. FURNISH AND INSTALL A COMPLETE GROUNDING SYSTEM IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODES AND ORDINANCES.
- B. ALL BRANCH CIRCUIT CONDUCTORS SHALL INCLUDE A SEPARATE COPPER, INSULATED (GREEN), EQUIPMENT GROUNDING CONDUCTOR SIZED PER ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE.
- C. GROUNDING PATH FROM CIRCUITS, EQUIPMENT, AND CONDUCTOR ENCLOSURES SHALL BE PERMANENT AND CONTINUOUS, AND SHALL HAVE A RESISTANCE TO GROUND OF LESS THAN 5 OHMS.
- D. ALL CABINETS, MOTOR FRAMES, MOTOR STARTERS, CONTACTORS, CONDUIT SYSTEMS, PANELBOARDS, TRANSFORMERS, ETC., SHALL BE THOROUGHLY GROUNDIED IN ACCORDANCE WITH THE NEC.
- 17. CONDUCTORS:**
- A. ALL CONDUCTORS SHALL BE COPPER AND SHALL BE INSTALLED IN CONDUIT. EXCEPTION: MC CABLE SHALL BE ALLOWED IN CONCEALED SPACES WHERE PERMISSIBLE BY CODE.
- B. ALL BRANCH CIRCUIT CONDUCTORS SHALL BE MINIMUM SIZE #12 AWG. TYPE "THHN" INSULATED. ALL FEEDERS AND SECONDARY SERVICE CONDUCTORS SHALL BE COPPER, WITH 600 VOLT INSULATION. FEEDER INSULATION SHALL BE TYPE "THHN" OR "XHHW".
- C. NO WIRING SMALLER THAN NO. 12 AWG SHALL BE USED UNLESS OTHERWISE NOTED, AND ALL WIRE NO. 10 AWG AND LARGER SHALL BE STRANDED, UNLESS OTHERWISE SPECIFIED.
- D. HOME RUNS TO PANELBOARDS 75 FEET IN LENGTH OR OVER SHALL BE NOT LESS THAN NO. 10 AWG OR LARGER AS NECESSARY TO MAINTAIN A MAXIMUM VOLTAGE DROP OF 3 PERCENT, WHETHER OR NOT SHOWN ON THE DRAWINGS.
- E. CONDUCTORS SHALL BE COLOR CODED PER THE NATIONAL ELECTRICAL CODE.
- 18. CONDUITS:**
- A. ALL CONDUITS SHALL BE RUN CONGEALED IN FINISHED AREAS UNLESS OTHERWISE NOTED. EXPOSING OF ANY CONDUIT IN UN-FINISHED AREAS SHALL BE ONLY DONE WITH THE WRITTEN APPROVAL OF THE ARCHITECT.
- B. CONDUIT INSTALLED IN CONCEALED AREAS NOT SUBJECT TO DAMAGE MAY BE ELECTRIC METALLIC TUBING "EMT". CONDUIT INSTALLED EXPOSED AND SUBJECT TO DAMAGE SHALL BE RIGID GALVANIZED STEEL CONDUIT.
- C. ALL CONDUIT SHALL BE 1/2" MINIMUM SIZE UNLESS OTHERWISE NOTED.
- D. ALL CONDUITS INSTALLED AT EXTERIOR LOCATIONS BELOW GRADE SHALL BE SCHEDULE 40 PVC. CONDUITS INSTALLED IN THE CONCRETE SLAB SHALL BE RIGID GALVANIZED STEEL CONDUIT.
- E. A GROUND WIRE SIZED PER ARTICLE 250 OF THE N.E.C. SHALL BE INCLUDED WITH ALL CIRCUIT CONDUCTORS.
- 19. FUSES:**
- A. ALL FUSES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. ALL FUSES SHALL BE OF THE SAME MANUFACTURER.
- B. CIRCUITS 1 TO 600 AMPERES SHALL BE PROTECTED BY U.L. CLASS "RK-1" CURRENT LIMITING FUSES. FUSES SHALL BE DUAL ELEMENT, TIME-DELAY TYPE AND BE LISTED BY THE UNDERWRITERS' LABORATORIES WITH AN INTERRUPTING RATING OF 200,000 AMPERES RMS SYMMETRICAL.
- a. ACCEPTABLE PRODUCTS:
- 1) BUSSMANN TYPE "LPN-RK" (250 VOLTS) OR "LPS-RK" (600 VOLTS).
 - 2) LITTLEFUSE TYPE "LNRK" (250 VOLTS) OR "LRSR" (600 VOLTS).
 - 3) RELIANCE TYPE "LENRK" (250 VOLTS) OR "LESRK" (600 VOLTS).

- C. MOTOR CIRCUITS:
- ALL INDIVIDUAL MOTOR CIRCUITS RATED 460 VOLTS OR LESS SHALL BE PROTECTED BY U.L. CLASS "RK-1" CURRENT LIMITING, DUAL ELEMENT, TIME-DELAY TYPE FUSES. THE FUSES FOR 1.15 SERVICE FACTOR MOTORS SHALL BE INSTALLED IN RATINGS APPROXIMATELY 125% OF MOTOR FULL LOAD CURRENT. UNDER SUCH CONDITIONS AS HIGH AMBIENT TEMPERATURES OR WHERE A MOTOR CANNOT BE BROUGHT TO SPEED QUICKLY, FUSES 150% OR 200% OF THE MOTOR FULL LOAD CURRENT SHALL BE USED. LARGER HORSEPOWER MOTORS SHALL BE PROTECTED BY U.L. CLASS "L" ON THE PLANS OR RECOMMENDED BY THE EQUIPMENT MANUFACTURER.
- a. ACCEPTABLE PRODUCTS:
- 1) SEE ABOVE.
- D. A FUSE IDENTIFICATION LABEL SHALL BE PLACED INSIDE EACH SWITCH DOOR. THE LABEL SHALL INDICATE FUSE TYPE, AMPERE RATING AND INTERRUPTING RATING. A WARNING LABEL SHALL BE PLACED ON THE OUTSIDE AND INSIDE OF EACH SWITCH DOOR WARNING THAT THE INSTALLATION OF ANOTHER SIZE OR TYPE FUSE MAY CAUSE A HAZARDOUS CONDITION. THE LABEL REQUIREMENTS ARE IN ADDITION TO THE OTHER LABELING REQUIREMENTS IN THE SPECIFICATIONS.
- E. SPARE: UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL PROVIDE THE OWNER WITH SPARE SETS OF FUSES EQUAL TO 10% (MINIMUM OF THREE) OF EACH TYPE AND RATING OF INSTALLED FUSES. CONTRACTOR SHALL PROVIDE SPARE FUSE CABINET(S) LOCATED CONVENIENT TO THE MAIN SERVICE EQUIPMENT.
- 20. LIGHTING AND RECEPTACLE PANELBOARDS:**
- A. PANELBOARDS FOR THE CONTROL OF GENERAL LIGHTING, AND RECEPTACLES SHALL BE DEAD FRONT TYPE WITH 4 WIRE MAINS AND BRANCHES OF THE CIRCUIT BREAKER TYPE PROVIDING THERMAL AND MAGNETIC TRIPPING. CIRCUIT BREAKERS SHALL BE THE MOLDED CASE QUICK-MAKE TYPE, AND SHALL BE PROVIDED WITH BRANCHES AS SCHEDULED ON THE DRAWINGS.
- B. ALL BREAKERS SHALL BE "BOLT-ON" TYPE. HANDLE TIES SHALL NOT BE PERMITTED.
- C. CIRCUIT BREAKERS SHALL BE CUTLER-HAMMER SERIES B FOR 240/120 VOLT AND SERIES G FOR 480/277 VOLT.
- D. ALL BUS BARS SHALL BE COPPER.
- E. INTERRUPTING RATING:
- PANELBOARDS SHALL HAVE FULLY RATED OR SERIES RATED INTERRUPTING RATINGS. PANELBOARDS SHALL BE LABELED WITH THE UL SHORT-CIRCUIT RATING. WHEN SERIES RATINGS ARE APPLIED WITH INTEGRAL OR REMOTE UPSTREAM DEVICES, A LABEL OR MANUAL SHALL BE PROVIDED. IT SHALL STATE THE CONDITION OF THE UL SERIES RATINGS INCLUDING: SIZE AND TYPE OF UPSTREAM DEVICE, BRANCH DEVICE THAT CAN BE USED, AND UL SERIES SHORT-CIRCUIT RATING.
- F. PANELBOARDS SHALL BE CUTLER-HAMMER PRL-1 OR PRL-2.
- G. ACCEPTABLE ALTERNATE MANUFACTURERS:
- a. GENERAL ELECTRIC.
 - b. SQUARE D COMPANY
 - c. PARK METAL
 - d. ELECTRICAL POWER PRODUCTS
 - e. SIEMENS ENERGY AND AUTOMATION
 - f. ALTERNATE MANUFACTURER
- 21. DUPLEX RECEPTACLES:**
- DUPLEX RECEPTACLES SHALL BE SPECIFICATION GRADE, 120 VOLT, 20 AMPERE, GROUNDING TYPE, EQUAL TO HUBBELL #5862 SERIES, P&S, OR ARROW-HART. COLOR SHALL BE SELECTED BY ARCHITECT OR OWNER.
- 22. GROUND FAULT RECEPTACLES:**
- GROUND FAULT RECEPTACLES SHALL BE SPECIFICATION GRADE, 120 VOLT, 20 AMPERE, U.L. LISTED UNDER 498 RECEPTACLE REQUIREMENTS AND 943 CLASS A REQUIREMENTS, SHALL CONFORM TO NEC REQUIREMENTS, AND EQUAL TO HUBBELL SERIES #5260, P&S, OR ARROW-HART. COLOR TO BE SELECTED BY ARCHITECT OR OWNER.
- 23. TOGGLE SWITCHES:**
- TOGGLE WALL SWITCHES SHALL BE 20 AMPERE, 120/277 VOLT, SPECIFICATION GRADE, SINGLE, DOUBLE, ETC., AS INDICATED, EQUAL TO HUBBELL #1120 SERIES, P&S, OR ARROW HART. COLOR TO BE SELECTED BY ARCHITECT OR OWNER.
- 24. WEATHERPROOF BOXES AND COVERS:**
- WIRING DEVICES INSTALLED AT EXTERIOR LOCATIONS SHALL BE INSTALLED IN A SINGLE GANG, DEEP WEATHERPROOF BOX WITH WHILE-IN-USE COVER PER NEC SECTION 406.8(B)(1), BOXES AND COVERS SHALL BE CONSTRUCTED OF POLYCARBONATE AND SHALL BE FULLY GASKETED. THE TRANSLUCENT COVER SHALL INCLUDE A PAD-LOCKABLE, BREAK-RESISTANT BULLNOSE AND LATCH. PASS & SEYMOUR #WUUC16-DC OR EQUAL.
- 25. DEVICE PLATES:**
- DEVICE PLATES SHALL BE STAINLESS STEEL TYPE 302, HUBBELL "S" SERIES, OR AS SELECTED BY ARCHITECT OR OWNER.
- 26. LIGHTING FIXTURES:**
- A. FLUORESCENT FIXTURES, UNLESS OTHERWISE INDICATED, SHALL BE SUITABLE FOR 120 VOLT, SINGLE PHASE, A.C., 60 HERTZ SERVICE AND SHALL BE EQUIPPED WITH THE QUANTITY AND TYPE OF T8 ENERGY SAVING FLUORESCENT LAMPS AS SPECIFIED IN THE LIGHT FIXTURE SCHEDULE PROVIDED ON THE DRAWINGS; FLUORESCENT LAMP BALLASTS SHALL BE ENERGY EFFICIENT, >98% POWER FACTOR, PARALLEL LAMP CONNECTION, CLASS "P", ELECTRONIC TYPE, WITH A BALLAST FACTOR OF >0.92, THD OF <10%, AND CREST FACTOR OF 1.7.
- B. LIGHTING FIXTURE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE. THE ELECTRICAL CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL LIGHTING FIXTURES WITH THE ARCHITECTURAL REFLECTED CEILING PLANS. LIGHT FIXTURES AND SPRINKLER HEAD LOCATIONS SHALL, UNLESS OTHERWISE NOTED, TAKE PRECEDENCE OVER AIR DISTRIBUTION DEVICE LOCATIONS.
- C. EXIT LIGHTS SHALL BE AS SCHEDULED ON THE DRAWINGS. UNITS SHALL BE SINGLE OR DOUBLE-FACED AND ARROWS SHALL BE PROVIDED AS INDICATED ON PLANS. MOUNTING SHALL BE AS INDICATED ON PLANS.
- D. ALL FLUORESCENT BALLASTS SHALL BE PROVIDED WITH DISCONNECTING MEANS PER NEC.
- 27. EMERGENCY LIGHTING:**
- A. THE ELECTRICAL CONTRACTOR SHALL INSTALL AN EMERGENCY LIGHTING SYSTEM AS SHOWN ON THE DRAWINGS, CONFORMING TO THE 2009 INTERNATIONAL FIRE CODE AND THE MICHIGAN BUILDING CODE.
- B. BRANCH CIRCUIT CONDUCTORS FOR EMERGENCY LIGHTS SHALL NOT RUN IN RACEWAY WITH OTHER BRANCH CIRCUIT CONDUCTORS, NOR SHALL THEY ENTER AN OUTLET BOX WITH OTHER WIRE.
- 28. EMERGENCY LIGHTING UNITS:**
- A. FURNISH AND INSTALL BATTERY OPERATED EMERGENCY LIGHTING UNITS AT LOCATIONS INDICATED ON THE PLANS OF TYPES SCHEDULED ON PLANS.
- B. EMERGENCY LIGHTING UNITS SHALL INCLUDE A SUITABLE SHELF OR WALL MOUNTING BRACKET AND SHALL CONTAIN ALL NECESSARY MODULES, READY AND HIGH CHARGE INDICATOR PILOT LIGHTS, TEST SWITCH, LAMPS, AND SUITABLE TERMINAL BOARDS FOR CONNECTION OF NORMAL ELECTRICAL SUPPLY CABLES.
- C. BATTERIES SHALL BE LEAD CALCIUM TYPE, OR NI-CAD TYPE, AS SCHEDULED.
- D. BATTERY CHARGER SHALL BE DESIGNED AS TO MAINTAIN THE BATTERIES FULLY CHARGED ON THE TRICKLE RATE.
- E. EMERGENCY LIGHTING UNITS UTILIZING INCANDESCENT LAMPS OR HALOGEN LAMPS RATED LESS THAN SCHEDULED ON THE DRAWINGS WILL NOT BE ACCEPTABLE. CONSULT LIGHTING FIXTURE SCHEDULE FOR MINIMUM ACCEPTABLE EQUIPMENT RATINGS. ANY EQUIPMENT SUBMITTED NOT MEETING THE MINIMUM REQUIREMENTS WILL BE REJECTED.
- 29. DISCONNECT SWITCHES:**
- DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE, NEMA 1 FOR INDOOR USE, AND NEMA 3R OUTDOOR USE RATED, 800 VOLT, DISCONNECT SWITCHES SERVING MOTOR LOADS SHALL BE HORSEPOWER RATED. SQUARE D, CUTLER-HAMMER OR SIEMENS ENERGY AND AUTOMATION.
- 30. MOTOR STARTERS:**
- A. STARTERS FOR SINGLE PHASE MOTORS SHALL BE MANUAL TOGGLE SWITCH TYPE WITH THERMAL OVERLOADS, SURFACE OR FLUSH MOUNTED AS REQUIRED. SQUARE D CLASS 2510.
- B. STARTERS FOR THREE PHASE MOTORS SHALL BE MAGNETICALLY OPERATED, MECHANICALLY-HELD TYPE WITH OVERLOADS, CONTROL TRANSFORMER AND 2 AUXILIARY CONTACTS, WITH HOA SELECTOR SWITCH AND RED & GREEN PILOT LIGHTS MOUNTED IN FRONT COVER. STARTERS SHALL BE MOUNTED IN NEMA 3R ENCLOSURES FOR USE IN KITCHEN AREAS, NEMA 1 IN INDOOR FINISHED AREAS, AND NEMA 4 FOR OUTDOOR INSTALLATION. SQUARE D CLASS 8536.
- 31. CONNECTION OF MECHANICAL EQUIPMENT:**
- A. THE ELECTRICAL CONTRACTOR IS CAUTIONED TO NOTE CAREFULLY OTHER SECTIONS OF THESE SPECIFICATIONS DESCRIBING ELECTRICAL EQUIPMENT TO BE FURNISHED UNDER THESE SECTIONS IN ORDER THAT HE MAY FULLY UNDERSTAND THE WIRING REQUIREMENTS.
- B. ALL POWER WIRING AND FEEDERS FOR MECHANICAL EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. MOTOR STARTERS WHICH ARE NOT AN INTEGRAL PART OF EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. SAFETY OR DISCONNECT SWITCHES WHERE INDICATED OR REQUIRED SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. MOTOR CONTROL WIRING AND EQUIPMENT WILL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR UNLESS OTHERWISE NOTED OR INDICATED ON THE DRAWINGS.
- C. COORDINATE ALL REQUIRED CONTROL WIRING AND LOW VOLTAGE WIRING WITH MECHANICAL EQUIPMENT SUPPLIER.
- 32. SHOP DRAWINGS:**
- ELECTRICAL CONTRACTOR SHALL SUBMIT EQUIPMENT SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW PRIOR TO INSTALLATION OF LIGHTING FIXTURES, ELECTRICAL DISTRIBUTION PANELS, MOTOR STARTERS, DISCONNECT SWITCHES, AND WIRING DEVICES. NOTE: REVIEW OF CONTRACTORS SHOP DRAWINGS DOES NOT RELIEVE THE ELECTRICAL CONTRACTOR OF HIS RESPONSIBILITY TO CONFORM TO THE CONTRACT DOCUMENTS AND APPLICABLE CODES.
- 33. GUARANTEE:**
- ELECTRICAL CONTRACTOR SHALL GUARANTEE ALL WORK INSTALLED BY HIS WORKMEN UNDER THIS CONTRACT TO BE FREE FROM ALL DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE YEAR AFTER THE ACCEPTANCE OF THE BUILDING BY THE OWNER, AND SHOULD DEFECTS OCCUR WITHIN THIS PERIOD, REPAIR AND/OR REPLACE DEFECTIVE ITEMS, AT NO EXPENSE TO THE OWNER.
- 34. NAMEPLATES:**
- MOTOR CONTROLS, PANELBOARDS, DISCONNECT SWITCHES, ETC., SHALL BE IDENTIFIED WITH MANUFACTURER'S NAMEPLATES, SHOP ORDERS, WHERE APPLICABLE ON COMPOSITE ASSEMBLIES, AND DESIGNATIONS USED ON THE DRAWINGS. NAMEPLATES FOR THIS PURPOSE SHALL BE LAMINATED PHENOLIC PLASTIC, BEVELED EDGE, BLACK WITH ENGRAVED WHITE LETTERS. EXCEPT WHERE IMPRACTICAL, LETTERS AND NUMERALS SHALL BE A MINIMUM OF 1/2" HIGH. DYMO LABELS SHALL NOT BE USED FOR THIS PURPOSE. PANEL DIRECTORIES SHALL BE NEATLY TYPED SHOWING EQUIPMENT SERVED AND LOCATION FOR EACH BREAKER OR SWITCH.
- 35. FINAL TESTING:**
- ALL CIRCUITS AND EQUIPMENT SHALL BE TESTED UPON COMPLETION OF WORK AND FINAL TESTS, WHEN REQUESTED, SHALL BE DONE IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE. ANY CIRCUITS OR EQUIPMENT FOUND TO BE DEFECTIVE SHALL BE REPLACED OR REPAIRED, AS NECESSARY, AND THEN RETESTED WITHOUT ADDITIONAL EXPENSE TO THE OWNER.
- 36. CLEANING:**
- UPON COMPLETION OF THE PROJECT, ALL ENCLOSURES SHALL BE LEFT FREE OF REFUSE AND THE EXTERIOR FREE OF DIRT AND PAINT SPLATTERS.
- mechanical electrical engineering consultants pc**
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- THIS DRAWING IS DIAGRAMMATIC AND SHOULD BE USED TO DETERMINE THE DESIGN INTENT. THE CONTRACTOR SHALL FIELD VERIFY ALL WORK AND SHALL NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES IN THE DOCUMENTS BEFORE PROCEEDING. FAILURE TO DO SO WILL RESULT IN THE CONTRACTOR TAKING FULL RESPONSIBILITY AND LIABILITY FOR SAID DISCREPANCIES. NOTICE: THE DRAWING AND THE DESIGN ARE THE PROPERTY OF MECHANICAL ELECTRICAL ENGINEERING CONSULTANTS, PC AND NO ALTERATIONS AND/OR TRANSFERS OF WORK ARE PERMITTED UNLESS WRITTEN APPROVAL IS GRANTED BY MECHANICAL ELECTRICAL ENGINEERING CONSULTANTS, PC.

prepared for:



prepared by:



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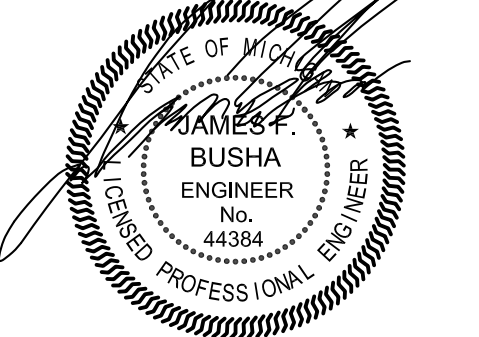
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ELECTRICAL SPECIFICATIONS

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Bids/Permits 1-14-15

SHEET E-301