SYMBOL	DESCRIPTION
	GENERAL
N1 / EL003	NOTE NUMBER / LOCATION OF NOTE ON EL003
L01 / EL006	DETAIL NUMBER / LOCATION SHEET OR DETAIL SHEET
N	NORTH ARROW ARROW INDICATES PROJECT NORTH
	ARCHITECTURAL ROOM NUMBER
	ARCHITECTURAL DOOR NUMBER
	DETAIL SYMBOL ARROW
	BURIED CONDUIT OR CABLE – EXISTING
	BURIED CONDUIT OR CABLE – NEW
	EXPOSED CONDUIT OR CABLE – EXISTING
	EXPOSED CONDUIT OR CABLE – NEW
	CONDUIT OR CABLE TURNING UP – EXISTING
	CONDUIT OR CABLE TURNING UP – NEW
	CONDUIT OR CABLE TURNING DOWN – EXISTING
	CONDUIT OR CABLE TURNING DOWN – NEW
MH	MANHOLE
HH	HAND HOLE
EX	EXPLOSION PROOF
WP	WEATHERPROOF
H	HYDRO POLE
ø2"	CONDUIT STUB–UP (ø2" DENOTES CONDUIT SIZE)
	POWER AND CONTROL
P1	RECEPTACLE AND/OR LIGHTING PANELBOARD – SURFACE MOUNTED
P1	RECEPTACLE AND/OR LIGHTING PANELBOARD – RECESSED
PP1	POWER AND/OR DISTRIBUTION PANELBOARD – SURFACE MOUNTED
PP1	POWER AND/OR DISTRIBUTION PANELBOARD – RECESSED
PPE1	EMERGENCY POWER PANELBOARD SURFACE MOUNTED PPE1 DENOTES EMERGENCY POWER PANEL NO.1
PPE1	EMERGENCY POWER PANELBOARD RECESSED MOUNTED PPE1 DENOTES EMERGENCY POWER PANEL NO.1
	FEEDER BUSWAY
30 15A	PLUG–IN BUSWAY WITH BUS PLUG 30 DENOTES SWITCH RATING, 15A DENOTES FUSE RATING
	CABLE TRAY/CABLETROUGH
	WIREWAY
	COMBINATION MAGNETIC STARTER
	PORTABLE DIESEL GENERATOR CONNECTION
	MAGNETIC STARTER
	MANUAL STARTER
M	HORSEPOWER RATED MOTOR TOGGLE SWITCH
	VARIABLE FREQUENCY DRIVE
C	MAGNETIC CONTACTOR
C	COMBINATION CONTACTOR
	DISCONNECT SWITCH – NON–FUSIBLE
F	FUSED DISCONNECT SWITCH
B	CIRCUIT BREAKER
	PUSHBUTTON STATION
MD	MOTORIZED DAMPER
B	BATTERY CHARGER
D	DOOR CONTROL PANEL
DL	DOCK LEVELLER
PDU	COMPUTER ROOM POWER DISTRIBUTION UNIT
PLC	PLC PANEL
TX	TRANSFORMER
CP	CONTROL PANEL
J	JUNCTION BOX
	BLANK JUNCTION BOX
P	PULL BOX
TB6	TERMINAL BOX WITH TERMINAL STRIPS
	BASEBOARD HEATING UNIT

SYMBOLS AND LEGEND AS APPLICABLE

SYMBOL	DESCRIPTION
JH	ELECTRIC UNIT HEATER
CH	ELECTRIC CONVECTION HEATER
FF	ELECTRIC FORCE–FLO HEATER
	SINGLE RECEPTACLE
	DUPLEX RECEPTACLE
	OVER COUNTER DUPLEX RECEPTACLE
	SPLIT DUPLEX RECEPTACLE (BOTTOM SWITCHED)
	SPLIT DUPLEX RECEPTACLE
	QUADRUPLEX RECEPTACLE
P	OUTLET ABOVE CEILING CONTAINING 2 DUPLEX RECEPTACLES
	RECEPTACLE SUPPLIED WITH EQUIPMENT
A	SPECIAL RECEPTACLE A DENOTES TYPE
	POKE THROUGH POWER OUTLET
A–28.S	**DESIGNATIONS FOR RECEPTACLE CIRCUIT** A–28.S – DENOTES CIRCUIT NUMBER A – DENOTES PANELBOARD NUMBER 28 – DENOTES CIRCUIT NUMBER .S – DENOTES SWITCHED CIRCUIT THROUGH RELAY PANEL OR LOCAL POWERPACK **DESIGNATIONS FOR RECEPTACLE TYPES** F – FLOOR E – EMERGENCY IG – ISOLATED GROUND GFCI – GROUND FAULT CIRCUIT INTERRUPTER WP – WEATHER PROOF WHILE IN USE B – BENCH MOUNTED PP – POWER PACK (OCCUPANCY SENSOR)
	DIRECT CONNECTION TO EQUIPMENT
RC	DIGITAL ROOM CONTROLLER
	SERVICE POLE
60A	WELDING RECEPTACLE (NUMBER DENOTES RATING)
T/S	TIME SWITCH
PE	PHOTO–ELECTRIC CONTROL
T	THERMOSTAT
	CONTROL DEVICE (NUMBER DENOTES TYPE) 1 – CORD OPERATED (EMERG.) SWITCH 2 – CAM SWITCH 3 – FLOW SWITCH 4 – FLOAT SWITCH 5 – FOOT SWITCH 6 – LEVEL SWITCH 7 – LIMIT SWITCH 8 – PROXIMITY SWITCH 9 – PRESSURE SWITCH 10– SPEED SWITCH 11– SPEED DIFFERENTIAL (SLIP) SWITCH 12– SELECTOR SWITCH 13– HAND–OFF–AUTO SWITCH 14– TEMPERATURE HIGH LIMIT – THL 15– TEMPERATURE LOW LIMIT – TLL 16– END SWITCH – ES 17– LIQUID DETECTOR
EF 1	**MECHANICAL OR ELECTRICAL EQUIPMENT TAG NUMBER** AC – AIR CONDITIONING UNIT ACC – AIR COOLED CONDENSER UNIT C – COMPRESSOR CU – CONDENSER UNIT DH – DOOR HEATER EF – EXHAUST FAN ETU – EXHAUST TERMINAL UNIT H – HUMIDIFIER HV – HEATING AND VENTILATING UNIT DHW – DOMESTIC HOT WATER HEATER P – PUMP RAF – RETURN AIR FAN RHC – RE–HEAT COIL SF – SUPPLY FAN STU – SUPPLY TERMINAL UNIT TU – TERMINAL UNIT UH – UNIT HEATER V – VENTILATING UNIT CF – CEILING FAN B – BOILER
	COMMUNICATIONS
N	COMMUNICATIONS OUTLET – WALL/FURNITURE MOUNTED "N" DENOTES QUANTITY OF JACKS/CABLES PER OUTLET
N C	COMMUNICATION OUTLET – CEILING MOUNTED "N" DENOTES QUANTITY OF JACKS/CABLES PER OUTLET
N F	COMMUNICATION OUTLET – FLOOR MOUNTED "N" DENOTES QUANTITY OF JACKS/CABLES PER OUTLET
"W"	FEED POINT FOR COMMUNICATIONS CABLING. LETTER DENOTES FEED LOCATION: W = WALL, F = FLOOR, P = PAC POLE,
AV	AV OUTLET (HDMI, VGA, AUDIO AND/OR RCA)
T	HANDS FREE COMMUNICATION SPEAKER
	TELEPHONE TERMINAL CABINET – SURFACE MOUNTED
	TELEPHONE TERMINAL CABINET – RECESSED
	TELECOMMUNICATION EQUIPMENT RACK
	TELECOMMUNICATION EQUIPMENT CABINET
	GROUNDING
	GROUND ROD
	GROUND ROD INSPECTION WELL
	GROUND BUS
	GROUND CONNECTION
	BURIED GROUND CABLE
A/G	GROUND CABLE – ABOVE GRADE
60"	GROUND CABLE PIGTAIL – EXPOSED FOR FUTURE CONNECTION 60" DENOTES LENGTH

SYMBOLS AND LEGEND AS APPLICABLE

SYMBOL	DESCRIPTION
	LIGHTING
F01 NL A–28.1	TYPICAL LUMINAIRE NOMENCLATURE: F01 – DENOTES LUMINAIRE TYPE NL – DENOTES NIGHT LIGHT CIRCUIT A–28.1 – DENOTES CIRCUIT NUMBER (PREFIX "E" IN CIRCUIT NUMBER DENOTES EMERGENCY PANEL) A – DENOTES PANELBOARD NUMBER 28 – DENOTES CIRCUIT NUMBER .1 – DENOTES SWITCH OR CONTROL CCT NUMBER **DESIGNATIONS FOR LUMINAIRE TYPES:** C – COMPACT FLUORESCENT F – FLUORESCENT H – METAL HALIDE L – LED M – MERCURY VAPOUR S – HIGH PRESSURE SODIUM T – INCANDESCENT X – EXIT SIGN B – EMERGENCY LIGHTING BATTERY PACK
	CEILING OR PENDANT MOUNTED LUMINAIRE
	CEILING OR PENDANT MOUNTED LUMINAIRE FOR LIFE SAFETY
	WALL MOUNTED LUMINAIRE
	WALL MOUNTED LUMINAIRE FOR LIFE SAFETY
	POLE MOUNTED LUMINAIRE
	CEILING OR PENDANT MOUNTED FLUORESCENT LUMINAIRE
	CEILING OR PENDANT MOUNTED FLUORESCENT LUMINAIRE FOR LIFE SAFETY
	WALL MOUNTED FLUORESCENT LUMINAIRE
	WALL MOUNTED FLUORESCENT LUMINAIRE FOR LIFE SAFETY
	LIGHT SWITCH **DESIGNATIONS FOR LIGHT SWITCHES** 3 – 3–WAY 4 – 4–WAY D – DIMMER M – MOMENTARY CONTACT P – PILOT LIGHT K – KEY OPERATED LV–1 – LOW VOLTAGE (SUFFIX "–1" INDICATES SWITCH NUMBER) T – TIME SWITCH LVM – LOW VOLTAGE MASTER WALL STATION
OS W	OCCUPANCY SENSOR "W" INDICATES TYPE (REFER TO DRAWING E21–01–01 FOR DETAILS)
PE	PHOTO–ELECTRIC CONTROL
	EXIT SIGN – CEILING MOUNTED
	EXIT SIGN – WALL MOUNTED
	EXIT SIGN – CEILING MOUNTED ARROW DENOTES DIRECTION CHEVRON
	CEILING MOUNTED COMBINATION EXIT SIGN & EMERGENCY LIGHTS
	WALL MOUNTED COMBINATION EXIT SIGN & EMERGENCY LIGHTS
	EMERGENCY BATTERY UNIT WITH 2 INTEGRAL HEADS AND DEDICATED SINGLE RECEPTACLE
	DOUBLE REMOTE EMERGENCY LIGHTING HEADS
	SINGLE REMOTE EMERGENCY LIGHTING HEAD
	REMOTE MOUNTED EMERGENCY BATTERY UNIT AND DEDICATED SINGLE RECEPTACLE
	EMERGENCY BATTERY UNIT WITH 2 INTEGRAL HEADS, HARD WIRED
	TRAFFIC SIGNAL
	SECURITY
	PUSHBUTTON
S R	CARD READER
D	ELECTROMAGNETIC DOOR LOCK
D S	ELECTRIC DOOR STRIKE/BOLT/LATCH
D O	DOOR OPERATOR
D K	DOOR BY–PASS KEYED SWITCH
M S	DOOR MONITOR SWITCH
G S	GLASS BREAK SENSOR
K P	SECURITY KEY PAD
V D	VEHICLE DETECTION
IR	MOTION DETECTOR
DL	DOOR LOCK – PUSHBUTTON OPERATED
	DOOR ALARM BUZZER
RTE	DOOR AUTO REQUEST TO EXIT SENSOR
B	DOOR BELL
	CLOCK – PROGRAMME
	CLOCK 'C' – CEILING/PENDANT, 'S' – SINGLE SIDE 'W' – WALL SURFACE, 'D' – DOUBLE SIDES 2.5" – 2.5" DIGIT HEIGHT 4" – 4" DIGIT HEIGHT 7" – 7" DIGIT HEIGHT
	MASTER CLOCK

SYMBOLS AND LEGEND AS APPLICABLE

SYMBOL	DESCRIPTION
	FIRE ALARM
	FIRE ALARM PANEL
ANN	REMOTE ANNUNCIATOR
GCC	GRAPHIC COMMAND CENTRE
FTP	FIRE ALARM TERMINAL PANEL (IAM CABINET)
ZONE #1	FIRE ALARM ZONE NUMBER
S R	AREA SMOKE DETECTOR R DENOTES BELOW RAISED FLOOR
S D	AREA SMOKE DETECTOR COMPLETE WITH REMOTE ALARM LIGHT
D	DUCT SMOKE DETECTOR
H	COMBINATION RATE OF RISE AND FIXED TEMPERATURE HEAT DETECTOR
CS	COMBINATION HEAT AND SMOKE DETECTOR
P	POST INDICATOR VALVE
FS	FLOW ALARM SWITCH
V	SUPERVISED VALVE
PS	PRESSURE SWITCH
IR	INFRA RED DETECTOR
D	CO2 DUMP STATION
A	CO2 ABORT STATION
E	EMERGENCY POWER OFF STATION
F	FIRE ALARM BELL
F 2	FIRE ALARM HORN, 2 DENOTES TYPE
F	CEILING MOUNTED SPEAKER
C	CO2 ALARM HORN
C	CO2 ALARM SIREN
C	CO2 ALARM BELL
F	FIRE ALARM MINI HORN C/W STROBE LIGHT (15cd UNLESS OTHERWISE NOTED)
	STROBE LIGHT WALL OR CEILING MOUNTED (15cd UNLESS OTHERWISE NOTED)
F	FIRE ALARM MANUAL PULL STATION
R	END OF LINE DEVICE
PS	PRE–ACTION SPRINKLER CONTROLLER
F A	FIREMAN'S HANDSET
FA	FIRE ALARM CONDUIT
M	ACTIVE FIELD DEVICE – MONITOR MODULE
C	ACTIVE FIELD DEVICE – CONTROL MODULE
R	FIRE ALARM RELAY
DH	MAGNETIC DOOR HOLDER DEVICE
I	INDIVIDUAL ADDRESSABLE MODULE (IAM)
IL	ISOLATOR MODULE
Z	ZONE ADAPTER MODULE (ZAM)
	PUBLIC ADDRESS & INTERCOM
S	COLUMN TYPE SPEAKER
S	CEILING MOUNTED SPEAKER
S	WALL MOUNTED SPEAKER
P	HORN TYPE SPEAKER
V	WALL VOLUME CONTROL
M	MICROPHONE PA STATION
PA	CONTROL PANEL OR RACK
C	CALL–IN SWITCH
P	WALL PROJECTOR JACK
A	AMPLIFIER
CS	COMBINATION SPEAKER AND CALL–IN SWITCH
A	ATTENUATOR (AMBIENT SOUND SENSOR)
C	INTERCOM DOOR STATION
C M	INTERCOM MASTER STATION

SYMBOLS AND LEGEND AS APPLICABLE

SYMBOL	DESCRIPTION
	TELEVISION AND CCTV
TV	CATV OUTLET
	OUTDOOR POLE MOUNTED PTZ CAMERA
	OUTDOOR POLE MOUNTED FIXED CAMERA
	OUTDOOR WALL/ROOF MOUNTED PTZ CAMERA
	OUTDOOR WALL/ROOF MOUNTED FIXED CAMERA
	INDOOR PTZ CAMERA
	INDOOR FIXED CAMERA
RP2	REMOTE PANEL RP2 DENOTES REMOTE PANEL NO.2
CCTV	CLOSED CIRCUIT TELEVISION MONITOR
	TELEVISION OR AM/FM ANTENNA
PT	EIGHT PORT BROADBAND TAP

SYMBOLS AND LEGEND AS APPLICABLE

GENERAL NOTES

1. VERIFY ALL DIMENSIONS WITH VENDOR'S SHOP DRAWINGS AND FIELD MEASUREMENTS. DIMENSIONS INDICATED ARE FOR ESTIMATING PURPOSES ONLY.
2. PROVISION FOR FUTURE EQUIPMENT AND CONSTRUCTION

   LEAVE CLEAR ALL SPACES DESIGNATED FOR FUTURE EQUIPMENT OR BUILDING EXPANSION.

   WHERE INDICATED, PROVIDE SERVICES FOR FUTURE EXTENSIONS COMPLETE WITH PRODUCTS NECESSARY FOR PRESENT TERMINATION AND TO PERMIT FUTURE EXTENSION.

   IDENTIFY EACH SERVICE BY A PERMANENT MARKER AT ITS TERMINATION.
3. REFER TO MH & MP SERIES DRAWINGS FOR EXACT LOCATION OF MECHANICAL EQUIPMENT.
4. DETERMINE EXACT LOCATION OF EQUIPMENT AND RECEPTACLES IN NOTED ROOMS. LOCATE EQUIPMENT AND RECEPTACLES TO SUIT. OBTAIN CONSULTANT'S APPROVAL BEFORE INSTALLING.
5. PROVIDE SUITABLE GALVANIZED STEEL CHANNEL AND/OR CHANNELS BETWEEN STRUCTURAL MEMBERS AND FASTEN WITH CLAMPS WHENEVER EQUIPMENT CANNOT BE DIRECTLY SUSPENDED FROM THE STRUCTURE. DO NOT DRILL ROOF DECK MATERIAL AND/OR ITS SUPPORT STRUCTURE OR ANY STRUCTURAL STEEL MEMBER.
6. REPAIR ALL WALLS, CEILING, FLOORS, ASPHALT, CONCRETE, ETC., CUT UNDER THIS DIVISION.
7. WHERE EQUIPMENT OTHER THAN THAT OF SPECIFIED MANUFACTURE IS TO BE INSTALLED, ENSURE THAT SPACE IS SUFFICIENT TO MEET ALL REQUIRE– MENTS. ASSUME FULL RESPONSIBILITY FOR THE INSTALLATION.
8. INSTALL LUMINAIRES IN MECHANICAL ROOMS TO CLEAR MECHANICAL DUCTS AND PIPING. INSTALL LUMINAIRES AFTER DUCT AND PIPING WORK IS COMPLETE.
9. PANEL SWITCH NIGHT LIGHTS. PROVIDE LOCK OUT BREAKER HANDLE.
10. MINIMUM SIZE WIRE:
    POWER – #12 AWG
    LIGHTING – #12 AWG
    CONTROL – #14 AWG
11. SPACE ARMOURED CABLE MORE THAN ONE CABLE DIAMETER APART TO MAINTAIN CAPACITY RATING.
12. INSTALL POLYPROPYLENE PULL CORD IN EMPTY CONDUITS.

NOTES AS APPLICABLE

MOUNTING HEIGHTS SCHEDULE

MOUNTING HEIGHTS TO TOP OF DEVICE.
ALL DIMENSIONS ARE ABOVE FINISHED FLOOR (AFF) UNLESS NOTED OTHERWISE.

LIGHT SWITCH	1200mm	
RECEPTACLE/TELECOM – FINISHED AREAS	450mm	
RECEPTACLE/TELECOM – UNFINISHED AREAS	1200mm	
RECEPTACLE – ABOVE COUNTER/MILLWORK	150mm	ABOVE SURFACE
FIRE ALARM MANUAL PULL STATION	1200mm	
FIRE ALARM END OF LINE DEVICE	1500mm	
FIRE ALARM HEAT DETECTOR	CEILING	
FIRE ALARM SMOKE DETECTOR	CEILING	
FIRE ALARM REMOTE ANNUNCIATOR	1500mm	MAX
PANEL	2000mm	
CONTROL PANEL	2000mm	
MOTOR STARTER	1800mm	
DISCONNECT SWITCH	1800mm	
PUSH BUTTON STATION	1200mm	
EMERGENCY LIGHT BATTERY UNIT IN UNFINISHED AREA	2750mm	
EXIT SIGN	300mm	ABOVE DOOR
FIRE ALARM HORN STROBES	2400MM	
MAG LOCK BUTTON RELEASE	1200mm	

MOUNTING HEIGHTS AS APPLICABLE

ROD Contract No.
T-1038-2019

DATE (mmm dd yyyy)	ISSUED FOR	REV
OCT 01 2018	TENDER	0

KEY PLAN

CONSULTANTS

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LICENSED PROFESSIONAL ENGINEER
K. D. SHEN
100121127
2018 10 01
PROVINCE OF ONTARIO

North Arrow

Detail Symbol
DETAIL NUMBER
LOCATION OR DETAIL SHEET

Project Manager: A. VAN VEEN	Architect/Engineer: T. SHEN
Project Leader: T .SHEN	Drawn: A. ZHU
Date: JAN 2013	Checked: C. BANTON

Client
THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title
ELECTRICAL LAYOUT
LEGEND

Check Scale (may be photo-reduced)
0 1 Inch 0 10mm

Project No.	Drawing No.
24RX12.0113	02–E00–00–01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:23:42 AM Path and File Name: \\caneast.ibigroup.com\\Ut\24rx12.0113_durham region orono & scugog depots\5.9 drawing\5Relectrical\layouts\02–e00–00–01.dwg

SINGLE LINE DIAGRAM

SYMBOL	DESCRIPTION
	MALE/FEMALE CONNECTOR OF DRAWOUT EQUIPMENT
	MEDIUM VOLTAGE FIXED CIRCUIT BREAKER
600A	DRAWOUT MEDIUM VOLTAGE CIRCUIT BREAKER NUMBER DENOTES AMPERE RATING
600A	MEDIUM VOLTAGE HORN GAP SWITCH NUMBER DENOTES AMPERE RATING
600A	MEDIUM VOLTAGE LOAD INTERRUPTER SWITCH NUMBER DENOTES AMPERE RATING
600A	MEDIUM VOLTAGE LOAD INTERRUPTER SWITCH – DOUBLE BREAK NUMBER DENOTES AMPERE RATING
100A	MEDIUM VOLTAGE FUSED DISCONNECT CUTOUT NUMBER DENOTES FUSE SIZE
	GROUND CONNECTION
	LIGHTNING ARRESTER OR SURGE DIVERTER
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
	POTHEAD
	STRESS CONE
	AIRCO INDICATING LIGHT
	DELTA/WYE TRANSFORMER CONNECTION WITH NEUTRAL OF WYE RESISTANCE GROUNDED
	DELTA/WYE WITH SOLID NEUTRAL GROUND TRANSFORMER CONNECTION
	WYE/WYE TRANSFORMER CONNECTION
	DELTA/DELTA TRANSFORMER CONNECTION
Y	ALTERNATOR (GENERATOR)
	TRANSFORMER WITH ON–LOAD TAP CHANGER ON PRIMARY WINDINGS
	SHIELDED TRANSFORMER
	POWER TRANSFORMER
	REACTOR
	POWER FACTOR CORRECTION CAPACITOR – FIXED
	FEEDER BUSDUCT/BUSWAY
	PLUG–IN BUSDUCT/BUSWAY
S	LOW VOLTAGE CIRCUIT BREAKER LETTER DENOTES THE FOLLOWING: S – SHUNT TRIP UV – UNDERVOLTAGE TRIP G – GROUND RELAY TRIP E – ELECTRICALLY OPERATED
MCP 15A	LOW VOLTAGE MOTOR CIRCUIT PROTECTOR NUMBER DENOTES AMPERE FRAME
30A	LOW VOLTAGE CIRCUIT BREAKER BUS PLUG NUMBER DENOTES AMPERE RATING

SYMBOLS AND LEGEND AS APPLICABLE

SYMBOL	DESCRIPTION
ST, IR: AF kA, LSIG, CM, MO, 3, A SENSOR	LOW VOLTAGE AIR CIRCUIT BREAKER WITH SOLID STATE TRIP UNIT: AF – BREAKER FRAME RATING CM – CURRECT MONITOR EO – ELECTRICALLY OPERATED G – GROUND FAULT TRIP FUNCTION I – INSTANTANEOUS TRIP FUNCTION IR – INTERRUPTING RATING L – LONG TIME TRIP FUNCTION MO – MANUALLY OPERATED S – SHORT TIME TRIP FUNCTION ST – SHUNT TRIP COIL
	DRAWOUT LOW VOLTAGE AIR CIRCUIT BREAKER
MTR	MOTOR OPERATED DISCONNECT SWITCH
ATS	AUTOMATIC TRANSFER SWITCH
30A	LOW VOLTAGE DISCONNECT SWITCH NUMBER DENOTES AMPERE RATING
15A	FUSE NUMBER DENOTES FUSE RATING
	LOW VOLTAGE FUSED DISCONNECT SWITCH
	LOW VOLTAGE DISCONNECT SWITCH FUSED BUS PLUG
2	CONTACTOR NUMBER DENOTES CONTACTOR SIZE
	OVERLOAD RELAY
	DRAWOUT CONTACTOR AND POWER FUSE
M	MANUAL MOTOR STARTER
1	MAGNETIC MOTOR STARTER NUMBER DENOTES STARTER SIZE
	SOLID STATE STARTER
	VARIABLE FREQUENCY DRIVE CONTROLLER
	AUTO TRANSFORMER STARTER
F, R	FORWARD–REVERSE STARTER

SYMBOLS AND LEGEND AS APPLICABLE

SYMBOL	DESCRIPTION
Y, Δ	WYE – DELTA STARTER
F, S	TWO SPEED STARTER F – FAST S – SLOW
F, S, R	TWO SPEED STARTER F – FAST S – SLOW R – REVERSE (COOLING TOWERS)
25	MOTOR – NUMBER DENOTES SIZE (HP)
60A	WELDING RECEPTACLE NUMBER DENOTES SIZE
	WELDING RECEPTACLE WITH LOCAL DISCONNECT
15	PACKAGED UNIT – NUMBER DENOTES SIZE (HP OR kW)
PP1	LIGHTING, RECEPTACLE OR POWER PANEL PP1 DENOTES POWER PANEL NO.1 PP – POWER PANEL P – RECEPTACLE AND/OR LIGHTING PANELBOARD

METERING AND PROTECTION DEVICES

SYMBOL	DESCRIPTION
PF	POWER FACTOR METER
GF	GROUND FAULT MONITOR
kW	kW METER
kWH	kWH METER
kVAR	kVAR METER
RH	RUNNING HOUR METER
Hz	FREQUENCY METER
51	RELAY DEVICE NUMBER (FOR DEFINITION SEE ANSI STANDARD C37.2)
T	TRANSDUCER
VS	VOLTMETER SWITCH
V	VOLTMETER
AS	AMMETER SWITCH
A	AMMETER
kW	KILOWATT TRANSDUCER
TP	VOLTAGE AND/OR CURRENT TEST PLUG
K	KEY INTERLOCK
	CONTROL TRANSFORMER
3, 400:5	CURRENT TRANSFORMER (CT) (400:5 DENOTES CT RATIO, NUMBER DENOTES QUANTITY)
	ZERO SEQUENCE CURRENT TRANSFORMER
2	WITHDRAWABLE FUSE AND POTENTIAL TRANSFORMER PT – NUMBER INDICATES TYPE OF CONECTION 1 SINGLE PHASE 2 OPEN DELTA 3 THREE PHASE

SYMBOLS AND LEGEND AS APPLICABLE

SYMBOL	DESCRIPTION
2	WITHDRAWABLE FUSE POTENTIAL TRANSFORMER (PT) NUMBER INDICATES TYPE OF CONNECTION 1 SINGLE PHASE 2 OPEN DELTA 3 THREE PHASE
2	FIXED PATTERN POTENTIAL TRANSFORMER (PT) NUMBER INDICATES TYPE OF CONECTION 1 SINGLE PHASE 2 OPEN DELTA 3 THREE PHASE

KEY INTERLOCK SYMBOLS

SYMBOL	DESCRIPTION
	DEVICE NORMALLY OPEN
	DEVICE NORMALLY CLOSED
	DIRECTION OF KEY TRANSFER
A–1 A–2 A–3	KEY INTERCHANGE NUMBER
	KEY
	INTERLOCK WITH KEY HELD. DEVICE IN POSITION AS SHOWN
	INTERLOCK WITH KEY REMOVED. DEVICE IN POSITION AS SHOWN
L–O	INTERLOCK USED TO LOCK DEVICE OPEN
L–C	INTERLOCK USED TO LOCK DEVICE CLOSED
LOC	INTERLOCK USED TO LOCK DEVICE OPEN AND CLOSED
	MULTI–LOCK INTERLOCK
	INTERLOCK WITH MASTER LOCK. (ALSO CALLED APARTMENT LOCK)
	INTERLOCK, DETACHABLE LATCH D. FOR DOORS – GUARDS
	INTERLOCK TRANSFER – T
	PADLOCK P
A|3	KEY INTERCHANGE NUMBER SHOWING KEY HELD
	AUXILIARY SWITCH – S 1–MAKE 1–BREAK
	AUXILIARY SWITCH – SS 2–MAKE 2–BREAK
S, E	SOLENOID KEY RELEASE UNIT. KEY RELEASED WHEN SOLENOID IS ENERGIZED OR D – DE–ENERGIZED
C	RELAY COIL DESIGNATION AND/OR ANSI DEVICE NUMBER C – CONTACTOR CR – CONTROL RELAY CTR – COUNTER HTR – HEATER L – LATCH (RELAY, CONTACTOR) M – MOTOR STARTER MF – MOTOR STARTER FORWARD MH – MOTOR STARTER HIGH ML – MOTOR STARTER LOW MR – MOTOR STARTER REVERSE TR – TIME DELAY RELAY

SYMBOLS AND LEGEND AS APPLICABLE

SCHEMATIC DIAGRAM

SYMBOL	DESCRIPTION
	MUSHROOM HEAD PUSHBUTTON – NORMALLY CLOSED, MOMENTARY CONTACT
	MUSHROOM HEAD PUSHBUTTON – NORMALLY OPEN, MOMENTARY CONTACT
	MUSHROOM HEAD PUSHBUTTON OPERATOR SWITCH, MAINTAINED CONTACT PUSH–PULL
	SELECTOR SWITCH
	SELECTOR SWITCH WITH BRIDGING CONTACT
MAN OFF AUTO	SELECTOR SWITCH – MANUAL–OFF–AUTO
	PUSHBUTTON – NORMALLY CLOSED, MOMENTARY CONTACT
	PUSHBUTTON – NORMALLY OPEN, MOMENTARY CONTACT
	PUSHBUTTON – MAINTAINED CONTACT
	FOOT SWITCH – NORMALLY OPEN
	FOOT SWITCH – NORMALLY CLOSED
	TIMER CONTACT – NORMALLY OPEN TIME DELAY TO CLOSE WHEN ENERGIZED N.O.T.C.
	TIMER CONTACT – NORMALLY CLOSED TIME DELAY TO OPEN WHEN ENERGIZED N.C.T.O.
	TIMER CONTACT – NORMALLY OPEN TIME DELAY TO OPEN WHEN DE–ENERGIZED N.O.T.O.
	TIMER CONTACT – NORMALLY CLOSED TIME DELAY TO CLOSE WHEN DE–ENERGIZED N.C.T.C.
	LIMIT SWITCH – NORMALLY OPEN
	LIMIT SWITCH – NORMALLY CLOSED
	LIMIT SWITCH – HELD CLOSED
	LIMIT SWITCH – HELD OPEN
	LIQUID LEVEL SWITCH – NORMALLY OPEN CLOSES ON LIQUID RISE
	LIQUID LEVEL SWITCH – NORMALLY CLOSED OPENS ON LIQUID RISE
	PRESSURE SWITCH – NORMALLY OPEN CLOSES ON PRESSURE INCREASE
	PRESSURE SWITCH – NORMALLY CLOSED OPENS ON PRESSURE INCREASE
	TEMPERATURE SWITCH – NORMALLY OPEN CLOSES ON TEMPERATURE RISE
	TEMPERATURE SWITCH – NORMALLY CLOSED OPENS ON TEMPERATURE RISE
	FLOW SWITCH – NORMALLY OPEN CLOSES WHEN FLOW DETECTED
	FLOW SWITCH – NORMALLY CLOSED OPENS WHEN FLOW DETECTED
	PROXIMITY SWITCH – NORMALLY CLOSED
	PROXIMITY SWITCH – NORMALLY OPEN
	CABLE OPERATED SWITCH
	SOLENOID VALVE COIL
	CHASSIS CONNECTION
	CONTACT – NORMALLY OPEN
	CONTACT – NORMALLY CLOSED
	PILOT LIGHT – PUSH–TO–TEST
A	PILOT LIGHT – LETTER INDICATES LENS COLOUR A – AMBER C – CLEAR R – RED B – BLUE G – GREEN W – WHITE
	THERMOCOUPLE (LETTER DENOTES TYPE)
	BATTERY
	DIODE

SYMBOLS AND LEGEND AS APPLICABLE

ROD Contract No.
T-1038-2019

DATE (mmm dd yyyy)	ISSUED FOR	REV
OCT 01 2018	TENDER	0

KEY PLAN

CONSULTANTS

IBI GROUP
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LICENSED PROFESSIONAL ENGINEER
X. D. SHEN
100121127
2018.01.01
PROVINCE OF ONTARIO

North Arrow: TRUE NORTH

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader: T SHEN	Drawn: A. ZHU
Date: JAN 2013	Checked: C. BANTON

Client
THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title
ELECTRICAL
SINGLE LINE SYMBOLS

Check Scale (may be photo-reduced)
0 1 Inch 0 10mm

Project No.	Drawing No.
24RX12.0113	02–E00–00–02

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:26:06 AM Path and File Name: \\conesat.ibigroup.com\1\to\24rx12.0113_durham region orono & scugog depots\5.9 drawing\9electrical\layouts\02–e00–00–02.dwg

SITE ELECTRICAL PLAN

SCALE 1:400

NOTES:

1. HYDRO ONE TO PROVIDE
   1. NEW HYDRO SERVICE WHICH INCLUDE
      1. NEW OVERHEAD LINE BETWEEN EXISTING HYDRO POLE AND NEW HYDRO POLE #1
      2. NEW PAD MOUNT TRANSFORMER (300KVA)
      3. PRIMARY CABLE TERMINATION AT TRANSFORMER AND NEW HYDRO POLE #1
   2. REMOVAL OF EXISTING 240V HYDRO SERVICE AFTER CONSTRUCTION

2. CONTRACTOR TO PROVIDE
   1. PRIMARY OVERHEAD LINE BETWEEN NEW HYDRO POLE #1, NEW OVERHEAD POLE #2, AND NEW DIP POLE #3.
   2. NEW OVERHEAD POLE #2, AND NEW DIP POLE #3
   2. PRIMARY AND SECONDARY U/G CONCRETE ENCASED DUCTBANK
   3. PRIMARY AND SECONDARY U/G CABLES
   4. HYDRO TRANSFORMER CONCRETE PAD, BOLLARDS AND GROUNDING

   REFER TO ("2011 UG STANDARD – HYDRO ONE"), SKETCH DU-09-202 "TYPICAL CONCRETE FOUNDATION – THREE PHASE PAD MOUNT TRANSFORMER (150-500KVA) ATTACHED IN SPECIFICATION SECTION 16115 FOR REFERENCE

3. ALL CONDUITS BELOW GRADE TO BE 53 DIA RIGID PVC EXCEPT WHERE SHOWN OTHERWISE. PROVIDE CONCRETE ENCASEMENT WHERE CONDUITS RUN UNDER VEHICLE AREAS AND ROADWAYS. PROVIDE ADDITIONAL HANDHOLES AND U/G PULL BOXES WHERE REQUIRED BY CODE. ALL HANDHOLE AND U/G PULL BOX COVERS TO BE H20 TRAFFIC RATED.

4. FOR DETAILS OF CCTV CAMERAS MOUNTED ON THE EXTERIOR OF THE BUILDING REFER TO AUXILIARY LAYOUT DRAWINGS. SHOWN HERE FOR CO-ORDINATION ONLY DO NOT DUPLICATE.

5. MAINTAIN EXISTING INCOMING POWER AND BELL SERVICE MAINTAIN FACILITY OPERATION DURING CONSTRUCTION. REMOVE EXISTING SECONDARY POWER CABLE AFTER CONSTRUCTION.

6. REMOVE EXISTING GATE POWER/SECURITY CONDUITS BETWEEN NEW HANDHOLES AND EXISTING BUILDING, PROVIDE TEMPORARY OVERHEAD CABLES (POWER/SECURITY) TO KEEP GATE OPERATION DURING CONSTRUCTION. PROVIDE NEW POWER AND SECURITY CABLES FROM NEW IT/SEC ROOM TO EXISTING GATE. ALLOW AFTER HOUR WORK FOR INSTALLATION AND PROGRAMMING, SCHEDULE WITH OWNER, NO INTERRUPTION TO GATE OPERATION DURING BUSINESS HOURS.

7. PROVIDE NEW POWER AND COMM HANDHOLES CONNECTING EXISTING U/G POWER AND COMM/SECURITY CONDUITS TO GATE AND STORAGE BUILDING. FROM NEW HANDHOLES, PROVIDE 2-53C (POWER) BETWEEN POWER HANDHOLE AND NEW ELEC ROOM, AND 3-53C (COMM, ONE FOR GATE SECURITY, ONE FOR STORAGE BUILDING COMM, ONE FOR FUTURE FIBER CABLE) BETWEEN COMM HANDHOLE AND NEW IT/SEC ROOM.

8. PROVIDE NEW POWER FEEDER CABLE FROM NEW ELEC ROOM TO NEW POWER HAND HOLE FOR THE EXISTING STORAGE BUILDING. SCHEDULE WITH OWNER FOR THE POWER SUPPLY CUT-OVER. ALLOW AFTER HOUR WORK, NO INTERRUPTION TO STORAGE BUILDING OPERATION DURING CONSTRUCTION.

9. REMOVE EXISTING LIGHTING POLE AND LIGHT FIXTURE, PROVIDE NEW POLE BASE, LIGHTING POLE AND POLE LIGHT FIXTURES. PROVIDE NEW WIRES FOR NEW POLE LIGHTS.

10. PROVIDE NEW HANDHOLE CONNECT TO EXISTING U/G CONDUIT, PROVIDE NEW 53C U/G CONDUIT BETWEEN HANDHOLE AND NEW LIGHT POLE FOR NEW POWER FEEDER CABLE FOR NEW POLE LIGHT AND BLOCK HEATER RECEPTACLES.

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A. P. WILLIAMS

North Arrow: True

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader	Drawn
T. SHEN	A. ZHU
Date	Checked
JAN 2013	C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM, WORKS DEPARTMENT, WHITBY, ONTARIO

Project: EXPAND GARAGE SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title: ELECTRICAL SITE PLAN

Check Scale (may be photo-reduced): 0 1 Inch 0 10mm

Project No.	Drawing No.
24RX12.0113	02-E01-00-01

User Name: Emma Fan Plot Date\Time: Tuesday, April 23, 2019 2:22:49 PM Path and File Name: J:\24rx12.0113_durham region econo & scugog depots\5.0 drawing\5Electrical\layouts\02-e01-00-01.dwg

INCOMING HYDRO AND EMERGENCY GENERATOR CONCRETE ENCASED DUCT BANK (TYPICAL)

NOTES:

1. ADJUST DUCT BANK DIMENSIONS TO SUIT NUMBER OF DUCTS AS PER INDICATED ON DRAWINGS.
2. ADJUST DUCT QUANTITY SIZES TO MATCH THOSE SHOWN ON DRAWINGS.
3. INSTALLATION TO COMPLY WITH OESC DIAGRAM B4–4.

1 DUCT BANK ENCASED IN REINFORCED CONCRETE (TYPICAL)
02–E09–00–01 N.T.S.

INCOMING TELECOM AND INTER–BUILDING TELECOM/POWER/AUXILIARY SYSTEM CONCRETE ENCASED DUCT BANK (TYPICAL)

NOTES:

1. ADJUST DUCT BANK DIMENSIONS TO SUIT NUMBER OF DUCTS AS PER INDICATED ON DRAWINGS.
2. ADJUST DUCT QUANTITY AND SIZES TO MATCH THOSE SHOWN ON DRAWINGS.

2 DUCT BANK ENCASED IN REINFORCED CONCRETE (TYPICAL)
02–E09–00–01 N.T.S.

NOTES:

1. ADJUST TRENCH WIDTH TO SUIT NUMBER OF CONDUITS.
2. FOR TRENCHES WITH LIGHTING CIRCUITS ONLY, USE #6 BARE COPPER GROUND CONDUCTOR.

3 TYPICAL DIRECT BURIED CONDUIT DETAIL
02–E09–00–01 N.T.S.

4 HAND HOLE DETAIL
02–E09–00–01 N.T.S.

5 HAND HOLE COVER DETAIL
02–E09–00–01 N.T.S.

6 ELECTRICAL INGROUND PULLBOX DETAIL
02–E09–00–01 N.T.S.

7 EXTERNAL LOOP GROUNDING CONN. TO BUILDING STEEL COLIMN
02–E09–00–01 N.T.S.

GROUNDING NOTES:

1. COMPLETE GROUNDING INSTALLATION SHALL BE TO THE APPROVAL OF ELECTRICAL SAFETY AUTHORITY.
2. ALL GROUNDING CONDUCTORS TO BE STRANDED MEDIUM HARD DRAWN BARE COPPER.
3. BOND CONDUIT SLEEVE TO GROUNDING CONDUCTOR USING "THOMAS & BETTS" GROUNDING BUSHING, #6 GROUNDING CONDUCTOR AND "BURNDY" CONNECTOR.
4. LEAVE 1.5m OF GROUNDING CONDUCTOR COILED FOR FUTURE CONNECTION.
4. LEAVE 1.5m OF GROUNDING CONDUCTOR COILED FOR FUTURE CONNECTION.

ITEM NO.	DESCRIPTION
1	CADWELD TYPE "TA" CONNECTION
2	CADWELD TYPE "VS" CONNECTION
3	CADWELD TYPE "XB" CONNECTION
4	CADWELD TYPE "GT" CONNECTION
5	CADWELD TYPE "GY" CONNECTION
6	CADWELD TYPE "RR" OR "RC" CONNECTION
7	CADWELD TYPE "XA" CONNECTION
8	CADWELD TYPE "VV" CONNECTION
9	CADWELD TYPE "GR" CONNECTION
10	CADWELD TYPE "NC" CONNECTION
11	"THOMAS & BETTS" 27mm DIA. BUSHING

8 CONDUIT FLOOR /WALL TERMINATION
02–E09–00–01 N.T.S.

11 TYPICAL LIGHT POLE DETAIL
02–E09–00–01 N.T.S.

9 LIGHTING POLE GROUNDING DETAIL
02–E09–00–01 N.T.S.

10 LIGHTING POLE FOUNDATION DETAIL
02–E09–00–01 N.T.S.

LIGHTING POLE FOUNDATION DETAIL NOTES:

1. PLACE BASE OF CONCRETE FOUNDATION AGAINST UNDISTURBED GROUND. TOP OF CONCRETE FOUNDATION TO BE LEVEL.STRENGTH OF CONCRETE TO BE MINIMUM 35 MPa AT 28 DAYS.
2. INSTALL CONDUITS WITH COUPLINGS LEVEL WITH TOP OF FOUNDATION AT TIME BASE INSTALLED.
3. SET A BRASS MARKER (13mm DIA. ROD L SHAPE) IN LINE WITH EACH CONDUIT EXIT FROM BASE. SECURE MARKER TO REINFORCING STEEL.
4. USE RICHMOND POLE ANCHORAGE TYPE DGR–1. PROVIDE COMPLETE ANCHORAGE ASSEMBLY INCLUDING STEEL BASKET, REMOVABLE ANCHOR BOLTS AND WASHERS. ASSEMBLY TO BE ASTM A–153 AND BE HOT DIPPED GALVANIZED. COAT BOLTS WITH WHITE NON–STAINING GREASE. PROVIDE NYLON BUSHINGS TO ISOLATE BOLT HEADS WHERE ALUMINUM POLES ARE USED. PROVIDE A 19mm PLYWOOD TEMPLATE TO ACCURATELY POSITION THE ANCHORAGE ASSEMBLY.
5. ALL DIMENSIONS TO BE REVIEWED BY THE CONSULTANT AFTER RECEIPT OF POLE SHOP DRAWINGS AND PRIOR TO THE INSTALLATION OF THE ANCHORAGE.
6. GROUNDING CONDUCTOR BETWEEN POLE GROUNDING LUG AND GROUND ROD OR GROUNDING CONDUCTOR IN TRENCH.
7. GROUNDING CONDUCTOR TO BE #6 STRANDED MEDIUM HARD DRAWN BARE COPPER.
8. ANCHORAGE BOLT CIRCLE TO MATCH POLE BOLT CIRCLE.
9. MINIMUM CONDUIT COVER TO BE 600mm
10. HEIGHT ABOVE GRADE IN PARKING AREA TO BE 300 FOR 12FT POLE, AND 1000 FOR REMAINING POLES

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LICENSED PROFESSIONAL ENGINEER X. D. SHEN 100121127 OCT.01 2018 PROVINCE OF ONTARIO

North Arrow: True

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader	Drawn
T. SHEN	A. ZHU
Date	Checked
JAN 2013	C. BANTON

Client
THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title
ELECTRICAL SITE DETAILS

Check Scale (may be photo-reduced)
0 1 inch
0 10mm

Project No.	Drawing No.
24RX12.0113	02–E09–00–01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:35:30 AM Path and File Name: \\caneast.ibigroup.com\Ut\24rx12.0113_durham region orono & scugog depots\5.9 drawing\5electrical\layouts\02–e09–00–01.dwg

1 / 02-E09-00-02 5KV DIP POLE DETAIL N.T.S.

2 / 02-E09-00-02 TYPICAL GUY WIRING DETAIL N.T.S.

TYPICAL GUYING ARRANGEMENT FOR POLES				
BILL OF MATERIAL (QUANTITIES SHOWN FOR 1 POLE ASSEMBLY)				
ITEM	QTY	DESCRIPTION	MANUFACTURER NO. OR EQUIVALENT	REMARKS
H04	1	MACHINE BOLT 19mm (3/4") DIAMETER SQUARE HEAD GALVANIZED C/W SQUARE NUT (LENGTH TO SUIT)	HUBBELL 89XX	
H05	1	WASHER, SQUARE, CURVED FOR 19mm (3/4") BOLT, 76mmX76mmX8mm (3"X3"X1/4")	HUBBELL 682212	
H06	1	WASHER, SPRING, LOCK FOR 19mm (3/4") BOLT	HUBBELL 4037	
H08	LOT	GUY WIRE 9.5mm (3/8") GRADE 180 GALVANIZED STEEL		
H09	1	GUY HOOK	HUBBELL GH6	
H11	3	PREFORMED GUY DEAD END FOR 9.5mm (3/8") GRADE 180 GALVANIZED STEEL GUY WIRE	PREFORMED LINE PRODUCTS GDE-1107	
H14	1	GUY CLAMP FOR 9.5mm (3/8") GUY WIRE	HUBBELL 6461	
H15	2	CLIP, WIRE ROPE FOR 9.5mm (3/8") GUY WIRE	HUBBELL 6482	
H16	1	GUY GUARD, YELLOW [2400mm (8FT) LONG]	HUBBELL 96FRPE	
H17	1	GUY STRAIN INSULATOR	HYDEL ENTERPRISES 451WGS	
H18	1	POWER INSTALLED SCREW ANCHOR, THIMBLEYE WITH 2134mm (7FT.) ROD, SINGLE HELIX 254mm (10")	HUBBELL E1020036 C199020104	
H19	2	LAG SCREW, 12mm (1/2") DIAMETER, 100mm (4") LONG	HUBBELL 508754	
G01	LOT	GROUND WIRE No. 2 AWG, STRANDED COPPER		
G02	LOT	STAPLES, GROUND WIRE, COPPER COATED	HUBBELL 9167	
G04	1	CLAMP, GROUND WIRE, FOR NUT END OF 19mm (3/4") BOLT	MACLEAN POWER SYSTEMS/ JOSYLN MANUFACTURING J1164	
G05	1	CONNECTOR-AMPACT FOR No. 2 AWG COPPER TO No. 2 AWG COPPER	TYCO ELECTRONICS/AMPACT 277060-1	

NOTES,

1. BILL OF MATERIAL IS FOR REFERENCE ONLY, CONTRACTOR IS RESPONSIBLE FOR FINAL TAKE-OFF.

2. MANUFACTURERS AND CATALOG NUMBERS LISTED ARE FOR REFERENCE ONLY, ALTERNATE PRODUCTS MAY BE USED IF APPROVED.

3. GUYWIRE OPTION 2 TO BE USED ONLY WHERE THERE ARE LIMITED SPACE TO ALLOW FOR FULL EXTENTION OF GUYWIRE (OPTION 1)

3 / 02-E09-00-02 GUY ATTACHEMENT DETAIL N.T.S.

4 / 02-E09-00-02 INSULATED GUY DETAIL N.T.S.

5 / 02-E09-00-02 GUY ANCHOR DETAIL N.T.S.

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North Arrow

Detail Symbol
DETAIL NUMBER
LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader	Drawn
T. SHEN	A. ZHU
Date	Checked
JAN 2013	C. BANTON

Client
THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title
ELECTRICAL SITE DETAILS

Check Scale (may be photo-reduced)
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Project No.	Drawing No.
24RX12.0113	02-E09-00-02

User Name: Emma Fan Plot Date\Time: Tuesday, April 23, 2019 2:23:38 PM Path and File Name: J:\24xx12.0113_durham region arena & scugog depot\5.9 drawing\5Electrical\layouts\02-E09-00-02.dwg

NOTES:

1. METER, INSTRUMENT TRANSFORMERS, ANCILLARY DEVICES AND SECONDARY WIRING SUPPLIED BY UTILITY (HYDRO ONE) AND INSTALLED BY CONTRACTOR. REFER TO HYDRO ONE 'CONDITION OF SERVICE' FOR DETAILED METERING REQUIREMENTS. CONTRACTOR TO COORDINATE WITH HYDRO ONE FOR DELIVERY, SCHEDULE AND INSTALLATION REQUIREMENT.
2. TRANSFER SWITCH REFERENCE UNIT ASCO 300 SERIES, 400A, TYPE 1 ENCLOSURE, OR APPROVED EQUAL.
3. EXISTING 240V HYDRO SERVICE (OVERHEAD LINES, TRANSFORMER, POLE, METERING, ETC) TO BE REMOVED BY HYDRO-ONE AFTER COMPLETION OF NEW HYDRO SERVICE.
4. REMOVE EXISTING U/G SECONDARY FEEDER CABLE AFTER COMPLETION OF NEW HYDRO SERVICE.
5. EXISTING POWER DISTRIBUTION TO REMAIN UNLESS NOTED OTHERWISE
6. PROVIDE SHORT-CIRCUIT STUDY, COORDINATION STUDY AND ARC-FLASH HAZARD ANALYSIS.
7. DISCONNECT POWER FEEDER TO EXISTING PANEL IN STORAGE BUILDING FROM EXISTING OVERHEAD POLE. PROVIDE HAND HOLE CLOSE TO THE BASE OF THE POLE AND RECONNECT FEEDER TO NEW SERVICE
8. ALL WORK BY CONTRACTOR UNLESS NOTED OTHERWISE

FEEDER AND CONDUIT SCHEDULE

NUMBER	SIZE	RATING (A)
1	3# 12 + 1# 12 GND – 21C	25
1A	4# 12 + 1# 12 GND – 21C	25
2	3# 10 + 1# 12 GND – 21C	35
2A	4# 10 + 1# 12 GND – 21C	35
3	3# 8 + 1# 10 GND – 21C	50
3A	4# 8 + 1# 10 GND – 21C	50
4	3# 6 + 1# 8 GND – 27C	65
4A	4# 6 + 1# 8 GND – 27C	65
5	3# 4 + 1# 8 GND – 27C	85
5A	4# 4 + 1# 8 GND – 35C	85
6	3# 3 + 1# 8 GND – 35C	100
6A	4# 3 + 1# 8 GND – 35C	100
7	3# 2 + 1# 6 GND – 35C	115
7A	4# 2 + 1# 6 GND – 35C	115
8	3# 1 + 1# 6 GND – 35C	130
8A	4# 1 + 1# 6 GND – 41C	130
9	3# 1/0 + 1# 6 GND – 41C	150
9A	4# 1/0 + 1# 6 GND – 53C	150
10	3# 2/0 + 1# 6 GND – 41C	175
10A	4# 2/0 + 1# 6 GND – 53C	175
11	3# 3/0 + 1# 6 GND – 53C	200
11A	4# 3/0 + 1# 6 GND – 53C	200
12	3# 4/0 + 1# 4 GND – 53c	230
12A	4# 4/0 + 1# 4 GND – 63C	230
13	3# 250kcmil + 1# 4 GND – 53C	255
13A	4# 250kcmil + 1# 4 GND – 63C	255
14	3# 300kcmil + 1# 4 GND – 63C	285
14A	4# 300kcmil + 1# 4 GND – 78C	285
15	3# 350kcmil + 1# 3 GND – 63C	310
15A	4# 350kcmil + 1# 3 GND – 78C	310
16	3# 400kcmil + 1# 3 GND – 78C	335
16A	4# 400kcmil + 1# 3 GND – 78C	335
17	3# 500kcmil + 1# 3 GND – 78C	380
17A	4# 500kcmil + 1# 3 GND – 91C	380
18	3# 600kcmil + 1# 2 GND – 78C	420
18A	4# 600kcmil + 1# 2 GND – 91C	420
19	3# 700kcmil + 1# 2 GND – 91C	460
19A	4# 700kcmil + 1# 2 GND – 103C	460
20	3# 750kcmil + 1# 2 GND – 91C	475
20A	4# 750kcmil + 1# 2 GND – 103C	475
21	3# 800kcmil + 1# 2 GND – 91C	490
21A	4# 800kcmil + 1# 2 GND – 103C	490
22	3# 900kcmil + 1# 1 GND – 91C	520
22A	4# 900kcmil + 1# 1 GND – 103C	520
23	3# 1000kcmil + 1# 1 GND – 103C	545
23A	4# 1000kcmil + 1# 1 GND – 116C	545

LOAD SUMMARY
(ESTIMATION BASED ON THE 5TH YEAR OF OPERATION)

CONNECTED LOAD: 279.46 kVA

DEMAND LOAD (SUMMER) : 149.9 KVA

DEMAND LOAD (WINTER) : 183.9 KVA

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North Arrow: True North

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Project Manager: A. VAN VEEN	Architect/Engineer: T. SHEN
Project Leader: T. SHEN	Drawn: A. ZHU
Date: JAN 2013	Checked: C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project: EXPAND GARAGE SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title: SINGLE LINE DIAGRAM

Check Scale (may be photo-reduced): 0 — 1 Inch; 0 — 10mm

Project No.: 24RX12.0113

Drawing No.: 02-E10-00-01

ROD Contract No.: T-1038-2019

User Name: Clive Banton Plot Date\Time: Wednesday, April 24, 2019 1:55:40 PM Path and File Name: j:\24x12.0113_durham region orono & scugog depots\5.9 drawing\5#electrical\layouts\02-e10-00-01.dwg

FIRST FLOOR – POWER LAYOUT

SCALE 1:100

NEW ELEC ROOM LAYOUT

SCALE: 1:50

2ND FLOOR – POWER SYSTEMS LAYOUT

SCALE 1:100

NOTES:

1. ALL WEATHER PROOF RECEPTACLE COVER TO BE THE "IN USE" TYPE
2. COORDINATE ON SITE WITH EQUIPMENT VENDER FOR EXACT POWER FEED LOCATIONS REQUIRED PRIOR TO ROUGH-IN. EXTEND CONDUITS/WIRES (UNDERGROUND OR WALL CEILING SURFACE MOUNT) FROM DISCONNECT SWITCH TO EXACT CONTROL PANEL LOCATION
3. ALL TRANSFORMERS WALL MOUNTED ON SUPPORT SHELF IN CEILING SPACE ABOVE ELEC PANELS.
4. ELEC POWER AND TELECOM GROUND BUS BARS CONNECT TO BUILDING GROUNDING WITH #3/0 BARE CONDUCTOR.
5. PROVIDE 21C CONDUITS FOR DETECTORS, REFER TO MECH DRAWING 02-M51-01-01 FOR QUANTITY AND DETECTOR LOCATIONS. COORDINATE ON SITE FOR EXACT PANEL AND DETECTOR LOCATIONS.
6. ALL NEW RECEPTACLES IN EXISTING OFFICE AREA TO BE SURFACED MOUNTED C/W WIREMOLD CABLE RACEWAY FROM CEILING SPACE, CONFIRM AND MARK EXACT LOCATION WITH OWNER PRIOR TO ROUGH-IN.

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR NEW AND EXISTING AREAS.
2. ALL EXISTING SYSTEMS TO REMAIN FUNCTIONAL UNLESS PERMISSION FOR SHUTDOWN IS GRANTED BY OWNER.
3. ALL WORK IN EXISTING AREA (GROUND FLOOR WASH BAY, HOIST BAY, OFFICES, EXISTING ELEC ROOM, VEHICLE STORAGE, AND 2ND FLOOR, ETC) TO BE AFTER HOURS. COORDINATE WITH OWNER FOR DETAIL CONSTRUCTION SCHEDULES

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North Arrow: TO TOP OF PLAN

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Project Manager	Architect/Engineer
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T. SHEN	A. ZHU
Date	Checked
JAN 2013	C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM, WORKS DEPARTMENT, WHITBY, ONTARIO

Project: EXPAND GARAGE SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title: MAIN BUILDING POWER LAYOUT

Check Scale (may be photo-reduced): 0 – 1 Inch; 0 – 10mm

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24RX12.0113	02-E11-01-01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:37:58 AM Path and File Name: \\conesat.ibigroup.com\J\to\24rx12.0113_durham region oronо & scugog depots\5.9 drawing\5Electrical\layouts\02-e11-01-01.dwg

Cct No.	*	Load Description	Volt-Amperes A	B	C	Breaker Pole	A	Wire Size		Breaker A	Pole	Volt-Amperes A	B	C	Load Description	*	Cct No.
1		Repair Bay #1 Receptacles	400			1	20	12	12	20	1	1216			Repair Bay #1 Ceiling lights		2
3		Repair Bay #1 Receptacles		400		1	20	12	12	20	1		1216		Repair Bay#2 Ceiling lights		4
5		Repair Bay #1 Receptacles			400	1	20	12	12	20	1			228	Repair Bay #1 Wall lights		6
7		Repair Bay #2 Receptacles	400			1	20	12	12	20	1	228			Repair Bay #2 Wall lights		8
9		Repair Bay #2 Receptacles		400		1	20	12		20	1				Spare		10
11		Repair Bay #2 Receptacles			400	1	20	12		20	1				Spare		12
13		Repair Bay #1 Receptacles	400			1	20	12	12	20	1	200			Electrical/IT/Security Room Lighting	L	14
15		Repair Bay #2 Receptacles		400		1	20	12	12	20	1		708		Night lights	L	16
17		2kw Wall fan Heater (Elec Rm)			1000	2	20	12	12	20	1			318	Exterior Lights - Repair Bay		18
19			1000						12	20	1	50			Exit Sights	L	20
21		2kw Wall fan Heater (IT/Sec Rm)		1000		2	20	12							SPACE		22
23					1000				12	20	1			200	DWH - 01		24
25		Arc, Mig Welder, Pressure Washer	2400			2	30	10	12	20	1	720			Ceiling Fans CF-101/102		26
27		Repair Bay #2		2400					12	20	1		720		Ceiling Fans CF-103/104		28
29		Arc, Mig Welder, Pressure Washer			2400	2	30	10		20	1			500	Oil Interceptor / Fire Protection tanks Control Panels		30
31		Repair Bay #2	2400							20	1				Spare		32
33		Exterior Receptacles		200		1	20	12		20	1				Spare		34
35		EF-103 & Motrized damper (Elec Room)			200	1	20	12	8	40	2			2000	AC-101 / ACC-101		36
37		Utility Receptacles (Elec/IT Room)	300			1	20					2000					38
39		Roof Mounted Receptacle/AHU-101 Auxiliary		100		1	20	12	4	70	2		5000		UPS SYSTEM (10KV)		40
41		Electrical Room Receptacle			200	1	20	12						5000			42
43		Infrared Heaters H-101/102/103	200			1	20	12	12	20	1	200			Gas Detection Control Panel/detectors		44
45		Exterior Receptacles, Repair Bay		200		1	20	12	12	20	2		832		Pumps P-101/102		46
47		Exterior Receptacles, Repair Bay			200	1	20	12						832			48
49		Spare				1	20		12	20	1	500			Waste Oil Panel		50
51		Spare				1	20		12	20	1		200		Waste Oil System Heat Tracing	G	52
53		Spare				1	20			20	1				Spare		54
55		Spare				1	20			20	1				Spare		56
57																	58
59																	60
61																	62
63		Generator Enclosure Powr Panel		1000													64
65					1000	2	60	6									66
		Odd Circuit Number Subtotals	7500	6100	6800							5114	8676	9078	Even Circuit Number Subtotals		

Bus and Lugs Rating (A):	225	Total Phase A Load:	12.6 kVA
Main Circuit Breaker Rating (A):		Total Phase B Load:	14.8 kVA
Circuit Breaker IC Rating (kA):	14	Total Phase C Load:	15.9 kVA
Phase:	3	Total Connected Load:	43.3 kVA
Wires:	4	Demand Factor:	75 %
Line to Line Voltage (V):	208	Demand Load:	32.5 kVA
Line to Neutral Voltage (V):	120	Future Load:	0.0 kVA
Number of Poles:	66	Total Demand Load:	32.5 kVA
Mounting:	Surface	Total Demand Current:	90.1 A

Features:
Sprinkler Shield

"L" Denotes Handle Lock "
"S" Denotes Shunt Trip "
"G" Denotes GFCI Breaker "
"T" Denotes Handle Tie "

Remarks:
from 45kVA Transformer TX-A

Project Title: SCUGOG DEPOT,
Project Number: 24RX12.0113
Plan Drawing Number:
Revision Number: 0 Revision Date: 2018-10-01

IBI Group

Panelboard **RP-A**

Cct No.	*	Load Description	Volt-Amperes A	B	C	Breaker Pole	A	Wire Size		Breaker A	Pole	Volt-Amperes A	B	C	Load Description	*	Cct No.
1		Block Heater Receptacle Repair Bay #2 south	1400			1	20	12	8	20	1	1400			Block Heater Receptacle Bollard Site South		2
3		Block Heater Receptacle Repair Bay #1 South		1400		1	20	12	8	20	1		1400		Block Heater Receptacle Bollard Site South		4
5		Block heater Receptacle Repair Bay West wall			1400	1	20	12	8	20	1			1400	Block Heater Receptacle Bollard Site South		6
7		Block heater Elec Room East wall	1400			1	20	12	8	20	1	1400			Block Heater Receptacle Bollard Site South		8
9		Block heater Receptacle (Future)		1400		1	20		8	20	1		1400		Block Heater Receptacle Bollard Site South		10
11		Block heater Receptacle (Future)			1400	1	20		8	20	1			1400	Block Heater Receptacle Bollard Site South		12
13		Block heater Receptacle (Future)	1400			1	20			20	1	1400			Block Heater Receptacle (Future)		14
15		Block heater Receptacle (Future)		1400		1	20			20	1		1400		Block Heater Receptacle (Future)		16
17		Block heater Receptacle (Future)			1400	1	20			20	1			1400	Block Heater Receptacle (Future)		18
19		Block heater Receptacle (Future)	1400			1	20			20	1	1400			Block Heater Receptacle (Future)		20
21		Spare				1	20			20	1		1400		Block Heater Receptacle (Future)		22
23		Sapre				1	20			20	1			1400	Block Heater Receptacle (Future)		24
25		Spare				1	20			20	1	1400			Block Heater Receptacle (Future)		26
27		Spare				1	20			20	1		1400		Block Heater Receptacle (Future)		28
29		Spare				1	20			20	1			1400	Block Heater Receptacle (Future)		30
31		Spare				1	20			20	1	1400			Block Heater Receptacle (Future)		32
33		Spare				1	20			20	1				Spare		34
35		Spare				1	20			20	1				Spare		36
37		Spare				1	20			20	1				Spare		38
39		Spare				1	20			20	1				Spare		40
41		Spare				1	20			20	1				Spare		42
		Odd Circuit Number Subtotals	5600	4200	4200							8400	7000	7000	Even Circuit Number Subtotals		

Bus and Lugs Rating (A):	400	Total Phase A Load:	14.0 kVA
Main Circuit Breaker Rating (A):		Total Phase B Load:	11.2 kVA
Circuit Breaker IC Rating (kA):	14	Total Phase C Load:	11.2 kVA
Phase:	3	Total Connected Load:	36.4 kVA
Wires:	5	Demand Factor:	80 %
Line to Line Voltage (V):	208	Demand Load:	29.1 kVA
Line to Neutral Voltage (V):	120	Future Load:	0.0 kVA
Number of Poles:	42	Total Demand Load:	29.1 kVA
Mounting:	Surface	Total Demand Current:	80.8 A

Features:
Sprinkler Shield

"L" Denotes Handle Lock "
"S" Denotes Shunt Trip "
"G" Denotes GFCI "
"T" Denotes Handle Tie "

Remarks:
Block Heaters
75kVA Transformer TX-BH

Project Title: SCUGOG DEPOT
Project Number: 24RX12.0113
Plan Drawing Number:
Revision Number: 0 Revision Date: 2018-10-01

IBI Group

Panelboard **RP-BH**

Cct No.	*	Load Description	Volt-Amperes L1	L2	Breaker Pole	A	Wire Size		Breaker A	Pole	Volt-Amperes L1	L2	Load Description	*	Cct No.
1		Receptacle (IT CABINET)	800		1	20	12	12	20	1	400		Receptacle (TELECOM)		2
3		Receptacle (IT CABINET)		800	1	20	12	12	20	1		400	Receptacle (SECURITY)		4
5		Receptacle (CCTV CABINET)	800		1	20	12	12	20	1	400		Receptacle (SECURITY)		6
7		BMS Control Panel		200	1	20	12	12	20	1		200	Receptacles		8
9		SPARE			1	20			20	1	200		Receptacles		10
11		SPARE			1	20			20	1			SPARE		12
13		Space											Space		14
15		Space											Space		16
17		Space											Space		18
19		Space											Space		20
21		RP-UPS2 (Existing Office)	1800		2	60	6						Space		22
23				1800									Space		24
		Odd Circuit Number Subtotals	3400	2800							1000	600	Even Circuit Number Subtotals		

Bus and Lugs Rating (A):	125		
Main Circuit Breaker Rating (A):	60	Total Line 1 Load:	4.4 kVA
Circuit Breaker IC Rating (kA):	14	Total Line 2 Load:	3.4 kVA
Phase:	1	Total Connected Load:	7.8 kVA
Wires:	3	Demand Factor:	100 %
Line to Line Voltage (V):	240	Demand Load:	7.8 kVA
Line to Neutral Voltage (V):	120	Future Load:	0.0 kVA
Number of Poles:	24	Total Demand Load:	7.8 kVA
Mounting:	surface	Total Demand Current:	32.5 A

Features:
Sprinkler Shield

"L" Denotes Handle Lock "
"S" Denotes Shunt Trip "
"G" Denotes GFCI "
"T" Denotes Handle Tie "

Remarks:
from 10KVA UPS
PANEL c/w Door

Project Title: SCUGOG DEPOT
Project Number: 24RX12.0113
Plan Drawing Number:
Revision Number: 0 Revision Date: 2018-10-01

Panelboard **RP-UPS1**

Cct No.	*	Load Description	Volt-Amperes L1	L2	Breaker Pole	A	Wire Size		Breaker A	Pole	Volt-Amperes L1	L2	Load Description	*	Cct No.
1		Receptacles	600		1	20	12	12	20	1	600		Receptacles		2
3		Receptacles		300	1	20	12	12	20	1		600	Receptacles		4
5		Receptacles	600		1	20	12	12	20	1	600		Receptacles		6
7		Receptacles		300	1	20	12	12	20	1			SPARE		8
9		SPARE			1	20			20	1			SPARE		10
11		SPARE			1	20			20	1			SPARE		12
13		space											space		14
15		space											space		16
17		space											space		18
19		space											space		20
21		space											space		22
23		space											space		24
		Odd Circuit Number Subtotals	1200	600							1200	600	Even Circuit Number Subtotals		

Bus and Lugs Rating (A):	125		
Main Circuit Breaker Rating (A):	60	Total Line 1 Load:	2.4 kVA
Circuit Breaker IC Rating (kA):	14	Total Line 2 Load:	1.2 kVA
Phase:	1	Total Connected Load:	3.6 kVA
Wires:	3	Demand Factor:	100 %
Line to Line Voltage (V):	240	Demand Load:	3.6 kVA
Line to Neutral Voltage (V):	120	Future Load:	0.0 kVA
Number of Poles:	24	Total Demand Load:	3.6 kVA
Mounting:	surface	Total Demand Current:	15.0 A

Features:
Sprinkler Shield

"L" Denotes Handle Lock "
"S" Denotes Shunt Trip "
"G" Denotes GFCI "
"T" Denotes Handle Tie "

Remarks:
Existing office area
Fed from RP-UPS1
panel c/w Door

Project Title: SCUGOG DEPOT
Project Number: 24RX12.0113
Plan Drawing Number:
Revision Number: 0 Revision Date: 2018-10-01

Panelboard **RP-UPS2**

N

FIRST FLOOR – HAZARDOUS CLASSIFICATION LAYOUT

SCALE 1:100

LEGEND: HAZARDOUS AREAS

CLASS 1 ZONE 2:

BELOW GROUND FLOOR LEVEL AND
UP TO 50mm ABOVE THE GROUND FLOOR LEVEL

NOTES:

1. EQUIPMENT AND WIRING INSTALLED IN HAZARDOUS AREAS MUST COMPLY WITH OESC SECTION 18 ACCORDINGLY.
2. EQUIPMENT INSTALLED ABOVE HAZARDOUS AREAS UP TO 3.6m ABOVE THE FINISHED FLOOR LEVEL MUST COMPLY WITH OESC RULE 20-110

ROD Contract No.
T-1038-2019

DATE (mmm dd yyyy)	ISSUED FOR	REV
OCT 01 2018	TENDER	0

KEY PLAN

CONSULTANTS

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LICENSED PROFESSIONAL ENGINEER
X. D. SHEN
100121127
OCT.01 2018
PROVINCE OF ONTARIO

North Arrow: Plan North

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager: A. VAN VEEN	Architect/Engineer: T. SHEN
Project Leader: T. SHEN	Drawn: A. ZHU
Date: mmm dd yyyy	Checked: C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM, WORKS DEPARTMENT, WHITBY, ONTARIO

Project:
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title:
PANEL SCHEDULES & HAZARDOUS AREA LAYOUT

Check Scale (may be photo-reduced): 0 — 1 Inch; 0 — 10mm

Project No.	Drawing No.
24RX12.0113	02-E19-00-01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:39:23 AM Path and File Name: \\comeast.ibigroup.com\L\to\24rx12.0113_durham region oronc & scugog depots\5-9 drawing\5electrical\layouts\02-e19-00-01.dwg

N

FIRST FLOOR – LIGHTING LAYOUT

SCALE 1:100

NOTES:

1. REFER TO LOW VOLTAGE LIGHTING CONTROL DIAGRAM ON DRAWING 01–E29–00–01, LIGHTING SEQUENCE OF OPERATIONS AND LOW VOLTAGE RELAY PANEL SCHEDULE FOR MORE INFORMATION.
2. VERIFY EXACT LOCATION AND INSTALLATION FOR INTERFACES AND LOW VOLTAGE SWITCHES PER RECOMMENDATION OF MANUFACTURE.
3. COORDINATE LUMINAIRE LOCATIONS AND MOUNTING HEIGHT ON SITE TO AVOID ANY INTERFERENCE WITH BEAMS, MECHANICAL DUCTS, PIPES, ETC.
4. PHOTOSENSOR – DESIGN BASED ON WATTSTOPPER PRODUCTS – MODELS AS NOTED

   OUTDOOR PHOTOCELL (FOR SITE/EXTERIOR LIGHTING ONLY): LMPO–200 C/W INTERFACE LMIO–301
5. SWITCHES – SWITCHES ARE TO CONTROL LIGHTING ONLY (REFER TO LOW VOLTAGE LIGHTING CONTROL DIAGRAM ON DRAWING 01–E29–00–01)

   SWITCHES WITH NO TYPE ARE LINE VOLTAGE.

   M – LOW VOLTAGE MOMENTARY SWITCH.
   LV – LOW VOLTAGE WALL STATION.

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR NEW AND EXISTING AREAS.
2. ALL EXISTING SYSTEMS TO REMAIN FUNCTIONAL UNLESS PERMISSION FOR SHUTDOWN IS GRANTED BY OWNER.
3. ALL WORK IN EXISTING AREA (GROUND FLOOR WASH BAY, HOIST BAY, OFFICES, EXISTING ELEC ROOM, VEHICLE STORAGE, AND 2ND FLOOR, ETC) TO BE AFTER HOURS. COORDINATE WITH OWNER FOR DETAIL CONSTRUCTION SCHEDULES

ROD Contract No.
T-1038-2019

DATE (mmm dd yyyy)	ISSUED FOR	REV
OCT 01 2018	TENDER	0

KEY PLAN

CONSULTANTS

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LICENSED PROFESSIONAL ENGINEER
X. D. SHEN
100121127
OCT.01 2018
PROVINCE OF ONTARIO

North Arrow: True North

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader	Drawn
T. SHEN	A. ZHU
Date	Checked
JAN 2013	C. BANTON

Client
THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title
MAIN BUILDING
LIGHTING LAYOUT

Check Scale (may be photo-reduced)
0 1 Inch 0 10mm

Project No.	Drawing No.
24RX12.0113	02–E21–01–01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:40:43 AM Path and File Name: \\conest.ibigroup.com\J\Ja\24rx12.0113_durham region orono & scugog depots\5.9 drawing\5Electrical\layouts\02-e21-01-01.dwg

NOTES:

1. VERIFY MOUNTING DETAIL WITH LUMINAIRE MANUFACTURER PRIOR TO INSTALLATION.

1 / 02-E29-00-01 TYPICAL BUILDING MOUNTED EXTERIOR LUMINAIRE DETAIL

N.T.S.

NOTES:

1. VERIFY MOUNTING DETAIL WITH LUMINAIRE MANUFACTURER PRIOR TO INSTALLATION.

2 / 02-E29-00-01 TYPICAL SUSPENDED FLUORESCENT LUMINAIRE MOUNTING

N.T.S.

NOTES:

1. 1 5/8" X 1 5/8" COLD FORMED CONTINUOUS CHANNEL, UNISTRUT P1000, USED AS HEADER STEEL BETWEEN ROOF SUPPORT STEEL, SHALL BE LIMITED TO A LOADING PRODUCING MAXIMUM MOMENT NO GREATER THAN 423 FT-LBS WITH A MAXIMUM SPAN OF 3m (10'-0"). DO NOT USE PIERCED CHANNEL.
2. PROVIDE DOUBLE NUTS AND WASHER AT EVERY LOAD POINT.
3. PROVIDE SWIVEL HANGERS WHERE SUPPORT CHANNEL IS SLOPED.

3 / 02-E29-00-01 TYPICAL CHANNEL SUPPORT SUSPENDED LUMINAIRES

N.T.S.

NOTE:

1. THE WIRING SCHEMATIC DIAGRAM IS BASED ON WATTSTOPPER PRODUCT FOR REFERENCE ONLY. COORDINATE WITH MANUFACTORY FOR EXACT DEVICES, WIRINGS, CONDUITS AND MOUNTING DETAILS.
2. VERIFY EXACT LOCATIONS AND QUANTITIES FOR INTERFACE MODULES AND LOW VOLTAGE SWITCHES WITH MANUFACTORY PRIOR TO INSTALLATION.
3. PROVIDE JUNCTION BOXES OR ENCLOSURES FOR INTERFACE MODULES AS REQUIRED BY MANUFACTORY.
4. REFER TO SPEC 16590 FOR WRING, UNLESS OTHERWISE NOTED.
5. VERIFY ALL POWER REQUIREMENT WITH SUPPLIER PRIOR TO INSTALLATION.

4 / 02-E29-00-01 LOW VOLTAGE LIGHITNG CONTROL SCHEMATIC DIAGRAM

N.T.S.

ROD Contract No.
T-1038-2019

DATE (mmm dd yyyy)	ISSUED FOR	REV
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LICENSED PROFESSIONAL ENGINEER
X. D. SHEN
100121127
OCT.01 2018
PROVINCE OF ONTARIO

North Arrow: Plan North

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader: T. SHEN	Drawn: A. ZHU
Date: mmm dd yyyy	Checked: C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project:
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title:
LIGHTING DETAILS
LV CONTROL DIAGRAM

Check Scale (may be photo-reduced): 0 — 1 Inch; 0 — 10mm

Project No.	Drawing No.
24RX12.0113	02-E29-00-01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:43:26 AM Path and File Name: \\conesat.ibigroup.com\U\Vol24rx12.0113_durham region orono & scugog depots\5.9 drawing\5Electrical\layouts\02-e29-00-01.dwg

Rev.: 0 Issued: Oct 01, 2018

LUMINAIRE SCHEDULE

TYPE	VOLTS	LAMP (QTY)	DESCRIPTION	MFR.TYPE/SERIES
B01	120	6W MR16 LED (2)	Emergency Battery Unit, 120 Volt Input, 12 Volt Output, Wattage Capacity For Minimum 120 Mins. Enclosed In NEMA 1 Code Gauge Steel Housing, White Finish, 10 Year Life, Time Delay Relay, Voltmeter, Integral and/or Remote 6 Watt MR16 LED Heads as Shown on Plans, White. Total Watts 72 for Battery Unit	Lumacell RG12S Series Beghelli Nova Series Ready-Lite LDX Series Approved equal
L01	120	LED	Wall Mounted LED Luminaire, Die Cast Aluminum Housing and Removable Hinged Door Frame, Injection Molded Acrylic Optical System, Type IV Distribution, IP66 Enclosure Rating on Lightbars, Luminaire Finished With Polyester Powder Coating, Colour Black. 2 Lightbars, 4,231 Lumens, 6000K CCT, 51 Watts	Eaton Cooper McGraw Edison Impact Elite LED Trapezoid, IST-B02-BL4 Series Lithonia WST Series Acuity Brands Lighting Pollaris LED Trapezoid Approved equal
L02	120	LED	Wall Mounted LED Luminaire, Die Cast Aluminum Housing and Removable Hinged Door Frame, Injection Molded Acrylic Optical System, Type IV Distribution, IP66 Enclosure Rating on Lightbars, Luminaire Finished With Polyester Powder Coating, Colour Black. 1 Lightbar, 2,115 Lumens, 6000K CCT, 27 Watts	Eaton Cooper McGraw Edison Impact Elite LED Trapezoid IST-B01-BL4 Series Lithonia WST Series Acuity Brands Lighting Pollaris LED Trapezoid Approved equal
L05	120	LED	4 ft Long LED Strip Light, Steel Channel With Baked White High Reflective Finish, Acrylic Lens, Pendant Mounted. 4400 Lumens, 4000K CCT, 85CRI, 50 Watts,	Eaton Cooper Metalux SNLED With Wide Lens Lithonia ZL1D Series Approved equal
L06	120	LED	4 ft long High Bay LED fixture Enclosed And Gasketed suspended from ceiling, wide/Medium distribution for open area, clear acrylic lense High Impact, 0-10V dimming Driver 19000 Lumens, 4000K CCT, 80CRI, 152W Watts,	Eaton Cooper Metalux VT4 LED Series Lithonia FHE LED Series Approved equal
L07	120	LED	4' Wall Mounted Enclosed And Gasketed LED Luminaire Suitable For Wet Location, Fiberglass Reinforced Polyester Housing, Prismatic Lens/High Impact Additive 4000 Lumens, 4000K CCT, 80CRI, 38W Watts,	Eaton Cooper MetaluxVaportite LED Series Lithonia FEM LED series Approved equal
X01	120	LED	Green Pictogram Exit Sign, White Aluminum Housing, Single or Double Face, Direction Arrows Where Shown on Plan, Ceiling, Pendant, or Wall Mounted as Required For Location, 12V Connection For Emergency	Lumacell LA Series Beghelli Ready-Lite Approved equal
P01	347	LED MINIMUM 70 CRI (2)	Two pole mounted LED luminaires in 180 degree orientation, forward throw distribution, cast aluminum housing with power coat finish. 30 LED's 1050 Driver, surge protection device, tool-less entry, 25ft tapered round galvanized steel pole with power coat finish, pole and luminaire finish color to be determined by architect. 2x102 Watts, 2x11673 lumens. Fixture c/w integrated photo cell.	Lithonia 2 x DSX1 P3 SERIES, Eaton Cooper GLEON Galleon LED Series 25FT POLE Approved equal

LIGHTING CONTROL SEQUENCE OF OPERATIONS

ROOM NAMES	SEQUENCE:
INTERIOR LIGHTS	
Electrical Room IT/Security Room	Sequence: ON/OFF: Line Voltage on/off switch
Repair Bay	Sequence: ON: Occupant enters the space and turns on the lights from 3-way wall mounted low voltage switches at each entrance. 4 lighting control zones: Zone 1-Bay #1 suspended lights, Zone 2-Bay #2 suspended lights, Zone 3-Bay #1 wall mounted lights, Zone #4 Bay #2 wall mounted lights. OFF: The lights also can be turned off through wall mounted low voltage switches. Additional Control: After Hours Mode will be programmed to begin at 07:00 PM. If no override control (low voltage wall switches) is activated, the lights in the space turn off. After Hours Mode will end at 07:00 AM.
Night Lights	Sequence: ON: Lights will be on all day. OFF: n/a
EXTERIOR LIGHTS	
Exterior Lights	Sequence: ON: Lights automatically turn on via photocell or time clock, unless otherwise noted. OFF: Lights automatically turn off at photocell or time clock, unless otherwise noted.
Exterior Lights Above Overhead Doors	Sequence: ON: Lights automatically turn on via Low Voltage Switches. OFF: Lights automatically turn off via Low Voltage Switches.

Relay No.	Circuit Controlled Panelboard	Cct.No.	Zone No.	Low Voltage Switch No.	Area Controlled		Remarks
1	RP-A	2	1	LV-1A, LV-1B	Suspended High-bay Lights	Repair Bay #1	LV Switches (3-way) @ North and South Entrances
2	RP-A	4	2	LV-2A, LV-2B	Suspended High-bay Lights	Repair Bay #2	
3	RP-A	6	3	LV-3A, LV-3B	Wall Mounted Lights	Repair Bay #1	
4	RP-A	8	4	LV-4A, LV-4B	Wall Mounted Lights	Repair Bay #2	
5	RP-A	18.1	5	-	Exterior Lights		Exterior Photocell or Time Clock
6	RP-A	18.2	6	LV-5, 6	Exterior Lights above Roll-up doors		LV switch
7	RP-A						spare
8	RP-A						spare

Notes:
1. Refer to Lighting Control Sequence of Operations and LV Control Diagram on drawing E29-00-01 for more information.

Plan Drawing Number:		Project Title:	SCUGOG DEPOT
Surface Mounted, Sprinkler Shield		Project Number:	24RX12.0113
IBI Group		Relay Panel LV-A	

ROD Contract No.
T-1038-2019

DATE (mmm dd yyyy)	ISSUED FOR	REV
OCT 01 2018	TENDER	0

KEY PLAN

CONSULTANTS

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LICENSED PROFESSIONAL ENGINEER X. D. SHEN 100121127 OCT.01 2018 PROVINCE OF ONTARIO

North Arrow: Plan True

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager: A. VAN VEEN	Architect/Engineer: T. SHEN
Project Leader: T. SHEN	Drawn: A. ZHU
Date: mmm dd yyyy	Checked: C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project: EXPAND GARAGE SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title: LUMINAIRE SCHEDULE LIGHTING CONTROL SEQUENCE

Check Scale (may be photo-reduced): 0 1 Inch 0 10mm

Project No.	Drawing No.
24RX12.0113	02-E29-00-02

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:44:16 AM Path and File Name: \\conreast.ibigroup.com\1\to\24rx12.0113_durham region oreno & scugog depots\5.9 drawing\5electrical\layouts\02-e29-00-02.dwg

1 TELECOM STRUCTURED CABLING SYSTEM RISER DIAGRAM

02-E30-00-01

ABBREVIATION:

OVP	OVER VOLTAGE PROTECTOR
LC	FIBER LC CONNECTOR
BIX	TYPE BIX PUNCH DOWN IDC TERMINATION
PP	PATCH PANEL RJ45 TERMINATION
WAP	WIRELESS ACCESS POINT
CCTV	CCTV SECURITY CAMERA
NIC	NOT IN CONTRACT

NOTES:

1. CABLING SYSTEM TO BE BELDEN, COMMUNICATIONS CONTRACTOR TO BE BELDEN CERTIFIED SYSTEM VENDER (CSV).
2. ONE CABLE PER JACK PER VOICE OR PER DATA SERVICE. QUANTITY OF VOICE AND/OR DATA JACKS IN EACH OUTLET AND QUANTITY OF OUTLETS AS PER LAYOUT DRAWINGS.
3. ALL PATCH CORDS SUPPLIED BY CONTRACTOR, INSTALLED BY OWNER. REFER TO SPECIFICATION FOR DETAILS.
4. ALL CABLES INSTALLED IN UNDERGROUND DUCT TO BE OUTDOOR WATERPROOF TYPE.
5. REFER TO SPECIFICATION FOR ALL CABLE AND TERMINATION DETAILS.
6. EXTEND EXISTING INCOMING BELL SERVICE (TELEPHONE CABLE) FROM EXISTING ELEC ROOM TO NEW ELEC ROOM WALL BACKBOARD DURING THE CUT OVER AFTER COMPLETION OF ALL NEW CABLING. EXISTING BELL SERVICE TO EXIST CABLING SYSTEM TO REMAIN OPERATIONAL DURING CONSTRUCTION.

NOTES:

1. ALL ITEMS ARE IN CONTRACT UNLESS NOTED AS "NIC"
2. PA SYSTEM HEAD END EQUIPMENT IN IT CABINET IN IT/SEC ROOM.
3. AMPLIFIER SHALL BE LOADED TO NOT EXCEED 65% CAPACITY. VERIFY AMPLIFIER LOADING PRIOR TO INSTALLATION. BASE HORNS TAPPED AT 7.5W.

2 PA SYSTEM RISER DIAGRAM

02-E30-00-01

ROD Contract No.
T-1038-2019

DATE (mmm dd yyyy)	ISSUED FOR	REV
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KEY PLAN

CONSULTANTS

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LICENSED PROFESSIONAL ENGINEER X. D. SHEN 100121127 OCT.01 2018 PROVINCE OF ONTARIO

North Arrow: TRUE NORTH

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager: A. VAN VEEN	Architect/Engineer: T. SHEN
Project Leader: T. SHEN	Drawn: A. ZHU
Date: JAN 2013	Checked: C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM, WORKS DEPARTMENT, WHITBY, ONTARIO

Project: EXPAND GARAGE SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title: AUXILIARY SYSTEMS RISER DIAGRAM – 1

Check Scale (may be photo-reduced): 0 — 1 Inch; 0 — 10mm

Project No.	Drawing No.
24RX12.0113	02-E30-00-01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:46:06 AM Path and File Name: \\conesat.ibigroup.com\J\to\24rx12.0113_durham region orono & scugog depots\5.9 drawing\59electrical\layouts\02-e30-00-01.dwg

1 SECURITY SYSTEM RISER DIAGRAM
02-E30-00-02

LEGEND:

- ELECTRIC DOOR STRIKE
- CARD READER
- KEY PAD
- MONITOR SWITCH (DOOR CONTACT)
- REQUEST TO EXIT SENSOR (RTE)
- SMOKE DETECTOR (S)
- HEAT DETECTOR (H)
- DOOR ALARM
- PUSH BUTTON
- MOTION DETECTOR (IR)
- GLASS BREAK SENSOR
- JUNCTION/PULL BOX (JB)
- MONITOR MODULE (M)

NOTES:

1. "NIC" DENOTES NOT IN CONTRACT
2. DEVICES AND WIRING TOPOLOGY SHOWN SCHEMATICALLY ONLY, ADJUST TO SUIT ACTUAL SYSTEM REQUIREMENT, REFER TO LAYOUT DRAWINGS FOR LOCATIONS AND QUANTITY OF DEVICES.
3. WEATHER-PROOF ENCLOSURE AND HEATER FOR ALL OUTDOOR CCTV CAMERAS. ALL CCTV HEAD-END EQUIPMENT IN CCTV CABINET.
4. PROVIDE ALL REQUIRED PROVISION FOR 3RD PARTY SECURITY/FIRM SYSTEM REMOTE MONITORING. SYSTEM MONITORING SERVICE AFTER OCCUPANCY NOT IN THIS CONTRACT (IN A SEPARATE CONTRACT BETWEEN OWNER AND 3RD PARTY MONITORING COMPANY)
5. ALL NEW CCTV AND SECURITY HEAD END EQUIPMENT INSTALLED AT NEW IT/SECURITY ROOM.

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LICENSED PROFESSIONAL ENGINEER X. D. SHEN 100121127 OCT.01 2018 PROVINCE OF ONTARIO

North Arrow: True

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader	Drawn
T. SHEN	A. ZHU
Date	Checked
JAN 2013	C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM, WORKS DEPARTMENT, WHITBY, ONTARIO

Project: EXPAND GARAGE SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title: AUXILIARY SYSTEMS RISER DIAGRAM – 2

Check Scale (may be photo-reduced): 0 1 Inch; 0 10mm

Project No.	Drawing No.
24RX12.0113	02-E30-00-02

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:47:29 AM Path and File Name: \\canesst.ibigroup.com\1\Us\24rx12.0113_durham region orono & scugog depots\5.9 drawing\5Electrical\layouts\02-e30-00-02.dwg

N

FIRST FLOOR – AUXILIARY SYSTEMS LAYOUT

SCALE 1:100

N

2ND FLOOR – AUXILIARY SYSTEMS LAYOUT

SCALE 1:100

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR NEW AND EXISTING AREAS.
2. ALL EXISTING SYSTEMS TO REMAIN FUNCTIONAL UNLESS PERMISSION FOR SHUTDOWN IS GRANTED BY OWNER.
3. ALL WORK IN EXISTING AREA (GROUND FLOOR WASH BAY, HOIST BAY, OFFICES, EXISTING ELEC ROOM, VEHICLE STORAGE, AND 2ND FLOOR, ETC) TO BE AFTER HOURS. COORDINATE WITH OWNER FOR DETAIL CONSTRUCTION SCHEDULES

NOTES:

1. ALL NEW VOICE/DATA AND PA CABLING IN OPEN AND NON-ACCESSABLE CEILING AREAS TO BE INSTALLED IN CONDUITS, IN T-BAR CEILING AREA TO BE INSTALLED IN J-HOOKS.
2. ALL SECURITY AND CCTV CABLING TO BE INSTALLED IN DEDICATED CONDUIT SYSTEM NOT SHARED WITH OTHER SYSTEMS.
3. ALL CONDUITS WITH PULL STRINGS, BUSHING AND FIRE STOP (WHERE PENETRATE FIRE RATED WALLS). DISTANCE BETWEEN PULL BOXES NOT GREATER THAN 30M (100'); AGGREGATED BENDS BETWEEN PULL BOX AND END AND ADJACENT PULL BOX NOT MORE THAN 180 DEGREES.
4. REFER TO AUXILIARY SYSTEMS RISER DIAGRAM DRAWINGS FOR CABLING INFORMATION. ALL NEW IT(VOICE/DATA), PA, SECURITY AND CCTV EQUIPMENT IN NEW IT/SEC ROOM.
5. INSTALL PA HEADEND EQUIPMENT IN IT CABINET IN IT/SEC ROOM. PROVIDE PA SYSTEM COMMISSIONING. ADJUST OVERALL GAIN AND INDIVIDUAL SPEAKER TAPPING TO SUIT DURING COMMISSIONING TO DEMONSTRATE PROPER OPERATIONS AND COVERAGE. PROGRAMMING AND COORDINATE WITH OWNER IT FOR PROVIDING PAGING FROM VOIP PHONE SET.

   SPEAKER HORN TYPE TO BE TOA SC-615T OR ACCEPTED EQUAL.
   ALLOW COST FOR PROVIDING ONE MODULAR DIGITAL MIXER/AMPLIFIER, TOA A-9120SM2, C/W SP-11N SIP MODULE (VoIP PHONE) AND D-001T DUAL MIC/LINE INPUT WITH DSP. OR ACCEPTED EQUAL.
6. IN EXISTING AREA, PROVIDE NEW VOICE AND DATA CABLING TO REPLACE EXISTING VOICE AND DATA CABLING. INSTALL NEW CABLING FROM NEW ELEC ROOM IT CABINET TO WORK AREA IN NEW SUPPORTING PATH WAY CONSISTING OF CONDUITS AND J-HOOKS. ALL EXISTING CABLING ARE FED FROM EXISTING ELEC ROOM. COMPLETE INSTALLATION AND TESTING BEFORE DISCONNECTING AND REMOVING EXISTING CABLING. ALLOW COST FOR WORK AT AFTER-HOURS FOR BOTH NEW INSTALLATION AND DEMOLITION TO ENSURE NO INTERRUPTION TO THE FACILITY REGULAR OPERATION.
7. ALL NEW VOICE/DATA IN EXISTING OFFICE AREA TO BE SURFACED MOUNTED SIDE BY SIDE WITH NEW UPS POWER RECEPTACLES, C/W WIREMOLD CABLE RACEWAY FROM CEILING SPACE, CONFIRM AND MARK EXACT LOCATION WITH OWNER PRIOR TO ROUGH-IN.
8. COORDINATION WITH OWNER AND REGION IT AND SECURITY STAFF FOR TELEPHONE, DATA, CCTV AND SECURITY SYSTEMS CUT OVER DETAILS.

ROD Contract No.
T-1038-2019

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KEY PLAN

CONSULTANTS

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LICENSED PROFESSIONAL ENGINEER
K. D. SHEN
100121127
OCT.01 2018
PROVINCE OF ONTARIO

North Arrow: TO THE TOWN

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager: A. VAN VEEN	Architect/Engineer: T. SHEN
Project Leader: T. SHEN	Drawn: A. ZHU
Date: JAN 2013	Checked: C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project:
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title:
MAIN BUILDING
FIRST FLOOR
AUXILIARY SYSTEMS

Check Scale (may be photo-reduced): 0 — 1 Inch 0 — 10mm

Project No.	Drawing No.
24RX12.0113	02-E31-01-01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:48:08 AM Path and File Name: \\conest.ibigroup.com\\to\24rx12.0113_durham region orono & scugog depots\5.9 drawing\5Electrical\layouts\02-e31-01.dwg

NOTES:

1. 19mm G1S PLYWOOD FIRE RATED BACKBOARD C/W 2 COATS OF FIRE RETARDANT PAINT, WALL SURFACE MOUNT, ON WALLS AS INDICATED, PAINT COLOR TO MATCH WALL.
2. CABLE RUNWAY 450 (18") WIDE, SOLID SIDE STRINGER 50x10, RUNG SPACING 230. SUPPORT SPACING 1500 OR LESS, MANUFACTURED ACCESSORIES. (TYPICAL)
3. RADIUSED RUNWAY DROP-OUT SUPPORTS PROTECT CABLES AT TRANSITION FROM CABLE RUNWAY. EXACT LOCATIONS TO BE DETERMINED ON SITE, ALLOW FOR TOTAL OF 4.
4. TELECOM CABINET (750Wx1050Dx2000H) WITH SIDE PANELS, CABLE MANAGERS, MOUNTING RAILS. REFER TO SPEC FOR DETAILS. (TYPICAL)
5. MOUNTING HEIGHT OF ALL WALL OUTLETS / RECEPTACLES TO BE 300AFF UNLESS NOTED OTHERWISE.
6. ALL CONDUITS/SLEEVES WITH BUSHING AND FIRESTOP, ALL U/G CONDUITS STUB-UP 100AFF ABOVE FLOOR SLAB
7. ROOM DIMENSIONS SHOWN FOR CO-ORDINATION ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT DIMENSION.
8. GROUND TELECOM/UPS/CCTV CABINETS AND CABLE RUNWAY TO TELECOM GROUNDING BUSBAR WITH DEDICATED #6 GROUND WIRES
9. 3-53C CONDUITS TO SITE COMMUNICATIONS HANDHOLE. (ONE FOR FUTURE FIBER CABLE, ONE FOR GATE SECURITY, ONE FOR STORAGE BUILDING)

1 NEW IT/SECURITY ROOM LAYOUT
02-E39-00-01 SCALE 1 : 25

NOTES:

1. THIS SKETCH IS FOR SCHEMATIC PURPOSE ONLY. QUANTITIES TO SUIT CABLING AND EQUIPMENT REQUIREMENTS AS PER LAYOUT AND RISER DIAGRAM DRAWING.
2. FOR COMPONENTS LISTED, REFER TO SPECIFICATION FOR DETAILS.
3. CO-ORDINATE WITH BELL CANADA FOR EXATC LOCATION OF THE BIX BLOCK PRIOR TO INSTALLATION.

① BIX TYPE IDC MOUNT (250 PAIR) C/W CONNECTORS, DESIGNATION STRIP AND LABELS.

② BIX TYPE DISTRIBUTION RING (TYPICAL).

2 NEW IT/SECURITY ROOM BACKBOARD (NORTH) ELEVATION
02-E39-00-01 SCALE N.T.S.

NOTES:

1. THIS SKETCH IS FOR SCHEMATIC PURPOSE ONLY. QUANTITIES TO SUIT CABLING AND EQUIPMENT REQUIREMENTS AS PER LAYOUT AND RISER DIAGRAM DRAWING.
2. IT CABINET TO BE 42U, 30"(750)Wx42"(1050)D, C/W KEY LOCK, FAN KIT, MOUNTING BRACKET, 2 VERTICAL CABLE MANAGERS, ETC, AND TO BE GROUNDED TO TELECOM GROUNDING BAR.
3. CONFIRM WITH OWNER IT STAFF FOR FINAL RACK ELEVATION PRIOR TO INSTALLATION.
4. UPS CABINET TO BE PART OF UPS PACKAGE.
5. REFER TO SPECIFICATION FOR DETAIL EQUIPMENT LIST

3 NEW IT/SECURITY ROOM IT & UPS CABINETS ELEVATION
02-E39-00-01 SCALE N.T.S.

NOTES:

1. THIS SKETCH IS FOR SCHEMATIC PURPOSE ONLY. QUANTITIES TO SUIT CABLING AND EQUIPMENT REQUIREMENTS AS PER LAYOUT AND RISER DIAGRAM DRAWING.
2. FOR COMPONENTS LISTED, REFER TO SPECIFICATION FOR DETAILS.

4 NEW IT/SECURITY ROOM BACKBOARD (WEST) ELEVATION
02-E39-00-01 SCALE N.T.S.

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KEY PLAN

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LICENSED PROFESSIONAL ENGINEER X. D. SHEN 100121127 OCT.01 2018 PROVINCE OF ONTARIO

North Arrow: TRUE NORTH

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader	Drawn
T. SHEN	A. ZHU
Date	Checked
JAN 2013	C. BANTON

Client
THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title
TELECOM ROOM
LAYOUT AND DETAILS

Check Scale (may be photo-reduced)
0 1 Inch 0 10mm

Project No.	Drawing No.
24RX12.0113	02-E39-00-01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:48:59 AM Path and File Name: \\conest.ibigroup.com\\to\24rx12.0113_durham region orono & scugog depots\5.9 drawing\59electrical\layouts\02-e39-00-01.dwg

NOTES:

1. THIS CONSTRUCTION DETAIL IS FOR SCHEMATIC PURPOSE ONLY, REFER TO POWER AND SECURITY LAYOUT DRAWINGS AND DOOR HARDWARE SCHEDULE FOR EXACT COMPONENTS REQUIRED AND CONDUIT ROUTING.
2. ALL CONDUITS WITH PULL STRING, JUNCTION BOXES, PULL BOXES, DEVICE BOXES AND POWER WIRES BY DIV.26.
3. SECURITY DOOR CONTROLLER, CARD READER, ALARM BUZZER, KEYPAD, REQUEST TO EXIT SENSOR AND SECURITY WIRES BY SECURITY VENDER WHERE REQUIRED.
4. POWER SUPPLY, ELECTRIC STRIKE/BOLT/LATCH, DOOR CONTACT (MONITOR SWITCH), BY DOOR HARDWARE CONTRACTOR WHERE REQUIRED.
5. PROVIDE CONTINUOUS ELECTRICAL RACEWAY CONSISTING OF CONDUIT AND/OR CABLE TRAY. NO FREE AIR RUNNING SECURITY CABLE.
6. JUNCTION BOX SIZED TO ACCOMMODATE LOCAL DOOR CONTROL SYSTEM; MIN. 300x300x150 WITH REMOVABLE AND TAMPER RESISTANT COVER; SURFACE MOUNTED FOR SOLID WALL CONSTRUCTION. SAME WITH 100x100x54 DEVICE BOX WITH 38MM EXTENSION RING TO DEPTH OF 92MM, FLUSH MOUNT FOR CAVITY OR BLOCK WALL CONSTRUCTION. USE COMMON CONDUIT, PULL BOXES AND JUNCTION BOXES FOR INTRUSION DETECTION AND ACCESS CONTROL WIRING.
7. USE JUNCTION BOX AT CORNER FOR BLOCK WALL CONSTRUCTION. CONCEAL VERTICAL CONDUIT. SURFACE MOUNT HORIZONTAL CONDUIT ON SOLID WALL ONLY
8. DEVICE BOX TO MOUNT FLUSH WITH SURFACE. PROVIDE SINGLE DEVICE COVER PLASTER RING FOR CAVITY OR BLOCK WALL CONSTRUCTION. REFER TO LAYOUT DRAWING FOR LOCATION. COORDINATE WITH DOOR HARDWARE SCHEDULE FOR EXACT SIZE. DISPENSE WITH WALL BOX WHEN MULLION MOUNT IS INDICATED IN THE DOOR HARDWARE SCHEDULE.
9. BOLT RELEASE/RETRACT DEVICE MAY BE PUSH-BAR OR LEVER TYPE. USE TYPE INDICATED IN DOOR HARDWARE SCHEDULE.
10. WHERE DOOR PERFORMANCE REQUIREMENTS CALL FOR INTRUSION DETECTION AND ACCESS CONTROL, USE MAY BE MADE OF 2 SEPARATE SINGLE POLE SWITCHES OR ONE COMMON 2 POLE SWITCH. MAINTAIN SEPARATION BETWEEN WIRING OF TWO SYSTEMS.
11. USE OF BRIDGING CONDUIT ACCEPTABLE FOR CAVITY OR BLOCK WALL CONSTUCTION WHERE SITE CONDITIONS PERMIT.

1 SECURITY SINGLE DOOR DETAIL

02-E39-00-02 SCALE N.T.S.

NOTES:

1. PULL BOX SIZED MINIMUM 300x300x150 WITH REMOVABLE AND TAMPER RESISTANT COVER; SURFACE MOUNTED FOR SOLID OR BLOCK WALL CONSTRUCTION. SAME WITH 120x120x54 FLUSH MOUNT BACK BOX FOR CAVITY WALL CONSTRUCTION. USE COMMON CONDUIT, PULL BOXES AND JUNCTION BOXES FOR INTRUSION DETECTION AND ACCESS CONTROL WIRING WHERE REQUIRED.
2. USE JUNCTION BOX AT CORNER FOR BLOCK WALL CONSTRUCTION. CONCEAL VERTICAL CONDUIT. SURFACE MOUNT HORIZONTAL CONDUIT ON SOLID WALL ONLY.
3. DOOR OPEN/CLOSE MONITOR SWITCH INCLUDED IN DOOR HARDWARE.
4. PROVIDE CONTINUOUS ELECTRICAL RACEWAY CONSISTING OF CONDUIT. AVOID RUNNING SECURITY CABLE IN FREE AIR.
5. THIS CONSTRUCTION DETAIL IS FOR SCHEMATIC PURPOSE, REFER TO LAYOUT DRAWINGS AND ARCHITECTURAL HARDWARE SCHEDULE FOR EXACT COMPONENTS REQUIRED AND CONDUIT ROUTING.
6. DEVICE BOX TO MOUNT FLUSH WITH SURFACE. PROVIDE SINGLE DEVICE COVER PLASTER RING FOR CAVITY OR BLOCK WALL CONSTRUCTION. REFER TO LAYOUT DRAWING FOR LOCATION. COORDINATE WITH DOOR HARDWARE SCHEDULE FOR EXACT SIZE. DISPENSE WITH WALL BOX WHEN MULLION MOUNT IS INDICATED IN THE DOOR HARDWARE SCHEDULE.

3 OVERHEAD DOOR DETAIL

02-E39-00-02 SCALE N.T.S.

NOTES:

1. THIS CONSTRUCTION DETAIL IS FOR SCHEMATIC PURPOSE ONLY, REFER TO POWER AND SECURITY LAYOUT DRAWINGS AND DOOR HARDWARE SCHEDULE FOR EXACT COMPONENTS REQUIRED AND CONDUIT ROUTING.
2. ALL CONDUITS WITH PULL STRING, JUNCTION BOXES, PULL BOXES, DEVICE BOXES AND POWER WIRES BY DIV.26.
3. SECURITY DOOR CONTROLLER, CARD READER, ALARM BUZZER, KEYPAD, REQUEST TO EXIT SENSOR AND SECURITY WIRES BY SECURITY VENDER WHERE REQUIRED.
4. POWER SUPPLY, DOOR OPERATOR/CONTROLLER, DOOR POWER PUSH BUTTON, ELECTRIC STRIKE/BOLT/LATCH, DOOR CONTACT (MONITOR SWITCH), BY DOOR HARDWARE CONTRACTOR WHERE REQUIRED.
5. PROVIDE CONTINUOUS ELECTRICAL RACEWAY CONSISTING OF CONDUIT AND/OR CABLE TRAY. NO FREE AIR RUNNING SECURITY CABLE.
6. JUNCTION BOX SIZED TO ACCOMMODATE LOCAL DOOR CONTROL SYSTEM; MIN. 300x300x150 WITH REMOVABLE AND TAMPER RESISTANT COVER; SURFACE MOUNTED FOR SOLID WALL CONSTRUCTION. SAME WITH 100x100x54 DEVICE BOX WITH 38MM EXTENSION RING TO DEPTH OF 92MM, FLUSH MOUNT FOR CAVITY OR BLOCK WALL CONSTRUCTION. USE COMMON CONDUIT, PULL BOXES AND JUNCTION BOXES FOR INTRUSION DETECTION AND ACCESS CONTROL WIRING.
7. USE JUNCTION BOX AT CORNER FOR BLOCK WALL CONSTRUCTION. CONCEAL VERTICAL CONDUIT. SURFACE MOUNT HORIZONTAL CONDUIT ON SOLID WALL ONLY
8. DEVICE BOX TO MOUNT FLUSH WITH SURFACE. PROVIDE SINGLE DEVICE COVER PLASTER RING FOR CAVITY OR BLOCK WALL CONSTRUCTION. REFER TO LAYOUT DRAWING FOR LOCATION. COORDINATE WITH DOOR HARDWARE SCHEDULE FOR EXACT SIZE. DISPENSE WITH WALL BOX WHEN MULLION MOUNT IS INDICATED IN THE DOOR HARDWARE SCHEDULE.
9. BOLT RELEASE/RETRACT DEVICE MAY BE PUSH-BAR OR LEVER TYPE. USE TYPE INDICATED IN DOOR HARDWARE SCHEDULE.
10. WHERE DOOR PERFORMANCE REQUIREMENTS CALL FOR INTRUSION DETECTION AND ACCESS CONTROL, USE MAY BE MADE OF 2 SEPARATE SINGLE POLE SWITCHES OR ONE COMMON 2 POLE SWITCH. MAINTAIN SEPARATION BETWEEN WIRING OF TWO SYSTEMS.
11. USE OF BRIDGING CONDUIT ACCEPTABLE FOR CAVITY OR BLOCK WALL CONSTUCTION WHERE SITE CONDITIONS PERMIT.

2 SECURITY SINGLE DOOR DETAIL (POWER OPERATED)

02-E39-00-02 SCALE N.T.S.

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KEY PLAN

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LICENSED PROFESSIONAL ENGINEER
X. D. SHEN
100121127
OCT 01 2018
PROVINCE OF ONTARIO

North Arrow: Plan North

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader	Drawn
T. SHEN	A. ZHU
Date	Checked
mmm dd yyyy	C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project: EXPAND GARAGE SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title: SECURITY SYSTEM DETAILS

Check Scale (may be photo-reduced): 0 — 1 Inch; 0 — 10mm

Project No.	Drawing No.
24RX12.0113	02-E39-00-02

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:49:36 AM Path and File Name: \\conesat.ibigroup.com\J\to\24rx12.0113_durham region orono & scugog depots\5.9 drawing\59electrical\layouts\02-e39-00-02.dwg

OPTION 1

1 OUTDOOR CCTV CAMERA WALL CORNER PENDANT MOUNT
02-E39-00-03 SCALE N.T.S.

2 OUTDOOR CCTV CAMERA WALL SURFACE PENDANT MOUNT
02-E39-00-03 SCALE N.T.S.

3 OUTDOOR CCTV CAMERA WALL SURFACE MOUNT
02-E39-00-03 SCALE N.T.S.

4 INDOOR CCTV CAMERA CEILING SURFACE / PENDANT MOUNT
02-E39-00-03 SCALE N.T.S.

5 INDOOR CCTV CAMERA WALL SURFACE MOUNT
02-E39-00-03 SCALE N.T.S.

6 INDOOR CCTV CAMERA TRUSS PENDANT MOUNT
02-E39-00-03 SCALE N.T.S.

7 OUTDOOR CCTV CAMERA CONDUIT WALL PENETRATION DETAIL (TYPICAL)
02-E39-00-03 SCALE N.T.S.

ROD Contract No.
T-1038-2019

DATE (mmm dd yyyy)	ISSUED FOR	REV
OCT 01 2018	TENDER	0

KEY PLAN

CONSULTANTS

IBI GROUP
100-175 Galaxy Boulevard
Toronto ON M9W 0C9 Canada
tel 416 679 1930 fax 416 675 4620
ibigroup.com

This drawing has been prepared solely for the use of the Regional Municipality of Durham and there are no representations of any kind made by IBI Group to any party with whom IBI Group has not entered into a contract

LICENSED PROFESSIONAL ENGINEER
X. ZI. SHEN
100121127
OCT.01 2018
PROVINCE OF ONTARIO

North Arrow: True North

Detail Symbol: DETAIL NUMBER / LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader	Drawn
T. SHEN	A. ZHU
Date	Checked
mmm dd yyyy	C. BANTON

Client: THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title
SECURITY SYSTEM DETAILS

Check Scale (may be photo-reduced)
0 1 Inch
0 10mm

Project No.	Drawing No.
24RX12.0113	02-E39-00-03

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:50:15 AM Path and File Name: \\consast.ibigroup.com\J\to\24rx12.0113_durham region orono & scugog depots\5.9 drawing\59electrical\layouts\02-e39-00-03.dwg

N

GROUNDING & LIGHTNING PROTECTION LAYOUT

SCALE 1:100

NOTES

1. REFER TO SPECIFICATION FOR ALL LIGHTNING AND BONDING CONDUCTORS TYPE.
2. ALL CONNECTIONS TO LIGHTNING PROTECTION CONDUCTOR SHALL BE MADE USING EXOTHERMIC WELDS OR APPROVED COMPRESSION CONNECTORS.
3. CONNECTIONS TO SOLID METALLIC OBJECTS OR GROUND BAR SHALL BE MADE WITH TWO-HOLE COPPER COMPRESSION TYPE LUGS.
4. NO-OX-ID COMPOUND IS TO BE USED BETWEEN ALL CONNECTIONS WHERE DISSIMILAR METALS COME IN CONTACT.
5. LIGHTNING PROTECTION SHALL BE PROVIDED BY A SUB-CONTRACTOR LICENSED BY THE ONTARIO FIRE MARSHAL TO PERFORM LIGHTNING PROTECTION WORK.
6. CONFORM TO THE FOLLOWING CODES AND STANDARDS
   (i) CAN/CSA-B72-M87 INSTALLATION CODE FOR LIGHTNING PROTECTION SYSTEMS
7. ON COMPLETION OF LIGHTNING PROTECTION WORK PROVIDE CERTIFICATE OF INSTALLATION TO THE FIRE MARSHAL OF ONTARIO WITH A COPY TO THE CONSULTANT.
8. LIGHTNING PROTECTION CONDUCTOR DOWN RUN FIXED TO OUTSIDE WALL OF BUILDING; BOTTOM 2.4m OF DOWN RUN CONDUCTOR SHALL BE PROTECTED BY PVC PIPE.
9. COPPER-CLAD STEEL GROUND ROD (3000mm x ø19mm). TOP OF GROUND ROD TO BE MINIMUM 400mm BELOW GRADE AND MINIMUM 600mm FROM WALLS OR FOUNDATIONS.
10. DIRECT BURIED LIGHTNING CONDUCTOR MINIMUM 400mm BELOW GRADE, BOND TO GROUND RODS.
11. NEW LIGHTNING PROTECTION CONDUCTOR TO BE INSTALLED ON THE HIGHEST PART OF THE ROOF PERIMETER (ON TOP OF PARAPET).
12. CONNECT AHU UNITS, EXHAUST FANS, MECH AND PROCESS VENTS, AND ALL METALLIC OBJECTS ON THE ROOF TO LIGHTNING PROTECTION CONDUCTOR. REFER TO MECH AND ARCH ROOF PLAN

DISCLAIMER

THE DESIGN OF THE LIGHTNING PROTECTION SYSTEM INDICATED ON THIS DRAWING INCLUDING ILLUSTRATIONS AND NOTES APPLIES TO THE NEW EXPANSION AREA ONLY

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR NEW AND EXISTING AREAS.
2. ALL EXISTING SYSTEMS TO REMAIN FUNCTIONAL UNLESS PERMISSION FOR SHUTDOWN IS GRANTED BY OWNER.
3. ALL WORK IN EXISTING AREA (GROUND FLOOR WASH BAY, HOIST BAY, OFFICES, EXISTING ELEC ROOM, VEHICLE STORAGE, AND 2ND FLOOR, ETC) TO BE AFTER HOURS. COORDINATE WITH OWNER FOR DETAIL CONSTRUCTION SCHEDULES

ROD Contract No.
T-1038-2019

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OCT 01 2018	TENDER	0

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X. D. SHEN
100121127
OCT.01 2018
PROVINCE OF ONTARIO

North Arrow

Detail Symbol

DETAIL NUMBER
LOCATION OR DETAIL SHEET

Project Manager	Architect/Engineer
A. VAN VEEN	T. SHEN
Project Leader	Drawn
T. SHEN	A. ZHU
Date	Checked
JAN 2013	C. BANTON

Client
THE REGIONAL MUNICIPALITY OF DURHAM
WORKS DEPARTMENT
WHITBY ONTARIO

Project
EXPAND GARAGE
SCUGOG DEPOT
10 REGIONAL RD. 21, R.R.#14, PORT PERRY

Drawing Title
MAIN BUILDING
GROUNDING & LIGHTNING
PROTECTION LAYOUT

Check Scale (may be photo-reduced)
0 1 Inch 0 10mm

Project No.	Drawing No.
24RX12.0113	02-E61-01-01

User Name: Emma Fan Plot Date\Time: Monday, March 18, 2019 11:51:01 AM Path and File Name: \\conest.ibigroup.com\J\Ja\24rx12.0113_durham region orono & scugog depots\5.9 drawing\59electrical\layouts\02-e61-01-01.dwg