KU-02-664

NOTES:

DESIGN IS BASED ON AREMA 2004 AND CN GUIDELINES.

THESE DRAWINGS TO BE READ IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS.

EXISTING DIMENSIONS ARE APPROXIMATE ONLY. CONTRACTOR SHALL SITE VERIFY ALL DIMENSIONS.

DESIGN LOADS

COOPER E90 PLUS CN IMPACT FOR DIESEL AND ELECTRICAL LOCOMOTIVES.

FOUNDATIONS

FOUNDATION DESIGN IS BASED ON THE GEOTECHNICAL INVESTIGATION PERFORMED BY UMA ENGINEERING LTD. AND REPORT DATED MARCH 2005 AND OCTOBER 2005 PREPARED BY UMA ENGINEERING LTD. ENSURE THAT THE REQUIREMENTS OUTLINED IN THESE REPORTS ARE READ AND UNDERSTOOD PRIOR TO COMMENCING WITH FOUNDATION WORK. FOR TEST HOLE LOCATIONS REFER TO THE GEOTECHNICAL REPORTS OR SITE PLAN DRAWINGS P-3258-127, DRAWING 3 OF 21.

PROTECT EXCAVATIONS FROM RAIN, SNOW, FREEZING TEMPERATURES AND STANDING WATER.

REMOVE GROUND WATER ENTERING EXCAVATIONS BY AN APPROVED DEWATERING METHOD.

DO NOT PLACE CONCRETE AGAINST FROZEN GROUND. THAW BY AN APPROVED METHOD, THEN PROTECT EXCAVATIONS FROM FREEZING PRIOR TO PLACING CONCRETE.

PRECAST CONCRETE PILES

400 A/F PRESTRESSED PRECAST CONCRETE PILES.

MAXIMUM ALLOWABLE LOAD DRIVEN TO REFUSAL IS 800 kN.

BATTER IS AS INDICATED ON THE DRAWINGS. PILES SHALL BE DRIVEN VERTICALLY UNLESS SHOWN OTHERWISE ON THE DRAWINGS. BATTERED PILES SHALL BE DRIVEN TO THE BATTER SPECIFIED AND SHALL NOT BE JACKED OR PULLED INTO THEIR FINAL POSITION.

ROCK SOCKET CAISSONS

THE CAISSONS SHALL BE 1067 ø TO TILL LAYER, 914 ø THEREAFTER TO SOUND BEDROCK AS DETERMINED BY THE CONTRACT ADMINISTRATOR. THE ROCK SOCKET SHALL BE 760 ø TO THE SPECIFIED LENGTH OF 3500mm OR AS DEEMED NECESSARY BY THE CONTRACT ADMINISTRATOR. ANY PROPOSED FIELD CHANGE SHALL BE APPROVED IN WRITING BY THE CONTRACT ADMINISTRATOR PRIOR TO COMMENCEMENT OF THE WORK.

MAXIMUM ALLOWABLE LOAD 5850 kN

CAST IN PLACE CONCRETE

CONCRETE MATERIALS, QUALITY, MIXING, PLACING, FORMWORK AND OTHER CONSTRUCTION PRACTICES TO CONFORM TO CSA-A23.1-2000.

SEE SPECIFICATION FOR CONCRETE MIX DESIGN REQUIREMENTS.

REQUIRED CONCRETE STRENGTH AT 28 DAYS:

CONCRETE LOCATION 28-DAY STRENGTH

ABUTMENT FOOTING	35 MPa
ABUTMENT BACKWALL	35 MPa
WINGWALL	35 MPa
PIER PILE CAP BEAM	35 MPa
TRAINMANS WALKWAY	35 MPa
CAISSON FILL	40 MPa
WORKING SLAB	10 MPa

DO NOT USE CALCIUM CHLORIDE IN CONCRETE MIX.

FLY ASH MAY BE USED IN MIX TO A MAXIMUM OF 15% OF CEMENT MATERIALS.

REINFORCING

REINFORCING STEEL TO CONFORM TO CSA G30.18, GRADE 400.

CONCRETE CLEAR COVER TO REINFORCEMENT UNLESS NOTED OTHERWISE:

ABUTMENT	75mm
PIER PILE CAP BEAM	60mm
CAISSONS	75mm
BOX GIRDERS	60mm
OTHER	50mm
CONCRETE CAST AGAINST EARTH	75mm

SUPPLY SUPPORT BARS TO SUPPORT MAIN REINFORCEMENT AS REQUIRED.

LAP SPLICE SCHEDULE

BAR SIZE	EMBEDDMENT	TENSION LAP
10M	300	400
15M	400	550
20M	500	700
25M	800	1100
30M	950	1200
35M	1100	1500

LAP SPLICE SCHEDULE IS FOR CLASS B SPLICE UNLESS NOTED OTHERWISE AND APPLIES TO REINFORCING SPLICES NOT OTHERWISE DETAILED.

LOCATE REINFORCING SPLICES NOT INDICATED ON THE DRAWINGS AT POINTS OF MINIMUM STRESS. LOCATIONS OF SPLICES TO BE APPROVED BY THE ENGINEER.

BEFORE PLACING REBAR, ENSURE IT IS CLEAN, FREE OF LOOSE SCALE, DIRT, OR OTHER FOREIGN COATING WHICH WOULD REDUCE THE BOND TO CONCRETE.

PRECAST CONCRETE BOX GIRDERS

CONCRETE MATERIALS, QUALITY, MIXING, PLACING, FORM WORK AND OTHER CONSTRUCTION PRACTICES SHALL CONFORM TO LATEST EDITION OF CSA A23.4 - PRECAST CONCRETE MATERIALS AND CONSTRUCTION.

THE CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AS FOLLOWS:

a) AT TIME OF TRANSFER OF PRE-TENSIONING FORCES f'ci = 45 MPa
b) AT 28 DAYS f'c = 70 MPa

THE PRE-STRESSING STEEL SHALL CONSIST OF LOW RELAXATION 15ø SEVEN WIRE PRE-STRESSING STRAND, MINIMUM ULTIMATE STRENGTH 1860 MPa. WITH INITIAL FORCE PER STRAND OF 195 kN.

THE POST-TENSIONING STRAND SHALL BE LOW RELAXATION STRAND TO CONFORM TO CSA G279, GRADE 1860, UNCOATED, HIGH TENSILE, LOW RELAXATION SEVEN WIRE STRAND.

GIRDER INSTALLATION WILL NOT BE PERMITTED UNTIL 28-DAY STRENGTH HAS BEEN REACHED. CYLINDER BREAKS MUST BE PROVIDED TO VERIFY GIRDER CONCRETE STRENGTH.

PRIOR TO LATERAL POST TENSIONING, BRACING SHALL BE INSTALLED AS TO PREVENT LONGITUDINAL SHIFTING OF GIRDERS DURING STRESSING. THE DESIGN AND IMPLEMENTATION OF THE BRACING SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA RETAINED BY THE CONTRACTOR. TWO COPIES OF SEALED DESIGN NOTES AND DRAWINGS SHALL BE SUBMITTED TO THE CONTRACT ADMINISTRATOR SEVEN (7) DAYS FOR APPROVAL PRIOR TO FABRICATION.

INSTALL THREE (3) 15ø TENDONS IN ALL SPANS TRANSVERSE POST TENSIONING DUCTS. FINAL STRESS TO 0.7 fpu AND PRESSURE GROUT THE DUCTS WITH 70 MPa NON-SHRINK GROUT.

INSTALL BACKER ROD BETWEEN ADJACENT GIRDERS TO SEAL ANY GAPS THAT STILL EXIST AFTER STRESSING. FILL ALL LONGITUDINAL SHEAR KEYS WITH 70 MPa NON-SHRINK GROUT.

BEARINGS

ALL GIRDER BEARINGS SHALL BE ELASTOMERIC LAMINATED BEARINGS BY GOODCO OR APPROVED EQUAL.

THE EXPANSION BEARINGS SHALL BE 40mm THICK WITH TWO 3mm STEEL PLATES AND SHALL CONFORM TO DIMENSIONS AS SHOWN ON THE DRAWINGS. THE DUROMETER SHALL BE 55 FOR EXPANSION BEARINGS.

THE FIXED BEARINGS SHALL BE 40mm THICK WITH TWO 3mm STEEL PLATES AND SHALL CONFORM TO DIMENSIONS AS SHOWN ON THE DRAWINGS. THE DUROMETER SHALL BE 60 FOR THE FIXED BEARINGS.

FIXED ANCHOR PINTEL SHALL BE STAINLESS STEEL ANSI TYPE 316.

EXPANSION JOINTS

ALL EXPANSION JOINTS SHALL BE GOODCO GOODFLEX TYPE C OR APPROVED EQUAL. THE NEOPRENE SEAL SHALL BE GOODCO FL-125 OR APPROVED EQUAL.

WITHIN THE TRAINMAN'S WALKWAY, O.S. BROWN K-5000 COMPRESSION SEAL SHALL BE USED AND INSTALLED WITHIN THE STEEL ANGLES. THE WIDTH OF THE O.S. BROWN COMPRESSION SEAL SHALL BE IN EXCESS OF THE SPECIFIED ROOT OPENING TO ALLOW FOR THERMAL MOVEMENT AND GIRDER SHRINKAGE. EXPANSION JOINT SHOP DRAWINGS ARE TO BE SUBMITTED TO THE CONTRACT ADMINISTRATOR FOR REVIEW PRIOR TO FABRICATION.

ALL STEEL ANGLES AND PLATES SHALL BE HOT DIP GALVANIZED AFTER FABRICATION AND ASSEMBLY AND SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

MISCELLANEOUS METAL

ALL MISCELLANEOUS STEEL SHALL CONFORM TO CAN/CSA G40.21 GRADE 300W UNLESS OTHERWISE NOTED. HOLLOW STRUCTURAL SECTION SHALL BE GRADE 350W.

ALL MISCELLANEOUS METAL SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH CSA G164.

WELDING

WELDING SHALL BE UNDERTAKEN BY A COMPANY WITH PROVEN CAPABILITIES IN THIS TYPE OF WORK AND SHALL HAVE THE APPROVAL OF THE CANADIAN WELDING BUREAU TO THE REQUIREMENTS OF CSA W47.1.

WELDING SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST ISSUE OF CSA W59.

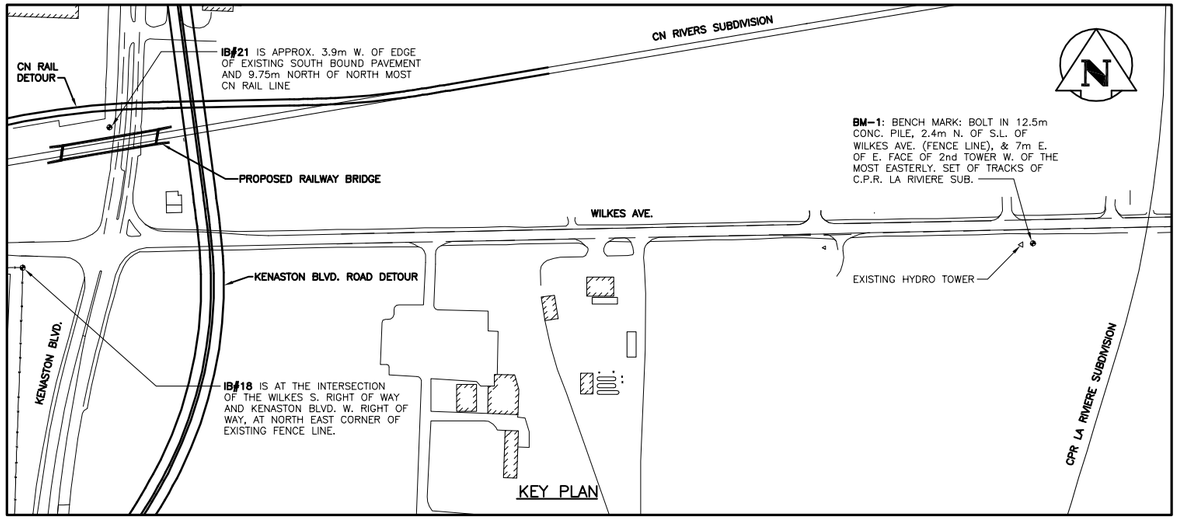
THE WELDING ELECTRODE SHALL BE E480XX.

TEMPORARY DRAINAGE SYSTEM

THE CONTRACTOR IS RESPONSIBLE FOR DESIGN AND IMPLEMENTATION OF A TEMPORARY DRAINAGE SYSTEM FOR DEWATERING THE SUBSTRUCTURE EXCAVATIONS. THE CONTRACTOR MUST SUBMIT A DRAWING TO THE CONTRACT ADMINISTRATOR FOR REVIEW SHOWING THE PROPOSED DRAINAGE SYSTEM. EXCAVATION CANNOT COMMENCE UNTIL APPROVAL HAS BEEN RECEIVED FROM THE CONTRACT ADMINISTRATOR FOR THE TEMPORARY DRAINAGE SYSTEM.

TEMPORARY SHORING

THE CONTRACTOR IS RESPONSIBLE FOR DESIGN AND IMPLEMENTATION OF TEMPORARY SHORING AS SHOWN ON THE DRAWINGS. THE LIMITS OF SHORING IS RELATED TO THE PROPOSED EXCAVATION AND LOCATION OF GROUP TELECON FIBRE OPTIC CABLE. THE CONTRACTOR MAY REVISE THE SHORING LENGTHS TO SUIT AN ALTERNATE EXCAVATION WITH IN THE LIMITS SHOWN. THE CONTRACTOR MUST SUBMIT A DRAWING FOR REVIEW, SHOWING THE PROPOSED LIMITS OF EXCAVATION AND SHORING FOR SU5. EXCAVATION CANNOT COMMENCE UNTIL APPROVAL HAS BEEN RECEIVED FROM THE CONTRACT ADMINISTRATOR FOR THE TEMPORARY SHORING.



DESIGN DATA

DESIGN SPECIFICATION	– AREMA 2004 – CN GUIDELINES
LIVE LOAD	– COOPER E90 PLUS CN IMPACT FOR DIESEL AND ELECTRICAL LOCOMOTIVES
LATERAL DESIGN LOAD	– BRAKING OF ONE TRAIN COOPER E90 (FACTORED). – BRAKING AND TRACTION OF TWO TRAINS COOPER E90 (SERVICE LOADS). – BRAKING AND TRACTION OF TWO TRAINS COOPER E90 IN OPPOSITE DIRECTION (FACTORED).
BALLAST	– BRIDGE DESIGNED FOR 700mm DEPTH OF BALLAST
CONCRETE	– SUBSTRUCTURE f'c = 35 MPa – CAISSONS f'c = 40 MPa – SUPERSTRUCTURE: BOX GIRDERS f'c = 70 MPa TRAINMANS WALKWAY f'c = 35 MPa – ALL OTHER CONCRETE f'c = 35 MPa U.N.O.
REINFORCING STEEL	– CSA G30.18 – (LATEST EDITION) GRADE 400
STRUCTURAL STEEL	– CSA. G40.21 – GRADE 350W
PRESTRESSING STEEL	– LOW RELAXATION STRESS RELIEVED 15 DIA. SEVEN WIRE STRAND, fpu = 1860 MPa
PRECAST CONCRETE PILES	– 400 ø A/F PRECAST PRESTRESSED HEXGONAL PILE – MAX. ALLOWABLE AXIAL LOAD = 800 kN
ROCK SOCKET CAISSONS	– 1067 ø STEEL SLEEVE, CONCRETE FILLED CAISSON TO TILL – 914 ø CONCRETE CAISSON TO SOUND BEDROCK – 760 ø x 3500 CONCRETE ROCK SOCKET – MAX. ALLOWABLE AXIAL LOAD = 5850 kN

MAJOR ITEMS OF WORK

1. SUPERSTRUCTURE AND SUBSTRUCTURE EXCAVATION.
2. SUPPLY AND INSTALLATION OF PRECAST CONCRETE PILES
3. INSTALLATION OF ROCK SOCKET CAISSONS.
4. CONSTRUCTION OF REINFORCED CONCRETE SUBSTRUCTURE UNITS.
5. SUPPLY AND INSTALLATION OF BEARINGS.
6. FABRICATION OF PRESTRESSED PRECAST CONCRETE BOX GIRDERS.
7. BACKFILL AROUND ABUTMENTS.
8. INSTALLATION OF PRECAST CONCRETE BOX GIRDERS.
9. INSTALLATION OF LATERAL STRESSING.
10. SUPPLY AND INSTALLATION OF EXPANSION JOINTS.
11. CONSTRUCTION OF REINFORCED CONCRETE TRAINMAN'S WALKWAY.
12. SUPPLY AND INSTALLATION OF WATERPROOFING MEMBRANE.
13. FABRICATION AND INSTALLATION OF RAILING.
14. INSTALLATION OF ROUGHED-IN LIGHTING.

CN ITEMS OF WORK

1. SUPPLY AND INSTALLATION OF BALLAST ON BRIDGE.
2. SUPPLY AND PLACEMENT OF TRACK ON BRIDGE.
3. TAMP AND FINAL PLACEMENT OF TRACK ON BRIDGE.
4. BRIDGE TRACK TIE-IN TO EXISTING MAINLINE.

SITE ACCESS:

THE BRIDGE CONSTRUCTION SITE CAN ONLY BE ACCESSED FROM THE SOUTH AND WEST.

SOUTH ACCESS

- TRAVELING SOUTH ON KENASTON BLVD. DETOUR, TURN ONTO PREVIOUS KENASTON BLVD., SOUTH OF THE RAILWAY CROSSING, NORTH OF STERLING LYON PARKWAY.
- CONTINUE TRAVELING NORTH ON KENASTON BLVD. TO SITE.
- ACCESS TO SITE TRAVELING NORTH ON DETOUR THROUGH MEDIAN OPENING REQUIRES TRAFFIC FLAGGING.

WEST ACCESS (RESTRICTED BY GATES)

- TRAVELING WEST ON SLP, TURN EAST (RIGHT) & TRAVEL THROUGH GATE.
- CONTINUE TRAVELING EAST ON WILKES AVE. TO KENASTON BLVD.
- TURN NORTH (LEFT) ON KENASTON BLVD. TO SITE.

CLARKE TRANSPORT ACCESS

- TRAVELING EAST OR WEST ON STERLING LYON PARKWAY WEST OF KENASTON BLVD., TURN NORTH ON TO CLARKE TRANSPORT ACCESS ROAD.
- EXIT CLARKE TRANSPORT YARD ONTO KENASTON BLVD.
- TURN NORTH LEFT ON KENASTON BLVD. TO SITE.

LIST OF ABBREVIATIONS

@	AT
A/F	ACROSS FLATS
ALT.	ALTERNATING
ALUM.	ALUMINUM
APPROX.	APPROXIMATE
B.O.	BY OTHERS
B/O	BOTTOM OF
BOT.	BOTTOM
B/R	BASE OF RAIL
BRG.	BEARING
B.W.	BOTH WAYS
C.I.P.	CAST-IN-PLACE
CJ.	CONTRUCTION JOINT
℄	CENTRE LINE
C/W	COMPLETE WITH
CONC.	CONCRETE
CONT.	CONTINUOUS
CL.	CLEAR
CS	COMBINED SEWER
CSP	CORRUGATED STEEL PIPE
DBL.	DOUBLE
DIA.	DIAMETER
DTL.	DETAIL
DWG.	DRAWING
DWL.	DOWEL
EA.	EACH
E.E.	EACH END
E.F.	EACH FACE
E.W.	EACH WAY
EQ.	EQUAL
EQ. SP.	EQUAL SPACE
EL.	ELEVATION
EXIST	EXISTING
EXP. JT.	EXPANSION JOINT
F.F.	FAR FACE
GALV.	GALVANIZING
GRAN.	GRANULAR
GT	GROUP TELECOM
HORIZ.	HORIZONTAL
IB	IRON BAR
I.F.	INSIDE FACE
LG.	LONG
MK.	MARK
MAX.	MAXIMUM
m	METRE
MIN.	MINIMUM
mm	MILLIMETRE
N.E.	NORTHEAST
N.F.	NEAR FACE
N.I.C. NOT	IN CONTRACT
N.T.S.	NOT TO SCALE
No.	NUMBER
N.W.	NORTHWEST
O/C	ON CENTRE
O/H	OVERHEAD
OPNG.	OPENING
O/O	OUTSIDE TO OUTSIDE
PL.	PLATE
PVC	POLYVINYL CHLORIDE
QTY.	QUANTITY
R	RADIUS
REINF.	REINFORCEMENT
SC	SAW CUT
SHT.	SHEET
S.E.	SOUTHEAST
SRS	STORM RELIEF SEWER
STD.	STANDAR
STIRR	STIRRUP
STR.	STRAIGHT
S.U.	SUBSTRUCTURE UNIT
S.W.	SOUTHWEST
THK.	THICK
TYP.	TYPICAL
T	TOP
T/O	TOP OF
U/N	UNLESS NOTED
U.N.O.	UNLESS NOTED OTHERWISE
U/S	UNDERSIDE
VERT.	VERTICAL
W.P.	WORKING POINT
W/	WITH

LOCATION PREFIX

P – PIER
A – ABUTMENT
D – DECK
G – GIRDER
T – TRAINMAN'S WALKWAY
C – CAISSON

REINFORCING MARK NUMBERING SYSTEM

eg: F 25 15
- 15 – MARK
- 25 – SIZE OF BAR
- F – LOCATION PREFIX

SECTION AND DETAILS

A/C – A: SECTION NUMBER OR DETAIL LETTER
B – DRAWING WHERE SECTION OR DETAIL IS TAKEN
A/B|C – C: DRAWING WHERE SECTION OR DETAIL IS DRAWN

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

APEGM
Certificate of Authorization
Stantec Consulting Ltd.
No. 1301 Expiry: April 30, 2006

LOCATION APPROVED
UNDERGROUND STRUCTURES
SUPV. U/G STRUCTURES COMMITTEE — DATE

NOTE:
LOCATION OF UNDERGROUND STRUCTURES AS SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE BUT NO GUARANTEE IS GIVEN THAT ALL EXISTING UTILITIES ARE SHOWN OR THAT THE GIVEN LOCATIONS ARE EXACT. CONFIRMATION OF EXISTENCE AND EXACT LOCATION OF ALL SERVICES MUST BE OBTAINED FROM THE INDIVIDUAL UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.

B.M. 66-001
ELEV. 233.425m

NO.	REVISIONS	DATE	BY
1	ISSUED FOR ADDENDUM No.2	05.11.15	MJB
0	ISSUED FOR TENDER	05.10.26	MJB

Stantec Consulting Ltd.
905 Waverley Street, Winnipeg, Manitoba
Tel 204-489-5900 Fax 204-453-9012

DESIGNED BY	MJB	CHECKED BY	GWM
DRAWN BY	JMB	APPROVED BY	MJB
HOR. SCALE:	AS NOTED	AUTHORIZED BY:	DATE
VERTICAL:	AS NOTED	R. FINGAS	05.10.26
DATE	05.10.26	R. FINGAS, P. ENG. BRIDGE PROJECTS ENGINEER	

ENGINEER'S SEAL
ORIGINAL SEALED BY M.J. BOISSONNEAULT P. ENG. 05.10.26

CONSULTANT DRAWING NO.
113703042-604

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

KENASTON UNDERPASS
KENASTON BLVD. / CN RIVERS SUB. MILE 5.18
RAILWAY BRIDGE CONSTRUCTION

GENERAL NOTES & KEY PLAN

SHEET 2 OF 21
CAD FILE DRAWING NUMBER KU-02-664.dwg
CITY DRAWING NUMBER P-3258-126

CN Drawing No. AA611-5.18-1.02

V:\113703042\active\113703042 - Kenaston UP DESIGN\CAD\CONTRACT 4- Bridge\Bridge Plan Set\KU-15-664.dwg
2005-11-14 04:07PM By: jbeamonte