

GENERAL NOTES

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

CONTRACTOR SHALL SITE VERIFY ALL EXISTING DIMENSIONS.

DESIGN DATA

SPECIFICATIONS:

- AREMA MANUAL FOR RAILWAY ENGINEERING, 2013.
 - CHAPTER 8: CONCRETE STRUCTURES AND FOUNDATIONS.
 - CHAPTER 15: STEEL STRUCTURES
- CAN/CSA-A23.3-04 DESIGN OF CONCRETE STRUCTURES (2007).
- CSA W59-03 WELDED STEEL CONSTRUCTION (R2008).
- RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS, 2004.

LIVE LOADING

- COOPER E 60 LOAD.
- CITY OF WINNIPEG GWWD EXISTING ROLLING STOCK.

FOUNDATIONS:

- THE FOUNDATION DESIGN IS BASED ON A GEOTECHNICAL INVESTIGATION REPORT DATED 5 FEBRUARY 2014 BY AMEC EARTH AND ENVIRONMENTAL, A DIVISION OF AMEC AMERICAS LIMITED.
- FOR BORE HOLE LOCATIONS REFER TO SHEET S101.
- THE GEOTECHNICAL REPORTS HAVE BEEN INCLUDED IN THE SPECIFICATION.

STEEL H-PILES:

- STEEL H-PILES TO CAN/CSA G40.21M, GRADE 350W.
- PILES SHALL BE DRIVEN TO THE ELEVATIONS SHOWN ON THE DRAWINGS OR UNTIL THE REQUIRED PILE CAPACITY IS ACHIEVED, WHICHEVER COMES FIRST.
- BATTERED PILES SHALL NOT BE JACKED OR PULLED INTO THEIR FINAL POSITION.

| | S.U./S.U.2 |
|-----------------------------------|---------------|
| | PRIMARY LOADS |
| MAXIMUM SERVICE LOAD (kN) | 505 |
| MAXIMUM ALLOWABLE RESISTANCE (kN) | 532 |

STRUCTURAL STEEL:

- STRUCTURAL STEEL SHALL MEET THE MINIMUM REQUIREMENTS OF CSA/G40.20-04/G40.21-04 (R2009) GENERAL REQUIREMENTS FOR ROLLED OR WELDED STRUCTURAL QUALITY STEEL.
- COILED STEEL IS NOT PERMITTED.
- STEEL STRUCTURAL MEMBERS DESIGNATED AS FRACTURE CRITICAL (FCM) ARE DESIGNED AS FCM ON THE DESIGN DRAWINGS.
- STEEL STRUCTURAL MEMBERS NOT DESIGNATED AS FCM BUT USED AS PRIMARY MEMBERS (PM) ARE DESIGNATED AS PM ON THE DESIGN DRAWINGS.
- STEEL STRUCTURAL MEMBERS
 - FCM MEMBERS TO GRADE 350AT, CATEGORY 5
 - PM MEMBERS TO GRADE 350AT, CATEGORY 3
 - OTHER MEMBERS TO GRADE 350A
- GRADE 350AT CATEGORY 5 IMPACT TEST REQUIREMENTS ARE MINIMUM AVERAGE ENERGY 40J AT A TEST TEMPERATURE OF -20°C.
- FLANGE PLATES IN EXCESS OF 38mm SHALL BE NORMALIZED UNLESS THE STEEL MANUFACTURER CAN SUPPLY EVIDENCE TO, AND OBTAIN APPROVAL FROM CITY OF WINNIPEG THAT CONTROLLED PLATE ROLLING PROCEDURES MEETS CITY OF WINNIPEG REQUIREMENTS.
- FABRICATION SHALL BE IN ACCORDANCE WITH AREMA CHAPTER 15 PART 3.
- MILL CERTIFICATES FOR ALL STEEL BRIDGE COMPONENTS ARE TO BE SUBMITTED TO AND APPROVED BY CITY OF WINNIPEG OR ITS AUTHORIZED CONSULTANT PRIOR TO FABRICATION.
- SHOP DRAWINGS ARE TO BE SUBMITTED TO AND REVIEWED BY CITY OR WINNIPEG'S CONSULTANT PRIOR TO FABRICATION.
- SHOP INSPECTION OF FABRICATION OF STRUCTURAL STEEL BRIDGE SPANS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TECHNICAL SPECIFICATION.
- FULL SHOP ASSEMBLY OF ALL FCM AND PM STRUCTURAL STEEL COMPONENTS REQUIRED FOR INSPECTION PRIOR TO SHIPPING.

CONCRETE:

- CONCRETE TO CSA A23.1-04/A23.2-04 CONCRETE MATERIALS AND METHODS OF CONCRETE CONSTRUCTION/METHODS OF TEST FOR CONCRETE.
- SUBSTRUCTURE
 - f'c=35 MPa
 - EXPOSURE CLASS S-1
 - TYPE HS OR Hsb BLENDED HYDRAULIC CEMENT
 - CATEGORY 1 AIR ENTRAINMENT
 - 20mm NOMINAL AGGREGATE.
- GROUT TO BE NON-SHRINK, NON-METALLIC, f'c=35 MPa.
- CONCRETE COVER 75mm UNLESS NOTED OTHERWISE.

REINFORCING STEEL:

- REINFORCING STEEL INSTALLATION DEVELOPMENT LENGTH AND SPLICING TO AREMA CHAPTER 8.
- SPLICES BETWEEN THE PILE CAP DOWELS AND THE VERTICAL REINFORCING STEEL IN THE ABUTMENT WALL AND WINGWALLS SHALL BE A CLASS C SPLICE. ALL OTHER SPLICES CLASS B.
- REINFORCING STEEL TO BE DEFORMED BARS TO CAN/CSA G30.18-M92 (R2002) BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT, GRADE 400W GALVANIZED.

| BAR SIZE | Id (mm) | CLASS B SPLICE 1.3*Id (mm) | CLASS C SPLICE 1.7*Id (mm) |
|----------|---------|-------------------------------|-------------------------------|
| 15M | 400 | 520 | 680 |
| 20M | 500 | 650 | 850 |
| 25M | 600 | 845 | 1105 |
| 30M | 900 | 1170 | 1530 |

MISCELLANEOUS METAL:

- MISCELLANEOUS METAL TO CAN/CSA G40.20-04/G40.21-04 GENERAL REQUIREMENTS FOR ROLLED OR WELDED STRUCTURAL QUALITY STEEL.
- STEEL PLATE GRADE 300W.
- STOCK SECTIONS TO GRADE 350W.
- HOLLOW STRUCTURAL STEEL SECTIONS TO GRADE 350W CLASS C.
- ALL GALVANIZED.

WELDING:

- CSA W59 WELDED STEEL CONSTRUCTION, 2003 (R2008).
- SHOP INSPECTION OF WELDING AND WELD PROPERTIES FOR STRUCTURAL STEEL BRIDGE SPANS SHALL BE IN ACCORDANCE WITH CSA W59 BY FABRICATORS CERTIFIED TO MINIMUM DIVISION 1 OR 2 OF CSA W47.1-09 CERTIFICATION OF COMPANIES FOR FUSION WELDING OF STEEL STRUCTURES.
- WELD METAL SHALL HAVE CORROSION RESISTANT PROPERTIES TO THOSE OF THE PARENT

MATERIALS:

- MINIMUM 6mm FILLET WELDS UNLESS NOTED OTHERWISE, TO BE COMPATIBLE WITH BASE METAL THICKNESS.
- SUBMERGED-ARC WELDING (SAW) IS REQUIRED FOR WELDS IN FCM.
- WELD PROCEDURES FOR FCM WELDS SHALL INCLUDE SUPPLEMENTAL IMPACT TESTING TO LEVEL 1 IN ACCORDANCE WITH CSA W47.1.
- FLUX CORED WELDING (FCAW) IS PERMITTED FOR NON-FCM PROVIDED ELECTRODES WITH A DESIGNATION OF H8 OR LOWER ARE USED.
- FLANGE TO WEB TEE JOINTS ON THROUGH PLATE GIRDERS MAY BE CANADIAN WELDING BUREAU (CWB) PREQUALIFIED FILLET WELDED JOINTS.
- ALL BUTT JOINTS SHALL BE CWB PREQUALIFIED COMPLETE JOINT PENETRATION WELDED JOINTS.
- ALL BUTT JOINTS IN FLANGES SHALL BE STRESS-RELIEF HEAT TREATED IN ACCORDANCE WITH CSA W59.
- ALL FLANGE TO WEB FILLET WELDS AND 25% BY LENGTH OF ALL OTHER WELDS SHALL BE TESTED BY MAGNETIC PARTICLE METHOD.
- SHOP SPLICES OF THE WEBS AND FLANGES OF THE THROUGH PLATE GIRDERS SHALL BE COMPLETED BEFORE THE WEBS AND FLANGES ARE JOINED TO EACH OTHER.
- ALL BUTT JOINTS IN FLANGES AND WEBS SHALL BE TESTED BY RADIOGRAPHIC METHOD.
- ALL FCM WELDS SHALL BE CONSIDERED AS CYCLICALLY LOADED TENSILE WELDS FOR WELD QUALITY TESTING IN ACCORDANCE WITH CSA W59.

BOLTING:

- RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS (RCSC) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS", 2004.
- BOLTS SHALL MEET THE MINIMUM REQUIREMENTS OF ASTM A325 TYPE 3 C/W ASTM A563 GRADE C3 OR DH3 HEAVY HEX BUTS AND ASTM F436 TYPE 3 HARDENED STEEL WASHERS.
- MANUFACTURERS COMPLIANCE CERTIFICATES FOR BOLTS, NUTS AND WASHERS ARE TO BE SUBMITTED TO AND APPROVED BY CITY OF WINNIPEG'S CONSULTANT PRIOR TO SUPPLY.
- HOLES TO BE 2mm IN DIAMETER LARGER THAN THE BOLT UNLESS NOTED OTHERWISE.
- BOLTS, NUTS AND WASHERS SHALL BE SUPPLIED AS A PRE-ASSEMBLED UNIT.
- ALL BOLTS SHALL BE INSTALLED BY THE TURN-OF-NUT METHOD, UNLESS NOTED OTHERWISE.
- ONLY BOLTS AND NUTS FABRICATED IN CANADA OR UNITED STATES OF AMERICA ARE PERMITTED.

BEARINGS:

- BEARING SHALL BE ELASTOMERIC BEARING AS DETAILED ON SHEET S-109.
- BEARING MATERIAL SHALL BE
 - EXPANSION: 60 DUROMETER
 - FIXED: 60 DUROMETER

PROTECTIVE COATINGS:

- GALVANIZED TO CAN/CSA G164 HOT DIP GALVANIZING OR IRREGULARLY SHAPED ARTICLES. DAMAGED GALVANIZING TO ASTM A780 STANDARD PRACTICE FOR REPAIR OF DAMAGED AND UNCOATED AREAS OF HOT-DIP GALVANIZED COATINGS. ALL MATERIALS TO FIT AFTER GALVANIZING.
- METALLIZING TO CAN/CSA G189 SPRAYED METAL COATINGS FOR ATMOSPHERIC CORROSION PROTECTION. ALL MATERIALS TO FIT AFTER METALLIZING.
- NOT WITH STANDING AND IN ADDITION TO CSA G189-1996 METALLIZING SHALL BE IN ACCORDANCE WITH SSPC-CS 23.00/4WS C2.23M/NACE No.12.
- MINIMUM DRY FILM ZINC THICKNESS SHALL BE 150 MICROMETRES.
- METALLIZING TO BE SEALED USING SSPC-PAINT 27 BASIC ZINC CHROMATE-VINYL BUTYRAL WASH PRIMER FOLLOWED BY SSPC-PAINT 9 WHITE (PIGMENTED) VINYL PAINT OR APPROVED EQUIVALENTS. THE MINIMUM DRY FILM THICKNESS OF THE VINYL PAINT SHALL BE 38 MICROMETRES.
- A COMPATIBLE WATERBORNE ACRYLIC PAINT, MATCHING THE COLOUR OF OXIDIZED STEEL (SIMILAR TO CGSB 504-107 BROWN) SHALL BE APPLIED AS A TOP COAT OVER THE SEALING COATS. THE MINIMUM DRY FILM THICKNESS OF THE WATERBORNE ACRYLIC PAINT SHALL BE 50 MICROMETRES.
- THE METALLIZED AREAS OF THE UNDERSIDE OF THE THROUGH PLATE GIRDERS SHALL NOT BE SEALED NOR PAINTED.

BACKFILL AND COMPACTION:

- GRANULAR COMPACTED TO 98% OF STANDARD PROCTOR DENSITY AT OPTIMUM MOISTURE CONTENT.
- COMMON COHESIVE BACKFILL COMPACTED TO 95% OF STANDARD PROCTOR DENSITY IN OPTIMUM MOISTURE CONTENT.
- THE ZONES OF COMPACTION SHALL BE AS SHOWN ON THE DRAWINGS.

TEMPORARY SITE DRAINAGE:

- CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND IMPLEMENTATION OF A TEMPORARY DRAINAGE SYSTEM FOR DEWATERING THE SUBSTRUCTURE EXCAVATIONS.

SUPERSTRUCTURE SHIPPING, ASSEMBLY AND INSTALLATION:

- FABRICATOR IS RESPONSIBLE FOR SHIPPING ALL MATERIAL UNASSEMBLED FOB TO SITE. LIFTING POINTS AS REQUIRED FOR THE LOADING OF STRUCTURAL STEEL FOR SHIPPING SHALL BE DESIGNED BY THE FABRICATOR.
- ERECTION MARKS SHALL BE PAINTED ON ALL MEMBERS, AND FOR WEATHERING STEEL SHALL BE PLACED IN SUITABLE INCONSPICUOUS PLACES.
- CONTRACTOR IS RESPONSIBLE FOR SITE ASSEMBLY AND INSTALLATION.
- SHOULD THE CONTRACTOR PREFER SHIPPING ALL OR SOME SUPERSTRUCTURE ELEMENTS ASSEMBLED TO SITE, COORDINATION WITH THE FABRICATOR IS REQUIRED. PROPOSED ASSEMBLED SHIPPING METHOD TO BE REVIEWED BY CITY OF WINNIPEG'S CONTRACTOR ADMINISTRATOR.

MISCELLANEOUS NOTES:

- THE DRAWING NOTES REPRESENT A SUMMARY OF REQUIREMENTS AND ALL ASSOCIATED SPECIFICATIONS AND DOCUMENTS ARE TO BE REFERRED AND ADHERED TO AS REQUIRED.

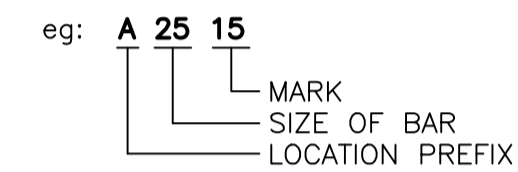
| MARK | DESCRIPTION |
|------|-----------------|
| G1 | EXTERIOR GIRDER |
| G2 | EXTERIOR GIRDER |

| MARK | DESCRIPTION |
|------|-------------------|
| FB1 | FLOOR BEAM |
| FB2 | FLOOR BEAM |
| FB3 | FLOOR BEAM |
| FB4 | FLOOR BEAM |
| ST1 | STRINGER |
| ST2 | STRINGER |
| ST3 | STRINGER BEAM END |

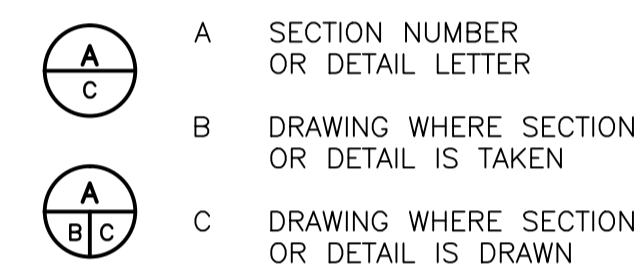
LIST OF ABBREVIATIONS

| | | | |
|---------|---|--------|------------------------|
| AREMA | AMERICAN RAILWAY ENGINEERING & MAINTENANCE-OF-WAY ASSOCIATION | No. | NUMBER |
| @ | AT | O.F. | OUTSIDE FACE |
| ALT. | ALTERNATING | O/C | ON CENTRE |
| ALUM. | ALUMINIUM | O/O | OUTSIDE TO OUTSIDE |
| APPROX. | APPROXIMATE | PL. | PLATE |
| AVE. | AVE. | PM | PRIMARY MEMBER |
| B | BOLTS | QTY. | QUANTITY |
| BC | BEGIN CURVE | R | RADIUS |
| BM | BENCHMARK | REINF. | REINFORCEMENT |
| B.C. | BY OTHERS | SHT. | SHEET |
| B/O | BOTTOM OF | SP | SPACING |
| BOT. | BOTTOM | SS | STAINLESS STEEL |
| B/W | BOTH WAYS | STD | STANDARD |
| BRG. | BEARING | STR. | STRAIGHT |
| C.I.P. | CAST-IN-PLACE | SU. | SUBSTRUCTURE UNIT |
| CJ. | CONSTRUCTION JOINT | SYM. | SYMMETRICAL |
| C.W.B. | CANADIAN WELDING BUREAU | T&B | TOP & BOTTOM |
| CL | CENTRE LINE | THK. | THICK |
| C/W | COMPLETE WITH | T.P.G. | THROUGH PLATE GIRDER |
| CONC. | CONCRETE | TYP. | TYPICAL |
| CONT. | CONTINUOUS | T/O | TOP OF |
| CL. | CLEAR | U.N.O. | UNLESS NOTED OTHERWISE |
| DBL. | DOUBLE | U/S | UNDERSIDE |
| Ø | DIAMETER | VERT. | VERTICAL |
| DTL. | DETAIL | WM | WATERMAIN |
| DWG. | DRAWING | WP | WORKING POINT |
| EA. | EACH | W/ | WITH |
| EC | END CURVE | | |
| E.E. | EACH END | | |
| E.F. | EACH FACE | | |
| E.C. | EACH WAY | | |
| EQ. | EQUAL | | |
| EQ. SP. | EQUAL SPACE | | |
| EL. | ELEVATION | | |
| CRES. | EXISTING | | |
| FCM | FRACTURE CRITICAL MEMBER | | |
| F.F. | FAR FACE | | |
| FG. | FINISHED GRADE | | |
| GALV. | GALVANIZING | | |
| G | GIRDER | | |
| GRAN. | GRANULAR | | |
| HORIZ. | HORIZONTAL | | |
| IB | IRON BAR | | |
| I.F. | INSIDE FACE | | |
| LG. | LONG | | |
| MK. | MARK | | |
| MAX. | MAXIMUM | | |
| m | METRE | | |
| MIN. | MINIMUM | | |
| mm | MILLIMETRE | | |
| N.T.S. | NOT TO SCALE | | |

REINFORCING MARK NUMBERING SYSTEM



SECTION AND DETAILS



| | | | | | | | |
|--|--|--|--|---|--|---|--|
| LOCATION APPROVED UNDERGROUND STRUCTURES SUPV. U/G STRUCTURES COMMITTEE DATE _____ | | B.M. ELEV. | | 100 - 1355 Taylor Avenue, Winnipeg MB Canada www.stantec.com | | ENGINEER'S SEAL | |
| 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. | | DESIGNED BY: S.S.Y. CHECKED BY: M.J.B. | | DRAWN BY: J.A.S. APPROVED BY: M.J.B. | | CONSULTANT DRAWING NO. G004 | |
| NO. REVISIONS | | DATE | | BY | | DATE 2014.03.24 | |
| D ISSUED FOR TENDER 14.03.24 J.M.B. | | HOR. SCALE: VERTICAL: | | RELEASED FOR CONSTRUCTION: | | SHEET 2 OF 15 CAD FILE DRAWING NUMBER 32050-s-004-800.dwg CITY DRAWING NUMBER D-13423 | |

| | |
|--|--|
| THE CITY OF WINNIPEG WATER AND WASTE DEPARTMENT ENGINEERING DIVISION | |
| GREATER WINNIPEG WATER DISTRICT RAILWAY BRIDGE REPLACEMENT AT MILE 22.15 GENERAL NOTES | |