## 26 05 00 COMMON WORK RESULTS FOR ELECTRICAL

### 26 05 00 - 1.0 ELECTRICAL INSTALLATION

- SUPPLY & INSTALL ALL ITEMS, ARTICLES, MATERIAL OPERATIONS INCLUDING ALL LABOUR, EQUIPMENT, MATERIALS & TOOLS NECESSARY TO COMPLETE ALL SYSTEMS SHOWN ON THE DRAWINGS RENDERING A COMPLETE INSTALLATION, ELETRICAL SYSTEMS TO BE FULLY FUNCTIONING OPERATING TO THE SATISFACTION OF THE OWNER & THE DESIGN PROVIDED.
- THE INSTALLATION SHALL COMPLY WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE CANADIAN ELECTRICAL CODE, THE ELECTRICAL SAFETY CODE & ALL RULES, BY-LAWS & AUTHORITIES HAVING JURISDICTION
- THE SCOPE OF WORK IS AS DESCRIBED HEREIN & SHOWN ON THE DRAWINGS. AS WELL AS WORK ASSOCIATED ALL CURRENT. APPLICABLE STANDARDS & CODES AS WELL AS ALL BY-LAWS

### 26 05 00 - 2.0 DRAWINGS & SPECIFICATIONS

- DRAWINGS ARE DIAGRAMMATIC & SHOW APPROXIMATE LOCATIONS OF EQUIPMENT & CONNECTING SERVICES. ANY INFORMATION REGARDING ACCURATE MEASUREMENT OF THE BUILDING ARE TO BE TAKEN AT THE SITE. DO NOT SCALE THE DRAWINGS, & DO NOT USE THE DRAWINGS FOR PREFABRICATION
- READ THE ELECTRICAL DRAWINGS IN CONJUNCTION WITH ALL OTHER STRUCTURAL, ARCHITECTURAL, SITE CIVIL, LANDSCAPE SPRINKLER, MECHANICAL, ETC., DRAWINGS. PROPERLY PLAN, COORDINATE, & ESTABLISH THE LOCATIONS & ROUTING OF SERVICES WITH ALL SUBCONTRACTORS AFFECTED PRIOR TO INSTALLATION SUCH THAT THE SERVICES WILL CLEAR EACH OTHER AS WELL AS ANY OBSTRUCTIONS, INCLUDING STRUCTURAL COMPONENTS OF THE BUILDING.
- THE DRAWINGS ARE INTENDED TO CONVEY THE SCOPE OF WORK & DO NOT SHOW ARCHITECTURAL & STRUCTURAL DETAILS. ELECTRICAL CONTRACTOR SHALL PROVIDE, AT ELECTRICAL CONTRACTOR'S COST, ALL OFFSETS, FITTINGS, TRANSFORMATIONS. & SIMILAR PRODUCTS REQUIRED AS A RESULT. OF OBSTRUCTIONS & OTHER ARCHITECTURAL & STRUCTURAL DETAILS BUT NOT SHOWN ON THE DRAWINGS.
- THE DRAWINGS & SPECIFICATIONS ARE COMPLEMENTARY & INTENDED TO BE COOPERATIVE. PERFORM ALL WORK THAT IS SHOWN, SPECIFIED, OR REASONABLY IMPLIED ON THE DRAWINGS BUT NOT MENTIONED IN THE SPECIFICATION, OR VICE-VERSA, AS THOUGH FULLY COVERED BY BOTH.
- SHOULD ANY DISCREPANCY APPEAR BETWEEN THE DRAWINGS & SPECIFICATIONS WHICH LEAVES THE ELECTRICAL CONTRACTOR IN DOUBT AS TO THE TRUE INTENT & MEANING OF THE PLANS & SPECIFICATIONS, A RULING SHALL BE OBTAINED FROM THE ENGINEER. IF THIS IS NOT DONE, IT WILL BE ASSUMED THAT THE MOST EXPENSIVE ALTERNATE HAS BEEN ALLOWED FOR.

## <u> 26 05 00 - 3.0 PERMITS, FEES, & CERTIFICATES</u>

CONTRACTOR TO OBTAIN ALL PERMITS REQUIRED. ARRANGE FOR INSPECTION OF THE WORK BY INSPECTION AUTHORITY & PAY ALL FEES PROVIDE FINAL CERTIFICATE TO THE OWNER. WORK SHALL NOT COMMENCE ON THE INSTALLATION UNTIL ESA (ONTARIO ELECTRICAL SAFETY AUTHORITY) PLANS REVIEW AS WELL AS THE LOCAL UTILITY'S REVIEW COMMENTS HAVE BEEN RECEIVED & REVIEWED BY THE ENGINEER AS WELL AS THIS CONTRACTOR.

## <u> 26 05 00 - 4.0 EXAMINATION OF THE SITE</u>

PRIOR TO SUBMITTING THEIR TENDER. THE ELECTRICAL CONTRACTOR SHALL CAREFULLY EXAMINE THE SITE & ASCERTAIN ALL CONDITIONS. WHICH SHALL AFFECT HIS TRADE. REPORT TO THE CONSULTANT, PRIOR TO BID SUBMITTAL, ANY EXISTING SITE CONDITION THAT WILL OR MAY AFFECT PERFORMANCE OF THE WORK AS PER THE DRAWINGS & SPECIFICATIONS. FAILURE TO DO SO WILL NOT BE GROUNDS FOR ADDITIONAL COSTS

# <u> 26 05 00 - 5.0 STANDARD OF MATERIAL & WORKMANSHIP</u>

- ALL MATERIALS & EQUIPMENT SHALL BE NEW, CSA APPROVED, BEAR CSA STAMP & BE OF THE BEST COMMERCIAL QUALITY OBTAINABLE FOR THE PURPOSE. ALL ITEMS REQUIRED TO PROVIDE A COMPLETE WORKING SYSTEM - INCLUDING ITEMS NOT SPECIFIED • OR SHOWN, SHALL BE INCLUDED.
- ALL WORK SHALL BE EXECUTED IN A NEAT & WORKMANLIKE MANNER BY JOURNEYMAN TRADESMEN WHO PERFORM ONLY THE • TELEVISION OUTLETS: 450 MM (18 IN.). WORK THAT THEIR CERTIFICATES PERMIT, OR BY APPRENTICE TRADESMEN UNDER DIRECT ON SITE SUPERVISION OF AN EXPERIENCED JOURNEYMAN TRADESMAN.
- WORKMANSHIP SHALL BE OF THE HIGHEST STANDARDS THROUGHOUT & SHALL BE MINIMUM OF THE CURRENT TRADE PRACTICES FOR ELECTRICAL INSTALLATIONS IN THIS BUILDING.
- UNLESS OTHERWISE SPECIFIED ALL EQUIPMENT IS TO BE INSTALLED IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS & INSTRUCTIONS. & REQUIREMENTS OF GOVERNING CODES, STANDARDS, & REGULATIONS. GOVERNING CODES, STANDARDS, & REGULATIONS TAKE PRECEDENCE OVER MANUFACTURER'S INSTRUCTIONS.
- ENSURE THAT PROPER ACCESS & SERVICE CLEARANCES ARE MAINTAINED AROUND EQUIPMENT, & WHERE APPLICABLE, ACCESS SPACE FOR FUTURE EQUIPMENT REMOVAL OR REPLACEMENT IS NOT IMPEDED. REMOVE & REPLACE ANY EQUIPMENT WHICH DOES NOT MEET THIS REQUIREMENT.
- THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ALL WORK COMPLETED CONTRARY TO THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE CAUSED TO THE OWNER OR ANY OF THE OTHER TRADES BY IMPROPER LOCATION OR CARRYING OUT OF HIS WORK.
- PROVIDE A CERTIFICATE OF GUARANTEE OF WORKMANSHIP & MATERIAL FOR ONE YEAR FROM DATE OF ACCEPTANCE.

# 26 05 00 - 6.0 COORDINATION OF THE WORK

- REVIEW ALL THE CONTRACT DOCUMENTS & COORDINATE THE WORK WITH THE WORK OF ALL OTHER TRADES.
- PROPERLY PLAN, COORDINATE, & ESTABLISH THE LOCATIONS & ROUTING OF SERVICES WITH ALL SUBCONTRACTORS AFFECTED PRIOR TO INSTALLATION SUCH THAT THE SERVICES WILL CLEAR EACH OTHER AS WELL AS ANY OBSTRUCTIONS, INCLUDING STRUCTURAL COMPONENTS OF THE BUILDING.
- COORDINATE THE LOCATIONS OF THE ELECTRICAL DEVICES WITH THE MILLWORK DRAWINGS. THE CONTRACTOR SHALL REVIEW THE ARCHITECTURAL DRAWINGS & SECTIONS FOR LOCATIONS OF MILLWORK PRIOR TO ROUGH-IN. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ ENGINEER OF ANY DISCREPANCIES. CONFIRM FINAL LOCATION OF ALL DEVICES WITH THE ARCHITECT & OWNER IN WRITING.
- COORDINATE SIZE OF BREAKERS & FEEDERS WITH ALL MECHANICAL EQUIPMENT, FEEDERS ON DRAWINGS ARE BASED ON DESIGN LOADS PROVIDED IN MECHANICAL DRAWINGS. SHOP DRAWINGS PRIOR TO ROUGH-IN & PURCHASE OF MATERIAL EQUIPMENT TO POWER UP MECHANICAL UNITS. DISCREPANCIES ARE TO BE NOTED TO THE ENGINEER.

### 26 05 00 - 7.0 PENETRATIONS

- 1. ANY OR ALL CUTTING, CORING & PATCHING SHALL BE VERIFIED WITH THE OWNER PRIOR TO PERFORMING WORK. PAYMENT FOR SUCH SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ANY PENETRATION OF STRUCTURAL MEMBERS, FLOORS OR CEILINGS TO BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD.
- THIS DIVISION SHALL PREPARE SLEEVING DRAWINGS INDICATING THE SIZE & LOCATIONS OF OPENINGS REQUIRED IN CONCRETE FLOOR SLABS, ROOF SLABS/DECKS & WALLS FOR CONDUIT, BUS DUCTS & EQUIPMENT FOR REVIEW BY THE STRUCTURAL ENGINEER & ARCHITECT
- CONTRACTORS SHALL NOTIFY THE OWNER OR GENERAL CONTRACTOR (& OTHER CONTRACTORS WHO ARE INVOLVED) OF ALL OPENINGS, FOUNDATION WORK, HANGERS, INSERTS, ANCHORS, OR OTHER PROVISIONS NECESSARY IN THEIR WORK FOR THE INSTALLATION OF HIS WORK. & SHALL FURNISH ALL INFORMATION & NECESSARY MATERIALS IN AMPLE TIME SO THAT PROPER PROVISIONS CAN BE MADE FOR SAME, & SHALL SUPPLY & CORRECTLY, ACCURATELY PLACE ALL INSERTS, SLEEVES. ANCHORS, ETC.
- 4. FAILURE TO COMPLY WITH THESE REQUIREMENTS ON THE PART OF THIS CONTRACTOR WILL RENDER HIM RESPONSIBLE FOR THE COST OF CUTTING OPENINGS. INSTALLING HANGERS & OTHER PROVISIONS AT A LATER DATE, & THE SUBSEQUENT PATCHING. ETC., THEREBY REQUIRED.
- NO CUTTING SHALL BE DONE WITHOUT PERMISSION. ALL SUCH WORK SHALL BE DONE BY TRADESMEN SKILLED IN & CERTIFIED FOR THIS PARTICULAR TRADE.
- ALL PENETRATIONS TO BE APPROVED BY THE ARCHITECT OR LANDLORD IN WRITING.
- ANY EXTERIOR PENETRATION TO BE APPROPRIATELY FLASHED & WEATHER PROOFED WITH APPROVED SEALING METHODS.

### 26 05 00 - 8.0 ACCESS DOORS

- SUPPLY ACCESS DOORS TO GIVE ACCESS TO ALL ELECTRICAL WORK WHICH MAY NEED MAINTENANCE OR REPAIR BUT WHICH IS CONCEALED IN INACCESSIBLE CONSTRUCTION, EXCEPT AS OTHERWISE SPECIFIED HEREIN OR ON THE DRAWINGS.
- ACCESS DOORS IN FIRE RATED CONSTRUCTION ARE TO BE ULC LISTED & LABELED AND OF A RATING TO MAINTAIN THE FIRE SEPARATION INTEGRITY.

## <u>26 05 00 - 9.0 FIRE STOPPING</u>

WHERE ELECTRICAL WORK PENETRATES FIRE RATED CONSTRUCTION, PROVIDE ULC LISTED & LABELED FIRESTOPPING & SMOKE SEAL MATERIALS INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF CAN4-S115 (RATINGS F, FT, FH, AND FTH AS REQUIRED), CAN/ULC-S101, & ALL OTHER GOVERNING AUTHORITIES TO SEAL THE PENETRATIONS.

## <u>26 05 00 - 10.0 MOUNTING HEIGHTS</u>

- MOUNTING HEIGHT OF EQUIPMENT IS FROM FINISHED FLOOR TO CENTERLINE OF EQUIPMENT UNLESS SPECIFIED OR INDICATED OTHERWISE.
- 2. IF MOUNTING HEIGHT OF EQUIPMENT IS NOT SPECIFIED OR INDICATED, VERIFY BEFORE PROCEEDING WITH INSTALLATION.
- 3. FOR BARRIER-FREE MOUNTING HEIGHTS FOR DEVICES, CONFORM TO REQUIREMENTS OF THE GOVERNING CODE OR REGULATION.
- 4. INSTALL ELECTRICAL EQUIPMENT AT FOLLOWING HEIGHTS UNLESS INDICATED OTHERWISE.
- LOCAL SWITCHES: 1200 MM (48 IN.).
- WALL RECEPTACLES GENERAL: 450 MM (18 IN.). WALL RECEPTACLES - ABOVE TOP OF CONTINUOUS BASEBOARD HEATER: 200 MM (8 IN.).
- WALL RECEPTACLES ABOVE TOP OF COUNTERS OR COUNTER SPLASH BACKS: 175 MM (7 IN.).
- WALL RECEPTACLES IN MECHANICAL ROOMS: 1200 MM (48 IN.) PANELBOARDS: 2000 MM (80 IN.) TO TOP OF PANEL.
- TELEPHONE AND INTERPHONE OUTLETS: 450 MM (18 IN.). WALL MOUNTED TELEPHONE AND INTERPHONE OUTLETS: 1200 MM
- FIRE ALARM STATIONS: 1150 MM TO CENTRE.
- WALL MOUNTED FIRE ALARM HORNS: 2300 MM (90 IN.).
- WALL MOUNTED SPEAKERS: 2100 MM (83 IN.). CLOCKS: 2100 MM (83 IN.).
- BARRIER FREE PUSHBUTTONS: 1100 MM (43 IN.). WALL MOUNTED EXIT SIGNS - FOR 2400 MM (95 IN.) TO 2500 MM (100
- IN.) CEILING AREAS: 2100 MM (83 IN.). WALL MOUNTED EXIT SIGNS - FOR ALL CEILINGS GREATER THAN
- 2500 MM (100 IN.) CEILING AREAS: 2400 MM (95 IN.). WALL MOUNTED BATTERY PACKS & EMERGENCY HEADS - FOR 2400 MM (95 IN.) TO 2500 MM (100 IN.) CEILING AREAS: 2100 MM (83 IN.). WALL MOUNTED BATTERY PACKS & EMERGENCY HEADS - FOR ALL
- CEILINGS GREATER THAN 2500 MM (100 IN.) CEILING AREAS: 2400 MM (95 IN )
- WALL MOUNTED OCCUPANCY SENSORS: 1200 MM (48 IN.). WALL MOUNTED VISIBLE SIGNAL DEVICES: ENTIRE LENS SHALL BE
- NO LESS THAN 2000 MM (79 IN.) & NO MORE THAN 2400 MM (95 IN.) TOP OF REMOTE ANNUNCIATOR & PASSIVE GRAPHIC PANELS SHALL BE NO MORE THAN 1800MM (72 IN.) ABOVE FINISHED FLOOR.

# <u>26 05 00 - 10.0 CONSTRUCTION SCHEDULE</u>

- 1. OWNER (OR OWNER'S REPRESENTATIVE) TO PROVIDE THE ENGINEER WITH ACCURATE CONSTRUCTION SCHEDULE AT THE OUTSET OF CONSTRUCTION & INCLUDE UPDATES AS APPLICABLE.
- THIS CONTRACTOR SHALL SCHEDULE & PERFORM HIS WORK TO MEET THE COMPLETION SCHEDULE, NOTED ABOVE, AS SET OUT BY

# 26 05 00 - 11.0 CHANGES OR REVISIONS & EXTRAS

- NO ADDITIONAL MONEY OVER THE CONTRACT PRICE SHALL BE PAID UNLESS AN APPROVED CHANGE ORDER IS ISSUED BY THE ENGINEER.
- CLAIMS FOR EXTRAS SHALL BE SUBMITTED WITH A COMPLETE BREAKDOWN OF MATERIAL, LABOUR, HOURLY RATES, ETC.
- 3. THERE SHALL BE NO EXTRA CLAIM FOR RELOCATION OF ANY EQUIPMENT WITHIN 10 FEET FROM ORIGINAL LOCATION.
- WHENEVER THE CONSULTANT PROPOSES IN WRITING TO MAKE A CHANGE OR REVISION TO THE DESIGN, ARRANGEMENT, QUANTITY OR TYPE OF ANY WORK FROM THAT REQUIRED BY THE CONTRACT DOCUMENTS, PREPARE AND SUBMIT TO THE CONSULTANT FOR APPROVAL, A QUOTATION BEING THE ELECTRICAL CONTRACTOR'S PROPOSED COST FOR EXECUTING THE CHANGE OR REVISION.

# <u>26 05 00 - 12.0 SHOP DRAWINGS:</u>

- BASED ON CONTRACT WITH OWNER. THE ENGINEER WILL REVIEW SHOP SUBMISSION DWGS FROM THE CONTRACTOR TO REVIEW THE ITEMS FOR GENERAL CONFORMITY TO THE DESIGN DWGS.
- CONTRACTOR SHALL CONFIRM THE FEEDER SIZES & BREAKERS ON 2. THESE SHOP DRAWINGS SHALL INCLUDING BUT NOT LIMITED TO DISTRIBUTION, LUMINAIRES, EXIT SIGNS, OCCUPANCY SENSORS, BATTERY PACKS, FIRE ALARM EQUIPMENT, TELECOMMUNICATIONS EQUIPMENT & CABLING. ALLOW MINIMUM 5 BUSINESS DAYS TO RETURN REVIEWED SHOP DRAWINGS. (BASED ON COMPLEXITY)

- 3. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS. THE ENGINEER'S REVIEW OF SHOP DRAWINGS SHALL BE FOR GENERAL DESIGN ONLY & SHALL NOT RELIEVE THE ELECTRICAL CONTRACTOR OR SUPPLIER FROM THEIR RESPONSIBILITY FOR ERRORS, PROPER FITTING, & CONSTRUCTION OF THE WORK & FURNISHING OF MATERIALS. THE REVIEW SHALL NOT BE CONSTRUED AS APPROVING DEPARTURES FROM THE CONTRACT DOCUMENT REQUIREMENTS IF SUCH DEPARTURES ARE NOT SPECIFICALLY NOTED IN A COVERING LETTER ACCOMPANYING SUCH DRAWINGS.
- 4. ALTHOUGH EVERY EFFORT HAS BEEN MADE TO QUANTIFY THE NUMBER OF ELEMENTS & FIXTURES REQUIRED FOR THE COMPLETE INSTALLATION, THE SHOP DRAWING REVIEW DOES NOT CONSTITUTE ANY QUALIFICATION OF QTY'S REQUIRED.

## <u>26 05 00 - 13.0 SUBSTITUTIONS</u>

1. FIXTURE / EQUIPMENT SUBSTITUTIONS, IF INITIATED BY THE CONTRACTOR, SHALL BE MADE SO AS TO ENSURE OPERATING PERFORMANCE IS NOT REDUCED. RE-REVIEW OF SPECIFICATIONS FOR SUBSTITUTED EQUIPMENT MAY RESULT IN ADDITIONAL CHARGES BY THIS CONSULTANT. ALL CORRESPONDENCE FOR CLARIFICATION OF DESIGN FEATURES, SPECIFICATIONS, & EQUIPMENT SUBSTITUTIONS SHALL BE MADE IN WRITING INCLUDING APPROVED SHOP DRAWINGS OF NEW PRODUCTS. ALLOW FOR A 1 WEEK RESPONSE TIME FROM CONSULTANT. ANY ADDITIONAL COSTS RELATED TO EQUIPMENT SUBSTITUTIONS TO BE ABSORBED BY THE CONTRACT.

## 26 05 00 - 14.0 ELECTRICAL WORK TESTING REQUIREMENTS

- 1. SATISFACTORILY PERFORM ALL TESTING REQUIRED BY GOVERNING AUTHORITIES, CODES, REGULATION BEFORE ENERGIZING ANY PORTION OF THE ELECTRICAL SYSTEM. RESULTS OF SUCH TESTS SHALL CONFORM TO THE REQUIREMENTS OF THE CANADIAN ELECTRICAL CODE & SHALL BE TO THE SATISFACTION OF THE AUTHORIZED INSPECTION AGENCY & THE ENGINEER.
- 2. ANY TEST RESULTS THAT DO NOT MEET THE MINIMUM REQUIREMENTS OF THE MANUFACTURER. CANADIAN ELECTRICAL CODE. AUTHORIZED INSPECTION AGENCY & THE ENGINEER SHALL BE REPAIRED IN A METHOD APPROVED BY THE ENGINEER & RETESTED AT THE EXPENSE OF THE CONTRACTOR.
- 3. SUBMIT ALL TEST RESULTS TO THE ENGINEER FOR APPROVAL

26 05 00 - 15.0 EQUIPMENT AND SYSTEM COMMISSIONING

1. AFTER SUCCESSFUL START-UP & PRIOR TO SUBSTANTIAL PERFORMANCE, COMMISSION THE ELECTRICAL WORK USING APPROVED COMMISSIONING SHEETS. SUBMIT FINAL COMMISSIONING DATA SHEETS. INCLUDE FOR EQUIPMENT MANUFACTURER'S REPRESENTATION AT THE SITE TO ASSIST IN THE COMMISSIONING PROCESS

## <u>26 05 00 - 16.0 INTERRUPTION OF SERVICES</u>

1. ANY INTERRUPTION OF THE ELECTRICAL SERVICES TO ANY PART OF THE BUILDING SHALL ONLY OCCUR AS AUTHORIZED BY THE OWNER & WITH NOTIFICATION TO ANY MONITORING ORGANIZATIONS OR PARTIES. MAKE ALL NECESSARY ARRANGEMENTS WITH THOSE CONCERNED & INCLUDE FOR ANY OVERTIME REQUIRED TO ENSURE THAT THE INTERRUPTION IS HELD TO A MINIMUM.

## **26 05 00 - 17.0 CLEANING AND WASTE REMOVAL**

- . CLEAN ALL ELECTRICAL EQUIPMENT THAT HAS BEEN EXPOSED TO CONSTRUCTION DUST & DIRT, INSIDE & OUT, PRIOR TO TURN OVER TO OWNER. EQUIPMENT IS SUBJECT TO REVIEW BY ENGINEER'S REPRESENTATIVE &/OR OWNER.
- 2. CONTRACTOR IS RESPONSIBLE FOR REMOVING THEIR OWN WASTE FROM THE SITE. ALL RE-USABLE MATERIALS SHALL BE RECYCLED.

1. DEMONSTRATE THE FUNCTION AND OPERATION OF EACH SYSTEM

- 26 05 00 18.0 DEMONSTRATION OF THE SYSTEM
- TO THE OWNER.

# 26 05 00 - 19.0 PROJECT CLOSEOUT SUBMITTALS

- PRIOR TO APPLICATION FOR SUBSTANTIAL PERFORMANCE, SUBMIT ALL REQUIRED ITEMS AND DOCUMENTATION SPECIFIED, INCLUDING THE
- 1. ALL EQUIPMENT MANUALS & SPECIFICATION SHEETS REQUIRED FOR PROPER MAINTAINING & SERVICING OF THE EQUIPMENT
- 2. RECORD "AS-BUILT" DRAWINGS: AS-BUILT DRAWINGS SHALL BE CLEARLY MARKED IN RED INCLUDING ALL CHANGES TO THE ORIGINAL TENDER DRAWINGS COVERED BY ADDENDA, CHANGE ORDERS, FIELD CHANGES, JOB CONDITIONS, ETC.
- 3. ESA (ELECTRICAL SAFETY AUTHORITY) INSPECTION CERTIFICATE.
- 4. EMERGENCY & DETECTION TEST CERTIFICATE FROM THE DIV. 26 CONTRACTOR AS APPLICABLE. (REFER TO SPECIFIC REQUIREMENTS ON DWG.)
- A WRITTEN WARRANTY TO BE PROVIDED FOR A MIN. OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER. PROVIDE LABOUR, MATERIAL & SERVICES TO CORRECT ALL FAULTS REPORTED DURING THE GUARANTEE PERIOD.

# 26 05 19 ELECTRICAL POWER CONDUCTORS & CABLES (0 - 600V)

# 26 05 19 - 1.0 DISTRIBUTION & BRANCH CIRCUIT CONDUCTORS

- CONDUCTORS TO BE SIZED IN ACCORDANCE WITH THE CANADIAN ELECTRICAL CODE. CONDUCTOR SIZES INDICATED ON THE DRAWINGS ARE MINIMUM SIZES & MUST BE INCREASED, WHERE REQUIRED, TO SUIT LENGTH OF RUN AND VOLTAGE DROP IN ACCORDANCE WITH THE VOLTAGE DROP SCHEDULE.
- NO WIRE SMALLER THAN NO. 12 AWG GAUGE SHALL BE USED FOR BRANCH CIRCUIT WIRING. ALL LINE VOLTAGE WIRING TO BE INSTALLED IN EMT CONDUIT.
- ALUMINUM CONDUCTORS WILL NOT BE ACCEPTED WITH THE EXCEPTION OF MAIN SERVICE ENTRANCE CONDUCTORS. CONSULT ENGINEER FOR ADDITIONAL INFORMATION.
- 4. CONDUCTORS TO & INCLUDING NO. 10 AWG ARE TO BE SOLID. CONDUCTORS LARGER THAN NO. 10 AWG ARE TO BE STRANDED. ALL CONDUCTORS ARE TO BE CONSTRUCTED FROM 98% CONDUCTIVE COPPER & ARE TO BE APPROVED FOR 600 VOLTS. CONDUCTORS ARE TO BE COLOUR CODED, FACTORY IDENTIFIED ON THE INSULATION WITH THE MANUFACTURER'S NAME, CONDUCTOR SIZE & METAL, VOLTAGE RATING, CSA TYPE & DESIGNATION. CONDUCTORS ARE TO BE AS FOLLOWS UNLESS INDICATED OTHERWISE ON DRAWINGS:
- RW-90, RW-U90 (XLPE) IN ACCORDANCE WITH CAN/CSA C22.2 NO.38 TW75, TWU IN ACCORDANCE WITH CSA C22.2 NO. 75,
- CSA C22.2 NO. 124, RHW CABLE IN ACCORDANCE WITH REQUIREMENTS OF CSA C22.2 NO. 38. CI CABLE IN ACCORDANCE WITH REQUIREMENTS OF CSA C22.2 NO.

MI ULC 2 HOUR FIRE RATED CONDUCTOR IN ACCORDANCE WITH

### BX (ARMOURED CABLE) IS ONLY PERMITTED FOR LIGHT FIXTURE DROPS IN ACOUSTIC CEILINGS (MAX. LENGTH 5') & MAY BE USED IN HOLLOW PARTITIONS FOR SWITCH OR SUSPENDED CEILING FOR FIXTURE DROPS ONLY. ANY DROPS SHALL NOT EXCEED 10' (3M). AC-90 (BX ARMOURED CABLE) IS NOT TO BE INSTALLED IN OPEN CEILINGS OR ANY OTHER EXPOSED APPLICATION. ALL CABLES ARE TO BE PROPERLY FASTENED TO BUILDING STRUCTURE IN A NEAT & PROFESSIONAL MANNER. EXCESSIVE USE OF BX CABLE IS NOT PERMITTED & RESULT THE ELECTRICAL CONTRACTOR TO REPLACE ALL NEW WIRING WITH PROPER WIRING & CONDUIT AT CONTRACTORS EXPENSE.

## <u>26 05 19 - 2.0 LOW VOLTAGE (50 VOLT & UNDER) CONDUCTORS</u>

- 1. GENERAL PURPOSE LOW VOLTAGE WIRING IN CONDUIT: "T-90" OR "RW90" STRANDED COPPER CONDUCTORS AS SPECIFIED ABOVE.
- 2. LOW VOLTAGE WIRING IN CONDUIT FOR FIRE ALARM SYSTEMS: EQUAL TO NEXANS CANADA "SECUREX II" FAS/LVT/FT1300 VOLT WIRE TO CSA C22.2 NO. 208, FIRE /ALARM AND SIGNAL WIRE, 105°C (220°F) RATED, CONSISTING OF SOLID COPPER CONDUCTORS (STRANDED FOR CONTROL WIRING), FLAME RETARDANT PVC INSULATION, AN ALUMINUM/MYLAR OPTIONAL SHIELD WITH A #22 AWG TINNED COPPER INSULATION AND A DRAIN WIRE, AND, IF REQUIRED FOR THE APPLICATION, INTERLOCKING ALUMINUM ARMOUR WITH OR WITHOUT AN OVERALL JACKET.

### 26 05 19 - 3.0 CONDUCTOR COLOUR CODING:

- UNLESS OTHERWISE SPECIFIED, COLOUR CODE CONDUCTORS TO IDENTIFY PHASES, NEUTRAL, & GROUND BY MEANS OF SELF-LAMINATING COLOURED VINYL TAPE, COLOURED CONDUCTOR INSULATION, OR PROPERLY COLOURED PLASTIC DISCS. COLOURS ARE TO BE AS FOLLOWS:
- PHASE A RED PHASE B – BLACK
- PHASE C BLUE
- NEUTRAL WHITE CONTROL – ORANGE

## 26 05 19 - 4.0 INSTALLATION OF CONDUCTOR

- 1. ALL EQUIPMENT, JUNCTION BOXES, PULL BOXES, LIQUID TIGHT FLEX, ETC. TO BE BONDED TO GROUND THROUGH INSULATED GREEN BONDING WIRES TO THE REQUIREMENT OF THE ELECTRICAL SAFETY CODE AND INSPECTION AUTHORITIES.
- 2. PROVIDE PULL BOXES FOR CONDUIT RUNS GREATER THAN 35
- 3. ALL EMT CONDUIT TO BE CONCEALED UNLESS APPROVED BY THE OWNER. WHERE EMT RUNS HORIZONTALLY ACROSS WALL STUDS NOTCHES SHOULD BE CUT TO RECESS CONDUIT. NOTCHES TO BE PROTECTED BY STEEL PLATES.
- 4. NON-FIRE RATED CONDUCTORS: UNLESS OTHERWISE SPECIFIED HEREIN OR ON THE DRAWINGS, NON-FIRED RATED CONDUCTORS ARE TO BE USED AS FOLLOWS:
- CONDUCTORS UNDERGROUND INSIDE OR OUTSIDE THE BUILDING, AND IN NON-CLIMATE CONTROLLED AREAS – TWU
- UNLESS OTHERWISE SPECIFIED, CONDUCTORS IN ACCESSIBLE CEILING SPACES, WITHIN STUD WALL CONSTRUCTION, AND IN FURNITURE SYSTEMS TO LUMINARIES AND WIRING DEVICES – AC90 (BX) FLEXIBLE ARMOURED CABLE, MAXIMUM 6 M (20') RUN PERMITTED FOR ISOLATED POWER SYSTEM WIRING - RW90
- FOR CONDUCTORS EXCEPT AS SPECIFIED ABOVE OR ELSEWHERE IN THE SPECIFICATION OR ON THE DRAWINGS – T90 NYLON OR
- FIRE RATED CONDUCTORS: UNLESS OTHERWISE SPECIFIED HEREIN OR ON THE DRAWINGS, FIRE RATED CONDUCTORS ARE TO BE ULC 2 HOUR RATED BARE MI CABLE, OR "RHW" OR "CI" CONDUCTORS IN STEEL CONDUIT.

# <u>26 05 19 - 5.0 VOLTAGE DROP</u>

- VOLTAGE DROP FOR WIRING SHALL MEET REQUIREMENTS AS LAID OUT IN THE CANADIAN ELECTRICAL CODE. GENERALLY MAXIMUM BRANCH CIRCUIT CONDUCTOR DISTANCES (120VAC) TO MAINTAIN MAX. 3% VOLTAGE DROP ARE AS FOLLOWS:
- 15A-1P BREAKER #12AWG WIRING 80 FEET (24 METRES)
- 15A-1P BREAKER #10AWG WIRING 125 FEET (39 METRES) 20A-1P BREAKER - #12AWG WIRING - 60 FEET (18 METRES) 20A-1P BREAKER - #10AWG WIRING - 95 FEET (29 METRES)

# 26 05 26 GROUNDING & BONDING

- 1. GROUNDING & BONDING WORK IS TO BE IN ACCORDANCE WITH REQUIREMENTS OF THE FOLLOWING:
- CSA C22.2 NO. 41, GROUNDING AND BONDING EQUIPMENT (TRI-NATIONAL STANDARD WITH UL 467)
- CSA C22.2 NO. 0.4, GROUNDING AND BONDING OF ELECTRICAL REQUIREMENTS OF THE ELECTRICAL SAFETY AUTHORITY AND ANY OTHER GOVERNING AUTHORITY
- CAN/CSA Z32, ELECTRICAL SAFETY AND ESSENTIAL ELECTRICAL SYSTEMS IN HEALTH CARE FACILITIES . PROVIDE GROUNDING ELECTRODES, CONDUCTORS, CONNECTIONS

& EQUIPMENT TO ENSURE A SOLIDLY GROUNDED ELECTRICAL

- 2. SEPARATE GROUND & BONDING CONDUCTORS SHALL BE PROVIDED IN EACH CONDUIT. ALL EXPOSED METAL PARTS & NON CURRENT CARRYING EQUIPMENT, BASES, ETC. SHALL BE
- 3. MAKE GROUNDING CONNECTIONS SO AS TO TERMINATE AT SINGLE GROUNDING POINT.
- 4. INSTALL SEPARATE GROUND CONDUCTOR TO OUTDOOR LIGHTING

MECHANICAL EQUIPMENT SHALL BE BONDED TO THE EQUIPMENT

GROUNDING SYSTEM, THIS INCLUDES BUT NOT LIMITED TO FANS, PUMPS, CHILLERS, ETC. 6. RECEPTACLES SHALL BE GROUNDED TO OUTLET BOX BY MEANS OF A BONDING JUMPER. AND SHALL PROVIDE GROUNDING CLIP ON

EACH TOGGLE SWITCH, SUCH THAT CONTACT IS MADE BETWEEN

# 26 05 29 HANGERS & SUPPORTS

SUPPORT EQUIPMENT, CONDUIT OR CABLES USING CLIPS, SPRING-LOADED BOLTS, CABLE CLAMPS DESIGNED AS ACCESSORIES TO BASIC CHANNEL MEMBERS.

MOUNTING STRAP, SCREW, FACEPLATE AND OUTLET BOX.

2. INSTALL FASTENINGS & SUPPORTS AS REQUIRED FOR EACH TYPE OF EQUIPMENT CABLES & CONDUIT & IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION.

## 26 05 33 RACEWAY AND BOXES

## 26 05 33.13 CONDUIT

- 1. RIGID GALVANIZED STEEL TO CSA C22.2 NO. 45, SIZE AS INDICATED.
- 2. ELECTRICAL METALLIC TUBING (EMT) WITH COUPLINGS & EXPANDED ENDS AS REQUIRED TO CSA C22.2 NO. 83. SIZE AS INDICATED.
- 3. RIGID PVC CONDUIT FOR EXPOSED, ABOVE GROUND WORK TO CSA C22.2 NO. 211.1, SIZE AS INDICATED. FLEXIBLE PVC IS NOT
- 4. FLEXIBLE GALVANIZED STEEL LIQUID-TIGHT CONDUIT TO CSA C22.2
- EMT CONDUIT FITTINGS. CONNECTORS. COUPLINGS TO CSA C22.2. NO. 18. ZINC-PLATED STEEL/ MALLEABLE IRON CONSTRUCTION. ALL CONNECTIONS & COUPLINGS TO BE SET SCREW TYPE, IE. CONCRETE TIGHT.
- 6. CONDUIT FITTINGS: UNLESS OTHERWISE SPECIFIED, CONDUIT FITTINGS ARE TO BE OF THE SAME MATERIAL AS THE CONDUIT & SUITABLE IN ALL RESPECTS FOR THE APPLICATION. PROVIDE PROPER ADAPTORS FOR JOINING CONDUIT OF DIFFERENT
- 7. CONDUIT IS SIZED ON THE DRAWINGS. CONDUIT NOT SIZED ON THE DRAWINGS IS TO BE SIZED IN ACCORDANCE WITH THE GOVERNING CODES/REGULATIONS. THE SIZES OF BRANCH CIRCUIT CONDUCTORS SHOWN/SPECIFIED ARE MINIMUM SIZES & MUST BE INCREASED TO SUIT LENGTH OF RUN & VOLTAGE DROP, & WHERE THIS OCCURS, INCREASE THE CONDUIT SIZE TO SUIT, CONDUIT SIZES SHALL BE MINIMUM OF 3/4"Ø & CONFORM TO ELECTRICAL SAFETY CODE. WHERE SIZES ARE INDICATED & THEY EXCEED CODE, THEY SHALL NOT BE REDUCED.
- 8. USE RIGID, GALVANIZED STEEL, THREADED CONDUIT WHERE CONDUIT IS SUBJECT TO MECHANICAL INJURY.
- 9. RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES.
- 10. DO NOT LOCATE CONDUITS LESS THAN 3" (75 MM) PARALLEL TO STEAM OR HOT WATER LINES.
- 11. IN-SLAB CONDUIT: LOCATE TO SUIT REINFORCING STEEL
- 12. ENSURE THAT ALL CONDUIT LEFT EMPTY FOR FUTURE WIRING IS CLEAN, CAPPED. AND PROPERLY IDENTIFIED. PROVIDE END BUSHINGS AND FISH CORD IN ALL SUCH CONDUIT.

# **26 05 33.16 JUNCTION & PULL BOXES**

- UNLESS OTHERWISE SPECIFIED, EACH BOX IS TO BE CSA
- 2. WELDED STEEL CONSTRUCTION WIRE SCREW-ON FLAT COVERS FOR SURFACE MOUNTING.
- 3. COVER WITH 1" (25 MM) MINIMUM EXTENSION ALL AROUND, FOR FLUSH-MOUNTED PULL & JUNCTION BOXES.
- 4. INSTALL PULL BOXES IN CONDUIT RUNS SO AS NOT TO EXCEED 30 M OF CONDUIT RUN OR EQUIVALENT OF TWO (2) 90° BENDS BETWEEN PULL BOXES.

## 26 05 33.16 OUTLET BOXES

- 1. UNLESS OTHERWISE SPECIFIED, EACH BOX IS TO BE CSA. CERTIFIED. SUITABLE IN ALL RESPECTS FOR THE APPLICATION SINGLE OR MULTI-GANG AS REQUIRED, & COMPLETE WITH SUITABLE SECURING LUGS. CONNECTORS SUITABLE FOR THE CONNECTED CONDUIT, KNOCKOUTS, &, WHERE NECESSARY, SUITABLE PLASTER RINGS. CONCRETE RINGS, COVERS AND ANY OTHER REQUIRED
- 2. ALL LIGHTING FIXTURES, RECEPTACLES & OTHER WIRING DEVICES FOR ANY CONDUIT SYSTEM SHOWN SHALL BE PROVIDED WITH AN OUTLET BOX.
- 3. 4" (100 MM) OCTAGON OR SQUARE OUTLET BOXES OR LARGER, C/W FITTINGS FOR LIGHTING FIXTURES & AS REQUIRED FOR SPECIAL
- 4. WALL OUTLET BOXES SHALL BE: NO. 1104 SERIES, FLUSH MOUNTED IN DRYWALL PARTITIONS
- MBS SERIES MASONRY BOXES (GALVANIZED STEEL) FLUSH MOUNTED IN MASONRY WALLS (BLOCK WALLS).

# BLANK COVER PLATES FOR BOXES WITHOUT WIRING DEVICES.

**26 05 36 CABLE TRAYS** 1. CABLE TRAYS SHALL BE IN ACCORDANCE WITH CSA-C22.1 CANADIAN ELECTRICAL CODE & ANSI/NFPA 70 – NATIONAL

GANG BOXES SHALL BE USED AT LOCATIONS WHERE DEVICES ARE

# ELECTRICAL CODE REQUIREMENTS.

GROUPED. PROVIDE BARRIERS AS REQUIRED.

- 26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS IDENTIFY ALL EQUIPMENT WITH ENGRAVED LAMACOID
- NAMEPLATES. 2. ALL PANELS WITH CIRCUITS ADDED OR REMOVED SHALL HAVE NEW COMPUTER GENERATED PANEL SCHEDULES PLACE IN THEM. SCHEDULE SHALL INDICATE PANEL DESIGNATION, WHERE PANEL IS FED FROM, VOLTAGE, PHASE, BRANCH CIRCUIT NUMBERS,

## BREAKER AMPERAGE & CIRCUIT DESCRIPTION. 26 21 16 UNDERGROUND SERVICE ENTRANCE

- 1. DUCT SEALING COMPOUND: NON-THERMOPLASTIC SEALING COMPOUND WHICH ALLOWS FOR EXPANSION AND CONTRACTION OF DUCTS WITHOUT LOSS OF SEALING PROPERTIES.
- 2. PROVIDE CABLE IN UNDERGROUND DUCTS AS INDICATED. DO NOT PULL SPLICED CABLES INTO DUCTS.
- 3. PRIOR TO PULLING CABLE, CLEAN DUCTS BY PULLING A STIFF BRISTLE BRUSH THROUGH EACH DUCT. 4. USE APPROVED CABLE PULLING LUBRICANT AND PULLING
- HARDWARE. 5. INSTALL MULTIPLE CABLE IN DUCTS SIMULTANEOUSLY.

WITH MOISTURE SEAL TAPE.

- 6. TO FACILITATE MATCHING OF COLOUR CODED MULTI-CONDUCTOR CONTROL CABLE, REEL OFF IN THE SAME DIRECTION DURING INSTALLATION.
- 8. WHEN INSTALLATION OF THE CABLES IS COMPLETE, SEAL THE ENDS OF THE DUCT WITH DUCT SEALING COMPOUND.

7. BEFORE PULLING LEAD COVERED CABLE INTO DUCTS & UNTIL

THE CABLES ARE PROPERLY TERMINATED, SEAL ENDS WITH

WIPING SOLDER. SEAL THE ENDS OF NON-LEAD COVERED CABLE

## (16421) PROJE

Elec. - Specification

Elec. - Specification

E-4 Elec. Site Lighting

E-5 Photometric Site Plan

E-7 Elec. Lighting - Base Bldg.

Electrical Site Power

E-6 Elec. Power/Comm. - Base Bldg.

Sheet #

M-1

M-2

M-3

M-4

P-1

P-2

E-1

E-3

PROJECT DRAWING REGISTER	
Sheet Name	NODT
Mechanical - Specification	INCh I
Mechanical - Specification	ENGINEERING &
Mechanical Site Plan	
HVAC - Base Bldg.	92 Caplan Ave
Plumbing - Specification	Barrie, Ontari
Plumbing - Specification	Tel. (705) 719-1003
Plumbing - Base Bldg.	dlong@nset.ca

e. Suite #517 rio L4N 9J2 Fax (705) 719-0490 dlong@nset.ca www.nset.ca

HSTAF

## **GENERAL DRAWING / DESIGNER NOTES**

- ALL CONSTRUCTION METHODS AND MATERIALS TO CONFORM TO THE LATEST EDITION OF THE PROVINCE OF ONTARIO'S "BUILDING CODE". LOCAL REGULATIONS AND AUTHORITIES HAVING
- THE CONSULTANT RESERVES THE RIGHT TO MAKE REASONABLE CHANGES IN ORDER TO ACCOMMODATE CONDITIONS ARISING DURING CONSTRUCTION FOR ADDITIONAL FEES, ADDITIONAL APPLY AND ARE TO BE NEGOTIATED BETWEEN THE OWNER ANI
- DRAWINGS ONLY SHOW GENERAL INTENT AND SCOPE OF WORK EXACT DETAILS OF INSTALLATIONS ARE TO BE PROVIDED BY CONTRACTOR(S), DO NOT SCALE DRAWINGS
- CONTRACTOR/AGENT/OWNER TO REPORT ALL DISCOVERIES OF FREORS OMISSIONS OR DISCREPANCIES TO THE DESIGNER
- PROCEED WITH CONSTRUCTION ONLY USING THE LATEST REVISED DRAWINGS MARKED "ISSUED FOR CONSTRUCTION". THIS DRAWING IS SPECIFIC TO THIS PROJECT AND CANNOT BE USED FOR OTHER "SIMILAR" PROJECTS.
- ECHNOLOGIES LTD. UN-AUTHORIZED RE-PRODUCTION OR USE ON CONTRACT WITH OWNER THE ENGINEER WILL REVIEW SHOP SUBMISSION DWGS FROM THE CONTRACTOR TO REVIEW THE ITEMS FOR GENERAL CONFORMITY TO THE DESIGN DWGS. THE SHOP DWG REVIEW WILL NOT RELEASE THE

THIS DRAWING IS THE PROPERTY OF NORTHSTAR ENGINEERING

WORKING SYSTEM. THESE SHOP DRAWINGS SHALL CONSIST OF PLUMBING FIXTURES. HVAC EQUIPMENT, HVAC DIFFUSERS. MINIMUM 1-2 WEEKS FOR COMPLETION (BASED ON COMPLEXITY) THE DESIGNER DOES NOT ACCEPT RESPONSIBILITY FOR

CONTRACTOR FROM ESPONSIBILITY TO MAKE A FEASIBLE

- RESPONSIBILITY FOR ANY FINAL ASSEMBLY(S) THAT VIOLATE APPLICABLE BUILDING CODES IS NOT ACCEPTED BY THE
- REQUESTS FOR CHANGES OR SUBSTITUTIONS TO EQUIPMENT PLANS AND / OR SPECIFICATIONS WILL BE SUBJECT TO
- ADDITIONAL FEES CHARGED BY THE CONSULTAN SITE VISITS TO REVIEW IMPLEMENTED DESIGNS WITHIN THE SCOPE OF THIS PROJECT TO BE ARRANGED WITH THE OWNER
- MINIMUM FORTY EIGHT (48) HOURS PRIOR NOTICE TO BE PROVIDED FOR SITE VISITS - ONCE ARRANGED. REQUESTS FOR THE RELEASE OF THIS DRAWING SET FROM
- NORTHSTAR ENGINEERING & TECHNOLOGIES LTD. FOR THE PURPOSE OF TENDERING PURPOSES BY ANY CONTRACTOR TO BE MADE BY THE OWNER OR ARCHITECT IN WRITING. TENDER PRICING BY CONTRACTORS OF DRAWINGS TO BE BASED
- ON DWGS MARKED "ISSUED FOR TENDER" OR "ISSUED FOR CONSTRUCTION" ONLY. ALL REQUESTS FOR DESIGN CHANGES / SUBSTITUTIONS TO BE MADE IN WRITING. ADDITIONAL FEES MAY APPLY. ALLOW

MINIMUM (1) ONE WEEK TO REVIEW AND RESPOND TO CHANGE

	DRAWING REVISIONS											
No.	Description	Date										
3	Issued for SPA comments	May 18/22										

McCowan & Associates

279 Yonge St. Barrie ON

Allandale Marketplace -

Engineer's Seal:

Burger King Dwg. Name:

Elec. - Specification

Checked by: D.B.D.

NSET Project #:

12" = 1'-0" Revision Drawing #:

Project Date: Mar. 04/21

Drawn by: Northstar Eng.

Arch-D (24" x 36"

## 26 22 00 TRANSFORMERS

- TRANSFORMERS SHALL BE COMPLETE WITH COPPER WINDINGS & MEET THE REQUIREMENTS OF CSA 802.2 - CURRENT EDITION FOR ENERGY EFFICIENCY.
- MOUNT DRY TYPE TRANSFORMER UP TO 75KVA ON WALL WITH ANGLE IRON FRAME SECURELY SUPPORTED FROM STRUCTURE & VIBRO-ACOUSTIC ISOLATORS.
- MOUNT DRY TYPE TRANSFORMER 75KVA & ABOVE ON 4" CONCRETE PAD C/W VIBRO-ACOUSTIC ISOLATORS.

### **26 24 16 PANELBOARDS**

- PANELBOARDS IN ACCORDANCE WITH REQUIREMENTS OF CAN/CSA-C22.2 NO. 29.
- PANELBOARDS TO HAVE THE FOLLOWING MINIMUM RATINGS FOR INTERRUPTING CAPACITY OR AS INDICATED ON THE DRAWINGS OR PANEL SCHEDULES.
- 120/208V PANELBOARDS 10KA 347/600V PANELBOARDS – 22KA
- MAIN BREAKER SHALL OCCUPY A SEPARATE COMPARTMENT FROM BRANCH BREAKER. PANELS WITH MAIN BREAKERS IN BRANCH BREAKER COMPARTMENT WILL NOT BE ACCEPTED.
- MAINS, NUMBER OF CIRCUITS, & NUMBER & SIZE OF BRANCH CIRCUIT BREAKERS AS INDICATED.
- 5. COPPER BUS WITH FULL SIZE COPPER MAINS & NEUTRAL.

## 26 27 26 WIRING DEVICES

- ALL WIRING DEVICES ARE TO BE CSA CERTIFIED AS A MINIMUM, IN ACCORDANCE WITH THE FOLLOWING STANDARDS, AS APPLICABLE:
- CAN/CSA C22.2 NO. 42, GENERAL USE RECEPTACLE, ATTACHMENT PLUGS & SIMILAR WIRING DEVICES CAN/CSA C22.2 NO. 42.1, COVER PLATES FOR FLUSH MOUNTED
- DEVICES CSA C22.2 NO. 111. GENERAL USE SNAP SWITCHES
- . ALL WIRING DEVICES ARE TO BE SUPPLIED BY THE SAME MANUFACTURER
- SWITCHES: SPECIFICATION GRADE, PREMIUM QUALITY, BACK AND SIDE WIRED, 20 AMPERE, 120-277 VOLT A.C. QUIET ACTION WHITE DECORATIVE ROCKER TYPE TOGGLE SWITCHES, SINGLE POLE, 2-POLE, 3-WAY, OR KEY TYPE AS INDICATED ON THE DRAWINGS.
- HAZARDOUS LOCATION SWITCH: EXPLOSION-PROOF, SURFACE MOUNTING, FRONT OPERATED SWITCHES SUITABLE FOR USE IN **CLASS 1 DIVISION 2 LOCATIONS**
- OCCUPANCY SENSOR SWITCH: DIGITAL ULTRASONIC SENSOR TYPE, 120-277 VOLT A.C. WITH INTEGRAL PHOTO SENSOR AND SELECTED TO SUIT THE AREA AND OCCUPANCY OF THE ROOM
- STANDARD RECEPTACLES: BACK OR SIDE WIRED, U-GROUND, 2 POLE RECEPTACLES AS FOLLOWS:
- 15 AMP. 125 VOLT DUPLEX RECEPTACLE: 3-WIRE, NEMA 5-15R 15 AMP. 250 VOLT DUPLEX RECEPTACLE: 3-WIRE, NEMA 6-15R
- 20 AMP, 125 VOLT DUPLEX RECEPTACLE; 3-WIRE, NEMA 5-20R
- 20 AMP. 250 VOLT DUPLEX RECEPTACLE: 3-WIRE, NEMA 6-20R 30 AMP. 250 VOLT SIMPLEX RECEPTACLE: 3-WIRE, NEMA 6-30R
- 30 AMP. 125/250 VOLT SIMPLEX RECEPTACLE: 3-WIRE, NEMA 14-30R
- 50 AMP. 250 VOLT SIMPLEX RECEPTACLE: 3-WIRE, NEMA 6-50R 50 AMP. 125/250 VOLT SIMPLEX RECEPTACLE: 4-WIRE, NEMA 14-50R
- GROUND FAULT RECEPTACLES: HEAVY-DUTY, 15/20 AMPERE, 125 VOLT. ULC CLASS A. GROUP 1. AUTOMATIC GROUND FAULT CIRCUIT INTERRUPTING DUPLEX RECEPTACLES WITH A 10 KA SHORT CIRCUIT CURRENT RATING AUTOMATIC SELF-TEST DIAGNOSTICS, GREEN POWER ON LED, AND RED GROUND FAULT LED. GROUND FAULT RECEPTACLES FOR INDOOR CLIMATE CONTROLLED & OUTDOOR OR NON-CLIMATE CONTROLLED AREAS ARE TO BE AS
- INDOOR CLIMATE CONTROLLED AREAS: EQUAL TO HUBBELL
- CANADA NO. GFST15/GFSTT20 "AUTOGUARD" OUTDOOR AREAS AND INDOOR NON-CLIMATE AREAS: EQUAL TO HUBBELL CANADA NO. GFR5262TR/GFR 4362TR "AUTOGUARD"
- TAMPER-RESISTANT DUPLEX RECEPTACLES: SPECIFICATION GRADE, BACK OR SIDE WIRED, U-GROUND, 2-POLE, 3-WIRE TAMPER-RESISTANT DUPLEX RECEPTACLES AS SPECIFIED ABOVE, 15 AMPERE OR 20 AMPERE, 125 VOLT AS INDICATED ON THE DRAWINGS, EACH WITH THERMOPLASTIC SHUTTERS TO LIMIT ACCESS TO ENERGIZED CONTACTS.

# 26 28 00 CIRCUIT BREAKERS

- BREAKERS ARE TO BE MOULDED CASE, BOLT-ON BREAKERS IN ACCORDANCE WITH CSA/C22.2 NO. 5. MOLDED-CASE CIRCUIT BREAKERS, MOLDED-CASE SWITCHES, & CIRCUIT BREAKER ENCLOSURES, CALIBRATED FOR OPERATION IN A 40°C (105°F) AMBIENT TEMPERATURE.
- BRANCH CIRCUIT BREAKER INTERRUPTING CAPACITY IS TO SUIT THE PANELBOARD VOLTAGE & BE AS SCHEDULED, OR IN ACCORDANCE WITH CODE REQUIREMENTS TO SUIT THE APPLICATION.
- FOR GROUND FAULT BREAKERS, CSA CLASS A, GROUP 1 COMBINATION THERMAL MAGNETIC TRIP BREAKERS WITH SOLID-STATE GROUND DEFAULT INTERRUPTERS.
- 4. PROVIDE SPARE BREAKERS OR SPACE FOR FUTURE BREAKERS.

# 26 51 00 INTERIOR LIGHTING

- ALL LIGHTING FIXTURES ARE TO BE ULC LISTED, CSA CERTIFIED &
- LIGHTING FIXTURES & LAMPS ARE SCHEDULED ON THE DRAWINGS. PROVIDE LIGHTING FIXTURES & LAMPS WHERE SHOWN. INCLUDE FOR ALL REQUIRED SITE ASSEMBLY, & PROVIDE ALL REQUIRED INSTALLATION & SUPPORT HARDWARE.
- THE LIGHTING EQUIPMENT FOR THIS PROJECT AND SPECIFIED HEREIN HAS BEEN CAREFULLY SELECTED FOR ITS ABILITY TO MEET THE PROJECT'S LUMINOUS ENVIRONMENT REQUIREMENTS. MANUAL & COMPUTER CALCULATIONS HAVE BEEN PERFORMED TO ENSURE THAT THE LIGHTING EQUIPMENT THAT HAS BEEN SPECIFIED COMPLIES WITH ESTABLISHED CRITERIA. THE ENGINEER RESERVES THE RIGHT NOT TO ACCEPT ANY ALTERNATES OR SUBSTITUTIONS. IF ALTERNATES OR SUBSTITUTIONS ARE ENTERTAINED. THEN IT IS THE RESPONSIBILITY OF THE CONTRACTOR/SUPPLIER TO PROVIDE ALL INFORMATION REQUIRED HEREIN & DETAILED LAYOUTS & LIGHTING CALCULATIONS DEMONSTRATING THE PERFORMANCE OF THE ALTERNATE LUMINAIRE MEETS OR EXCEEDS THE ORIGINAL LIGHTING DESIGN WHILE NOT CONSUMING ANY ADDITIONAL ENERGY. THE CONTRACTOR/ SUPPLIER IS RESPONSIBLE TO ENSURE THE LIGHT LEVELS PROVIDED IN THE ALTERNATE SUBMITTAL PACKAGE ARE ACHIEVED. IN THE CASE THAT THE LIGHTING HAS BEEN SUBSTITUTED FROM THE ENGINEERS DESIGN, THE CONTRACTOR IS TO NOTIFY THE OWNER/ OR OWNER'S REPRESENTATIVE, AS APPLICABLE / AS WELL AS THE ENGINEER IN WRITING WITH THE

REVISED DESIGN DOCUMENTS SPECIFIED ABOVE.

- 4. COORDINATE WITH THE ARCHITECTURAL DRAWINGS (REFLECTED CEILING PLANS, SECTIONS, ELEVATION, DETAILS,...) FOR ALL LIGHTING FIXTURE LOCATIONS. THE MOUNTING HEIGHTS OF THE LIGHTING FIXTURES SHALL BE CONFIRMED PRIOR TO ROUGH-IN. NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- 5. PRIOR TO ROUGH-IN FOR LIGHTING FIXTURE INSTALLATIONS, **EXAMINE DRAWINGS & SITE CONDITIONS TO DETERMINE THAT** SUITABLE SPACE IS AVAILABLE FOR THE FIXTURE INSTALLATION AS SHOWN. IF SUFFICIENT SPACE IS NOT AVAILABLE, NOTIFY THE CONSULTANT IMMEDIATELY &, IF REQUIRED, RELOCATE THE FIXTURES WITHIN REASONABLE DISTANCES WITHOUT ADDITIONAL
- 6. INSTALLATION OF ALL LIGHTING EQUIPMENT SHALL COMPLY WITH THE CURRENT EDITION OF APPLICABLE ELECTRICAL SAFETY CODE.
- 7. SUPPORT ALL LIGHTING FIXTURES IN SUSPENDED CEILINGS FROM THE SLAB OR BUILDING CONSTRUCTION ABOVE, INDEPENDENT OF THE SUSPENDED CEILING CONSTRUCTION USING #12 JACK CHAIN HANGERS. SUPPORT CONTINUOUS ROWS OF FIXTURES AT MINIMUM 1.2 M (48") CENTRES.
- 8. LEVEL & PLUMB ALL LIGHTING FIXTURES WITH THE STRUCTURE & OTHER EQUIPMENT, & IN A HORIZONTAL OR VERTICAL POSITION AS INTENDED.
- RIGIDLY INSTALLED & ADJUSTED TO GIVE A NEAT FLUSH FIT TO THE SURFACE ON WHICH IT IS MOUNTED. WHERE LIGHTING FIXTURES PENETRATE A FIRE RATED CEILING THEY ARE TO BE ENCLOSED IN AN ENCLOSURE WITH A RATING TO MATCH THAT OF THE CEILING. THE ENCLOSURE IS TO BE CONSTRUCTED BY THE TRADE CONSTRUCTING THE CEILING ENSURE THAT CONDUCTORS CONNECTING THE FIXTURES ARE FIRE RATED TYPE AND THAT CEILING PENETRATIONS FOR CONDUCTORS ARE PROPERLY SEALED WITH FIRE STOPPING AND SMOKE SEAL MATERIAL. FIXTURES INSTALLED IN THE FIRE RATED ENCLOSURES ARE TO BE EQUIPPED WITH THERMAL OVERLOAD PROTECTION.
- 10. AT THE COMPLETION OF CONSTRUCTION & ACCEPTANCE OF WORK, ALL LIGHTING FIXTURES SHALL BE CLEAN, COMPLETE WITH ALL NECESSARY ACCESSORIES & PROVIDED WITH THE REQUIRED OPERATING LAMP(S).

## 26 52 13.13 EMERGENCY LIGHTING

- 1. ALL EMERGENCY LIGHTING IS TO BE CSA CERTIFIED IN ACCORDANCE WITH:
- CSA C22.2 NO. 141, UNIT EQUIPMENT FOR EMERGENCY LIGHTING UL 924, STANDARD FOR EMERGENCY LIGHTING & POWER
- **EQUIPMENT** CAN/CSA- C860, PERFORMANCE OF INTERNALLY-LIGHTED EXIT
- CAN/ULC-S572, PHOTOLUMINESCENCE & SELF-LUMINOUS SIGNS AND PATH MARKING SYSTEMS, INCLUDING APPENDIX A AS **APPLICABLE**
- CSA C22.2 NO. 107.2, BATTERY CHARGERS WHERE REMOTE LAMP HEADS ARE INDICATED, INSTALL & CONNECT TO THE BATTERY UNIT WITH 12/24 VDC WIRING IN CONDUIT AS INDICATED.
- 3. AIM ALL ADJUSTABLE LAMP HEADS TO PROVIDE MAXIMUM COVERAGE TO EGRESS ROUTES.
- PROVIDE SELF-CONTAINED EMERGENCY LIGHTING UNITS WHERE SHOWN. INCLUDE FOR ALL REQUIRED SITE ASSEMBLY, PROVIDE ALL REQUIRED INSTALLATION & SUPPORT HARDWARE, & PLUG THE ASSEMBLIES INTO ADJACENT RECEPTACLES. CIRCUIT TO BE IDENTIFIED IN PANELS c/w LOCK ON BREAKER. Confirm EXACT LOCATIONS & MOUNTING HEIGHTS PRIOR TO INSTALLATION.
- 5. THE SELF-CONTAINED EMERGENCY LIGHTING UNITS SHALL BE CAPABLE OF SUPPLYING THE WATTAGE AS INDICATED.
- . CONTRACTOR TO COMMISSION & TEST COMPLETED SYSTEM. PROVIDE A CERTIFICATE OF PROPER OPERATION FOR COMPLETE SYSTEM.
- 7. TEST TO INCLUDE BATTERY MINIMUM DURATION AT FULL LIGHTING LEVEL:
- HIGH BUILDINGS AS A MINIMUM 2 HR.
- GROUP B AS A MINIMUM 1 HR. ALL OTHER - AS A MINIMUM 1/2 HR

# 26 52 13.16 EXIT SIGNS

- 1. ALL EXIT SIGNS TO BE CSA CERTIFIED SAME AS EMERGENCY LIGHTING - REFER TO SECTION 26 52 13.13.
- PROVIDE EXIT SIGNS WHERE SHOWN. INCLUDE FOR ALL REQUIRED SITE ASSEMBLY, & PROVIDE ALL REQUIRED INSTALLATION & SUPPORT HARDWARE.
- 3. CONFIRM EXACT EXIT SIGN LOCATIONS PRIOR TO ROUGHING-IN, & IN ANY CASE, ENSURE THAT EXIT SIGNS ARE NOT LESS THAN 2 M (6-1/2') FROM THE UNDERSIDE OF THE FIXTURE TO THE FINISHED FLOOR.
- 4. EXIT LIGHTS TO BE CIRCUITED TO LOCAL ROOM'S LIGHTING AS INDICATED WITH LOW VOLTAGE DC WIRING CONNECTED TO EMERGENCY BATTERY PACK. INSTALL WIRING IN CONDUIT. CIRCUIT TO BE IDENTIFIED IN PANELS C/W LOCK ON BREAKER.

# 26 56 00 EXTERIOR LIGHTING

- 1. ALL LIGHTING FIXTURES ARE TO BE ULC LISTED, CSA CERTIFIED & LABELED.
- 2. LIGHTING FIXTURES & LAMPS ARE SCHEDULED ON THE DRAWINGS. PROVIDE EXTERIOR LIGHTING FIXTURES WHERE SHOWN & IN ACCORDANCE WITH THE LIGHTING SCHEDULES. INCLUDE FOR ALL REQUIRED SITE ASSEMBLY, & PROVIDE ALL REQUIRED INSTALLATION & SUPPORT HARDWARE.
- 3. THE LIGHTING EQUIPMENT FOR THIS PROJECT AND SPECIFIED HEREIN HAS BEEN CAREFULLY SELECTED FOR ITS ABILITY TO MEET THE PROJECT'S LUMINOUS ENVIRONMENT REQUIREMENTS. MANUAL & COMPUTER CALCULATIONS HAVE BEEN PERFORMED TO ENSURE THAT THE LIGHTING EQUIPMENT THAT HAS BEEN SPECIFIED COMPLIES WITH ESTABLISHED CRITERIA. THE ENGINEER RESERVES THE RIGHT NOT TO ACCEPT ANY ALTERNATES OR SUBSTITUTIONS. IF ALTERNATES OR SUBSTITUTIONS ARE ENTERTAINED. THEN IT IS THE RESPONSIBILITY OF THE CONTRACTOR/SUPPLIER TO PROVIDE ALL INFORMATION REQUIRED HEREIN & DETAILED LAYOUTS & LIGHTING CALCULATIONS DEMONSTRATING THE PERFORMANCE OF THE ALTERNATE LUMINAIRE MEETS OR EXCEEDS THE ORIGINAL LIGHTING DESIGN WHILE NOT CONSUMING ANY ADDITIONAL ENERGY. THE CONTRACTOR/ SUPPLIER IS RESPONSIBLE TO ENSURE THE LIGHT LEVELS PROVIDED IN THE ALTERNATE SUBMITTAL PACKAGE ARE
- 4. CONFIRM EXACT LIGHTING FIXTURES LOCATIONS PRIOR TO ROUGHING-IN.
- SECURE GRADE MOUNTED BUILDING FLOODLIGHTING FIXTURES TO CONCRETE PADS SET FLUSH WITH FINISHED GRADE.
- 6. PROVIDE POLES WITH MOUNTING BRACKETS FOR POLE MOUNTED LIGHTING FIXTURES. FOR DIRECT BURY CONCRETE POLES, BACKFILL THE EXCAVATION AROUND THE POLE WITH CONCRETE

- SECURE METAL POLES TO REINFORCED CONCRETE BASES. INSTALL POLE ANCHOR BOLT SUPPORT HARDWARE IN THE BASE CONCRETE DURING THE POUR, & ENSURE THAT THE HARDWARE IS PROPERLY POSITIONED & REMAINS PROPERLY POSITIONED UNTIL CONCRETE HAS SET. PROVIDE VANDAL-PROOF ANCHOR BOLT
- 8. ENSURE THAT ALL POLES ARE TRUE AND PLUMB.

# 27 05 00 COMMON WORK RESULTS FOR COMMUNICATION SYSTEM

- PROVIDE EMPTY PATHWAYS, FISH WIRES, BOXES, COVER PLATES, CONDUIT, BACKBOARDS, MISCELLANEOUS & POSITIONING MATERIAL FOR A COMPLETE SYSTEM FOR COMMUNICATIONS SYSTEMS WIRING, ALL AS INDICATED ON THE DRAWINGS.
- 2. PERFORM ALL REQUIRED COMMUNICATION SYSTEMS GROUNDING & BONDING COMPLETE WITH BUS. BONDING BACKBONES. & BONDING CONDUCTORS. UNLESS OTHERWISE SPECIFIED, GROUNDING AND BONDING WORK IS TO BE IN ACCORDANCE WITH REQUIREMENTS OF ANSI J-STD-607-A, & THE REQUIREMENTS OF ALL OTHER GOVERNING AUTHORITIES.
- 3. BOND METALLIC CONDUITS, BOXES, CABLE TRAYS, DUCTS, & NON-CURRENT CARRYING METAL PARTS OF EQUIPMENT TOGETHER TO THE COMMUNICATIONS GROUNDING & BONDING SYSTEM.
- 9. WALL OR SIDE BRACKET MOUNTED FIXTURE HOUSING SHALL BE 4. INCLUDE FOR GROUND CONNECTIONS TO ALL COMMUNICATION SYSTEM RACKS.

## 28 46 00 FIRE DETECTION & ALARM

- PROVIDE A COMPLETE FIRE ALARM SYSTEM. FIRE ALARM SYSTEM INSTALLATION & TESTING IS TO BE IN ACCORDANCE WITH REQUIREMENTS OF THE FOLLOWING:
- CAN/ULC-S524-14, INSTALLATION OF FIRE ALARM SYSTEMS. CAN/ULC-S536-04, INSPECTION & TESTING OF FIRE ALARM
- CAN/ULC-S537-13. VERIFICATION OF FIRE ALARM SYSTEMS. CAN/ULS-S573-2018 STANDARD FOR INSTALLATION OF ANCILLARY DEVICES.
- CURRENT EDITION OF APPLICABLE BUILDING CODE.
- 2. SYSTEM COMPONENTS SHALL BE LISTED BY ULC/CSA & COMPLY WITH APPLICABLE PROVISIONS OF THE NATIONAL BUILDING CODE. THE LOCAL/PROVINCIAL BUILDING CODE. & MEET REQUIREMENTS OF LOCAL AUTHORITY HAVING JURISDICTION.
- 3. PROVIDE AN ADDRESSABLE SINGLE STAGE FULLY SUPERVISED, ADDRESSABLE, MICROPROCESSOR-BASED, FIRE ALARM SYSTEM. UTILIZING DIGITAL TECHNIQUES FOR DATA CONTROL & DIGITAL, & MULTIPLEXING TECHNIQUES FOR DATA TRANSMISSION.
- 4. SYSTEM TO CARRY OUT FIRE ALARM & PROTECTION FUNCTIONS; INCLUDING RECEIVING ALARM SIGNALS; INITIATING GENERAL & TWO-STAGE ALARM: SUPERVISING COMPONENTS & WIRING: **ACTUATING ANNUNCIATORS & AUXILIARY FUNCTIONS: INITIATING** TROUBLE SIGNALS & SIGNALLING TO MONITORING AGENCY.
- 5. INSTALL CENTRAL CONTROL UNIT & CONNECT TO AC POWER SUPPLY.
- 6. INSTALL MANUAL ALARM STATIONS & CONNECT TO ALARM CIRCUIT
- LOCATE & INSTALL DETECTORS & CONNECT TO ALARM CIRCUIT WIRING. DO NOT MOUNT DETECTORS WITHIN 1 M (3 FT. 3-3/8 IN.) OF AIR OUTLETS. MAINTAIN AT LEAST 600 MM (2 FT.) RADIUS CLEAR SPACE ON CEILING, BELOW & AROUND DETECTORS. LOCATE DUCT TYPE DETECTORS IN STRAIGHT PORTIONS OF DUCTS INSTALLATION WILL BE COMPLETE WITH SAMPLING TUBES
- 8. CONNECT ALARM CIRCUITS TO MAIN CONTROL PANEL.
- 9. INSTALL BELLS, HORNS & VISUAL SIGNAL DEVICES & CONNECT TO SIGNALLING CIRCUITS.
- 10. CONNECT SIGNALLING CIRCUITS TO MAIN CONTROL PANEL.
- 11. INSTALL END-OF-LINE DEVICES.
- 12. INSTALL REMOTE ANNUNCIATOR PANELS AND CONNECT TO ANNUNCIATOR CIRCUIT WIRING.
- 13. INSTALL DOOR RELEASING DEVICES.
- 14. INSTALL REMOTE RELAY UNITS TO CONTROL FAN SHUT DOWN.
- 15. COORDINATE WITH SPRINKLER DRAWINGS & SPRINKLER CONTRACTOR, REVIEW & COORDINATE WITH ALL SPRINKLER DEVICE LOCATIONS. SPRINKLER DEVICES SHOULD BE WIRED SUCH THAT OPENING OF A DEVICE WILL CAUSE A TROUBLE ON AN ALARMING DEVICE OR A SUPERVISORY ON A SUPERVISING DEVICE
- 16. CONTRACTOR SHALL ENSURE THE VERIFICATION OF THE FIRE ALARM INCLUDES ANY SECURITY DOORS.
- 17. ALL FIRE ALARM TEST & VERIFICATION REPORTS ARE TO BE SUBMITTED WITH A COVERING LETTER FROM THE MANUFACTURER CLEARLY STATING THAT THERE ARE NO DEFICIENCIES WITH THE INSTALLATION PRIOR TO RELEASING THE RESPECTIVE AREA FOR OCCUPANCY.

<u>ELECTRICAL SCOPE OF WORK:</u>
CONTRACTOR TO VISIT THE SITE & FAMILIARIZE THEMSELVES WITH THE REQUIREMENTS OF THIS DESIGN.

REFER TO SPECIFICATION & GENERAL PROJECT NOTES & DETAILS INCLUDED IN THIS SET OF DWGS.

THE WORK SHALL CONSIST OF, BUT SHALL NOT BE LIMITED TO THE FOLLOWING:

## **TENDER PHASE**

- DWGS ARE GENERAL LAYOUT CONTRACTOR TO PROVIDE A COMPLETE
- WORKING SYSTEM ALL QUESTIONS RELATED TO MISSING OR UNCLEAR DESIGN DETAILS TO BE COMMUNICATED IMMEDIATELY TO THE ENGINEER VIA THE GENERAL CONTRACTOR USING THE RFI PROCESS.

(NORTHSTAR GENERALLY WILL NOT PROVIDE VERBAL DIRECTIVES ON

VISIT THE SITE TO REVIEW THE EX. CONDITIONS PROVIDE ANY QUESTIONS TO THE BID ADMINISTRATOR IN WRITING

## **PLANNING & MOBILIZATION PHASE**

THIS PROJECT)

- THIS CONTRACTOR SHALL BE RESPONSIBLE FOR & SHALL OBTAIN ALL PERMITS, INSPECTIONS, ETC. AS REQUIRED BY ALL AUTHORITIES HAVING JURISDICTION OVER THIS WORK & SHALL PAY FOR SAME.REVIEW SITE CONDITIONS AGAIN TO CONFIRM THE VIABILITY OF THE DESIGN.
- ALL PERMITS SHALL BE DELIVERED TO THE OWNERS REPRESENTATIVE AS SOON AS THEY BECOME AVAILABLE & PRIOR TO PROJECT COMPLETION
- REVIEW THE SITE & ALL DRAWINGS PRIOR TO COMMENCEMENT OF THE WORK AND IDENTIFY ITEMS REQUIRING CLARIFICATION, IN ADVANCE.
- REPORT ANY CONFLICTS TO THE ENGINEER IN WRITING PROVIDE SHOP DWGS FOR THE ENGINEER TO REVIEW.
- SHOP DRAWINGS WILL NOT CONSTITUTE A CHANGE IN CONCEPT OR CONTROLS. CONTRACTOR TO COORDINATE WITH OTHER TRADES. THIS TYPE OF CHANGE WILL COME IN THE FORM OF AN OFFICIAL CHANGE NOTICE THROUGH THE PROJECT COORDINATOR.
- THE GENERAL CONTRACTOR AND/OR CLIENT PROJECT COORDINATOR TO FACILITATE A COMPLETE REVIEW OF ALL TRADES DESIGN DRAWINGS
- ENGINEER TO BE RETAINED TO FACILITATE TO ATTEND AN ALL TRADES PROJECT KICK-OFF ONSITE (OWNER IN ATTENDANCE).
- THIS TRADE SHALL REVIEW THE TOGETHER WITH THE MECHANICAL CONTRACTOR FOR THE CONTROLS & POWER DETAILING & COORDINATE THE WORK TOGETHER & NOTICE THE ENGINEER OF ANY DISCREPANCIES IMMEDIATELY
- MECHANICAL ITEMS THAT HAVE ELECTRICAL FEATURES OVER 50V TO BE REVIEWED WITH THE MECHANICAL TRADES

## **CONSTRUCTION PHASE**

- WORK SHALL NOT COMMENCE ON THE INSTALLATION UNTIL ESA (ONTARIO ELECTRICAL SAFETY AUTHORITY) PLANS REVIEW AS WELL AS THE LOCAL UTILITY'S REVIEW COMMENTS HAVE BEEN RECEIVED & REVIEWED BY THE ENGINEER AS WELL AS THIS CONTRACTOR.
- CONTRACTOR TO OBTAIN A COPY OF ALL TENANT LEASE REQUIREMENTS & IS RESPONIBLE FOR ALL LISTED
- SUPPLY ALL LABOUR, MATERIALS, TOOLS, EQUIPMENT & SUPERVISION TO COMPLETE THE SCOPE OF WORK INCLUDING BUT NOT LIMITED TO ALL WORK SHOWN OR INFERRED ON THE DRAWINGS, THIS SCOPE OF WORK AND ADDENDA, AND AS PER THE FOLLOWING:
- CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS LISTED & SHOWN IN THE SPECIFICATIONS, DRAWINGS, & DETAILS,
- CONTRACTOR TO BE RESPONSIBLE FOR COORDINATION OF NEW ELECTRICAL SERVICE WITH UTILITY & PROVIDE ALL NECESSARY PROVISIONS FOR A COMPLETE INSTALLATION.
- PROVIDE ALL EXCAVATION, BACKFILLING, CONCRETE, REINFORCING FOR EXTERIOR LIGHT POLES, WIRING & DUCTBANKS. COORDINATE ALL INCOMING DUCTBANK WITH CIVIL SERVICES ON SITE.
- ENSURE NO INTERFERENCE BETWEEN ELECTRICAL & SITE CIVIL CONTRACTOR TO ARRANGE ESA (ONTARIO ELECTRICAL SAFETY AUTHORITY) INSPECTION FOR ELECTRICAL UNDERGROUND WORKS
- PRIOR TO COVER. NOTIFY THE ENGINEER IN WRITING PRIOR INSPECTION DATE SUPPLY & INSTALL COMPLETE ELECTRICAL DISTRIBUTION SYSTEM
- INCLUDING SWITCHBOARDS, PANELS & DISCONNECTS SWITCHES. SUPPLY & INSTALL HOUSEKEEPING PAD FOR ALL ELECTRICAL EQUIPMENTS IN ELECTRICAL ROOM.
- SUPPLY & INSTALL ALL NECESSARY CONDUIT WIRING & CONNECTIONS FOR A COMPLETE INSTALLATION. SUPPLY & INSTALL FIRE STOPPING AS PER SECTION 26 05 00 9.0 FIRE STOPPING. CONTRACTOR TO ARRANGE FOR HILTI FIRE STOPPING
- REVIEW & PROVIDE SHOP DWG OF ALL FIRE STOPPING. SUPPLY & INSTALL LIGHTING & POWER DISTRIBUTION SYSTEM AS SHOWN ON THE DRAWINGS
- SUPPLY & INSTALL ALL ACCESS DOORS AS PER SECTION 26 05 00 -8.0

SUPPLY & INSTALL ALL EMERGENCY LIGHT BATTERY UNITS & EXIT

SUPPLY & INSTALL ALL LIGHTING FIXTURES, SWITCHES & RECEPTACLES.

## DIV. 23, DIV. 26 **RESPONSIBILITIES**

**ELECTRICAL REPORTS** 

**REQUIRED FOR SIGN-OFF** 

THE FOLLOWING REPORTS MUST BE

SUBMITED TO THE ENGINEER PRIOR

TO FINAL APPROVAL OF THE

SAFETY - SUCCESSFUL

**EMERGENCY LIGHTING** 

**CERTIFICATON LETTER** 

WARRANTY LETTER

(16421) Google Map for Project

**DURATION - SUCCESSFUL** 

FIRE ALARM VERIFICATION

ACCORDANCE WITH CAN/CSA

CONTRACTOR COMPLETION &

SUCCESSUL REPORT IN

COMPLETED SYSTEM.

CERTIFICATE

## ALL CONTROL AND ELECTRICAL POWER DEVICES OVER 50 VOLTS (ALSO TO BE INSTALLED, WIRED

- & TESTED BY DIV. 26 CONT.) ESA (ONTARIO) - ELECTRICAL DIV. 23 TO SUPPLY: HEATING / COOLING UNITS.
  - LECTRICAL RESISTANCE HEATER GAS FIRED HVAC EQUIPMENT, EXHAUST FANS, HVAC ELECTRICA CONTROL DEVICES UNDER 50
  - VOLTS (ALSO TO BE INSTALLED, WIRED & TESTED BY DIV. 23 CONT.)

# (16421) PROJECT DRAWING REGISTER

M-2 Mechanical - Specification

P-2 Plumbing - Specification

P-3 Plumbing - Base Bldg.

E-1 Elec. - Specification

E-2 Elec. - Specification

E-3 Electrical Site Power

E-5 Photometric Site Plan

E-7 Elec. Lighting - Base Bldg.

E-4 Elec. Site Lighting

M-4 HVAC - Base Bldg.

Mechanical Site Plan

Plumbing - Specification

E-6 Elec. Power/Comm. - Base Bldg.

M-3

Sheet Name

Mechanical - Specification

NGINEERING & TECHNOLOGIES LTD

92 Caplan Ave. Suite #517 Barrie, Ontario L4N 9J2 Tel. (705) 719-1003 Fax (705) 719-0490 dlong@nset.ca www.nset.ca

**GENERAL DRAWING / DESIGNER NOTES** 

ALL CONSTRUCTION METHODS AND MATERIALS TO CONFORM TO THE LATEST EDITION OF THE PROVINCE OF ONTARIO'S "BUILDING CODE", LOCAL REGULATIONS AND AUTHORITIES HAVING

THE CONSULTANT RESERVES THE RIGHT TO MAKE REASONABLE CHANGES IN ORDER TO ACCOMMODATE CONDITIONS ARISING DURING CONSTRUCTION FOR ADDITIONAL FEES ADDITIONAL APPLY AND ARE TO BE NEGOTIATED BETWEEN THE OWNER AND

DRAWINGS ONLY SHOW GENERAL INTENT AND SCOPE OF WORK EXACT DETAILS OF INSTALLATIONS ARE TO BE PROVIDED BY CONTRACTOR(S), DO NOT SCALE DRAWINGS

CONTRACTOR/AGENT/OWNER TO REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE DESIGNER PROCEED WITH CONSTRUCTION ONLY USING THE LATEST REVISED DRAWINGS MARKED "ISSUED FOR CONSTRUCTION".

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PLUMBING FIXTURES. HVAC EQUIPMENT, HVAC DIFFUSERS.

MINIMUM 1-2 WEEKS FOR COMPLETION (BASED ON COMPLEXITY) THE DESIGNER DOES NOT ACCEPT RESPONSIBILITY FOR RESPONSIBILITY FOR ANY FINAL ASSEMBLY(S) THAT VIOLATE

APPLICABLE BUILDING CODES IS NOT ACCEPTED BY THE REQUESTS FOR CHANGES OR SUBSTITUTIONS TO EQUIPMENT,

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ALL REQUESTS FOR DESIGN CHANGES / SUBSTITUTIONS TO BE MADE IN WRITING. ADDITIONAL FEES MAY APPLY. ALLOW MINIMUM (1) ONE WEEK TO REVIEW AND RESPOND TO CHANGE DRAWING REVISIONS

May 18/22

Description

Issued for SPA comments

McCowan & Associates

279 Yonge St. Barrie ON

Allandale Marketplace -

Engineer's Seal:

Burger King Dwg. Name: Elec. - Specification

NSET Project #:

Drawn by: Northstar Eng. | Checked by: D.B.D. 12" = 1'-0" Revision

Project Date: Mar. 04/21

(16421) Satellite View for Project

Drawing #:

Arch-D (24" x 36"





EX. RETAIL MALL **ELECTRICAL ROOM** 

EX. 300kVA PAD

**TRANSFORMER** 

NEW ELEC. SERVICE FROM ELECTRICAL ROOM

EX. RETAIL MALL

NEW ELEC. & COMM

SERVICE DOWN THE BUILDING PERIMETER TO

- CONTRACTOR TO PROVIDE A SEPARATE

CONDUIT UTILIZING DIRECTIONAL BORE

(CONTRACTOR TO **COORDINATE WITH ALL** 

EX. U/G SERVICES)

PROPOSED BUILDING:

BURGER KING

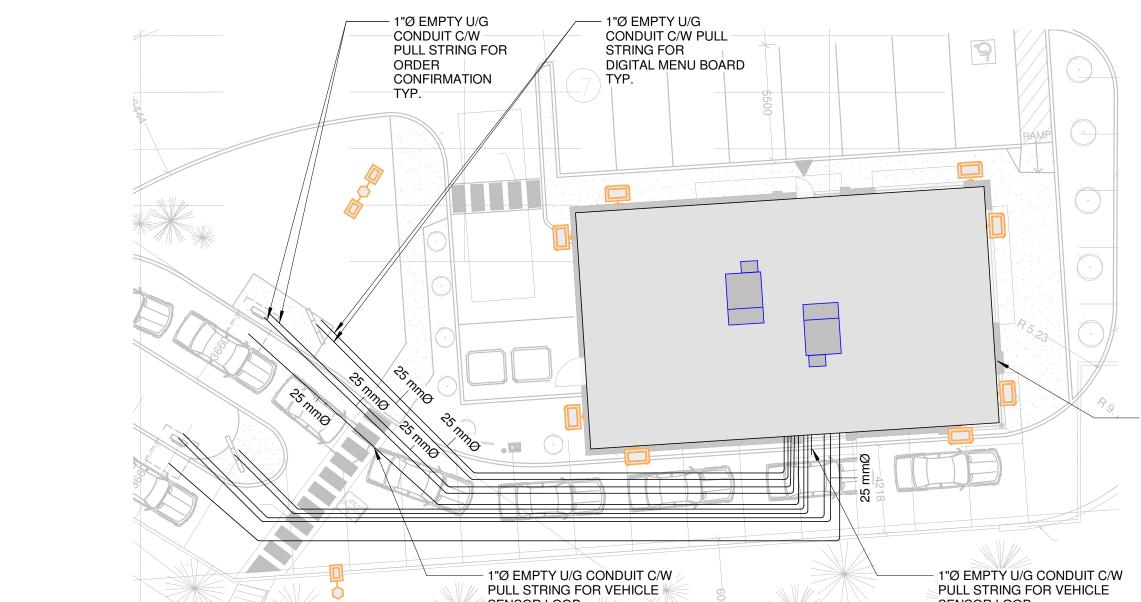
5 E-3

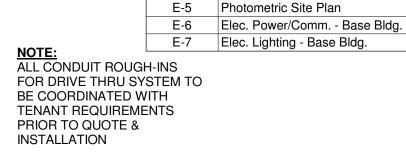
METHOD

QUOTE FOR 4"Ø (100mm) U/G POWER & COMM.

UP TO ROOF

MOUNTED





Sheet Name

Mechanical - Specification

Mechanical - Specification

Plumbing - Specification

Plumbing - Base Bldg. Elec. - Specification Elec. - Specification Electrical Site Power Elec. Site Lighting

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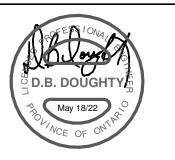
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Issued for SPA Dec. 23/21 Mar. 18/22 Issued for SPA comments May 18/22

Engineer's Seal:



McCowan & Associates

279 Yonge St. Barrie ON

Allandale Marketplace -

Burger King Dwg. Name:

Electrical Site Power

NSET Project #: 16421

Arch-D (24" x 36")

Drawn by: Northstar Eng. Checked by: D.B.D. Revision #: 3.0

As indicated Drawing #:

Project Date: Mar. 04/21

(16421) PROJECT DRAWING REGISTER M-3 Mechanical Site Plan M-4 HVAC - Base Bldg. P-2 Plumbing - Specification PROPOSED BURGER KING SENSOR LOOP SENSOR LOOP

(16421) Site - Electrical Site Plan - Proposed - Callout **►** E-3 / 1 : 180

POWER & COMM CONDUIT

MOUNTED TO SIDE OF WALL - NEW ELEC. SERVICE ON

- NEW 4" Ø COMM SERVICE CONDUIT ON ROOF



EX. ELECTRICAL ROOM

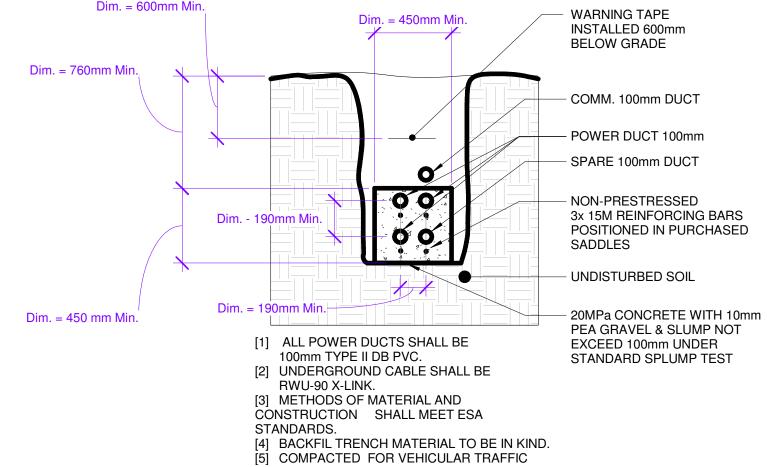


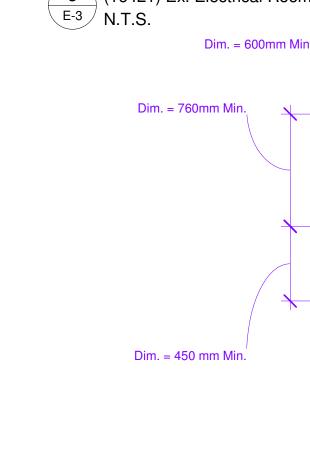
WIRE - 200A SERVICE TO BURGER KING 1 RUN OF (4) 300MCM (AL RWU90) IN 78mm C

NEW 347/600V - 3PH - 4

(16421) Ex. Electrical Room

EX. 800A SWITCHBOARD





E-3 N.T.S.

2 Electrical Service Detail/ 4 Duct

(16421) Site - Electrical Site Plan - Proposed E-3 1" = 30'-0"

EX. RETAIL MALL N.I.C.

# **CONTRACTOR DEMOLITION INSTRUCTION LEGEND** (ELECTRICAL)

DIV. 26 KEYNOTE 'X' DENOTES INSTRUCTION REFER TO CONTRACTOR FIRE PROTECTION KEYNOTE 'X' DENOTES INSTRUCTION, REFER TO CONTRACTOR INSTRUCTION LIST COMM. SYSTEMS KEYNOTE 'X' DENOTES INSTRUCTION REFER TO CONTRACTOR
INSTRUCTION LIST DATA SYSTEMS KEYNOTE 'X' DENOTES INSTRUCTION REFER TO CONTRACTOR
INSTRUCTION LIST

VOICE SYSTEMS KEYNOTE 'X' DENOTES INSTRUCTION REFER TO CONTRACTOR
INSTRUCTION LIST VOICE/DATA SYSTEMS KEYNOTE 'X' DENOTES INSTRUCTION, REFER TO CONTRACTOR
INSTRUCTION LIST

ELECTRICAL (DIV. 26)

1 - EX. DEVICE TO REMAIN. PROTECT DURING CONST., CONTRACTOR TO CLEAN, INSPECT & TEST FOR CORRECT PERFORMANCE AT JOB COMPLETION.

SERVICES. TEST AFTER RE-INSTALL. 3 - REMOVE EX. DEVICE, PRESERVE DEVICE & EXTEND ELEC. SERVICE FOR NEW LOCATION - SEE PROPOSED PLANS - (MAKE-

5 - DEMOLISH EX. DEVICE, PRESERVE & EXTEND ELEC. SERVICE FOR A NEW, APPROVED DEVICE - SEE PROPOSED PLANS -

6 - DEMOLISH EX. DEVICE / ELEC. SERVICE TO DEVICE (MAKE-

WALL PACK / WALL / LED CONTRACTOR INSTRUCTION LIST: LUMINAIRE / EXTERIOR 2 - EX. DEVICE TO BE REMOVED DURING DEMOLITION & RESERVED FOR RE-INSTALL DURING CONST. TO SAME EX. 4 - DEMOLISH EX. DEVICE, PRESERVE ELEC. SERVICE FOR NEW, APPROVED DEVICE IN SAME LOCATION (MAKE-SAFE

Grand total

**EXTERIOR** 

LUMINAIRE / EXTERIOR

POLE LIGHT / QUADRUPLE / RECT. HEAD /

LIGHTING LEGEND LUMINAIRE / EXTERIOR Dim. = 380mm MIN. POLE LIGHT / SINGLE / RECT. HEAD / Dim. = 760mm MIN. Dim. = 290mm MIN LUMINAIRE / EXTERIOR POLE LIGHT / DOUBLE / RECT. HEAD / \_\_\_Dim. = 290mm NOTES: 1. TRENCH WIDTH SHALL BE 500mm. 2. DUCTS SHALL BE 27mm TYPE II DB PVC.

> 4 Light Pole Trench Detail E-4 N.T.S.

> > ÉX. RETAIL MALL

(MASTER-E) Contractor Demolition Instruction List - Div. 26 - Lighting

Project Numbered Notes - Lighting

WARNING TAPE

BELOW GRADE

27mm CONDUIT

UNDISTURBED

SAND BASE

SOIL

INSTALLED 380mm

ELECTRICAL SERVICE

(CENTER IN TRENCH)

1 EX. DEVICE TO REMAIN. PROTECT DURING CONST., CONTRACTOR TO CLEAN, INSPECT & TEST FOR CORRECT PERFORMANCE AT JOB COMPLETION.

3. UNDERGROUND WIRE SHALL BE 2#8RWU-90 + GRD

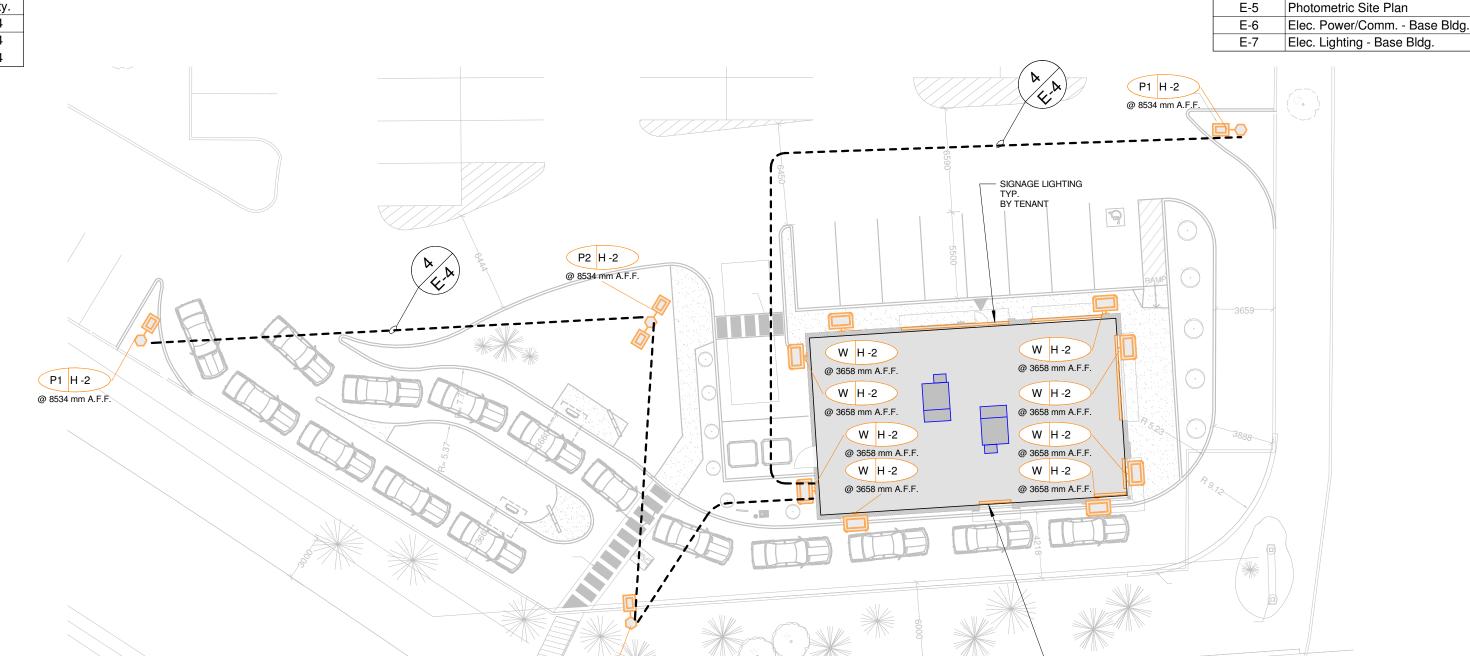
BACKFIL TRENCH MATERIAL TO BE 'IN-KIND'.

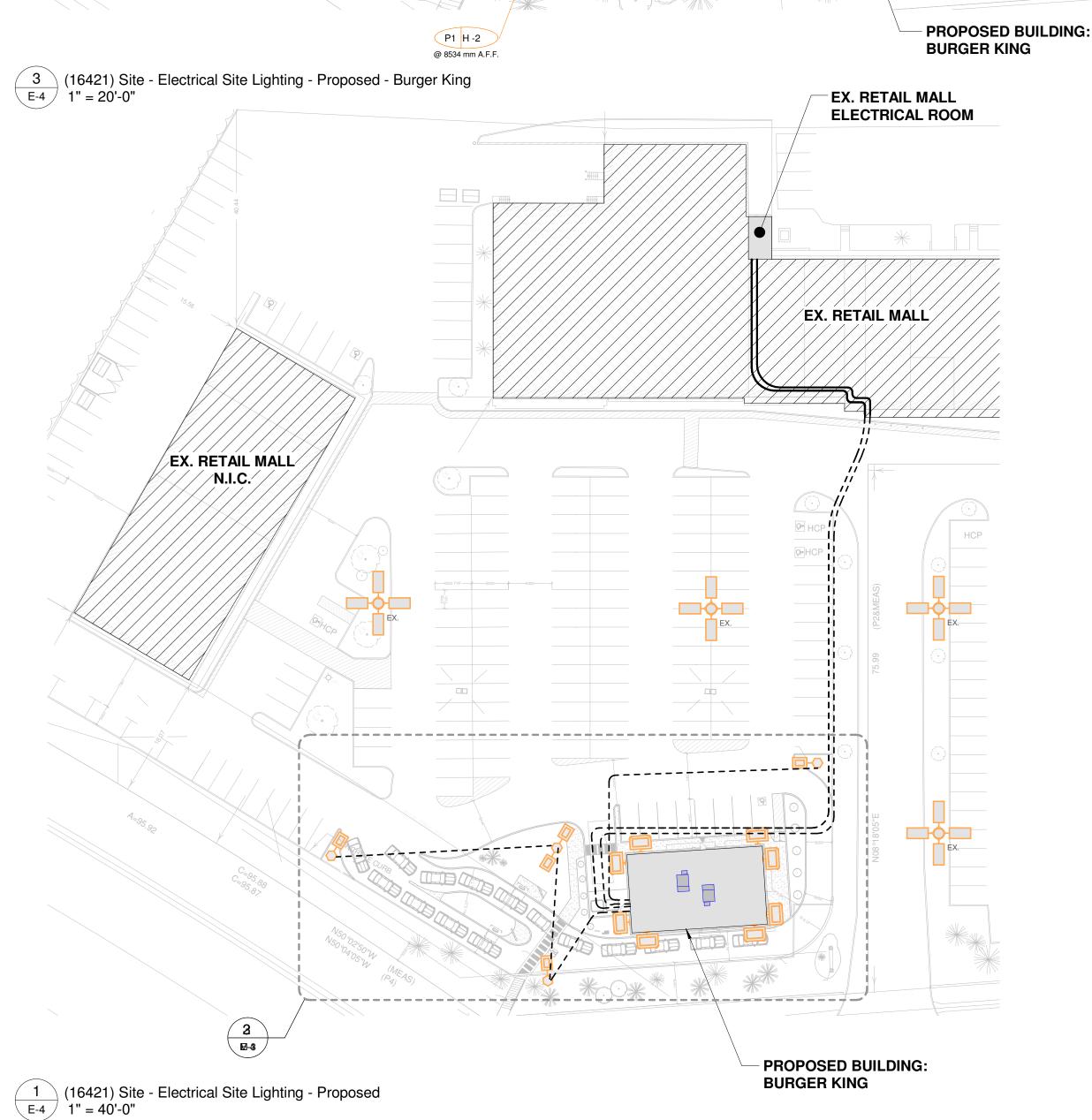
COMPACTED FOR VEHICULAR TRAFFIC AREAS.

4. METHODS OF MATERIAL AND CONSTRUCTION SHALL MEET ESA STANDARDS.

#### Elevation of Light Source | Comments Level Type Qty. Fixture Finish Manufacturer Part # Accessory 1 Temperature 1 - Floor 4 (EX.) / LIGHT / OUTDOOR / POLE LIGHT **EXISTING** EXISTING EXISTING 120 V 2 VA EXISTING P26-64L-600-WW-G2-AR-3-UNV-TLRPC-BK LED 114W 1 - Floor | P1 | 3 | LUMINAIRE / OUTDOOR / POLE LIGHT / SINGLE / RECT. HEAD / LED DIRECT GARDCO 120 V 114 VA DIV. 26 1 - Floor | P2 | 1 | LUMINAIRE / OUTDOOR / POLE LIGHT / DOUBLE / RECT. HEAD / LED DIRECT BLACK 3000 K 12614 lm 120 V 228 VA **GARDCO** P26-64L-600-WW-G2-AR-3-UNV-TLRPC-BK | LED 228W POLE POLE DIV. 26 1 - Floor W 8 LUMINAIRE / OUTDOOR / WALL PACK / WALL / LED DIRECT BLACK SIGNIFY PWS-48L-400-AM-G2-3-UNV-PCB-F1-BK LED 30W 3000 K 2425 lm 120 V 30 VA

(MASTER-E) Lighting Fixture Schedule - Outdoor - (New) Supplied By Alternate NSET NOT PERMITTED NOT PERMITTED DIV. 26 NOT PERMITTED







(16421) PROJECT DRAWING REGISTER

Mechanical - Specification

Mechanical - Specification

Mechanical Site Plan

Plumbing - Specification

Plumbing - Base Bldg.

Elec. - Specification

Elec. - Specification

Electrical Site Power

Elec. Site Lighting

M-4 HVAC - Base Bldg.

P-2 Plumbing - Specification

M-3

E-2

Sheet Name

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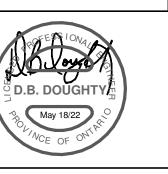
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1 Issued for SPA	
I ISSUEU IOI SI A	Dec. 23/21
2 Preliminary	Mar. 18/22
3 Issued for SPA comments	May 18/22



McCowan & Associates

279 Yonge St. Barrie ON

Project Name:
Allandale Marketplace -Burger King

Dwg. Name:

Elec. Site Lighting

16421 Drawn by: Northstar Eng. Checked by: D.B.D.

As indicated Drawing #:

Project Date: Mar. 04/21

Arch-D (24" x 36")



EX. RETAIL MALL

N.I.C.

LIG	EXTERIOR HTING LEGEND
	LUMINAIRE / EXTERIOR WALL PACK / WALL / LED
	LUMINAIRE / EXTERIOR POLE LIGHT / SINGLE / RECT. HEAD / LED
	LUMINAIRE / EXTERIOR POLE LIGHT / DOUBLE / RECT. HEAD / LED
	LUMINAIRE / EXTERIOR POLE LIGHT / QUADRUPLE / RECT. HEAD / LED

				edule - Outdoor - (New)											
Level Type	Qty.	Description	Fixture Finish	Color Temperature	Lumens	Voltage	VA	Manufacturer	Part #	Lamping	Elevation of Light Source	Mounting Comments	Accessory 1	Supplied By	Approved Alternate_NSET
1 - Floor	4	(EX.) / LIGHT / OUTDOOR / POLE LIGHT				120 V 2	VA	EXISTING	EXISTING	EXISTING				EXISTING	
1 - Floor P1	3	LUMINAIRE / OUTDOOR / POLE LIGHT / SINGLE / RECT. HEAD / LED DIRECT	BLACK	3000 K	12614 lm	120 V 11	4 VA	GARDCO	P26-64L-600-WW-G2-AR-3-UNV-	LRPC-BK LED 114W	336"	POLE	POLE	DIV. 26	NOT PERMITTED
1 - Floor P2	1	LUMINAIRE / OUTDOOR / POLE LIGHT / DOUBLE / RECT. HEAD / LED DIRECT	BLACK	3000 K	12614 lm	120 V 22	.8 VA	GARDCO	P26-64L-600-WW-G2-AR-3-UNV-	TLRPC-BK LED 228W	336"	POLE	POLE	DIV. 26	NOT PERMITTED
1 - Floor W	8	LUMINAIRE / OUTDOOR / WALL PACK / WALL / LED DIRECT	BLACK	3000 K	2425 lm	120 V 30	VA	SIGNIFY	PWS-48L-400-AM-G2-3-UNV-PCE	-F1-BK LED 30W	144"	WALL		DIV. 26	NOT PERMITTED
	16														
	16														



NOTE: ALL EXTERIOR LIGHTING ARE DARK SKY COMPLIANCE

TYPE P1 & P2

TYPE W

P1 H-2 @ 8534 mm A.F.F. 11.3 11.2 10.6 10.1 10.0 10.8 11.5 12.4 13.1 13.8 14.4 14.6 14.3 13.4 12.4 11.1 11.6 12.6 15.7 19.7 23.4 28.8 25.5 7.1 5 16.1 16.1 15.2 13.7 13.1 13.5 14.8 15.7 16.8 18.4 20.6 21.6 21.7 19.8 16.9 15.1 14.5 13.5 14.7 17.0 20.2 23.7 26.2 23.5 6.4 3.3 $1 \quad \overset{+}{2}2.2 \quad \overset{+}{2}2.1 \quad \overset{+}{2}0.7 \quad \overset{+}{1}8.5 \quad \overset{+}{1}6.8 \quad \overset{+}{1}6.8 \quad \overset{+}{1}6.5 \quad \overset{+}{1}8.2 \quad \overset{+}{2}1.7 \quad \overset{+}{2}4.5 \quad \overset{+}{2}6.4 \quad \overset{+}{2}8.9 \quad \overset{+}{3}2.3 \quad \overset{+}{3}3.4 \quad \overset{+}{3}2.4 \quad \overset{+}{2}8.0 \quad \overset{+}{2}4.3 \quad \overset{+}{2}4.2 \quad \overset{+}{2}1.0 \quad \overset{+}{2}0.2 \quad \overset{+}{2}0.1 \quad \overset{+}{2}0.8 \quad \overset{+}{2}1.0 \quad \overset{+}{2}0.1 \quad \overset{+}{2}0.8 \quad \overset{+}{2}1.0 \quad \overset{+}{2}0.1 \quad$ P1 H-2 @ 8534 mm A.F.F. <sup>+</sup>73.4 <del>| </del> <sup>+</sup>49.5 <del>| </del> <sup>+</sup>77.4 <u>| </u> <sup>+</sup>102.4 <u>| </u> <sup>+</sup>94.7 <del>| </del> <sup>+</sup>67.2 <del>| </del> <sup>+</sup> <sup>+</sup>29.2 <sup>+</sup>24.5 <sup>+</sup>21.4 <sup>+</sup>20.2 <sup>+</sup>20.7 <sup>+</sup>23.0 <sup>+</sup>29.9 <sup>+</sup>44. 88534 mm AP-2.8 68.7 <sup>+</sup>65.5 58.1 PI-HIS MH: 28 20.8 21.6 24.2 28.9 36.2 46.0 56.8 51.9 55.0 119.6 39.8 14.0 2.7 1.1W H -2 @ 3658 mm A.F.F. W H-2 @ 3658 mm A.F.F W H-2 @ 3658 mm A.F.F. 20.7 20.7 22.0 24.7 29.2 W H-2 34.5 38.2 38.6 31.1 28.7 1,22.6 46.6 13.9 2.5 1.0 @ 3658 mm A.F.F. W H-2 W H-2 @ 3658 mm A.F.F. @ 3658 mm A.F.F. 24.5 29.3 113.5 48.3 14.0 / 2.4 W H-2 W H-2 @ 3658 mm A.F.F. @ 3658 mm A.F.F. 23.5 29.3 34.3 10.8 35.9 35.5 36.7 30.7  $34.7 \ \boxed{38} \ \boxed{5} \ \boxed{36.0} \ \boxed{35.7} \ \boxed{35.3} \ \boxed{35.5} \ \boxed{31.8} \ \boxed{31.6} \ \boxed{27.6} \ \boxed{27.8} \ \boxed{23.3} \ \boxed{18.3} \ \boxed{14.1} \ \boxed{10.6} \ \boxed{6.4} \ \boxed{2.5} \ \boxed{0.9}$ 

**PROPOSED BUILDING:** 

**BURGER KING** 

(16421) PROJECT DRAWING REGISTER Sheet Name

P-1 Plumbing - Specification

P-2 Plumbing - Specification

E-6 Elec. Power/Comm. - Base Bldg.

E-7 Elec. Lighting - Base Bldg.

P-3 Plumbing - Base Bldg. E-1 Elec. - Specification E-2 Elec. - Specification E-3 Electrical Site Power E-4 Elec. Site Lighting E-5 Photometric Site Plan

M-1 Mechanical - Specification **ENGINEERING & TECHNOLOGIES LTD** M-2 Mechanical - Specification M-3 Mechanical Site Plan M-4 HVAC - Base Bldg.

Barrie, Ontario L4N 9J2 Tel. (705) 719-1003 Fax (705) 719-0490 dlong@nset.ca www.nset.ca

92 Caplan Ave. Suite #517



## **GENERAL DRAWING / DESIGNER NOTES:**

ALL CONSTRUCTION METHODS AND MATERIALS TO CONFORM TO THE LATEST EDITION OF THE PROVINCE OF ONTARIO'S "BUILDING

THE CONSULTANT RESERVES THE RIGHT TO MAKE REASONABLE CHANGES IN ORDER TO ACCOMMODATE CONDITIONS ARISING CONSTRUCTION COSTS ARRIVING FROM SUCH CHANGES MAY APPLY AND ARE TO BE NEGOTIATED BETWEEN THE OWNER AND

DRAWINGS ONLY SHOW GENERAL INTENT AND SCOPE OF WORK. EXACT DETAILS OF INSTALLATIONS ARE TO BE PROVIDED BY CONTRACTOR(S). DO NOT SCALE DRAWINGS.

CONTRACTOR/AGENT/OWNER TO REPORT ALL DISCOVERIES OF ERRORS, OMISSIONS OR DISCREPANCIES TO THE DESIGNER.

PROCEED WITH CONSTRUCTION ONLY USING THE LATEST

THIS DRAWING IS THE PROPERTY OF NORTHSTAR ENGINEERING &

THIS DRAWING IS SPECIFIC TO THIS PROJECT AND CANNOT BE

TECHNOLOGIES LTD. UN-AUTHORIZED RE-PRODUCTION OR USE

SHOP DRAWINGS: BASED ON CONTRACT WITH OWNER, THE ENGINEER WILL REVIEW SHOP SUBMISSION DWGS FROM THE CONTRACTOR TO REVIEW THE ITEMS FOR GENERAL CONFORMITY TO THE DESIGN DWGS. THE SHOP DWG REVIEW WILL NOT RELEASE THE CONTRACTOR FROM ESPONSIBILITY TO MAKE A FEASIBLE WORKING SYSTEM. THESE SHOP DRAWINGS SHALL CONSIST O PLUMBING FIXTURES, HVAC EQUIPMENT, HVAC DIFFUSERS. MINIMUM 1-2 WEEKS FOR COMPLETION (BASED ON COMPLEXITY)

THE DESIGNER DOES NOT ACCEPT RESPONSIBILITY FOR OTHER DESIGNER'S WORK IN ASSOCIATION WITH THIS PROJECT RESPONSIBILITY FOR ANY FINAL ASSEMBLY(S) THAT VIOLATE APPLICABLE BUILDING CODES IS NOT ACCEPTED BY THE

REQUESTS FOR CHANGES OR SUBSTITUTIONS TO EQUIPMENT, PLANS AND / OR SPECIFICATIONS WILL BE SUBJECT TO

ADDITIONAL FEES CHARGED BY THE CONSULTANT SITE VISITS TO REVIEW IMPLEMENTED DESIGNS WITHIN THE

SCOPE OF THIS PROJECT TO BE ARRANGED WITH THE OWNER. MINIMUM FORTY EIGHT (48) HOURS PRIOR NOTICE TO BE

PROVIDED FOR SITE VISITS - ONCE ARRANGED. REQUESTS FOR THE RELEASE OF THIS DRAWING SET FROM NORTHSTAR ENGINEERING & TECHNOLOGIES LTD. FOR THE

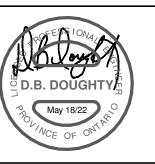
PURPOSE OF TENDERING PURPOSES BY ANY CONTRACTOR TO I MADE BY THE OWNER OR ARCHITECT IN WRITING.

TENDER PRICING BY CONTRACTORS OF DRAWINGS TO BE BASED ON DWGS MARKED "ISSUED FOR TENDER" OR "ISSUED FOR

ALL REQUESTS FOR DESIGN CHANGES / SUBSTITUTIONS TO BE

MADE IN WRITING. ADDITIONAL FEES MAY APPLY. ALLOW MINIMUM (1) ONE WEEK TO REVIEW AND RESPOND TO CHANGE

No.	Description	Date
1	Issued for SPA	Dec. 23/21
2	Preliminary	Mar. 18/22
3	Issued for SPA comments	May 18/22



McCowan & Associates

279 Yonge St. Barrie ON

Project Name:
Allandale Marketplace -Burger King

Dwg. Name:

Drawing #:

Photometric Site Plan

16421

Checked by: D.B.D. Drawn by: Northstar Eng. As indicated

E-5

Arch-D (24" x 36" Project Date: Mar. 04/21

(16421) Site - Electrical Site Lighting - Photometric E-5 1" = 10'-0"

## **NATURAL GAS PIPING**

ENTIRE NATURAL GAS INSTALLATION SHALL CONFIRM TO NATIONAL STANDARD OF CANADA CAN/CSA-B149.10 NATURAL GAS **INSTALLATION CODE AS PREPARED** BY CANADIAN GAS ASSOCIATION AND IN ACCORDANCE WITH THE LATEST LOCAL AMENDMENTS. PIPING SHALL BE SCHEDULE 40 BLACK CARBON STEEL PIPE COMPLYING WITH ASTM-A53/ FITTINGS SHALL BE OF EITHER MALLEABLE IRON OR STEEL SCREWED FITTINGS COMPLYING WITH ANSI-B16.3. ALL GAS PIPING SHALL BE PAINTED

YELLOW BY CONTRACTOR. A READILY ACCESSIBLE MANUAL SHUT-OFF VALVE SHALL BE INSTALLED FOR EACH APPLIANCE AND SHALL BE OF EITHER LUBRICATED PLUG, OR ECCENTRIC



(16421) U/G Elec. and N. Gas Concept M-3 N.T.S.

- NEW GAS LINE FROM EX. SERVICE UP TO ROOF

NEW GAS LINE DOWN BUILDING

PERIMETER TO U/G

N81°41'55"W 39

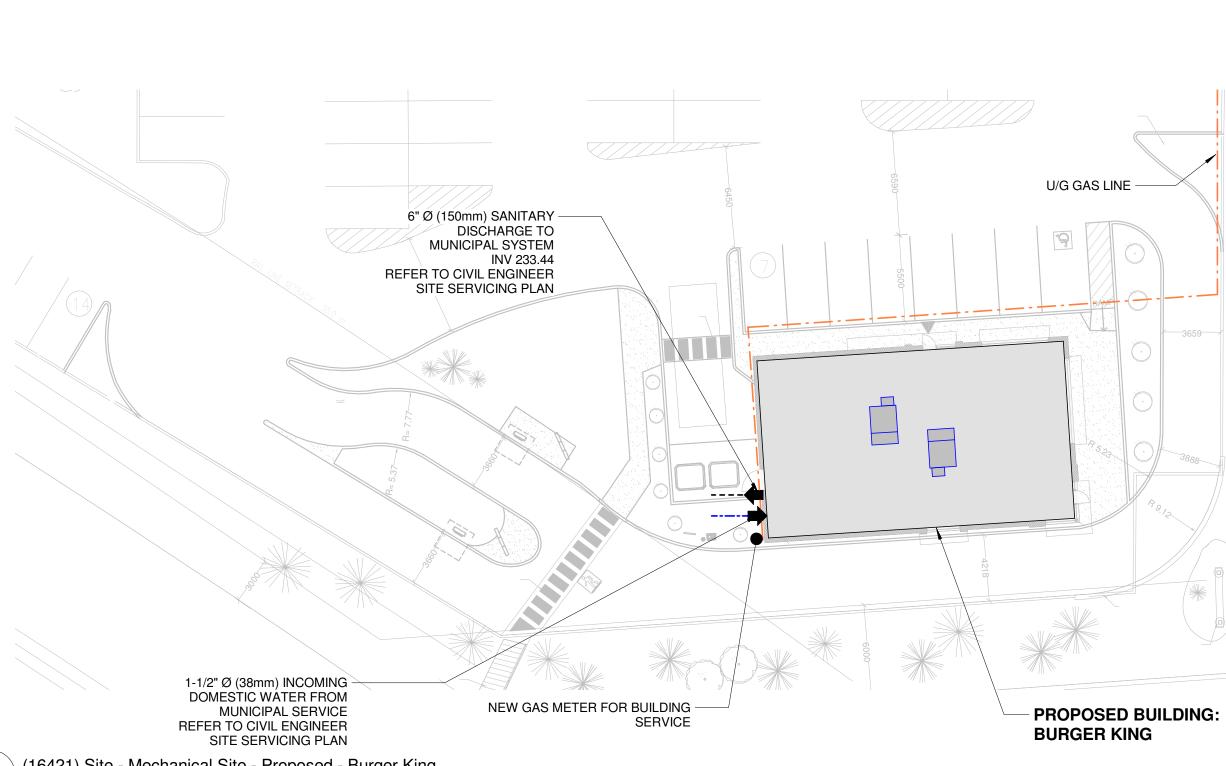
- EX. GAS SERVICE



EX. GAS SERVICE LOCATION



EX. GAS SERVICE (16421) Ex. Gas Service





(16421) PROJECT DRAWING REGISTER

M-1 Mechanical - Specification

M-2 Mechanical - Specification

M-3 Mechanical Site Plan

P-1 Plumbing - Specification

P-2 Plumbing - Specification

P-3 Plumbing - Base Bldg.

E-1 Elec. - Specification

E-2 Elec. - Specification

E-3 Electrical Site Power

E-5 Photometric Site Plan

E-7 Elec. Lighting - Base Bldg.

Elec. Power/Comm. - Base Bldg.

E-4 Elec. Site Lighting

M-4 HVAC - Base Bldg.

Sheet Name

92 Caplan Ave. Suite #517 Barrie, Ontario L4N 9J2 Tel. (705) 719-1003 Fax (705) 719-0490 dlong@nset.ca www.nset.ca



## GENERAL DRAWING / DESIGNER NOTES:

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PROCEED WITH CONSTRUCTION ONLY USING THE LATEST REVISED DRAWINGS MARKED "ISSUED FOR CONSTRUCTION".

THIS DRAWING IS SPECIFIC TO THIS PROJECT AND CANNOT BE USED FOR OTHER "SIMILAR" PROJECTS.

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ALL REQUESTS FOR DESIGN CHANGES / SUBSTITUTIONS TO BE MADE IN WRITING. ADDITIONAL FEES MAY APPLY. ALLOW MINIMUM (1) ONE WEEK TO REVIEW AND RESPOND TO CHANGE REQUESTS.

	DRAWING REVISIONS											
No.	Description	Date										
1	Issued for SPA	Dec. 23/21										
2	Preliminary	Mar. 18/22										
3	Issued for SPA comments	May 18/22										

Engineer's Seal:



McCowan & Associates

279 Yonge St. Barrie ON

Project Name:
Allandale Marketplace -Burger King

Dwg. Name:

Drawing #:

Mechanical Site Plan

NSET Project #: 16421

Drawn by: Northstar Eng. Checked by: J.D.L. Scale: As indicated Revision #: 3.0

M-3

Arch-D (24" x 36") Project Date: Mar. 04/21



(16421) Site - Mechanical Site - Proposed

**EX. RETAIL MALL** 

/N.I.C./

6" Ø (150mm) SANITARY DISCHARGE TO MUNICIPAL SYSTEM INV 233.44 REFER TO CIVIL ENGINEER SITE SERVICING PLAN 1-1/2" Ø (38mm) INCOMING – DOMESTIC WATER FROM MUNICIPAL SERVICE REFER TO CIVIL ENGINEER SITE SERVICING PLAN NEW GAS METER FOR BUILDING -SERVICE

PROPOSED BUILDING: **BURGER KING** 

ÉX. RETAIL MALL



2 (16421) Site - Mechanical Site - Proposed - Burger King 1" = 20'-0"



## by (s) ignify

## Site & Area

### **PureForm**

### P26 medium area light



Gardco PureForm LED area medium P26 features a sleek, low profile design and optimal performance. PureForm area medium is designed to achieve maximum pole spacing, with lumen output up to 28,900 lumens. Multiple distribution and shielding options are available to achieve maximum control. A full range of control options provides additional energy savings.

TYPE P1 & P2: P26-64L-600-WW-G2-AR-3-UNV-TLRPC-BK

Project:	
Location:	
Cat.No:	
Туре:	
Lumens:	Qty:
Notes:	

### Ordering guide

### example: P26-64L-800-NW-G2-AR-3-120-HIS-MGY

Prefix P26	Number of LEDs	Drive (	Current	LED Colo	r - Generatio	n	Mounting			stribution			Volta	age
P26 PureForm area medium, 26"	(3 modules)  64L 64 LEDs	600 700 600 700 800	400 mA 500 mA 600 mA 700 mA 600 mA 700 mA 800 mA 700 mA 800 mA	NW-G2 CW-G2 WY-G2 BW-G2	Warm White 70 CRI Gene Neutral Wh 70 CRI Gene Cool White 70 CRI Gene Warm Yello 80 CRI Gene Balanced W 80 CRI Gene Direct Amb Generation	eration 2 iite 4000K, eration 2 5000K, eration 2 w 2700K, eration 2 /hite 3500K eration 2 er (590nm)	mus (See SF WS	Arm Mount (standard) <sup>2</sup> following mounting kit t be ordered separate e accessories)  Slip Fitter Mount <sup>3</sup> (fits to 2 <sup>3</sup> / <sub>8</sub> " O.D. tenon)  Wall mount with surface conduit rea entry permitted I Retrofit arm mount	2- 2- 2- Ty 3 3- 3- Ty 4 4- 4-	Type 2  -90 Rotated at 90° -270 Rotated at 270°  /pe 3  Type 3  Type 3  -90 Rotated at 90° -270 Rotated at 270°  /pe 4  Type 4  -90 Rotated at 90° -270 Rotated at 270°  Rotated at 270°  Rotated at 270°  Rotated at 270°	BLC BLC-90	Type 5 Type 5W  Auto Front Row Auto Front Row, rotated at 90° Auto Front Row, rotated at 270° Back Light Control Back Light Control rotated at 90° Back Light Control rotated at 90° Back Light Control rotated at 270°	208 240 277 347 480 UNV	120V 208V 240V 277V 347V 480V 120-277V (50/60Hz) 347-480V (50/60Hz)
Options  Dimming controls  Motion s			Motion ser	nsing lens	Photo-sensin				Electr	rical	Lum	inaire	Finish	
DCC Dual Circuit FAWS Field Adjusta LLC Integral wire BL Bi-level func DynaDimmer: Autom CS50 Security 509 CM50 Median 50%	able Wattage Seleveless module 4.6.7.17 ctionality 4.17 natic Profile Dimmir 7 hours Dimming, 7 hours	ng 64.7 4.7		•	rh #3 lens <sup>15</sup> rh #7 lens <sup>16</sup>	TLRD5 Twis TLRD7 Twis TLRPC Twis	t Loc t Loc	ntrol Button <sup>7,8</sup> k Receptacle 5 Pin <sup>9</sup> k Receptacle 7 Pin <sup>9</sup> k Receptacle cell <sup>8,10</sup>	F2 F3 Pole I FP1 FP2 FP3	Single (120, 277, 347VAC) Double (208, 240, 480VAI Canadian Double Pull (201 240, 480VAC) S12  Mount Fusing Single (120, 277, 347VAC) Double (208, 240, 480VAI Canadian Double Pull (208, 240, 480VAC) Protection (10kA standa	inclustration in the control of the	are Pole Adapter uded as standard ninal Block <sup>11</sup> nd Pole Adapter uto 3"- 3.9" O.D. pole) <sup>12</sup> rnal Housing Side Shield <sup>13</sup>	BK WH BZ DGY MGY Cus	Black White Bronze Dark Gray Medium Gray tomer specified Specify optional color or RAL (ex: RAL7024) Custom color (Must supply color chip for required factory quote)

- 1. Extended lead times apply. Contact factory for details.
- 2. Mounts to a 4-5" round pole with adapter included for square poles.
- Limited to a maximum of 45 degrees aiming above horizontal.
- 4. Not available with other dimming control options.
- 5. Not available with motion sensor.
- 6. Not available with photocontrol.
- 7. Not available in 347 or 480V.

- 8. Must specify input voltage.
- Dimming will not be connected to NEMA receptacle if ordering with other control options.
- Not available in 480V. Order photocell separately with TLRD5/7.
- 11. Not available with DCC.
- 12. Not available with SF and WS. RPAs provided with black finish standard.
- 13. HIS not available with Type 5, 5W, and BLC optics.
- 14. Limited to max. 600mA configurations.
- 15. Not available with DD, DCC, and FAWS dimming control options.
- 16. Not available with DD, DCC, FAWS and LLC dimming control options
- 17. Must specify a motion sensor lens.









# Area light

PureForm P26<sup>2</sup> Accessories (ordered separately, field installed)

Shielding Access	sories	Mounting Accessories								
House Side shie	eld	PureForm PTF2 (pole top fitter fits 23/8-21/2" OD x 4" depth tenon)								
Standard optic		PTF2-P26/34-1-90-(F) 1 luminaire at 90°								
HIS-48-H1	Internal House Side	PTF2-P26/34-2-90-(F) 2 luminaires at 90°								
	Shield for 48 LEDs (3 modules)	PTF2-P26/34-2-180-(F) 2 luminaires at 180°								
HS-64-H1	Internal House Side	PTF2-P26/34-3-90-(F) 3 luminaires at 90°								
	Shield for 64 LEDs	PTF2-P26/34-4-90-(F) 4 luminaires at 90°								
	(4 modules)	PTF2-P26/34-3-120-(F) 3 luminaires at 120°								
HIS-80-H1	Internal House Side Shield for 80 LEDs	PureForm PTF3 (pole top fitter fits 3-31/2" OD x 6" depth tenon)								
	(5 modules)	PTF3-P26/34-1-90-(F) 1 luminaire at 90°								
		PTF3-P26/34-2-90-(F) 2 luminaires at 90°								
)ptic at 90 or 2 <b>IIS-48-V</b> 1	270 orientation: Internal House Side	PTF3-P26/34-2-180-(F) 2 luminaires at 180°								
	Shield for 48 LEDs	PTF3-P26/34-3-90-(F) 3 luminaires at 90°								
	(3 modules)	PTF3-P26/34-4-90-(F) 4 luminaires at 90°								
HIS-64-V1	Internal House Side	PTF3-P26/34-3-120-(F) 3 luminaires at 120°								
	Shield for 64 LEDs (4 modules)	PureForm PTF4 (pole top fitter fits 31/2-4" OD x 6" depth tenon)								
HIS-80-V1	Internal House Side	PTF4-P26/34-1-90-(F) 1 luminaire at 90°								
	Shield for 80 LEDs	PTF4-P26/34-2-90-(F) 2 luminaires at 90°								
	(5 modules)	PTF4-P26/34-2-180-(F) 2 luminaires at 180°								
		PTF4-P26/34-3-90-(F) 3 luminaires at 90°								
		PTF4-P26/34-4-90-(F) 4 luminaires at 90°								
		PTF4-P26/34-3-120-(F) 3 luminaires at 120°								
		P26-SF-G2-(F) Slip Fitter Mount (fits to 2 3/8" O.D. tenon)								
		P26-RAM-G2-(F) Retrofit Arm mount kit								
		P26-WS-G2-(F) Wall mount with surface conduit rear entry permitted								
		P26-BD-G2 Bird deterrent								
		(F) = Specify finish								

- 1. HIS not available with Type 5, 5W, and BLC optics.
- 2. Consult Signify to confirm whether specific accessories are BAA-compliant.

# Area light

LED Wattage and Lumen Values - 3000K

		LED		Average		Type 2			Type 3		Type 4			
Ordering Code	Total LEDs	Current (mA)	Color Temp.	System Watts	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	
P26-48L-400-WW-G2-x	48	400	3000	60	7,673	B2-U0-G2	128	7,420	B1-U0-G2	124	7,698	B1-U0-G2	128	
P26-48L-500-WW-G2-x	48	500	3000	74	9,380	B2-U0-G2	126	9,070	B2-U0-G2	122	9,409	B2-U0-G2	127	
P26-48L-600-WW-G2-x	48	600	3000	89	10,967	B3-U0-G2	123	10,604	B2-U0-G2	119	10,999	B2-U0-G2	124	
P26-48L-700-WW-G2-x	48	700	3000	101	12,477	B3-U0-G2	123	12,064	B2-U0-G2	119	12,514	B2-U0-G2	124	
P26-64L-600-WW-G2-x	64	600	3000	114	14,493	B3-U0-G3	127	14,013	B2-U0-G3	123	14,536	B2-U0-G3	127	
P26-64L-700-WW-G2-x	64	700	3000	133	16,402	B3-U0-G3	124	15,859	B2-U0-G3	119	16,451	B3-U0-G3	124	
P26-64L-800-WW-G2-x	64	800	3000	153	18,384	B3-U0-G3	121	17,775	B3-U0-G3	117	18,438	B3-U0-G3	121	
P26-80L-700-WW-G2-x	80	700	3000	169	20,727	B3-U0-G3	123	20,041	B3-U0-G4	119	20,788	B3-U0-G4	123	
P26-80L-800-WW-G2-x	80	800	3000	192	22,735	B3-U0-G3	119	21,983	B3-U0-G4	115	22,803	B3-U0-G4	119	
P26-80L-900-WW-G2-x	80	900	3000	219	24,409	B3-U0-G3	111	23,602	B3-U0-G4	108	24,482	B3-U0-G4	112	

		LED		Average		Type 5			Type 5W			Type AFR		Type BLC		
Ordering Code	Total LEDs	Current (mA)	Color Temp.	System Watts	Lumen Output	BUG Rating	Efficacy (LPW)									
P26-48L-400-WW-G2-x	48	400	3000	60	7,916	B3-U0-G2	132	7,948	B3-U0-G2	132	7,854	B2-U0-G1	131	5,872	B0-U0-G2	98
P26-48L-500-WW-G2-x	48	500	3000	74	9,674	B3-U0-G2	130	9,716	B4-U0-G2	131	9,599	B2-U0-G2	129	7,178	B0-U0-G2	97
P26-48L-600-WW-G2-x	48	600	3000	89	11,308	B4-U0-G2	127	11,359	B4-U0-G2	128	11,223	B3-U0-G2	126	8,392	B1-U0-G2	94
P26-48L-700-WW-G2-x	48	700	3000	101	12,863	B4-U0-G2	127	12,923	B4-U0-G2	128	12,769	B3-U0-G2	126	9,548	B1-U0-G2	94
P26-64L-600-WW-G2-x	64	600	3000	114	14,940	B4-U0-G2	131	15,011	B4-U0-G2	131	14,832	B3-U0-G2	130	11,091	B1-U0-G2	97
P26-64L-700-WW-G2-x	64	700	3000	133	16,907	B4-U0-G2	127	16,988	B5-U0-G3	128	16,786	B3-U0-G2	126	12,552	B1-U0-G2	95
P26-64L-800-WW-G2-x	64	800	3000	153	18,949	B4-U0-G2	124	19,041	B5-U0-G3	125	18,814	B3-U0-G2	123	14,068	B1-U0-G3	92
P26-80L-700-WW-G2-x	80	700	3000	169	21,363	B5-U0-G3	127	21,468	B5-U0-G3	127	21,212	B3-U0-G2	126	15,861	B1-U0-G3	94
P26-80L-800-WW-G2-x	80	800	3000	192	23,463	B5-U0-G3	122	23,548	B5-U0-G3	123	23,267	B3-U0-G2	121	17,398	B1-U0-G3	91
P26-80L-900-WW-G2-x	80	900	3000	219	25,202	B5-U0-G3	115	25,282	B5-U0-G4	115	24,981	B3-U0-G2	114	18,679	B1-U0-G3	85

### LED Wattage and Lumen Values - 4000K

		LED		Average		Type 2			Type 3			Type 4	
Ordering Code	Total LEDs	Current (mA)	Color Temp.	System Watts	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
P26-48L-400-NW-G2-x	48	400	4000	60	8798	B2-U0-G2	146	8509	B2-U0-G2	142	8827	B2-U0-G2	147
P26-48L-500-NW-G2-x	48	500	4000	74	10755	B2-U0-G2	145	10401	B2-U0-G2	140	10789	B2-U0-G2	145
P26-48L-600-NW-G2-x	48	600	4000	89	12574	B3-U0-G2	141	12160	B2-U0-G2	137	12614	B2-U0-G3	142
P26-48L-700-NW-G2-x	48	700	4000	101	14305	B3-U0-G3	142	13834	B2-U0-G3	137	14351	B2-U0-G3	142
P26-64L-600-NW-G2-x	64	600	4000	114	16617	B3-U0-G3	145	16069	B2-U0-G3	141	16670	B3-U0-G3	146
P26-64L-700-NW-G2-x	64	700	4000	133	18806	B3-U0-G3	142	18186	B3-U0-G3	137	18866	B3-U0-G4	142
P26-64L-800-NW-G2-x	64	800	4000	153	21078	B3-U0-G3	138	20383	B3-U0-G4	134	21145	B3-U0-G4	139
P26-80L-700-NW-G2-x	80	700	4000	169	23764	B3-U0-G3	141	22981	B3-U0-G4	136	23840	B3-U0-G4	141
P26-80L-800-NW-G2-x	80	800	4000	192	26067	B3-U0-G3	136	25208	B3-U0-G4	132	26150	B3-U0-G4	137
P26-80L-900-NW-G2-x	80	900	4000	219	27986	B3-U0-G3	128	27064	B3-U0-G4	123	28076	B3-U0-G4	128

Values from photometric tests performed in accordance with IESNA LM-79 and are representative of the configurations shown. Actual performance may vary due to installation and environmental variables, LED and driver tolerances, and field measurement considerations. It is highly recommended to confirm performance with a photometric layout.

 $NOTE: Some\ data\ may\ be\ scaled\ based\ on\ tests\ of\ similar\ (but\ not\ identical)\ luminaires.\ Contact\ factory\ for\ configurations\ not\ shown.$ 

# Area light

LED Wattage and Lumen Values - 4000K (continued)

		LED		Average		Type 5			Type 5W			Type AFR			Type BLC	
Out of a Code	Total	Current	Color	System	Lumen	BUG	Efficacy									
Ordering Code	LEDs	(mA)	Temp.	Watts	Output	Rating	(LPW)									
P26-48L-400-NW-G2-x	48	400	4000	60	9068	B3-U0-G2	151	9114	B4-U0-G2	152	9006	B2-U0-G1	150	6735	B0-U0-G2	112
P26-48L-500-NW-G2-x	48	500	4000	74	11083	B4-U0-G2	149	11141	B4-U0-G2	150	11009	B3-U0-G2	148	8233	B1-U0-G2	111
P26-48L-600-NW-G2-x	48	600	4000	89	12954	B4-U0-G2	146	13025	B4-U0-G2	146	12871	B3-U0-G2	145	9626	B1-U0-G2	108
P26-48L-700-NW-G2-x	48	700	4000	101	14736	B4-U0-G2	146	14819	B4-U0-G2	147	14643	B3-U0-G2	145	10951	B1-U0-G2	108
P26-64L-600-NW-G2-x	64	600	4000	114	17116	B4-U0-G2	150	17214	B5-U0-G3	151	17009	B3-U0-G2	149	12721	B1-U0-G2	111
P26-64L-700-NW-G2-x	64	700	4000	133	19369	B5-U0-G3	146	19481	B5-U0-G3	147	19249	B3-U0-G2	145	14396	B1-U0-G3	108
P26-64L-800-NW-G2-x	64	800	4000	153	21708	B5-U0-G3	142	21834	B5-U0-G3	143	21575	B3-U0-G2	141	16136	B1-U0-G3	106
P26-80L-700-NW-G2-x	80	700	4000	169	24474	B5-U0-G3	145	24617	B5-U0-G4	146	24325	B3-U0-G2	144	18192	B1-U0-G3	108
P26-80L-800-NW-G2-x	80	800	4000	192	26880	B5-U0-G3	140	27003	B5-U0-G4	141	26682	B3-U0-G3	139	19955	B1-U0-G3	104
P26-80L-900-NW-G2-x	80	900	4000	219	28872	B5-U0-G3	132	28991	B5-U0-G4	132	28647	B4-U0-G3	131	21425	B1-U0-G4	98

### LED Wattage and Lumen Values - 5000K

		LED		Average		Type 2			Type 3			Type 4	
Ordering Code	Total LEDs	Current (mA)	Color Temp.	System Watts	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)	Lumen Output	BUG Rating	Efficacy (LPW)
P26-48L-400-CW-G2-x	48	400	5000	60	8,237	B2-U0-G2	137	7,965	B1-U0-G2	133	8,262	B2-U0-G2	138
P26-48L-500-CW-G2-x	48	500	5000	74	10,069	B2-U0-G2	135	9,736	B2-U0-G2	131	10,100	B2-U0-G2	136
P26-48L-600-CW-G2-x	48	600	5000	89	11,772	B3-U0-G2	132	11,383	B2-U0-G2	128	11,807	B2-U0-G2	133
P26-48L-700-CW-G2-x	48	700	5000	101	13,393	B3-U0-G2	133	12,950	B2-U0-G2	128	13,433	B2-U0-G3	133
P26-64L-600-CW-G2-x	64	600	5000	114	15,557	B3-U0-G3	136	15,042	B2-U0-G3	132	15,603	B2-U0-G3	137
P26-64L-700-CW-G2-x	64	700	5000	133	17,607	B3-U0-G3	133	17,024	B3-U0-G3	128	17,659	B3-U0-G3	133
P26-64L-800-CW-G2-x	64	800	5000	153	19,734	B3-U0-G3	129	19,080	B3-U0-G3	125	19,792	B3-U0-G4	130
P26-80L-700-CW-G2-x	80	700	5000	169	22,248	B3-U0-G3	132	21,512	B3-U0-G4	128	22,315	B3-U0-G4	132
P26-80L-800-CW-G2-x	80	800	5000	192	24,404	B3-U0-G3	127	23,597	B3-U0-G4	123	24,477	B3-U0-G4	128
P26-80L-900-CW-G2-x	80	900	5000	219	26,201	B3-U0-G3	119	25,335	B3-U0-G4	115	26,280	B3-U0-G4	120

		LED		Average		Type 5			Type 5W			Type AFR			Type BLC	
Ordering Code	Total LEDs	Current (mA)	Color Temp.	System Watts	Lumen Output	BUG Rating	Efficacy (LPW)									
P26-48L-400-CW-G2-x	48	400	5000	60	8,497	B3-U0-G2	141	8,532	B4-U0-G2	142	8,430	B2-U0-G1	140	6,304	B0-U0-G2	105
P26-48L-500-CW-G2-x	48	500	5000	74	10,384	B4-U0-G2	140	10,429	B4-U0-G2	140	10,305	B2-U0-G2	139	7,705	B1-U0-G2	104
P26-48L-600-CW-G2-x	48	600	5000	89	12,138	B4-U0-G2	136	12,193	B4-U0-G2	137	12,047	B3-U0-G2	135	9,008	B1-U0-G2	101
P26-48L-700-CW-G2-x	48	700	5000	101	13,808	B4-U0-G2	137	13,872	B4-U0-G2	137	13,706	B3-U0-G2	136	10,249	B1-U0-G2	101
P26-64L-600-CW-G2-x	64	600	5000	114	16,037	B4-U0-G2	140	16,113	B5-U0-G3	141	15,921	B3-U0-G2	139	11,905	B1-U0-G2	104
P26-64L-700-CW-G2-x	64	700	5000	133	18,149	B4-U0-G2	137	18,236	B5-U0-G3	137	18,018	B3-U0-G2	136	13,473	B1-U0-G3	101
P26-64L-800-CW-G2-x	64	800	5000	153	20,340	B5-U0-G3	133	20,439	B5-U0-G3	134	20,195	B3-U0-G2	132	15,101	B1-U0-G3	99
P26-80L-700-CW-G2-x	80	700	5000	169	22,932	B5-U0-G3	136	23,044	B5-U0-G3	137	22,769	B3-U0-G2	135	17,026	B1-U0-G3	101
P26-80L-800-CW-G2-x	80	800	5000	192	25,186	B5-U0-G3	131	25,277	B5-U0-G4	132	24,975	B3-U0-G2	130	18,675	B1-U0-G3	97
P26-80L-900-CW-G2-x	80	900	5000	219	27,053	B5-U0-G3	123	27,138	B5-U0-G4	124	26,815	B3-U0-G3	122	20,051	B1-U0-G3	91

Values from photometric tests performed in accordance with IESNA LM-79 and are representative of the configurations shown. Actual performance may vary due to installation and environmental variables, LED and driver tolerances, and field measurement considerations. It is highly recommended to confirm performance with a photometric layout.

NOTE: Some data may be scaled based on tests of similar (but not identical) luminaires. Contact factory for configurations not shown.

# Area light

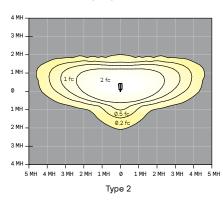
### **Predicted Lumen Depreciation Data**

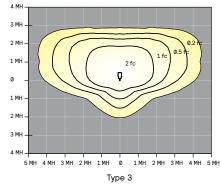
Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions.  $L_{70}$  is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published  $L_{70}$  hours limited to 6 times actual LED test hours

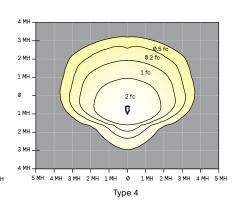
Ambient Temperature °C	Driver mA	Calculated L <sub>70</sub> Hours	L <sub>70</sub> per TM-21	Lumen Maintenance % at 60,000 hrs
25°C	up to 900 mA	>100,000 hours	>60,000 hours	>88%

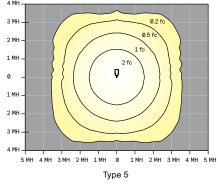
### **Optical Distributions**

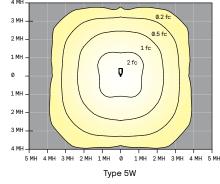
Based on 20' mounting height

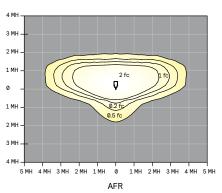


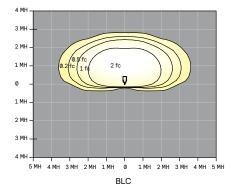








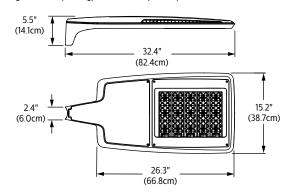




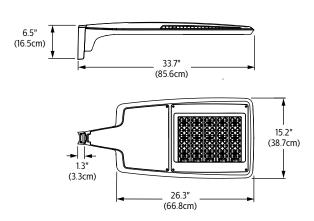
# Area light

### **Dimensions**

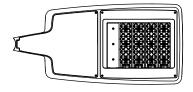
Standard Arm (AR) Weight: 27 Lbs (12.4 Kg) EPA: 0.26ft² (.024m²)



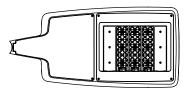
Retrofit Arm (RAM) Weight: 28 Lbs (12.7 Kg) EPA: 0.28ft² (.026m²)



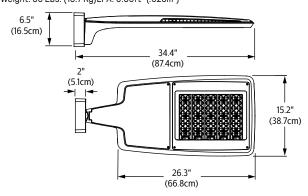
4 module configuration



3 module configuration

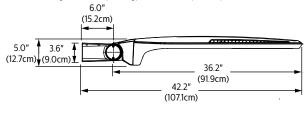


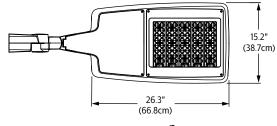
Wall (WS)
Weight: 30 Lbs. (13.7 Kg)EPA: 0.30ft<sup>2</sup> (.028m<sup>2</sup>)

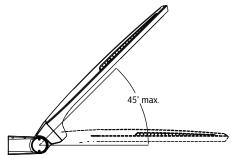


Slip fitter (SF)

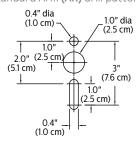
Weight: 32 Lbs (14.6 Kg) EPA: 0.38ft<sup>2</sup> (.035m<sup>2</sup>)



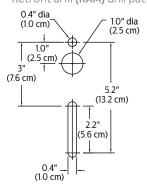




Standard Arm (AR) drill pattern



Retrofit arm (RAM) drill pattern

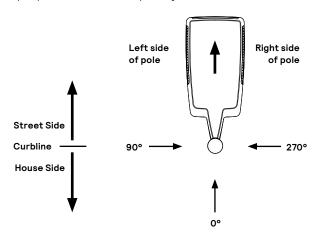


## Area light

### **Optical Orientation Information**

### **Standard Optic Position**

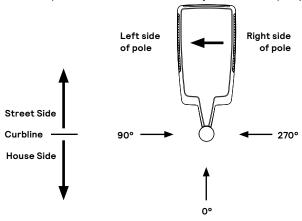
Luminaires ordered with asymmetric optical systems in the standard optic position will have the optical system oriented as shown below:



Note: The hand hole will normally be located on the pole at the 0° point.

### Optic Rotated Left (90°) Optic Position

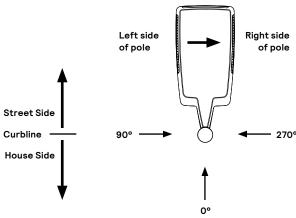
Luminaires ordered with optical systems in the Optic Rotated Left (90°) optic position will have the optical system oriented as shown below (Type 5 and 5W optics are not available with factory set rotatable optics):



Note: The hand hole will normally be located on the pole at the 0° point.

### Optic Rotated Right (270°) Optic Position

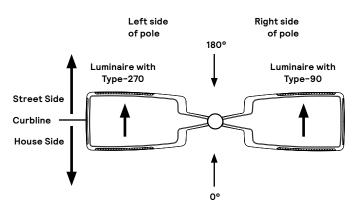
Luminaires ordered with optical systems in the Optic Rotated Right (270°) optic position will have the optical system oriented as shown below (Type 5 and 5W optics are not available with factory set rotatable optics):



Note: The hand hole will normally be located on the pole at the 0° point.

## Twin Luminaire Assemblies with Type-90/Type-270 Rotated Optical Systems

Twin luminaire assemblies installed with rotated optical systems are an excellent way to direct light toward the interior of the site (Street Side) without additional equipment. It is important, however, that care be exercised to insure that luminaires are installed in the proper location.



Luminaires with Optic Rotated Right (270°) are installed on the LEFT Side of Pole Luminaires with Optic Rotated Left (90°) are installed on the RIGHT Side of Pole

Note: The hand hole location will depend on the drilling configuration ordered for the pole.

## Area light

### **Specifications**

#### Housing

Two-piece sealed enclosure with main part of the housing designed as the structural and heat sink frame enclosed by cover to give its unique form. It also includes integral arm and separate, self-retained hinged, one-piece die cast door frame. All die-cast parts made of low copper die cast aluminum alloy for a high resistance to corrosion. The sleek profile with optimized surface area allows housing to provide excellent convection heat transfer with minimum use of heat fins, giving the freedom to have a clean minimalist aesthetic design. Luminaire housing rated to IP66, tested in accordance to Section 9 of IEC 60598-1.

### Vibration resistance

Luminaire is tested and rated 3G over 100,000 cycles conforming to standards set forth by ANSI C136.31-2010. Testing includes vibration in three axes, all performed on the same luminaire.

### Light engine

Light engine comprises of a module of 16-LED aluminum metal clad board fully sealed with optics offered in multiples of 3, 4 and 5 modules or 48, 64 and 80 LEDs. Module is RoHS compliant. Color temperatures: 3000K +/- 125K, 4000K, 5000K +/- 200K. Minimum CRI of 70. Also available in 2700K, 3500K, and Direct Amber with extended lead times. Direct Amber LED is narrow spectrum with dominant wavelength at 596 nm (peak wavelength at 601 nm). Contact factory for details. LED light engine is rated IP66 in accordance to Section 9 of IEC 60598-1.

### **Energy saving benefits**

System efficacy up to 150 lms/W with significant energy savings over Pulse Start Metal Halide luminaires. Optional control options provide added energy savings during unoccupied periods.

#### Optical systems

Type 2, 3, 4, 5, 5W, and AFR distributions available. Internal Shield option mounts to LED optics and is available with Type 2, 3, 4, and AFR distributions including a dedicated BLC optic to provide the best backlight control possible for those stringent requirements around property lines. Types 2, 3, 4, AFR, and BLC when specified and used as rotated, are factory set only. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (U0 per IESNA TM-15).

### Mounting

Standard luminaire arm mounts to 4" O.D. round poles. Can also be used with 5" O.D. poles. Square pole adapter included with every luminaire. Round Pole Adapter (RPA) required for 3-3.9" poles. PureForm features a retrofit arm kit. When specified with the retrofit arm (RAM) option, PureForm seamlessly simplifies site conversions to LED by eliminating the need for additional pole drilling on most existing poles. RAM will be boxed separately. Also optional are slipfitter and wall mounting accessories. Note that only fixed mounts (AR, RAM, WS) are required to meet IDA compliance. SF mounting will not meet IDA.

### Control options

 $\mbox{O-10V}$  dimming (DD): Access to  $\mbox{O-10V}$  dimming leads supplied through back of luminaire (for secondary dimming controls by others). Cannot be used with other control options.

**Dual Circuit Control (DCC):** Luminaire equipped with the ability to have two separate circuits controlling drivers and light engines independently. Permits separate switching of separate modules controlled by use of two sets of leads, one for each circuit. Not recommended to be used with other control options, motion response, or photocells.

Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest position at the lumen output selected. Use chart below to estimate reduction in lumen output desired. Cannot be used with other control options or motion response.

FAWS Position	Percent of Typical Lumen Output
1	25%
2	50%
3	55%
4	65%
5	75%
6	80%
7	85%
8	90%
9	95%
10	100%

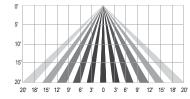
Note: Typical value accuracy +/- 5%

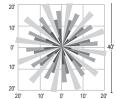
Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profiles provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. Dimming profiles include two dimming settings including dim to 30% or 50% of the total lumen output. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic diming profile schedule. Automatic dimming profile scheduled with the following settings:

- CS50/CS30: Security for 7 hours night duration (Ex., 11 PM 6 AM)
- CM50/CM30: Median for 8 hours night duration (Ex., 10 PM 6 AM) All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1 or 2 hours before depending of the duration of dimming. Cannot be used with other dimming control options.

Wireless system (LLC): Optional wireless controller integral to luminaire ready to be connected to a Limelight system (sold by others). The system allows you to wirelessly manage the entire site, independent lighting groups or individual luminaires while on-site or remotely. Based on a high-density mesh network with an easy to use web-based portal, you can conveniently access, monitor and manage your lighting network remotely. Wireless controls can be combined with site and area, pedestrian, and parking garage luminaires as well, for a completely connected outdoor solution. Equipped with motion response with #3 lens for 8-25' mounting heights.

### LLC-IMRI3 Luminaire with #3 lens





### Motion response options

Bi-Level Infrared Motion Response (BL-IMRI): Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL-IMRI is set/operates in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/ light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. This can also be done with FSIR-100 Wireless Remote Programming Tool (contact Technical Support for details).

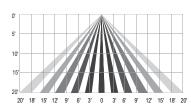
## Area light

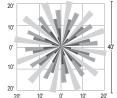
### Specifications (cont'd)

Infrared Motion Response with Other Controls: When used in combination with other controls (Automatic Dimming Profile), motion response device will simply override controller's schedule with the added benefits of a combined dimming profile and sensor detection. In this configuration, the motion response device cannot be re-programmed with FSIR-100 Wireless Remote Programming Tool. The profile can only be re-programmed via the controller.

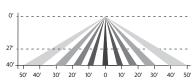
Infrared Motion Response Lenses (IMRI3/IMRI7): Infrared Motion Response Integral module is available with two different sensor lens types to accommodate various mounting heights and occupancy detection ranges. Lens #3 (IMRI3) is designed for mounting heights up to 20' with a 40' diameter coverage area. Lens #7 is designed for higher mounting heights up to 40' with larger coverage areas up to 100' diameter coverage area. See charts for approximate detection patterns:

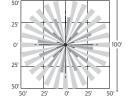
### IMRI3 Luminaire with #3 lens





IMRI7 Luminaire with #7 lens





### Electrical

Twist-Lock Receptacle (TLRD5/TLRD7/ TLRPC): Twist Lock Receptacle with 5 pins enabling dimming or with 7 pins with additional functionality (by others) can be used with a twistlock photoelectric cell or a shorting cap. Dimming Receptacle Type B (5-pin) and Type D-24 (7-pin) in accordance to ANSI C136.41. Can be used with third-party control system. Receptacle located on top of luminaire housing. When specifying receptacle with twistlock photoelectric cell, voltage must be specified. When ordering Twist-lock receptacle (TLRD5 or TLRD7), photocell or shorting cap is not included. TLRPC is shipped standard with 5 pin.

**Driver:** Driver efficiency (>90% standard). 120-480V available (restrictions apply). Open/short circuit protection. Optional 0-10V dimming to 10% power. RoHS compliant.

**Button Photocontrol (PCB):** Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208–277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Surge protection (SP1/SP2): Surge protection device tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/10kA waveforms for Line-Ground, Line-Neutral and Neutral-Ground, and in accordance with DOE MSSLC Model Specification for LED Roadway Luminaires Appendix D Electrical Immunity High test level 10kV/10kA. 20kV / 10kA surge protection device that provides extra protection beyond the SP1 10kV/10kA level

### Listings

UL/cUL wet location listed to the UL 1598 standard, suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Most PureForm P26 configurations are qualified under Premium DesignLights Consortium® category. Consult DLC Qualified Products list to confirm your specific luminaire selection is approved. CCTs 3000K and warmer are Dark Sky Approved.

#### Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DGY), and medium gray (MGY). Consult factory for specs on optional or custom colors.

#### Warranty

PureForm luminaires feature a 5-year limited warranty.
See <a href="mailto:signify.com/warranties">signify.com/warranties</a> for complete details and exclusions.

### Buy American Act of 1933 (BAA):

This product is manufactured in one of our US factories and, as of the date of this document, this product was considered a commercially available off-the-shelf (COTS) item meeting the requirements of the BAA. This BAA designation hereunder does not address (i) the applicability of, or availability of a waiver under, the Trade Agreements Act, or (ii) the "Buy America" domestic content requirements imposed on states, localities, and other non-federal entities as a condition of receiving funds administered by the Department of Transportation or other federal agencies. Prior to ordering, please visit <a href="https://www.signify.com/baa">www.signify.com/baa</a> to view a current list of BAA-compliant products to confirm this product's current compliance.



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## by (s) ignify

## **Wall Mount**

### **PureForm**





Gardco PureForm LED wall sconce PWS features narrow spectrum amber LEDs combined with special shielding, making it a wildlife friendly lighting solution. Multiple distribution and shielding options are available to achieve maximum control. A full range of control options provides additional energy savings.

TYPE W:

PWS-48L-400-AM-G2-3-UNV-PCB-F1-BK

Project:	
Location:	
Cat.No:	
Туре:	
Lamps:	Qty:
Notes:	

### Ordering guide

### example: PWS-48L-500-AM-G2-2-UNV-FWC-DGY

	Number	Drive	LED Color -			Options				
Prefix PWS	of LEDs	Current	Generation	Distribution	Voltage	Dimming controls	Motion-sensing lens	Photo-sensing	Electrical & Shield	Finish
PWS Pure- Form wall sconce	48L 48 LEDS	400 400 mA 600 600 mA	AM-G2 Direct Amber (590nm) Generation 2 <sup>2</sup>	2 Type 2 3 Type 3 4 Type 4	UNV 120-277V HVU 347-480V 120 120V 208 208V 240 240V 277 277V 347 347V 480 480V	DD 0-10V External dimming (controls by others) <sup>4</sup> DCC Dual Circuit Control <sup>4,5,6,9</sup> FAWS Field Adjustable Wattage Selector <sup>4,5</sup> SW Interface Module for SiteWise <sup>3,4,6</sup> BL Bi-level functionality <sup>4,10</sup> DynaDimmer: Automatic Profile Dimming <sup>4,7</sup> CS50 Security 50% Dimming, 7 hours CM50 Median 50% Dimming, 9 hours DA50 All Night 50% Dimming, 7 hours CM30 Security 30% Dimming, 7 hours CM30 Median 30% Dimming, 8 hours CM30 Median 30% Dimming, 9 hours DA50 All Night 50% Dimming, 9 hours CM30 All Night 30% Dimming, 9 hours DA30 All Night 30% Dimming, 9 hours DA30 All Night 30% Dimming	IMRI2 <sup>11</sup> Integral with #2 Iens IMRI3 <sup>15</sup> Integral with #3 Iens	PCB Photocontrol Button 7.8.12	Fusing F1 Single (120, 277, 347VAC) s F2 Double (208, 240, 480VAC) s F3 Canadian Double Pull (208, 240, 480VAC) s Surge Protection (10kA is standard) SP2 Increased 20kA FWC Wildlife Friendly External House side shield 1	Textured BK Black WH White BZ Bronze DGY Dark Gray MGY Medium Gray  Customer specified RAL Specify optional color or RAL (ex: RAL7024) CC Custom color (Must supply color chip for required factory quote)

- 1. External shield shipped with luminaire.
- 2. Extended lead times apply. Contact factory for details.
- 3. Available only in 120 or 277V.
- 4. Not available with other dimming control options.
- 5. Not available with motion sensor.
- 6. Not available with photocontrol.7. Not available in 347 or 480V.
- 8. Must specify input voltage.
- 9. Not available with 64L.

- 10. Must specify a motion sensor lens.
- 11. Not available with DD, DCC, and FAWS dimming control options.





## wall mount

### Luminaire Accessories (order separately)

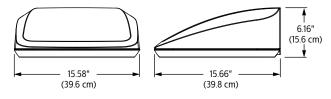
### **Mounting Accessories** System accessories Wall Mount Wireless system remote mount module PWS-WS-G2 Wall Mounted Box for LLCR2-(F) #2 lens - specify finish in place of (F) Surface Conduit Painted LLCR3-(F) #3 lens - specify finish in place of (F) Black **Central Remote Motion Response** (used connected to SiteWise main panel) MS2-A-FVR-3 \_\_ 1/2 - 14 NPSM CONDUIT BACKFEED MS2-A-FVR-7 3/4 - 14 NPSM \_ CONDUIT BACKFEED 3/4 - 14 NPSM \_ CONDUIT TOP FEED — 3/4 - 14 NPSM CONDUIT TOP FEED FOUR Ø0.38" (Ø0.95cm) HOLES FOR MOUNTING

### Wireless system remote controller accessory

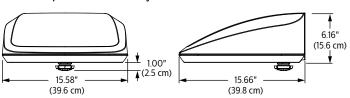
Wireless system offers a remote radio/sensor module that allows connection to a Limelight system (sold by others). Remote module can be mounted to wall or pole with j-box supplied. May be specified by choosing one of two different lenses to accommodate a variety of mounting heights/sensor detection ranges. Must specify option DD on luminaires that are planned to be used with remote mount controllers.

### **Dimensions**

### Standard Luminaire



### Motion Response and Wireless System









3 modules



Luminaire Weights	
PureForm LED wall sconce PWS	Weight
Luminaire	24 lbs

## wall mount

### LED Wattage and Lumen Values - Unshielded

		LED	Dominant	Average		Type 2			Туре 3		Type 4		
	LED	Current	Wavelength	System	Lumen	Efficacy	BUG	Lumen	Efficacy	BUG	Lumen	Efficacy	BUG
Ordering Code	Qty	(mA)	(nm)	Wattage (W)	Output	(Lm/W)	Rating	Output	(Lm/W)	Rating	Output	(Lm/W)	Rating
PWS-48L-400-AM-G2-x	48	400	596	48	2834	59	B1-U0-G1	2740	57	B1-U0-G1	2843	60	B1-U0-G1
PWS-48L-600-AM-G2-x	48	600	596	73	3316	46	B1-U0-G1	3207	44	B1-U0-G1	3327	46	B1-U0-G1
PWS-64L-600-AM-G2-x	64	600	596	94	4367	46	B1-U0-G1	4223	45	B1-U0-G1	4381	46	B1-U0-G1

### LED Wattage and Lumen Values - Shielded

		LED	Dominant	Average		2-FWC			3-FWC			4-FWC	
	LED	Current	Wavelength	System	Lumen	Efficacy	BUG	Lumen	Efficacy	BUG	Lumen	Efficacy	BUG
Ordering Code	Qty	(mA)	(nm)	Wattage (W)	Output	(Lm/W)	Rating	Output	(Lm/W)	Rating	Output	(Lm/W)	Rating
PWS-48L-400-AM-G2-x	48	400	596	48	1094	23	B1-U0-G0	1058	22	B1-U0-G0	1098	23	B1-U0-G0
PWS-48L-600-AM-G2-x	48	600	596	73	1280	18	B1-U0-G0	1238	17	B1-U0-G0	1284	18	B1-U0-G0
PWS-64L-600-AM-G2-x	64	600	596	94	1686	18	B1-U0-G0	1630	17	B1-U0-G0	1691	18	B1-U0-G0

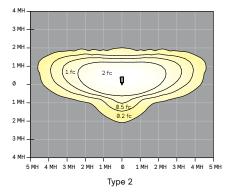
### **Predicted Lumen Depreciation Data**

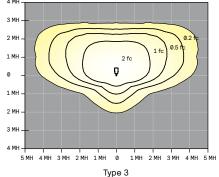
Predicted performance derived from LED manufacturer's data and engineering design estimates, based on IESNA LM-80 methodology. Actual experience may vary due to field application conditions.  $L_{70}$  is the predicted time when LED performance depreciates to 70% of initial lumen output. Calculated per IESNA TM21-11. Published  $L_{70}$  hours limited to 6 times actual LED test hours

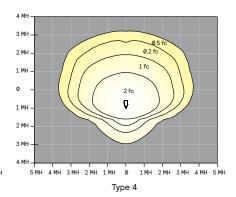
Ambient Temperature °C	Drive current	Calculated L <sub>70</sub> Hours	L <sub>70</sub> per TM-21	Lumen Maintenance % at 60,000 hrs
25°C	up to 600 mA	>100,000 hours	>60,000 hours	>88%

### **Optical Distributions**

Based on 20' mounting height







### wall mount

### **Specifications**

#### Housing

Main body housing and door frame made of low copper die cast aluminum alloy for a high resistance to corrosion. Door hinges secured by aircraft cable to allow access to driver or other electronic components for servicing. The door frame acts as the main heat transfer component and it is optimized to allowing the main housing to have no fins, giving the freedom to have a clean minimalist aesthetic design while allowing it to house emergency battery backup equipment and various other options. Luminaire housing rated to IP65, tested in accordance to Section 9 of IEC 60598-1.

### Light engine

Light engine comprises of a module of 16-LED aluminum metal clad board fully sealed with optics offered in multiples of 3 and 4 modules or 48 and 64 LEDs. Module is RoHS compliant. Direct Amber LED is narrow spectrum with dominant wavelength at 596 nm (peak wavelength at 601 nm). Contact factory for details. LED light engine is rated IP66 in accordance to Section 9 of IEC 60598-1.

### Optical systems

Type 2, 3, and 4 distributions available. Performance tested per LM-79 and TM-15 (IESNA) certifying its photometric performance. Luminaire designed with 0% uplight (U0 per IESNA TM-15).

#### Mounting

Mounting is completed through integral back plate that features a separate recessed feature for hook and lock quick mount plate that secures with two set screws from bottom of luminaire. Luminaire ships fully assembled, ready to install.

### Control options

**0-10V dimming (DD):** Access to 0-10V dimming leads supplied through back of luminaire (for secondary dimming controls by others). Cannot be used with other control options.

Field Adjustable Wattage Selector (FAWS): Luminaire equipped with the ability to manually adjust the wattage in the field to reduce total luminaire lumen output and light levels. Comes pre-set to the highest position at the lumen output selected. Use chart below to estimate reduction in lumen output desired. Cannot be used with other control options or motion response.

FAWS Position	Percent of Typical Lumen Output
1	25%
2	50%
3	55%
4	65%
5	75%
6	80%
7	85%
8	90%
9	95%
10	100%

Note: Typical value accuracy +/- 5%

SiteWise (SW): SiteWise system includes a controller fully integrated in the luminaire that enables the luminaires to communicate with a dimming signal transmitter cabinet located on site using patented central dimming technology. A locally accessible mobile app allows users to access the system and set functionalities such as ON/OFF, dimming levels and scheduling. SiteWise is available with motion response options in order to bring the light back to 100% when motion is detected. Cannot be used with other control options or photocell options. Additional functionalities are available such as communication with indoor lighting and connection to BMS systems. Complete information on the control system can be found on the SiteWise website at philips.com/sitewise.

Automatic Profile Dimming (CS/CM/CE/CA): Standard dimming profile of 30% or 50% provide flexibility towards energy savings goals while optimizing light levels during specific dark hours. When used in combination with not programmed motion response it overrides the controller's schedule when motion is detected. After 5 minutes with no motion, it will return to the automatic diming profile schedule. Automatic dimming profile scheduled with the following settings:

- CS50/CS30: Security for 7 hours night duration (Ex., 11 PM 6 AM)
- CM50/CM30: Median for 8 hours night duration (Ex., 10 PM 6 AM)
- CE50/CE30: Economy for 9 hours night duration (Ex., 9 PM 6 AM)
- CA50/CA30: for all night (during all dark hours)

All above profiles are calculated from mid point of the night. Dimming is set for 6 hours after the mid point and 1, 2, or 3 hours before depending of the duration of dimming. Cannot be used with other dimming control options.

### wall mount

Specifications (cont'd)

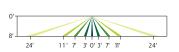
Motion response options

**Bi-Level Infrared Motion Response (BL-IMRI3):** Motion Response module is mounted integral to luminaire factory pre-programmed to 50% dimming when not ordered with other control options. BL-IMRI is set/operates in the following fashion: The motion sensor is set to a constant 50%. When motion is detected by the PIR sensor, the luminaire returns to full power/light output. Dimming on low is factory set to 50% with 5 minutes default in "full power" prior to dimming back to low. When no motion is detected for 5 minutes, the motion response system reduces the wattage by 50%, to 50% of the normal constant wattage reducing the light level. Other dimming settings can be provided if different dimming levels are required. This can also be done with FSIR-100 Wireless Remote Programming Tool (contact Technical Support for details).

Infrared Motion Response with Other Controls (SW-IMRI3): When used in combination with other controls (Automatic Dimming Profile and SiteWise), motion response device will simply override controller's schedule with the added benefits of a combined dimming profile and sensor detection. In this configuration, the motion response device cannot be re-programmed with FSIR-100 Wireless Remote Programming Tool. The profile can only be reprogrammed via the controller.

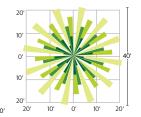
Infrared Motion Response Lenses (IMRI2/IMRI3): Infrared Motion Response Integral module is available with two different sensor lens types to accommodate various mounting heights and occupancy detection ranges. Lens #2 (IMRI2) is designed for lower mounting heights up to 8' with larger coverage areas up to 44' diameter coverage area. Lens #3 (IMRI3) is designed for mounting heights up to 20' with a 40' diameter coverage area. See charts for approximate detection patterns:

IMRI2 Luminaire or remote mount controller with #2 lens



IMRI3 Luminaire or remote mount controller with #3 lens





#### Electrical

**Driver:** Driver efficiency (>90% standard). 120-480V available (restrictions apply). Open/short circuit protection. Optional 0-10V dimming to 10% power. RoHS compliant.

**Button Photocontrol (PCB):** Button style design for internal luminaires mounting applications. The photocontrol is constructed of a high impact UV stabilized polycarbonate housing. Rated voltage of 120V or 208–277V with a load rating of 1000 VA. The photocell will turn on with 1-4Fc of ambient light.

Surge protection (SP1/SP2): Each luminaire is provided as standard with surge protector tested in accordance with ANSI/IEEE C62.45 per ANSI/IEEE C62.41.2 Scenario I Category C High Exposure 10kV/5kA waveforms for Line Ground, Line Neutral and Neutral Ground, and in accordance with U.S. DOE (Department of Energy) MSSLC (Municipal Solid-State Street Lighting Consortium) Model Specification for LED Roadway Luminaires Appendix D Electrical Immunity High Test Level 10kV / 5kA. Optional 20kV is available for additional protection.

#### Listings

UL/cUL listed to the UL 1598 standard, suitable for wet locations when mounted downward facing. Also listed for damp locations when inverted upward facing when mounted in covered ceiling application. Suitable for use in ambient temperatures from -40° to 40°C (-40° to 104°F). Florida Wildlife Certified

#### Finish

Each standard color luminaire receives a fade and abrasion resistant, electrostatically applied, thermally cured, triglycidal isocyanurate (TGIC) textured polyester powdercoat finish. The surface treatment achieves a minimum of 1000 hours for salt spray resistant finish in accordance with testing performed and per ASTM B117 standard. Standard colors include bronze (BZ), black (BK), white (WH), dark gray (DGY), and medium gray (MGY). Consult factory for specs on optional or custom colors.

### Warranty

44 ft

PureForm luminaires feature a 5-year limited warranty. See signify.com/warranties for complete details and exclusions.

