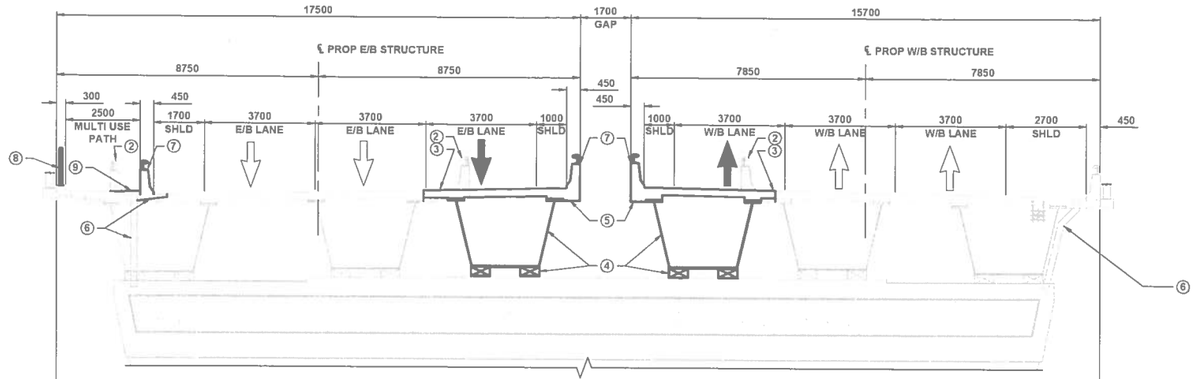
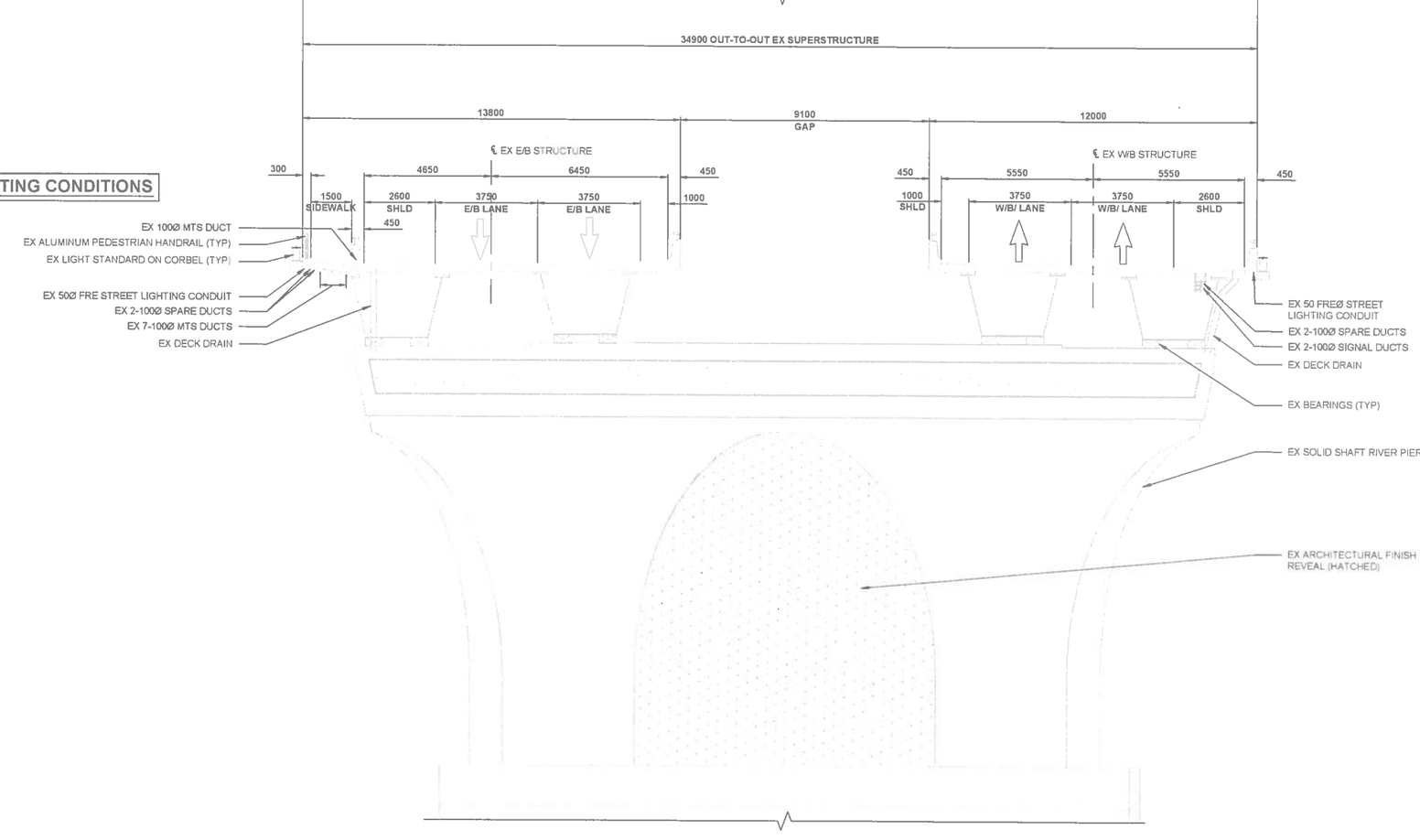
APPENDIX C – DRAWING NO. 51 FROM BID OPP. NO. 533-2014 – FUNCTIONAL DESIGN OF KILDONAN SETTLER'S BRIDGE FUTURE WIDENING

PROPOSED WIDENING
FUNCTIONAL WIDTH & SCOPE OF WORK



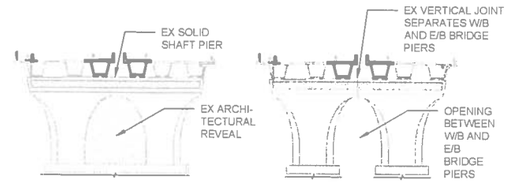
EXISTING CONDITIONS



C 21 **SECTION AT STA 10+575**
PROPOSED BRIDGE WIDENING
RIVER PIER SHOWN

FUNCTIONAL DESIGN NOTES:

1. THIS DRAWING DESCRIBES FUNCTIONAL ENGINEERING DESIGN AND IS NOT TO BE USED FOR CONSTRUCTION
2. THE PROPOSED WIDENING AND FUNCTIONAL SCOPE OF WORK AS DEPICTED HAS BEEN DEVELOPED TO PROVIDE A BASIS FOR THE CHIEF PEGUIS TRAIL EXTENSION FUNCTIONAL DESIGN COST ESTIMATE
3. FOR THE PURPOSE OF THIS FUNCTIONAL DESIGN EXERCISE NO LOAD EVALUATION HAS BEEN PERFORMED, AND THE SCOPE OF WORK HAS BEEN ASSUMED BASED ON A BASIC UNDERSTANDING OF THE STRUCTURAL MECHANICS OF THE KILDONAN SETTLERS BRIDGE. THE EXISTING BRIDGE CONSISTS OF A CAST-IN-PLACE CONCRETE DECK ON STEEL BOX GIRDERS ON CAST-IN-PLACE SHAFT PIERS ON SUBSTRUCTURE. THE EXISTING SUBSTRUCTURE VARIES BETWEEN SUBSTRUCTURE UNITS AND IS SUMMARIZED BELOW
   - 3.1. THERE ARE TWO RIVER PIERS, WHICH CONSIST OF SOLID CONCRETE PIER SHAFTS ON CAST-IN-PLACE MASS FOUNDATIONS FOUNDED ON BEDROCK, WITH TIE-DOWNS TO BEDROCK. THE EAST PIER SHAFT INCORPORATES CONCRETE CAISSONS DRILLED INTO BEDROCK. AN ARCH-SHAPED ARCHITECTURAL REVEAL IS INCORPORATED INTO THE PIER SHAFT
   - 3.2. THERE ARE TWO LAND PIERS, WHICH CONSIST OF TWO ADJACENT, BUT SEPARATE SOLID CONCRETE PIER SHAFTS ON CAST-IN-PLACE PILE CAPS ON PRECAST HEXAGONAL PILES AND/OR CONCRETE CAISSONS. AN OPENING IS PRESENT AT THE LAND PIERS WHICH MIMICS THE ARCHITECTURAL REVEAL OF THE RIVER PIERS. THOUGH THE PIER CAP APPEARS VISUALLY CONTINUOUS, THERE IS A 20 MM WIDE FLEXCELL FILLED VERTICAL JOINT THAT SEPARATES THE PIER CAPS OF THE WESTBOUND AND EASTBOUND SUPERSTRUCTURES
   - 3.3. THERE ARE TWO ABUTMENTS, WHICH ARE CONVENTIONAL STUB ABUTMENTS CONSISTING OF CAST-IN-PLACE WINGWALLS, BACKWALLS, AND ABUTMENT SEATS SUPPORTED ON EITHER PRECAST HEXAGONAL PILES OR DRIVEN STEEL PILES. THERE ARE SEPARATE ABUTMENTS FOR THE WESTBOUND AND EASTBOUND SUPERSTRUCTURES, WITH A GAP IN-BETWEEN



EX RIVER PIER (TYP) **EX LAND PIER (TYP)**

4. THE LOCATION OF THE PROPOSED WIDENING WILL RESULT IN ADDITIONAL DEAD LOADS (NEW SUPERSTRUCTURE) AND LIVE LOADS (ADDITIONAL LANE OF TRUCKS) ON THE FOUNDATIONS. BASED ON A GENERAL UNDERSTANDING OF THE STRUCTURAL MECHANICS OF THE BRIDGE, THE FOLLOWING SUBSTRUCTURE WORKS HAVE BEEN ASSUMED FOR THE PURPOSE OF THE CHIEF PEGUIS TRAIL EXTENSION FUNCTIONAL DESIGN COST ESTIMATE
   - 4.1. RIVER PIERS ARE ASSUMED TO HAVE ADEQUATE CAPACITY TO SUPPORT THE ADDITIONAL LOADING.
   - 4.2. LAND PIERS ARE ASSUMED TO NOT HAVE ADEQUATE CAPACITY TO SUPPORT THE ADDITIONAL LOADING. IT IS ASSUMED THAT THE EXISTING OPENING WILL BE IN-FILLED WITH A CONCRETE WALL, SUPPORTED ON A PILED FOUNDATION
   - 4.3. ABUTMENTS DO NOT PRESENTLY HAVE A BEARING SEAT AT THE LOCATION OF THE PROPOSED WIDENING. IT IS ASSUMED THAT THE GAP BETWEEN THE EXISTING ABUTMENT SEATS WOULD BE IN-FILLED WITH AN ABUTMENT SEAT AND BACKWALL AND BE SUPPORTED ON A PILED FOUNDATION.
5. THE CITY OF WINNIPEG UNDERBRIDGE INSPECTION AND MAINTENANCE UNIT HAS SUFFICIENT BOOM REACH TO ACCESS THE FULL WIDTH OF THE UNDERSIDE OF THE TWINNED BRIDGES BY POSITIONING THE TRUCK IN THE OUTERMOST LANE OF EACH BRIDGE OF THE PROPOSED BRIDGE WIDENING. THERE IS SUFFICIENT BOOM REACH TO REACH OVER THE PROPOSED ACTIVE TRANSPORTATION PATH IN ORDER TO INSPECT THE COMPLETE UNDERSIDE OF THE SOUTHMOST BRIDGE AND SOUTH SIDE OF THE PIERS
6. UTILITIES DEPICTED ON THE BRIDGE ARE BASED ON THE ORIGINAL CONSTRUCTION DRAWINGS (1989), AND THE USE AND OCCUPANCY OF DUCTS MAY HAVE CHANGED SINCE THAT TIME

FUNCTIONAL SCOPE OF WORK:

(1) RELOCATE UTILITY CABLES AS REQUIRED. PERFORM SUBSTRUCTURE UPGRADES AT LAND PIERS AND ABUTMENTS, PER NOTE 3 (ABOVE)

(2) DEMOLISH AND REMOVE EXISTING REINFORCED CONCRETE TRAFFIC BARRIERS.

(3) DEMOLISH AND REMOVE EXISTING REINFORCED CONCRETE DECK CANTILEVER.

(4) SUPPLY AND INSTALL NEW BEARINGS AND NEW GIRDERS.

(5) INSTALL NEW CAST-IN-PLACE DECK WIDENING.

(6) INSTALL ADDITIONAL DECK DRAINS IF REQUIRED AND MODIFY DRAIN INLETS FOR WIDENED SIDEWALK/ NARROWED ROADWAY.

(7) INSTALL NEW CAST-IN-PLACE TRAFFIC BARRIERS, INCORPORATE NEW UTILITY DUCTS AS REQUIRED.

(8) REMOVE EXISTING ALUMINUM PEDESTRIAN HANDRAIL, AND INSTALL NEW BICYCLE RAIL.

(9) INSTALL CONCRETE OVERLAY TO ACHIEVE DESIRED SIDEWALK GRADE.

(10) REPLACE DECK JOINTS AT ABUTMENTS

NEXT STEPS FOR DESIGN INVESTIGATION:

THE FOLLOWING INVESTIGATIONS ARE BEYOND THE SCOPE OF THE CHIEF PEGUIS TRAIL EXTENSION FUNCTIONAL DESIGN, BUT ARE VIEWED BY THE DESIGN TEAM AS NATURAL NEXT STEPS IN PREPARATION FOR THE PROPOSED BRIDGE WIDENING

1. SUBSTRUCTURE ASSESSMENT TO CONFIRM ADEQUACY FOR PROPOSED BRIDGE WIDENING, INCLUDING
   - 1.1 LOAD EVALUATION OF EXISTING RIVER PIERS AND STRENGTHENING PRELIMINARY DESIGN, IF REQUIRED;
   - 1.2 LOAD EVALUATION OF EXISTING LAND PIERS AND STRENGTHENING PRELIMINARY DESIGN, IF REQUIRED,
   - 1.3. PRELIMINARY DESIGN OF ABUTMENT WIDENING
2. CONDITION ASSESSMENT OF THE EXISTING STRUCTURE NEARER TO THE TIME OF FUTURE WIDENING TO DETERMINE ADDITIONAL TIMELY REHABILITATION INTERVENTIONS TO SUPPORT THE LIFE CYCLE EXTENSION OF THIS BRIDGE. POTENTIAL ADDITIONAL SCOPE OF WORK MIGHT INCLUDE BRIDGE DECK AND/OR WEARING SURFACE RENEWAL, BRIDGE APPROACH ROAD AND/OR APPROACH SLAB RENEWAL OR REPLACEMENT, AND OTHER ITEMS.
3. CONSTRUCTABILITY STUDY TO OPTIMIZE THE TYPE OF GIRDERS, GIRDER ERECTION METHODOLOGY, AND DETAILED TRAFFIC STAGING FOR THE PROPOSED BRIDGE WIDENING. THE BOX GIRDER CROSS-SECTION SHOWN IS BASED ON THE EXISTING GIRDERS, BUT ALTERNATIVES SUCH AS STEEL PLATE I-GIRDERS MAY MERIT INVESTIGATION IN THE INTEREST OF DETERMINING THE LOWEST COST ALTERNATIVE THAT SATISFIES THE TECHNICAL REQUIREMENTS
4. BRIDGE LIGHTING INVESTIGATION TO CONFIRM EXISTING LIGHT STANDARD HEIGHT AND LUMINOSITY IS SUFFICIENT TO ILLUMINATE PROPOSED NEW INTERIOR LANES.
5. BRIDGE DRAINAGE INVESTIGATION TO CONFIRM EXISTING DRAIN CAPACITY IS SUFFICIENT TO DRAIN ADDITIONAL CATCHMENT AREA PROVIDED BY BRIDGE WIDENING AND STILL MEET EXPECTED LEVEL OF SERVICE IN A DESIGN STORM EVENT.

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

APEGM Certificate of Authorization MORRISON HERSHFIELD No. 1736

GBM: N/A
ELEV: N/A

No.	REVISIONS	YY/MM/DD	BY
B	ISSUED FOR REPORT	16/04/08	DAN
A	ISSUED FOR CLIENT REVIEW	15/09/18	DAN

MORRISON HERSHFIELD

DESIGNED BY	WRJ/DAN	CHECKED BY	RPB/BE
DRAWN BY	DAN	APPROVED BY	BWB
HOR. SCALE	1:100	RELEASED FOR CONSTRUCTION	
VERT. SCALE	1:100		
DATE	16/04/08	DATE	

PROFESSIONAL'S SEAL

ORIGINAL DRAWING REV No. B

SEALED BY

D.A. NEILSON
Member 37248
16/04/08

CONSULTANT DRAWING No.
W140008-T-F051_RX.dwg

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CHIEF PEGUIS TRAIL EXTENSION
MAIN STREET TO BROOKSIDE BOULEVARD
FUNCTIONAL DESIGN
CHIEF PEGUIS TRAIL
KILDONAN SETTLER'S BRIDGE FUTURE WIDENING

CITY DRAWING NUMBER: N/A
SHEET 51 OF 53
DRAWING No. 51
REV B