DESIGN SPECIFICATIONS

1. CANADIAN HIGHWAY BRIDGE DESIGN CODE (CHBDC) CAN/CSA-S6-06

LIVE LOADING

1. CAN/CSA-S6-06 CL-625 AND LANE LOAD

ROADWAY GEOMETRY

1. TAC GEOMETRIC DESIGN GUIDE FOR CANADIAN ROADS
2. CITY OF WINNIPEG STREET AND TRANSPORTATION MANUAL

STEEL PILES

1. STEEL H-PILES TO CSA-G40.20/G40.21 GRADE 350W AND FITTED WITH PRUYN HARD-BITE POINT MODEL HP77750-B DRIVING SHOES OR EQUIVALENT IN ACCORDANCE WITH B6.
2. PILES SHALL BE DRIVEN TO REFUSAL
3. PILES SHALL BE DRIVEN TO WITHIN 2% FROM VERTICAL OR BATTER SHOWN. PILES SHALL NOT BE OUT OF POSITION BY MORE THAN 150 mm FROM THE POSITION SPECIFIED AFTER DRIVING.
4. BATTERED PILES SHALL NOT BE JACKED OR PULLED INTO THEIR FINAL POSITION
5. PILES DAMAGED BY IMPROPER DRIVING OR DRIVEN OUT OF POSITION SHALL BE EITHER WITHDRAWN AND REPLACED OR REPLACED IN ADJACENT POSITION SUBJECT TO APPROVAL OF THE CONTRACT ADMINISTRATOR

CAISSONS

1. 914 O.D. x 9.5mm THICK STEEL CASING TO ROCK LAYER.
2. 762 ø ROCK SOCKET.
3. STEEL CASINGS TO BE CSA G40.20/G40.21 GRADE 300W. CASING TO BE HOT DIP GALVANIZED AS SHOWN ON THE DRAWINGS.
4. ELEVATIONS/LENGTHS AS SHOWN ON DRAWINGS.
5. ENTIRE CAISSONS TO BE FILLED WITH CONCRETE.

CONCRETE

1. CONCRETE TO CSA A23.1/A23.2 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION / METHODS OF TEST FOR CONCRETE
2. PERMEABLE FORMWORK LINER SHALL BE USED ON ALL EXPOSED FORMED SURFACES
3. THE AREA OF CONCRETE ON WHICH BEARING PLATES OR PADS ARE TO BE PLACED SHALL BE AT THE SPECIFIED ELEVATIONS AND SHALL BE FINISHED OR GRINDED TO A SMOOTH AND EVEN SURFACE
4. ALL EXPOSED FACES TO HAVE 20 mm CHAMFER U.N.O.
5. CAISSONS
   a. f'c = 40 MPa
   b. EXPOSURE CLASS C-1
   c. AIR ENTRAINMENT CATEGORY 1
   d. MAXIMUM AGGREGATE SIZE 20 mm
6. PIER CAPS
   a. f'c = 40 MPa
   b. EXPOSURE CLASS C-1
   c. AIR ENTRAINMENT CATEGORY 1
   d. MAXIMUM AGGREGATE SIZE 20 mm
   e. SYNTHETIC FIBRES
   f. MINIMUM POST RESIDUAL CRACKING INDEX 0.15
7. STRUCTURAL DECK, SIDEWALKS, ABUTMENTS, APPROACH SLABS, APPROACH FOOTINGS
   a. f'c = 45 MPa
   b. EXPOSURE CLASS C-1
   c. AIR ENTRAINMENT CATEGORY 1
   d. MAXIMUM AGGREGATE SIZE 20 mm
   e. SYNTHETIC FIBRES
   f. MINIMUM POST RESIDUAL CRACKING INDEX 0.15
8. HIGH PERFORMANCE CONCRETE WEARING SURFACE
   a. f'c = 50 MPa
   b. EXPOSURE CLASS C-XL
   c. AIR ENTRAINMENT CATEGORY 1
   d. MAXIMUM AGGREGATE SIZE 20 mm
   e. SYNTHETIC FIBRES
   f. MINIMUM POST RESIDUAL CRACKING INDEX 0.15
9. BARRIERS
   a. f'c = 35 MPa
   b. EXPOSURE CLASS C-1
   c. AIR ENTRAINMENT CATEGORY 1
   d. MAXIMUM AGGREGATE SIZE 20 mm
   e. SYNTHETIC FIBRES
   f. MINIMUM POST RESIDUAL CRACKING INDEX 0.15

PRECAST PRESTRESSED CONCRETE

1. CONCRETE TO CSA A23.4 PRECAST CONCRETE MATERIALS AND CONSTRUCTION
2. PRESTRESSING STEEL TO CSA G279 STEEL FOR PRESTRESSED CONCRETE TENDONS SHALL BE LOW RELAXATION 12.7 mm ø SEVEN WIRE PRE-STRESSING STRAND MINIMUM ULTIMATE STRENGTH 1860 MPa, WITH AN INITIAL FORCE PER STRAND OF 137.7 kN
3. GIRDER INSTALLATION PERMITTED AFTER 28-DAY STRENGTH HAS BEEN REACHED
4. TRANSVERSE POST-TENSIONING STEEL SHALL BE LOW RELAXATION 12.7 mm ø SEVEN WIRE PRE-STRESSING STRAND MINIMUM ULTIMATE STRENGTH 1860 MPa, WITH AN INITIAL FORCE PER STRAND OF 128.5 kN
5. INSTALL TWO TRANSVERSE STRANDS IN TENSIONING DUCTS AND PRESSURE GROUT THE DUCTS WITH NON-SHRINK, NON-METALLIC, 45 MPa GROUT
6. INSTALL BACKER ROD BETWEEN ADJACENT GIRDER SHEAR KEYS TO SEAL ANY GAPS THAT STILL EXIST AFTER STRESSING, FILL LONGITUDINAL SHEAR KEYS WITH 45 MPa NON-SHRINK GROUT
7. PRECAST CONCRETE
   a. f'c = 45 MPa
   b. fci = 35 MPa
   c. EXPOSURE CLASS C-1
   d. AIR ENTRAINMENT CATEGORY 1
   e. MAXIMUM AGGREGATE SIZE 20 mm

REINFORCING STEEL

10. REINFORCING STEEL TO BE DEFORMED BARS TO CAN/CSA G30.18-M92 (R2002) BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT, GRADE 400W BLACK - CAISSONS, PIER CAPS, ABUTMENTS, BOTTOM MAT OF APPROACH SLABS
11. SOLID STAINLESS STEEL REINFORCING TO BE DEFORMED BARS TO ASTM A955M DEFORMED AND PLAIN STAINLESS STEEL BARS FOR CONCRETE REINFORCEMENT, 300 SERIES, MINIMUM GRADE 420, UNS S24100, UNS S31653 OR UNS S31803, TOP MAT OF APPROACH SLABS, GIRDER TO DECK DOWELS, STRUCTURAL DECK, SIDEWALKS, SIDEWALK CURBS, BARRIERS
12. FABRICATION OF THE SOLID STAINLESS STEEL REINFORCING BARS SHALL BE SUCH THAT THE BAR SURFACES ARE NOT CONTAMINATED WITH DEPOSITS OF IRON AND NONSTAINLESS STEELS
13. SOLID STAINLESS STEEL REINFORCING BARS SHALL BE STORED SEPARATELY FROM CARBON STEEL REINFORCING BARS
14. REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF THE REINFORCING STEEL INSTITUTE OF CANADA (RSIC) MANUAL OF STANDARD PRACTICE
15. LAP SPLICE SCHEDULE IS FOR CLASS B SPLICE U.N.O.

BAR SIZE	EMBEDDMENT	TENSION LAP
10M	300	400
15M	400	600
20M	500	800
25M	800	1200
30M	950	1500

16. LOCATE REINFORCING SPLICES NOT INDICATED ON THE DRAWINGS AT POINTS OF MINIMUM STRESS
17. BEFORE PLACING REBAR, ENSURE IT IS CLEAN, FREE OF LOOSE SCALE, DIRT, OR OTHER FOREIGN COATING WHICH WOULD REDUCE THE BOND TO CONCRETE.
18. CONCRETE CLEAR COVER SHALL 60 mm U.N.O.

MISCELLANEOUS METAL

1. STEEL PLATE TO CSA-G40.20/G40.21 GRADE 300W. GRADE 350W FOR STOCK SECTIONS
2. SS FOR PIERS - ANGLES, PERFORATED SHEETS, REFER TO THE SPECIFICATION

WELDING

1. SHOP AND FIELD WELDING TO CSA W59 WELDED STEEL CONSTRUCTION BY FABRICATORS OR CONTRACTORS CERTIFIED TO MINIMUM DIVISION 2 OF CSA W47.1 CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL STRUCTURES
2. ELECTRODES TO BE COMPATIBLE WITH BASE METAL. MINIMUM 6mm FILLET WELDS UNLESS NOTED OTHERWISE AND TO BE COMPATABLE WITH BASE METAL THICKNESS. WELD TERMINATIONS SHALL BE MINIMUM 3mm MAXIMUM 6mm. SEAL ALL WELDS.

FASTENERS

1. ALL STRUCTURAL BOLTS FOR STEEL WORK TO BE ASTM A325 TYPE 1, U.N.O. BOLTS c/w ASTM A563 GRADE DH HEAVY HEX NUTS AND ASTM F436 TYPE 1 HARDENED STEEL WASHERS. ASTM A563 NUTS MAY BE SUBSTITUTED WITH ASTM A194 GRADE 2H NUTS.
2. BOLTS NOTED TO BE A307 SHALL BE ASTM A307 GRADE A AND c/w ASTM A563 GRADE A HEX NUTS AND ASTM F844 WASHERS
3. ANCHOR BOLTS TO ASTM F1554 GRADE 105 C/W ASTM A563 GRADE DH HEAVY HEX NUTS AND ASTM F436 TYPE 1 HARDENED STEEL WASHERS C/W ASTM A563 GRADE DH HEAVY HEX JAM NUTS WHERE NOTED.
4. SS FOR PIER COVER SHEETS, REFER TO THE SPECIFICATION
5. ALL BOLT HOLES SHALL BE DRILLED 2mm LARGER THAN THE SPECIFIED BOLT DIAMETER, U.N.O.

BEARINGS

1. ELASTOMERIC BEARINGS TO AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES
2. ELASTOMERIC MATERIAL SHALL BE NATURAL RUBBER GRADE 5 AND HAVE 60 DURO HARDNESS AT PIERS AND 50 DURO AT ABUTMENTS
3. SHIM PLATES INSIDE BEARINGS TO ASTM A1011 GRADE C WITH A MINIMUM THICKNESS OF 3 mm

PROTECTIVE COATINGS

1. GALVANIZING TO CAN/CSA G164 HOT DIP GALVANIZING OF IRREGULARLY SHAPED ARTICLES
2. DAMAGED GALVANIZING TO ASTM A780 STANDARD PRACTICE FOR REPAIR OF DAMAGED AND UNCOATED AREAS OF HOT-DIP GALVANIZED COATINGS
3. ALL STRUCTURAL STEEL, BOLTS, STUDS, NUTS AND WASHERS SHALL BE GALVANIZED, EXCEPT FOR STAINLESS STEEL AND ALUMINUM COMPONENTS
4. ALL MATERIALS TO FIT AFTER GALVANIZING.

GENERAL NOTES

1. THESE DRAWINGS TO BE READ IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS
2. ALL SPECIFICATIONS TO LATEST EDITION UNLESS NOTED OTHERWISE (U.N.O.)
3. ALL FABREEKA PADS TO MATCH THEIR ASSOCIATED BEARING PLATE DIMENSIONS INCLUDING BOLT HOLE LOCATIONS
4. EMSEAL SHALL BE SIZED ACCORDING TO ROOT OPENING
5. THE CONTRACTOR IS RESPONSIBLE FOR DESIGN AND INSTALLATION OF TEMPORARY SHORING AS SHOWN ON THE DRAWINGS. THE CONTRACTOR MUST SUBMIT AN ENGINEERED DESIGN AND DRAWING(S) FOR THE REVIEW AND APPROVAL FROM THE CONTRACT ADMINISTRATOR.

LIST OF ABBREVIATIONS

@	AT
A/F	ACROSS FLATS
ALT.	ALTERNATING
ALUM.	ALUMINUM
APPROX.	APPROXIMATE
A.T.	ACTIVE TRANSPORTATION
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
C.J.	CONTRUCTION JOINT
C	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.D.	INSIDE DIAMETER
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.D.	OUTSIDE DIAMETER
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
S.S.	STAINLESS STEEL
STD.	STANDARD
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

A - ABUTMENT
C - CAISSON
D - DECK
G - GIRDER
P - PIER

REINFORCING MARK NUMBERING SYSTEM

eg: F 25 15 S

- S — STAINLESS STEEL MARK
- 15 — SIZE OF BAR
- 25 — LOCATION PREFIX
- F

SECTION AND DETAILS

A — SECTION NUMBER OR DETAIL LETTER

B — DRAWING WHERE SECTION OR DETAIL IS TAKEN

C — DRAWING WHERE SECTION OR DETAIL IS DRAWN

APEGM
Certificate of Authorization
Stantec Consulting Ltd.
No. 1301 Date:_____

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

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. ELEV.

NO.	REVISIONS	DATE	BY
0	ISSUED FOR TENDER	11.12.15	K.S.A.

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DESIGNED BY	K.S.A.	CHECKED BY	K.S.A.
DRAWN BY	J.M.B.	APPROVED BY	B.J.W.
HOR. SCALE:	AS SHOWN	RELEASED FOR CONSTRUCTION:	
VERTICAL:			
DATE	DEC. 15, 2011	DATE	

ENGINEER'S SEAL

CONSULTANT DRAWING NO.
S-101

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

STURGEON ROAD
BRIDGE REPLACEMENT
PORTAGE AVENUE TO HALLONQUIST DRIVE
BRIDGE DESIGN DATA & GENERAL NOTES

SHEET 9 OF 81
CAD FILE DRAWING NUMBER 31590s-101-767.dwg
CITY DRAWING NUMBER B120-12-009

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Date: 2011 Dec 22 9:14am Login: Beernaerts, James