ELECTRICAL SPECIFICATIONS

GENERAL INSTRUCTION

1. SUPPLY AND INSTALL A COMPLETE ELECTRICAL SYSTEM INCLUDING ALL MATERIALS, EQUIPMENT, SERVICES AND LABOUR NECESSARY AS SHOWN OR IMPLIED FOR A COMPLETE INSTALLATION.
2. ALL WORK SHALL COMPLY WITH THE CANADIAN BUILDING CODE, CANADIAN ELECTRICAL CODE, MANITOBA BUILDING CODE, THE MANITOBA ELECTRICAL SAFETY CODE AND ALL OTHER APPLICABLE CODES AND REGULATIONS.
3. FURNISH INSPECTION CERTIFICATES, PRIOR TO FINAL PAYMENT, TO SHOW INSTALLED WORK CONFORMS TO SPECIFICATION AND REGULATIONS. PAY ALL FEES AND PERMIT COSTS.
4. ELECTRICAL CONTRACTOR SHALL VERIFY DIMENSIONS OF EQUIPMENT TO BE INSTALLED.
5. ALL MATERIALS SHALL BE NEW AND CSA CERTIFIED.
6. PROVIDE SHOP DRAWINGS FOR REVIEW AND APPROVAL BY THE ENGINEER.
7. ELECTRICAL CONTRACTOR TO REPAIR ALL SURFACES DAMAGED DUE TO WORK PERFORMED TO THE SATISFACTION OF THE OWNER.
8. PROTECT EXISTING WORK AND EQUIPMENT DURING CONSTRUCTION.
9. TEST ALL SYSTEM COMPONENTS FOR PROPER OPERATION AND SAFETY.
10. DRAWINGS INDICATE GENERAL LOCATION. DO NOT SCALE.
11. CO-ORDINATE ELECTRICAL REQUIREMENTS FOR ALL EQUIPMENT SUPPLIED BY OWNER OR OTHER TRADES. NOTIFY ENGINEER OF ANY CONFLICTS PRIOR TO INSTALLATION.
12. TO DETERMINE THE OVERALL EXTENT OF ELECTRICAL WORK, THE ELECTRICAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE MECHANICAL DRAWINGS AND CIVIL DRAWINGS.
13. CARRY OUT DEMOLITION AS SHOWN AND AS REQUIRED TO SUIT RENOVATIONS AND ALL NEW CONSTRUCTION REQUIREMENTS. DETERMINE EXTENT OF DEMOLITION ON SITE. ALL TECK CABLE REMOVED AND MADE REDUNDANT BY THIS WORK SHALL BECOME THE PROPERTY OF THE OWNER. ALL OTHER MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

CONDUITS

1. PVC DB2 DUCT TO CSA C22.2 NO. 211.1.
2. USE PVC DB2 DUCT UNDERGROUND UNLESS OTHERWISE SPECIFIED.
3. PROTECT CONDUITS FROM DAMAGE WHERE THEY STUB OUT OF THE CONCRETE AND PROVIDE SLEEVES IN ADVANCE OF CONCRETE POUR, WHERE CONDUITS PASS THROUGH SLAB.
4. RACEWAY SYSTEMS TO BE COMPLETELY INSTALLED, DRY AND CLEAN BEFORE PULLING CONDUCTORS.
5. PROVIDE POLYPROPYLENE FISH WIRE IN ALL EMPTY CONDUITS.

WIRING

1. MULTI-CONDUCTOR TECK 90 CABLES TO CSA STANDARD C22.2 NO. 131. CABLES TO BE 1000 V INSULATION, ALUMINUM SHEATH AND OVERALL PVC JACKET. INSULATION TO BE 1000V CROSS-LINKED POLYETHYLENE SUITABLE FOR INSTALLATION AT A TEMPERATURE DOWN TO MINUS 40 'C' COMPLETE WITH ALUMINUM SHEATH AND OVERALL PVC JACKET. TECK 90 CABLES TO BE COPPER UNLESS OTHERWISE INDICATED.

DUCT PLUG AND END CAP

1. PLUG WITH PULLING EYE AND CAP FOR 100MM DIAMETER DB2 PVC DUCT.

   ROYAL BUILDING PRODUCTS CAT. NO. PLUG04 (PLUG)
   ROYAL BUILDING PRODUCTS CAT. NO. CAP04 (END CAP)
   OR APPROVED EQUAL

TRENCHING

1. EXCAVATE TRENCH WITH SUITABLE MACHINERY TO DEPTHS AND DIMENSIONS AS SHOWN IN TRENCH DETAILS. TRENCH DETAILS ARE PROVIDED AS A GUIDE ONLY. ELECTRICAL CONTRACTOR TO CONFIRM ALL DEPTHS ARE COMPLIANT WITH MANITOBA ELECTRICAL SAFETY CODE.
2. PROVIDE VINYL MARKER TAPE MOUNTED HALFWAY BETWEEN CABLE INSTALLATION AND GRADE LEVEL.
3. CUT AND TRIM SIDES OF TRENCHES EVENLY AND AS NEAR VERTICAL AS POSSIBLE AND SHORE AS REQUIRED TO PREVENT CAVE-IN.
4. KEEP BOTTOM OF TRENCH CLEAN AND CLEAR OF LOOSE MATERIAL AND SLOPE OR GRADE AS REQUIRED.
5. SANDFILL SHALL BE UNIFORMLY GRADED CLEAN SAND WITH A MAXIMUM AGGREGATE SIZE OF 2.00 MM AND MAXIMUM OF 8% PASSING THE NUMBER OF 200 SIEVE.
6. NO COVERING UP OR BACKFILLING OF ELECTRICAL EQUIPMENT SHALL BE PERFORMED UNTIL THE ELECTRICAL INSPECTOR HAS BEEN NOTIFIED AND PERMISSION TO COVER HAS BEEN GRANTED.
7. BACKFILL TRENCHES TO THE SATISFACTION OF THE OWNER.

GROUNDING

1. GROUNDING EQUIPMENT TO CSA C22.2 NO. 41.
2. COPPER GROUNDING CONDUCTORS TO: CSA 22.1 SECTION 10 LATEST EDITION.
3. NON-CORRODING ACCESSORIES NECESSARY FOR GROUNDING SYSTEM.
4. INSTALL COMPLETE PERMANENT, CONTINUOUS GROUNDING SYSTEM INCLUDING CONDUCTORS, CONNECTORS AND ACCESSORIES.
5. USE MECHANICAL CONNECTORS FOR GROUNDING CONNECITONS TO EQUIPMENT PROVIDED WITH LUGS.
6. PERFORM GROUND CONTINUITY AND RESISTANCE TESTS USING A METHOD APPROPRIATE TO SITE CONDITIONS PRIOR TO ENERGIZING ELECTRICAL SYSTEMS.

BOLLARDS

1. BOLLARDS ARE TO BE PROVIDED BY OTHERS. ENSURE THERE IS A 500MM CLEARANCE BETWEEN THE BOLLARD CONCRETE ENCASEMENT AND THE DIRECT BURIED CABLES ENTERING ELECTRICAL EQUIPMENT CONCRETE PAD.

SPLITTER BOX

1. PAD MOUNT SPLITTER BOX. DETAILS AS FOLLOWS;

   A. 600 VOLT, 3 PHASE, 3-WIRE
   B. BUS RATING: 200 AMPS MINIMUM
   C. SPLITTER TO ACCOMMODATE THREE INDIVIDUAL 600 VOLT, 3 PHASE, 3 -WIRE CIRCUITS
   D. EACH SPLITTER SECTION TO HAVE ITS OWN INCOMING AND OUTGOING CABLE SECTION
   E. NEMA 3R RATED ENCLOSURE
   F. PADLOCKABLE HANDLE C/W 3 POINT, LATCH, RODS AND GUIDES
   G. COMMON GROUND BUS
   H. 12 GAUGE STEEL
   I. ZINC RICH PRIMER AND TWO COATS OF SPECIAL EPOXY PAINT
   J. NEOPRENE GASKET
   K. ASA #61 GRAY FINISH
   L. LAMACOID NAMEPLATE: 'MAIN WHARF SPLITTER BOX'

   LITTELFUSE CAT. NO. CSTE-431-PMA-3WAY OR APPROVED EQUAL

STRUT AND ACCESSORIES

1. STRUT CHANNEL TO BE TYPE 304 STAINLESS STEEL, 16MM WIDE X 13MM DEEP, 12 GAUGE, 3050 MM LENGTH.
   THOMAS & BETTS 'SUPERSTRUT' CAT. NO. D1200-10-SS OR APPROVED EQUAL
2. CABLE CLAMP TO BE ONE-PIECE HEAVY-DUTY CONSTRUCTION COMPLETE WITH PARALLEL HOOK DESIGN TO KEEP CABLE SQUARE WITH STRUT. FIELD VERIFY EXISTING CABLE DIAMETER SIZES TO DETERMINE SIZES OF CLAMPS REQUIRED.

   THOMAS & BETTS 'COBRA' CABLE CLAMP CAT. NO. CPC-SS (SIZE AS REQUIRED) OR APPROVED EQUAL.
3. END CAP TO BE WHITE PLASTISOL FOR STRUT CHANNEL.

   THOMAS & BETTS 'SUPERSTRUT' CAT. NO. B804NEOPWH OR APPROVED EQUAL

LIGHT STANDARD

1. LED HIGH PERFORMANCE, HIGH EFFICACY, LONG LIFE LUMINIARE, COOL WHITE COLOUR TEMPERATURE, TYPE 2 SHORT DISTRIBUTION, ROUND POLE MOUNTING, NEMA TWIST-LOCK RECEPTACLE, PHOTOCELL, NATURAL ALUMINUM FINISH, INTEGRAL SLIP FITTER FOR TENON MOUNTING, 100,000 HOURS EXPECTED LIFE SERVICE.

   LITHONIA CAT. NO.
   DSXO-20C-1000-40K-T2S-RPA-PER-DLL127F1.5JU-DNAXD- AST20-190 (NO EQUAL)

LIGHT POLE

1. 20 FOOT HIGH ROUND TAPERED ALUMINUM POLE COMPLETE WITH CAST ALUMINUM POLE CAP, SATIN ALUMINUM FINISH, INTERNAL DAMPER FOR 2ND MODE VIBRATION DAMPENING, GROUNDING PROVISION, REINFORCED HANDHOLE WITH COVER, 9.5 INCH BOLT CIRCLE DIAMETER, TENON MOUNTING.

   HAPCO CAT. NO. RTA20C6B4-01(TENON MOUNT) (NO EQUAL)

POWER INTERRUPTIONS

1. THE FOLLOWING SCOPE OF WORK SECTIONS PROVIDES A BASE LINE OF THE SEQUENCE OF WORK TO BE PERFORMED. THE CONTRACTOR IS TO PLAN THE WORK SUCH THAT THE POWER INTERRUPTIONS TO THE MAIN WHARF AND MARGINAL WHARF ELECTRICAL EQUIPMENT ARE OF A MINIMUM DURATION. NECESSARY POWER INTERRUPTIONS TO PERFORM THE WORK SHALL BE CO-ORDINATED WITH THE OWNER.

SCOPE OF WORK -POWER TO MAIN WHARF

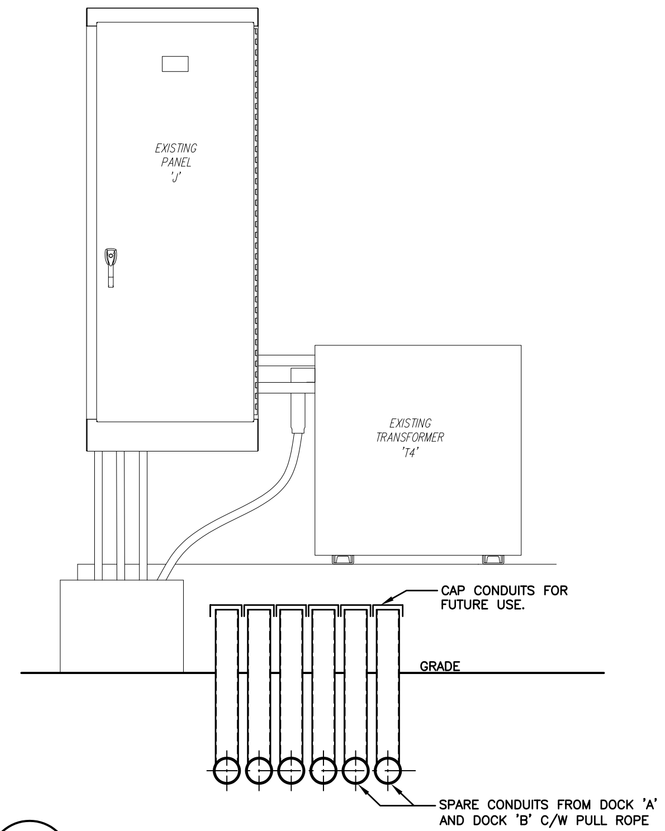
1. AT THE MAIN DISTRIBUTION CABINET LOCATE THE THREE CIRCUIT BREAKERS CURRENTLY PROVIDING POWER TO THE MAIN WHARF AND POSITION THE CIRCUIT BREAKERS TO THE 'OFF' POSITION.
2. LOCATE THE THREE EXISTING DIRECT BURIED TECK CABLES PROVIDING POWER TO THE MAIN WHARF.
3. THE MARGINAL WHARF AND TRANSITIONAL WHARF IS TO BE EXCAVATED FOR RESURFACING. COORDINATE WITH THE GENERAL CONTRACTOR TO EXPOSE THE THREE EXISTING TECK CABLES. OVERSEE THE METHOD OF EXCAVATION TO ENSURE THE TECK CABLES ARE NOT DAMAGED.
4. ONCE THE THREE TECK CABLES HAVE BEEN EXPOSED CUT THE THREE TECK CABLES AT STARTING POINT OF MAIN WHARF. PULL BACK THE THREE TECK CABLES TO THE STARTING POINT OF THE MARGINAL WHARF RENOVATION NEAR THE TOURIST INFORMATION CENTER.
5. PROVIDE A NEW TRENCH AS INDICATED. THE TRENCH IS TO START NEAR THE TOURIST INFORMATION CENTER AND END AT THE NEW SPLITTER BOX CONCRETE BASE PROVIDED BY OTHERS.
6. INSTALL THE THREE EXISTING TECK CABLES IN THE TRENCH AND STUB UP INTO THE NEW CONCRETE PAD FOR THE NEW SPLITTER BOX. THE CONCRETE PAD IS TO BE PROVIDED BY OTHERS.
7. PRIOR TO COVERING UP OR BACKFILLING OF THE DUCTS ENSURE THE ELECTRICAL INSPECTION DEPARTMENT HAS BEEN NOTIFIED AND PERMISSION TO COVER HAS BEEN GRANTED.
8. COVER UP AND BACKFILL THE TRENCH.
9. SUPPLY AND INSTALL A NEW SPLITTER BOX
10. TERMINATE THE THREE TECK DIRECT BURIED TECK CABLES TO BUS BARS IN THE NEW SPLITTER BOX. PROVIDE LUGS AND ALL REQUIRED ACCESSORIES.
11. TERMINATE THE THREE FREE AIR TECK CABLES ON THE MAIN WHARF UTILIDOR TO BUS BARS IN THE NEW SPLITTER BOX. PROVIDE LUGS AND ALL REQUIRED ACCESSORIES.
12. PROVIDE FITTINGS AS REQUIRED FOR TECK CABLES EXITING THE NEW SPLITTER BOX TO ENSURE THE NEMA 3R RATING OF THE SPLITTER BOX IS MAINTAINED.
13. CONFIRM CONTINUITY OF EACH OF THE THREE CIRCUITS.
14. TURN THE THREE CIRCUIT BREAKERS IN THE MAIN DISTRIBUTION CABINET TO THE 'ON' POSITION TO RE-ESTABLISH POWER TO THE MAIN WHARF.

SCOPE OF WORK -SPARE DUCTS TO DOCK 'A' AND DOCK 'B'

1. EXISTING DIRECT BURIED TECK CABLES TO DOCK 'B', DOCK 'A' AND PANEL 'J1' ARE TO REMAIN AS IS. LOCATE TECK CABLES AND COORDINATE WITH GENERAL CONTRACTOR TO ENSURE THE TECK CABLES ARE NOT DAMAGED DURING THE EXCAVATION OF THE MARGINAL WHARF.
2. THE POWER FEED FOR THE TECK CABLES ORIGINATES AT PANEL 'J'. POSITION THE CIRCUIT BREAKERS TO THE 'OFF' POSITION DURING THE EXCAVATION OF THE MARGINAL WHARF.
3. PROVIDE A TRENCH FOR THE INSTALLATION OF THREE NEW DIRECT BURIED DUCTS FROM PANEL 'J' TO DOCK 'A'.
4. PROVIDE A TRENCH FOR THE INSTALLATION OF THREE NEW DIRECT BURIED DUCTS FROM PANEL 'J' TO DOCK 'B'.
5. PROVIDE THREE NEW DIRECT BURIED 100MM DIAMETER DB2 PVC DUCTS IN EACH OF THE TWO TRENCHES. THE DUCTS ARE TO BE STUBBED UP AT THE FACE OF THE EXISTING CONCRETE SUPPORT FOR THE FENCE SURROUNDING THE FUEL COMPOUND AS INDICATED. THE OTHER END OF THE DUCTS ARE TO EXIT THE FACE OF THE STEEL SHEET PILING AT LOCATIONS INDICATED.
6. PROVIDE A POLYPROPYLENE FISH WIRE IN EACH DUCT.
7. PROVIDE A DUCT PLUG AND END CAP AT EACH END OF THE SIX NEWLY INSTALLED DUCTS.
8. PRIOR TO COVERING UP OR BACKFILLING OF THE DUCTS ENSURE THE ELECTRICAL INSPECTION DEPARTMENT HAS BEEN NOTIFIED AND PERMISSION TO COVER HAS BEEN GRANTED.
9. COVER UP AND BACKFILL THE TRENCH.

SCOPE OF WORK -INSTALLATION OF NEW LIGHT STANDARDS AT CENTER WHARF

1. PROVIDE AND INSTALL 5 NEW LIGHT STANDARDS FOR THE CENTER WHARF.
2. ORIENTATE THE HANDHOLE SO THAT IT IS ACCESSIBLE FROM THE WHARF.
3. CONCRETE BASES FOR THE LIGHT STANDARDS TO BE PROVIDED BY OTHERS.



C / E-3 SECTION - SPARE CONDUIT TERMINATION
SCALE: 1:20

120/208 VOLT, 400 AMP MAINS, 3 PHASE, 4 WIRE — TYPE : GE AQF3424MBX; MOUNTING : SURFACE; FED FROM : MAIN DISTRIBUTION

PANEL 'J'

LOCATION : MARGINAL WHARF

REMARKS: EXISTING PANEL, NEMA 3R

DESCRIPTION OF LOAD	WATTAGE ØA	WATTAGE ØB	WATTAGE ØC	CCT No.	BKR AMP	SN A B C	BKR AMP	CCT No.	WATTAGE ØA	WATTAGE ØB	WATTAGE ØC	DESCRIPTION OF LOAD
				1				22				
A-DOCK				2	90		90	23				B-DOCK
				3				24				
				4				25				
A-DOCK				5	90		90	26				PANEL 'J1'
				6				27				
				7				28				
A-DOCK				8	90		90	29				B-DOCK
				9				30				
				10				31				
				11				32				
				12				33				
				13				34				
?				14	15			35				
				15				36				
?				16	15			37				
?				17	15			38				
?				18	15			39				
SPARE				19	*15			40				
SPARE				20	*15			41				
SPARE				21	*15			42				

* IDENTIFY CIRCUITS 19, 20, AND 21 AS 'SPARE'

120/208 VOLT, 100 AMP MAINS, 3 PHASE, 4 WIRE — TYPE : SQ D QO LOADCENTRE; MOUNTING : SURFACE; FED FROM : PANEL 'J'

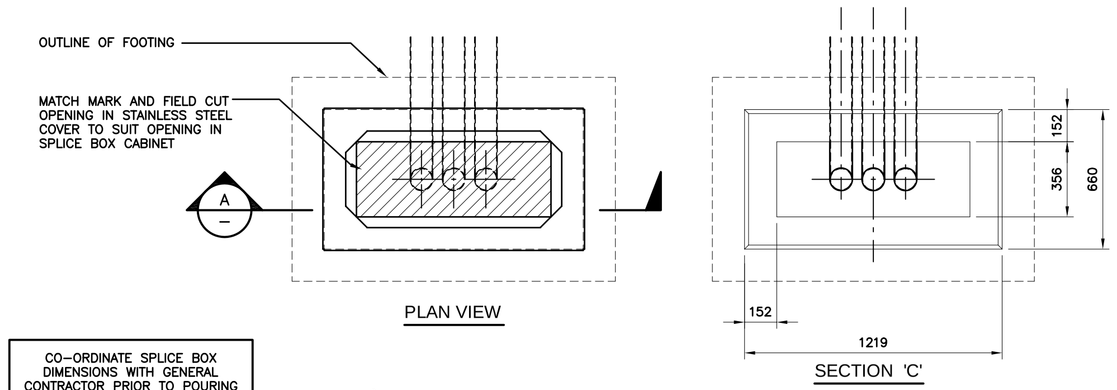
PANEL 'J1'

LOCATION : MARGINAL WHARF

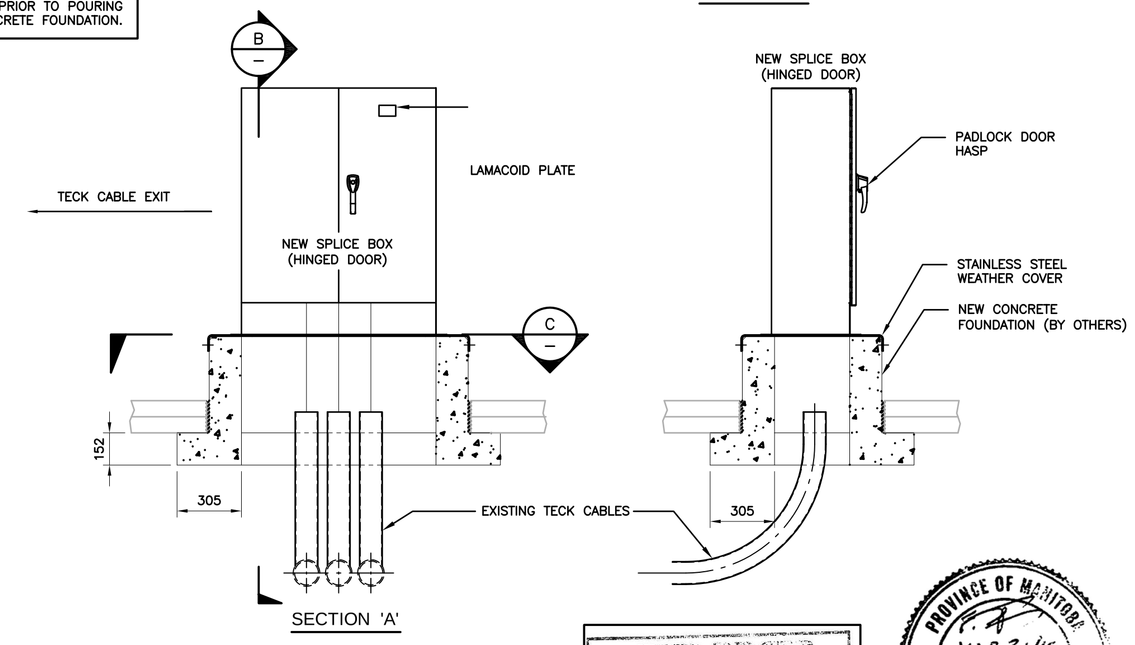
REMARKS: EXISTING PANEL NEMA 3R ENCLOSURE

DESCRIPTION OF LOAD	WATTAGE ØA	WATTAGE ØB	WATTAGE ØC	CCT No.	BKR AMP	SN A B C	BKR AMP	CCT No.	WATTAGE ØA	WATTAGE ØB	WATTAGE ØC	DESCRIPTION OF LOAD
NORTH FISH CONVEYOR				1	20			2				
CENTRE FISH CONVEYOR				3	20		60	4				PIER PEDESTAL
THIS POLE FISH CONVEYOR				5	20			6				
NORTH LIGHT PLUG				7	15		15	8				CENTRE POLE PLUG
CENTRE POLE LIGHT				9	15		15	10				THIS POLE PLUG
THIS POLE LIGHT				11	15			12				
DIESEL				13	*15		30	14				NORTH PEDESTAL
GAS				15	*15			16				
SEWAGE				17	*15			18				
				19				20				
				21				22				
				23				24				

* PROVIDE THREE NEW CIRCUIT BREAKERS AS INDICATED.



CO-ORDINATE SPLICE BOX DIMENSIONS WITH GENERAL CONTRACTOR PRIOR TO POURING OF NEW CONCRETE FOUNDATION.



5 / E-3 DETAIL - NEW SPLICE BOX
SCALE: 1:20

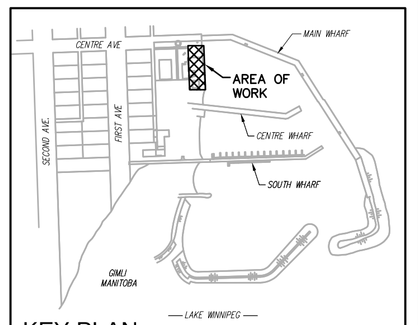
Certificate of Authorization
JML Engineering Ltd.
No. 2186 Date: MARCH 31 2016

PROVINCE OF MANITOBA
MAR 31/16
F. GORENSZACH
Member
36145
REGISTERED PROFESSIONAL ENGINEER

DEPARTMENT OF FISHERIES AND OCEANS CANADA
SMALL CRAFT HARBOURS
CENTRAL AND ARCTIC REGION

JML Engineering
105 Villa Street, 2nd Floor
Thunder Bay, ON P7A 7W5
Phone: 807.345.1131
Fax: 807.345.1229
Email: info@jmleng.com

TBT ENGINEERING CONSULTING GROUP
PROFOR DIVISION
Thunder Bay Phone: (807) 623-3013
E-mail: info@tbte.ca



KEY PLAN
N.T.S.

revision	description	date
0	ISSUED FOR CONSTRUCTION	2016/03/31
C	ISSUED FOR 99% REVIEW	2016/03/15
B	ISSUED FOR 66% REVIEW	2016/02/19
A	ISSUED FOR 33% REVIEW	2016/01/22

Do not scale drawings.
Verify all dimensions and conditions on site and immediately notify the engineer of all discrepancies.

A / BC
A Detail No. / No. du détail
B drawing no. – where detail required / dessin no. – où détail exigé
C drawing no. – where detailed / dessin no. – où détaillé

project title / titre du projet
GIMLI — MANITOBA
MARGINAL AND TRANSITIONAL WHARF
WHARF REHABILITATION

drawing title / titre du dessin
MARGINAL AND TRANSITIONAL WHARF
PANEL SCHEDULES
ELECTRICAL DETAILS.
ELECTRICAL SPECIFICATIONS

drawn by / dessine par: STEPHANIE NUTTALL
designed by / conc par:
approved by / approuve par: FRANCO GORENSZACH
tender soumission: SMALL CRAFT HARBOURS — project manager / administrateur de projets
project date / date du projet: MARCH 2016
project no. / no. du projet:
drawing no. / dessine no.: E-4