

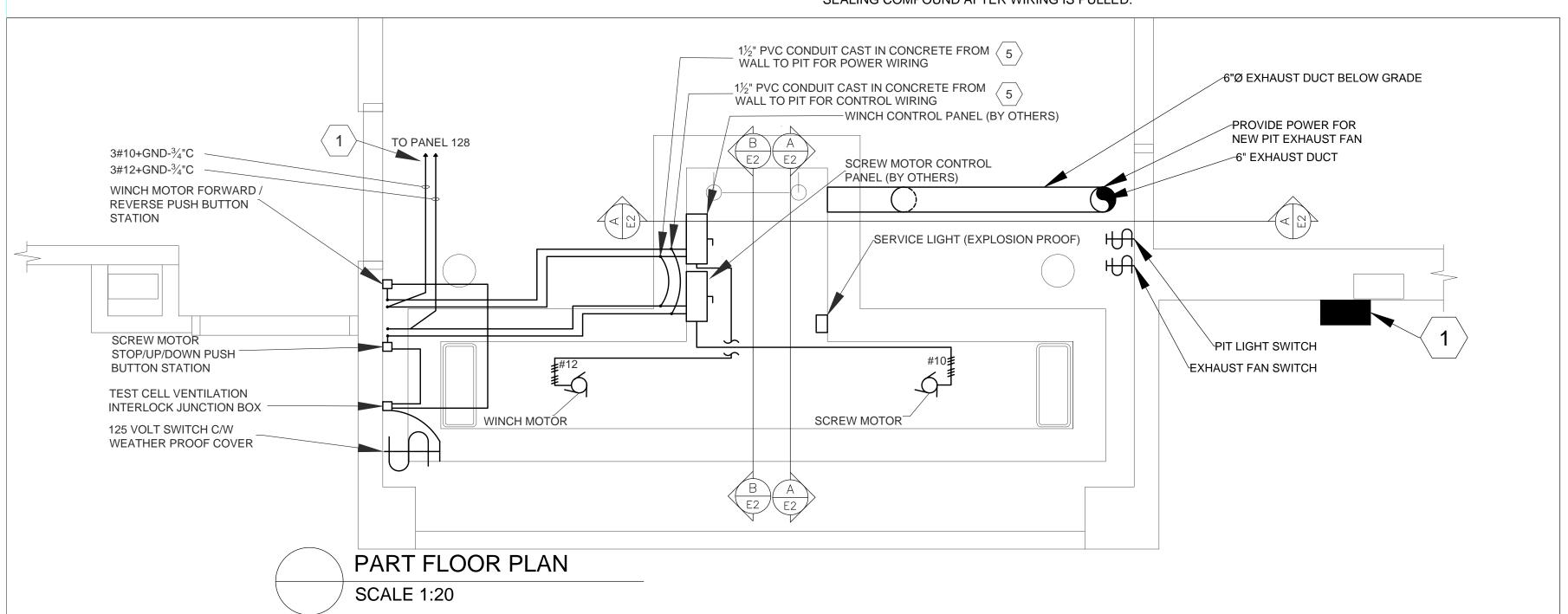
FLEXIBLE CONDUIT.

TEST CELL.

② RUN ALL CONDUITS ABOVE TEST CELL FALSE

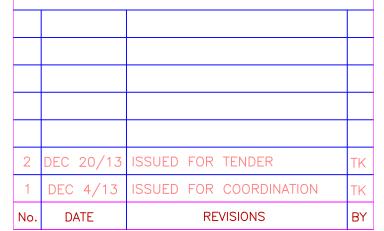
CEILING AND WALL MOUNT SURFACE CONDUITS IN

- **EXISTING PANEL '128.'**
- ADD 40AMP 3POLE BREAKER AND FEED SCREW MOTOR AND CONTROL PANEL - ADD 30AMP 3POLE BREAKER AND FEED WINCH MOTOR AND CONTROL PANEL -ADD 15 AMP SINGLE POLE BREAKER AND FEED LIGHT FIXTURE AND SWITCH
- CONTROL PANELS SUPPLIED BY OTHERS INSTALLED & WIRED BY THIS CONTRACTOR.
- WIRING BETWEEN CONTROL PANEL AND CONTROL DEVICES BY THIS
- ALLOW FOR 50 METERS OF 2#14 AWG IN 12mm EMT CONDUIT BETWEEN VENTILATION BOX AND VENTILATION RELAY IN MECHANICAL CLOSET.
- PROVIDE 'EYS' FITTING ON ALL CAST CONDUITS AND FILL WITH 3M FLEXIBLE SEALING COMPOUND AFTER WIRING IS PULLED.

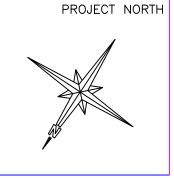


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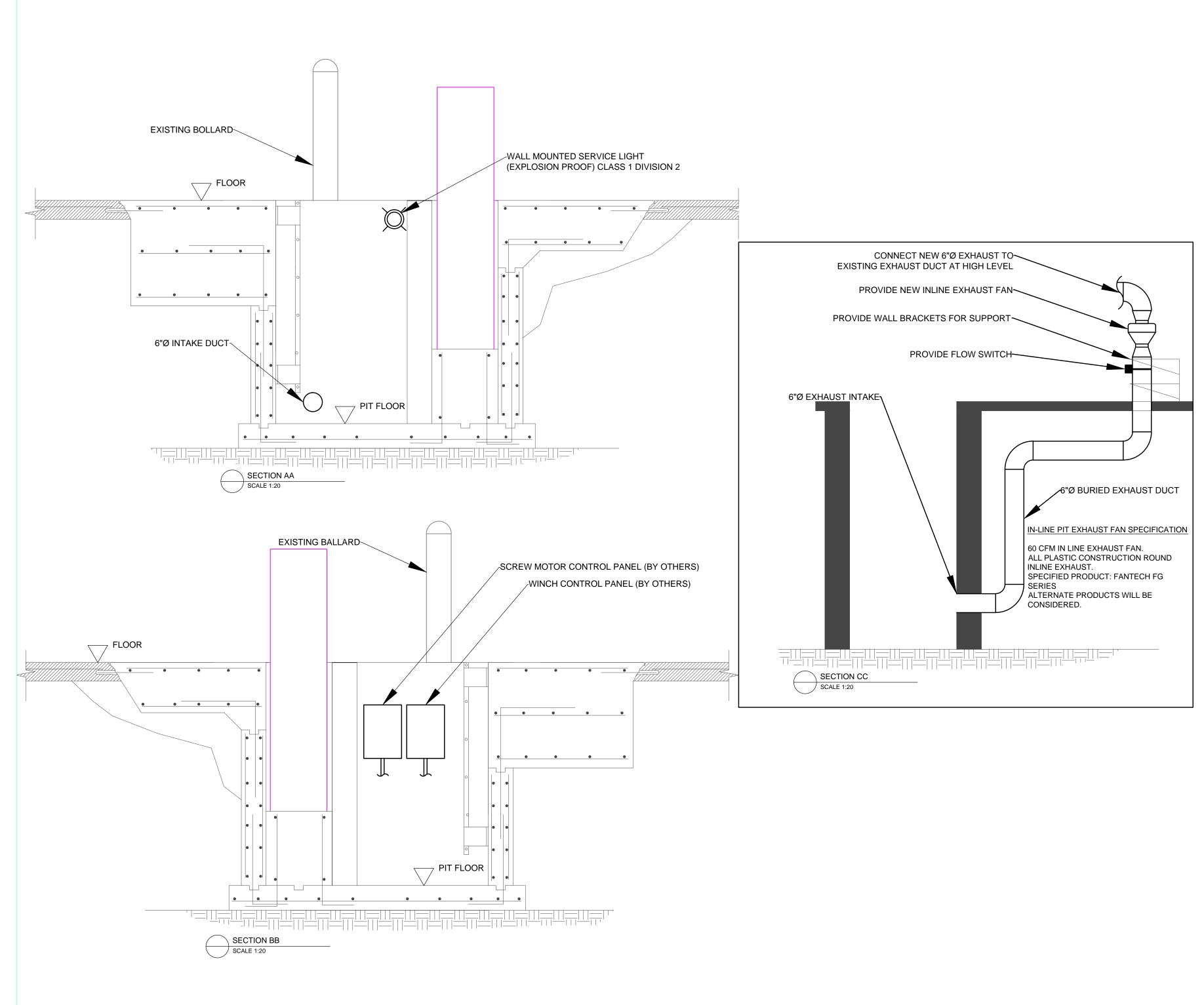
Tel. 613-592-1677 Fax. 613-599-1412

PROJECT

ERMS TEST CELL #2 **RESTRAINT SYSTEM** 335 River Road OTTAWA, ONTARIO

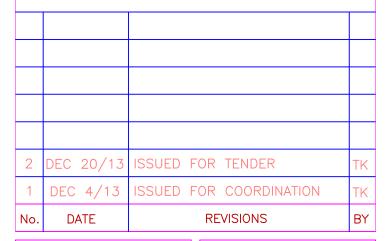
PARTIAL PLANS **GENERAL NOTES**

DRAWN:	T.K.	DRAWING No.
APPROVED:	T.V.	
DATE:	NOV 11/13	-M/E-1
SCALE:	VARIES	
SIZE:	ARCH C	

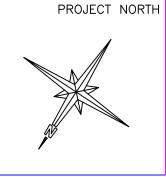


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Tel. 613-592-1677 Fax. 613-599-1412

PROJECT

ERMS TEST CELL #2
RESTRAINT SYSTEM
335 River Road
OTTAWA, ONTARIO

DRAWING

SECTIONS & DETAILS

DRAWN:	T.K.	DRAWING No.
APPROVED:	T.V.	
DATE:	NOV 11/13	-M/E-2
SCALE:	VARIES	
SIZE:	ARCH C	

GENERAL INSTRUCTIONS

CONDITIONS OF CONTRACT

- THE OWNERS INSTRUCTIONS TO BIDDERS AND THE GENERAL CONDITIONS OF THE DESIGNERS SPECIFICATIONS ARE AN INTEGRAL PART OF THIS CONTRACT AND SHALL BE READ IN CONJUNCTION HEREWITH. THESE INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS SHALL BE FULLY BINDING ON THE GENERAL CONTRACTOR AND HIS SUB-CONTRACTORS TO THE FULL SATISFACTION OF THE DESIGNER, ENGINEER AND
- THE RESPONSIBILITY AND SCOPE OF EACH SUB-TRADE RESTS SOLELY WITH THE CONTRACTOR. EXTRAS WILL NOT BE CONSIDERED BASED ON THE GROUNDS OF DIFFERENCE IN INTERPRETATION OF SPECIFICATIONS AND DRAWINGS AS TO WHICH TRADE INVOLVED SHALL PROVIDE CERTAIN SPECIALTIES OR MATERIALS
- IT IS A CONDITION OF THIS CONTRACT, THAT THE CONTRACTOR WILL, IN THE PERFORMANCE OF THE SERVICES FOR THE OWNER AS DESCRIBED IN THIS CONTRACT, PERFORM WORK IN ACCORDANCE WITH ONTARIO BUILDING CODE LATEST EDITION, THE ONTARIO HYDRO ELECTRICAL SAFETY CODE, THE SEWAGE SYSTEMS ENVIRONMENTAL OTECTION ACT ONTARIO, WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS), O.REG 644/88, THE ONTARIO GAS UTILIZATION CODE, AND ANY OTHER CODE OF PROVINCIAL OR LOCAL APPLICATION, INCLUDING HOURS OF WORK, RATES OF PAY, JOB SAFETY AND ALL OTHER MATTERS IN WHICH THE MUNICIPAL OR FEDERAL AUTHORITIES HAVE JURISDICTION, PROVIDED THAT IN ANY CASE OF CONFLICT OR DISCREPANCY, THE MORE STRINGENT REQUIREMENTS SHALL APPLY.
- COMPLY WITH STANDARD FOR BUILDING CONSTRUCTION OPERATIONS, ISSUED BY THE ONTARIO FIRE MARSHALL'S OFFICE AND ALL APPLICABLE FIRE SAFETY CODES, LAWS, AND
- IT IS INCUMBENT UPON THE CONTRACTOR TO INFORM ITSELF OF ANY SUCH LEGISLATION AND THE CONTRACTOR AGREES THAT IN THE EVENT OF NON-COMPLIANCE WITH THIS LEGISLATION, IT WILL INDEMNIFY AND HOLD HARMLESS THE OWNER FROM ANY COSTS AND DAMAGES RESULTING FROM SUCH NON-COMPLIANCE
- ALL WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH STANDARDS OF GOOD PRACTICE SUCH AS, BUT NOT LIMITED TO, SMACNA AND ASHRAE, MEET OR EXCEED REQUIREMENTS OF CONTRACT DOCUMENTS, SPECIFIED STANDARDS, CODES AND REFERENCED DOCUMENTS DESCRIBED IN THESE INSTRUCTIONS.

EXAMINATION OF WORK

THIS PROJECT INVOLVES RENOVATIONS TO EXISTING BUILDING, THEREFORE EXAMINE THE SITE AND LOCAL CONDITIONS TO DETERMINE THE DIFFICULTIES IN CARRYING OUT THE WORK INDICATED AND SPECIFIED PRIOR TO SUBMITTING FINAL PRICE.

IT IS THE INTENT OF THIS SPECIFICATION AND DRAWINGS TO PROVIDE FOR A COMPLETE AND FULLY OPERATING SYSTEM IN COMPLETE ACCORD WITH ALL APPLICABLE CODES. THESE DOCUMENTS MAY NOT SHOW OR DESCRIBE EACH AND EVERY ITEM REQUIRED FOR THE COMPLETE INSTALLATION; THEREFORE, THE CONTRACTOR SHALL MAKE PROVISIONS FOR ALL LABOUR, MATERIAL AND EQUIPMENT DEEMED NECESSARY TO COMPLETE THE WORK INDICATED OR REASONABLY IMPLIED ON ALL DRAWINGS.

THIS CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR LAYING OUT HIS WORK AND FOR ANY DAMAGE OR EXTRA COSTS CAUSED TO THE OWNER OR OTHER CONTRACTORS BY IMPROPER LOCATION OR CARRYING OUT OF HIS WORK. CARRY ALL NECESSARY INSURANCE COVERAGE

PERMITS, CERTIFICATES, FEES, ETC.

GIVE ALL NOTICES. OBTAIN ALL PERMITS AND PAY ALL FEES SO THAT THE WORK PECIFIED HEREIN MAY BE CARRIED OUT, EXCEPT FOR OCCUPANCY PERMIT WHICH WILL BE OBTAINED BY THE OWNER. AT THE ENGINEER'S REQUEST, FURNISH ANY CERTIFICATES AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH THE LAWS AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION.

THE CONTRACTOR, AS A CONDITION PRECEDENT TO FINAL PAYMENT AFTER COMPLETION OF THIS WORK, SHALL GIVE THE OWNER A WRITTEN GUARANTEE WARRANTING A APPARATUS FURNISHED UNDER THE CONTRACT TO REMAIN IN PERFECT SERVICEABLE CONDITION FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL PERFORMANCE OF HIS WORK AS ESTABLISHED BY THE PROJECT MANAGER AND

DOCUMENTS REQUIRED

- 1. MAINTAIN AT JOB SITE ONE COPY OF EACH OF THE FOLLOWING DOCUMENTS:
- SPECIFICATIONS.
- CHANGE ORDERS.
- OTHER MODIFICATIONS TO CONTRACT.
- FIELD TEST REPORTS.
 MANUFACTURERS' INSTALLATION AND APPLICATION INSTRUCTIONS.

- NO EXTRA WORK IS TO BE CARRIED OUT WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER OR THE OWNER'S REPRESENTATIVE.
- CONTRACTOR SHALL PROVIDE QUOTATIONS FOR EXTRA WORK AS DIRECTED UNDER CONTEMPLATED CHANGE NOTICES (CCN'S) ISSUED IN WRITING BY THE ENGINEER OR THE
- CONTRACTOR TO SUBMIT ITEMIZED BREAKDOWN FOR BOTH MATERIAL AND LABOUR FOR ALL CONTEMPLATED CHANGE NOTICES. CONTRACTOR WILL USE THE CCN FORMS PROVIDED WITH THE TENDER DOCUMENTS. ALL COLUMNS TO BE USED WHERE
- AT THE START OF THE PROJECT THE CONTRACTOR SHALL SUBMIT FOR REVIEW THE HOURLY LABOUR RATE THAT IS PROPOSED FOR PRICING ON ALL EXTRA WORK THAT MAY
- LABOUR RATE TO INCLUDE ONLY: PAY AND VACATION PAY.
- WELFARE AS PER UNION COLLECTIVE AGREEMENT (ACCEPTED ONLY IF
- CONTRACTOR IS A UNION CONTRACTOR). E.I. OR C.P.P. AS PER FEDERAL GOVERNMENT REQUIREMENTS. W.S.I.B. PAYMENTS AS PER ONTARIO REGULATIONS.
- INSURANCE AS PER REQUIREMENTS OR REGULATING BODY
- MATERIAL WILL BE PRICES AT THE CONTRACTOR'S COST. COPIES OF SUPPLIER'S INVOICES MAY BE REQUIRED TO SUBSTANTIATE MATERIAL COSTS WHEN REQUESTED.
- THE AMOUNT OF MARK-UP ALLOWED FOR PROFIT AND OVERHEAD WILL BE IN ACCORDANCE WITH THOSE IN THE CONTRACT DOCUMENTS WITH THE TENDER. TO BE MODIFIED TO REFLECT THE ALLOWED PROFIT AND OVERHEAD STATED IN THE CONTRACT
- THE MARK-UPS APPLY TO THE NET WHERE A CHANGE INCLUDES BOTH EXTRAS AND
- COST OF WORK BY A SUB-TRADE TO THE DIVISION 26 CONTRACTOR WILL BE DETERMINED BY THE SUB-TRADE USING THE SAME ITEMIZED BREAKDOWN FORMAT AND THE SAME CCN
- 10. A MARK-UP OF 5% WILL BE PERMITTED BY THE DIVISION 26 CONTRACTOR FOR SUB-TRADE

PROGRESS BILLING

- CONTRACTOR TO SUBMIT ITEMIZED BREAKDOWN FOR THE PROJECT BASED ON THE CONTRACT PRICE AGREED TO FOR THIS PROJECT. CONTEMPLATED CHANGE NOTICES ONCE AUTHORIZED BY THE OWNER WILL BE ADDED TO THE MONTHLY PROGRESS CLAIM.
- CLAIMS FOR PAYMENT SHALL BE SUBMITTED FOR REVIEW PRIOR TO THE END OF THE PAY PERIOD TO ALLOW FOR A TIMELY REVIEW BY THE ENGINEER.
- CONTRACTOR SHALL SUBMIT PROGRESS CLAIMS FOR REVIEW AND PAYMENT AUTHORIZATION IN ACCORDANCE WITH THE TERMS OF THE CONTRACT

AS-BUILT AND RECORD DRAWINGS

1. OWNERS REPRESENTATIVE WILL PROVIDE TWO(2) SETS OF DRAWINGS AT THE START OF CONSTRUCTION TO ALLOW THE CONTRACTOR TO KEEP AND MAINTAIN ACCURATE

- ON SET SHALL BE KEPT ON SITE TO RECORD THE INFORMATION REFLECTING CHANGES AND INSATLLATION ON A DAILY BASIS DURING CONSTRUCTION. AT THE END OF THE PROJECT ALL INFORMATION FROM THE CONSTRUCTION SET SHALL BE TRANSFERRED ONTO THE CLEAN SET AND SENT TO THE ENGINEER FOR THE FINAL REVIEW.
- FAILURE TO KEEP UP TO DATE AS-BUILT DRAWING MAY JEOPARDIZE MONTHLY PROGRESS PAYMENTS. AS-BUILT DRAWING WILL BE REVIEWED AT THE SAME TIME AS MONTLY PROGRESS PAYMENT INSPECTIONS ARE CONDUCTED.

BEFORE FABRICATION OR DELIVERY OF ANY MATERIALS OR EQUIPMENT, SUBMIT A MINIMUM OF FOUR (4) COMPLETE SETS OF SHOP DRAWINGS AND DATA SHEETS COVERING ALL ITEMS OF EQUIPMENT FURNISHED AND INTENDED FOR INSTALLATION UNDER THIS CONTRACT FOR APPROVAL BY THE ENGINEER

TEMPORARY AND TRIAL USAGE

TEMPORARY OR TRIAL USAGE BY THE OWNER OF ANY MACHINERY, APPARATUS. EQUIPMENT OR ANY OTHER WORK OR MATERIALS SUPPLIED UNDER THE CONTRACT BEFORE FINAL WRITTEN ACCEPTANCE BY THE ENGINEER IS NOT TO BE CONSTRUED AS EVIDENCE OF THE ACCEPTANCE OF SAME BY THE OWNER. THE OWNER SHALL HAVE THE PRIVILEGE OF SUCH TEMPORARY AND TRIAL USAGE AS SOON AS THIS CONTRACTOR CLAIMS THAT SAID WORK IS COMPLETED. ANY DAMAGE CAUSED BY DEFECTIVE MATERIAL OR WORKMANSHIP THROUGH TEMPORARY OR TRIAL USAGE BY THE OWNER SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR.

TEMPORARY AND TRIAL USAGE (CONTINUED)

ANY PERMANENT EQUIPMENT USED TEMPORARILY FOR TEMPORARY HEAT OR OTHERWISE WILL BE COMPLETELY REPAIRED, REPLACED, AND CLEANED TO THE FULL

EXPLOSIVES ACTUATED FASTENING DEVICES

1. DO NOT EMPLOY POWER GUNS USING EXPLOSIVES, UNLESS EXPRESSLY PERMITTED BY THE PROJECT MANAGER; COMPLY WITH REQUIREMENTS OF CSA Z-166 (SAFETY CODE FOR EXPLOSIVE ACTUATED TOOLS).

STORAGE

1. THE SECURITY OF THE CONTRACTOR'S EQUIPMENT AND MATERIALS SHALL BE HIS RESPONSIBILITY. CONTRACTOR SHALL LIAISE WITH THE BUILDING OPERATOR AS

PROVIDE WARNING SIGNS IN LOCATIONS WHERE RENOVATIONS AND ALTERATION WORK IS ADJACENT TO AREAS AFFECTING THE PUBLIC.

EQUIPMENT AND SITE CLEANLINESS

- DUCTS AND EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT, CUTTINGS AND OTHER FOREIGN SUBSTANCES. DISCONNECT, CLEAN AND RECONNECT WHENEVER NECESSARY FOR THE PURPOSE OF LOCATING AND REMOVING OBSTRUCTIONS. REPAIR WORK DAMAGED IN THE COURSE OF REMOVING OBSTRUCTIONS.
- THE CONTRACTOR SHALL AT ALL TIMES KEEP THE PREMISES FREE FROM THE ACCUMULATION OF WASTE MATERIAL TO THE SATISFACTION OF THE PROJECT MANAGER PLACE DUST PROTECTION IN THE FORM OF COVER SHEETS OVER EQUIPMENT AND FURNITURE TO ENSURE NO DUST INFILTRATION. CLEANING TO BE COMPLETED AT THE END OF EACH SHIFT TO THE SATISFACTION OF THE PROJECT MANAGER.

FURNISH THREE (3) SETS OF OPERATING AND MAINTENANCE DATA FOR ALL NEW EQUIPMENT AND SYSTEMS. DATA SHALL BE ASSEMBLED IN BOOKLET FORM WITH HARD COVER AND INDEX. IDENTIFY FRONT COVER WITH NAME AND LOCATION OF THE PROJECT, CONSULTING ENGINEER AND CONTRACTOR. SUBMIT ONE COPY TO THE ENGINEER FOR

MATERIALS

1. MATERIALS AND EQUIPMENT INSTALLED SHALL BE NEW, FULL WEIGHT AND OF BEST QUALITY SPECIFIED. USE SAME BRAND OF MANUFACTURER FOR EACH SPECIFIC STATIONAL MAIN DYNAMICALLY BALANCE ROTATING EQUIPMENT FOR APPLICATION. STATICALLY AND DYNAMICALLY BALANCE ROTATING EQUIPMENT FOR MINIMUM VIBRATION AND LOW OPERATING NOISE LEVEL. REPLACE MATERIAL OR HIP BELOW SPECIFIED QUALITY AND RELOCATE WORK WRONGLY PLACED TO THE SATISFACTION OF THE ENGINEER

APPROVALS

1. THE PRICE SUBMITTED FOR THIS CONTRACT SHALL BE BASED ON THE USE OF MATERIALS AND EQUIPMENT AS SPECIFIED. IF THIS CONTRACTOR WISHES TO QUOTE ON EQUIVALENT MATERIALS AND EQUIPMENT, HE MUST QUOTE ON PRODUCTS APPROVED BY THE ENGINEER, IN WRITING, AS AN EQUIVALENT TO THE PRODUCT SPECIFIED. THIS CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY ADDITIONAL WORK OR MATERIALS REQUIRED BY ALL OTHER CONTRACTORS TO ACCOMMODATE APPROVED EQUIVALENT MATERIALS OR EQUIPMENT. EXTRAS WILL NOT BE APPROVED TO COVER SUCH WORK.

THE CONTRACTOR IS RESPONSIBLE FOR THIS WORK AND SHALL CO-ORDINATE LOCATIONS FOR ALL HOLES FOR PIPES, DUCTS THROUGH FLOORS AND ROOF, ETC., AND OVIDE SLEEVES REQUIRED TO EXECUTE THE INSTALLATION. X-RAY FLOORS AND STRUCTURAL WALLS BEFORE CUTTING TO LOCATE EXISTING REBAR AND CONDUITS, AND MUST OBTAIN PROJECT MANAGER'S APPROVAL FOR PROPOSED CUTTING BEFORE PROCEEDING. PROVIDE ULC APPROVED FIRE STOPPING SYSTEM FOR ALL PENETRATIONS THROUGH RATED ASSEMBLIES.

SUPPLY TO THE INSTALLING TRADES, ACCESS DOORS FOR SERVICING EQUIPMENT AND ACCESSORIES OR FOR INSPECTION OF LIFE SAFETY OR OPERATING DEVICES. MATERIAL SHALL BE OF 3mm CORE THICKNESS BONDERIZED STEEL COMPLETE WITH HEAVY DUTY RUST RESISTANT CONCEALED HINGES, POSITIVE LOCKING AND SELF-OPENING SCREW DRIVER LOCK. FRAME SHALL BE 300 X 300mm MINIMUM AND 600 X 600 MAXIMUM AS REQUIRED FOR THE TYPE OF ASSOCIATED WALL OR CEILING CONSTRUCTION. ALL DOORS ARE TO BE ACCURATELY LOCATED TO PROVIDE ACCESSIBILITY FOR NEW AND **EXISTING EQUIPMENT**

ALL CRANE OR LIFTING OPERATIONS WILL BE CO-ORDINATED WITH, AND APPROVED BY,

ANY SHUTDOWN THAT MAY BE REQUIRED OF EXISTING EQUIPMENT MUST HAVE PRIOR APPROVAL FROM THE PROJECT MANAGER AND ENGINEER. PROVIDE A MINIMUM OF 48

HOURS NOTICE. ALL MATERIALS REMOVED DURING DEMOLITION SHALL BECOME THE PROPERTY OF THE OWNER AND STOCKPILED AS DIRECTED ON SITE. MATERIAL REJECTED BY THE OWNER

ELECTRICAL SPECIFICATIONS

SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

ELECTRICAL INSTALLATION: TO CSA C22.1-09

- 2. LIGHTING FIXTURES: TO CSA C22.2 No. 9-96 (2006)
- 3. FIXTURE BALLAST: TO CSA C22.2 No. 74-96 (R2005
- ONTARIO BUILDING CODE-2006.
- ONTARIO ELECTRICAL SAFETY CODE-2009.

MOUNTING HEIGHTS

INSTALL ELECTRICAL EQUIPMENT AT FOLLOWING HEIGHTS UNLESS INDICATED

- LOCAL SWITCHES: 1200mm
- GENERAL: 400mm
- ABOVE COUNTERS: 175mm PANEL BOARDS: 1800mm FROM TOP TELECOMMUNICATION OUTLETS: 400mm

CONTRACTOR TO CO-ORDINATE WITH OTHER TRADES TO ENSURE THAT ELECTRICAL EQUIPMENT AND FEEDERS ASSOCIATED WITH MECHANICAL EQUIPMENT AND/OR IS LOCATED IN WALLS BEING DEMOLISHED IS ALSO BEING REMOVED.

- EXISTING EQUIPMENT SHOWN AS RELOCATED TO BE CLEANED AND MADE OPERATIONAL Y THIS CONTRACTOR PRIOR TO ITS RELOCATION
- CONTRACTOR TO REPLACE BROKEN AND DISCOLOURED LIGHT FIXTURE ACRYLIC LENSES AS INDICATED BY THE ENGINEER.

ANY SHUTDOWN THAT MAY BE REQUIRED OF EXISTING EQUIPMENT, MUST HAVE PRIOR APPROVAL FROM THE ENGINEER.

IDENTIFICATION

- IDENTIFY WITH LAMACOID NAMEPLATES ALL ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS AND/OR MENTIONED IN THE SPECIFICATION SUCH AS MOTORS, SWITCHES, STARTERS, PANEL BOARDS, TRANSFORMERS, CONTROLS, AND SPECIAL RECEPTACLES, REGARDLESS OF WHETHER OR NOT THE ELECTRICAL EQUIPMENT WAS FURNISHED
- UNDER THIS SECTION OF THE SPECIFICATION. IDENTIFICATION REVIEWED BY ENGINEER UNLESS OTHERWISE SPECIFIED, NAMEPLATES SHALL BE RIGID LAMACOID, MINIMUM 1.5mm THICK WITH BLACK LETTERS ENGRAVED ON A WHITE BACKGROUND. NAMEPLATES TO BE NEATLY PLACED, AND SQUARE TO SURROUNDING BUILDING OR EQUIPMENT LINES, AND
- PROVIDE NEATLY TYPED UPDATED CIRCUIT DIRECTORIES IN A PLASTIC HOLDER ON THE INSIDE DOOR OF NEW PANEL BOARDS, WITH COPY IN MANUAL

FASTENED IN PLACE WITH MECHANICAL FASTENERS (SCREWS OR POP RIVETS) AS

- IDENTIFY ALL PULL AND JUNCTION BOXES, WITH P-TOUCH LABEL IDENTIFICATION,
- NDICATING SOURCE PANEL AND CIRCUIT NUMBERS. IDENTIFY ALL RECEPTACLES AND SWITCHES WITH P-TOUCH LABELS, BLACK LETTERING ON TRANSPARENT TAPE, INDICATING SOURCE PANEL AND CIRCUIT NUMBER. LABELS TO

LOCATION OF OUTLETS

REVIEWED BY ENGINEER.

BE LOCATED ON FRONT OF COVERPLATE.

- LOCATE OUTLETS AS SHOWN ON DRAWINGS. REFER TO INTERIOR DESIGNER DRAWINGS FOR LOCATION OF OUTLETS WHICH ARE DIMENSIONED OR OTHERWISE LOCATED
- DO NOT INSTALL OUTLETS BACK-TO-BACK IN WALL; ALLOW MINIMUM 150mm HORIZONTAL CLEARANCE BETWEEN BOXES, AND LOCATE IN SEPARATE STUD CAVITIES WHEREVER
- CHANGE LOCATION OF OUTLETS AT NO EXTRA COST OR CREDIT, PROVIDING DISTANCE DOES NOT EXCEED 3 METERS AND INFORMATION IS GIVEN BEFORE INSTALLATION.

CTRIC MOTORS AND WIRING
THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO SUPPLY ALL MOTOR STARTERS, EXCEPT ON PRE-WIRED PACKAGED EQUIPMENT, DISCONNECT SWITCHES FOR ALL MOTORS FOR THE PROJECT, AND ALL WIRING TO STARTERS AND MOTORS EXCEPT WHERE SHOWN OR NOTED OTHERSWISE. EQUIPMENT REQUIRING CONNECTION TO AN ELECTRICAL POWER SOURCE SHALL BE CSA OR HYDRO APPROVED FOR USE AT LOCATION OF INSTALLATION. THE MECHANICAL CONTRACTOR SHALL SUPPLY AND INSTALL ALL LOW VOLTAGE CONTROL WIRING WITHIN 'EMT' CONDUIT FOR A COMPLETE AND OPERATING INSTALLATION UNLESS OTHERWISE SPECIFIED.

- ALL WIRING TO BE COPPER, R90 XLPE, STRANDED WITH 'BRADY LABEL' MAKING SLEEVES AT EACH END, UNLESS OTHERWISE NOTED ON DRAWINGS. WIRING TO BE COLOUR CODED AS PER CODE. MINIMUM WIRE SIZE TO BE No.12 AWG FOR POWER AND LIGHTING
- LEAVE ADEQUATE LENGTHS OF WIRE IN JUNCTION BOXES FOR CONNECTIONS TO
- 'Bx' WIRING IN WALLS ONLY.
- RUN A GREEN INSULATED GROUND WIRE SIZED AS PER CODE IN ALL CONDUIT RUNS. DO NOT RELY ON CONDUIT AS GROUND.

CONDUITS

1. EACH LENGTH OF CONDUIT TO BE NEW AND BEAR CSA STAMP OF APPROVAL.

- 2. ALL CONDUITS RUN ABOVE THE SUSPENDED CEILING TO BE 'EMT'
- PROVIDE NYLON PULLROPES IN ALL EMPTY CONDUIT RUNS
- MODULAR TO MATCH EXISTING: NOCOM MODULAR WIRING CABLES SYSTEM FOR CONNECTION OF FLUORESCENT TROFFER LIGHT FIXTURES, CONSISTENT WITH BASE
- SMART-CONNECT CABLES: START, JOINER, DROP, SWITCH DROP CABLES AS REQUIRED.
- CONNECTORS: MOULDED PVC RECEPTACLES AND ADAPTERS.
- REMOVE AND RECONNECT AS REQUIRED TO OBTAIN LIGHTING CIRCUITS INDICATED AND ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- TERMINATE STARTER AND DROP CABLES AT LIGHT SWITCHES AND LIGHT FIXTURES NOT
- OUTFITTED WITH NOCOM RECEPTACLES. TURN OVER UNUSED CABLES TO BUILDING OWNER.

ELECTRO-GALVANIZED STEEL, COATING EQUAL TO THAT TO THE CONDUIT.

- 2. MINIMUM 37 mm DEEP 100 mm SQUARE OR OCTAGONAL AS REQUIRED.
- EQUIP WITH PLASTER RINGS DEEP ENOUGH FOR WALL FINISH MATERIAL TO FIT OVER THE BOX AND WITHIN 6 mm OF THE COVER OPENING.

PROVIDE PULLBOXES WHERE RUNS EXCEED 30 METERS IN LENGTH AND HAVE MORE THAN 2-90° BENDS.

- DUPLEX RECEPTACLES, CSA TYPE 5-15R 125 VOLT, 15A 'U' GROUND WITH FOLLOWING WITH THE FOLLOWING FEATURES:
- RECEPTACLES OF SPECIFICATION GRADE
- RECEPTACLES OF ONE MANUFACTURER THROUGHOUT PROJECT. IVORY UREA MOULDED HOUSING.
 SUITABLE FOR No. 12 AWG FOR BACK AND SIDE WIRING. SIDE WIRING.
- BREAK-OFF LINKS FOR USE AS SPLIT RECEPTACLES. EIGHT (8) BACK WIRED ENTRANCES, FOUR(4) SIDE WIRING SCREWS.
- DOUBLE WIPE CONTACTS AND RIVETED GROUNDING CONTACTS.
- TO CSA C22.2 NO. 111-00 (R2005)
- 15A, 347 VOLT SINGLE POLE, 3 WAY SWITCHES, AS INDICATED.

 MANUALLY OPERATED GENERAL PURPOSE AC SWITCHES WITH THE FOLLOWING
- TERMINAL HOLES APPROVED FOR NO. 10 AWG WIRE.
- UREA OR MELAMINE MOULDING FOR PARTS SUBJECT TO CARBON TRACKING SUITABLE FOR BACK AND SIDE WIRING.
- TOGGLE OPERATED LOCKING FULLY RATED FOR TUNGSTEN FILAMENT AND

5 SWITCHES OF ONE MANUFACTURER THROUGH OUT

SINGLE PHASE MANUAL MOTOR STARTER IN CSA 1 ENCLOSURE C/W SINGLE OVERLOAD HEATER ELEMENT AND PLOT LIGHT.

MANUAL MOTOR STARTER RATINGS TO MATCH MOTOR CHARACTERISTICS.

DISCONNECT SWITCH TO BE RATED HORSEPOWER AND BE EQUIPPED WITH PROVISIONS FOR THREE(3) LOCKING DEVICES AND TO BE CEMA 1 UNLESS OTHERWISE INDICATED, MPERAGE AS INDICATED ON DRAWINGS AND MOUNTED 1500mm ABOVE FINISHED FLOOR TO CENTRELINE OF HANDLE.

FUSE TYPE REFERENCE J1, HAS BEEN ADOPTED FOR USE IN THIS SPECIFICATION.

- FUSES: PRODUCT OF ONE MANUFACTURER.
- 3. HRCI-J FUSES (FORMERLY CLASS J). TYPE J1, TIME DELAY, CAPABLE OF CARRYING 500% OF ITS RATED CURRENT FOR 10
- SECOND MINIMUM. 5. INSTALL FUSES IN MOUNTING DEVICES IMMEDIATELY BEFORE ENERGIZING CIRCUIT.

- TRANSFORMERS

 1. THE TRANSFORMER DESCRIBED HEREIN IS SPECIFICALLY DESIGNED TO ADDRESS HARMONIC PROBLEMS AND MUST MEET THE FOLLOWING REQUIREMENTS.
- .1 COMPLETE REMOVAL OF THE 3RD HARMONIC TRIPLENS AND OTHER ZERO
- SEQUENCE HARMONIC CURRENTS WITHIN THE SECONDARY WINDINGS
- .2 PRIMARY-SECONDARY PHASE SHIFT TO ACHIEVE CANCELLATION OF 5th, 7th, 17th, 19th,... HARMONIC CURRENTS ON THE PRIMARY SIDE BUS WITH OTHER SOURCES. REDUCE CURRENT IMBALANCE OF FUNDAMENTAL FREQUENCY CURRENT ON
- PRIMARY SIDE OF THE TRANSFORMER.

 4 HARMONIC CANCELLATION SHALL BE ACHIEVED BY ELECTROMAGNETIC MEANS ONLY TO CAPACITORS OR ELECTRONIC CIRCUITRY IS PERMITTED.
- ELECTRICAL CHARACTERISTICS:
 .1 3 PHASE, 600 VOLT INPUT, 120/208 VOLT OUTPUT, 60Hz, kVA RATINGS AS INDICATED ON SINGLE LINE DIAGRAM.
- PRIMARY-SECONDARY PHASE-SHIFT FOR 5th AND 7th HARMONICS: 0 DEGREES AND 180 DEGREES, AS REQUIRED. POSITIVE AND NEGATIVE SEQUENCE IMPEDANCE AT 60Hz: 3.0%.
- CREST FACTOR SUITABILITY: 4.5.
 CAPABILITY TO DELIVER FULL NAMEPLATE KVA TO LOADS OF K- FACTOR UP TO: 30.

MAGNETIZING INRUSH CURRENT: MAXIMUM 10 TIMES FULL LOAD RATING.

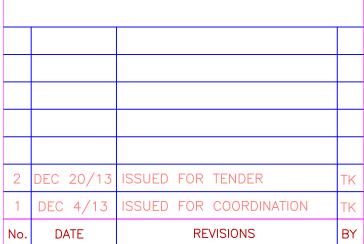
NEUTRAL CONNECTION SHALL BE RATED AT TWICE THE CAPACITY OF THE SECONDARY PHASE CURRENT.

- THREE PHASE COMMON CORE CONSTRUCTION.
- CONVECTION AIR COOLED, EEMAC 2R SPRINKLER-PROOF ENCLOSURE, REMOVABLE COPPER WINDINGS
- INSULATION: CLASS 'H', 150°C TEMPERATURE RISE. BASIC IMPULSE LEVEL (BIL): 30kV.
- TYPE ANN. SOUND LEVEL: MAX. 45db AT 5 FEET.

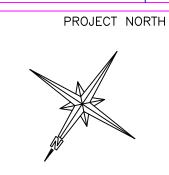
VOLTAGE CLASS: 1.2kV.

MAGNETIC FIELD AT 1.5 FEET: MAXIMUM 0.1 GAUSS. FULL LOAD EFFICIENCY AT 170°C: 97%.

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OTTAWA, ONTARIO

ERMS TEST CELL #2 RESTRAINT SYSTEM

DRAWING

PROJECT

SECTIONS & DETAILS

DRAWN:	T.K.	DRAWING No.
APPROVED:	T.V.	
DATE:	NOV 11/13	-M/E-3
SCALE:	VARIES	
SIZE:	ARCH C	