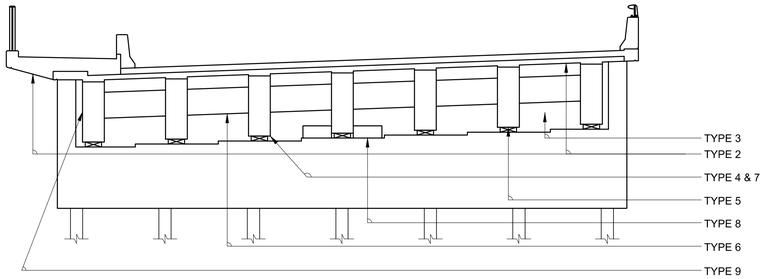

SECTION - EXISTING ABUTMENT

NORTH OF EAST BRIDGE SHOWN
WEST BRIDGE SIMILAR
SCALE: 1:75

SCOPE OF MAINTENANCE WORK:

TYPE 1 - LOCAL CONCRETE CURB REPAIR AT HANDRAIL POST (NOT SHOWN).

TYPE 2 - DECK SOFFIT DELAMINATION WORK.

TYPE 3 - LOW BACKWALL COVER WORK.

TYPE 4 - GIRDER END AND SIDE SPALLING WORK.

TYPE 5 - GIRDER SPALLING AT SHEAR BLOCK AND GIRDER SOFFIT DELAMINATION WORK.

TYPE 6 - END DIAPHRAGM DELAMINATION WORK.

TYPE 7 - GIRDER SIDE FACE DELAMINATION REPAIR.

TYPE 8 - SHEAR BLOCK DELAMINATION REPAIR.

TYPE 9 - DELAMINATION REPAIR AT GIRDER W1-2 No. 7.

GENERAL

1. GEOMETRY, REINFORCEMENT AND LAYOUT OF THE EXISTING STRUCTURE ARE BASED ON EXISTING DESIGN INFORMATION AND LIMITED FIELD SURVEY DATA. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL NECESSARY DIMENSIONS SUCH THAT WORK CAN BE CONSTRUCTED AS SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE CONTRACT ADMINISTRATOR PRIOR TO CONSTRUCTION.
2. WHOLE DIMENSIONS SHOWN ON THESE DRAWINGS ARE IN MILLIMETERS. DECIMAL DIMENSIONS ARE IN METRES. THE ORIGINAL BRIDGE STRUCTURE WAS CONSTRUCTED WITH IMPERIAL UNITS OF MEASURE (HARD UNIT CONVERSION WHERE APPLICABLE).
3. THE SCALES SHOWN ON THESE DRAWINGS ARE BASED ON A1 SIZED DRAWING SHEETS. DO NOT DETERMINE DIMENSIONS BY SCALING OFF DRAWINGS.
4. EXCEPT WHERE INDICATED OTHERWISE THESE DRAWINGS SHOW DETAILS FOR THE COMPLETED STRUCTURE. THE CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF WORKERS AND THE DESIGN AND STABILITY OF ANY TEMPORARY WORKS DURING CONSTRUCTION. CONSTRUCTION METHODS REQUIRING THE TEMPORARY INSTALLATION OF SHORING, SCAFFOLDING, BRACING, ETC. SHALL BE SUBMITTED TO THE CONTRACT ADMINISTRATOR FOR REVIEW AND ACCEPTANCE PRIOR TO PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL RETAIN A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF MANITOBA TO PERFORM AND TAKE RESPONSIBILITY FOR ANY SUCH DESIGNS NECESSARY TO COMPLETE THE CONSTRUCTION AND AS REQUIRED BY THE CONTRACT DOCUMENTS.
5. CONTRACTOR TO REPORT ALL UNSOUND CONDITIONS IMMEDIATELY TO THE CONTRACT ADMINISTRATOR.

SCOPE OF MAINTENANCE WORK & SEQUENCE NOTES:

1. SCOPE OF MAINTENANCE WORK: THE SCOPE OF WORK INCLUDES REINFORCED CONCRETE MAINTENANCE TO MARYLAND BRIDGE NB AND MARYLAND BRIDGE SB. WORK TYPICALLY CONSISTS OF LOCAL CONCRETE PATCH REPAIRS AND ARC-SPRAY ZINC CATHODIC PROTECTION FOR CONCRETE GIRDERS, BRIDGE DECK SOFFITS, END DIAPHRAGMS, HANDRAIL CURBS, ABUTMENT BACKWALLS AND SHEAR BLOCKS.

   WORKS HAVE BEEN SUB-CATEGORIZED INTO TYPES, AS DESCRIBED BELOW, ANNOTATED IN THE SCOPE OF MAINTENANCE WORK FIGURE. EXAMPLES OF TYPICAL REPAIRS ARE SHOWN IN THIS DRAWING PACKAGE. EXACT LOCATIONS AND EXTENTS TO BE AS MARKED BY THE CONTRACT ADMINISTRATOR IN THE FIELD:
   a. TYPE 1 - LOCAL FORMED AND POURED CONCRETE REPAIRS AT NORTH PLAZA HANDRAIL CURBS.
   b. TYPE 2 - SURFACE PREPARATION BY ABRASIVE BLASTING, AND ARC SPRAY ZINC CATHODIC PROTECTION AT LOCATIONS OF DECK SOFFIT DELAMINATION.
   c. TYPE 3 - SURFACE PREPARATION BY ABRASIVE BLASTING, AND ARC SPRAY ZINC CATHODIC PROTECTION AT LOCATIONS OF LOW BACKWALL COVER.
   d. TYPE 4 - SURFACE PREPARATION BY ABRASIVE BLASTING, AND ARC SPRAY ZINC CATHODIC PROTECTION AT LOCATIONS OF GIRDER END SPALLS.
   e. TYPE 5 - SURFACE PREPARATION BY ABRASIVE BLASTING, AND ARC SPRAY ZINC CATHODIC PROTECTION AT LOCATIONS OF GIRDER SOFFIT DELAMINATION AND GIRDER SPALLS AT SHEAR BLOCK.
   f. TYPE 6 - REMOVE DELAMINATED CONCRETE, SURFACE PREPARATION BY ABRASIVE BLASTING, AND ARC SPRAY ZINC CATHODIC PROTECTION AT LOCATIONS OF END DIAPHRAGM DELAMINATION.
   g. TYPE 7 - REMOVE DELAMINATED CONCRETE, SURFACE PREPARATION BY ABRASIVE BLASTING, PERFORM FORMED AND PRESSURED GROUTED CONCRETE PATCH REPAIR, SURFACE PREPARATION BY ABRASIVE BLASTING, AND ARC SPRAY ZINC CATHODIC PROTECTION AT LOCATIONS OF GIRDER SIDE FACE DELAMINATION.
   h. TYPE 8 - REMOVE DELAMINATED CONCRETE, SURFACE PREPARATION BY ABRASIVE BLASTING, PERFORM FORMED AND PRESSURED GROUTED CONCRETE PATCH REPAIR, SURFACE PREPARATION BY ABRASIVE BLASTING, AND ARC SPRAY ZINC CATHODIC PROTECTION AT LOCATIONS OF SHEAR BLOCK DELAMINATION.
   i. TYPE 9 - REMOVE DELAMINATED CONCRETE, SURFACE PREPARATION BY ABRASIVE BLASTING, PERFORM FORMED AND PRESSURED GROUTED CONCRETE PATCH REPAIR, SURFACE PREPARATION BY ABRASIVE BLASTING, AND ARC SPRAY ZINC CATHODIC PROTECTION AT FULL HEIGHT DELAMINATION OF GIRDER W1-2 No.7.

PROPOSED SEQUENCE - TYPE 9

1. IMPLEMENT TRAFFIC CONTROL FOR LANE CLOSURE ON SOUTHBOUND MEDIAN LANE FOR GIRDER REPAIR.
2. CONDUCT REMOVALS & ABRASIVE BLASTING FOR FLANGE AND DECK SOFFIT .
3. PERFORM FLANGE AND DECK SOFFIT LOCAL PATCH REPAIR.
4. CONDUCT REMOVALS AND ABRASIVE BLASTING FOR WEB REPAIR.
5. PERFORM WEB LOCAL PATCH REPAIR.
6. PERFORM ARC SPRAY ZINC CATHODIC PROTECTION.

WORK ZONES AND ACCESS:

1. MAINTENANCE WORKS ARE REQUIRED AT SEVERAL LOCATIONS AS SHOWN ON THE REPAIR LOCATION PLAN ON SHEET 03.
2. WORK ZONES 1, 2, 3, 4 - REPAIRS IN THE VICINITY OF THE ABUTMENTS WITH ACCESS FROM THE GROUND BELOW THE BRIDGE.
3. CONTRACTOR IS PERMITTED TO USE EXISTING LOCKED AND GATED FENCES AT WORK ZONES 1 THROUGH 4 AS POTENTIAL LAYDOWN AREAS. THE CONTRACTOR ASSUMES ALL RISK IN USING THESE AREAS FOR LAYDOWN. THE CITY ASSUMES NO LIABILITY FOR MATERIALS STORED IN THESE AREAS BY THE CONTRACTOR.

TRAFFIC STAGING AND LANE CLOSURES:

1. WORK ZONE 1: A LANE CLOSURE WILL BE REQUIRED FOR REPAIR TYPE 9 FROM THE INITIATION OF GIRDER CONCRETE REMOVALS TO COMPLETION OF CURING. A SINGLE CONTINUOUS LANE CLOSURE OF MAXIMUM 21 DAYS DURATION SHALL BE PERMITTED.
2. THE CONTRACTOR IS NOT ALLOWED TO CLOSE ANY TRAFFIC LANE DURING THE TIME PERIOD OF JULY 24 TO AUGUST 13, INCLUSIVE, TO ACCOMODATE THE CANADA SUMMER GAMES SPECIAL EVENT.
3. WORK ZONE 2, 3, AND 4: NO LANE CLOSURES ARE PERMITTED. ALL WORK IS CONDUCTED FROM BELOW.

DESIGN NOTES:

1. DESIGN STANDARD: CANADIAN HIGHWAY BRIDGE DESIGN CODE S6-14; UPDATE NO.1, APRIL 2016.
2. DESIGN SCOPE CLARIFICATION: A LOAD EVALUATION AND ASSESSING THE NEED FOR STRENGTHENING WAS CARRIED OUT BY THE CITY OF WINNIPEG.

MATERIAL NOTES:

1. PATCHING GROUT: MASTEREMACO S 440 MC LOW-SHRINK HIGH-EARLY STRENGTH CONCRETE GROUT. MINIMUM COMPRESSIVE STRENGTH OF GROUT CUBE: 40 MPa @ 7 DAYS; 50 MPa @ 28 DAYS.
2. STAINLESS STEEL WELDED WIRE MESH: CONFORMING TO AISI 304.
3. POST-INSTALLED FASTENINGS:
   a. INSTALLATION OF POST-INSTALLED FASTENINGS BY TRAINED PERSONNEL TO MANUFACTURER'S INSTRUCTIONS.
   b. USE ADHESIVE ANCHOR SYSTEMS UNLESS NOTED OTHERWISE.
   c. EPOXY ADHESIVE SHALL BE TWO-PART INJECTABLE ADHESIVE SPECIFICALLY DESIGNED FOR STRUCUTRALLY CONNECTING ANCHORS TO EXISITNG CONCRETE. BASIS OF DESIGN: HILTI RE500.
4. CORROSION CONTROL SYSTEM: ACTIVATED ARC SPRAY ZINC GALVANODE ASZ+ SYSTEM SUPPLIED BY VECTOR CORROSION TECHNOLOGIES OR ACCEPTED EQUIVALENT.

TIMBER FORMWORK NOTES:

1. FORMWORK SHALL BE DESIGNED BY THE CONTRACTOR TO MEET THE REQUIREMENTS OF CAN/CSA S269.1-16.
2. DESIGN FORMWORK TO RESIST THE FULL HYDROSTATIC PRESSURE OF GROUT.
3. REPAIR ALL FORM-TIE HOLES USING AN ACCEPTED TROWEL-ON PATCHING MATERIAL. SUBMIT PROPOSED PRODUCT FOR CONTRACT ADMINISTRATOR'S REVIEW AND ACCEPTANCE.
4. OBSERVE THE FOLLOWING LIMITS ON MECHANICALLY ANCHORED FORM TIE PLACEMENT WITH RESPECT TO EXISTING GIRDERS:
   a. FORM TIES REQUIRING COMPLETE PENETRATIONS THROUGH GIRDERS SHALL NOT BE PERMITTED.
   b. REMOVE ALL TEMPORARY MECHANICAL ANCHORS FOLLOWING COMPLETION OF THE WORK, AND REPAIR HOLES. ANY ANCHOR COMPONENTS TO BE LEFT-IN-PLACE MUST BE STAINLESS STEEL.
5. MINIMUM PLYWOOD THICKNESS 20 mm. MAXIMUM STUD SPACING 450 mm CENTRE TO CENTRE. MAXIMUM WHALER SPACING 760 mm CENTRE TO CENTRE.

REPAIR TASK NOTES:

1. PROTECTION OF BEARINGS:
   a. PROTECT EXISTING ELASTOMERIC BEARINGS DURING THE WORK BY USE OF SUITABLE PHYSICAL PROTECTION SUCH AS PLYWOOD AND/OR MASTIC TAPE.
2. REMOVALS:
   a. CONDUCT GIRDER REMOVALS IN THE PRESENCE OF THE CONTRACT ADMINISTRATOR'S REPRESENTATIVE, BY MEANS AND METHODS REVIEWED AND ACCEPTED BY THE CONTRACT ADMINISTRATOR. CONDUCT OTHER REMOVALS BY MEANS AND METHODS REVIEWED AND ACCEPTED BY THE CONTRACT ADMINISTRATOR.
   b. USE A REBAR LOCATOR TO LOCATE EXISTING REINFORCING PRIOR TO REMOVALS. DO NOT DAMAGE EXISTING REINFORCING DURING REMOVALS.
   c. WITHIN 100 mm OF POST-TENSIONING DUCT LOCATIONS, DO NOT PERFORM ANY REMOVALS BEYOND THE FACE OF EXISTING REINFORCEMENT.
   d. PROVIDE SAWCUTS WHERE NECESSARY TO LIMIT THE EXTENTS OF DEMOLITION. SAWCUT DEPTH SHALL NOT EXCEED 20 mm.
   e. PERFORM REMOVALS WITH CHIPPING HAMMERS NO HEAVIER THAN NOMINAL 7 kg CLASS.
   f. REMOVALS SHALL BE TYPICALLY TO AT LEAST THE FACE OF EXISTING REINFORCEMENT AND THE DEPTH OF DELAMINATED CONCRETE. REMOVALS BEYOND THE FACE OF EXISTING REINFORCEMENT SHALL PROCEED ONLY IN THE PRESENCE OF THE CONTRACT ADMINISTRATOR.
   g. CONDUCT ADDITIONAL REMOVALS BEHIND EXISTING MILD STEEL REINFORCEMENT WHICH IS EXPOSED IN THE PATCH AREA, TO FORM A GAP BEHIND THE EXISTING REINFORCEMENT WITH A CLEAR OFFSET OF 20 mm OVER THE RADIUS OF THE REINFORCEMENT. DO NOT CONDUCT SUCH REMOVALS BEHIND PRESTRESSING STRANDS OR POST-TENSIONING DUCTS.
   h. ALL DEBRIS SHALL BE COLLECTED AND DISPOSED OF AT AN APPROPRIATE FACILITY OFF-SITE.
3. SURFACE PREPARATION OF COLD JOINTS FOLLOWING REMOVALS - ABRASIVE BLASTING:
   a. BLASTING ABRASIVE SHALL BE NON-METALLIC AND FREE OF CORROSION PRODUCING CONTAMINANTS AND OIL.
   b. ALL SURFACES OF THE COLD JOINT INTERFACE INCLUDING CONCRETE AND EXPOSED REINFORCING STEEL ARE TO BE ABRASIVELY BLASTED TO THE REQUIREMENTS OF SSPC-SP6/ NACE NO.3 COMMERCIAL BLAST CLEANING TO REVEAL A CLEAN SUBSTRATE AND KEPT CLEAN UNTIL CONCRETE PATCH PLACEMENT.
   c. ABRASIVE BLASTING SHALL BE FOLLOWED BY A HIGH PRESSURE WATER WASH TO REMOVE ALL RESIDUES.
   d. THE PREPARED SURFACE SHALL BE INSPECTED BY THE CONTRACT ADMINISTRATOR'S REPRESENTATIVE PRIOR TO CLOSING UP FORMS.
4. GIRDER TOP FLANGE, BOTTOM FLANGE, AND OTHER REINFORCED CONCRETE REPAIRS:
   a. IF DIRECTED BY THE CONTRACT ADMINISTRATOR, DRILL SUPPLEMENTARY ANCHORS AND/OR ATTACH SUPPLMENTARY STAINLESS STEEL REINFORCING MESH. REFER TO REPAIR DETAILS.
   b. APPLY WATER TO THE COLD JOINT INTERFACE PRIOR TO CLOSING FORMS IN ORDER TO ACHIEVE A SATURATED SURFACE DRY CONDITION. CONDUCT PATCH REPAIR WITHIN 12 HOURS OF CLOSING FORMS. ENSURE WATERTIGHTNESS OF FORMWORK.
   c. INSTALL FORMWORK.
   d. FORMS SHALL BE INSPECTED BY THE CONTRACT ADMINISTRATOR AND BY THE GROUT PUMPING CONTRACTOR PRIOR TO CONDUCTING THE CONCRETE PATCH REPAIR. ENSURE GROUT TUBES ARE POSITIONED TO ALLOW ALL AIR TO ESCAPE FROM FORMS.
   e. PREPARE AND PLACE GROUT ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
   f. PUMP GROUT INTO FORMS. CAP INLET AND OUTLET GROUT TUBES ONCE PRESENCE OF GROUT THROUGHOUT PATCH CONFIRMED.
   g. CURE FLANGE REPAIRS FOR 7 DAYS PRIOR TO FORM REMOVAL.
5. GIRDER WEB REPAIRS:
   a. PERFORM GIRDER WEB REPAIRS FOLLOWING COMPLETION OF GIRDER TOP AND BOTTOM FLANGE REPAIRS.
   b. PERFORM REMOVALS AND ABRASIVE BLASTING AS DESCRIBED ABOVE.
   c. INSTALL FORMWORK.
   d. FORMS SHALL BE INSPECTED BY THE CONTRACT ADMINISTRATOR AND BY THE GROUT PUMPING CONTRACTOR PRIOR TO CONDUCTING THE CONCRETE PATCH REPAIR. ENSURE GROUT TUBES ARE POSITIONED TO ALLOW ALL AIR TO ESCAPE FROM FORMS.
   e. PREPARE AND PLACE GROUT ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
   f. PUMP GROUT INTO FORMS. CAP INLET AND OUTLET GROUT TUBES ONCE PRESENCE OF GROUT THROUGHOUT PATCH CONFIRMED.
   g. CURE WEB REPAIR 7 DAYS PRIOR TO FORM REMOVAL.
6. QUALITY ASSURANCE TESTING:
   a. COLLECT THREE 50 X 50 X 50 GROUT CUBE SAMPLES OF PATCH REPAIR MATERIAL AT REPAIR TYPE 9. BREAK ONE CUBE PRIOR TO OPENING THE LANE ABOVE TO TRAFFIC. BREAK TWO CUBES AT 28 DAYS. TEST ACCORDING TO ASTM C 109.
   b. PERFORM PULL-OFF TEST OF DECK SOFFIT CONCRETE PATCH AT REPAIR TYPE 9 ACCORDING TO ASTM C1583.
7. CATHODIC PROTECTION:
   a. CONTRACTOR TO SUBMIT ACTIVATED ARC SPRAY ZINC METALLIZING SHOP DRAWINGS FOR ALL REPAIR DETAILS AND INSTALLATION PROCEDURE FOR CONTRACT ADMINISTRATOR'S REVIEW AND ACCEPTANCE PRIOR TO PROCEEDING WITH THE WORK.
   b. DESIGN LIFE: 15 CALENDAR YEARS BEFORE TOTAL CONSUMPTION OF ZINC
   c. ACTIVATED ARC SPRAY ZINC METALLIZING PROCEDURE - BASIS OF DESIGN: GALVANODE ASZ+ BY VECTOR CORROSION TECHNOLOGIES.
   d. COMPLETE ALL REQUIRED CONCRETE REPAIRS.
   e. ALLOW AT LEAST 28 DAYS TO ELAPSE FROM DATE OF CONCRETE POUR BEFORE INSTALLATION.
   f. FORM ELECTRICAL CONNECTION TO EXISTING MILD REINFORCING STEEL USING REVIEWED AND ACCEPTED CONNECTION DETAIL, INCLUDING SELF-TAPPING THREADED ROD SCREW. TWO CONNECTIONS ARE REQUIRED PER VERTICAL FACE, UNLESS NOTED OTHERWISE. DO NOT FORM CONNECTIONS WITH PRESTRESSING STRAND OR POST-TENSIONING DUCTS.
   g. ESTABLISH ELECTRICAL CONTINUITY BETWEEN ADJACENT CONNECTIONS TO BE METALLIZED.
   h. ABRASIVE BLAST CONCRETE SURFACES TO BE METALLIZED TO SSPC-SP 13 / NACE NO. 6 SURFACE PREPARATION OF CONCRETE.
   i. METALLIZE ALL SURFACES INDICATED.
   j. PLACE 100 X 100 FLATTENED EXPANDED ZINC MESH PLATE, WASHER, AND NUT OVER THREADED ROD AND TIGHEN NUT.
   k. PROVIDE AN ADDITIONAL LAYER OF METALLIZING OVER THE ZINC MESH PLATE., THE ADDITIONAL LAYER SHALL EXTEND 150 BEYOND THE PLATE IN ALL DIRECTIONS.
   l. APPLY HUMECTANT TO ALL METALLIZED SURFACES.

BID OPPORTUNITY No. 377-2017

ENGINEERS GEOSCIENTISTS MANITOBA
Certificate of Authorization
MORRISON HERSHFIELD
No. 1736

METRIC
WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES

LOCATION APPROVED
UNDERGROUND STRUCTURES

SUPR. 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.

BM ELEV

No.	REVISIONS	YY/MM/DD	BY
1	ISSUED FOR TENDER	17/05/12	DAN

MORRISON HERSHFIELD

DESIGNED BY	AGG	CHECKED BY	DAN
DRAWN BY	MS	APPROVED BY	BE
HOR SCALE	AS SHOWN	RELEASED FOR CONSTRUCTION	
VERT SCALE	AS SHOWN		
DATE		DATE	

PROFESSIONAL'S SEAL
PROVINCE OF MANITOBA
D.A. NEILSON
ORIGINAL SIGNED
17/05/12
37248
REGISTERED PROFESSIONAL ENGINEER

CONSULTANT FILE NAME
5160850 Bridge works details.dwg

Winnipeg

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

MARYLAND TWIN BRIDGES
2017 MAINTENANCE WORKS

SCOPE OF WORK & SPECIFICATIONS

CITY DRAWING NUMBER	B108-17-02
SHEET	02
OF	07
DRAWING No.	02
REV	1