Harnett COUNTY NORTH CAROLINA

Emergency Services Department
www.harnett.org

Fire Marshal Division
P.O. Box 370
Lillington, NC 27546
910-893-7580

Reviewed for Fire Code Compliance
Harnett COUNTY NORTH CAROLINA Leslie Jackson
07/25/2025 1:48:50 PM

Application for Plan Review

Permit Type: Fire Alarm Detection System/Related Equipment

Date Received: _____ Received By:_____

Name of Project: Baucom Business Plaza - S1

Physical Address of Project: 11132 U.S. 401 N

Plans Submitted By: Christopher Mercer

Project Phone: (910)-922-7010

Contact Person/Address: 818 Ramsey Street
Fayetteville, NC 28301

Contact Phone: (910)-433-2868 (910)-584-4740

Contractor's Name/Info: Christopher Mercer
LIC# SP.FA/LV.24116

Contractor's Phone: (910)-584-4740

Contact Email: Christopher@gillsecurity.com

- **Plans that are submitted will be reviewed as quickly as possible with an average time of review between 7-10 working days.**
- **Status checks may be conducted on plan reviews by visiting the website http://hteweb.harnett.org/Click2GovBP/Index.jsp or by calling the Harnett County Central Permitting Office (910-893-7525 : Opt. 2), or the Harnett County Fire Marshal's Office (910-893-7580).**
- **Approved plans must be picked up from the Central Permitting Office and all fees paid before any required inspections can be conducted.**

PLUMBING GENERAL NOTES

GENERAL REQUIREMENTS:

1. GENERAL AND SPECIAL CONDITIONS: GENERAL AND SPECIAL CONDITIONS ARE HEREBY MADE AN INTEGRAL PART OF THIS DIVISION OF THE SPECIFICATIONS INSOFAR AS SAME ARE APPLICABLE TO THE WORK UNDER THIS DIVISION AND UNLESS OTHERWISE SPECIFIED.
2. SCOPE PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETION AND OPERATION OF ALL SYSTEMS IN THIS SECTION OF WORK IN ACCORDANCE WITH ALL APPLICABLE CODES.
3. PERMITS: APPLY FOR AND PAY FOR ALL NECESSARY PERMITS, FEES, AND INSPECTIONS REQUIRED BY ANY PUBLIC AUTHORITY HAVING JURISDICTION.
4. WARRANTY: PROVIDE ALL MATERIALS AND EQUIPMENT UNDER THIS SECTION OF THE SPECIFICATIONS WITH A ONE YEAR WARRANTY FROM THE DATE OF ACCEPTANCE OF WORK BY THE OWNER.
5. COORDINATION: VERIFY ALL ROUGH-IN LOCATIONS AND COORDINATE PIPING AND EQUIPMENT LOCATIONS WITH WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS TO AVOID CONFLICTS. CONTRACTOR MUST COORDINATE WITH OTHER TRADES FOR ALL STRUCTURES, PIPING, CONDUIT, DUCTWORK, LIGHTING, ETC. TO PROPERLY BE INSTALLED. ANY CONFLICTS SHALL BE RESOLVED AT NO CHARGE TO THE OWNER. COORDINATE INSTALLATION OF ALL PLUMBING LINES AT CMU WALLS SO THAT PLUMBING LINES ARE PLACED IN WALL DURING CMU WALL CONSTRUCTION. CUTTING AND PATCHING OF CMU WALLS IN PLACE WILL NOT BE PERMITTED.
6. FIELD VERIFICATION: FIELD VERIFY EXISTING CONDITIONS BEFORE STARTING CONSTRUCTION AND NOTIFY THE ARCHITECT/ENGINEER OF RECORD OF ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND EXISTING CONDITIONS AND/OR ANY POTENTIAL PROBLEMS OBSERVED BEFORE CONTINUING WORK IN THE EFFECTED AREAS.
7. PLUMBING SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO:
   - PLUMBING FIXTURES AND EQUIPMENT
   - FIRE STOPPING
   - DOMESTIC WATER SYSTEM
   - SANITARY WASTE AND VENT SYSTEM
   - GAS SYSTEM
   - STORM DRAIN/SEWER SYSTEM

FIXTURES:

1. PROVIDE COMPLETE FIXTURES AND INCLUDE SUPPLIES, STOPS, VALVES, FAUCETS, DRAINS, TRAPS, TAIL PIECES, ESCUTCHEONS, ETC.

FIRE STOPPING:

1. FIRE STOP ALL PENETRATIONS, BY PIPING OR CONDUITS, OF FIRE RATED WALLS, FLOORS AND PARTITIONS. PROVIDE A DEVICE(S) OR SYSTEM(S) WHICH HAS BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814 AND INSTALL IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE A DEVICE(S) OR SYSTEM(S) WITH AN 'F' RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED.

DOMESTIC WATER:

1. FURNISH AND INSTALL A COMPLETE SYSTEM OF HOT AND COLD WATER, AND WASTE PIPING FROM EXISTING SUPPLIES TO ALL FIXTURES AND/OR EQUIPMENT REQUIRING THIS SERVICE. VERIFY LOCATION OF BEGINNING POINTS.
2. DOMESTIC WATER PIPING BELOW GRADE:
   SOFT ANNEALED SEAMLESS COPPER TUBING, TYPE 'K' WITH NO JOINTS BELOW GRADE (ASTM B 88).
3. DOMESTIC WATER PIPING AND JOINTS ABOVE GRADE:
   HARD DRAWN SEAMLESS COPPER TUBING, TYPE 'L' WITH 95-5 SILVER SOLDERED JOINTS (ASTM B 88). CPVC AND OR CROSS-LINKED POLYTHEYLENE (PEX TYPE A) (ASTM F877) PLASTIC HOT AND COLD WATER DISTRIBUTION IS ALLOWED WHERE PERMISSIBLE AND PRE-APPROVED.
4. STERILIZE DOMESTIC WATER PIPING IN ACCORDANCE WITH THE AMERICAN WATER WORKS ASSOCIATION'S SPECIFICATIONS AND LOCAL HEALTH DEPARTMENT REGULATIONS.
5. INSULATE DOMESTIC WATER PIPING ABOVE GRADE (EXCEPT EXPOSED CONNECTIONS TO PLUMBING FIXTURES) WITH ENGINEERED POLYMER FOAM INSULATION OR FIBERGLASS WITH FITTING INSERTS AND PVC COVERS. FOLLOW THIS SCHEDULE:

SERVICE	PIPE SIZE	INS. THICKNESS
DOMESTIC HOT WATER (105-140 DEG.F)	1/2" - 1-1/2"	1/2"
DOMESTIC HOT WATER (105-140 DEG.F)	2" AND UP	3/4"
DOMESTIC HOT WATER (140-160 DEG.F)	ALL	1"
DOMESTIC HOT WATER CIRCULATION	ALL	1/2"
DOMESTIC COLD WATER	ALL	1/2"

6. DOMESTIC WATER PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES ARE REQUIRED TO MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS, AS TESTED BY ASTM E84 (NFPA 255) METHOD.
7. DO NOT INSTALL DOMESTIC WATER PIPING IN AREAS SUBJECT TO FREEZING TEMPERATURES. INSTALL WATER PIPING IN EXTERIOR WALLS ON THE CONDITIONED SIDE OF THE WALL INSULATION.
8. SHUT OFF VALVES: PROVIDE FULL PORT, BALL TYPE, AND INSTALL IN A LOCATION THAT PERMITS ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS. PROVIDE ACCESS DOORS IF REQUIRED.
9. PROTECT COPPER PIPING AGAINST CONTACT WITH DISSIMILAR METALS. ALL HANGERS, SUPPORTS, ANCHORS, AND CLIPS SHALL BE COPPER OR COPPER PLATED. WHERE COPPER PIPING IS CARRIED ON IRON TRAPEZE HANGERS WITH OTHER PIPING, PROVIDE A PERMANENT ELECTROLYTIC ISOLATION MATERIAL TO PREVENT CONTACT WITH OTHER METALS.
10. PROTECT COPPER PIPING AGAINST CONTACT WITH ALL MASONRY. WHERE COPPER IS SLEEVED THROUGH MASONRY, PROVIDE COPPER OR RED BRASS SLEEVES. WHERE COPPER MUST BE CONCEALED IN OR AGAINST MASONRY PARTITIONS, PROVIDE A HEAVY COATING OF ASPHALTIC ENAMEL ON THE COPPER PIPING AND15# ASPHALT SATURATED FELT BETWEEN THE PIPING AND THE MASONRY PARTITION.
11. HOSE BIBS SHALL BE PROVIDED WITH A NON-REMOVABLE VACUUM BREAKER.
12. FURNISH BURST PROOF BRAIDED FLEXIBLE CONNECTORS FOR SINK CONNECTIONS AND CONNECTIONS TO EQUIPMENT.
13. PROVIDE ZURN WILKINS MODEL 740 (OR EQUAL) BACKFLOW PREVENTION TYPE VACUUM BREAKER FOR ICE MACHINE, CARBONATOR AND OTHER EQUIPMENT AS REQUIRED BY CODE.
14. P.C. SHALL VERIFY THE INCOMING WATER PRESSURE AND PROVIDE A PRESSURE REDUCING VALVE IF PRESSURE IS 80 PSI OR GREATER.
15. P.C. SHALL INSTALL HAMMER ARRESTORS ON PROJECTS THAT USE QUICK CLOSING DEVICES SUCH AS FLUSH VALVES, ICE MAKER, WASHER MACHINES, ETC., SIZED PER MANUFACTURER RECOMMENDATIONS.
16. PC SHALL PROVIDE ALL WATER HEATERS (WATTAGE/INPUT AND CAPACITY AS NOTED IN SCHEDULE). ALL WATER HEATERS SHALL BE THIRD PARTY CERTIFIED; PROVIDE PANS FOR WATER HEATERS IN ACCORDANCE WITH 504.7 OF THE NC PLUMBING CODE. ELECTRICAL CONNECTIONS SHALL BE BY ELECTRICAL CONTRACTOR. PC SHALL COORDINATE WITH EC ON ELECTRICAL CHARACTERISTICS OF THE EQUIPMENT PROVIDED.
17. ALL PUMPS SHALL BE RATED FOR TRANSPORT OF POTABLE WATER. PUMPS IN AN INDIVIDUAL WATER SUPPLY SYSTEM SHALL BE CONSTRUCTED AND INSTALLED SO AS TO PREVENT CONTAMINATION FROM ENTERING THE WATER SUPPLY SYSTEM.

SANITARY WASTE AND VENT PIPING:

16. FURNISH AND INSTALL COMPLETE SYSTEMS OF SOIL, WASTE, AND VENT PIPING FROM ALL PLUMBING FIXTURES, AND/OR OTHER EQUIPMENT. ALL SOIL, WASTE AND VENT LINES SHALL BE CONCEALED IN THE BUILDING CONSTRUCTION WHERE POSSIBLE.
17. INVERT ELEVATIONS SHALL BE ESTABLISHED AND VERIFIED BEFORE WASTE PIPING IS INSTALLED IN ORDER THAT PROPER SLOPES WILL BE MAINTAINED.
18. SANITARY WASTE AND VENT PIPING AND FITTINGS: SERVICE WEIGHT CAST IRON, HUB AND SPIGOT TYPE WITH COMPRESSION JOINTS (ASTM A 74) OR NO-HUB PIPING WITH COUPLINGS (CISPI 301).

    IF PERMITTED BY LOCAL CODES, SCHEDULE 40 PVC (ASTM D 2665) WITH SCHEDULE 40 SOCKET-TYPE PIPE FITTINGS (ASTM D 3311) MAY BE USED. DO NOT INSTALL PVC PIPING IN RETURN AIR PLENUMS. PVC FOAM CORE DWV PIPING NOT PERMITTED.
19. SLOPE SANITARY WASTE PIPING 2-1/2" AND SMALLER AT 1/4" PER FOOT MIN. SLOPE SANITARY WASTE PIPING 3" AND LARGER AT 1/8" PER FOOT MINIMUM.
20. WHERE WASTE PIPING IS EXPOSED IN REST ROOM AREAS, PROVIDE CHROME PLATED BRASS PIPING, WITH MATCHING STOPS AND ESCUTCHEONS. PROVIDE REMOVABLE TRAPS WITH INTEGRAL CLEAN-OUT PLUG FOR ALL LAVATORIES.
21. INSTALL CLEAN-OUTS IN A LOCATION THAT PERMITS ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS. PROVIDE CLEANOUTS AT THE BASE OF ALL WASTE STACKS, AT ALL CHANGE IN DIRECTION OF PIPING IN EXCESS OF 45 DEGREES AND EVERY 100 FEET.
22. ALL INDIRECT WASTE CONNECTIONS TO BE INSTALLED WITH AN AIR GAP BETWEEN INDIRECT WASTE PIPE AND THE FLOOD RIM OF THE WASTE RECEPTOR SHALL BE MINIMUM OF TWICE THE EFFECTIVE OPENING OF THE INDIRECT WASTE PIPE.
23. ROOF PENETRATIONS SHALL MAINTAIN A MINIMUM CLEARANCE OF 16" BETWEEN PENETRATIONS.
24. PLUMBING VENTS SHALL BE INSTALLED WITH MINIMUM HEIGHTS AS REQUIRED BY LOCAL JURISDICTION HAVING AUTHORITY.

BACKFLOW PREVENTION:

1. VERIFY BACKFLOW PREVENTOR REQUIREMENTS OF LOCAL AUTHORITY AND PROVIDE BACKFLOW PREVENTION DEVICES AS REQUIRED. COORDINATE LOCATION WITH OTHER TRADES.

WATER METER:

1. VERIFY DOMESTIC WATER METER REQUIREMENTS OF LOCAL AUTHORITY AND PROVIDE DOMESTIC WATER METER AS REQUIRED. COORDINATE LOCATION WITH OTHER TRADES.

SEISMIC REQUIREMENTS:

1. PROPERLY SUPPORT AND BRACE VERTICALLY AND HORIZONTALLY ALL PIPING, APPARATUS, EQUIPMENT, ETC. IN ACCORDANCE WITH APPLICABLE CODES TO PREVENT EXCESSIVE MOVEMENT DURING SEISMIC CONDITIONS.

GAS PIPING:

1. WORK TO INCLUDE PIPING FROM GAS METER TO GAS FIRED EQUIPMENT. PLUMBING CONTRACTOR TO PROVIDE SHUT-OFF VALVE, DIRT TRAP AND PRESSURE REGULATOR AT THE GAS FIRED EQUIPMENT.
2. ALL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE LOCAL CODE REQUIREMENTS AND THE PROVISIONS OF NFPA-54 AND NFPA-58.
3. THE CONTRACTOR SHALL SUPPLY ALL PERMITS, FEES AND LICENSES REQUIRED FOR THE WORK AND FOR ALL INSPECTIONS REQUIRED.
4. PIPE 3" AND SMALLER SHALL BE SCHEDULE 40 STEEL WITH THREADED MALLEABLE FITTINGS.
5. VALVES SHALL BE GAS COCKS MANUFACTURED BY NIBCO.
6. ALL PIPING EXPOSED TO THE OUTDOORS OR RUN IN UNCONDITIONED SPACES SHALL BE PAINTED WITH TWO COATS OF RUST RESISTANT ENAMEL.
7. ALL GAS PIPING WITH A SERVICE PRESSURE GREATER THAN 0.5PSI MUST BE IDENTIFIED PER NCFGC 410.2.
8. PRESSURE TEST PORTS MUST BE PROVIDED AT ALL MP REGULATORS IN ACCORDANCE TO NCFGC 410.2.
9. ALL GAS PIPING MUST COMPLY WITH NCFGC T.415.1.

PLUMBING FIXTURE SCHEDULE

MARK	DESCRIPTION	REMARKS	FIXTURE CONNECTIONS			
			CW	HW	WASTE	VENT
FCO	FLOOR CLEANOUT	ZURN MODEL ZN-1400 "LEVEL-TROL" ADJUSTABLE FLOOR CLEANOUT WITH NICKEL BRONZE TOP. CLEANOUT SIZE SHALL MATCH LINE SIZE. PROVIDE ANY NECESSARY MODIFICATIONS OR ACCESSORIES SUCH AS CARPET MARKER, TILE OR SQUARE TOP AS REQUIRED TO BE FLUSH WITH AND MATCH FLOOR FINISH. PROVIDED AND INSTALLED BY PLUMBING CONTRACTOR.	-	-	4"	-
WC-1	WATER CLOSET - TANK TYPE (ADA)	AMERICAN STANDARD - CHAMPION PRO (1.28 GPF) # 211AA004.020. TWO PIECE FLOOR MOUNTED WATER CLOSET. ADA HEIGHT. COLOR: WHITE. PROFLOW PFTSCOF2000WH ELONGATED BOWL SEAT, COLOR: WHITE. PROVIDED AND INSTALLED BY PLUMBING CONTRACTOR.	1/2"	-	3"	2"
LV-1	LAVATORY (ADA) - WALL HUNG	WALL HUNG LAVATORY (AMERICAN STANDARD "LUCERNE." 0355012020) WITH CONCEALED ARM CARRIER MOUNTING. PROVIDE PROFLO PFWS2840CP FAUCET. HANDICAP DRAIN OFFSET W/GRID DRAIN (ZURN Z8746- PC) AND CHROME PLATED P. - TRAP (ZURN Z8701-PC). McGUIRE MODEL LF2165, CHROME PLATED BRASS ANGLE SUPPLY STOPS WITH BRASS STEMS, WHEEL HANDLES, 1/2" IPS INLETS, 3/8" COMPRESSION OUTLETS, 12" CHROME PLATED FLEXIBLE SUPPLY RISERS. INSULATE TRAP AND SUPPLY LINES (TRUEBRO "LAVGUARD" #103 E-Z). PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL AN ASSE 1070 COMPLIANT THERMOSTATIC MIXING VALVE SET AT 105 DEGREES.	1/2"	1/2"	2"	2"

NOTE: CONTRACTOR SHALL COORDINATE FINAL FIXTURE SELECTIONS WITH OWNER AND ARCHITECT PRIOR TO PURCHASE AND INSTALLATION

PLUMBING DRAWING INDEX	
P0.1	PLUMBING LEGENDS AND NOTES
P1.1	WASTE PIPING PLAN - TOP FLOOR
P1.2	WATER PIPING PLAN - TOP FLOOR

PLUMBING LEGEND

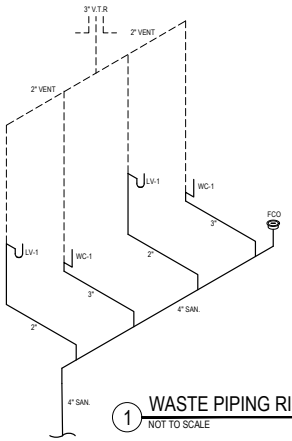
	DOMESTIC COLD WATER PIPING (CW)
	DOMESTIC HOT WATER PIPING (HW)
	SANITARY PIPING
	GREASE PIPING
	VENT PIPING
OR	FLOOR CLEANOUT
	PIPE CONTINUES
OR	PIPE DOWN
OR	PIPE UP
	BALL VALVE
	PRESSURE REDUCING VALVE
M	METER
PC	PLUMBING CONTRACTOR
CW	DOMESTIC COLD WATER PIPING
HW	DOMESTIC HOT WATER PIPING
HWR	DOMESTIC HOT WATER RECIRCULATING
SAN	SANITARY WASTE PIPING
VTR	VENT THROUGH ROOF

SEE ARCHITECTURAL PLANS FOR MINIMUM FACILITIES CALCULATIONS

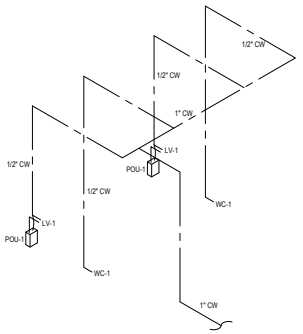
CONNECTED LOADS	
SOIL AND WASTE	DFU
COLD WATER	WFSU
DEMAND	GPM

PLUMBING EQUIPMENT SCHEDULE

MARK	DESCRIPTION	LOCATION	MANUFACTURER	MODEL	SPECIFICATIONS
POU-1	POINT-OF-USE WATER HEATER	BATHROOMS	EEMAX	SPEX2412	TANKLESS POINT-OF-USE WATER HEATER. UNIT SHALL HAVE ABS UL 94 5VA RATED COVER. UNIT SHALL ALLOW MOUNTING IN ANY ORIENTATION. ELEMENT SHALL BE REPLACEABLE CARTRIDGE INSERT. ELEMENT SHALL BE IRON-FREE. NICKEL-CHROME MATERIAL. UNIT SHALL HAVE REPLACEABLE FILTER IN THE INLET CONNECTOR. UNIT SHALL INCLUDE AN INTEGRATED FLOW METER TO ENSURE ACCURATE TURN-ON / TURN-OFF FLOW RATE. HEATER SHALL BE FITTED WITH 3/8" COMPRESSION FITTINGS TO ELIMINATE THE NEED FOR SOLDERING. MAXIMUM OPERATING PRESSURE OF 150 PSI. DIAGNOSTIC FEATURES TO INCLUDE LED ERROR/FAULT INDICATOR. HEATER SHALL EMPLOY TECHNOLOGY THAT ENGAGES UPON START-UP TO AVOID DRY-FIRE OCCURRENCE. HOT WATER STORAGE TANKS PROHIBITED. UNIT SHALL BE EEMAX OR APPROVED EQUAL.



1 WASTE PIPING RISER DIAGRAM
NOT TO SCALE



2 WATER PIPING RISER DIAGRAM
NOT TO SCALE

SHARPE
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Wilsons Mills, NC 27593
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NC License # P-2621

DISCLAIMER

PRELIMINARY
NOT FOR CONSTRUCTION

DESIGN FOR:
BAUCOM BUSINESS PLAZA - S1
11132 U.S. 401 N
FUQUAY-VARINA, NC 27526

REV. NO.	DATE	DESCRIPTION
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ISSUE NO.	DATE	DESCRIPTION
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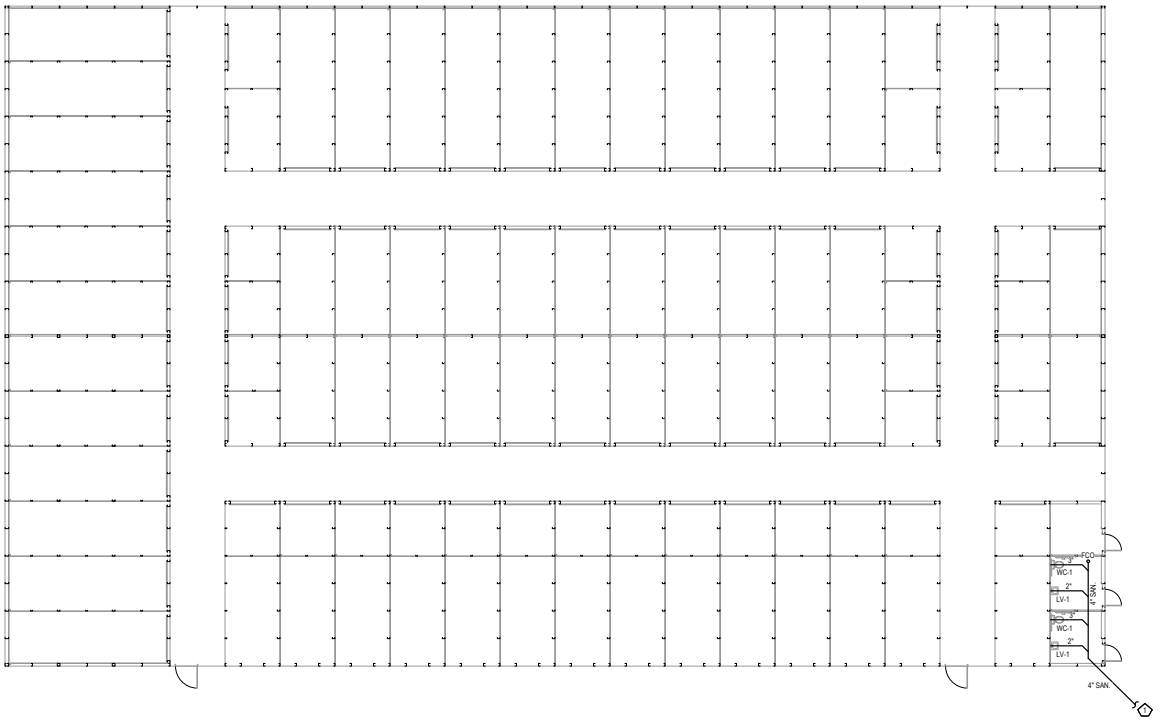
PROJECT NO.	DRAWN BY: DBAS
24-029	CHECKED BY: DBAS

PLUMBING LEGENDS AND NOTES

P0.1

WASTE KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	CONTINUES TO SANITARY SEWER TIE IN ON SITE. SEE SITE PLANS BY OTHERS FOR EXACT TIE-IN LOCATION.



1 WASTE PLAN - TOP FLOOR
SCALE - 3/32" = 1'0"

SHARPE
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P.O. Box G
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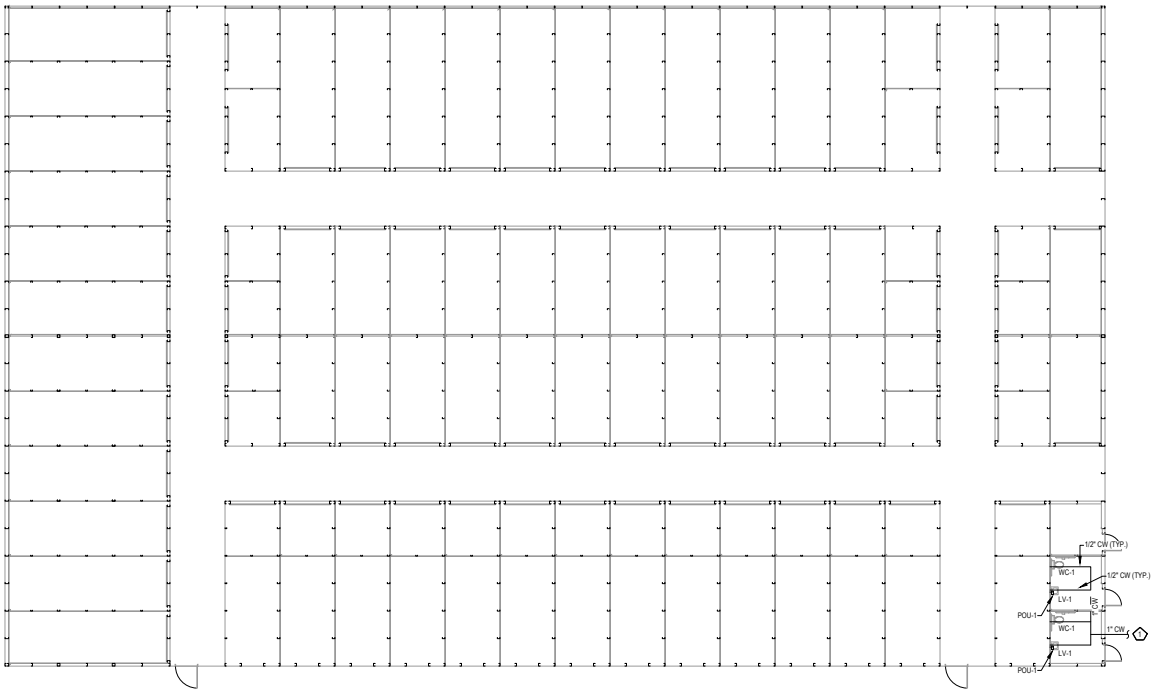
PROJECT NO.: 24-029
DRAWN BY: DBAG
CHECKED BY: DBAG

WASTE PIPING PLAN - TOP FLOOR

P1.1

WATER KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	CONTINUES TO CW TIE IN ON SITE. SEE SITE PLANS BY OTHERS FOR EXACT TIE-IN LOCATION AND LOCATION OF MAIN SHUT-OFF VALVE.

ALL REQUIRED VALVES NOT SHOWN.
INSTALL FULL OPEN VALVES PER 2018 PC CODE 606.1.5 AND 606.1.8
INSTALL SHUT OFF VALVES PER 2018 NC PLUMBING CODE 606.2 AND 606.2.1



1 WATER PLAN - TOP FLOOR
SCALE - 3/32" = 1'0"

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PROJECT NO.: 24-029
DRAWN BY: DBAG
CHECKED BY: DBAG

WATER PIPING PLAN - TOP FLOOR

P1.2

HVAC GENERAL NOTES

1. MECHANICAL CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETE INSTALLATION AND OPERATION OF ALL SYSTEMS IN THIS SECTION OF WORK IN ACCORDANCE WITH RECOMMENDED PRACTICE, 2018 NORTH CAROLINA MECHANICAL CODE AND ALL APPLICABLE CODES ADOPTED BY THE AUTHORITY HAVING JURISDICTION.
2. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF WALLS, DOORS, WINDOWS, FURNITURE, LIGHTS, CEILING DIFFUSERS, ETC.
3. ALL MECHANICAL PERMITS AND INSPECTION FEES SHALL BE OBTAINED AND PAID FOR BY THE MECHANICAL CONTRACTOR.
4. MECHANICAL CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS FOR ONE YEAR. REFRIGERANT COMPRESSORS SHALL BE GUARANTEED FOR FIVE YEARS. WARRANTY PERIOD SHALL BE EFFECTIVE THE DAY THE PROJECT IS ACCEPTED BY THE OWNER.
5. DRAWINGS ARE DIAGRAMMATIC AND MAY NOT SHOW ALL REQUIRED FITTINGS. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE TYPE, SIZE AND LOCATION OF ALL AIR DEVICES, DUCTWORK, PIPING AND EQUIPMENT WITH THE CEILING PLAN, LIGHTS, STRUCTURAL ELEMENTS AND OTHER TRADES. MECHANICAL CONTRACTOR TO FURNISH AND INSTALL ALL BENDS, OFFSETS, ELBOWS, ETC. AS REQUIRED. VERIFY ALL CLEARANCES PRIOR TO FABRICATING DUCTWORK, OR ORDERING ANY EQUIPMENT, PIPING, ETC.
6. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING MATERIALS AND INSTALLING THE WORK IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES ADOPTED BY THE AUTHORITY HAVING JURISDICTION.
7. THE MC SHALL VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS. THE MC SHALL CONTACT THE ENGINEER TO RESOLVE ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THESE PLANS. THE MC SHALL COORDINATE WITH OTHER TRADES PRIOR TO THE START OF CONSTRUCTION.
8. THE MC SHALL VERIFY THE FUNCTIONALITY AND OPERATION OF ALL EXISTING MECHANICAL EQUIPMENT IN THE AREA OF WORK, REPLACE FILTERS, LEAK TEST AND RECHARGE REFRIGERANT LINES, REPLACE OR LUBRICATE BEARINGS, CHECK LINKAGES AND ACTUATORS, AND PERFORM OTHER MAINTENANCE SERVICE AS NECESSARY TO GET THE EQUIPMENT IN PROPER WORKING ORDER.
9. DUCTWORK
   A. NON-RESIDENTIAL AREAS: ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS WITH A MINIMUM PRESSURE CLASSIFICATION OF 2", SEAL CLASS C, WITH A MAXIMUM LEAKAGE RATE OF 5% RESIDENTIAL/DWELLING AREAS: ALL DUCTWORK SHALL BE FIBROUS GLASS DUCT BOARD FACED ON THE OUTSIDE WITH A FIRE RETARDANT, REINFORCED FOIL-SCRIM-KRAFT FACING, CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS. DUCT INSULATION IS TO BE MIN. R-6 WHEN LOCATED WITHIN THE CONDITIONED BUILDING ENVELOPE; MIN. R-8 WHEN LOCATED IN THE ATTIC, OUTSIDE THE BUILDING ENVELOPE OR UNCONDITIONED SPACES.
   B. ALL SQUARE ELBOWS SHALL HAVE TURNING VANES.
   C. ALL DUCT DIMENSIONS SHOWN ARE INTERNAL CLEAR DIMENSIONS.
   D. PROVIDE A MANUAL BALANCING DAMPER AT ALL SUPPLY AND RETURN BRANCH TAKEOFFS, AS WELL AS ALL OUTSIDE AIR MAIN & BRANCH DUCTS.
   E. FLEXIBLE DUCT, IF SHOWN ON DRAWINGS, SHALL BE INSULATED ROUND DUCT WITH AN OUTER GLASS REINFORCED SILVER MYLAR JACKET ENCLOSING MIN. 1-1/2" THICK GLASS FIBER INSULATION AROUND A CONTINUOUS INNER LINER, AND SHALL CONFORM TO THE REQUIREMENTS OF U.L. 181 FOR CLASS 1 FLEXIBLE AIR DUCTS. MAXIMUM LENGTH OF FLEXIBLE DUCT SHALL BE 6 FEET FOR COMMON AREA SYSTEMS; MAXIMUM LENGTH OF FLEXIBLE DUCT SHALL NOT BE LIMITED FOR DWELLING UNIT SYSTEMS. *R* VALUE TO MEET/EXCEED ENERGY CODE (NCECC SECTION C 403.2.9): DUCT INSULATION IS TO BE MIN. R-6 WHEN LOCATED WITHIN THE CONDITIONED BUILDING ENVELOPE; MIN. R-8 WHEN LOCATED IN THE ATTIC, OUTSIDE THE BUILDING ENVELOPE OR UNCONDITIONED SPACES.
   F. ALL SHEET METAL DUCTWORK WITHIN 10' OF THE AIR HANDLING UNIT SHALL BE PROVIDED WITH ACOUSTICAL DUCT LINER. THIS IS IN ADDITION TO THERMAL INSULATION REQUIREMENTS.
   G. ALL DUCT SYSTEMS ARE TO BE PER U.L. STANDARDS. DUCTS ARE TO BE INSTALLED WITH NO RESTRICTIONS AND AN ABSOLUTE MINIMUM AMOUNT OF AIR LEAKAGE.
   H. ALL DUCT INSULATION SHALL BE RUN CONTINUOUSLY THROUGH FLOORS AND PARTITIONS.
10. PIPING
   A. CONDENSATE DRAINS SHALL BE SCHEDULE 40 PVC OR TYPE L COPPER WITH SOLDERED JOINTS WHEN INSTALLED BELOW CEILING LEVEL. DRAINS INSTALLED IN A RETURN AIR PLENUM SHALL BE TYPE L COPPER WITH SOLDERED JOINTS OR SCHEDULE 40 CPVC.
   B. REFRIGERANT PIPING SHALL BE TYPE ACR WROUGHT COPPER WITH WROUGHT COPPER FITTINGS AND BRAZED JOINTS.
   C. REFRIGERANT COMPONENTS SHALL BE PRESSURE TESTED IN ACCORDANCE WITH ASHRAE 15.
   D. MECHANICAL CONTRACTOR SHALL PROVIDE REFRIGERANT PIPING FOR ALL MECHANICAL SYSTEMS WITHIN THIS SCOPE OF WORK. COORDINATE ROUTING AND INSTALLATION WITH THE GENERAL CONTRACTOR. SIZE REFRIGERANT LINES PER MANUFACTURER'S REQUIREMENTS.
11. INSULATION
   A. DUCT LINER - FIBROUS GLASS DUCT LINER, WITH COATED SURFACE EXPOSED TO AIR STREAM. APPLY WITH MECHANICAL FASTENERS AND 100% COVERAGE OF ADHESIVE. LINER TO BE COATED WITH AN EPA REGISTERED ANTI-MICROBIAL AGENT. DUCT INSULATION VALUE IS TO BE MIN. R-6 WHEN LOCATED WITHIN THE CONDITIONED BUILDING ENVELOPE; MIN. R-8 WHEN LOCATED IN THE ATTIC, OUTSIDE THE BUILDING ENVELOPE OR UNCONDITIONED SPACES. DUCT LINER USED FOR ACOUSTICAL PURPOSES ONLY SHALL BE 1" THICK.
   B. DUCT WRAP - MINERAL FIBER BLANKET, WITH REINFORCED FOIL AND PAPER VAPOR RETARDANT JACKET. APPLY WITH MECHANICAL FASTENERS AND ADHESIVE. DUCT INSULATION IS TO BE MIN. R-6 WHEN LOCATED WITHIN THE CONDITIONED BUILDING ENVELOPE; MIN. R-8 WHEN LOCATED IN THE ATTIC, OUTSIDE THE BUILDING ENVELOPE OR UNCONDITIONED SPACES.
   C. INTERIOR CONDENSATE DRAINS - INSULATE CONDENSATE DRAINS LOCATED IN THE ATTIC, EXTERIOR WALLS OR UNCONDITIONED SPACES WITH 1/2" THICK FLEXIBLE ELASTOMERIC PIPE INSULATION.
   D. REFRIGERANT SUCTION LINES - INSULATE WITH 1" THICK FLEXIBLE ELASTOMERIC PIPE INSULATION. PROVIDE ALUMINUM JACKET OVER INSULATION FOR ALL EXTERIOR REFRIGERANT PIPING.
   E. AIR DISTRIBUTION - INSULATE THE TOP-SIDE OF ALL AIR DISTRIBUTION DEVICES.
12. ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS & ROOF SHALL BE FLASHED & COUNTER-FLASHED IN A WATERPROOF MANNER.
13. EXTEND ALL CONDENSATE DRAINS TO JANITORS SINK, FLOOR DRAIN, SPLASH BLOCK OR AS REQUIRED PER CODE. DRAINS FROM MECHANICAL EQUIPMENT SHALL BE PROVIDED W/ A DEEP SEAL TRAP. SLOPE CONDENSATE DRAIN PIPING AT MIN. 1/8" PER FOOT.
14. NON-RESIDENTIAL AREAS: LOCATE ALL THERMOSTATS, SWITCHES AND OTHER CONTROL DEVICES AT 4'-0" ABOVE FINISHED FLOOR. FURNISH A THERMOSTATIC CONTROL DEVICE FOR EVERY DEVICE REQUIRING ONE WHETHER SHOWN ON DRAWINGS OR NOT. RESIDENTIAL/DWELLING AREAS: LOCATE ALL THERMOSTATS, SWITCHES AND OTHER CONTROL DEVICES AT 4'-0" TO ABOVE FINISHED FLOOR FOR STANDARD DWELLING UNITS. 4'-0" TO TOP OF DEVICE FOR ACCESSIBLE UNIT TYPES. FURNISH THERMOSTATIC CONTROL DEVICE FOR EVERY DEVICE REQUIRING ONE WHETHER SHOWN ON DRAWINGS OR NOT.
15. ALL EQUIPMENT SHALL BE INSTALLED PER CODE & MANUFACTURER'S REQUIREMENTS FOR PROPER OPERATION AND SERVICE/ACCESS CLEARANCES.
16. ALL EQUIPMENT SHALL BE U.L LISTED.
17. MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO AIR QUANTITIES INDICATED ON PLANS. CONTRACTOR SHALL PROVIDE A COMPLETE BALANCING REPORT FOR AT LEAST ONE SYSTEM IN EACH DWELLING UNIT TYPE, AND ALL COMMON AREA SYSTEMS IN ACCORDANCE WITH NEBB OR AABC STANDARDS.
18. CONTROL WIRING FOR ALL MECHANICAL SYSTEMS WITHIN THIS SCOPE OF WORK SHALL BE BY THE MECHANICAL CONTRACTOR.
19. DUCT SMOKE DETECTORS SHALL BE INSTALLED IN THE RETURN AIR DUCT OR PLENUM UPSTREAM OF ANY FILTERS OR DECONTAMINATION EQUIPMENT UPON ACTIVATION THE SMOKE DETECTOR SHALL SHUT DOWN THE AIR HANDLING UNIT AS REQUIRED BY 2018 NORTH CAROLINA MECHANICAL CODE 606. * IF THERE IS A FIRE ALARM SYSTEM: DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR, INSTALLED BY THE MECHANICAL CONTRACTOR. ACTIVATION OF THE DUCT SMOKE DETECTOR SHALL INITIATE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY ATTENDED LOCATION. * IF THERE IS NOT A FIRE ALARM SYSTEM: DETECTORS SHALL BE FURNISHED, WIRED AND INSTALLED BY THE MECHANICAL CONTRACTOR. ACTIVATION OF THE DUCT SMOKE DETECTOR SHALL INITIATE A VISIBLE AND AUDIBLE SUPERVISORY SIGNAL AT A CONSTANTLY ATTENDED LOCATION.
20. PROVIDE A CLEAN SET OF FILTERS FOR ALL AIR HANDLING EQUIPMENT AT SUBSTANTIAL COMPLETION.
21. MAINTAIN A MINIMUM 10'-0" BETWEEN OUTDOOR AIR INTAKES AND EXHAUST FAN DISCHARGE AND PLUMBING VENTS, ETC. FIELD COORDINATE FINAL LOCATIONS.
22. PROVIDE 4" THICK CONCRETE PAD FOR ALL GROUND MOUNTED OUTDOOR MECHANICAL UNITS. PADS SHALL BE MINIMUM 6" LARGER THAN UNIT ON ALL SIDES.
23. RUN DUCT UP WITHIN STRUCTURE OR THROUGH JOIST WEBS WHERE POSSIBLE & WHERE REQUIRED TO MAINTAIN CEILING HEIGHTS. PROVIDE OFFSETS AND/OR TRANSITIONS IN DUCT WHERE REQUIRED WITH MAX. 45° DEG. ELBOWS. MAKE BRANCH TAPS OFF TOP, SIDES OR BOTTOM AS REQUIRED. NO BACK TO BACK 90° DEG. ELBOWS ALLOWED.
24. REFRIGERANT PIPING SHALL BE SIZED & INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTALLATION INSTRUCTIONS.
25. ALL EQUIPMENT SHALL BE LABELED ACCORDING TO NUMBERING / IDENTIFICATION SYSTEM PER PLANS.
26. ALL EQUIPMENT SUPPORTS ARE REQUIRED TO MEET ASCE 9.6.
27. MECHANICAL CONTRACTOR SHALL PROVIDE U.L. LISTED FIRE DAMPERS, RADIATION DAMPERS AND/OR FIRE/SMOKE DAMPERS WHERE REQUIRED FOR FIRE PROTECTION AS REQUIRED BY LOCAL CODES. M.C. SHALL PROVIDE A MEANS OF ACCESS TO TEST & RESET ALL SUCH DAMPERS AND/OR ACTUATORS.
28. ON MAKING PIPE CONNECTIONS TO EQUIPMENT, CARE SHOULD BE TAKEN TO ARRANGE PIPES SO AS NOT TO INTERFERE WITH OPENING OF ACCESS DOORS.
29. ELECTRICAL CONTRACTOR TO PROVIDE ALL HIGH VOLTAGE (120V AND GREATER) ELECTRICAL WIRING, CONDUIT, DISCONNECT SWITCHES, FUSES, ETC. TO ALL MECHANICAL EQUIPMENT WITHIN THIS SCOPE OF WORK. ALL FINAL ELECTRICAL CONNECTIONS ARE BY ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL COORDINATE ELECTRICAL REQUIREMENTS FOR ALL APPROVED MECHANICAL EQUIPMENT WITH THE ELECTRICAL CONTRACTOR.
30. PRIOR TO BEGINNING ANY WORK, MECHANICAL CONTRACTOR IS RESPONSIBLE TO NOTIFY THE OWNER'S REPRESENTATIVE, ARCHITECT OR ENGINEER IF THE MECHANICAL DESIGN CONFLICTS WITH EXISTING OR UNFORESEEN FIELD CONDITIONS.
31. MECHANICAL CONTRACTOR SHALL PROVIDE A MIN. OF FOUR COPIES OF SHOP DRAWINGS TO THE ARCHITECT/ENGINEER FOR ALL INSTALLED EQUIPMENT AND MATERIALS NEEDING APPROVAL PRIOR TO PURCHASING. IN ADDITION, M.C. SHALL PROVIDE THE OWNER WITH TWO COPIES OF OPERATION & MAINTENANCE MANUALS FOR ALL INSTALLED EQUIPMENT, MANUFACTURER'S & INSTALLER'S WARRANTIES AND TRAINING FOR CONTROLS OF ALL SUCH EQUIPMENT.

Mechanical Design Summary

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

Thermal Zone: 3A
winter dry bulb: 23.1 °F
summer dry bulb: 91.7 °F
summer wet bulb: 75.6 °F

Interior design conditions
winter dry bulb: 70 °F
summer dry bulb: 75 °F
relative humidity: 50%

Building heating load: 356,500 btu

Building cooling load: 291,700 btu

Mechanical Spacing Conditioning System
Unitary
description of unit: Split System DX
heating efficiency: See Schedules
cooling efficiency: See Schedules
size category of unit: See Schedules
Boiler
Size category. If oversized, state reason.: N/A
Chiller
Size category. If oversized, state reason.: N/A

List equipment efficiencies: N/A

To the best of my knowledge, the mechanical design for this building complies with mechanical and equipment requirements of the 2018 North Carolina state building code and 2018 North Carolina energy conservation code.

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
T	THERMOSTAT (HONEWELL VISION PRO 8000 OR EQUAL) WITH KEY LOCKING GUARD COVER
	CEILING SUPPLY DIFFUSER
	CEILING RETURN DIFFUSER
	SPIRAL DUCT SUPPLY DIFFUSER
-X-	RECTANGULAR METAL DUCT
XØ	ROUND METAL/SPIRAL DUCT
	MAIN TRUNK AND BRANCH DUCT TAKEOFF WITH VOLUME DAMPER
	FLEX DUCT
EC	1" DOOR UNDER CUT
)))	TURNING VANES
SA	SUPPLY AIR
RA	RETURN AIR
EA	EXHAUST AIR
OA	OUTSIDE AIR
CFM	CUBIC FEET PER MINUTE
AH	AIR HANDLER
HP	HEAT PUMP
AC	AIR CONDITIONING UNIT
RTU	ROOFTOP UNIT
BDD	BACK DRAFT DAMPER
REL	RELOCATE
VD	VOLUME DAMPER
AFF	ABOVE FINISHED FLOOR
GC	GENERAL CONTRACTOR
MC	MECHANICAL CONTRACTOR

AIR DISTRIBUTION SCHEDULE

TAG	DESCRIPTION	MANUFACTURER	MODEL	FRAME/MOUNTING	FACE SIZE/LENGTH	MAX NC	REMARKS
A	DOUBLE DEFLECTION SUPPLY	TITUS	300FS	SURFACE	18"X6"	20	1,2,3,4
R	ALUMINUM RETURN GRILLE	TITUS	3FS	SURFACE	36"X12"	30	1,2,3

1. PROVIDE WITH STANDARD WHITE FINISH
2. PROVIDE ALUMINUM CONSTRUCTION
3. PROVIDE TRANSITION TO OFFSET GRILLE 45 DEG. TOWARDS FLOOR. SEE DETAIL 3 ON SHEET M2.1.
4. OR EQUAL BY HART AND COOLEY, PRICE, OR NAILOR

SPLIT-SYSTEM HEAT PUMP SCHEDULE

TAG	MANUFACTURER / MODEL	NOMINAL CAPACITY (TONS)	COMPRESSOR #	COND. FAN #	SEER	HSPF	VOLT / PHASE / HZ	MCA (AMPS)	MOCP	WEIGHT(LBS)	REMARKS
HP-1 THROUGH HP-8	YORK / YH2E48TB21S	4	1	1	14.3	7.5	208/1/60	26.1	45	215	1,2,4,5,6,7,8

SPLIT-SYSTEM AIR HANDLING UNIT SCHEDULE

TAG	MANUFACTURER / MODEL	NOMINAL CAPACITY (TONS)	ELEC. HEAT (kW)	AIRFLOW (CFM)	OUTDOOR AIR (CFM)	E.S.P. IN W.G	SENSIBLE CAPACITY (MBH)	LATENT CAPACITY (MBH)	VOLT / PHASE / HZ	MCA (AMPS)	MOCP	WEIGHT(LBS)	REMARKS
AHU-1 THROUGH AHU-8	YORK / JHETC48GBCS2N1	4	10	1600	320*	0.50	34.7	13.4	208/1/60	50	60	129	2,3,4,6,7,8

1. PROVIDE CONCRETE PAD FOR UNIT TO SIT ON
2. 7-DAY PROGRAMMABLE THERMOSTAT AND TEMPERATURE SENSOR SHALL MEET REQUIREMENTS OF LATEST ENERGY CODE
3. REPLACE ALL FILTERS AT PROJECT COMPLETION
4. PROVIDE HEAT STRIP OUTDOOR TEMPERATURE LOCKOUT TO PREVENT SUPPLEMENTAL HEAT OPERATION IN RESPONSE TO THE THERMOSTAT BEING CHANGED TO A WARMER SETTING. SET NO LOWER THAN 35°F AND NO HIGHER THAN 40 DEG. F
5. PROVIDE HARD START KIT
6. CONSULT MANUFACTURER ON REFRIGERANT LINE SETS EXCEEDING 60'-0" IN DEVELOPED LENGTH
7. BASIS OF DESIGN YORK, ACCEPTABLE ALTERNATIVE MANUFACTURERS: TRANE, CARRIER, DAIKIN, LENNOX, BRYANT, HEIL, GOODMAN
8. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES
* SET OUTSIDE AIR VOLUME TO 320CFM FOR AHU-3,4,5,7

FAN SCHEDULE

TAG	MANUFACTURER	MODEL	AIRFLOW (CFM)	E.S.P IN W.G	SONES	FAN TYPE	MOUNT	VOLT/PHASE/HZ	MCA (AMPS)	CONTROL	REMARKS
EF-1	GREENHECK	SP-A90	75	0.125	1.4	EXHAUST	CEILING MOUNT	115 / 1 / 60	0.3	WALL SWITCH / OCC. SENSOR	1,2,3
EF-2	GREENHECK	SP-A90	75	0.125	1.4	EXHAUST	CEILING MOUNT	115 / 1 / 60	0.3	WALL SWITCH / OCC. SENSOR	1,2,3

1. PROVIDE INTEGRAL BACKDRAFT DAMPER
2. PROVIDE FAN SPEED CONTROL IF REQUIRED TO MEET SPECIFIED CFM RATING.
3. COORDINATE LINE VOLTAGE AND CONTROL WIRING TERMINATIONS WITH ELECTRICAL CONTRACTOR PRIOR TO ROUGH-IN INSTALLATION

ELECTRIC UNIT HEATER SCHEDULE

TAG	MANUFACTURER	MODEL	INPUT (kW)	VOLT/PHASE/HZ	FLA (AMPS)	MOCP	REMARKS
EUH-1,2,3	MARKEL	HF3316T2SRPW	3	208/1/60	14.4	20	1,2,3,4

1. MOUNT ON WALL ABOVE FINISHED FLOOR.
2. PROVIDE THERMOSTAT AND SET FOR OPERATION AT 45 DEG. F.
3. PROVIDE WITH SUMMER FAN SWITCH.
4. OR OWNER APPROVED EQUIVALENT .

OUTSIDE AIR VENTILATION CALCULATIONS

HVAC Unit	Location	Zone Occupancy	Occupant Density (People/1000 sf)	Outdoor Air CFM/Person (Rp)	Zone Population (Pz)	Outdoor Air CFM/ sf (Ra)	Floor Area (Az)	Initial Zone Outdoor Airflow (Vbz)	Zone Area Distribution Effectiveness (Ez)	People Quantity (Ps)	Design Zone Supply Air (CFM)
See Schedule	Corridors	Corridors	0	0	0	0.06	21184	1271.04	0.8	10	**12800**
										10	**12800**
									Required OA Intake (CFM)		**1271**

Calculations are based on the 2018 NCMC Table 403.3.1.1

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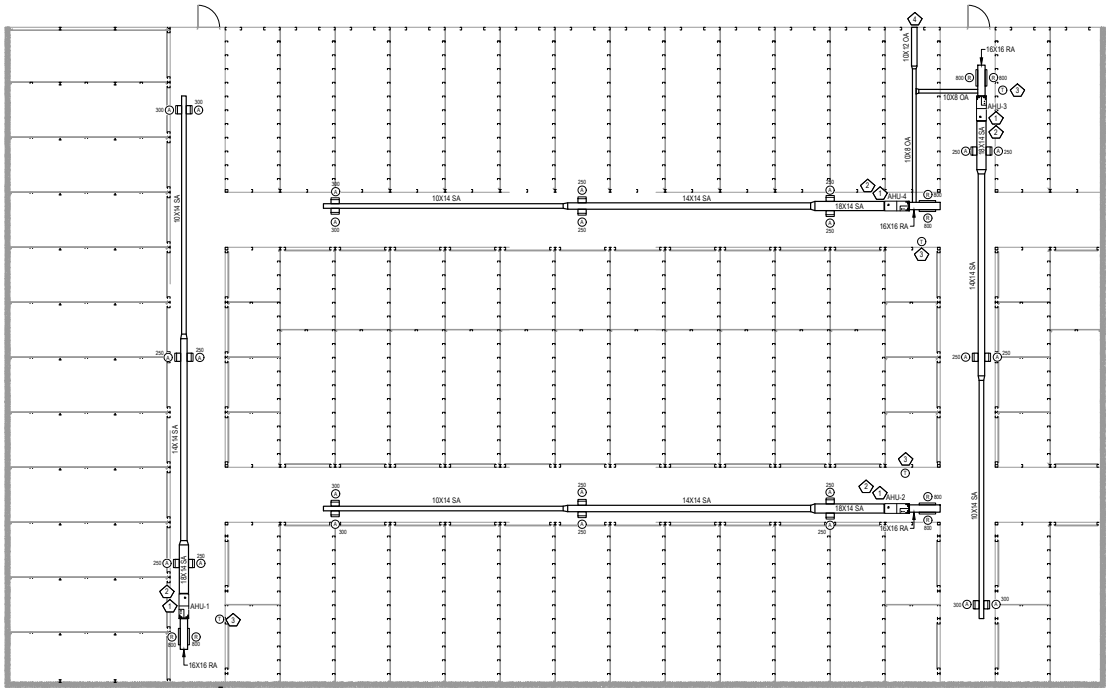
MECHANICAL LEGENDS AND NOTES

M0.1

MECHANICAL KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	SUSPEND UNIT FROM STRUCTURE ABOVE. COORDINATE EXACT MOUNTING LOCATION WITH OWNER.
2	ROUTE CONDENSATE LINES TO DAYLIGHT. PROVIDE CONDENSATE PUMP FOR UNITS ON BOTTOM FLOOR NOT IN CLOSE PROXIMITY TO DAYLIGHT.
3	COORDINATE EXACT MOUNTING LOCATION OF THERMOSTAT WITH OWNER PRIOR TO ROUGH-IN.
4	MC TO ROUTE OUTSIDE AIR DUCT THROUGH SIDEWALL. PROVIDE WITH WALL CAP. MAINTAIN MINIMUM 10'0" FROM ALL FORMS OF EXHAUST.



1 MECHANICAL PLAN - BOTTOM FLOOR
SCALE - 3/32" = 1'0"

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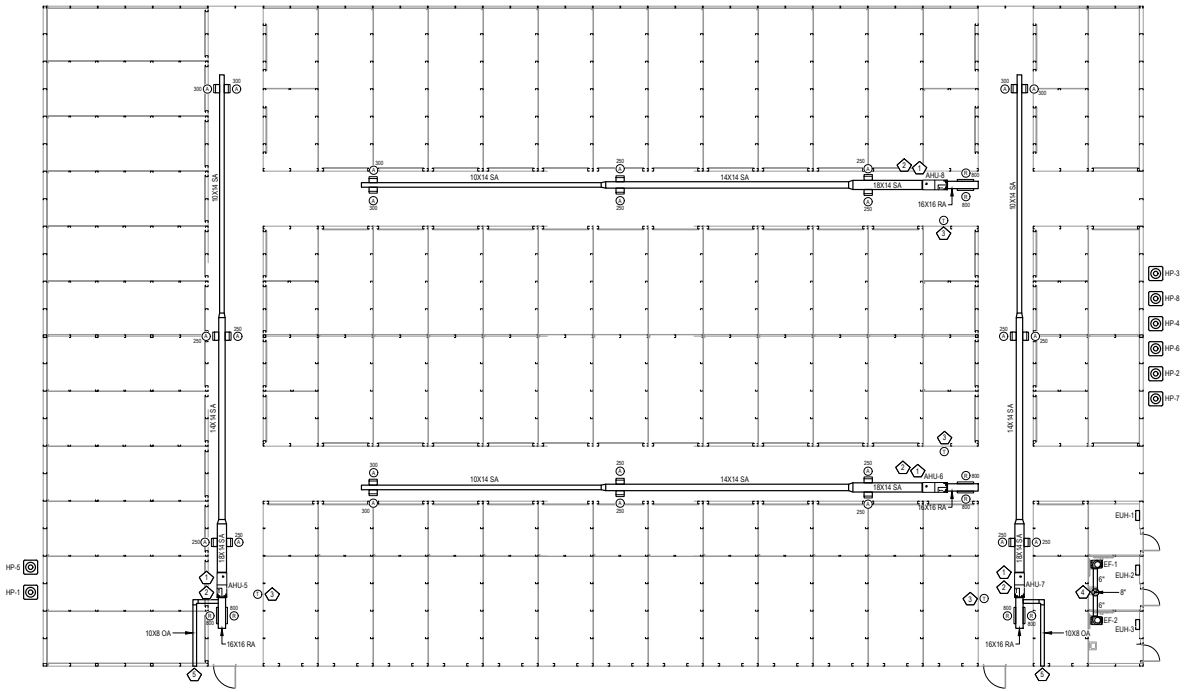
MECHANICAL PLAN - BOTTOM FLOOR

M1.1

MECHANICAL KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	SUSPEND UNIT FROM STRUCTURE ABOVE. COORDINATE EXACT MOUNTING LOCATION WITH OWNER.
2	ROUTE CONDENSATE LINES TO DAYLIGHT.
3	COORDINATE EXACT MOUNTING LOCATION OF THERMOSTAT WITH OWNER PRIOR TO ROUGH-IN.
4	COMBINE EACH 6"Ø EXHAUST DUCT TO SINGLE 8"Ø EXHAUST DUCT THROUGH ROOF WITH ROOF CAP. PROVIDE BACKDRAFT DAMPER FOR EACH EXHAUST FAN UPSTREAM OF COMBINING EXHAUST DUCTS IF NOT INTEGRAL TO FAN FROM MANUFACTURER. MAINTAIN MINIMUM 10'0" FROM ALL OUTSIDE AIR INTAKES.
5	MC TO ROUTE OUTSIDE AIR DUCT THROUGH SIDEWALL. PROVIDE WITH WALL CAP. MAINTAIN MINIMUM 10'0" FROM ALL FORMS OF EXHAUST.



1 MECHANICAL PLAN - TOP FLOOR
SCALE - 3/32" = 1'0"

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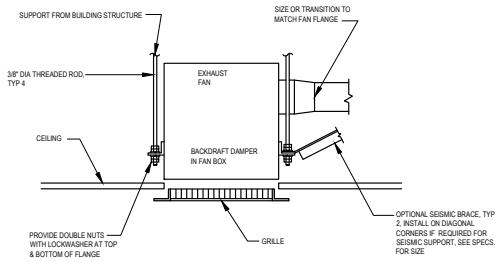
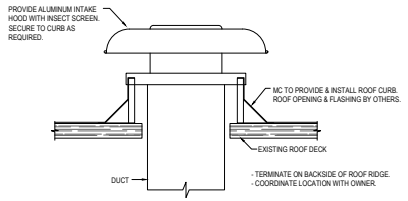
MECHANICAL PLAN - TOP FLOOR

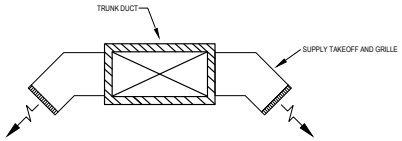
M1.2



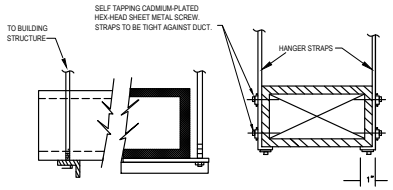
1 CEILING EXHAUST FAN DETAIL
NOT TO SCALE



2 ROOF CAP DETAIL
NOT TO SCALE



3 SUPPLY GRILLE TAKOFF DETAIL
NOT TO SCALE



HANGER SIZES FOR RECTANGULAR DUCTS

MAX. SIDE	HANGER	SUPPORT ANGLE HORIZONTAL	SPACING MAXIMUM
30"	1" x 18" GAUGE STRAP	NONE REQUIRED	10'-0"
36"	1/4" ROUND ROD	1-1/2" x 1-1/2" x 1/8"	8'-0"
48"	1/4" ROUND ROD	2" x 2" x 1/8"	8'-0"
60"	5/16" ROUND ROD	2" x 2" x 1/8"	8'-0"
84"	3/8" ROUND ROD	2" x 2" x 1/8"	8'-0"

4 RECTANGULAR DUCT HANGER DETAIL
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MECHANICAL DETAILS

M2.1

GENERAL ELECTRICAL NOTES

G1. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH 2020 NATIONAL ELECTRICAL CODE WITH N.C AMENDMENTS AND ALL APPLICABLE LOCAL AND STATE CODES.

G2. ALL MATERIAL, EQUIPMENT AND APPLIANCES SHALL BE NEW, LABELED AND LISTED FOR ITS INTENDED USE BY A QUALIFIED THIRD-PARTY ELECTRICAL TESTING LABORATORY (I.E. UL, ETL, ETC.) AND THE NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION PER NEC ARTICLES 90.7, 110.2 AND 110.3. WHERE UNDERWRITER'S LABORATORIES LABELING IS AVAILABLE FOR THE CLASS OF MATERIAL INVOLVED, MATERIALS SHALL BE FURNISHED WITH A UL LABEL OR LISTING, OR THE ELECTRICAL CONTRACTOR SHALL PROVE IT IS NOT REQUIRED.

G3. ALL ELECTRICAL PERMITS AND INSPECTION FEES SHALL BE OBTAINED AND PAID FOR BY THE ELECTRICAL CONTRACTOR.

G4. ELECTRICAL CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF ELECTRICAL EQUIPMENT. DO NOT SCALE ELECTRICAL PLANS. OBTAIN ALL DIMENSIONS FROM THE ARCHITECT'S DIMENSIONED DRAWINGS AND FIELD MEASUREMENTS. THE CONTRACTOR SHALL REVIEW ARCHITECTURAL PLANS FOR DOOR SWINGS AND BUILT-IN EQUIPMENT; CONDITIONS INDICATED ON THOSE PLANS SHALL GOVERN FOR THIS WORK.

G5. VERIFY ALL UTILITY REQUIREMENTS FOR ELECTRICAL SERVICE (PRIOR TO STARTING ANY WORK) SUCH AS VOLTAGE, PHASES, FAULT CURRENT, ETC... AND COORDINATE EXACT LOCATION OF INCOMING ELECTRICAL SERVICE WITH LOCAL POWER COMPANY PRIOR TO PROJECT START. NOTIFY ENGINEER OF ANY DIFFERENCES FROM WHAT IS SHOWN ON PLANS.

G6. ELECTRICAL CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS FOR ONE YEAR EFFECTIVE FROM THE DATE OF SUBSTANTIAL COMPLETION.

G7. A COMPLETE GROUNDING SYSTEM SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH ARTICLE 250 OF THE NEC, AND AS SHOWN ON THE DRAWINGS.

G8. ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF ELECTRICAL EQUIPMENT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. DO NOT CUT ANY MATERIAL THAT WILL WEAKEN THE STRUCTURE WITHOUT WRITTEN PERMISSION OF THE ARCHITECT. PATCHING SHALL BE ACCOMPLISHED TO MATCH ADJACENT SURFACES IN EVERY RESPECT. ENGAGE ORIGINAL INSTALLER FOR CUTTING/PATCHING OF ROOFS.

G9. PROVIDE A TYPED DIRECTORY IN ALL PANELBOARDS CLEARLY DESCRIBING THE LOCATION AND TYPE OF LOAD SERVED FOR ALL CIRCUITS.

G10. THE ELECTRICAL CONTRACTOR SHALL REQUEST A SELECTIVE BREAKER COORDINATION STUDY FROM THE ELECTRICAL GEAR MANUFACTURER PER NEC 700 REQUIREMENTS.

G11. PROVIDE ENGRAVED PHENOLIC NAMEPLATES FOR ALL PANELBOARDS AND DISCONNECT SWITCHES, WHITE LETTERS ON BLACK BACKGROUND. NAMEPLATE SHALL CONTAIN EQUIPMENT DESIGNATION, VOLTAGE, FEEDER SOURCE, AIC RATING & DATE INSTALLED.

G12. PROVIDE "FLASH HAZARD" LABELS FOR ALL PANELBOARDS IN ACCORDANCE WITH NEC REQUIREMENTS.

G13. ALL TERMINALS/LUGS SHALL BE 60 DEGREE/75 DEGREE RATED.

G14. FUSES 0-600 AMPS SHALL BE UL CLASS "RK-5" LOW PEAK DUAL ELEMENT TIME DELAY WITH 200,000 AMPERE INTERRUPTING RATING AS MANUFACTURED BY BUSSMAN UNLESS NOTED OTHERWISE.

G15. ALL WATER HEATERS SHALL HAVE DISCONNECT SIZED PER 422.11(E)(3).

G16. ELECTRICAL CONTRACTOR SHALL MAKE ALL FINAL ELECTRICAL CONNECTIONS TO EQUIPMENT REGARDLESS OF WHO SUPPLIES THE EQUIPMENT. THIS INCLUDES ALL HVAC, PLUMBING AND OWNER FURNISHED EQUIPMENT CONNECTIONS OF 120V OR HIGHER.

G17. RACEWAYS SHALL BE INSTALLED CONCEALED IN NEW WALL CONSTRUCTION, ABOVE CEILINGS, BELOW FLOOR, AND IN OTHER CAVITIES TO THE GREATEST EXTENT POSSIBLE. WHERE EXPOSED RACEWAYS MUST BE USED, LAYOUT RACEWAYS TO MINIMIZE THE NUMBER OF VERTICAL RUNS.

G18. ALL EXPOSED RACEWAY SHALL BE RUN PARALLEL OR PERPENDICULAR TO THE BUILDING SURFACES AND SHALL BE PAINTED AS DIRECTED BY THE ARCHITECT. NO EXPOSED CONDUIT SHALL BE ALLOWED IN FINISHED SPACES EXCEPT AS PERMITTED BY OWNER OR ARCHITECT. EXPOSED RACEWAY IN FINISHED SPACES SHALL BE WIREMOLD TYPE.

G19. BEFORE COMMENCING WITH ANY ROUGH-IN, COORDINATE THE EXACT LOCATION AND MOUNTING HEIGHT OF ALL WALL MOUNTED DEVICES WITH THE ARCHITECTURAL INTERIOR ELEVATIONS, CASEWORK SHOP DRAWINGS, AND EXISTING CONDITIONS. IF ANY DISCREPANCIES ARE DISCOVERED, NOTIFY THE ARCHITECT FOR FURTHER DIRECTION. MINOR ADJUSTMENTS IN DEVICE LOCATION, I.E. 5'-0" IN ANY DIRECTION SHALL BE DONE AT NO ADDITIONAL COST TO THE CONTRACT.

G20. ALL WIRING SHALL BE INSTALLED IN IMC, RMC, EMT OR TYPES AC AND MC FLEXIBLE CABLES. RNC CONDUIT (PVC), SHALL ONLY BE USED UNDERGROUND AND OUTDOORS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. MINIMUM SIZE CONDUIT SHALL BE 3/4". AC AND MC FLEXIBLE CABLES SHALL BE USED ONLY IN AREAS PERMITTED BY CODE. INDOOR BRANCH CIRCUIT WIRING MAY BE TYPE NM, NMC, OR NMS FOR DWELLING UNITS OR OTHER BUILDINGS PERMITTED TO BE OF TYPES III, IV OR V CONSTRUCTION. DWELLING UNIT SERVICE FEEDERS MAY BE TYPE SE OR USE CABLES IN AREAS PERMITTED BY CODE. AMPACITY FOR SE AND USE CABLES SHOWN ON THE SER FEEDER SCHEDULE INCLUDED IN THESE DRAWINGS IS BASED ON THE 60 C AMPACITY OF TABLE 310.15(B)(16) FOR INSTALLATION IN INSULATION. SHOULD SER CABLE NOT BE IN CONTACT WITH INSULATION CONTACT ENGINEER FOR REVISED FEEDER SIZES (IN INSULATION SHALL BE AS DEFINED IN ARTICLE 310.15(A)(2) AND AS DETERMINED BY THE LOCAL AHJ). ALL SER FEEDERS LOCATED WITHIN TYPE I AND/OR II BUILDING AREAS (NONCOMBUSTIBLE CONSTRUCTION) SHALL BE RUN IN EMT CONDUIT PER NEC. ONCE THE CONDUIT PENETRATES THE TRANSITION SLAB AND ENTER INTO THE TYPE III, IV OR V CONSTRUCTION THE SER CABLE MAY BE RUN FREELY AS ALLOWED PER NEC. ALL OTHER WIRING IN DWELLING UNITS EXCEEDING 50 AMPERES SHALL BE INSTALLED IN EMT INDOORS OR PVC OUTDOORS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE.

G21. ALL FLEX SHALL BE LIQUID TIGHT FLEXIBLE METAL.

G22. PROVIDE A PULL WIRE OR FISH TAPE IN ALL EMPTY CONDUITS. PROVIDE A BLANK COVER PLATE OVER ALL UNUSED BOXES INCLUDING DATA/COMM BOXES.

G23. WHERE A SINGLE HOMERUN IS SHOWN THE CIRCUIT SHALL BE INSTALLED IN A DEDICATED CONDUIT. DO NOT COMBINE WITH OTHER CIRCUITS. WHERE A CIRCUIT HOMERUN IS NOT SHOWN THE CONTRACTOR SHALL COMBINE CIRCUITS AS FOLLOWS AND IN ACCORDANCE WITH THE NEC:

1. A MAXIMUM OF THREE 20A, 1 POLE BRANCH CIRCUITS MAY BE COMBINED IN COMMON HOMERUN SHARING A COMMON NEUTRAL OR WITH SEPARATE NEUTRALS, FOR A TOTAL OF SIX CURRENT CARRYING CONDUCTORS. ALL BRANCH CIRCUITS LARGER THAN 20A SHALL BE SEPARATELY HOMERUN TO PANEL.
2. EACH MULTIWIRE BRANCH CIRCUIT SHARING A COMMON NEUTRAL SHALL BE PROVIDED WITH A MEANS THAT WILL SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES.

G24. CONDUCTORS SHALL BE COPPER, RATED AT NOT LESS THAN 600 VOLTS. MINIMUM SIZE SHALL BE NO. 12 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS. ALL WIRE #8 AWG AND LARGER SHALL BE STRANDED, #10 THRU #12 AWG CONDUCTORS SHALL BE SOLID. ALL INSULATION TYPES SHALL BE THWN/THHN. FEEDER CIRCUIT CONDUCTORS MAY BE COPPER OR ALUMINUM.

G25. 20A/120V BRANCH CIRCUITS EXTENDING UP TO 56' IN LENGTH, FROM PANEL TO FARTHEST DEVICE, SHALL USE AT MINIMUM NO. 12 (CU) CONDUCTORS AND 3/4"C. FOR 20A/120V BRANCH CIRCUITS EXTENDING UP TO 93' IN LENGTH, FROM PANEL TO FARTHEST DEVICE, SHALL USE NO. 10 (CU) CONDUCTORS AND 3/4"C. ANY BRANCH CIRCUIT LENGTHS THAT EXCEED 93', THE ELECTRICAL CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY FOR UPDATED CONDUCTOR AND CONDUIT SIZES.

G26. TO PREVENT UNDER-VOLTAGE, THE FEEDERS SHOWN ON THE VOLTAGE DROP TABLE(S) HAVE BEEN SIZED TO COMPENSATE FOR WHEREVER A MAXIMUM TOTAL VOLTAGE DROP ON BOTH FEEDERS AND BRANCH CIRCUITS TO THE FARTHEST DEVICE DOES NOT EXCEED 5%. FOR FEEDER LENGTHS EXCEEDING THE ONE-WAY DISTANCES PROVIDED ON THE VOLTAGE DROP TABLE(S) THE ELECTRICAL CONTRACTOR SHALL IMMEDIATELY CONTACT THE ENGINEER PRIOR TO BIDDING, PURCHASING AND ROUGHING-IN FOR UPDATED CONDUCTOR AND CONDUIT SIZES BASED ON UPDATED VOLTAGE DROP CALCULATIONS.

G27. FOR EVERY WIRING DEVICE MARK THE BRANCH CIRCUIT TO WHICH IT IS CONNECTED ON THE BACK OF EACH DEVICE PLATE, USING AN INDELIBLE MARKER PEN.

G28. COORDINATE ALL DEVICE AND DEVICE PLATE COLORS WITH OWNER/ARCHITECT. DEVICES AND DEVICE PLATES LOCATED IN CABINETRY SHALL BE A DARK COLOR TO MATCH CABINETRY FINISH.

G29. EXACT LOCATION OF ALL FLOOR-MOUNTED OUTLETS SHALL BE COORDINATED WITH THE OWNER/ARCHITECT BEFORE ROUGH-IN.

G30. TWO OR MORE ADJACENT POWER OR COMMUNICATION RECEPTACLES SHALL BE GANGED WITH A COMMON FACEPLATE - IF THEY CANNOT BE GANGED THEY SHALL BE INSTALLED WITH A MINIMUM DISTANCE BETWEEN UNITS.

G31. WALL RECEPTACLES SHOWN BACK TO BACK MAY BE OFFSET BUT SHALL BE INSTALLED DIRECTLY ADJACENT TO ONE ANOTHER.

G32. LIGHT SWITCHES SHALL BE NO MORE THAN 6" FROM EDGE OF DOOR FRAME.

G33. WHERE PENETRATIONS ARE MADE THROUGH A REQUIRED FIRE-RESISTIVE WALL, FLOOR, OR PARTITION FOR THE PURPOSE OF RUNNING RACEWAY CARRYING ELECTRICAL, TELEPHONE, TELEVISION, OR LOCAL COMMUNICATION AND/OR SIGNALING CIRCUITS, THE OPENING AROUND THE RACEWAY SHALL BE FIRE STOPPED PER THE STATE BUILDING CODE. COORDINATION WITH THE GENERAL CONTRACTOR SHALL BE MAINTAINED TO ENSURE THAT THIS FIRE STOPPING IS ACCOMPLISHED. USE APPROVED ASSEMBLIES SUCH AS THE FOLLOWING:

* CONDUIT PENETRATIONS OF 1,2,3 & 4 HOUR GYP BOARD WALLS - U.L.#WL1001
* CONDUIT PENETRATIONS OF 2,3 & 4 HOUR CONCRETE OR BLOCK WALLS - U.L.#CAJ1001
* CONDUIT PENETRATIONS OF 2,3 & 4 HOUR CONCRETE FLOORS - U.L.#CAJ1001
* CONDUIT PENETRATIONS OF 1 HOUR GYPBOARD CEILING ASSEMBLY - L526
* MULT. CONDUIT PENETRATIONS OF 2,3 & 4 HOUR CONCRETE OR BLOCK WALL OR FLOOR - CAJ1042

G34. IN REQUIRED FIRE RATED WALLS AND PARTITIONS, OPENINGS FOR INSTALLATION OF BOXES SHALL BE IN ACCORDANCE WITH THE APPLICABLE BUILDING CODE AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS INCLUDED WITH THE BOX LISTING. COORDINATE CLOSELY WITH THE GENERAL CONTRACTOR TO ENSURE THAT THE INTEGRITY OF THE U.L. RATING IS MAINTAINED.

G35. OUTLET BOXES FOR DEVICES MOUNTED ON OPPOSITE SIDES OF FIRE RATED PARTITIONS SHALL NOT BE MOUNTED IN THE SAME WALL CAVITY. SEPARATE WALL PENETRATIONS BY MOUNTING ON OPPOSITE SIDES OF WALL STUDS OR OTHER VERTICAL STRUCTURAL MEMBER IN THE WALL.

G36. PRIOR TO ORDERING ANY EQUIPMENT THE ELECTRICAL CONTRACTOR SHALL PROVIDE SHOP DRAWING SUBMITTALS TO THE OWNER, ARCHITECT AND ELECTRICAL ENGINEER FOR THE LIGHTING FIXTURES, ELECTRICAL GEAR, FIRE ALARM SYSTEM AND OTHER SIMILAR SYSTEMS. SHOP DRAWING SUBMITTALS SHALL BE PROVIDED REGARDLESS IF THE EQUIPMENT BEING SUPPLIED IS THE SAME AS WHAT IS SPECIFIED ON THE PLANS.

G37. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING RESTRAINTS TO RESIST THE EARTHQUAKE EFFECTS ON THE ELECTRICAL SYSTEM. THE REQUIREMENTS FOR THOSE RESTRAINTS ARE FOUND IN THE IBC, THE ANCHORING OF THE EQUIPMENT SHALL COMPLY WITH IBC SECTION 1613.

G38. IF DURING THE COURSE OF WORK THE ELECTRICAL CONTRACTOR DISCOVERS A PROBLEM WITH THE PERFORMANCE OF THE INSTALLATION RELATIVE TO THE PLANS AND SPECIFICATIONS OR NEC OR OTHER CODES, THE ELECTRICAL CONTRACTOR SHALL IMMEDIATELY BRING THE PROBLEM TO THE ATTENTION OF THE ARCHITECT AND ENGINEER FOR RESOLUTION PRIOR TO THE EXECUTION OF THE WORK.

G39. SEE PANEL SCHEDULES FOR BRANCH CIRCUIT CONDUCTOR SIZES. THE "WIRE SIZE" COLUMN INDICATES THE SIZE OF THE PHASE (IE HOT) AND NEUTRAL CONDUCTORS. THE EC SHALL SIZE THE EQUIPMENT GROUNDING CONDUCTORS PER NEC TABLE 250.122, THE EC SHALL SIZE THE CONDUIT (IF REQUIRED) PER NEC ANNEX C. THE QUANTITY OF CONDUCTORS IS BASED ON THE "POLE" COLUMN AND FOLLOWS THE PROCESS BELOW, PARALLEL SET QUANTITIES ARE MULTIPLIED BY THE NUMBER OF SETS:

120V/277V - 1 POLE
1 - PHASE (IE HOT) - CONDUCTOR SIZE PER "WIRE SIZE" COLUMN IN PANEL SCHEDULE
1 - NEUTRAL - CONDUCTOR SIZE PER "WIRE SIZE" COLUMN IN PANEL SCHEDULE
1 - GROUND - PER NEC TABLE 250.122
CONDUIT SIZED PER NEC ANNEX C (IF REQUIRED)

208V/240V/480V - 2 POLE
2 - PHASE (IE HOT) - CONDUCTOR SIZE PER "WIRE SIZE" COLUMN IN PANEL SCHEDULE
1 - NEUTRAL (EC VERIFY IF REQUIRED FOR INSTALLED EQUIPMENT) - CONDUCTOR SIZE PER "WIRE SIZE" COLUMN IN PANEL SCHEDULE
1 - GROUND - PER NEC TABLE 250.122
CONDUIT SIZED PER NEC ANNEX C (IF REQUIRED)

208V/240V/480V - 3 POLE
3 - PHASE (IE HOT) - CONDUCTOR SIZE PER "WIRE SIZE" COLUMN IN PANEL SCHEDULE
1 - NEUTRAL (EC VERIFY IF REQUIRED FOR INSTALLED EQUIPMENT) - CONDUCTOR SIZE PER "WIRE SIZE" COLUMN IN PANEL SCHEDULE
1 - GROUND - PER NEC TABLE 250.122
CONDUIT SIZED PER NEC ANNEX C (IF REQUIRED)

G40. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH GEAR MANUFACTURER WHERE THE HIGHEST CONTINUOUS TRIP SETTING FOR WHICH THE ACTUAL DEVICE INSTALLED IN A CIRCUIT BREAKER IS RATED OR CAN BE ADJUSTED IS 1200A OR HIGHER SHALL HAVE ARC ENERGY REDUCTION IN ACCORDANCE WITH NEC 240.87.

G41. COLOR CODE CONDUCTORS PER NEC. FEEDERS SHALL BE IDENTIFIED IN ACCORDANCE WITH NEC 215.12. USE BLACK, RED, AND BLUE FOR PHASES A, B, AND C RESPECTIVELY ON 208Y/120 VOLT THREE-PHASE Y SYSTEMS AND WHITE FOR THE NEUTRAL. ISOLATED GROUND WIRES SHALL BE GREEN WITH YELLOW BANDS OR STRIPES. THIS IDENTIFICATION SHALL BE MADE AT EACH POINT WHERE A CONNECTION IS MADE. COLORS SHALL BE FACTORY APPLIED FOR CONDUCTORS #6 AWG AND SMALLER. ALL EQUIPMENT GROUNDING CONDUCTORS SHALL BE GREEN IN COLOR AND MINIMUM #12 AWG. THE EC SHALL PROVIDE PLENUM RATED CABLE FOR ANY ELECTRICAL, TELEPHONE, COMMUNICATION, OR OTHER CABLE THAT ENTERS CEILING RETURN PLENUMS.

G42. WHERE CONDUCTORS ARE RUN IN PARALLEL, THE EC SHALL COMPLY WITH NEC 310.4.

G43. ISOLATED-GROUND TYPE RECEPTACLES SHALL BE INSTALLED IN ACCORDANCE WITH 250.146(D). ISOLATED GROUND RECEPTACLES SHALL BE ORANGE IN COLOR.

G44. IN ASSEMBLY AREAS EXCEEDING 100 PERSONS OCCUPANCY, WIRING METHODS SHALL COMPLY WITH NEC 518.

ELECTRICAL SYSTEM AND EQUIPMENT METHOD OF COMPLIANCE SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

Method of Compliance: Energy Code - Prescriptive

Lighting schedule:

lamp type required in fixture
number of lamps in fixture
ballast type used in the fixture
number of ballasts in fixture
total wattage per fixture
— See Light Fixture Schedule on sheet

total interior wattage specified vs. allowed:
total exterior wattage specified vs. allowed:

Additional Efficiency Package Options
(When using the 2018 NCECC; not required for ASHRAE 90.1)

- ☐ C406.2 More Efficient HVAC Equipment Performance
- ☑ C406.3 Reduced Lighting Power Density
- ☐ C406.4 Enhanced Digital Lighting Controls
- ☐ C406.5 On-Site Renewable Energy
- ☐ C406.6 Dedicated Outdoor Air System
- ☐ C406.7 Reduced Energy Use in Service Water Heating

DESIGNER STATEMENT:

To the best of my knowledge and belief, the design of this building/space complies with the electrical system and equipment requirements of the 2018 North Carolina Energy Conservation Code.

ELECTRICAL SYMBOL LEGEND

	DUPLEX RECEPTACLE, 20A, 120 VOLT, +18" A.F.F. (U.N.O.) "GFCI" INDICATES GROUND FAULT PROTECTION "WP" INDICATES WEATHERPROOF
	QUADPLEX RECEPTACLE, 20A, 120 VOLT, +18" A.F.F. (U.N.O.)
	SIMPLEX RECEPTACLE, 20A, 120 VOLT, +18" A.F.F. (U.N.O.)
	208/230 VOLT 1Ø RECEPTACLE
	208/230 VOLT 3Ø RECEPTACLE
	DUPLEX RECEPTACLE RECESSED IN FLOOR WITH BRASS COVER
	QUADPLEX RECEPTACLE RECESSED IN FLOOR WITH BRASS COVER
	DUPLEX RECEPTACLE MOUNTED IN CEILING
	QUADPLEX RECEPTACLE MOUNTED IN CEILING
J	JUNCTION BOX
	DISCONNECT SWITCH, FUSED, HEAVY DUTY. NEMA 1 FOR INTERIOR, NEMA 3R FOR EXTERIOR. FUSE ACCORDING TO NAMEPLATE DATA
	NON-FUSED PULL DISCONNECT SWITCH. NEMA 1 FOR INTERIOR, NEMA 3R FOR EXTERIOR.
	TELEPHONE/DATA JACK (JUNCTION BOX WITH 1" CONDUIT STUBBED TO ABOVE CEILING) CONDUCTORS AND TERMINATIONS PROVIDED AND INSTALLED BY COMMUNICATIONS CONTRACTOR.
WS	PASSIVE INFRARED CEILING MOUNTING LINEAR OCCUPANCY SENSOR (WATTSTOPPER CX-100-3 OR EQUAL). TWO-SIDED AISLEWAY OCCUPANCY SENSOR. PROVIDE POWER PACK AS NEEDED FOR OPERATION. WIRE TO LOW VOLTAGE SWITCH FOR MANUAL OVERRIDE. SET OCCUPANCY TIMER TO 15 MINUTES.
$	SINGLE POLE SWITCH
$3	3 WAY SWITCH
$WS	WALL MOUNT INFRARED OCCUPANCY SENSOR WITH UP TO 30 MINUTE TIME-ON SETTING AND MANUAL OVERRIDE. MIN. COVERAGE 500+ SQFT. WATTSTOPPER MODEL WS-250 OR EQUAL, 120.277V RATED
$M	MOTOR RATED SWITCH RATED AT 20 AMPS, VOLTAGE TO MATCH EQUIPMENT
$WP	20 AMP SWITCH IN WEATHERPROOF BOX WITH WEATHERPROOF COVER
	ELECTRICAL PANEL
PC	DUSK/DAWN PHOTOCELL
GC	GENERAL CONTRACTOR
EC	ELECTRICAL CONTRACTOR
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
RECEPT	RECEPTACLE
LTS	LIGHTS
IG	ISOLATED GROUND
WP	WEATHER PROOF (DEVICE TO HAVE WEATHERPROOF IN-USE COVER)
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
AFCI	ARC FAULT CIRCUIT INTERRUPTER

ELECTRICAL DRAWING INDEX	
E0.1	ELECTRICAL LEGENDS AND NOTES
E1.1	LIGHTING PLAN - BOTTOM FLOOR
E1.2	LIGHTING PLAN - TOP FLOOR
E1.3	POWER PLAN - BOTTOM FLOOR
E1.4	POWER PLAN - TOP FLOOR
E2.1	PANEL SCHEDULES AND ONE-LINE DIAGRAM
E3.1	ELECTRICAL DETAILS

LUMINAIRE SCHEDULE

MARK	DESCRIPTION	MANUFACTURER	MODEL	CCT	MOUNTING	MAX WATTS	BALLAST/DRIVER	REMARKS
A	8' LINEAR LED	LITHONIA	CSS-L96-8000LM-UVOLT-35K-80CRI	3500K	SURFACE	75	LED	1
B	4' LINEAR LED	LITHONIA	CSS-L48-4000LM-UVOLT-35K-80CRI	3500K	SURFACE	35	LED	1
C	FLOOD LIGHT	NUVO	65-715	3000K	SURFACE	20	LED	1
D	EXTERIOR GOOSE NECK	NUVO	65-661	VARIES	SURFACE	50	LED	1
	EXIT UNIT COMBO LIGHT	EXITRONIX	VLED-1-WH-EL90-R	-	VARIES	2	LED	1
	EMERGENCY WALL LIGHT	EXITRONIX	LED-90-G2	-	VARIES	2	LED	1
	REMOTE LED LAMP HEAD / WP	EXITRONIX	2CLED-WP		SURFACE	2	LED	1

1. PROVIDE INTEGRAL MOTION SENSOR.

GENERAL NOTES:

A. THE CONTRACTOR SHALL VERIFY THE LEAD TIME OF ALL PRODUCTS SPECIFIED IN THIS SCHEDULE AT THE TIME OF PACKAGE QUOTE.
B. DURING THE BID PROCESS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DELIVERY/SCHEDULING ISSUES.
C. NO SUBSTITUTIONS WILL BE ALLOWED DUE TO THE LACK OF COORDINATION OF DELIVERY DATES AND CONSTRUCTION SCHEDULE AFTER BID.
D. ALL EXPEDITED EXPENSES SHALL BE THE RESPONSIBILITY OF THE CONTRACTORS.
E. FIXTURES TO BE INSTALLED IN CEILINGS, INDICATE ON THE ARCHITECTURAL PLANS AS HAVING INSULATION IN CONTACT WITH THE CEILING SURFACE. SHALL BE IC RATED BY MANUFACTURER.
F. LIGHTING FIXTURES SHALL MEET THE AESTHETICS, DESCRIPTION AND SPECIFICATIONS. SUBSTITUTIONS SHALL INCLUDE PT. BY PT. CALCULATIONS.
G. LIGHTING FIXTURES, AS SPECIFIED, HAVE BEEN SO SELECTED TO ACHIEVE REQUIRED/DESIRED FOOTCANDLE LEVELS IN THEIR RESPECTIVE AREA. HENCE SPECIFIC FIXTURE CHARACTERISTICS WHICH MAY CREATE PARTICULAR ILLUMINATION RESULTS ARE ESSENTIAL. ANY DEVIATIONS FROM SPECIFIED FIXTURES SHALL DEEM THE SUBMITTING AGENT AND CONTRACTORS RESPONSIBLE IN PROVIDINGSUCH DEVIATION FOR THE ARCHITECT/ENGINEER AND OWNER TO MAKE AN INFORMED DECISION.
H. SUBSTITUTIONS APPROVED BY THE ENGINEER PREVIOUS TO BID ARE ACCEPTABLE AS LONG AS THEY ARE EQUAL TO THE FIXTURE SPECIFIED, UNLESS OTHERWISE NOTED. THIS INCLUDES LENS, COLORS, REFLECTORS, PHOTOMETRICS, HOUSING MATERIAL, FINISHES, ETC. ALL SUBSTITUTIONS SHALL BE SUBMITTED TO THE ENGINEER WITH CUT SHEETS FOR APPROVAL. SUBSTITUTE FIXTURES SHALL BE PRICED WITH THE SPECIFIED FIXTURE AND LISTED SEPARATELY SO THE ARCHITECT, ENGINEER AND OWNER CAN MAKE AN INFORMED DECISION.
I. ANY FIXTURE WITH THE TEXT "NL" ADJACENT TO IT SHALL INDICATE THAT THAT FIXTURE IS A NIGHT LIGHT (24HR LIGHT). THE FIXTURE SHALL BE CONNECTED TO THE UNSWITCHED HOT LEG OF THE INDICATED CIRCUIT.
J. ACRYLIC PRISMATIC LENSES SHALL BE 0.156" NOMINAL MINIMUM THICKNESS.
K. ALL EXIT AND EMERGENCY FIXTURES SHALL COMPLY WITH NCSBC STANDARDS AND HAVE AUTOMATIC TESTING DEVICES.
L. LED EMERGENCY BATTERY SHALL PROVIDE 1400 MINIMUM LUMENS OUTPUT FROM 1 LAMP FOR 90 MINUTES MINIMUM.
M. ELECTRICAL CONTRACTOR SHALL CONNECT ALL LED EMERGENCY FIXTURES TO CLOSEST AVAILABLE LIGHTING CIRCUIT UNLESS NOTED OTHERWISE.
N. LED MODULES SHALL BE REPLACEABLE.
O. ELECTRICAL CONTRACTOR SHALL RECEIVE APPROVAL FOR ALL LIGHTING FIXTURES FROM ARCHITECT/OWNER PRIOR TO PURCHASE AND ROUGH-IN. THE ABOVE FIXTURE TYPES ARE LISTED AS THE DESIGN BASIS.

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PRELIMINARY
NOT FOR CONSTRUCTION

DESIGN FOR:
BAUCOM BUSINESS PLAZA - S1
11132 U.S. 401 N
FUQUAY-VARINA, NC 27526

REV. NO.	DATE	DESCRIPTION
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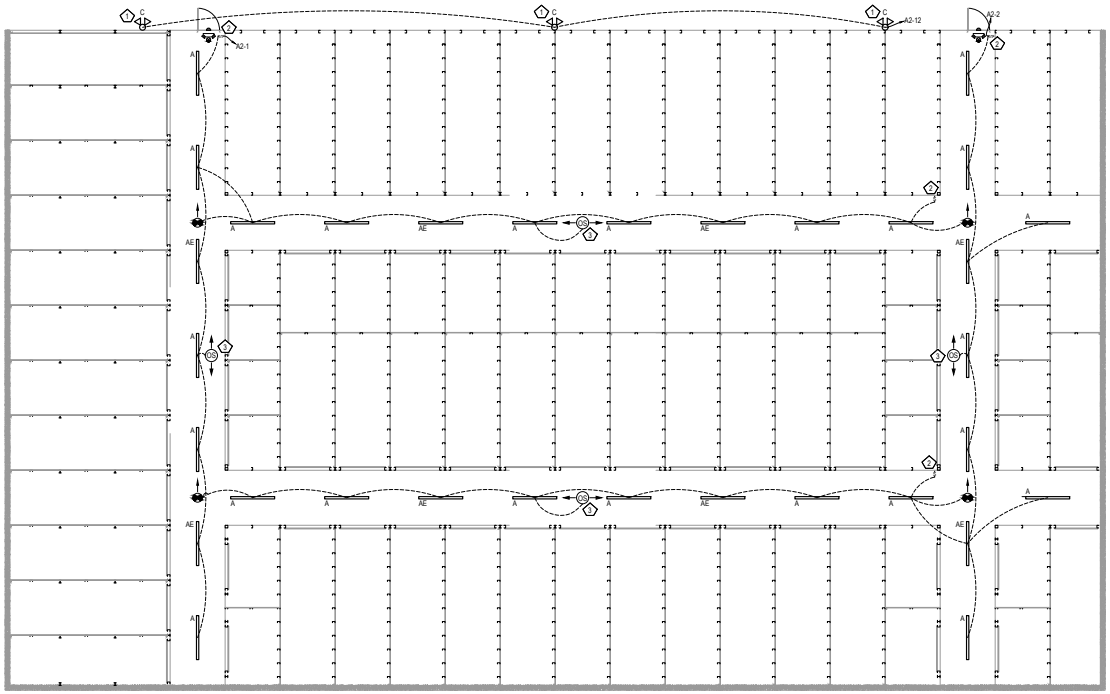
PROJECT NO.: 24-029
DRAWN BY: DBAG
CHECKED BY: DBAG

ELECTRICAL LEGENDS AND NOTES

E0.1

LIGHTING KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	LIGHTING TO BE CONTROLLED BY INTEGRAL MOTION SENSORS TO FIXTURES.
2	PROVIDE LOW VOLTAGE SWITCH FOR MANUAL CONTROL OF LIGHTING FIXTURES.
3	VERIFY ANGLE AND MOUNTING LOCATION OF 2-WAY LINEAR MOTION SENSOR TO ENSURE OPERATION IN SPACE.



1 LIGHTING PLAN - BOTTOM FLOOR
SCALE - 3/32" = 1'0"

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BID NO.	DATE	DESCRIPTION
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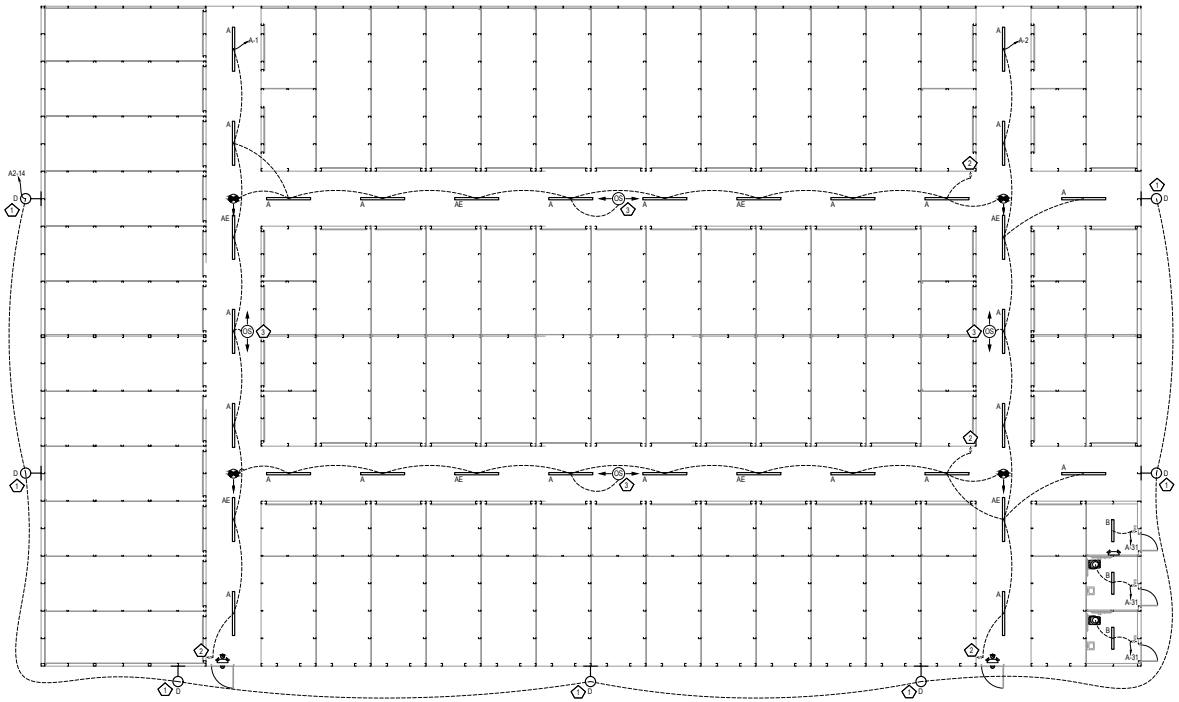
PROJECT NO.:	DRAWN BY:
24-029	DBAG
	CHECKED BY: DBAG

LIGHTING PLAN - BOTTOM FLOOR

E1.1

LIGHTING KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	LIGHTING TO BE CONTROLLED BY INTEGRAL MOTION SENSORS TO FIXTURES.
2	PROVIDE LOW VOLTAGE SWITCH FOR MANUAL CONTROL OF LIGHTING FIXTURES.
3	VERIFY ANGLE AND MOUNTING LOCATION OF 2-WAY LINEAR MOTION SENSOR TO ENSURE OPERATION IN SPACE.



1 LIGHTING PLAN - TOP FLOOR
SCALE - 3/32" = 1'0"

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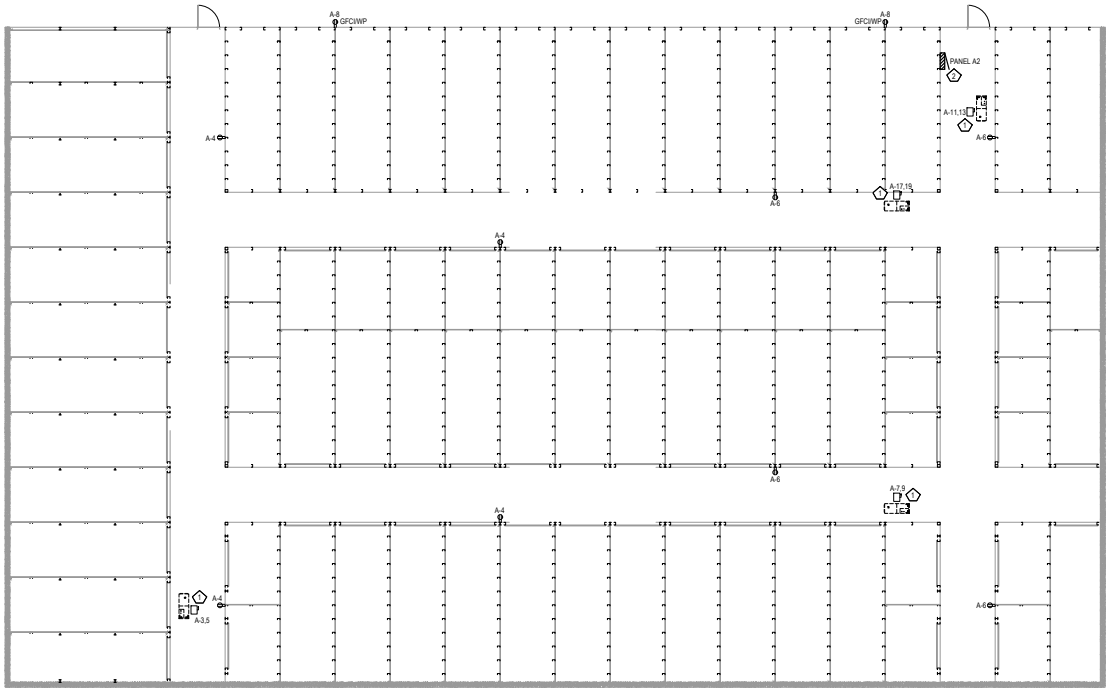
24-029	CHECKED BY: DBAG

LIGHTING PLAN - TOP FLOOR

E1.2

POWER KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	PROVIDE EQUIPMENT DISCONNECT. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.
2	VERIFY EXACT MOUNTING LOCATION OF PANEL PRIOR TO BEGINNING WORK.



1 POWER PLAN - BOTTOM FLOOR
SCALE - 3/32" = 1'0"

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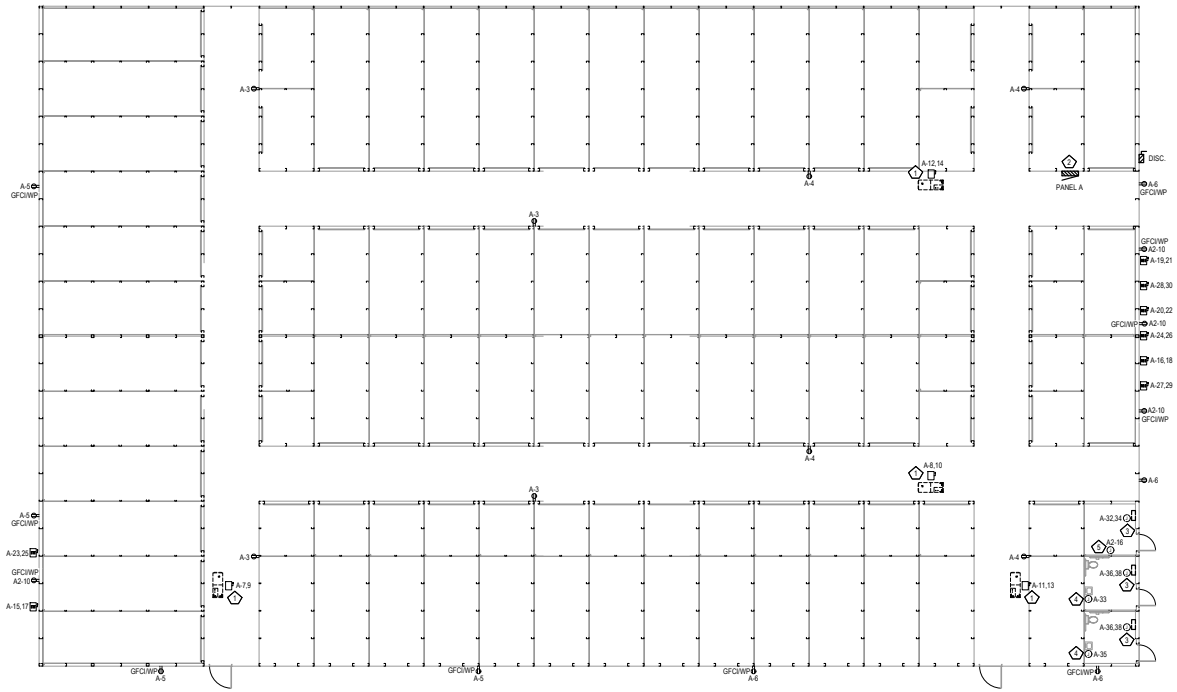
PROJECT NO.:	DRAWN BY: DBAS
24-029	CHECKED BY: DBAS

POWER PLAN - BOTTOM FLOOR

E1.3

POWER KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	PROVIDE EQUIPMENT DISCONNECT. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.
2	VERIFY EXACT MOUNTING LOCATION OF PANEL PRIOR TO BEGINNING WORK.
3	PROVIDE RECESSED JUNCTION BOX FOR UNIT HEATER.
4	PROVIDE JUNCTION BOX FOR POINT OF USE WATER HEATER. PROVIDE MEANS OF DISCONNECT FOR MAINTENANCE.
5	PROVIDE JUNCTION BOX FOR FIRE ALARM CONTROL PANEL.



1 POWER PLAN - TOP FLOOR
SCALE - 3/32" = 1'0"

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DESIGN FOR:
BAUCOM BUSINESS PLAZA - S1
11132 U.S. 401 N
FUQUAY-VARINA, NC 27526

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PROJECT NO.: 24-029
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CHECKED BY: DBAS

POWER PLAN - TOP FLOOR

E1.4

600 AMP MAIN LUG ONLY — **PANELBOARD A** — LOCATION: **S1**

600 AMP BUS RATING **42** POLES **22** KA SHORT CIRCUIT RATING ENCLOSURE RATING: **NEMA 1**

208Y/120 VOLTS **3** PHASE **4** WIRE **60** HZ. MOUNTING: **SURFACE**

CIRCUIT NO.	DESCRIPTION	BREAKER AMPS/POLES	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/POLES	DESCRIPTION	CIRCUIT NO.
1	TOP FLOOR LIGHTING	20/1	1.31	1.69		20/1	TOP FLOOR LIGHTING	2
3	GENERAL RECEPTS.	20/1		0.72	0.72	20/1	GENERAL RECEPTS.	4
5	EXTERIOR RECEPTS.	20/1			0.72	0.72	20/1	EXTERIOR RECEPTS.	6
7	AHU-5	60/2	5.20	5.20			60/2	AHU-6	8
9					5.20	5.20			10
11	AHU-7	60/2				5.20	5.20	60/2	AHU-8	12
13			5.20	5.20					14
15	HP-1	45/2			2.71	2.71		45/2	HP-2	16
17							2.71	2.71			18
19	HP-3	45/2	2.71	2.71				45/2	HP-4	20
21					2.71	2.71			22
23	HP-5	45/2					2.71	2.71	45/2	HP-6	24
25			2.71	2.71					26
27	HP-7	45/2			2.71	2.71		45/2	HP-8	28
29							2.71	2.71			30
31	BATHROOM/SPRINKLER LIGHTING	20/1	0.35	1.50			20/2	EUH-1	32
33	POINT OF USE WATER HEATER	20/1			2.40	1.50			34
35	POINT OF USE WATER HEATER	20/1					2.40	1.50	20/2	EUH-2	36
37			13.76	1.50					38
39	PANEL A2	200/3			16.32	1.50		20/2	EUH-3	40
41							16.32	1.50			42
	TOTAL PHASE KVA PER PHASE		51.75		49.82		49.82			
	TOTALCONNECTED KVA		151.39							
	AMPS PER PHASE		431		415		415			

DEMAND KVA: 180.40

DEMAND AMPS: 501

NOTES:
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3
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200 AMP MAIN LUG ONLY — **PANELBOARD A2** — LOCATION: **BOTTOM FLOOR**

225 AMP BUS RATING **30** POLES **10** KA SHORT CIRCUIT RATING ENCLOSURE RATING: **NEMA 1**

208Y/120 VOLTS **3** PHASE **4** WIRE **60** HZ. MOUNTING: **SURFACE**

CIRCUIT NO.	DESCRIPTION	BREAKER AMPS/POLES	LOAD KVA PHASE A	LOAD KVA PHASE B	LOAD KVA PHASE C	BREAKER AMPS/POLES	DESCRIPTION	CIRCUIT NO.
1	BOTTOM FLOOR LIGHTING	20/1	1.50	1.50		20/1	BOTTOM FLOOR LIGHTING	2
3	AHU-1	60/2			5.20	0.72	20/1	GENERAL RECEPTS.	4
5							5.20	0.72	20/1	GENERAL RECEPTS.	6
7	AHU-2	60/2	5.20	0.36					20/1	EXTERIOR RECEPTS.	8
9					5.20	0.72			20/1	SERVICE RECEPTS.	10
11	AHU-3	60/2					5.20	0.08	20/1	BOTTOM EXTERIOR LIGHTING	12
13			5.20	0.35					20/1	TOP EXTERIOR LIGHTING	14
15	AHU-4	60/2			5.20	0.18			20/1	FIRE ALARM CONTROL PANEL	16
17							5.20			SPACE	18
19	SPACE									SPACE	20
21	SPACE									SPACE	22
23	SPACE									SPACE	24
25	SPACE									SPACE	26
27	SPACE									SPACE	28
29	SPACE									SPACE	30
	TOTAL PHASE KVA PER PHASE		14.11		17.22		16.395			
	TOTALCONNECTED KVA		47.725							
	AMPS PER PHASE		118		144		137			

DEMAND KVA: 63.59

DEMAND AMPS: 177

NOTES:
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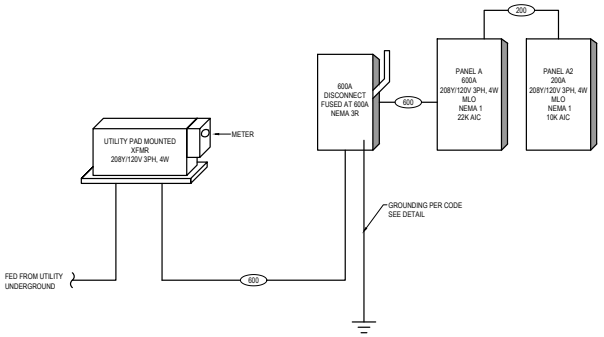

1 ONE-LINE DIAGRAM

NOT TO SCALE

FEEDER SCHEDULE - 3 PHASE

STANDARD OVERCURRENT PROTECTION SIZE	FEEDER WIRE - # SETS (CONDUCTOR SIZE, EQUIP. GND., CONDUIT SIZE) CONDUCTOR TYPE: THHN - DRY; THWN - WET			
	COPPER WIRE	GEC	ALUMINUM WIRE	GEC
30	1 [4 #10, #10G, 3/4"C]		1 [4 #8, #8G, 3/4"C]	
35	1 [4 #8, #10G, 3/4"C]		1 [4 #6, #8G, 1"C]	
40	1 [4 #8, #10G, 3/4"C]		1 [4 #6, #8G, 1"C]	
45	1 [4 #6, #10G, 1"C]		1 [4 #4, #8G, 1-1/4"C]	
50	1 [4 #6, #10G, 1"C]		1 [4 #4, #8G, 1-1/4"C]	
60	1 [4 #4, #10G, 1-1/4"C]		1 [4 #3, #8G, 1-1/4"C]	
70	1 [4 #4, #8G, 1-1/4"C]		1 [4 #2, #6G, 1-1/4"C]	
80	1 [4 #3, #8G, 1-1/4"C]		1 [4 #1, #6G, 1-1/2"C]	
90	1 [4 #2, #8G, 1-1/4"C]		1 [4 #1/0, #6G, 2"C]	
100	1 [4 #1, #6G, 1-1/2"C]	#8	1 [4 #1/0, #6G, 2"C]	#6
110	1 [4 #1, #6G, 1-1/2"C]	#8	1 [4 #1/0, #4G, 2"C]	#6
125	1 [4 #1, #6G, 1-1/2"C]	#6	1 [4 #2/0, #4G, 2"C]	#4
150	1 [4 #1/0, #6G, 2"C]	#6	1 [4 #3/0, #4G, 2"C]	#4
175	1 [4 #2/0, #6G, 2"C]	#4	1 [4 #4/0, #4G, 2-1/2"C]	#2
200	1 [4 #3/0, #6G, 2"C]	#4	1 [4 #250KCMIL, #4G, 2-1/2"C]	#2
225	1 [4 #4/0, #4G, 2-1/2"C]	#2	1 [4 #300KCMIL, #2G, 3"C]	#1/0
250	1 [4 #250KCMIL, #4G, 2-1/2"C]	#2	1 [4 #350KCMIL, #2G, 3"C]	#1/0
300	1 [4 #300KCMIL, #4G, 3"C]	#2	1 [4 #500KCMIL, #2G, 3"C]	#1/0
350	2 [4 #2/0, #3G, 2"C]	#2	2 [4 #4/0, #1G, 2-1/2"C]	#1/0
400	2 [4 #3/0, #3G, 2"C]	#2	2 [4 #250KCMIL, #1G, 2-1/2"C]	#1/0
450	2 [4 #4/0, #2G, 2-1/2"C]	#1/0	2 [4 #300KCMIL, #1/0G, 3"C]	#3/0
500	2 [4 #250KCMIL, #2G, 2-1/2"C]	#1/0	2 [4 #350KCMIL, #1/0G, 3"C]	#3/0
600	2 [4 #350KCMIL, #1G, 3"C]	#2/0	2 [4 #500KCMIL, #2/0G, 3"C]	#4/0
700	2 [4 #500KCMIL, #1/0G, 3"C]	#2/0	3 [4 #350KCMIL, #3/0G, 3"C]	#4/0
800	3 [4 #300KCMIL, #1/0G, 3"C]	#3/0	3 [4 #400KCMIL, #3/0G, 3"C]	#4/0
1000	3 [4 #400KCMIL, #2/0G, 3"C]	#3/0	4 [4 #350KCMIL, #4/0G, 3"C]	#4/0
1200	4 [4 #350KCMIL, #3/0G, 3"C]	#3/0	4 [4 #500KCMIL, #250KCMIL G, 3"C]	#250 KCMIL
1600	5 [4 #400KCMIL, #4/0G, 3"C]	#3/0	6 [4 #400KCMIL, #350KCMIL G, 3"C]	#250 KCMIL
2000	6 [4 #400KCMIL, #250KCMIL G, 3"C]	#3/0	7 [4 #500KCMIL, #400KCMIL G, 3"C]	#250 KCMIL
2500	7 [4 #500KCMIL, #350KCMIL G, 3"C]	#3/0	9 [4 #500KCMIL, #600KCMIL G, 3"C]	#250 KCMIL
3000	8 [4 #500KCMIL, #400KCMIL G, 3"C]	#3/0	10 [4 #500KCMIL, #600KCMIL G, 3"C]	#250 KCMIL
4000	11 [4 #500KCMIL, #500KCMIL G, 3"C]	#3/0	13 [4 #500KCMIL, #750KCMIL G, 3"C]	#250 KCMIL

FEEDER SCHEDULE NOTES:

1. ALL FEEDER SIZES MAY NOT BE LISTED IN ONE-LINE DIAGRAM
2. ELECTRICAL CONTRACTOR TO VERIFY CONDUIT SIZE REQUIRED IF WIRE TYPES OTHER THAN THOSE LISTED ABOVE ARE USED. REFER TO APPLICABLE TABLE IN ANNEX C OF NEC.
3. IF CONDUIT OTHER THAN EMT IS REQUIRED, BASE BID ON NEXT TRADE SIZE ABOVE THAT INDICATED.
4. 'GEC' DENOTES GROUNDING ELECTRODE CONDUCTOR PER NEC TABLE 250.66.

* EC SHALL VERIFY WITH AUTHORITY HAVING JURISDICTION AND UTILITY COMPANY THAT ALUMINUM CONDUCTORS ARE ACCEPTABLE FOR USE AS UTILITY TRANSFORMER SECONDARIES AND FEEDER CIRCUITS.

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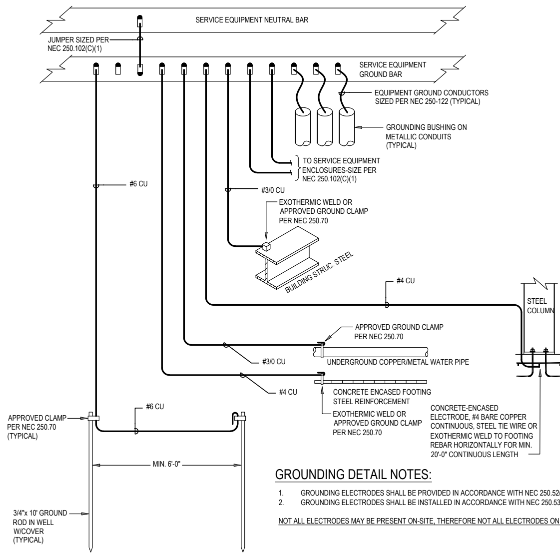
PANEL SCHEDULES AND ONE-LINE DIAGRAM

E2.1



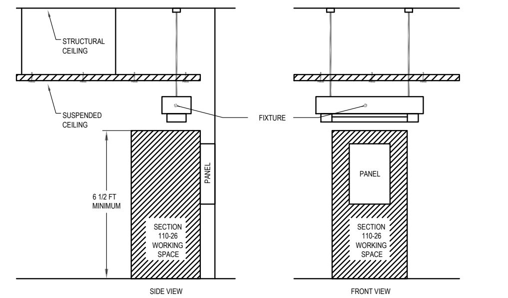
GROUNDING DETAIL NOTES:

1. GROUNDING ELECTRODES SHALL BE PROVIDED IN ACCORDANCE WITH NEC 250.52(A).
2. GROUNDING ELECTRODES SHALL BE INSTALLED IN ACCORDANCE WITH NEC 250.53

NOT ALL ELECTRODES MAY BE PRESENT ON-SITE, THEREFORE NOT ALL ELECTRODES ON THIS DETAIL MAY APPLY. DETAIL IS DIAGRAMMATIC ONLY

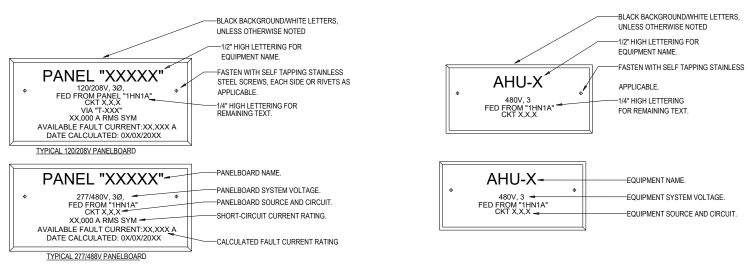
1 SERVICE GROUNDING DETAIL

NOT TO SCALE



2 WORKING CLEARANCE FOR ELECTRICAL EQUIPMENT

NEC ARTICLE 110.26

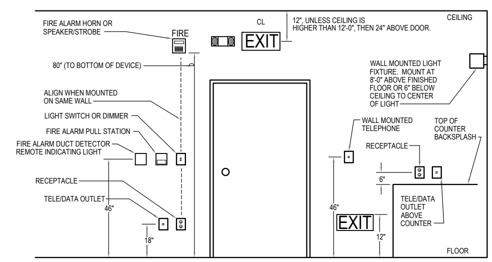


PANELBOARD NAMEPLATES

NOTES:
1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS, COLORS, ETC.
2. PROVIDE SHORT-CIRCUIT CURRENT RATING AND AVAILABLE FAULT CURRENT ON EACH NON-DWELLING SERVICE EQUIPMENT NAMEPLATE.

3 TYPICAL NAMEPLATE DIAGRAM

NOT TO SCALE



NOTES:
1. ALL DIMENSIONS ARE TO CENTER LINE OF DEVICE, UNLESS OTHERWISE NOTED.

4 TYPICAL DEVICE MOUNTING ELEVATION

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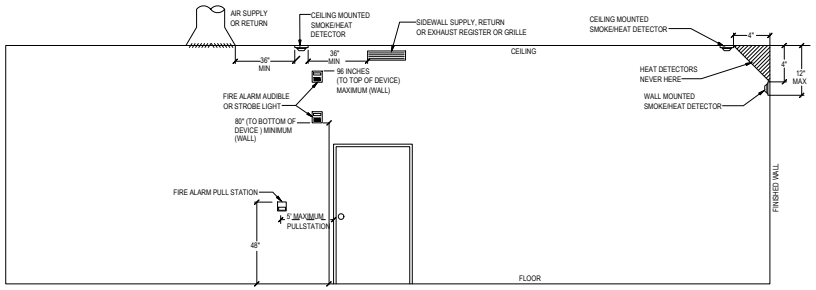
24-029	DBAS
	CHECKED BY: DBAS

ELECTRICAL DETAILS

E3.1

FIRE ALARM GENERAL NOTES

1. FACP SHALL HAVE A MINIMUM 24HR. BATTERY BACKUP.
2. FACP SHALL BE FULLY ANALOG ADDRESSABLE.
3. FACP SHALL BE CONNECTED TO A UL APPROVED CENTRAL STATION.
4. ZONE PER NFPA 72, 2013 AND MANUFACTURER'S RECOMMENDATIONS WITH NO ONE ZONE EXCEEDING 15,000 S.F. PER FLOOR.
5. COORDINATE QUANTITY AND LOCATIONS OF DEVICES WITH CONTRACT DRAWINGS.
6. LOCATE SMOKE DETECTOR WITHIN 5' OF THE MAGNETIC HOLD OPEN DOORS. (TYPICAL)
7. LOCATE FIRE ALARM PULL STATION WITHIN 5' OF THE EXIT DOOR.
8. LOCATE SMOKE/HEAT DETECTOR WITHIN 5' OF THE FA EQUIPMENT (FACP, FATC, NAC).
9. LOCATION OF CEILING MOUNTED SMOKE/HEAT DETECTOR SHALL BE FIELD COORDINATED PRIOR TO ROUGH IN. THE DETECTOR SHALL BE A MINIMUM OF 2' AWAY FROM LIGHT FIXTURE AND A MINIMUM OF 3' AWAY FROM AIR DISTRIBUTION DEVICES.
10. AUTOMATIC DOOR CLOSING SHALL BE ACCOMPLISHED BY THE ACTIVATION OF THE BUILDING FIRE ALARM SYSTEM. SMOKE DETECTOR ACTIVATION SHALL ALERT THE BUILDING FIRE ALARM SYSTEM. THE FIRE ALARM SYSTEM SHALL CAUSE ALL HOLD OPEN DOORS TO CLOSE UPON ALARM ACTIVATION IN THE BUILDING.
11. ACTIVATION OF AN ALARM ZONE SHALL CAUSE ALL AIR HANDLING EQUIPMENT TO SHUT DOWN (ALL DAMPERS, AIR HANDLERS AND EXHAUST FANS MUST STOP).
12. ACTIVATION OF KITCHEN HOOD SUPPRESSION SYSTEM PROVIDES SIGNAL TO FACP WHICH IN TURN ACTIVATES ALL ANNUNCIATING ZONES & SHUTS DOWN HOOD SUPPLY AIR. HOOD EXHAUST SHALL CONTINUE TO OPERATE.
13. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF ALL FLOW, PRESSURE, & TAMPER SWITCHES WITH FIRE PROTECTION CONTRACTOR PRIOR TO INSTALLATION.
14. ALL VISUAL DEVICES WITHIN THE SAME AREA SHALL BE SYNCHRONIZED.
15. ALL FIRE ALARM WIRING SHALL BE IN RED COLORED CONDUIT./FIRE ALARM CABLING SHALL BE PLENUM RATED.
16. PROVIDE MULTI-TEMPORAL SOUNDING CAPABILITY AT ALL AUDIO DEVICES FOR EMERGENCY NOTIFICATION FOR NON VOICE SYSTEMS COMPONENTS.
17. THE FIRE ALARM SYSTEM MANUFACTURER SHALL PROVIDE NOTIFICATION APPLIANCE CIRCUIT (NAC) POWER EXTENDERS AS REQUIRED.
18. THE DUCT SMOKE DETECTORS SHALL COMPLY WITH IFC 907.2.12.1.2 AND 907.3.1.
19. PROVIDE DITEK #DTK-DF12DS1 SERIES OR EQUAL TVSS FOR 120V SUPPLY TO FIRE ALARM CONTROL PANELS. WITH TYHS DRY CONTACT TO BE MONITORED BY FACP. PROVIDE DITEK DTK-2MHLP24F-WB OR EQUAL FOR ALL FIRE ALARM CABLES THAT EXIT THE PHYSICAL BUILDING. TAMPER SWITCHES DTK-2MHLP24B-WB, AND EACH UBIEXTENDER FIRE ALARM PANEL. NAC, P/V, IDC SURGE: DTK-2MHLP24B-WB OR EQUAL. DIALER SURGE: DTK -2MHTPWB FIBER MEDIA CONVERTER PROTECTOR DTK-PVPIP OR EQUAL.
20. THE CIRCUIT FEEDING THE FIRE ALARM PANEL IS DEDICATED FOR THE FIRE ALARM ONLY. BREAKER SHALL BE PROVIDED WITH A LABEL "FIRE ALARM CIRCUIT" AND SHALL BE RED. PROVIDE BREAKER LOCK ON DEVICE.
21. PROVIDE REMOTE LIGHT WITH TEST SWITCH FOR DUCT SMOKE DETECTOR ON CEILING WHERE UNIT IS ABOVE CEILING.
22. CONTRACTOR SHALL INCLUDE IN BID LABOR AND MATERIAL FOR UP TO (2) DUCT DETECTORS. (5) ANNUNCIATION DEVICES. (2) SMOKE DETECTORS AND (2) PULL STATIONS 100' FROM LOCAL PANEL (IN WALL) AS REQUIRED BY LOCAL AHJ/ENGINEER. INCLUDE ALL PROGRAMMING COSTS.
23. CONTRACTOR RESPONSIBLE FOR SHOP DRAWINGS AS REQUIRED BY LOCAL AHJ.
24. DUCT DETECTORS SHALL BE VERIFIED WITH THE MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION. TOTAL QUANTITY MINIMUM SHALL BE BASED ON BOTH MECHANICAL SCHEDULES AND MECHANICAL PLAN LOCATIONS AND ELECTRICAL PLANS. WHEN DEVICE QUANTITIES (ELECTRICAL VS. MECHANICAL) ARE IN CONFLICT, PROVIDE THE GREATER QUANTITY OF DETECTORS.
25. DIGITAL ALARM COMMUNICATOR TRANSMITTER SHALL BE ACCEPTABLE TO THE REMOTE CENTRAL STATION AND SHALL COMPLY WITH UL 632. CELLULAR LINE - SINGLE MAIN SOURCE. PROVIDE NAPCO STARLINK (SLD-CMDA-FIRE) FIRE ALARM COMMUNICATOR AND SLE-ANTEX150 EXTERNAL ANTENNA TO OR EQUAL AND COORDINATED WITH THE CELLULAR DIAL OUT SERVICE. CELLULAR DIAL OUT SHALL BE BACKED UP AS PART OF BATTERY BACKUP AS WELL AS GENERATOR BACKED UP WHERE AVAILABLE. FUNCTIONAL PERFORMANCE: UNIT SHALL RECEIVE AN ALARM, SUPERVISORY, OR TROUBLE SIGNAL FROM FIRE-ALARM CONTROL UNIT AND AUTOMATICALLY CAPTURE A PRESET NUMBER FOR A REMOTE CENTRAL STATION. WHEN CONTACT IS MADE WITH CENTRAL STATION(S), SIGNALS SHALL BE TRANSMITTED. IF SERVICE ON THE CELLULAR LINE IS INTERRUPTED FOR LONGER THAN 45 SECONDS, TRANSMITTER SHALL INITIATE A LOCAL TROUBLE SIGNAL. TRANSMITTER SHALL AUTOMATICALLY REPORT CELLULAR SERVICE RESTORATION TO THE CENTRAL STATION. IF SERVICE IS LOST, TRANSMITTER SHALL INITIATE THE LOCAL TROUBLE SIGNAL.
26. SLEEPING AREAS SHALL COMPLY WITH NFPA 72 2013 SECTION 18.4.5.3. WHERE AUDIBLE APPLIANCES ARE PROVIDED TO PRODUCT SIGNALS FOR SLEEPING AREAS. AUDIBLE DEVICE SHALL PRODUCE A LOW FREQUENCY ALARM SIGNAL OF 520HZ SQUAREWAVE ALARM SIGNAL.



NOTES:
1. LOCATIONS WHERE TV MOUNT IS BACK TO BACK ON SAME WALL, AN OFFSET OF 8-12" WILL BE NEEDED FOR INSTALLATION OF JACK/RECEPTACLE.
2. DEVICES ABOVE COUNTER TOPS SHALL BE A MAXIMUM OF 48" TO TOP OF DEVICE.
3. DEVICES NEXT TO DOOR EXIT SHALL BE WITHIN 8" (MAXIMUM) TYPICAL OF DOOR UNLESS OBSTACLES SUCH AS SIDELITES, ETC.
4. ALL DEVICES ARE TO CENTER LINE OF DEVICE, UNLESS OTHERWISE NOTED.

1 MOUNTING HEIGHTS OF DEVICES-ELEVATION
NOT TO SCALE

FIRE ALARM SYSTEM INPUT/OUTPUT MATRIX

SYSTEM OUTPUTS

FACP ANNUNCIATION | NOTIFICATION | REQUIRED FIRE SAFETY CONTROL

SYSTEM INPUTS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
1 FIRE ALARM SYSTEM AC POWER FAILURE			●	●								●	●					●								1
2 FIRE ALARM SYSTEM LOW BATTERY					●	●						●														2
3 OPEN CIRCUIT					●	●						●														3
4 GROUND FAULT					●	●						●														4
5 NOTIFICATION APPLIANCE CIRCUIT SHORT					●	●						●														5
6 BUILDING MANUAL PULL STATIONS	●	●					●	●	●	●			●						●	●						6
7 CORRIDOR SMOKE DETECTORS	●	●					●	●	●	●			●	●					●	●	●	●	●	●		7
8 AREA SMOKE DETECTORS	●	●					●	●	●	●			●	●					●	●	●	●	●	●		8
9 HVAC AIR DUCT SMOKE DETECTORS			●	●			●				●									●						9
10 AREA HEAT DETECTORS	●	●					●	●	●	●			●	●					●	●	●	●	●	●		10
11 HOOD OR ROOM FIRE SUPPRESSION SYSTEM ALARM	●	●					●	●	●	●			●	●					●	●						11
12 SPRINKLER TAMPER SWITCH			●	●			●				●															12
13 SPRINKLER WATER FLOW IN BUILDING	●	●					●	●	●	●			●	●					●	●						13
14 SPRINKLER WATER FLOW IN ELEV EQUIP RM OR SHAFT	●	●					●	●	●	●			●	●			●	●	●	●						14
15 ELEV EQUIP RM AREA SMOKE DETECTOR	●	●					●	●	●	●			●	●			●	●	●	●						15
16 ELEV SHAFT AND ELEV EQUIP RM HEAT DETECTORS	●	●					●	●	●	●			●	●			●	●	●	●						16
17 ELEV LOBBY SMOKE DETECTORS - UPPER FLOORS	●	●					●	●	●	●			●	●					●	●	●	●	●	●		17
18 ELEV LOBBY SMOKE DETECTOR - RECALL FLOOR	●	●					●	●	●	●			●	●			●	●	●	●	●	●	●	●		18
19 ELEV CONTROLLER POWER SHUNT TRIP STATUS			●	●			●				●															19
20 FIRE PUMP POWER FAILURE/PHASE REVERSAL			●	●			●				●															20
21 FIRE PUMP RUNNING	●	●					●	●	●	●			●	●					●	●	●					21
22 FIRE PUMP SYSTEM NOT IN AUTOMATIC			●	●			●				●															22
23 LEGALLY REQUIRED GENERATOR SYSTEM LOW FUEL			●	●			●				●															23
24 LEGALLY REQUIRED GENERATOR NOT IN AUTOMATIC			●	●			●				●															24
25 AREA OF REFUGE TWO-WAY COMMUNICATIONS STATUS			●	●			●				●															25
26 -																										26
27 -																										27
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	

NFPA FIRE ALARM LEGEND	
SYMBOL	DESCRIPTION
FACP	FIRE ALARM CONTROL PANEL
TPS$_N$	FIRE ALARM TERMINAL CABINET (N = TRANSPONDER NUMBER)
FSCP$_N$	FIRE SUPPRESSION CONTROL PANEL (N DENOTES SUPPRESSION TYPE)
GAP$_N$	GRAPHIC ANNUNCIATOR PANEL
DACT	DIGITAL ALARM COMMUNICATOR TRANSMITTER
FAA	FIRE ALARM ANNUNCIATOR
PRN	PRINTER
MIC	REMOTE VOICE / EVACUATION VOICE / EVACUATION MICROPHONE
	FIRE SERVICE OR EMERGENCY PHONE STATION
WF	WATER FLOW SWITCH
LT	LOW TEMPERATURE SWITCH
PS	HIGH PRESSURE SWITCH
MR	MAIN / RESERVE
PS	PRESSURE DETECTOR / SWITCH
VS	VALVE SUPERVISORY SWITCH
A	ABORT SWITCH
MS	MANUAL RELEASING STATION
AIM	ADDRESSABLE INPUT MONITOR
AOM	ADDRESSABLE OUTPUT (RELAY)
AIO$_N$	ADDRESSABLE INPUT/OUTPUT MODULE (N DENOTES NUMBER OF INPUTS AND OUTPUTS)
ACM	ADDRESSABLE CONTROL MODULE
X	GAS DETECTOR (X = GAS TYPE , EX. CO FOR CARBON MONOXIDE)
X	HEAT DETECTOR/SENSOR (X = TYPE)
X	PROVIDE BOX, AS SHOWN, TO DENOTE COMBINATION DETECTORS
LH	HEAT DETECTOR LINE TYPE
F	PULL STATION / FIRE ALARM
	SMOKE DETECTOR/SENSOR (DEFAULT PHOTOELECTRIC TYPE)
ION	SMOKE DETECTOR - IONIZATION TYPE
SS	SMOKE ALARM (SINGLE STATION)
MS	SMOKE ALARM (MULT. STATION)
SB	DETECTOR WITH SOUNDER BASE
MC	DETECTOR - MULTI CRITERIA TYPE
	DUCT SMOKE DETECTOR (NFPA 72, SECTION 17.7.5.5)
	AUDIBLE ONLY APPLIANCE (WALL MOUNTED)
CD	VISUAL ONLY APPLIANCE (WALL MOUNTED)
CD	AUDIBLE/VISUAL APPLIANCE (WALL MOUNTED)
CD	VISUAL ONLY APPLIANCE (CEILING MOUNTED)
	AUDIBLE ONLY APPLIANCE (CEILING MOUNTED)
CD	AUDIBLE/VISUAL APPLIANCE (CEILING MOUNTED)
	END OF LINE RESISTOR

SHARPE ENGINEERING & CONSULTING, pllc
P.O. Box G
Wilsons Mills, NC 27593
NC License # P-2621
P: 336.452.5815
sharpeengr.com

PRELIMINARY
NOT FOR CONSTRUCTION

DESIGN FOR:
BAUCOM BUSINESS PLAZA - S1
11132 U.S. 401 N
FUQUAY-VARINA, NC 27526

REV. NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		

ISSUE NO.	DATE	DESCRIPTION
1	XX/XX/XX	XX/XX/XX
2		
3		
4		
5		
6		
7		

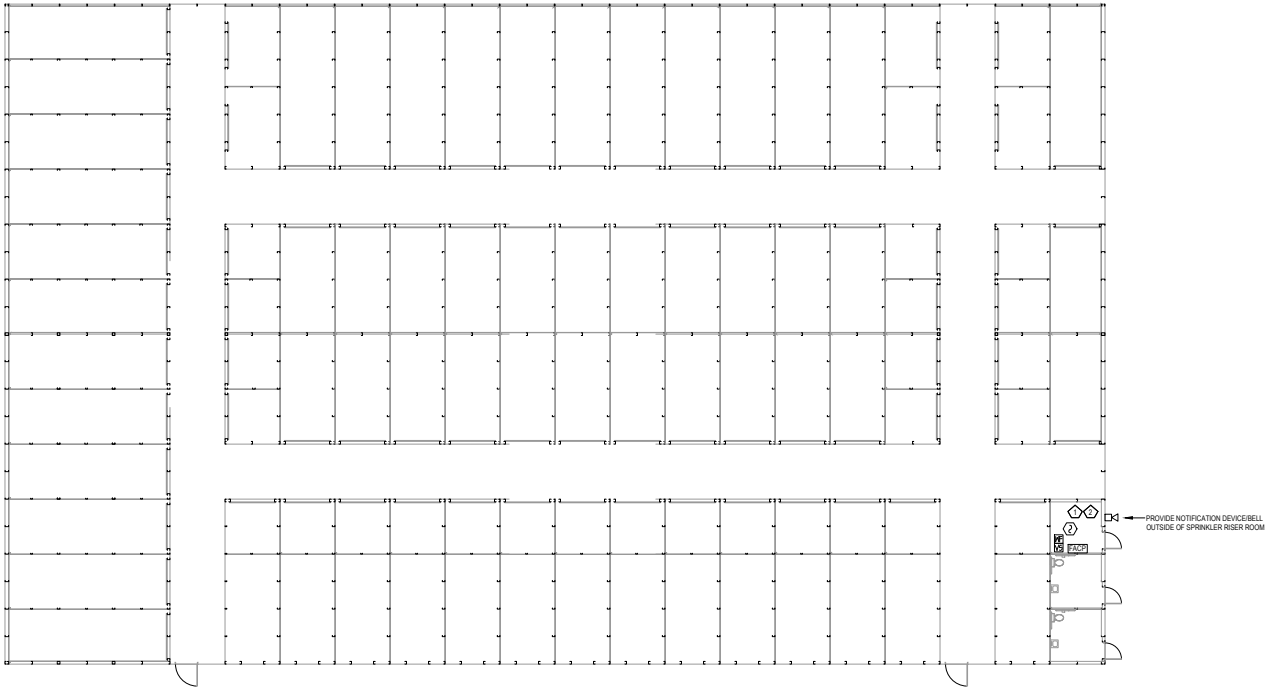
PROJECT NO.: 24-029
DRAWN BY: DBAS
CHECKED BY: DBAS

FIRE ALARM LEGENDS AND NOTES

FA0.1

FIRE ALARM KEYNOTE LEGEND	
KEY VALUE	KEYNOTE TEXT
1	FIRE ALARM CONTROL PANEL LOCATED IN SPRINKLER ROOM. SMOKE ALARM TO BE PLACED ABOVE PANEL.
2	FLOW AND TAMPER SWITCHES TO BE INSTALLED WITH SPRINKLER SYSTEM AT RISER AND EACH ZONE CONTROL VALVE. COORDINATE ALL NECESSARY LOCATIONS WITH SPRINKLER CONTRACTOR.

NOTE:
BUILDING IS SPRINKLER MONITORED ONLY



1 FIRE ALARM PLAN - TOP FLOOR
SCALE - 3/32" = 1'0"

SHARPE
ENGINEERING & CONSULTING, PLLC
P.O. Box G
Wilsons Mills, NC 27593
NC License # P-2821
P: 336.415.5815
sharpeengr.com

PRELIMINARY
NOT FOR CONSTRUCTION

DESIGN FOR:
BAUCOM BUSINESS PLAZA - S1
11132 U.S. 401 N
FUQUAY-VARINA, NC 27526

REV. NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		

ISSD. NO.	DATE	DESCRIPTION
1	XX/X/XX	XX/X/XX
2		
3		
4		
5		
6		
7		

PROJECT NO.: 24-029
DRAWN BY: DBAS
CHECKED BY: DBAS

FIRE ALARM PLAN

FA1.1

*Each section below must be filled out by whoever is performing the work. Must be owner or licensed contractor. Address, company name & phone must match information on state license.

Application # _____

Harnett County Central Permitting
420 McKinney Pkwy Lillington, NC 27546
PO Box 65 Lillington, NC 27546
910-893-7525 ext. 1 Fax 910-893-2793 www.harnett.org/permits

COMMERCIAL

Application for Building and Trades Permit

Owner's Name: Jim Moore Date: 24 July 2025

Site Address: 11132 U.S. 401 N, Fuquay-Varina, NC 27526 Phone: 910-922-7010

Directions to job site from Lillington: _____

_____

_____

Subdivision: _____ Lot: _____

Description of Proposed Work: Installation of Fire Alarm Sprinkler Monitoring System

Heated SF _____ Unheated SF _____

General Contractor Information: Building Cost $ _____

_____ _____
Building Contractor's Company Name Telephone

_____ _____
Address Email Address

_____ _____
Signature of Owner/Contractor/Officer(s) of Corporation License #

Electrical Contractor Information: Electrical Cost $ _____

Description of Work _____ Service Size: _____Amps #T-Poles _____

_____ _____
Electrical Contractor's Company Name Telephone

_____ _____
Address Email Address

_____ _____
Signature of Owner/Contractor/Officer(s) of Corporation License #

Mechanical Contractor Information: Mechanical Cost $ _____

Description of Work _____ # Units_____

_____ _____
Mechanical Contractor's Company Name Telephone

_____ _____
Address Email Address

_____ _____
Signature of Owner/Contractor/Officer(s) of Corporation License #

Plumbing Contractor Information: Plumbing Cost $ _____

Description of Work _____ # Baths_____

_____ _____
Plumbing Contractor's Company Name Telephone

_____ _____
Address Email Address

_____ _____
Signature of Owner/Contractor/Officer(s) of Corporation License #

Insulation Contractor Information

_____ _____
Insulation Contractor's Company Name & Address Telephone

***NOTE: General Contractor must fill out and sign the second page of this application**

Sprinkler Contractor Information

Sprinkler Contractor's Company Name	Telephone
Address	Email Address
Signature of Officer(s) of Corporation	License #

Fire Alarm Contractor Information

Gill Security Systems, Inc	910-818-2868
Fire Alarm Contractor's Company Name	Telephone
818 Ramsey Street, Fayetteville, NC 28301	Christopher@gillsecurity.com
Address	Email Address
Christopher Mercer	SP.FA/LV.24116
Signature of Officer(s) of Corporation	License #

Driveway Access - NC Department of Transportation Driveway Access/Permit? _____Yes XX No

I hereby certify that I have the authority to make necessary application, that the application is correct and that the construction will conform to the regulations in the Building, Electrical, Plumbing and Mechanical codes, and the Harnett County Zoning Ordinance. I state the information on the above contractors is correct as known to me and if **any** changes occur including listed contractors, site plan, number of bedrooms, building and trade plans, Environmental Health permit changes or proposed use changes, I certify it is my responsibility to notify the Harnett County Central Permitting Department of any and all changes.

Expired Permit Fees - 6 months to 2 years permit re-issue fee is $150.00. After 2 years re-issue fee is charged at full price per current fee schedule.

Christopher Mercer	24 July 2025
Signature of Owner/Contractor/Officer(s) of Corporation	Date

Affidavit for Worker's Compensation N.C.G.S. 87-14

The undersigned applicant being the:

_____ General Contractor _____ Owner XX Officer/Agent of the Contractor or Owner

Do hereby confirm under penalties of perjury that the person(s), firm(s) or corporation(s) performing the work set forth in the permit:

XX Has three (3) or more employees and has obtained workers' compensation insurance to cover them.

_____ Has one (1) or more subcontractors(s) and has obtained workers' compensation insurance to cover them.

_____ Has one (1) or more subcontractors(s) who has their own policy of workers' compensation insurance covering themselves.

_____ Has no more than two (2) employees and no subcontractors.

While working on the project for which this permit is sought it is understood that the Central Permitting Department issuing the permit may require certificates of coverage of worker's compensation insurance prior to issuance of the permit and at any time during the permitted work from any person, firm or corporation carrying out the work.

Company or Name: Gill Security Systems, Inc

Sign w/Title: Christopher Mercer Commercial Sales Date: 24 Jul 2025

BaucomBusinessPlazaS1 - Battery Calculation Report

PANEL INFORMATION

Panel Type	ES-50XP
No. of Loops	1
No. of Devices	4
Status	PASS

BATTERY & CHARGER REQUIREMENT

Normal Operation	In Alarm	Suggested Battery	Suggested Capacity	Required Capacity	Suggested Batt. Box
24 Hours	5 Mins	**BAT-12120**	**12Ah**	**7.379Ah**	**BB-17F**

Standby/Quiescent Load

Standby Load Current: 0.243 x Panel in Normal Operation (In hours): 24 = 5.832 Ah

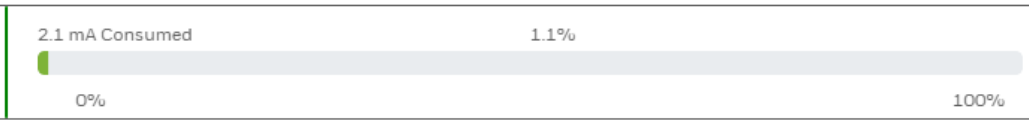
Alarm Load

In Alarm Load Current(In Amps): 0.857 x Panel In Alarm(In Hours): 0.083(5mins) = 0.071Ah

Total Current Load	= 5.903Ah
Multiply with derating factor	= x 1.25
Adding with spare capacity	= N/A
Total AH required	= 7.379 Ah

LOOP1 DETAILS

Number of devices: 4



PANEL MODULES & CIRCUITS

No. of Modules & Circuits: 3

Device Name	Quantity	Quiescent/Stand By (mA)	Alarms (mA)
Main Circuit Board	1	141	257
CLSS PATHWAY PRO	1	100	100

Loop Details

Loop1			
Device Name	**Quantity**	**Quiescent/Stand By (mA)**	**Alarms (mA)**
MDF-300	2	1.50	0.00
BG-12LX	1	0.30	0.00
SD365	1	0.30	0.00

NAC CIRCUITS

NAC Name	Alarms (mA)	Quiescent/Stand By (mA)
NAC Circuit 1	0500	0
NAC Circuit 2	0	0

BATTERY SHARING

Battery Sharing	Alarms (mA)	Quiescent/Stand By (mA)
Battery Sharing 1	0	0
Battery Sharing 2	0	0
Battery Sharing 3	0	0

BG-12LX

Addressable Manual Pull Station

FIRE·LITE ALARMS by Honeywell

Addressable Devices

General

The Fire·Lite BG-12LX is a state-of-the-art, dual-action (i.e., requires two motions to activate the station) pull station that includes an addressable interface (mounted inside) for Fire·Lite's addressable fire alarm control panels (FACPs) Because the BG-12LX is addressable, the control panel can display the exact location of the activated manual station. This leads fire personnel quickly to the location of the alarm.

Features

- Maintenance personnel can open station for inspection and address setting without causing an alarm condition.
- Built-in bicolor LED, which is visible through the handle of the station, flashes in normal operation and latches steady red when in alarm.
- Handle latches in down position and the word "ACTIVATED" appears to clearly indicate the station has been operated.
- Captive screw terminals wire-ready for easy connection to SLC loop (accepts up to 12 AWG/3.25 mm² wire).
- Can be surface mounted (with SB-10 or SB-I/O) or semi-flush mounted. Semi-flush mount to a standard single-gang, double-gang, or 4" (10.16 cm) square electrical box.
- Smooth dual-action design.
- Meets ADAAG controls and operating mechanisms guidelines (Section 4.1.3[13]); meets ADA requirement for 5 lb. maximum activation force.
- Highly visible.
- Attractive shape and textured finish.
- Key reset.
- Includes Braille text on station handle.
- Optional trim ring (BG12TR).
- Meets UL 38, Standard for Manually Actuated Signaling Boxes.

Construction

Shell, door, and handle are molded of durable polycarbonate material with a textured finish.

Specifications

- **Shipping Weight:** 9.6 oz. (272.15 g)
- **Normal operating voltage:** 24 VDC.
- **Maximum SLC loop voltage:** 28.0 VDC.
- **Maximum SLC standby current:** 375 µA.
- **Maximum SLC alarm current:** 5 mA.
- **Temperature Range:** 32°F to 120°F (0°C to 49°C)
- **Relative Humidity:** 10% to 93% (noncondensing)
- **For use indoors in a dry location**

Installation

The BG-12LX will mount semi-flush into a single-gang, double-gang, or standard 4" (10.16 cm) square electrical outlet box, or will surface mount to the model SB-10 or SB-I/O surface backbox. If the BG-12LX is being semi-flush mounted, then the optional trim ring (BG12TR) may be used. The BG12TR is usually needed for semi-flush mounting with 4" (10.16 cm) or double-gang boxes (not with single-gang boxes).

FLPullStation.jpg

Operation

Pushing in, then pulling down on the handle causes it to latch in the down/activated position. Once latched, the word "ACTIVATED" (in bright yellow) appears at the top of the handle, while a portion of the handle protrudes from the bottom of the station. To reset the station, simply unlock the station with the key and pull the door open. This action resets the handle; closing the door automatically resets the switch.

Each manual station, on command from the control panel, sends data to the panel representing the state of the manual switch. Two rotary decimal switches allow address settings (1 – 159 with Breakaway Tab removed for MS-9600 Series, 1 – 99 and MS-9200UDLS, 1 – 50 for MS-9050UD).

Architectural/Engineering Specifications

Manual Fire Alarm Stations shall be non-coded, with a key-operated reset lock in order that they may be tested, and so designed that after actual Emergency Operation, they cannot be restored to normal except by use of a key. An operated station shall automatically condition itself so as to be visually detected as activated. Manual stations shall be constructed of red-colored polycarbonate material with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in white letters, 1.00 inches (2.54 cm) or larger. Stations shall be suitable for surface mounting on matching backbox SB-10 or SB-I/O; or semi-flush mounting on a standard single-gang, double-gang, or 4" (10.16 cm) square electrical box, and shall be installed

within the limits defined by the Americans with Disabilities Act (ADA) or per national/local requirements. Manual Stations shall be Underwriters Laboratories listed.

Manual stations shall connect with two wires to one of the control panel SLC loops. The manual station shall, on command from the control panel, send data to the panel representing the state of the manual switch. Manual stations shall provide address setting by use of rotary decimal switches.

Product Line Information

BG-12LX: Dual-action addressable pull station. Includes key locking feature. (Listed for Canadian and non-Canadian applications.)

SB-10: Surface backbox; metal.

SB-I/O: Surface backbox; plastic.

BG12TR: Optional trim ring.

17003: Keys, set of two.

Agency Listings and Approvals

In some cases, certain modules or applications may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL/ULC Listed:** S711 (listed for Canadian and non-Canadian applications).
- **MEA:** 67-02-E.
- **CSFM:** 7150-0075:0184.
- **FM Approved.**

Patented: U.S. Patent No. D428,351; 6,380,846; 6,314,772; 6,632,108.

ISO 9001 CERTIFIED
ENGINEERING & MANUFACTURING
QUALITY SYSTEMS

This document is not intended to be used for installation purposes.
We try to keep our product information up-to-date and accurate.
We cannot cover all specific applications or anticipate all requirements.
All specifications are subject to change without notice.

Made in the U.S. A.

For more information, contact Fire•Lite Alarms. Phone: (800) 627-3473, FAX: (877) 699-4105.
www.firelite.com

ES-50X Series

Intelligent Addressable Fire Alarm Control Panels

FIRE·LITE ALARMS by Honeywell

Addressable Fire Alarm Control Panels

General

The **ES-50X, ES-50XC, ES-50XI,** and **ES-50XP** are the latest intelligent addressable fire alarm control panel (FACPs) from Fire•Lite Alarms and are direct replacement for the MS-9050UD. The ES-50X Series support up to 50 addressable devices in any combination of detectors or modules. With an extensive list of powerful features, the ES-50X Series programs just like Fire•Lite's other addressable panels, yet fits into applications previously served only by conventional panels.

The ES-50X and ES-50XC feature a pre-installed IPOTS-COM, a dual technology (POTS and IP) communicator. The POTS transmits system status (alarms, troubles, AC loss, etc.) to a Central Station via the public switched telephone network. The IP communicator's internet monitoring capability sends alarm signals over the Internet saving the monthly cost of two dedicated business telephone lines. Although not required, the secondary telephone line may be retained providing backup communication over the public switched telephone line. Optional cellular reporting is available using an HW-TG7F Series Communicators or the CLSS Pathway.

The ES-50XP features an integrated CLSS Pathway Pro Communicator, a dual-SIM (AT&T/ Verizon) 5G LTE-M Communicator with optional IP connection. The CLSS Pathway Pro transmits system status (alarms, troubles, AC loss, etc.) to the Central Station using LTE CAT-M1 networks, serving as a bridge between the fire system and the CLSS Cloud. The IP communicator's Internet monitoring capability sends alarm signals over the Internet, meeting requirements for backup communication. As an integrated communicator, the CLSS Pathway Pro, typically, can transmit data faster than dial capture methods.

Remote and local programming of the control panel is possible using the FS-Tools Upload/Download utility. Programming databases can be uploaded/downloaded via the panel's USB port (and USB cable) or via an ethernet connection using the IPOTS-COM communicator *(ES-50X and EX-50XC only)*. The USB port also allows for the download or upload of the entire program, history file, walk-test data, current status and system voltages by means of a USB flash drive.

The power supply and all electronics are contained on a circuit board supported on a new quick install chassis and housed in a metal cabinet. Available accessories include local and remote upload/download software, remote annunciators, and reverse polarity/city box transmitter (4XTMF).

Features

- Listed to UL Standard 864, 10th edition
- Pre-installed IPOTS-COM Ethernet IP and POTS (Plain Old Telephone Service) Central Station Communicator *(ES-50X and EX-50XC only)*
- Optional Cellular Central Station Communicators over AlarmNet® *(ES-50X and EX-50XC only)*
- Integrated CLSS Pathway Pro Communicator; dual SIM AT&T/Verizon networks with LTE-CAT-M1 5G technology *(EX-50XP only)*
- Cloud monitoring using Honeywell's Connected Life Safety Services (CLSS) Cloud solutions software *(EX-50XP only)*
- Compatible with SWIFT® wireless devices
- Auto-programming (learn mode) reduces installation time. Reports two devices set to the same address
- Two independently programmable, built-in, Class A or Class B NAC circuits
- Selectable strobe synchronization for System Sensor, Wheelock, and Gentex devices
- Notification Appliance Circuit End of Line resistor matching

- Four programmable function keys for ease of maintenance
- Two programmable relays and one fixed trouble relay
- Built-in Programmer
- Integral 80-character LCD display with backlighting
- Real-time clock/calendar with automatic daylight savings control
- History file with 1,000 event capacity
- Addressable sounder base
- Multi-criteria detector (smoke, heat, CO) with programmable response
- Control module delay timer
- Automatic detector sensitivity testing (NFPA 72 compliant)
- Automatic device type-code verification
- Point trouble identification
- Waterflow selection per module point
- Alarm verification selection per detector point
- Maintenance alert warns when smoke detector dust accumulation is excessive
- One-person audible or silent walktest with walktest log & printout
- System alarm verification selection per detector point
- PAS (Positive Alarm Sequence) and Pre-signal per point (NFPA 72 compliant)
- Up to 16 ANN-BUS annunciators- 8 per each ANN-Bus
- Remote Acknowledge, Alarm Silence, Reset and Drill via addressable modules or remote annunciator
- Upload/Download of program and data via USB with optional FS-Tools Programming Utility

SLC (DCL) COMMUNICATION LOOP

- Supports LiteSpeed™ and CLIP protocols
- SLC (DCL) operates up to 10,000 ft. (3,000 m) in LiteSpeed mode with twisted, unshielded wire
- Single addressable SLC (DCL) loop which meets NFPA Class B and Class A requirements
- 50 addressable device capacity (any combination of addressable detectors and modules)
- Compatible with Fire•Lite's addressable devices (refer to the *SLC Wiring Manual*)

NOTIFICATION APPLIANCE CIRCUITS (NACS)

- Two independently programmable output circuits. Circuits can be configured for Class A or Class B wiring.
  - Class B
  - Class A
- Silence Inhibit and Autosilence timer options
- Continuous, March Time, Temporal, or California code for main circuit board NACs with two-stage capability
- Selectable strobe synchronization per NAC
- 2.5 A special application, 250mA regulated, total power for NACs

NOTE: *Maximum or total 24VDC system power shared between all NAC circuits and the ANN-BUS is 2.7 A*

PROGRAMMING AND SOFTWARE

- Autoprogramming (learn mode) reduces installation time
- Custom English labels (per point) may be manually entered or selected from an internal library file
- Two programmable Form-C relay outputs
- 50 software zones
- Continuous fire protection during online programming
- Program Check automatically catches common errors not linked to any zone or input point
- **OFFLINE PROGRAMMING:** Create the entire program in your office using FS-Tools, a Windows®-based software package, and upload/download system programming locally. Offline programming requires an ethernet connection. FS-Tools is available on www.firelite.com.

User interface

LED INDICATORS

- Fire Alarm (red)
- AC Power (green)
- Trouble (yellow)
- Battery fault (yellow)
- Maintenance (yellow)
- Alarm Silenced (yellow)
- CO Alarm (yellow)
- Supervisory (yellow)
- Ground fault (yellow)
- Disabled (yellow)
- Communication (yellow)
- F1-F4 Programmable Function Keys (yellow)

KEYPAD

- 16 key alpha-numeric pad
- Alarm Silence
- Four (4) programmable function keys
- Acknowledge
- Drill (Manual Evacuate)
- Reset (lamp test)

Product Line Information

ES-50X: Addressable Fire Alarm Control Panel with one SLC loop. Includes main circuit board with display, pre-installed IPOTS-COM communicator, chassis with transformer, backbox with door, plastic bag containing screws, cables, key, etc.

ES-50XC: Addressable Fire Alarm Control Panel with one DCL loop. Includes main circuit board with display, pre-installed IPOTS-COM communicator, chassis with transformer, dress panel, backbox with door, plastic bag containing screws, cables, key, etc.

ES-50XI: Addressable Fire Alarm Control Panel with one SLC loop. Includes main circuit board with display, chassis with transformer, dress panel, backbox with door, plastic bag containing screws, cables, key, etc.

ES-50XP: Addressable Fire Alarm Control Panel with one SLC loop. Includes main circuit board with display, pre-installed CLSS Pathway Pro communicator, chassis with transformer, dress panel, backbox with door, plastic bag containing screws, cables, key, etc.

FS-Tools: Programming software for Windows®-based PC computer. Available for download at www.firelite.com.

IPOTS-COM: Dual technology (POTS and IP) communicator. (replacement board) *(ES-50X and EX-50XC only)*

HW-AV-LTE-M: Optional CLSS Pathway

HW-TG7FS-A/HW-TG7FS-V: CLSS-Enabled 5G /LTE-M Commercial Fire Alarm Communicators for AT&T® and Verizon®

HW-TG7FE-A/HW-TG7FE-V: CLSS-Enabled 5G/LTE-M Dual Path Commercial Fire Alarm Communicators for AT&T and Verizon

HW-TG7FP-A/HW-TG7FP-A: CLSS-Enabled 5G/LTE-M Sole Path Commercial Fire Alarm Communicators for AT&T and Verizon

DP-ES-R: Optional dress panel.

TR-CE: Optional trim ring for semi-flush mounting.

BB-2F: Optional cabinet for one or two modules.

BB-6F: Optional cabinet for up to six modules mounted on CHS-6 chassis.

BB-26: Battery backbox, holds up to two 25 AH batteries & CHG-75.

BB-55F: Battery box, houses two 55 AH batteries

CHS-6: Chassis, mounts up to six multi-modules in a BB-6F cabinet.

CHG-75: Battery charger for lead-acid batteries with a rating of 25 to 75 AH.

CHG-120F: Remote battery charging system for lead-acid batteries with a rating of 55 to 120 AH. Requires additional BB-55F for mounting.

NOTE: *CHG-120F or CHG-75 required for batteries larger than 18AH.*

BAT Series: Batteries, see data sheet DF-52397.

PRN Series: UL listed compatible event printer.

OPTIONAL MODULES

4XTMF Reverse Polarity Transmitter Module: Provides a supervised output for local energy municipal box transmitter, alarm and trouble. Includes a disable switch and disable trouble LED.0

COMPATIBLE ANNUNCIATORS

ANN-80: Remote, red LCD annunciator mimics the information displayed on the FACP LCD display. Recommended wire type is unshielded.

ANN-100: Remote LCD annunciator mimics the information displayed on the FACP LCD display. Recommended wire type is un-shielded. For use in FM applications only.

ANN-I/O: LED Driver Module provides connections to a user supplied graphic annunciator. (See DF-52430.)

ANN-LED: Annunciator Module provides three LEDs for each zone: Alarm, Trouble, and Supervisory. Ships with red enclosure. *(See DF-60241.)*

ANN-RLED: Provides alarm (red) indicators for up to 30 input zones or addressable points. *(See DF-60241.)*

ANN-RLY: Relay Module provides 10 programmable Form-C relays. Can be mounted inside the cabinet. (See DF-52431.)

ANN-S/PG: Serial/Parallel Printer Gateway module provides a connection for a serial or parallel printer. *(See DF-52429.)*

ADDRESSABLE DEVICES

All feature a polling LED and rotary switches for addressing.

SD365(A): Addressable low-profile photoelectric smoke detector. LiteSpeed only.

SD365(A)-IV: Addressable low-profile photoelectric smoke detector. Ivory. LiteSpeed and CLIP mode.

SD365T(A): Addressable low-profile photoelectric smoke detector with thermal sensor. LiteSpeed only.

SD365T(A)-IV: Addressable low-profile photoelectric smoke detector with thermal sensor. Ivory. LiteSpeed and CLIP mode.

SD365R(A): Remote test capable addressable photoelectric smoke detector for use with DNR(W)(A) duct detector housing. LiteSpeed only.

SD365R(A)-IV: Remote test capable addressable photoelectric smoke detector for use with DNR(W)(A) duct detector housing. Ivory. LiteSpeed and CLIP mode.

SD365CO: Addressable, low-profile device that provides fire, heat, and carbon monoxide (CO) detection.

SD365CO-IV: Addressable, low-profile device that provides fire, heat, and carbon monoxide (CO) detection. Ivory. LiteSpeed and CLIP mode.

H365(A): Low-profile 135°F fixed thermal sensor. LiteSpeed only.

H365(A)-IV: Low-profile 135°F fixed thermal sensor. Ivory. LiteSpeed and CLIP mode.

H365R(A): Low-profile, intelligent, rate-of-rise thermal sensor. LiteSpeed only.

H365R(A)-IV: Low-profile, intelligent, rate-of-rise thermal sensor. Ivory. LiteSpeed and CLIP mode.

H365HT(A): Low-profile intelligent 190°F/88°C fixed thermal sensor. LiteSpeed only.

H365HT(A)-IV: Low-profile intelligent 190°F/88°C fixed thermal sensor. Ivory. LiteSpeed and CLIP mode.

D365PL(A): Low-flow non-relay duct-detector housing; includes SD365R(A).

Legacy Devices

CP355(A) Addressable, intelligent smoke detector that incorporates an ionization sensing chamber.

SD355(A): Addressable low-profile photoelectric smoke detector.

SD355T(A): Addressable low-profile photoelectric smoke detector with thermal sensor.

SD355R(A): Remote test capable addressable photoelectric smoke detector for use with DNR(W)(A) duct detector housing.

SD355CO: Addressable, low-profile device that provides fire, heat, and carbon monoxide (CO) detection.

H355(A): Fast-response, low-profile heat detector.

H355R(A): Fast-response, low-profile heat detector with rate-of-rise option.

H355HT(A): Fast-response, low-profile heat detector that activates at 190°F/88°C.

AD355(A): Low-profile, intelligent, "Adapt" multi-sensor detector (B350LP base included).

B200S(A)(-WH)(-IV): Programmable, addressable sounder base.

B200SR(A)(-WH)(-IV): Addressable sounder base.

B200S-LF(-WH)(-IV): Programmable, addressable sounder base, low-frequency.

B200SR-LF(-WH)(-IV): Addressable sounder base, low-frequency.

BEAM355: Intelligent beam smoke detector.

BEAM355S: Intelligent beam smoke detector with integral sensitivity test.

D355PL(A): InnovairFlex low-flow non-relay duct-detector housing; includes SD355R(A).

DNR(A): InnovairFlex™ low-flow non-relay duct-detector housing. (Order SD355R(A)/SD365R(A) separately.)

DNRW: InnovairFlex low-flow non-relay duct-detector housing, with NEMA-4 rating. Watertight. (Order SD355R(A)/SD365R(A) separately.)

Addressable Modules

MMF-300(A): Addressable Monitor Module for one zone of normally-open dry-contact initiating devices. Mounts in standard 4.0" (10.16 cm.) box. Includes plastic cover plate and end-of-line resistor. Module may be configured for either a Class B or Class A IDC.

MDF-300(A): Dual Monitor Module. Same as MMF-300(A) except it provides two Class B-only IDCs.

MMF-301(A): Miniature version of MMF-300(A). Excludes LED and Class A option. Connects with wire pigtails. May mount in device backbox.

MMF-302(A): Similar to MMF-300(A). Addressable Monitor Module for one zone of conventional two-wire detectors. Requires resettable 24 VDC power. Refer to the *Device Compatibility Document* for listed compatible devices and quantity limitation.

CMF-300(A): Addressable Control Module for one Class B or Class A zone of supervised polarized Notification Appliances. Mounts directly to a 4.0" (10.16 cm.) electrical box. NAC option requires external 24 VDC to power notification appliances.

CRF-300(A): Addressable relay module containing two isolated sets of Form-C contacts, which operate as a DPDT switch. Mounts directly to a 4.0" (10.16 cm.) box, surface mount using the SMB500.

BG-12LX: Addressable manual pull station with interface module mounted inside.

I300(A): This module isolates the SLC (DCL) loop from short circuit conditions (required for Class A or Class X operation).

ISO-6(A): Six-fault isolator module. Mount one or two modules in a BB-2F cabinet (optional). Mount up to six modules on a CHS-6 chassis in a BB-6F cabinet.

SMB500: Used to mount all modules except MMF-301 and M301.

MMF-300-10(A): Ten-input monitor module. Mount one or two modules in a BB-2F cabinet (optional). Mount up to six modules on a CHS-6 chassis in a BB-6F cabinet.

MMF-302-6(A): Six-zone interface module. Mount one or two modules in a BB-2F cabinet (optional). Mount up to six modules on a CHS-6 chassis in a BB-6F cabinet.

CMF-300-6(A): Six-circuit supervised control module. Mount one or two modules in a BB-2F cabinet (optional). Mount up to six modules on a CHS-6 chassis in a BB-6F cabinet.

CRF-300-6(A): Six-relay control module (Form-C relays). Mount one or two modules in a BB-2F cabinet (optional). Mount up to six modules on a CHS-6 chassis in a BB-6F cabinet.

SWIFT Wireless Devices

W-GATE(A): LiteSpeed Wireless Gateway

W-SD355(A): LiteSpeed intelligent, wireless photo detector.

W-H355R(A): LiteSpeed intelligent wireless rate of rise (135°) heat detector.

W-SD355T(A): intelligent wireless photo/heat detector.

W-H355(A): LiteSpeed intelligent wireless fixed-temperature (135°) heat detector.

W-MMF(A): LiteSpeed Intelligent wireless monitor module.

W-CRF(A): LiteSpeed Intelligent wireless relay module.

W-BG12LX(A): LiteSpeed Intelligent wireless pull station.

WAV-RL, WAV-WL,WAV-CRL,WAV-CWL: LiteSpeed Intelligent AV bases.

W-USB: Wireless USB radio/antenna dongle that plugs into the USB port of a PC running SWIFT Tools.

SWIFT Tools: Programming and diagnostic utility for the Wireless Gateway and devices. Available for download from www.firelite.com.

NOTE: *For more information on Compatible Addressable Devices for use with the ES-50X, see the following data sheets (document numbers): SD365 Series (DF-61010), H365 Series (DF-61011), AD355 (DF-52386), BG-12LX (DF-52013), CMF-300-6 (DF-52365), CRF-300-6 (DF-52374), CMF/CRF Series (DF-52130), CP355 (DF-52383), H355 Series (DF-52385), I300 (DF-52389), ISO-6 (DF-60485), MMF-300 Series/MDF-300 (DF-52121), MMF-300-10 (DF-52347), MMF-302-6 (DF-52356), SD355/SD355T (DF-52384), and SLC Wiring Manual (51309).*

NOTE: *Legacy 300 Series detection devices such as the CP300/CP350, SD300(T)/SD350(T) and older modules such as the M300, M301, M302, C304, and BG-10LX are not compatible with LiteSpeed polling. If the SLC (DCL) contains one of these devices, polling must be set for standard CLIP protocol. Please consult factory for further information on previous 300 Series devices.*

ADDRESSABLE DEVICE ACCESSORIES

End-of-Line Resistor Assembly (R-47K and R-3.9K): The 47k ohm assembly supervises the MMF-300(A), MDF-300(A), MMF-301(A), and CMF-300(A) module circuits. The 3.9k ohm assembly supervises the MMF-302(A) module circuit. These resistors are included with each module.

Power Supervision Relay: Supervises the power to 4-wire smoke detectors and notification appliances.

Wiring Requirements

While shielded wire is not required, it is recommended that all SLC/DCL wiring be twisted-pair to minimize the effects of electrical interference. Refer to the panel manual for wiring details.

SYSTEM SPECIFICATIONS

System Capacity

- Intelligent Signaling Line Circuits (Digital Comm. Loops)..... 1
- Addressable device capacity..... 50
- Programmable software zones..... 50
- Annunciators..... 16

Electrical Specifications

AC Power: Operates in either 120 or 240 VAC, 50/60 Hz, 3.25 A, auto-sensing- no switch required. Wire size: minimum 14 AWG (2.00 mm2) with 600 V insulation. Non-power-limited, supervised.

Battery: Two 12 V 18 AH lead-acid batteries. Battery Charger Capacity: 7-18 AH (ES-50X cabinet holds maximum of two 18 AH batteries.)

Communication Loop: Supervised and power-limited.

Notification Appliance Circuits: Terminal Block provides connections for two NACs, Class B or Class A. Special Application power. Power-limited, supervised circuitry. Maximum signaling current per circuit: 2.5 amps special application, 250mA regulated. End-of-Line Resistor: 4.7k ohm, ½ watt (P/N 71252 UL listed) for Class B NAC; system capable of 1.9 kΩ - 22 kΩ ELR range. Refer to the *Fire•Lite Device Compatibility Document* for listed compatible devices.

Two Programmable Relays and One Fixed Trouble Relay: Contact rating: 2.0 A @ 30 VDC (resistive), 0.5 A @ 30 VAC (resistive). Form-C relays, non-power-limited, non-supervised.

Cabinet Specifications

Door: 19.26" (48.92 cm.) high x 16.82" (42.73 cm.) wide x 0.72" (1.82 cm.) deep. **Backbox:** 19.00" (48.26 cm.) high x 16.65" (42.29 cm.) wide x 5.25" (13.34 cm.) deep. **Trim Ring (TR-CE):** 22.00" (55.88 cm.) high x 19.65" (49.91 cm.) wide.

Shipping Specifications

Weight: 26.9 lbs. (12.20 kg.) **Dimensions:** 20.00” (50.80 cm.) high x 22.5” (57.15 cm.) wide x 8.5” (21.59 cm.) deep.

Temperature and Humidity Ranges

This system meets NFPA requirements for operation at 0 – 49°C/32 – 120°F and at a relative humidity 93% ± 2% RH (noncondensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15 – 27°C/60 – 80°F.

NFPA Standards

The ES-50X complies with the following NFPA 72 Fire Alarm Systems requirements:

- **LOCAL** (Automatic, Manual, Waterflow and Sprinkler Supervisory).
- **AUXILIARY** (Automatic, Manual and Waterflow) (requires 4XTMF).
- **REMOTE STATION** (Automatic, Manual and Waterflow) (Where a DACT is not accepted, the alarm, trouble and supervisory relays may be connected to UL 864 listed transmitters. For reverse polarity signaling of alarm and trouble, 4XTMF is required.)
- **PROPRIETARY** (Automatic, Manual and Waterflow).
- **CENTRAL STATION** (Automatic, Manual and Waterflow, and Sprinkler Supervised).
- **OT, PSDN** (Other Technologies, Packet-switched Data Network)
- **IBC 2012, IBC 2009, IBC 2006, IBC 2003, IBC 2000** (Seismic).
- **CBC 2007** (Seismic)

Agency Listings and Approvals

The listings and approvals below apply to the basic ES-50X control panel. In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult Fire•Lite for latest listing status.

ES-50X, ES-50XC, ES-50XI

- **UL:** S624
- **FM approved**
- **CSFM:** 7165-0075:0500, 7165-0075:0511
- **FDNY:** COA #2021-TMCOAP-009618-AMD

ES-50XP

- **ETL:** 5017286
- **CSFM:** 7165-0075:0511

ISO 9001 CERTIFIED ENGINEERING & MANUFACTURING QUALITY SYSTEMS

This document is not intended to be used for installation purposes.
We try to keep our product information up-to-date and accurate.
We cannot cover all specific applications or anticipate all requirements.
All specifications are subject to change without notice.

For more information, contact Fire•Lite Alarms. Phone: (800) 627-3473, FAX:(877) 699-4105.
www.firelite.com

Country of Origin: USA

MMF-300(A) Series, MDF-300

Addressable Monitor Modules

FIRE·LITE ALARMS by Honeywell

Addressable Devices

General

Four different monitor modules are available for Fire•Lite's intelligent control panels to suit a variety of applications. Monitor modules are used to supervise a circuit of dry-contact input devices, such as conventional heat detectors and pull stations, or monitor and power a circuit of two-wire smoke detectors (MMF-302(A)).

MMF-300(A) is a standard-sized module (typically mounts to a 4" [10.16 cm] square box) that supervises either a Style D (Class A) or Style B (Class B) circuit of dry-contact input devices.

MMF-301(A) is a miniature monitor module a mere 1.3" (3.302 cm) H x 2.75" (6.985 cm) W x 0.65" (1.651 cm) D that supervises a Style B (Class B) circuit of dry-contact input devices. Its compact design allows the MMF-301(A) to be mounted in a single-gang box behind the device it monitors.

MMF-302(A) is a standard-sized module used to monitor and supervise compatible two-wire, 24 volt, smoke detectors on a Style D (Class A) or Style B (Class B) circuit.

MDF-300(A) is a standard-sized dual monitor module used to monitor and supervise two independent two-wire Style B (Class B) dry-contact initiating device circuits (IDCs) at two separate, consecutive addresses in intelligent, two-wire systems.

LiteSpeed™ is a communication protocol developed by Fire•Lite Engineering that greatly increases the speed of communication between analog intelligent devices. Intelligent devices communicate in a grouped fashion. If one of the devices within the group has new information, the panel CPU stops the group poll and concentrates on single points. The net effect is response speed greater than five times that of other communication protocols.

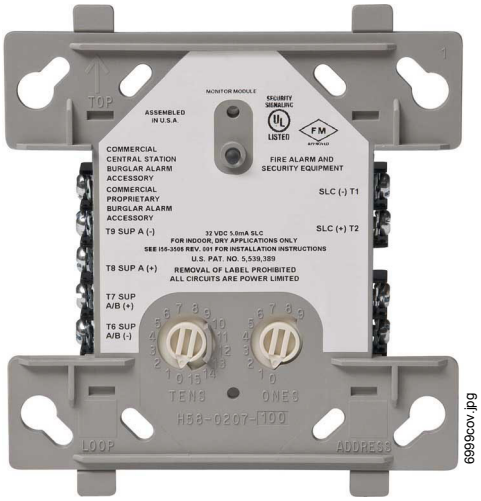
MMF-300(A) Monitor Module

- Built-in type identification automatically identifies this device as a monitor module to the control panel.
- Powered directly by two-wire SLC loop. No additional power required.
- High noise (EMF/RFI) immunity.
- SEMS screws with clamping plates for ease of wiring.
- Direct-dial entry of address: 01 – 159 on MS-9600 series panels, 01 – 99 on other compatible systems.
- LED flashes during normal operation and latches on steady to indicate alarm.

The MMF-300(A) Monitor Module is intended for use in intelligent, two-wire systems, where the individual address of each module is selected using the built-in rotary switches. It provides either a two-wire or four-wire fault-tolerant Initiating Device Circuit (IDC) for normally-open-contact fire alarm and supervisory devices. The module has a panel-controlled LED indicator. The MMF-300(A) can be used to replace M300(A) modules in existing systems.

MMF-300(A) Applications

Use to monitor a zone of four-wire smoke detectors, manual fire alarm pull stations, waterflow devices, or other normally-open dry-contact alarm activation devices. May also be used to monitor normally-open supervisory devices with special supervisory indication at the control panel. Monitored circuit may be wired as an NFPA Style B (Class B) or Style D (Class A) Initiating Device Circuit. A 47K Ohm End-of-Line Resistor (provided) terminates the Style B circuit. No resistor is required for supervision of the Style D circuit.



MMF-300(A) (Type H)

MMF-300(A) Operation

Each MMF-300(A) uses one of the available module addresses on an SLC loop. It responds to regular polls from the control panel and reports its type and the status (open/normal/short) of its Initiating Device Circuit (IDC). A flashing LED indicates that the module is in communication with the control panel. The LED latches steady on alarm (subject to current limitations on the loop).

MMF-300(A) Specifications

Nominal operating voltage: 15 to 32 VDC.

Maximum current draw: 5.0 mA (LED on).

Average operating current: 375 µA (LED flashing), 1 communication every 5 seconds, 47k EOL.

Maximum IDC wiring resistance: 1500 Ohms.

Maximum IDC Voltage: 11 Volts.

EOL resistance: 47K Ohms.

Temperature range: 32°F to 120°F (0°C to 49°C).

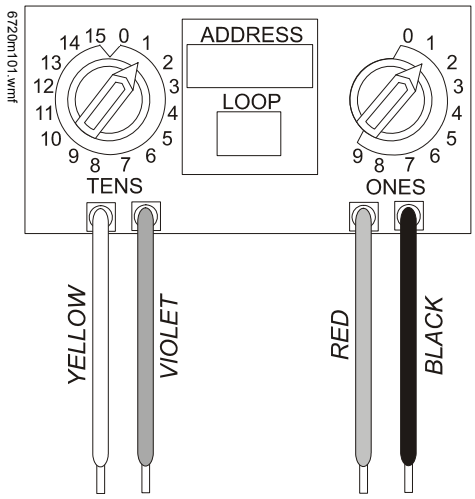
Humidity range: 10% to 93% noncondensing.

Dimensions: 4.5" (11.43 cm) high x 4" (10.16 cm) wide x 1.25" (3.175 cm) deep. Mounts to a 4" (10.16 cm) square x 2.125" (5.398 cm) deep box.

MMF-301(A) Mini Monitor Module

- Built-in type identification automatically identifies this device as a monitor module to the panel.
- Powered directly by two-wire SLC loop. No additional power required.
- High noise (EMF/RFI) immunity.

- Tinned, stripped leads for ease of wiring.
- Direct-dial entry of address: 01 – 159 on MS-9600 series panels, 01 – 99 on other compatible systems



The MMF-301(A) Mini Monitor Module can be installed in a single-gang junction directly behind the monitored unit. Its small size and light weight allow it to be installed without rigid mounting. The MMF-301(A) is intended for use in intelligent, two-wire systems where the individual address of each module is selected using rotary switches. It provides a two-wire initiating device circuit for normally-open-contact fire alarm devices. The MMF-301(A) can be used to replace M301(A) modules in existing systems.

MMF-301(A) Applications

Use to monitor a single device or a zone of four-wire smoke detectors, manual fire alarm pull stations, waterflow devices, or other normally-open dry-contact devices. May also be used to monitor normally-open supervisory devices with special supervisory indication at the control panel. Monitored circuit/device is wired as an NFPA Style B (Class B) Initiating Device Circuit. A 47K Ohm End-of-Line Resistor (provided) terminates the circuit.

MMF-301(A) Operation

Each MMF-301(A) uses one of the available module addresses on an SLC loop. It responds to regular polls from the control panel and reports its type and the status (open/normal/short) of its Initiating Device Circuit (IDC).

MMF-301(A) Specifications

Nominal operating voltage: 15 to 32 VDC.

Average operating current: 350 µA, 1 communication every 5 seconds, 47k EOL; 600 µA Max. (Communicating, IDC Shorted).

Maximum IDC wiring resistance: 1500 Ohms.

Maximum IDC Voltage: 11 Volts.

Maximum IDC Current: 450 µA.

EOL resistance: 47K Ohms.

Temperature range: 32°F to 120°F (0°C to 49°C).

Humidity range: 10% to 93% noncondensing.

Dimensions: 1.3" (3.302 cm) high x 2.75" (6.985 cm) wide x 0.65" (1.651 cm) deep.

Wire length: 6" (15.24 cm) minimum.

MMF-302(A) Interface Module

- Supports compatible two-wire smoke detectors.
- Supervises IDC wiring and connection of external power source.
- High noise (EMF/RFI) immunity.
- SEMS screws with clamping plates for ease of wiring.
- Direct-dial entry entry of address: 01 – 159 on MS-9600 series panels, 01 – 99 on other compatible systems.
- LED flashes during normal operation.
- LED latches steady to indicate alarm on command from control panel.

The MMF-302(A) Interface Module is intended for use in intelligent, addressable systems, where the individual address of each module is selected using built-in rotary switches. This module allows intelligent panels to interface and monitor two-wire conventional smoke detectors. It transmits the status (normal, open, or alarm) of one full zone of conventional detectors back to the control panel. All two-wire detectors being monitored must be UL compatible with the module. The MMF-302(A) can be used to replace M302(A) modules in existing systems.

MMF-302 (A) Applications

Use the MMF-302(A) to monitor a zone of two-wire smoke detectors. The monitored circuit may be wired as an NFPA Style B (Class B) or Style D (Class A) Initiating Device Circuit. A 3.9 K Ohm End-of-Line Resistor (provided) terminates the end of the Style B or D (class B or A) circuit (maximum IDC loop resistance is 25 Ohms). Install ELR across terminals 8 and 9 for Style D application.

MMF-302(A) Operation

Each MMF-302(A) uses one of the available module addresses on an SLC loop. It responds to regular polls from the control panel and reports its type and the status (open/normal/short) of its Initiating Device Circuit (IDC). A flashing LED indicates that the module is in communication with the control panel. The LED latches steady on alarm (subject to current limitations on the loop).

MMF-302(A) Specifications

Nominal operating voltage: 15 to 32 VDC.

Maximum current draw: 5.1 mA (LED on).

Maximum IDC wiring resistance: 25 Ohms.

Average operating current: 270 µA, 1 communication and 1 LED flash every 5 seconds, 3.9k eol.

EOL resistance: 3.9K Ohms.

External supply voltage (between Terminals T10 and T11):

- DC voltage: 24 volts power limited.
- Ripple voltage: 0.1 Vrms maximum.
- Current: 90 mA per module maximum.

Temperature range: 32°F to 120°F (0°C to 49°C).

Humidity range: 10% to 93% noncondensing.

Dimensions: 4.5" (11.43 cm) high x 4" (10.16 cm) wide x 1.25" (3.175 cm) deep. Mounts to a 4" (10.16 cm) square x 2.125" (5.398 cm) deep box.

MDF-300(A) Dual Monitor Module

The MDF-300(A) Dual Monitor Module is intended for use in intelligent, two-wire systems. It provides two independent two-wire initiating device circuits (IDCs) at two separate, consecutive addresses. It is capable of monitoring normally open contact fire alarm and supervisory devices. The module has a single panel-controlled LED.

NOTE: *The MDF-300(A) provides two Style B (Class B) IDC circuits ONLY. Style D (Class A) IDC circuits are NOT supported in any application.*

MDF-300(A) Specifications

Normal operating voltage range: 15 to 32 VDC.

Maximum current draw: 6.4 mA (LED on).

Average operating current: 750 µA (LED flashing).

Maximum IDC wiring resistance: 1,500 Ohms.

Maximum IDC Voltage: 11 Volts.

Maximum IDC Current: 240 µA

EOL resistance: 47K Ohms.

Temperature range: 32° to 120°F (0° to 49°C).

Humidity range: 10% to 93% (non-condensing).

Dimensions: 4.5" (11.43 cm) high x 4" (10.16 cm) wide x 1.25" (3.175 cm) deep. Mounts to a 4" (10.16 cm) square x 2.125" (5.398 cm) deep box.

MDF-300(A) Automatic Addressing

The MDF-300(A) automatically assigns itself to two addressable points, starting with the original address. For example, if the MDF-300(A) is set to address “26”, then it will automatically assign itself to addresses “26” and “27”.

NOTE: *“Ones” addresses on the MDF-300(A) are 0, 2, 4, 6, or 8 only. Terminals 6 and 7 use the first address, and terminals 8 and 9 use the second address.*

CAUTION:
Avoid duplicating addresses on the system.

Installation

MMF-300(A), MMF-302(A), and MDF-300(A) modules mount directly to a standard 4" (10.16 cm) square, 2.125" (5.398 cm) deep, electrical box. They may also be mounted to the SMB500 surface-mount box. Mounting hardware and installation instructions are provided with each module. All wiring must conform to applicable local codes, ordinances, and regulations. These modules are intended for power-limited wiring only.

The MMF-301(A) module is intended to be wired and mounted without rigid connections inside a standard electrical box. All wiring must conform to applicable local codes, ordinances, and regulations.

Agency Listings and Approvals

In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- **UL:** *S2424*.
- **ULC:** *S2424*.
- **FM Approved.**
- **CSFM:** 7300-0075:0185.
- **MEA:** 72-01-E.

Product Line Information

NOTE: *“A” suffix indicates ULC-listed model.*

MMF-300(A): Monitor module.

MMF-301(A): Monitor module, miniature.

MMF-302(A): Monitor module, two-wire detectors.

MDF-300(A): Monitor module, dual, two independent Class B circuits.

SMB500: Optional surface-mount backbox.

NOTE: *See installation instructions and refer to the SLC Wiring Manual, PN 51309.*

Architects’/Engineers’ Specifications

Specifications of these devices and all FireLite products are available from FireLite.

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For more information, contact Fire•Lite Alarms. Phone: (800) 627-3473, FAX: (877) 699-4105.
www.firelite.com

SD365 Series

Addressable Photoelectric Smoke Detectors

FIRE·LITE ALARMS by Honeywell

Addressable Devices

The Fire•Lite® Alarms SD365(A), SD365R(A), and SD365HT(A) intelligent plug-in smoke detectors are designed for both performance and aesthetics, and are direct replacements for the SD355 Series. A new modern, sleek, contemporary design and enhanced optical sensing chamber is engineered to sense smoke produced by a wide range of combustion sources in accordance with more stringent code standards.

Exclusively for use with Fire•Lite's addressable fire alarm control panels, the SD365(A) Series point ID capability allows each detector's address to be set with rotary, decimal address switches, providing exact detector location for emergency personnel to quickly locate a fire during its early stages, potentially saving precious rescue time while also reducing property damage. Two LEDs on each sensor light to provide a local, visible sensor indication.

The SD365(A) Series also offers 135°F (57°C) fixed temperature thermal sensing on the SD365T(A) and a remote test capable detector on the SD365R(A) for use with DNR(A)/DNRW duct smoke detector housings.

Features

SLC LOOP:

- Two-wire SLC loop connection
- Unit uses base for wiring
- Compatible with LiteSpeed™ and CLIP protocol systems
- Stable communication technique with noise immunity

ADDRESSING:

- Addressable by device
- Rotary, decimal addressing
  (Refer to the *Fire•Lite panel manuals* for device capacity.)

ARCHITECTURE:

- Sleek, low-profile, stylish design
- Unique single-source design to respond quickly and dependably to a broad range of fires
- Integral communications and built-in device-type identification
- Built-in tamper resistant feature
- Remote test feature from the panel
- Walk test with address display (an address on 121 will blink the detector LED: 12-[pause]-1*(LiteSpeed systems only)*
- Built-in functional test switch activated by external magnet
- Removable cover and insect-resistant screen for simple field cleaning
- Expanded color options

OPERATION:

- Designed to meet UL 268 7th Edition
- Factory preset at 1.5% nominal sensitivity for panel alarm threshold level
- LED "blinks" when the unit is polled (communicating with the fire panel) and latches in alarm.
- Low standby current

MECHANICALS:

- Sealed against back pressure
- SEMS screws for wiring of the separate base
- Designed for direct-surface or electrical-box mounting
- Plugs into separate base for ease of installation and maintenance
- Separate base allows interchange of photoelectric, ionization and thermal sensors

OPTIONS:

- Optional relay, isolator, and sounder bases

Installation

SD365 Series plug-in intelligent smoke detectors use a detachable base to simplify installation, service and maintenance. Installation instructions are shipped with each detector.

Mount detector base (all base types) on an electrical backbox which is at least 1.5" (3.81 cm) deep. For a chart of compatible junction boxes, see *DF-60059.*

NOTE: *Because of the inherent supervision provided by the SLC loop, end-of-line resistors are not required. Wiring "T-taps" or branches are permitted for Class "B" wiring only.*
When using relay or sounder bases, consult the I300(A) installation sheet I56-3626 for device limitations between isolator modules and isolator bases.

Construction

These detectors are constructed of fire-resistant plastic. The SD365 Series plug-in intelligent smoke detectors are designed to commercial standards and offer an attractive appearance.

Operation

Each SD365 Series detector uses one of the panel's addresses (total limit is panel dependent) on the Fire•Lite Signaling Line Circuit (SLC). It responds to regular polls from the control panel and reports its type and the status. If it receives a test command from the panel (or a local magnet test), it stimulates its electronics and reports an alarm. It blinks its LEDs when polled and turns the LEDs on when commanded by the panel. The SD365 Series offers features and performance that represent the latest in smoke detector technology.

Detector Sensitivity Test

Each detector can have its sensitivity tested (required per NFPA 72, Chapter 14 on *Inspection, Testing and Maintenance*) when installed/connected to an Fire•Lite addressable fire alarm control panel. The results of the sensitivity test can be printed for record keeping.

Product Line Information

***NOTE:** "-IV" suffix indicates CLIP and LiteSpeed device.*

***NOTE:** "A" suffix indicates Canadian version.*

SD365: White, low-profile intelligent photoelectric sensor, LiteSpeed only

SD365A: Same as SD365 but with ULC listing

SD365-IV: Ivory, low-profile intelligent photoelectric sensor

SD365A-IV: Same as SD365-IV but with ULC listing

SD365T: White, same as **SD365** but includes a built-in 135°F (57°C) fixed-temperature thermal device, LiteSpeed only

SD365TA: Same as SD365T but with ULC listing

SD365T-IV: Ivory, same as SD365T but includes a built-in 135°F (57°C) fixed-temperature thermal device

SD365TA-IV: Same as SD365T-IV but with ULC listing

SD365R: White, low-profile intelligent photoelectric sensor, remote test capable, for use with DNR/DNRW, LiteSpeed only

SD365RA: Same as SD365R but with ULC listing, for use with DNRA

SD365R-IV: Ivory, low-profile intelligent photoelectric sensor, remote test capable, for use with DNR/DNRW

SD365RA-IV: Same as SD365R-IV but with ULC listing, for use with DNRA

INTELLIGENT BASES

***NOTE:** For details on intelligent bases, see DF-60059.*

B300-6: White, 6" base, standard flanged low-profile mounting base *(CSFM: 7300-1653:0109)*

B300-6-IV: Ivory,6" base, standard flanged low-profile mounting base *(CSFM: 7300-1653:0109)*

B300A-6: Same as B300-6, ULC listed

B300A-6-IV: Ivory, 6" standard flanged low-profile mounting base, ULC listed

B300-6-BP: Bulk pack of B300-6, package contains 10

B501-WHITE: White, 4" standard European flangeless mounting base. UL/ULC listed *(CSFM: 7300-1653:0109)*

B501-BL: Black, 4" standard European flangeless mounting base. UL/ULC listed *(CSFM: 7300-1653:0109)*

B501-IV: Ivory color, 4" standard European flangeless mounting base. UL/ULC listed *(CSFM: 7300-1653:0109)*

B501-WHITE-BP: Bulk pack of B501-WHITE contains 10

B224RB-WH: White, relay base (*CSFM: 7300-1653:0216)*

B224RB-IV: Ivory, relay base (*CSFM: 7300-1653:0216)*

B224RBA-WH: White, relay base, ULC listing

B224RBA-IV: Ivory, relay base, ULC listing

B224BI-WH: White, isolator detector base (CSFM: 7300-1653:0216)

B224BI-IV: Ivory isolator detector base (CSFM: 7300-1653:0216)

B224BIA-WH: White, isolator detector base, ULC listing

B224BIA-IV: Ivory isolator detector base, ULC listing

B200S-WH: White, Intelligent addressable sounder base capable of producing sound output in high or low volume with ANSI Temporal 3, ANSI Temporal 4, continuous tone, marching tone, and custom tone. Uses LiteSpeed protocol. *(CSFM: 7300-1653:0213)*

B200S-IV: Ivory, Intelligent addressable sounder base capable of producing sound output in high or low volume with ANSI Temporal 3, ANSI Temporal 4, continuous tone, marching tone, and custom tone. Uses LiteSpeed protocol. *(CSFM: 7300-1653:0213)*

B200SA-WH: Same as B200S-WH, ULC listing

B200SA-IV: Same as B200S-IV, ULC listing

B200SCOA-WH: White, Intelligent, programmable sounder base in English/French (required in Canada for ULC applications with CO Series detector applications

B200SCOA-IV: Ivory Intelligent, programmable sounder base in English/French (required in Canada for ULC applications with CO Series detector applications, ULC listing

B200S-LF-WH: White, Low Frequency Intelligent, programmable sounder base. Produces a fundamental frequency of 520 Hz +/- 10% with a square wave or its equivalent; designed to meet the NFPA 72 sleeping space requirement. (*CSFM: 7300-1653:0238)*

B200S-LF-IV: Ivory, Low Frequency Intelligent, programmable sounder base. Produces a fundamental frequency of 520 Hz +/- 10% with a square wave or its equivalent; designed to meet the NFPA 72 sleeping space requirement. (*CSFM: 7300-1653:0238)*

B200SR-WH: White, Intelligent sounder base capable of producing sound output with ANSI Temporal 3 or continuous tone. Intended for retrofit applications. *(CSFM: 7300-1653:0213)*

B200SR-IV: Ivory, Intelligent sounder base capable of producing sound output with ANSI Temporal 3 or continuous tone. Intended for retrofit applications. *(CSFM: 7300-1653:0213)*

B200SRA-WH: Same as B200SR-WH with, ULC listing

B200SRA-IV: Same as B200SR-IV in Ivory color, ULC listing

B200SR-LF-WH: White, Low Frequency Intelligent, programmable sounder base. Produces a fundamental frequency of 520 Hz +/- 10% with a square wave or its equivalent; designed to meet the NFPA 72 sleeping space requirement. Intended for retrofit applications. (*CSFM: 7300-1653:0238)*

B200SR-LF-IV: Ivory, Low Frequency Intelligent, programmable sounder base. Produces a fundamental frequency of 520 Hz +/- 10% with a square wave or its equivalent; designed to meet the NFPA 72 sleeping space requirement. Intended for retrofit applications. (*CSFM: 7300-1653:0238)*

MOUNTING KITS AND ACCESSORIES

TR300: White, replacement flange for B210LP(A) base

TR300-IV: Ivory, replacement flange for B210LP(A) base

RA100Z(A): Remote LED annunciator. 3-32 VDC. Mounts to a U.S. single-gang electrical box. For use with B501(A) and B300-6(A).

M02-04-00: Test magnet

M02-09-00: Test magnet with telescoping handle

CK300: Color Kit (includes cover and trim ring), white, 10-pack

CK300-IV: Color Kit (includes cover and trim ring), ivory, 10-pack

CK300-BL: Color Kit (includes cover and trim ring), black, 10-pack

SYSTEM SPECIFICATIONS

Sensitivity:

- UL Applications: 0.5% to 4.0% per foot obscuration.
- ULC Applications: 0.5% to 3.5% per foot obscuration

Size: 2.0" (51mm) high; base determines diameter

  – B300-6: 6.1" (15.6 cm) diameter

  – B501: 4" (10.2 cm) diameter

For a complete list of detector bases see DF-60983

Shipping weight: 3.4 oz. (95 g)

Operating temperature range:

- SD365: 32°F to 122°F (0°C to 50°C)
- SD365T Series: 32°F to 100°F(0°C to 38°C)
- SD365R Series installed in a DNR/DNRW, -4°F to 158°F (-20°C to 70°C)

UL/ULC Listed Velocity Range: 0-4000 ft/min. (1219.2 m/min.), suitable for installation in ducts

Relative humidity: 10% – 93% non-condensing

Thermal ratings: fixed-temperature set point 135°F (57°C), rate-of-rise detection 15°F (8.3°C) per minute, high temperature heat 190°F (88°C)

ELECTRICAL SPECIFICATIONS

Voltage range: 15 - 32 volts DC peak

Standby current (max. avg.): 200µA @ 24 VDC (o ne communication every 5 seconds with LED enabled)

Max current: 4.5 mA @ 24 VDC (“ON”)

DETECTOR SPACING AND APPLICATIONS

Fire•Lite recommends spacing detectors in compliance with NFPA 72. In low airflow applications with smooth ceiling, space detectors 30 feet (9.1m). For specific information regarding detector spacing, placement, and special applications refer to NFPA 72. A *System Smoke Detector Application Guide*, document SPAG91, is available at **www.systemsensor.com.**

Listings and Approvals

Listings and approvals below apply to the SD365 Series detectors. In some cases, certain modules may not be listed by certain approval agencies, or listing may be in process. Consult factory for latest listing status.

- UL/ULC Listing: S1059
- FM Approved
- CSFM: 7272-0075:0502

For more information, contact Fire•Lite Alarms. Phone: (800) 627-3473, FAX:(877) 699-4105.
www.firelite.com

Country of Origin: Mexico