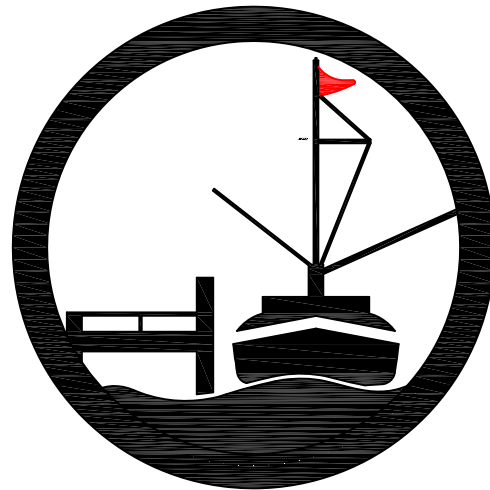


SMALL CRAFT HARBOURS
CENTRAL AND ARCTIC REGION



Riggs Engineering Ltd.
1240 Commissioners Rd. W, Suite 205
London, Ontario,
N6K 1C7
Tel: (519) 657-1040
Fax: (519) 657 8631
Website: www.riggsgengineering.com

- Detail No.
- drawing no. – where detail required refers to MA--
- drawing no. – where detailed refers to MA--

Stamp:



NOTES:

REVISIONS:	DATE:
1 ISSUED FOR TENDER	JUNE/23/2017

SCALE: AS NOTED
CLASS:

PROJECT:

2017 EAST HARBOUR WALL
REPAIRS

DESCRIPTION:
2011 EAST SIDE
ELECTRICAL SERVICES

DRAWN: AV	APPROVED: PL
DATE: 2017-03-31	DATE: 2017-03-31

LOCATION:

WHEATLEY, ONTARIO

DRAWING NO.: MA-13
LOCATOR CODE: F2930-160026

PART 1 - GENERAL

- 1.1 REQUIREMENTS INCLUDED
 1. THE GENERAL REQUIREMENTS, DIVISION 01 AND ANY SUPPLEMENTARY GENERAL CONDITIONS OF THE CONTRACT SHALL FORM A PART OF THIS SECTION.
 2. THE DRAWINGS AND SPECIFICATIONS COMPLAINT EACH OTHER AND TOGETHER STIPULATE THE CONTRACT REQUIREMENTS. THE MORE RESTRICTIVE CONDITIONS APPLY WHEN INTERPRETING DISCREPANCIES BETWEEN THE DRAWINGS AND SPECIFICATIONS.
 3. FULLY UNDERSTAND THE INTENT AND FUNCTION OF THE SYSTEMS DESCRIBED IN THIS SPECIFICATION. ALL ELECTRICAL SYSTEMS COVERED UNDER DIVISION 16 SHALL BE FULLY COMPLETE, TESTED, OPERABLE AND READY FOR THE OWNER'S USE. USE THE INFORMATION CONTAINED IN THE RELEVANT DRAWINGS AND/OR SPECIFICATION SECTIONS SUPPLEMENTED WITH DATA CONTAINED WITHIN OTHER SPECIFICATION SECTIONS OR PROVIDED BY EQUIPMENT SUPPLIERS OR OTHER SUB-CONTRACTORS. NO EXTRA WILL BE ALLOWED IN ORDER TO COMPLETE SYSTEMS INADEQUATELY INSTALLED OR NOT FULLY OPERATIONAL.
- 1.2 WORK INCLUDED
 1. PROVIDE ALL LABOUR, MATERIAL, EQUIPMENT, TOOLS AND TRANSPORTATION FOR THE SUPPLY AND INSTALLATION OF COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON THE DRAWINGS, SPECIFIED HEREIN OR AS REASONABLY INFERRABLE FROM EITHER.
- 1.3 REFERENCES
 1. PROVIDE MATERIAL CONFORMING TO THE MOST UP-TO-DATE CSA AND/OR UL REQUIREMENTS.
 2. REGULATORY AGENCIES:
 1. ELECTRICAL SAFETY AUTHORITY

- 1.4 WORKMANSHIP
 1. ONLY FIRST-CLASS WORKMANSHIP PERFORMED BY QUALIFIED TRADE PERSONS WILL BE ACCEPTED. NOT ONLY WITH REGARDS TO SAFETY AND DURABILITY BUT ALSO IN TERMS OF ACCESSIBILITY AND NEATNESS OF DETAIL. UNSATISFACTORY WORKMANSHIP SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
 2. EMPLOY SPECIALIZED LABOUR AS REQUIRED FOR THE INSTALLATION, TESTING AND/OR COMMISSIONING OF SPECIFIC SYSTEMS TO ENSURE PROPER OPERATION.
 3. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGES RESULTING FROM THE EXECUTION OF THIS WORK.

- 1.5 DRAWINGS
 1. THE DRAWINGS ARE INTENDED TO BE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF EQUIPMENT ONLY. NOT ALL BUILDING ELEMENTS ARE SHOWN. DO NOT SCALE THE DRAWINGS OR USE FOR FABRICATION PURPOSES.
 2. MAKE USE OF ALL AVAILABLE DOCUMENTATION, PRIOR TO TENDER, IN ORDER TO DETERMINE THE SCOPE OF WORK. NO CONCESSION SHALL BE MADE FOR FAILURE TO MAKE USE OF THE COMPLETE PACKAGE OF DRAWINGS AND SPECIFICATIONS MADE AVAILABLE DURING THE TENDER PERIOD.
 3. MAKE ALLOWANCES FOR SITE CONDITIONS AND CO-ORDINATION WITH OTHER TRADES.
 4. VISIT THE PROPOSED CONSTRUCTION SITE (WHEN APPLICABLE) AND ASCERTAIN IF THE WORK CAN BE PERFORMED AS SHOWN ON THE DRAWINGS. NO ALLOWANCES WILL BE MADE FOR ANYTHING THAT WOULD HAVE BEEN REVEALED DURING THE COURSE OF SUCH AN EXAMINATION.

- 1.6 RECORD DRAWINGS
 1. ONE COMPLETE SET OF PRINTS SHALL BE MAINTAINED IN GOOD CONDITION ON THE JOB-SITE AND BE MARKED WITH RED INK TO INDICATE REVISIONS MADE FROM THE ORIGINAL TENDERING DRAWINGS. THESE DRAWINGS SHALL BE LABELED "AS-BUILT" AND SUBMITTED TO THE ENGINEER PRIOR TO FINAL INSPECTION.

- 1.7 SHOP DRAWINGS
 1. SUBMIT NO FINDER THAN SEVEN (7) COPIES OF SHOP DRAWINGS FOR EQUIPMENT AS INDICATED IN THE INDIVIDUAL SPECIFICATION SECTIONS. DO NOT ORDER EQUIPMENT PRIOR TO RECEIPT OF APPROVED SHOP DRAWINGS.
 2. SHOP DRAWINGS SHALL CONTAIN THE FOLLOWING INFORMATION:
 1. EQUIPMENT DESIGNATION FROM THE DRAWINGS (E.G. POWER PANEL, "L" LIGHTING FIXTURE, ETC.)
 2. GENERAL CONTRACTOR AND ELECTRICAL SUB-CONTRACTOR'S REVIEW STAMPS.
 3. MANUFACTURER AND CATALOGUE OR MODEL NUMBER.
 4. EQUIPMENT RATINGS, DIMENSIONS AND WEIGHT.
 3. ARRANGE THE SHOP DRAWINGS SO THAT ALL COPIES OF ONE ITEM ARE GROUPED TOGETHER (E.G. SEVEN COPIES OF EACH LIGHTING FIXTURE BOUND TOGETHER, NOT ALL LIGHTING FIXTURES BOUND TOGETHER SEVEN TIMES).
 4. THE ENGINEER'S REVIEW OF SHOP DRAWINGS IS TO ENSURE GENERAL CONFORMITY WITH THE INTENT OF THE DESIGN, THE ELECTRICAL SUB-CONTRACTOR BEARS FULL RESPONSIBILITY FOR THE ACTUAL EQUIPMENT DESIGN, QUALITY, FUNCTION, CODE COMPLIANCE AND INSTALLATION.

- 1.8 PERMITS AND FEES
 1. OBTAIN AND PAY FOR ALL PERMITS REQUIRED FOR THE EXECUTION OF THE WORK GOVERNED BY THIS SPECIFICATION. CHARGES OR FEES TO LOCAL UTILITIES IN CONNECTION WITH THEIR WORK ASSOCIATED WITH THE PROJECT WILL BE PAID DIRECTLY BY THE OWNER. PROVIDE TO THE UTILITIES ANY INFORMATION IN ORDER TO DETERMINE THEIR SCOPE OF WORK.
 2. UPON COMPLETION OF THE WORK PROVIDE AN UNCONDITIONAL CERTIFICATE OF ACCEPTANCE FROM ONTARIO ELECTRICAL SAFETY AUTHORITY.
 3. NOTWITHSTANDING SECTION 2-010 (2) OF THE ONTARIO ELECTRICAL SAFETY CODE, ON BEHALF OF THE ENGINEER PROVIDE TO THE ELECTRICAL SAFETY AUTHORITY ANY DRAWINGS THAT THEY MAY REQUIRE.

- 1.9 RULES AND REGULATIONS
 1. ENSURE THAT THE INSTALLATION CONFORMS TO ALL REQUIREMENTS OF THE MOST CURRENT CANADIAN ELECTRICAL CODE, CSA STANDARDS, AND/OR ANY OTHER APPLICABLE MUNICIPAL OR PROVINCIAL REGULATION.
 2. THE DRAWINGS SHOW THE MINIMUM STANDARD ACCEPTABLE REGARDLESS OF ANY LESSER STANDARD SET BY ANY APPLICABLE CODE OR REGULATION.

- 1.10 INSPECTION
 1. THE WORK SHALL BE AVAILABLE FOR INSPECTION BY THE ENGINEER AT ANY TIME.
 2. IF WORK IS DETERMINED TO BE UNACCEPTABLE IN TERMS OF THESE SPECIFICATIONS THE CONTRACTOR SHALL TAKE IMMEDIATE MEASURES TO CORRECT THE DEFICIENCY.
 3. INFORM THE ENGINEER WHEN THE WORK IS READY FOR FINAL INSPECTION. DEFECTS SHALL BE MADE GOOD BEFORE FINAL PAYMENT IS AUTHORIZED.

- 1.11 ABBREVIATIONS AND DEFINITIONS
 1. WHEREVER WORDS SUCH AS "APPROVED", "DIRECTED", "PERMITTED", "REQUIRED" OR SIMILAR PHRASES ARE USED IN THIS SPECIFICATION IT SHALL BE IMPLIED THAT THE WORDS "BY (TO) THE ENGINEER" FOLLOW.
 2. WHEREVER THE WORD "PROVIDE" IS USED IT SHALL BE UNDERSTOOD THAT IT IS EQUIVALENT TO "FURNISH AND INSTALL", COMPLETE AND IN PLACE, INCLUDING ACCESSORIES, FINISHES, TESTS AND SERVICES TO RENDER THEM AS SPECIFIED COMPLETE READY FOR USE.
 3. WHEREVER THE WORD "FURNISH" IS USED IT MEANS PROCUREMENT OR FABRICATION OF MATERIALS, EQUIPMENT, OR COMPONENTS, OR PERFORMANCE OF SERVICES TO ORDER SPECIFIED AND SHOWN, WHERE USED WITH RESPECT TO MATERIALS, EQUIPMENT, OR COMPONENTS, THE TERM INCLUDES ORDERING AND DELIVERY TO PROJECT SITE BUT IS NOT INTENDED TO INCLUDE INSTALLATION OF ITEM, EITHER TEMPORARY OR FINAL.
 4. WHEREVER THE WORD "INSTALL" IS USED IT MEANS PLACEMENT OF MATERIALS, OR COMPONENTS, INCLUDING RECEIVING, UNLOADING, TRANSPORTING, STORING, UNPACKING AND INSTALLING AND PERFORMANCE OF SUCH TESTING AND FINISH WORK AS IS COMPARABLE WITH THE DEGREE OF INSTALLATION SPECIFIED.
 5. ABBREVIATIONS COMMONLY USED ON THE DRAWINGS ARE LISTED BELOW.

- 1.12 ORDERS AND EXTRA
 1. WHENEVER CHANGES REQUIRING AN ALTERATION TO THE CONTRACT OCCUR THE CONTRACTOR SHALL SUBMIT A WRITTEN PROPOSAL FOR THE CHANGES WITH THE FOLLOWING INFORMATION:
 1. MATERIAL QUANTITY AND UNIT COST.
 2. LABOUR HOURS AND COST RATE.
 3. MAKE-UPS FOR OVERHEAD AND PROFIT.
 4. APPLICABLE TAXES.
 2. ANALYSE THE SHEETS AND OTHER EVIDENCE OF COSTS SHALL BE PROVIDED, UPON REQUEST, IN ORDER TO SUBSTANTIATE A CLAIM.

- 1.12 GUARANTEE
 1. PROVIDE A GUARANTEE TO REPAIR ANY DEFECT IN MATERIAL OR WORKMANSHIP FOR ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION, EXCEPT AS NOTED BELOW OR REQUIRED BY OTHER SPECIFICATION SECTIONS.
 2. INCANDESCENT LAMP SHALL BE GUARANTEED FOR NINETY (90) DAYS FROM THE DATE OF SUBSTANTIAL COMPLETION.
 3. THE WARRANTY SHALL BE CONSIDERED NULL AND VOID SHOULD IT BE DETERMINED THAT NEGLIGENCE, MISUSE OR IMPROPER MAINTENANCE CAUSED THE DEFECT.

PART 2 - PRODUCTS

- 2.1 MATERIALS AND EQUIPMENT
 1. MATERIAL TO BE NEW AND CSA/ULC APPROVED.
 2. MATERIAL AND EQUIPMENT SPECIFIED BY TECHNICAL DESCRIPTION ONLY SHALL BE OF THE BEST QUALITY ATTAINABLE FOR THE APPLICATION.
 3. USE THE SAME MANUFACTURER, TYPE AND STYLE OF EQUIPMENT FOR PARTICULAR GROUPINGS, CLASS OR TYPE OF EQUIPMENT USED ON THE PROJECT.
 4. REQUESTS FOR CHANGES TO PROJECT SCHEDULE, EQUIPMENT SPECIFICATIONS OR CONTRACT VALUE DUE TO LATE ORDERING OF EQUIPMENT WILL NOT BE CONSIDERED.

- 2.2 SUBSTITUTIONS
 1. REQUESTS FOR APPROVAL OF ALTERNATE EQUIPMENT SHALL BE SUBMITTED COMPLETE WITH ALL PHYSICAL AND PERFORMANCE SPECIFICATIONS AND SHALL NOT DELAY THE PROJECT SCHEDULE. ALTERNATE EQUIPMENT INSTALLED WITHOUT WRITTEN APPROVAL MAY BE REPLACED AT NO COST TO THE OWNER, WITH THE SPECIFIED EQUIPMENT.
 2. MAKE ALLOWANCE FOR THE WORK OF THE GENERAL CONTRACTOR OTHER SUB-CONTRACTORS AFFECTED BY THE USE OF THE ALTERNATE EQUIPMENT. QUOTATIONS SUBMITTED WITH RESPECT TO THE USE OF THE SUBSTITUTE SHALL INCLUDE THE COSTS INCURRED BY ANY OTHER TRADES AFFECTED BY THE USE OF THE PROPOSED EQUIPMENT.

- 2.3 CONDUCTORS
 1. MINIMUM GAUGE FOR CONDUCTORS USED FOR POWER CIRCUITS IS #12 AWG AND COPPER. THE SIZE IS TO BE ADJUSTED FOR ICE-RATING DUE TO CONDUIT FILL, AMBIENT TEMPERATURE AND TO LIMIT VOLTAGE DROP TO NO MORE THAN 2% ON ANY FEEDER OR BRANCH CIRCUIT.
 2. INSULATION TO BE RATED AT 600 VOLT EQUAL TO CSA RATED THO (XLPO) OR R/90W/RN/90 (CROSS-LINKED POLYETHYLENE) AND WHERE A SPECIFIC TYPE OF INSULATION IS SHOWN THAT TYPE SHALL BE USED.
 3. ALL CONDUCTORS ARE COPPER UNLESS SPECIFICALLY NOTED OTHERWISE.
 4. ALL CONDUCTORS SHALL BE COLOUR CODED AT TERMINATIONS TO PANELS) AND EQUIPMENT. FOR CONDUCTORS #10AWG AND SIMILAR THE COLOUR SHALL BE THE INSULATION COLOUR ON THE CONDUCTOR. LARGER CONDUCTORS WILL BE PROVIDED WITH A 2" (50MM) BAND OF APPROPRIATELY COLOURED TAPE ADJACENT TO THE TERMINATION.

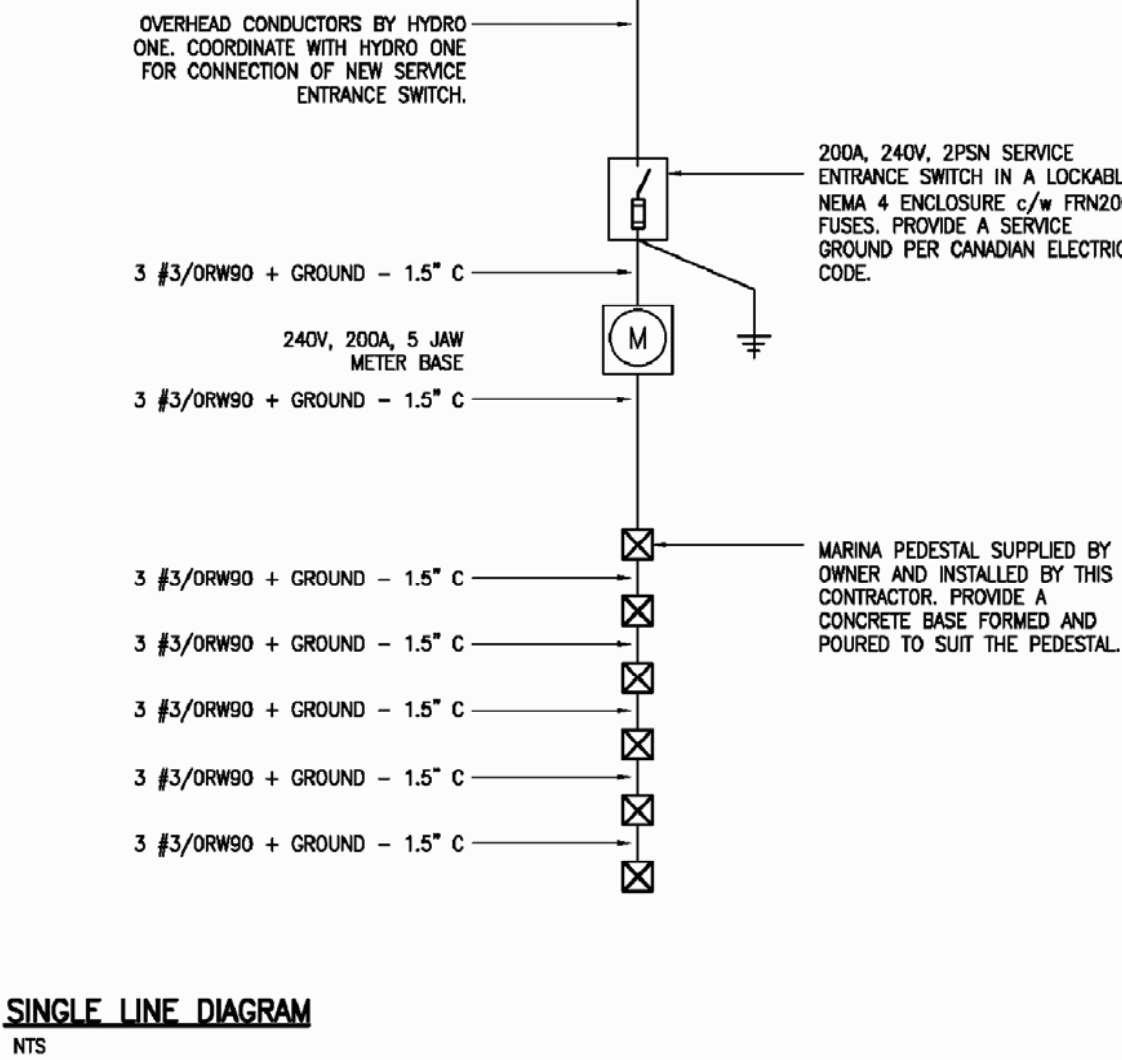
- 2.4 FUSES
 1. PHASE A - RED
 2. PHASE B - BLACK
 3. NEUTRAL - WHITE
 4. GROUND - GREEN

- 2.5 RACEWAYS
 1. PROVIDE RACEWAYS AS INDICATED ON THE DRAWINGS. WHERE SIZE IS NOT SPECIFIED PROVIDE IN ACCORDANCE WITH THE REQUIREMENTS ON THE DESG.
 1. THE FOLLOWING CONDUIT TYPES ARE APPROVED FOR USE ON THIS PROJECT:
 1. ELECTRICAL METALLIC TUBING (EMT) FOR GENERAL USE.
 2. RIGID POLYVINYL CHLORIDE (PVC) CONDUIT BELOW GRADE OR IN POURED CONCRETE STRUCTURES.
 3. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT FOR FINAL CONNECTIONS TO EQUIPMENT.
 2. CONDUIT FITTINGS SHALL BE SMOOTH TO THE END OF CONDUIT USED.
 3. UTILIZE STEEL SETSCREW CONNECTORS AND COUPLINGS FOR EMT CONDUIT. DIE-CAST OR PRESSURE-CAST CONNECTORS AND COUPLINGS ARE NOT ACCEPTABLE. LIQUID-TIGHT FITTINGS ARE TO BE USED OUTDOORS OR WHERE THE CONDUIT IS DIRECTLY EXPOSED TO WEATHER.

SPECIFICATION

PART 3 - EXECUTION

- 3.1 GENERAL REQUIREMENTS
 1. ALLOW FOR THE TRANSPORTATION OF EQUIPMENT THROUGH THE CONSTRUCTION SITE AND BUILDING. REPAIR ALL SURFACES AFFECTED BY THE MOVEMENT OF MATERIAL.
 2. RELOCATE ANY EQUIPMENT, RACEWAY OR DEVICE WITHIN 10'-0" (3000MM) OF THE LOCATION INDICATED ON THE DRAWINGS, AS DIRECTED BY THE ENGINEER, AT NO ADDITIONAL COST IF DIRECTED PRIOR TO ROUGH-IN.
 3. CLEAN ALL EQUIPMENT IMMEDIATELY PRIOR TO FINAL INSPECTION.
- 3.2 STORAGE OF MATERIALS
 1. PROVIDE A SUITABLE ON-SITE OFFICE SPACE AND A DRY, PROTECTED STORAGE AREA FOR MATERIAL AND EQUIPMENT TO MAINTAIN FACTORY FINISH.
 2. KEEP THE SITE FREE OF DEBRIS AND SURPLUS MATERIAL.
 3. UPON COMPLETION OF THE WORK REMOVE ALL TOOLS AND SURPLUS MATERIAL FROM THE SITE.
- 3.3 GROUNDING AND TESTING
 1. PROVIDE A COMPLETE GROUNDING SYSTEM; THERE IS NO ATTEMPT TO INDICATE ALL OF THE GROUNDING REQUIREMENTS ON THE DRAWINGS.
 2. BALANCE PHASE CURRENT SO THAT THE CURRENT ON ANY PHASE IS WITHIN 10% OF THE MEAN VALUE.
 3. MEASURE VOLTAGE AND CURRENT LEVELS NORMAL OPERATING CURRENT LEVELS.
 4. TEST BONDING CONTINUITY OF METALLIC RACEWAYS.
 5. TEST THE INSULATION GROUND FAULT RESISTANCE AND MEASURE FEEDERS PRIOR TO ENERGIZING.
 6. TEST FOR PROPER EQUIPMENT OPERATION.
 7. TEST THE FOLLOWING TESTS AND INCLUDE DATA IN OPERATING AND MAINTENANCE MANUALS:
 1. VOLTAGE READINGS AT THE FOLLOWING LOCATIONS:
 1. MAIN SERVICE CONNECTIONS
 2. EACH SERVICE PEGITIAL
 2. AMPERAGE READINGS AT THE FOLLOWING LOCATIONS:
 1. MAIN OVER-CURRENT DEVICE
- 3.4 CORROSION, PROTECTION & TOUCH-UP
 1. PRIME AND PAINT ALL FERROUS METAL SUPPORTS, BRACKETE, ETC.
 2. PROTECT ALL MATERIAL AND EQUIPMENT FROM ABUSE AND DAMAGE. REPAIR ANY DAMAGED SURFACE TO MATCH FACTORY FINISH.
- 3.5 EQUIPMENT IDENTIFICATION
 1. PROVIDE LAMINATED LABELS ON ALL DISTRIBUTION AND CONTROL EQUIPMENT, AS DETAILED BELOW.
 1. LABELS TO BE 1/8" (3MM) THICK WHITE BACKGROUND WITH 1/4" (6MM) BLACK LETTERING.
 2. LABELS TO CONFORM TO MARKING SPECIFIED IN INDIVIDUAL SPECIFICATION SECTIONS.
 3. MECHANICALLY FASTEN LAMINATED LABELS TO THE EQUIPMENT WITH SELF-TAPPING SCREWS IN PRE-DRILLED HOLES.
 4. TEMPORARY EQUIPMENT MARKINGS SHALL BE MADE IN INCONSPICUOUS LOCATIONS PREFERABLY ON THE INSIDE OF THE PANEL OR ENCLOSURE. ALL TEMPORARY MARKINGS SHALL BE REMOVED PRIOR TO FINAL INSPECTION.
 2. JUNCTION BOXES TO BE EXTERNALLY LABELED WITH INDELIBLE MARKER INDICATING CIRCUITS CONTAINED WITHIN.
- 3.6 MOUNTING
 1. PROVIDE ALL SUPPORTS REQUIRED FOR THIS WORK. EVERY CONDUIT TO HAVE AT LEAST ONE SUPPORT AND ALL BOXES, FITTINGS, PANELS AND EQUIPMENT ARE TO BE SUPPORTED INDEPENDENTLY OF CONNECTING CONDUITS.
- 3.7 CONDUCTORS
 1. INSTALL CONDUCTORS IN RACEWAYS AND TERMINATE AT EQUIPMENT OR SPLICES TO OTHER WIRING.
 2. CONDUCTORS FOR FEEDERS TO BE IDENTICAL IN TERMS OF CHARACTERISTICS AND LENGTH AND FREE OF SPLICES.
 3. USE ONLY SOLDERLESS CONNECTORS IN APPROVED BOXES FOR SPLICES/JUNCTIONS IN BRANCH CIRCUIT WIRING.
- 3.8 RACEWAYS
 1. INSTALL CONDUITS COMPLETE WITH ALL CONNECTORS, COUPLING, STRAPS, PULL AND JUNCTION BOXES TO FORM A CONTINUOUS RACEWAY FOR THE INSTALLATION OF CONDUCTORS AT A LATER TIME.
 2. PROVIDE CONDUIT SEALS WHERE REQUIRED BY THE CEG.
- 3.9 CONDUITS
 1. INSTALL CONDUCTORS IN RACEWAYS AND TERMINATE AT EQUIPMENT OR SPLICES TO OTHER WIRING.
 2. CONDUCTORS FOR FEEDERS TO BE IDENTICAL IN TERMS OF CHARACTERISTICS AND LENGTH AND FREE OF SPLICES.
 3. USE ONLY SOLDERLESS CONNECTORS IN APPROVED BOXES FOR SPLICES/JUNCTIONS IN BRANCH CIRCUIT WIRING.
- 3.10 JUNCTION AND PULL BOXES
 1. SUPPLY AND INSTALL PULL AND JUNCTION BOXES IN RACEWAY SYSTEMS AS REQUIRED TO INSTALL THE CONDUCTORS.
 2. INSTALL BOXES IN ACCESSIBLE LOCATIONS.
 3. SECURE BOXES INDEPENDENT OF CONNECTING CONDUITS.
 4. JUNCTION BOXES TO BE LABELED WITH PERMANENT MARKER INDICATING CIRCUITS CONTAINED WITHIN.
- 3.11 STEKWORK
 1. CHANNELS AND/OR INDIVIDUAL RACEWAYS TO BE INSTALLED IN TRENCH COMPLETE WITH SAND BEDDING UNLESS INDICATED AS CONCRETE ENCASED ON THE DRAWINGS.
 2. MULTIPLE PARALLEL RACEWAYS TO BE INSTALLED IN DUCTBANK(S) COMPLETE WITH SAND BEDDING UNLESS INDICATED AS CONCRETE ENCASED ON THE DRAWINGS.
 3. CO-ORDINATE EXCAVATION WITH LOCAL UTILITIES AND OBTAIN LOCATES ON ALL EXISTING, BURIED SERVICES PRIOR TO STARTING THE WORK.
 4. CLEAN RACEWAYS BY PULLING THROUGH A PURPOSE MADE APPLIANCE AND MARK THE LOCATION OF ENDS. PROVIDE AN APPROVED CAP AND A 1/4" (6MM) NYLON PULL-CORD IN ALL EMPTY CONDUITS.
 5. PLACE A WARNING TAPE 12" (300MM) BELOW GRADE ALONG ENTIRE LENGTH AND WIDTH OF DUCTBANK.
- 3.12 TRENCH
 1. TRENCH TO BE OF SUFFICIENT DEPTH TO ALLOW 27.5" (700MM) OF COVER, AND WIDTH TO ALLOW A 6" (150MM) ENVELOPE OF SAND OR CONCRETE AROUND THE RACEWAYS. OBTAIN LOCATES OF THE PRO. ASSEMBLES FROM OWNER. PROTECT THESE THE ROOFS FROM DAMAGE.
 2. RACEWAYS AND/OR CHANNELS ARE TO BE ENCASED IN 6" (150MM) OF FINE SAND.
 3. BACKFILL TO BE COMPACTED NATIVE MATERIAL TO 6" (150MM) BELOW SURFACE.
 4. THE BOTTOM OF THE TRENCH TO BE EXACTLY GRADED UNDISTURBED SOIL.
 5. PLACE A WARNING TAPE 12" (300MM) BELOW GRADE ALONG ENTIRE LENGTH OF TRENCH.
 6. SURFACE RESTORATION TO MATCH EXISTING CONDITIONS. USE COLD PATCH ASPHALT ONLY AFTER APPROVED BY THE ENGINEER.
- 3.13 DISCONNECTS
 1. FURNISH AND INSTALL DISCONNECT SWITCHES COMPLETE WITH FUSES AND CONNECT TO POWER SUPPLY WIRING AND WIRING TO THE CONNECTED LOAD.
 2. MOUNT ALL EQUIPMENT IN A NEAT, LOGICAL ARRANGEMENT. WIRING TO BE LABELED AND TERMINATED AT RIGHT ANGLES TO THE RACEWAY OR EQUIPMENT WITH NO EXCESS LENGTH OF CONDUIT.
 3. PROVIDE A SELF-SUPPORTING FRAMEWORK WHERE THERE IS INSUFFICIENT SPACE TO MOUNT THE EQUIPMENT OF THE INSULATION STRUCTURE IS NOT CAPABLE OF SUPPORTING THE WEIGHT OF THE DISCONNECTS.
 4. PROVIDE LAMINATED LABELS ON CIRCUIT DISCONNECTS INDICATED CONNECTED LOAD, VOLTAGE RATING AND MAXIMUM FUSE SIZE ON THREE (3) SEPARATE LINES (E.G. BOAT SERVICE * 240 VOLT * MAX FUSE 200A).
- 3.14 FUSES
 1. FUSES TO BE AS INDICATED ON THE DRAWINGS.
 2. ENSURE THAT ALL FUSES ARE CORRECTLY RATED FOR THE APPLICATION.
 3. SHIP FUSES IN THEIR ORIGINAL CONTAINERS AND INSTALL IN DISCONNECT SWITCHES AND/OR SWITCHBOARDS IMMEDIATELY PRIOR TO ENERGIZING CIRCUIT.
 4. PROVIDE THREE (3) SPARE FUSES OF EACH SIZE AND TYPE.
 5. HAND OVER SPARE FUSES (IN ORIGINAL CONTAINERS) TO THE OWNER UPON COMPLETION OF THE PROJECT.
- 3.15 ELECTRICAL SERVICE
 1. PROVIDE COMPLETE ELECTRICAL SERVICE AS SHOWN ON THE DRAWINGS AND AS FURTHER DESCRIBED HERE.
 2. GROUNDING SERVICE, EQUIPMENT, FEEDERS, AND THE WIRE SHALL BE PERFORMED IN ACCORDANCE WITH HYDRO ONE REQUIREMENTS.
 3. PROVIDE AN "ARTIFICIAL GROUNDING" SYSTEM IN ACCORDANCE WITH CANADIAN ELECTRIC CODE, SECTION 10.702. LOCATION SHALL BE TO APPROVAL OF THE SUPPLY & INSPECTION AUTHORITY REQUIREMENTS.
 4. PROVIDE A METER BASE, WHERE NOTED, ALL TO APPROVAL OF SUPPLY AUTHORITY.



SINGLE LINE DIAGRAM
NTS

SCALE: AS SHOWN	DATE: DEC 2011	CHG: TT
FILE: 4684	DESIGN: TT	DRAWN: TT
E1		

EAST SIDE ELECTRICAL SERVICE
WHEATLEY, ONTARIO
ELECTRICAL DETAILS

1930 Blue Heron Drive
London, ON, N6H 5L9
Tel: 519-472-5688
Fax: 519-472-5322
www.integratedengineering.ca

INTEGRATED
ENGINEERING

DO NOT SCALE THE DRAWING
THE CONTRACTOR IS RESPONSIBLE TO VERIFY THE DIMENSIONS OF ALL MATERIALS AND EQUIPMENT TO THE MANUFACTURER'S SPECIFICATIONS.
THE CONTRACTOR OF THIS DRAWING REMAINS THE SOLE RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED.

ISSUED FOR TENDER
ISSUED FOR REVIEW
DATE

DESCRIPTION
REVISIONS