

ELECTRICAL SPECIFICATIONS

**PART 1: GENERAL**

A. PROVIDE ALL WORK AND MATERIALS FOR THE INSTALLATION OF COMPLETE WIRING SYSTEMS AS SPECIFIED HEREIN AND INDICATED ON THE DRAWINGS.

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

C. ELECTRICAL CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS FOR ONE YEAR EFFECTIVE THE DAY THE PROJECT IS ACCEPTED BY THE OWNER.

D. WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, OSHA, STATE BUILDING CODE AND ALL OTHER APPLICABLE LOCAL REQUIREMENTS. ALL WORK SHALL COMPLY WITH THE LATEST ADDITION OF NECA STANDARDS OF INSTALLATION.

E. ALL MATERIALS, DEVICES, AND APPLIANCES SHALL BE NEW, EXCEPT WHERE OTHERWISE NOTED, AND SHALL BE LISTED BY AN APPROVED TESTING AGENCY WHERE SUCH A LISTING IS AVAILABLE. FACTORY ASSEMBLED EQUIPMENT SHALL BE LISTED AND LABELED AS AN ASSEMBLY. ANY EQUIPMENT NOT LISTED SHALL HAVE PRIOR APPROVAL FROM THE LOCAL AUTHORITY HAVING JURISDICTION. ALL MATERIALS SHALL COMPLY WITH APPLICABLE ANSI, IEEE AND NEMA STANDARDS.

F. PROVIDE ALL CUTTING, PATCHING, CHANNELING AND CHASING FOR INSTALLATION OF WORK AND REPAIR ANY DAMAGE OF EXISTING OR NEW INSTALLATIONS AT THE CONTRACTORS EXPENSE.

G. SHOP DRAWINGS AND CATALOG DATA SHALL BE SUBMITTED FOR APPROVAL PRIOR TO BEGINNING WORK. SUBMIT FOUR COPIES OF SHOP DRAWINGS FOR LIGHTING FIXTURES, LAMPS, BALLASTS AND PANELBOARDS. SUBMIT FOUR COPIES OF CATALOG DATA FOR DISCONNECT SWITCHES AND WIRING DEVICES.

H. PROVIDE ENGRAVED PHENOLIC NAMEPLATES FOR PANELBOARDS, WIRING TROUGHS, AND FUSED SWITCHES. WHITE LETTERS ON BLACK FOR 120/208 VOLT SYSTEMS. BLACK LETTERS ON WHITE FOR 277/480 VOLT SYSTEMS. LABEL ALL BREAKERS INSIDE THE PANEL NEXT TO THE BREAKER USING THE NUMBER SCHEME INDICATED ON THE DRAWINGS.

I. AN ELECTRICAL INSPECTION CERTIFICATE SHALL BE ISSUED BY THE LOCAL INSPECTION AUTHORITIES BEFORE APPROVAL FOR FINAL PAYMENT.

J. THE CONDUIT AND NEUTRAL SYSTEM SHALL BE GROUNDED AT THE MAIN SERVICE EQUIPMENT. GROUNDING ELECTRODE SYSTEM SHALL BE INSTALLED PER N.E.C. ARTICLE 250 AND AS INDICATED ON THE DRAWINGS.

K. WIRING SHALL BE TESTED FOR CONTINUITY AND GROUNDS BEFORE BEING ENERGIZED. FAULTY WIRING SHALL BE REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER.

L. 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 CONTRACTOR SHALL IMMEDIATELY BRING THE PROBLEM TO THE ATTENTION OF THE ARCHITECT OR ENGINEER FOR RESOLUTION PRIOR TO THE EXECUTION OF THE WORK.

M. THE ELECTRICAL CONTRACTOR SHALL CONNECT ALL EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS, UNLESS OTHERWISE NOTED, EXCEPT FOR CONTROL WIRING FOR EQUIPMENT NOT PROVIDED BY THE ELECTRICAL CONTRACTOR. CONTROL WIRING FOR SUCH EQUIPMENT SHALL BE PROVIDED BY THE RESPECTIVE DISCIPLINE.

N. COORDINATE LOCATION AND REQUIREMENTS FOR ELECTRICAL SERVICE WITH THE POWER COMPANY. WHERE MORE THAN ONE SERVICE IS SUPPLIED TO A BUILDING, PROVIDE IDENTIFICATION AT EACH SERVICE PER NEC 230-2(B) AND AS INDICATED ON THE DRAWINGS.

O. COORDINATE LOCATION AND REQUIREMENTS FOR TELEPHONE SERVICE WITH THE TELEPHONE COMPANY AND AS INDICATED ON THE DRAWINGS.

P. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PROVIDING TEMPORARY POWER.

**PART 2: RACEWAY**

A. CONDUIT SHALL BE ZINC-COATED EMT INDOORS. EMT FITTINGS SHALL BE STEEL SCREW. MINIMUM SIZE SHALL BE 1/2". UNLESS OTHERWISE NOTED. USE SCHEDULE 40 PVC OUTDOORS ABOVE 6'-0" OR BELOW GRADE. USE IMC WHERE REQUIRED BY CODE OR EXPOSED BELOW 6'-0".

B. SUPPORT ALL CONDUITS WITH STRAPS AND CLAMPS. RUN ALL CONDUIT PARALLEL OR PERPENDICULAR TO BUILDING WALLS.

C. JUNCTION AND PULL BOXES SHALL BE CODE GAUGE GALVANIZED SHEET METAL.

D. LIQUID-TIGHT FLEXIBLE METAL CONDUIT SHALL BE USED FOR EQUIPMENT CONNECTIONS, BUT NOT AS A WIRING METHOD OTHERWISE.

E. MC CABLE MAY BE USED AS A WIRING METHOD WHERE ALLOWED BY CODE.

F. RACEWAY PENETRATIONS THROUGH FLOOR SLABS AND FIRE-RATED WALLS SHALL BE FILLED WITH IMPERVIOUS, NON-SHRINK GROUT SUFFICIENTLY TIGHT TO PREVENT THE TRANSFER OF SMOKE, WATER, AND DUST. ROOF PENETRATIONS SHALL BE WITHIN THE EQUIPMENT CURB WHERE POSSIBLE.

G. CONDUIT INSTALLED UNDERGROUND OR IN CONCRETE SHALL HAVE JOINTS MADE WATER-TIGHT BY USE OF POLYTETRA-FLUOROETHYLENE TAPE. APPROVED SEALS SHALL BE PROVIDED IN HAZARDOUS LOCATIONS AS REQUIRED BY THE N.E.C.

**PART 3: CONDUCTORS**

A. ALL CONDUCTORS SHALL BE SINGLE CONDUCTOR COPPER, THHN/THWN, SOLID FOR SIZES #14 THROUGH #10. THHN/THWN STRANDED FOR SIZES #8 AND LARGER.

B. BRANCH CIRCUITS SHALL NOT BE SMALLER THAN #12 AWG. CONTROL WIRING MAY BE #14 AWG.

C. CONDUCTORS SHALL BE COLOR CODED BLACK/RED/BLUE FOR 120/208 VOLT SYSTEMS AND BROWN/ORANGE/YELLOW FOR 277/480 VOLT SYSTEMS FOR A, B, AND C PHASES, RESPECTIVELY.

D. WIRING TO LIGHTING FIXTURES SHALL BE AS REQUIRED BY UL LABEL.

E. ALL BRANCH CIRCUIT CONDUITS OR CABLE ASSEMBLIES SHALL CONTAIN INSULATED GREEN GROUNDING CONDUCTOR SIZED PER NEC 250-122.

F. ALL CONDUCTORS INSTALLED IN VERTICAL RACEWAYS SHALL BE SUPPORTED AT INTERVALS AS REQUIRED PER NEC ARTICLE 300-19.

G. ALL EQUIPMENT AND DEVICE TERMINATIONS SHALL BE LISTED FOR USE WITH 75°C INSULATED CONDUCTORS AT THEIR 75°C AND 90°C RATINGS.

H. PROVIDE A SEPARATE NEUTRAL FOR EACH PHASE CONDUIT ON ALL BRANCH CIRCUITS.

**PART 4: EXISTING SITE CONDITIONS**

A. EACH BIDDER SHALL VISIT THE PROJECT SITE TO BID AND FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS. CALL TO VISIT THE SITE SHALL NOT EXCUSE THE CONTRACTOR FROM PERFORMING ALL REQUIRED WORK NOR SHALL IT BE AN ACCEPTABLE REASON FOR REQUESTING A CHANGE TO THE CONTRACT.

**PART 5: WIRING DEVICES**

A. WIRING DEVICES SHALL BE WHITE WITH MATCHING PLASTIC COVER PLATES. SPECIFICATION GRADE AS INDICATED BELOW. EQUAL TO THE COOPER QUALITY INDICATED. CONTRACTOR SHALL VERIFY WITH OWNER/ARCHITECT PRIOR TO ORDERING DEVICES AND COVER PLATES.

TOGGLE SWITCHES SHALL BE AS FOLLOWS:

SINGLE POLE 20 AMP	COOPER 1221
DOUBLE POLE 20 AMP	COOPER 1222
THREE WAY 20 AMP	COOPER 1223

DUPLEX RECEPTACLES SHALL HAVE A NYLON FACE AND SHALL BE AS FOLLOWS:

15 AMP DUPLEX	COOPER 5252
20 AMP DUPLEX	COOPER 5252
15 AMP DUPLEX-GFCI	COOPER 6F5262
20 AMP DUPLEX-GFCI	COOPER 6F5262

B. DUPLEX RECEPTACLES ON DEDICATED CIRCUIT SHALL BE 20 AMP. OTHER DUPLEX RECEPTACLES MAY BE 15 AMP, UNLESS OTHERWISE NOTED.

C. OUTLET BOXES SHALL NOT BE MOUNTED BACK-TO-BACK.

D. A MAXIMUM OF 10 RECEPTACLES SHALL BE ON EACH BRANCH CIRCUIT.

E. WEATHERPROOF COVERS SHALL HAVE A LID SO THAT PLUGS MAY BE INSTALLED WITHOUT COMPROMISING THE WP FUNCTION, EQUAL TO INTERMATIC GUARDIAN ONE #WP1020C.

F. ALL OUTLETS (INCLUDING TELEPHONE, CABLE TV AND DATA) SHALL HAVE COVER PLATES, BLANK IF NOT USED.

**PART 6: DISCONNECT SWITCHES**

A. DISCONNECT SWITCHES SHALL BE HEAVY-DUTY TYPE IN NEMA 1 ENCLOSURES (UNLESS OTHERWISE INDICATED), FUSED OR NON-FUSED AS INDICATED. FUSED SWITCHES SHALL HAVE REJECTION-TYPE FUSE CLIPS. SWITCHES SHALL BE SQUARE D, OR EQUAL. FUSES SHALL BE CLASS R-5, TIME DELAY. A SET OF 3 SPARE FUSES OF EACH SIZE AND TYPE SHALL BE FURNISHED TO THE OWNER.

**PART 7: PANELBOARDS**

A. PANELBOARDS SHALL BE DEAD-FRONT SAFETY TYPE. ALL CIRCUIT BREAKERS SHALL BE MOLDED-CASE, BOLT-ON, AUTOMATIC THERMAL MAGNETIC TYPE, CALIBRATED FOR 40°C, OR AMBIENT COMPENSATION. CABINET SHALL BE 20 INCHES WIDE MINIMUM, WITH NOT LESS THAN 4-INCH WIRING GUTTERS AT TOP, SIDES, AND BOTTOM. SQUARE D "NFI," "NFOOD," OR EQUAL. BUS SHALL BE ALUMINUM WITH RATINGS AS INDICATED ON DRAWINGS. LUGS SHALL BE SIZED TO ACCOMMODATE CONDUCTORS INDICATED ON THE POWER RISER DIAGRAM.

B. PROVIDE HANDLE LOCK-ON DEVICES ON ALL CIRCUIT BREAKERS CONNECTED TO EMERGENCY, EXIT, AND NIGHT LIGHTING, FIRE ALARM, TELEPHONE AND SECURITY SYSTEMS.

C. CIRCUIT BREAKERS USED FOR SWITCHING OF LIGHTING OR SIGN CIRCUITS SHALL BE SWITCHING DUTY RATED AND SHALL BE MARKED "SWD".

**PART 8: DRY TYPE TRANSFORMERS**

A. TRANSFORMERS SHALL HAVE FOUR 2 1/2% BELOW-RATED VOLTAGE PRIMARY TAPS AND TWO 5% BELOW-RATED SECONDARY VOLTAGE TAPS. MINIMUM CONNECTIONS SHALL BE AT SIDES THROUGH LIQUID-TIGHT FLEXIBLE METAL CONDUIT. SECONDARY NEUTRAL SHALL BE PROPERLY GROUNDED AS A SERVICE GROUND. SQUARE D CLASS 7400, OR EQUAL. PROVIDE "K" RATED TRANSFORMERS AS INDICATED ON DRAWINGS.

**PART 9: LIGHT FIXTURES**

A. CATALOG NUMBERS GIVEN DENOTE MINIMUM QUALITY AND PERFORMANCE REQUIRED. EQUAL EQUIPMENT BY OTHER MANUFACTURERS IS ACCEPTABLE AS INDICATED ON THE LIGHT FIXTURE SCHEDULE.

B. H.I.D. BALLASTS SHALL BE HIGH POWER FACTOR WITH QUIETEST SOUND RATING.

C. LAY-IN FIXTURES SHALL BE SUSPENDED FROM STRUCTURE WITH 2 WIRES AT OPPOSITE CORNERS. DO NOT SUPPORT FROM CEILING GRID.

D. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF LIGHT FIXTURES.

E. ALL RECESSED LIGHTING FIXTURES SHALL BE THERMALLY PROTECTED.

F. COMPACT FLUORESCENT BALLASTS SHALL BE ELECTRONIC WITH EPO OF LIFE PROTECTION.

**PART 10: TELEPHONE/DATA SYSTEM**

A. FURNISH AND INSTALL A COMPLETE TELEPHONE/DATA CONDUIT SYSTEM AS INDICATED ON THE DRAWINGS. ALL OUTLET BOXES FOR TELEPHONE AND/OR DATA JACKS SHALL BE DOUBLE GANG WITH A SINGLE-GANG OPENING.

B. PULL AND LEAVE IN EACH CONDUIT ONE PULL CORD FOR PULLING IN CABLE. ALL WIRING, OUTLETS AND EQUIPMENT SHALL BE PROVIDED AND INSTALLED BY THE OWNERS TELE/DATA SUPPLIER.

C. TELEPHONE SERVICE CONDUITS SHALL BE PROVIDED TO THE PROPERTY LINE OR AS INDICATED ON THE DRAWINGS.

D. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A #6 AWG GREEN COPPER WIRE IN EACH CONDUIT FROM NEAREST COLD WATER METAL MAIN TO A LUG AT THE TELEPHONE/DATA BACKBOARD.

**PART 11: LIGHTING CONTROLS**

A. FURNISH AND INSTALL AN ELECTRONIC TIME CONTROLLER WHERE INDICATED. CONTROLLER SHALL BE CAPABLE OF SWITCHING 40 AMPERES PER POLE CONTINUOUSLY AT 120 VOLTS AND SHALL BE SPST (DPST, 3PST, DPDT, SPDT, AS REQUIRED).

B. LIGHTING CONTACTORS SHALL SWITCH A LOAD AT 120 VOLTS, 60 HZ AND SHALL HAVE THE NUMBER OF POLES INDICATED ON THE DRAWINGS. THE CONTRACTOR SHALL BE CONTINUOUSLY RATED 20 AMPERES PER POLE FOR ALL TYPES OF BALLAST AND TUNGSTEN LIGHTING AND RESISTANCE LOADS.

C. ALL LIGHTING CONTACTORS SHALL BE ELECTRICALLY HELD AND HAVE A NEMA 1 ENCLOSURE UNLESS OTHERWISE NOTED.

**PART 12: FIRE STOPPING**

A. ALL PENETRATIONS OF NON-RATED PENETRATIONS SHALL BE SEALED WITH RATED MATERIALS MEETING ASTM E-814.

B. PROVIDE FIRE STOPPING DEVICE(S) OR SYSTEM(S) WHICH HAVE BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814. INSTALL THE DEVICE(S) OR SYSTEM(S) IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE THE APPROPRIATE DEVICE(S) OR SYSTEM(S) WITH AN "F" RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED.

C. DEVICE(S) AND/OR SYSTEM(S) SHALL BE BY HILT, 3M OR EQUIVALENT.

D. WHERE OPENINGS FOR INSTALLATION OF ELECTRICAL BOXES EXCEEDS 16 SQUARE INCHES IN RATED WALLS OR PARTITIONS, THE OPENING SHALL BE PROTECTED AS REQUIRED BY THE APPROPRIATE WALL LISTING TYPE.

**PART 13: FIRE ALARM SYSTEM**

A. THE FIRE ALARM AND DETECTION SYSTEM SHALL BE INSTALLED PER THE LOCAL AHJ.

B. SYSTEM SHALL BE A CENTRALIZED, ANALOG, ADDRESSABLE, FULLY ELECTRONICALLY SUPERVISED (INCLUDING AUXILIARY SYSTEMS INTERCONNECT WIRING) SYSTEM LISTED BY UL IN COMPLIANCE WITH ALL APPLICABLE NFPA 72 AND OTHER STANDARDS AS WELL AS THE AMERICAN'S WITH DISABILITIES ACT (ADA). ALL FINAL CONNECTIONS, TESTING AND ADJUSTMENTS SHALL BE PERFORMED BY OR UNDER DIRECT SUPERVISION OF AN AUTHORIZED FACTORY REPRESENTATIVE. SYSTEM SHALL BE SIMPLE, NOTIFIER, EDWARDS OR EQUAL, AS ACCEPTED BY THE ENGINEER. SYSTEM SHALL HAVE A 24HR MINIMUM BATTERY BACKUP.

C. INITIATING DEVICE ACTIVATION SHALL CAUSE OPERATION OF THE PROPER ZONE ALARM CIRCUIT IN THE CONTROL PANEL, AND OPERATE ALL AUDIBLE INDICATING ALARMS. ALL AIR HANDLING UNITS SHALL BE STOPPED UPON ANY ALARM INPUT. EACH AIR HANDLER UNIT SHALL BE PROVIDED WITH A SYSTEM CONTROLLED RELAY TO EFFECT SHUTDOWN. ALL ALARM DEVICES AND LAMPS SHALL CONTINUE TO OPERATE UNTIL THE INITIATING DEVICE IS RESET. SUBSEQUENT ALARMS SHALL RESOUND THE SYSTEM. AN AUDIBLE AND VISUAL SIGNAL SHALL INDICATE SYSTEM TROUBLE. THE CONTROL PANEL SHALL PROVIDE FOR ACTIVATING A UL LISTED CENTRAL STATION SIGNAL.

D. REQUIRED BY THE LOCAL AUTHORITY HAVING JURISDICTION, THE FIRE ALARM SUPPLIER SHALL A SEPARATE SET OF PLANS FOR A SEPARATE FIRE ALARM PERMIT. THE ENGINEER IS NOT RESPONSIBLE FOR PRODUCING THESE DRAWINGS OR FOR SUBMITTING FOR THIS PERMIT, IT IS THE SOLE RESPONSIBILITY OF THE FIRE ALARM SUPPLIER. IN THE FIRE ALARM CONTRACTORS SUBMITTAL, REQUIREMENTS OF 81615-32.002 SHALL BE MET. THE FIRE ALARM CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING BATTERY CALCULATIONS, VOLTAGE DROP TABLES, WIRING METHODS TO SATISFY NOTED FLORIDA BUILDING CODE AND FLORIDA FIRE PREVENTION CODE.

E. CONDUIT:

- INSTALL CONDUIT IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, NFPA 70.
- INSTALL ALL WIRING IN A CONDUIT OR RACEWAY. CONDUIT FILL SHALL NOT EXCEED 40 PERCENT OF THE INTERIOR CROSS SECTIONAL AREA WHERE THREE OR MORE CABLES ARE INCLUDED WITHIN A SINGLE CONDUIT.
- SEPARATE CABLES FROM ANY OPEN CONDUCTORS OF CLASS 1 CIRCUITS AND DO NOT PLACE IN ANY CONDUIT, JUNCTION BOX, OR RACEWAY CONTAINING CLASS 1 CABLES.
- WIRING FOR LOW VOLTAGE CONTROL, ALARM NOTIFICATION, EMERGENCY COMMUNICATION, AND SIMILAR POWER-LIMITED AUXILIARY FUNCTIONS MAY BE INSTALLED IN THE SAME CONDUIT AS INITIATING AND SIGNALING LINE CIRCUITS. DESIGN SYSTEM TO PERMIT SIMULTANEOUS OPERATION OF ALL CIRCUITS WITHOUT INTERFERENCE OR LOSS OF SIGNALS.
- CONDUITS SHALL NOT ENTER THE CONTROL PANEL OR ANY OTHER COMPONENT PROVIDED EXCEPT WHERE ENTRY IS SPECIFIED BY THE MANUFACTURER.
- CONDUIT SHALL BE 3/4 INCH MINIMUM.
- EXTERIOR CONDUIT SHALL BE BURIED MINIMUM OF 30".

G. WIRE:

- ALL FIRE ALARM SYSTEM WIRING SHALL BE NEW. SEE CONDUIT & RACEWAY FOR ADDITIONAL INFORMATION.
- WIRING SHALL COMPLY WITH LOCAL, STATE, AND NATIONAL CODES AND AS RECOMMENDED BY THE MANUFACTURER. NUMBER AND SIZE OF CONDUCTORS SHALL BE AS RECOMMENDED BY THE MANUFACTURER, BUT SHALL BE NOT LESS THAN 18 AWG FOR INITIATING DEVICE AND SIGNALING LINE CIRCUITS, AND 14 AWG FOR NOTIFICATION APPLIANCE CIRCUITS. BUILDING WIRE SPECIFIED IN SECTION 28 05 19.
- ALL WIRING AND CABLE SHALL BE LISTED AND/OR APPROVED BY A REGISTERED TESTING AGENCY FOR USE WITH A PROTECTIVE SIGNALING SYSTEM.
- ALL FIELD WIRING SHALL BE SUPERIOR FOR OPEN CIRCUIT SHORT CIRCUITS, AND GROUNDED CONDUITS.

H. CONTROL PANEL: CONNECT TO SEPARATE DEDICATED BRANCH CIRCUIT WITH A SEPARATE DEDICATED DISCONNECT SWITCH. CIRCUIT TO BE LABELED FIRE ALARM.

I. ALL STROBES LOCATED WITHIN THE SAME AREA SHALL BE SYNCHRONIZED.

J. THE PROTECTIVE SIGNALING GROUNDING:

- ALL EQUIPMENT SHALL BE PROPERLY GROUNDED. MAIN PANEL SHALL BE GROUNDED DIRECTLY TO EACH SERVICE. SURGE PROTECTION SHALL BE INSTALLED ON THE AC SUPPLY CIRCUIT AT THE FIRE ALARM PANEL AND ON ALL INITIATING, NOTIFICATION AND MONITORING CIRCUITS AT THE FIRE ALARM PANEL. IN ADDITION SURGE PROTECTION SHALL BE INSTALLED ON ALL INITIATING, NOTIFICATION AND MONITORING CIRCUITS AT ALL POINTS OF ENTRY TO A BUILDING FROM THE OUTSIDE. ALL SURGE PROTECTION SHALL BE DITEX OR EQUIVALENT.

DITEX DTK-LVLP SERIES FOR LOW VOLTAGE DATA AND SIGNAL LINE PROTECTION.  
DITEX DTK-HW SERIES FOR HARD WIRE AC PROTECTION FOR 120VAC.

K. TESTING

THE COMPLETELY INSTALLED FIRE ALARM SYSTEM WILL BE FULLY TESTED IN COMPLIANCE WITH TESTING PROCEDURES FOR SIGNALING SYSTEMS (ANSI/NFPA 72) UNDER THE SUPERVISION OF A TRAINED MANUFACTURER'S REPRESENTATIVE. THE SYSTEM SHALL BE DEMONSTRATED TO PERFORM ALL THE FUNCTIONS AS SPECIFIED.

THE FIRE ALARM CONTRACTOR SHALL TEST:

- EVERY ALARM INITIATING DEVICE FOR PROPER RESPONSE AND PROGRAM EXECUTION.
- EVERY NOTIFICATION APPLIANCE FOR PROPER OPERATION AND AUDIBLE/VISUAL OUTPUT
- ALL AUXILIARY CONTROL FUNCTIONS SUCH AS ELEVATOR CAPTURE, SMOKE DOOR AND DAMPER RELEASE AND FUNCTIONAL OVERRIDE OF HVAC, VENTILATION, AND PRESSURIZATION CONTROLS.

L. THE SYSTEM SHALL BE COMMISSIONED IN ACCORDANCE WITH THE NEEDS OF THE OCCUPANTS OF THE PROTECTED BUILDING. BOTH "COMPLETE SYSTEM COMMISSIONING" AND "PHASED SYSTEM COMMISSIONING" SHALL BE POSSIBLE WITH THE SPECIFIED SYSTEM, AND THE EXECUTION OF EITHER METHOD OF COMMISSIONING SHALL BE TREATED AS STAND-ALONE PROJECTS, AND SHALL BE DOCUMENTED AS SUCH, INCLUDING THE NEED FOR A COMPLETE CONTRACT CLOSE OUT SUBMITTAL PACKAGE FOR EACH PROJECT PHASE.

M. COMPLETE SYSTEM COMMISSIONING:

A. THE FACTORY TRAINED AND AUTHORIZED FIRE ALARM CONTRACTOR IN THE PRESENCE OF THE LOCAL AHJ, THE BUILDING OWNERS' REPRESENTATIVE, AND A REPRESENTATIVE OF THE GENERAL CONTRACTOR SHALL PERFORM COMMISSIONING OF THE ENTIRE INSTALLED SYSTEM, IF DEEMED APPROPRIATE.

B. A COMPLETE SYSTEM DOCUMENTATION PACKAGE SHALL BE PROVIDED TO THE LOCAL AUTHORITY HAVING JURISDICTION AND THE BUILDING OWNERS' REPRESENTATIVE AT THE TIME OF COMMISSIONING.

N. INSTRUCTION OF OWNER

THE FIRE ALARM CONTRACTOR SHALL SCHEDULE AND EXECUTE AN INSTRUCTION CLASS FOR THE BUILDING OWNER, WHICH DETAILS THE PROPER OPERATION OF THE INSTALLED FIRE ALARM SYSTEM. THE INSTRUCTION SHALL ALSO COVER THE SCHEDULE OF MAINTENANCE REQUIRED BY NFPA 72 AND ANY ADDITIONAL MAINTENANCE RECOMMENDED BY THE SYSTEM MANUFACTURER. THIS INSTRUCTION SHALL ALSO BE SEPARATELY FURNISHED TO THE LOCAL MUNICIPAL FIRE DEPARTMENT IF SO REQUESTED BY THE LOCAL AUTHORITY HAVING JURISDICTION.

THE INSTRUCTION SHALL BE A MINIMUM OF 8 HOURS IN DURATION AND PRESENTED IN AN ORGANIZED AND PROFESSIONAL MANNER BY A PERSON FACTORY TRAINED IN THE OPERATION AND MAINTENANCE OF THE EQUIPMENT AND WHO IS ALSO THOROUGHLY FAMILIAR WITH THE INSTALLATION.

THE FIRE ALARM CONTRACTOR SHALL PROVIDE SERVICE AND OPERATION MANUALS OR ANY OTHER CURRICULA THAT MAY ENHANCE THE INSTRUCTION OF THE BUILDING OWNERS OR LOCAL MUNICIPAL FIRE DEPARTMENT IN THE OPERATION AND MAINTENANCE OF THE SYSTEM. ALSO PROVIDE SOFTWARES AND HARDWARE NECESSARY TO TROUBLESHOOT AND COMPLETELY PROGRAM THE SYSTEM.

**NORTH CAROLINA ENERGY CODE**

APPENDIX B (NORTH CAROLINA 2018 ENERGY CONSERVATION CODE)  
ELECTRICAL SUMMARY

METHOD OF COMPLIANCE:  PRESCRIPTIVE  PERFORMANCE  ENERGY COST BUDGET

**LIGHTING SCHEDULE**

LAMP TYPE REQUIRED IN FIXTURE: SEE LIGHT FIXTURE SCHEDULE ON SHEET E-002

NUMBER OF LAMPS IN FIXTURE: SEE LIGHT FIXTURE SCHEDULE ON SHEET E-002

BALLAST TYPE USED IN THE FIXTURE: SEE LIGHT FIXTURE SCHEDULE ON SHEET E-002

NUMBER OF BALLASTS IN FIXTURE: SEE LIGHT FIXTURE SCHEDULE ON SHEET E-002

TOTAL WATTAGE PER FIXTURE: SEE LIGHT FIXTURE SCHEDULE ON SHEET E-002

TOTAL INTERIOR WATTAGE SPECIFIED VS ALLOWED: 19,432 W VS. 58,964 W

EXTERIOR WATTAGE SPECIFIED VS ALLOWED: 0 W VS. 0 W

SECTION C401.2 SHALL BE ACHIEVED BY ONE OF THE BELOW:

a. C406.2 MORE EFFICIENT HVAC EQUIPMENT

b. C406.3 REDUCED LIGHTING POWER DENSITY

c. C406.4 ENHANCED DIGITAL LIGHTING CONTROL SYSTEM

d. C406.5 ON-SITE SUPPLY OF RENEWABLE ENERGY

e. C406.6 DEDICATED OUTDOOR AIR SYSTEM

f. C406.7 REDUCED ENERGY USE IN SERVICE WATER HEATING

**EQUIPMENT SCHEDULES WITH MOTORS (NOT USED FOR MECHANICAL SYSTEMS)**

MOTOR HORSEPOWER	N/A
NUMBER OF PHASES	N/A
MINIMUM EFFICIENCY	N/A
MOTOR TYPE	N/A
NUMBER OF POLES	N/A

**VOLTAGE DROP SCHEDULE**

120 VOLT BRANCH CIRCUITS UP TO 8 AMPS

RUN DISTANCE IN FEET	WIRE SIZE AWG
1' - 120'	#12
121' - 190'	#10
191' - 300'	#8
301' - 470'	#6

120 VOLT BRANCH CIRCUITS 9 AMPS TO 14 AMPS

RUN DISTANCE IN FEET	WIRE SIZE AWG
1' - 65'	#12
66' - 110'	#10
111' - 170'	#8
171' - 270'	#6

277 VOLT BRANCH CIRCUITS UP TO 14 AMPS

RUN DISTANCE IN FEET	WIRE SIZE AWG
1' - 160'	#12
161' - 250'	#10
251' - 390'	#8
391' - 620'	#6

WIRE SIZES INDICATED IN PANEL SCHEDULES ARE MINIMUM WIRE SIZES. CONTRACTOR SHALL UPSIZE WIRES BASED ON LOAD AND LENGTH OF RUN AS INDICATED IN SCHEDULE ABOVE.

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**ELECTRICAL NOTES TO CONTRACTOR:**

- HALLWAYS: FIXTURES SHALL BE MOUNTED IN A PERFECTLY STRAIGHT LINE
- ALL HALLWAYS ON MOTION SENSORS WITH 15' MINIMUM LINEAR DETECTION; SET TO KEEP LIGHTS ON 20 MINUTES AFTER DETECTION.
- EXTERIOR: ELECTRICIAN TO DELIVER ALL POWER VIA CONDUIT PLAN TO ALL EXTERIOR AND INTERIOR REQUIRED SERVICES: ELEVATOR, FIRE PANEL, PHONE, DATA, SIGN, IRRIGATION, HVAC, SECURITY, GATE, KEYPADS, ETC. NO EXCLUSIONS.
- ALL EXTERIOR ELECTRIC LINES TO BE IN CONDUIT OTHERWISE SPEC'D BY ELECTRICIAN.
- ALL INTERIOR LINES TO BE IN CONDUIT UNLESS OTHERWISE SPEC'D ON PLANS. NO EXPOSED ELECTRIC LINES IN HALLWAYS OR UNITS!
- ALL CONTROL PANELS TO BE CENTRALIZED IN ONE CONTROL ROOM NOT LARGER THAN 10'X10'
- ELECTRIC CONTROL ROOM TO INCLUDE FIRE ALARM, DATA & PHONE PANEL, SECURITY CONTROL PANEL/DVR, ELECTRIC PANELS, ALL ALARMS, ETC.
- GC AND EC TO COORDINATE ANY LOW VOLTAGE WORK WITH OWNER PRIOR TO ROUGH-IN WORK.
- ELECTRIC CONTRACTOR TO PROVIDE SERVICE WALKTHROUGH AFTER INSTALLATION WITH OWNER/OWNER REP.
- THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH ALL BUILDING SYSTEMS SUBCONTRACTORS (STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, AND ELECTRICAL POWER AND LIGHTING) AS WELL AS THE OWNER RETAINED SYSTEMS (INCLUDING BUT NOT NECESSARILY LIMITED TO SECURITY, DATA AND COMMUNICATIONS) TO AVOID CONFLICTS.
- THE MINIMUM VERTICAL CLEARANCE IN THE STORAGE AREAS AND HALLWAYS OF ALL THREE FLOORS IS +8'-0" AFF. PRIOR TO COMMENCING CONSTRUCTION SO THAT ANY CONFLICTS CAN BE IDENTIFIED, RESOLVED AND MANAGED WITHOUT DELAY OR COSTS TO THE OWNER. THE GC AND THE GC'S MEP & FP SUBS SHALL FULLY COORDINATE THE LAYOUT OF ALL WORK, SYSTEMS, STRUCTURAL MEMBERS AND COMPONENTS, EQUIPMENT, FIXTURES, DUCTWORK, PLUMBING AND FIRE PROTECTION LINES, SPRINKLER HEADS, ETC. LOCATED IN THE AREA BETWEEN +7'-10" AFF AND THE UNDERSIDE OF THE FLOOR OR ROOF DECK ABOVE.

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WAVE PROJECT #20193

Permit - Seal:

PRELIMINARY  
NOT FOR CONSTRUCTION  
OR PRICING

10/20/2020

**NOT FOR CONSTRUCTION**

Issued / Revisions:	Appd.	Date

Client:

Project:

**Storage Facility**

Country Club Rd.  
Winston-Salem, NC

Tab:

**ELECTRICAL SPECIFICATIONS**

Date:

Project No.:

Drawn by:

Sheet:

**E-001**