ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FLUORESCENT FIXTURE, RECESSED		BRANCH PANELBOARD, SURFACE, FLUSH
	FLUORESCENT FIXTURE, SURFACE		DISTRIBUTION PANELBOARD; SURFACE, FLUSH
	FLUORESCENT FIXTURE, OPEN STRIP		TELEPHONE TERM. CABINET; SURFACE, FLUSH
	INCANDESCENT OR HID FIXTURE, SURFACE/PENDANT	F	DISCONNECT SWITCH; FUSED
	INCANDESCENT OR HID FIXTURE, RECESSED		DISCONNECT SWITCH; UNFUSED
	INCANDESCENT OR HID FIXTURE, WALL MOUNTED		MOTOR STARTER; MAGNETIC
	PARKING LUMINAIRE	T	TRANSFORMER; DISTRIBUTION
	SPOT OR FLOODLIGHT	M	MOTOR OUTLET & CONNECTION
	ROADWAY LUMINAIRE		CONDUIT, CONCEALED; WALL OR CEILING
	POST OR WALKWAY LUMINAIRE		CONDUIT, CONCEALED; FLOOR OR UNDERGROUND
	EXIT LIGHT; CEILING, WALL; ARROW INDICATES DIRECTION		CONDUIT, EXPOSED
L	KEYLESS PORCELAIN LAMPHOLDER RATED 550W, 250V, GE #GE5740-7 OR EQUAL WITH 150W LAMP	T	CONDUIT, TELEPHONE
NL	LIGHT FIXTURE CONNECTED TO SECURITY "NL" LIGHTING CIRCUIT		CONDUIT, UP
E	EMERGENCY LIGHTING UNIT		CONDUIT, DOWN
F1 140	LETTER ADJACENT SUYMBOL INDICATES FIXTURE TYPE, NUMBER INDICATES INPUT WATTS	A–5	BRANCH CIRCUIT HOMERUN, CROSS HATCHING INDICATES NUMBER OF #12 AWG WIRES WHEN MORE THAN TWO, PANEL A, CIRCUIT NO. 5
$	LIGHT SWITCH S.P.S.T.; +48" U.O.N. TOP OF BOX	3	INDICATES NUMBER OF DETAIL NOTE
$2	LIGHT SWITCH 2 P.S.T.; +48" U.O.N. TOP OF BOX	EF 1	MECHANICAL EQUIPMENT DESIGNATION
$3	LIGHT SWITCH 3–WAY; +48" U.O.N. TOP OF BOX	D	SUBSCRIPT LETTER ADJACENT SYMBOL INDICATES CONTROL
$4	LIGHT SWITCH 4–WAY; +48" U.O.N. TOP OF BOX	2 5	NUMBER ADJACENT SUMBOL INDICATES CIRCUIT NO. ON PANELBOARD
$D	SWITCH, DIMMING, SIZED TO SERVE THE CONNECTED LOAD	+24"	INDICATES MOUNTING HEIGHT TO CENTER OUTLET A.F.F.
$P	SWITCH W/ PILOT LIGHT	U.O.N.	UNLESS OTHERWISE NOTED
$OL	THERMAL OVERLOAD SWITCH	A.F.F.	ABOVE FINISHED FLOOR
$AB	TWO SWITCHES AT LOCATION	A.F.G.	ABOVE FINISHED GRADE
$M	HP RATED SWITCH OR MANUAL MOTOR STARTER	N.I.C.	NOT IN CONTRACT
	OUTLET, DUPLEX CONVENIENCE, 20A, 125V; 15" A.F.F. U.O.N.	W.P.	ADJACENT TO SYMBOL INDICATES WEATHERPROOF OUTLET OR DEVICE
	OUTLET, DUPLEX CONVENIENCE MOUNTED ON COUNTER, SEE ARCHITECT FOR MOUNTING HEIGHT	G.F.I.	GROUND FAULT INTERRUPTER
D	OUTLET, DUPLEX CONVENIENCE, DEDICATED EQUIPMENT	BP	BATTERY PACK
IG	OUTLET, DUPLEX CONVENIENCE, ISOLATED FOR COMPUTERS WITH SEPARATE GROUND		LIGHT SWITCH & OUTLET COMBINATION
	OUTLET, FOURPLEX CONVENIENCE; +12" U.O.N.		CLOCK OUTLET, +7'–0" U.O.N.
20A	OUTLET, SINGLE, 250V, 3W, CURRENT RATING INDICATED ADJACENT SYMBOL; +12" U.O.N.	3 1/2	PULLBOX, STATE SPEC. NO. AS NOTED
T	OUTLET, THERMOSTAT; +60" U.O.N.	BP	BYPASS TIMER
J	JUNCTION BOX; CEILING, WALL		COMB. OUTLET, CAT 5 DATA/PHONE,+12" U.O.N.
	OUTLET, FLOOR POWER	SD	DUCT SMOKE DETECTOR
	OCCUPANCY SENSOR, WATTSTOPPER OR EQUM		OUTLET, TELEVISION, AT+12" U.O.N.
	JUNCTION BOX FOR OVERHEAD MEDICAL LIGHT; SWITCH PROVIDED IN FIXTURE; FIXTURE PROVIDED BY OWNER.		

GENERAL ELECTRICAL NOTES

SECTION 16100

BASIC ELECTRICAL REQUIREMENTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. REFER TO DRAWINGS AND CONTRACT FOR MATERIALS FURNISHED BY OWNER, INSTALLED BY CONTRACTOR OR FURNISHED AND INSTALLED BY OWNER.

1.2 SUMMARY

A. FURNISH ALL LABOR, SUPERVISION AND EQUIPMENT (UNLESS EQUIPMENT IS SPECIFICALLY NOTED AS "OWNER FURNISHED") FOR THE COMPLETE INSTALLATION OF A COMPLETE AND PROPERLY OPERATING ELECTRICAL SYSTEM WITH ALL NECESSARY AUXILIARIES AND APPURTENANCES.

B. NATIONAL ELECTRICAL PACKAGES

1. THE OWNER THROUGH A DESIGNATED NATIONAL ELECTRICAL PACKAGE VENDOR MAY PROVIDE SWITCHGEAR, PANELBOARDS, AND SPECIFIC LIGHTING FIXTURES. SEE DRAWINGS FOR DETAILS.
2. FURNISH ALL NECESSARY LABOR AND EQUIPMENT TO COMPLETELY INSTALL THE NATIONAL ELECTRICAL PACKAGE AS INDICATED IN THE DRAWINGS.

C. PROVIDE ALL EXCAVATION AND TAMP BACKFILL AS REQUIRED TO COMPLETE WORK. CORRECT ANY SETTLING DURING QUARANTINE PERIOD TO OWNER'S SATISFACTION.

1.3 QUALITY ASSURANCE

A. MANUFACTURER'S QUALIFICATIONS ELECTRICAL EQUIPMENT, AS INDICATED IN THE DRAWINGS, IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND REQUIREMENT. PROVIDE RELATED PRODUCTS AND ACCESSORIES PROTECTING FROM DIRT, MOISTURE, CONTAMINANTS AND WEATHER FROM ONE MANUFACTURER. STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. COMPANY EQUIPMENT MANUFACTURER'S, OTHER THAN THOSE LISTED, WILL BE ACCEPTABLE UPON WRITTEN APPROVAL OF CONSTRUCTION MANAGER, ALL ELECTRICAL MATERIALS SHALL BE LISTED AND LABELS BY UL AND SHALL CONFORM TO NEMA AND OTHER INDUSTRY STANDARDS.

B. CODES AND STANDARDS: ELECTRICAL SYSTEM SHALL CONFORM TO REQUIREMENTS OF NATIONAL, STATE AND LOCAL ELECTRIC CODES, LOCAL AUTHORITIES AND UTILITY COMPANY.

C. WORKMANSHIP: EXPERIENCED, WELL–TRAINED WORKERS COMPETENT TO COMPLETE THE WORK AS SPECIFIED SHALL PERFORM LABOR IN CONFORMANCE WITH GENERALLY ACCEPTED TRADE STANDARDS. INTALL ALL EQUIPMENT SQUARE AND PLUMB ALLOWING ACCESS FOR PROPER OPERATION AND SERVICE.

1.4 STRUCTURAL AND SPACE CONDITIONS

A. ALL WORK SHALL AVOID ABSTRUCTIONS AND INTERFERENCE WITH OTHER TRADES, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR AND FREE.

1.5 DRAWINGS

A. CONTRACTOR IS RESPONSIBLE FOR EXAMINING THE DRAWINGS, SPECIFICATIONS, SITE AND OTHER BID DOCUMENTS PRIOR TO SUBMITTING A PROPOSAL

B. THE DRAWINGS AS PREPARED ARE DIAGRAMMATIC. THE WORK SHALL FOLLOW AS CLOSELY AS ACTUAL CONSTRUCTION OF THE PROJECT AND THE WORK OF ALL TRADES PERMIT.

1.6 CUTTING AND PATCHING

A. CUTTING OR PATCHING NECESSARY TO PERMIT THE INSTALLATION OF ANY WORK UNDER THIS CONTRACT IS THE RESPONSIBILITY OF THIS TRADE. CUTTING AND PATCHING SHALL BE COORDINATED WITH OTHER TRADES SO AS NOT TO IMPACT OTHER WORK.

1.7 TESTING

A. TESTS: ENTIRE ELECTRICAL SYSTEM SHALL BE FULLY TESTED AND CORRECTED OF ANY SHORT CIRCUITS, OPEN GROUNDS, FAULTY WIRING AND INCORRECT CONNECTIONS. VERIFY FAN MOTOR SPEED AND DIRECTION.

PART 2 – EXECUTION

2.1 ELECTRICAL SYSTEM INSTALLATION, GENERAL

A. SEQUENCE, COORDINATE, AND INTEGRATE THE VARIOUS ELEMENTS OF ELECTRICAL SYSTEMS, MATERIALS, AND COMPONENTS.

1. COORDINATE ELECTRICAL SYSTEMS, EQUIPMENT, AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS.

2. VERIFY ALL DIMENSIONS BY FIELD MEASUREMENTS.

3. ARRANGE FOR CHASES, SLOTS, AND OPENINGS IN OTHER BUILDINGS COMPONENTS DURING PROGRESS OF CONSTRUCTION, TO ALLOW FOR ELECTRICAL INSTALLATIONS.

4. COORDINATE THE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SLEEVES TO BE SET IN POURED–IN–PLACE CONCRETE AND OTHER STRUCTURAL COMPONENTS, AS THEY ARE CONSTRUCTED.

5. SEQUENCE, COORDINATE, AND INTEGRATE INSTALLATIONS OF ELECTRICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK. GIVE PARTICULAR ATTENTION TO LARGE EQUIPMENT REQUIRING POSITIONING PRIOR TO CLOSING IN THE BUILDING.

6. WHERE MOUNTING HEIGHTS ARE NOT DETAILED OR DIMENSIONED, INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT TO PROVIDE THE MAXIMUM HEADROOM POSSIBLE.

7. COORDINATE CONNECTION OF ELECTRICAL SYSTEMS WITH EXTERIOR UNDERGROUND AND OVERHEAD UTILITIES AND SERVICES. COMPLY WITH REQUIREMENTS OF GOVERNING REGULATIONS, FRANCHISED SERVICE COMPANIES, AND CONTROLLING AGENCIES. PROVIDE REQUIRED CONNECTION FOR EACH SERVICE.

8. INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT TO CONFORM WITH DRAWINGS AND SPECS, TO GREATEST EXTENT POSSIBLE, CONFORM TO ARRANGEMENTS INDICATED BY THE CONTRACT DOCUMENTS, RECOGNIZING THAT PORTIONS OF THE WORK ARE SHOWN ONLY IN DIAGRAMMATIC FORM. WHERE COORDINATION REQUIREMENTS CONFLICT WITH INDIVIDUAL SYSTEM REQUIREMENTS, REFER CONFLICT TO THE CONSTRUCTION MANAGER FOR RESOLUTION PRIOR TO INSTALLATION.

9. INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, WHERE INSTALLED EXPOSED IN FINISHED SPACES.

10. INSTALL ELECTRICAL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE, AND REPAIR OR REPLACEMENT OF EQUIPMENT COMPONENTS. AS MUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS.

11. INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT GIVING RIGHT–OF–WAY PRIORITY TO SYSTEMS REQUIRED TO BE INSTALLED AT A SPECIFIED SLOPE.

2.2 IDENTIFICATION

A. PANELBOARD SCHEDULES–INTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND COMPLY WITH FOLLOWING REQUIREMENTS. PROVIDE TYPEWRITTEN DIRECTORIES IN BRANCH PANELBOARDS WITH CLEAR PLASTIC SHIELDS.

B. EQUIPMENT LABELS–PROVIDE ENGRAVED PLASTIC NAME PLATES ON ALL DISCONNECT SWITCHES, MOTOR STARTERS. CONTROL DEVICES, AND SWITCHES IN SERVICE ENTRANCE EQUIPMENTS.

END OF SECTION

BASIC MATERIALS AND METHODS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. REFER TO DRAWINGS AND CONTRACT FOR MATERIALS FURNISHED BY OWNER, INSTALLED BY CONTRACTOR OR FURNISHED AND INSTALLED BY OWNER.

1.2 SCOPE OF WORK

A. SECTION 16200 APPLIES TO ALL WORK HERE UNDER AND SHALL INCLUDE CONDUIT, BOXES, WIRE, WIRING DEVICES, MOTOR STARTERS, LIGHTING FIXTURES, HEAT TRACE AND RELATED MATERIALS

PART 2 – PRODUCTS

2.1 RACE WAY

A. SHALL BE AS INDICATED ON THE DRAWINGS

B. FLEXIBLE CONDUIT: UL LISTED LIQUID TIGHT CONDUIT WITH LIQUID TIGHT CONDUCTORS.

C. RIGID CONDUIT: RIGID GALVANIZED THREADED THICKWALL CONDUIT WITH THREADED FITTINGS SHALL BE PROVIDED IN SLABS ON GRADE. CONDUITS BELOW SLABS ON GRADE OR IN EARTH OUTSIDE OF BUILDINGS SHALL BE SCHEDULE 40 PVC WITH SEPARATE GROUNDING CONDUCTOR PER NEC, WHERE ACCEPTABLE BY LOCAL CODES. WHERE THE USE OF PVC CONFLICTS WITH LOCAL CODES, SUBSTITUTE RIGID GALVANIZED THREADED THICKWALL CONDUIT PAINTED WITH 2 COATS OF ASPHALTUM AND WITH 2 COATS APPLIED AT JOINTS AFTER INSTALLATION.

D. ELECTRIC METALLIC TUBING: ALL OTHER CONDUIT SHALL BE ELECTRIC METALLIC TUBING WITH COMPRESSION TYPE FITTINGS

E. CONCEALED BOXES SHALL BE 4" SQUARE GALVANIZED STEEL WITH GALVANIZED EXTENSION RINGS, TOTAL DEPTH OF NOT LESS THAN 2–1/2". SURFACE MOUNTED BOXES SHALL BE CAST WEATHERPROOF ALUMINUM.

2.2 WIRING

A. WIRING: CONDUCTORS SHALL BE 98% CONDUCTIVITY COPPER OF #12 AWG–MINIMUM SIZE.

B. INSULATION SHALL BE COLOR CODED, AND RATED FOR 600 VOLTS MINIMUM. TYPE THHN OR THWN SHALL BE USED WHERE CONDUIT SIZES ARE LIMITED. AT OTHER LOCATIONS, TYPE TW MAY BE USED IN SIZES #10 AND #12 AWG AND TYPE THW FOR LARGER SIZES.

C. WIRE CONNECTORS FOR SIZES #10 AWG AND LESS SHALL BE BUCHANAN "PRESS–SHURE", IDEAL "WRAP–CAP", T&B "STAKONS" OR 3M "SCOTCHLOK". CONNECTORS FOR WIRE SIZE #8 AND LARGER SHALL BE T&B OR BURNDY METHODS USING HYDRAULIC PRESSES.

2.3 WIRING DEVICES

A. WALL SWITCHES SHALL BE COLOR PER ARCH AND SHALL BE AS FOLLOWS OR APPROVED EQUAL.

20 A SP, 125/277 V.––A &H #1991W, BRYANT #4901W, OR HUBBELL #1221W.
TO A: 3W, 125/277 V ––– A&H #1993W, BRYANT #4903W, OR HUBBELL #1223W.
20 A 4W, 125/277 V ––A&H #1994W, BRYANT #4904W, OR HUBBELL #1224W.
20 A: SP, 125/277V WITH PILOT LIGHT–– ARROW–HART #1991–PL, BRYANT #4901–PL, OR HUBBELL #1221–PL
20 A, SP, 125//277v, WEATHERPROOF–– ARROW HART #1991/2881–C OR HUBBELL #1221/1795.

B. RECEPTACLES SHALL BE WHITE AND SHALL BE AS FOLLOWS OR APPROVED EQUAL. PROVIDE OTHER RECEPTACLES AS INDICATED ON THE DRAWINGS.
20A, 125V DUPLEX ––– A&H #5362W (1), BRYANT #5362W 20A, 125V
TWISTLOCK ––– HUBBELL 2310
30A, 250V, 3W ––– G ––– A & H #5700, BRYANT 9630FR OR HUBBELL #9430
50A, 250V, 3P, 4W – G ––– A & H, P & S OR HUBBELL 8450 WITH 8452 PLUG & 4/C #8 SO CORD.
GROUND FAULT –– A & H #CGF62, BRYANT #CGF62 OR HUBBEL #GF 5362. PROVIDE SPRING LOADED WEATHERPROOF COVERS WHERE REQUIRED BY CODE.
CLOCK & SIGN HANGER ––– A & H #5708, BRYANT #2828–GS OR HUBBELL #5235.

C. PROVIDE FACE PLATES FOR ALL DEVICES INCLUDING WALL SWITCHES, RECEPTACLES, AND TELEPHONE OUTLETS AND ALL WALL OUTLETS. FACEPLATES SHALL BE WHITE SATIN FINISHED STAINLESS STEEL.

D. DIMMERS SHALL BE WHITE ––– #D–18P.

E. PHOTO CELLS SHALL BE RATED 16.6 AMPS 120 VOLTS. LIGHTS SHALL BE 1.5 FOOTCANDLES FOR TURN ON AND 10 FOOTCANDLES FOR TURN OFF. SUITABLE FOR TEMPERATURE RANGES FOR –30 DEGREE'S F TO +140 DEGREES F AND WEATHERPROOF ENCLOSED. LOAD TO REMAIN ON IN CASE OF CELL FAILURE. SHALL HAVE A MINIMUM TIME DELAY OF 15 SECONDS. PROVIDE PARAGON CATALOG #CW201–00 OF EQUAL.

2.4 LIGHTING

A. LIGHTING FIXTURES SHALL BE FURNISHED BY CONTRACTOR AS SCHEDULED ON DRAWINGS EXCEPT FOR THOSE INDICATED TO BE FURNISHED BY OWNER. CONTRACTOR SHALL INSTALLALL LIGHTING FIXTURES AND PROVIDE NECESSARY MOUNTING HARDWARE. ALL RECESSED LIGHTING FIXTURES SHALL BE THERMALLY PROTECTED AND IC RATED AS REQUIRED BY CODE.

B. CONTRACTOR SHALL FURNISH AND INSTALL ONE COMPLETE SET OF LAMPS FOR ALL LIGHTING FIXTURES SUPPLIED BY THE CONTRACTOR. FIXTURES SUPPLIED BY THE OWNER OR OTHERS SHALL BE FURNISHED WITH LAMPS BY EACH RESPECTIVE FIXTURE SUPPLIER. PROVIDE LABEL IN EACH FIXTURE INDICATING SIZE AND TYPE OF LAMP CORRESPONDING WITH SCHEDULE ON DRAWING.

C. FLUORESCENT LAMPS SHALL BE COLOR SHOWN IN SCHEDULE, ENERGY EFFICIENT, MANUFACTURED BY GENERAL ELECTRIC WATT MISER II

D. INCANDESCENT LAMPS SHALL BE INSIDE FROSTED WITH 2500–HOUR LAMP LIFE RATED 130 VOLTS.

E. FLUORESCENT BALLAST'S SHALL BE ENERGY EFFICIENT. MANUFACTURED BY GENERAL ELECTRIC. MAXI–MISER II

2.5 STARTERS

A. STARTERS: THREE–PHASE UNITS SHALL BE SQUARE D TYPE 8536 WITH 120 VOLTS COIL, N.O. AUXILIARY CONTACT, AND WITH RED PILOT (IN COVER)

2.6 TIME CLOCK

A. PROVIDE TIME CLOCK AS SHOWN ON DRAWINGS.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

A. RACEWAY SYSTEM SHALL BE INSTALLED TO MAINTAIN THE MAXIMUM HEADROOM. COMMON SUPPORTS MAY BE USED FOR MECHANICAL AND ELECTRICAL EQUIPMENT BY COORDINATING THE WORK WITH ALL TRADES.

B. USE ONLY TYPE WIRE PULLING LUBRICANTS FOR WIRE #4 AWG OR LARGER. SPLICE WIRE ONLY IN ACCESSIBLE BOXES. MAKE WIRE JOINTS MECHANICALLY STRONG BEFORE APPLYING THE CONNECTOR, AND WHERE TAPE IS USED, WRAP EACH JOINT TO THE THICKNESS OF THE ORIGINAL INSULATION CLEAN AND POLISH METALLIC SURFACES BEFORE INSTALLING CONDUCTORS. APPLY PRESSURE TYPE LUGS ON STANDARD CONDUCTORS CONNECTED TO SCREW OR BOLT TYPE CONNECTIONS.

C. ALL WIRE SHALL BE INSTALLED IN A CONDUIT AND SHALL BE CONCEALED. IF UNFORESEEN CONDITION REQUIRES WIRE TO BE EXPOSED TO RACEWAY SHALL BE INSTALLED AS INCONSPICUOUSLY AS POSSIBLE, CUT RACEWAY SQUARES; REAM SMOOTH AND MAKE UP TIGHT. PLUG ENDS OF RACEWAYS DURING CONSTRUCTION AND SWAB CLEAN BEFORE PULLING WIRE OF CABLE.

D. ALL ELECTRICAL BOXES SHALL BE SUPPORTED FROM BUILDING STRUCTURAL MEMBERS INDEPENDENTLY OF THE CONDUIT RACEWAY. MECHANICAL SYSTEMS OF SUSPENDED CEILING SUPPORTS. RECESSED BOXES SHALL BE FLUSH WITH SURROUNDING SURFACES. ALL BOXES AND CABINETS SHALL BE PROTECTED DURING CONSTRUCTION AND SHALL BE CLEANED BEFORE PULLING WIRE AND INSTALLING DEVICES.

E. UNLESS NOTED OTHERWISE, RECEPTACLES SHALL BE INSTALLED 18" ABOVE THE FINISHED FLOOR AND SWITCHES SHALL BE 48" ABOVE FINISH FLOOR TO TOP OF BOX. RECEPTACLES NOTED ABOVE WORK COUNTER AND CABINETS SHALL BE MOUNTED ABOVE THE BACKSPLASH. WEATHERPROOF RECEPTACLES SHALL BE INSTALLED SO THAT THE COVER PROTECTS THE DEVICE IN THE OPEN POSITION. RECEPTACLES SHALL BE BONDED TO METALLIC BOXES OR TO SEPARATE GROUND CONDUCTOR PER NEC.

F. EQUIPMENT CONNECTIONS: PROVIDE ALL NECESSARY MOTOR STARTERS, DISCONNECT SWITCHES, CONTROLS, CONDUIT, BOXES WIRE, ETC. AND CONNECT COMPLETE TO EACH PIECE OF EQUIPMENT REQUIRING CONNECTIONS INDICATED ON THE DRAWINGS. WHERE EQUIPMENT RATINGS DIFFER FROM THAT INDICATED, CONSULT CONSTRUCTION MANAGER, WHERE EQUIPMENT IS NOTED AS FUTURE, TERMINATE CIRCUIT IN JUNCTION BOX AND TAPE ENDS OF THE CONDUCTORS.

G. LIGHTING FIXTURES: FIXTURES SUPPORTED IN EXPOSED GRID CEILINGS SHALL BE PROVIDED WITH CLIPS. FIXTURES MOUNTED IN OR ON TILE CEILINGS SHALL BE ALIGNED WITH TILES. LIGHTING FIXTURES SHALL BE SUPPORTING WIRE SHALL BE PROVIDED AT EACH FIXTURE CORNER. SURFACE MOUNTED LIGHT FIXTURES SHALL BE SECURED PER MANUFACTURER'S RECOMMENDATIONS.

H. CLEANING: ALL EQUIPMENT INCLUDING PANELBOARDS, SWITCHES, WIRING DEVICES, LIGHTING FIXTURES, WALL PLATES, ETC: SHALL BE FREE OF CORROSION, DIRT, POINT SPATTER OR DAMAGE OF ANY SORT AT FINAL ACCEPTANCE OF THE WORK. CONTRACTOR SHALL CLEAN, REPAIR OR REPLACE SOME AS INSTRUCTED BY THE CONSTRUCTION MANGER BEFORE FINAL PAYMENT.

I. CONNECTIONS TO EQUIPMENT SHALL BE MADE WITH A 3'–0" FLEXIBLE LIQUID TIGHT CONDUIT WITH LIQUID TIGHT CONNECTORS.

J. CONNECTIONS TO RECESSED LIGHTING FIXTURES SHALL BE MADE WITH 6'–0" OF FLEXIBLE CONDUIT FROM A BOX WITHIN 2'–0" OF THE FIXTURE.

3.2 INSTALLATION, HEAT TRACE – NOT USED

3.3 INSTALLATION, TIME CLOCK

A. PROVIDE 7 DAY CALENDAR DIAL TIME CLOCK WITH BYPASS PROVISIONS FOR EXTERIOR LIGHTS.

B. UPON COMPLETION OF THE INSTALLATION, SET THE TIME CONTROLS PER THE OWNERS REPRESENTATIVE'S SCHEDULE.

3.4 INSTALLATION, TELEPHONE SYSTEM

A. FURNISH AND INSTALL THE TELEPHONE EMPTY CONDUIT, PULL WIRE, TERMINAL BOXES, JUNCTION BOXES, AND OUTLET BOXES, IN BUILDING WHERE INDICATED ON THE DRAWINGS.

3.5 INSTALLATION, SOUND SYSTEM – NOT USED

3.6 INSTALLATION, COMPUTER CASH REGISTER SYSTEM – NOT USED

SECTION 16400
SERVICE AND DISTRIBUTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. REFER TO DRAWINGS AND CONTRACT FOR MATERIALS FURNISHED AND INSTALLED BY CONTRACTOR OR FURNISHED AND INSTALLED BY OWNER.

1.2 SCOPE OF WORK

A. SECTION 16400 APPLIES TO ALL WORK HERE UNDER AND SHALL INCLUDE WORK REQUIRED FOR METERING, GROUND RODS, PANEL BOARDS, DISCONNECT SWITCHES AND RELATED MATERIALS.

PART 2 – PRODUCTS

2.1 SERVICE ENTRANCE

A. CONTRACTOR SHALL VERIFY SERVICE VOLTAGE AND TYPE OF TERMINATION WITH LOCAL UTILITY COMPANY AND SHALL PROVIDE NECESSARY REVISIONS AND MODIFICATIONS REQUIRED. SERVICE TERMINATION'S MAY EITHER BE UNDERGROUND OR OVERHEAD DEPENDING ON THE UTILITY COMPANIES REQUIREMENT AND APPROVAL BY CONSTRUCTION MANAGER.

2.2 UTILITY COMPANY METERING

A. CONTRACTOR SHALL PROVIDE NECESSARY METERING FACILITIES INCLUDING METER SOCKET, CURRENT TRANSFORMER CABINET, CONDUIT AND OTHER WORK FOR METERING REQUIRED BY THE LOCAL UTILITY COMPANY.

2.3 GROUNDING

A. ALL EXPOSED NON CURRENT CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, METALLIC RACEME SYSTEMS, GROUNDING CONDUCTOR IN RACEWAYS AND NEUTRAL CONDUCTOR OF THE WIRING SYSTEM SHALL BE GROUNDED THE GROUND CONNECTION SHALL EXTEND TO THE POINT OF ENTRANCE OF THE METALLIC WATER SERVICE SHALL BE GROUNDED AS DESCRIBED BY NFPA 70 WHERE THERE ARE NO METALLIC WATER SERVICES TO THE BUILDINGS GROUND CONNECTIONS SHALL BE MADE TO DRIVEN GROUND RODS ON THE EXTERIOR OF THE BUILDING.

B. GROUND RODS SHALL BE OF ZINC–COATED COPPER CLAD STEEL NOT LESS THAN 3/4: IN DIAMETER, 8' LONG DRIVEN FULL LENGTH INTO THE EARTH. THE MAXIMUM RESISTANCE OF A DRIVEN GROUND ROD SHALL NOT EXCEED 25 OHMS UNDER NORMALLY DRY CONDITIONS. IF THIS RESISTANCE CANNOT BE OBTAINED WITH A SIGNAL ROD, ADDITIONAL RODS MAY BE COUPLED AND DRIVEN WITH THE FIRST ROD.

2.4 PANELBOARDS

B. BRANCH PANELBOARDS WILL BE FURNISHED TO THE CONTRACTOR, UNLESS NOTED AS SUPPLIED BY OWNER, FOR INSTALLATION BY THE ELECTRICAL CONTRACTOR UNLESS INDICATED OTHER ON DRAWINGS. THEY WILL BE UNASSEMBLED BOLT ON CIRCUIT BREAKER TYPE, MINIMUM OF 14" WIDE AND 5 3/4: DEEP, RECESSED OR SURFACE MOUNTED AS INDICATED. PROVIDE TYPEWRITTEN CIRCUIT DIRECTORY ON INSIDE DOOR PROTECTED WITH CLEAR PLASTIC SHIELD IN A CARDHOLDER CIRCUIT BREAKERS SHALL BE THERMAL MAGNETIC FULL SIZE, COMMON TRIP ON 2 AND 3 POLE WITH TRIP FREE HANDLES, RATED NOT LESS THAN 10,000 RMS AMPERES.

2.5 DISCONNECT SWITCHES

A. HVAC DISCONNECT SWITCHES SHALL BE FURNISHED BY THE CONTRACTOR, UNLESS NOTED AS SUPPLIED BY OWNER, FOR INSTALLATION BY THE ELECTRICAL CONTRACTOR UNLESS INDICATED OTHERWISE ON DRAWINGS. ALL DISCONNECT SWITCHES WILL BE NORMAL DUTY TYPE NEMA ND, FUSED UNLESS NOTED OTHERWISE, WAND WITH OPERATOR INTERLOCKED WITH THE DOOR SO DOOR CAN BE OPENED ONLY IN THE "OFF" POSITION.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

A. PANELBOARDS SHALL BE INSTALLED AT HEIGHT INDICATED. DISCONNECT SWITCHES SHALL BE INSTALLED 4'–0" ABOVE FINISHED FLOOR WHERE POSSIBLE. ALL CABINETS SHALL BE VACUUM CLEANED BEFORE PULLING WIRE.

END OF SECTION

CITY OF BAKERSFIELD APPROVED SPC12 DATE BUILDING DEPT.

PASQUINI ENGINEERING INCORPORATED
903 H Street Suite 300
Bakersfield, CA 93304
Telephone: (661) 328-8600
Fax: (661) 328-8630

NO.	DATE

DIANE MIRONOWSKI
OFFICE/ WAREHOUSE
6107 WOODMERE DR.
BAKERSFIELD, CA.

THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS A "WET STAMP & SIGNATURE" FROM BOTH THE ENGINEER OF RECORD AND A APPROVAL STAMP WITH A "WET STAMP & SIGNATURE" FROM THE LOCAL GOVERNING AGENCY ARE PRESENT.

DWG. BY	L.H.
CHK'D BY	
DATE	2-13-12
JOB NO.	6510
FILE NO.	651022

REGISTERED PROFESSIONAL ENGINEER MARC ADRIAN PASQUINI No. C 49179 CIVIL STATE OF CALIFORNIA
EXP. 12/31/12

SHEET
E-1
OF SHEET