

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 AND REPORT DATED MARCH 2005 AND OCTOBER 2005 PREPARED BY UMA ENGINEERING LTD.

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

PLACE A MAT OF LEAN MIX CONCRETE 10 MPa IMMEDIATELY UPON COMPLETION OF AN EXCAVATION TO MINIMIZE LOSS OF MOISTURE OR DEGRADATION OF THE BASE.

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.

ROCK SOCKET CAISSONS

THE CAISSONS SHALL BE 1067 Ø TO TILL LAYER, 914 Ø THEREAFTER TO SOUND BEDROCK AS DETERMINED BY THE CONTRACT ADMINISTRATOR.

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

Table with 2 columns: Component and Strength (MPa). Rows include Abutment Footing, Abutment Backwall, Wingwall, Pier Pile Cap Beam, Trainman's Walkway, Caisson Fill, Working Slab.

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:

Table with 2 columns: Component and Clear Cover (mm). Rows include Abutment, Pier Pile Cap Beam, Caissons, Box Girders, Other, Concrete Cast Against Earth.

SUPPLY SUPPORT BARS TO SUPPORT MAIN REINFORCEMENT AS REQUIRED.

LAP SPLICE SCHEDULE

Table with 3 columns: Bar Size, Embedment, Tension Lap. Rows include 10M, 15M, 20M, 25M, 30M, 35M.

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.

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.

INSTALL THREE (3) 15Ø TENDONS IN ALL SPANS TRANSVERSE POST TENSIONING DUCTS. STRESS TO 0.7 fpu AND PRESSURE GROUT THE DUCTS WITH 100 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 100 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 FIXED BEARINGS SHALL BE 40mm THICK WITH TWO 3mm STEEL PLATES AND SHALL CONFORM TO DIMENSIONS AS SHOWN ON THE DRAWINGS.

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.

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. 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.

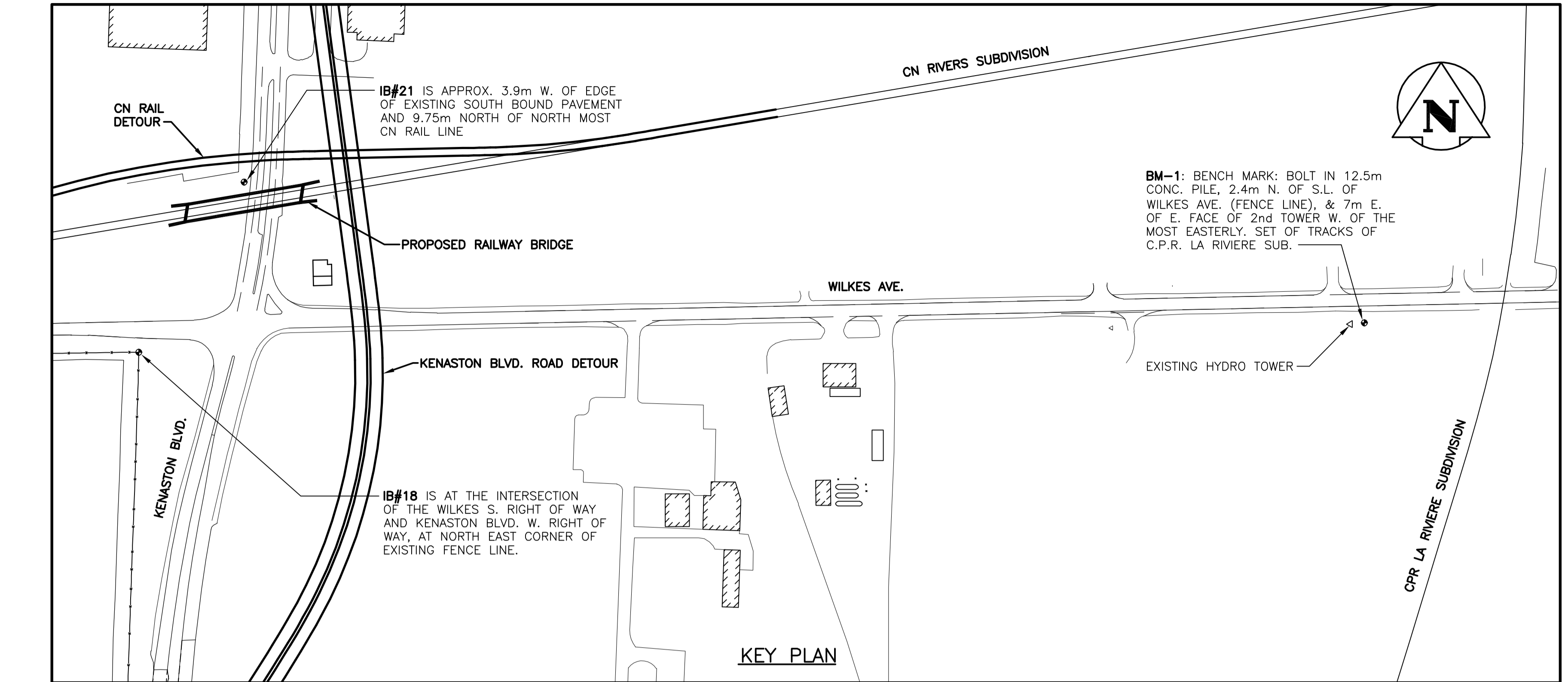
THE WELDING ELECTRODE SHALL BE E480XX.

TEMPORARY DRAINAGE SYSTEM

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

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.



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)
BALLAST - BRIDGE DESIGNED FOR 700mm DEPTH OF BALLAST
CONCRETE - SUBSTRUCTURE, CAISSONS, SUPERSTRUCTURE
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 HEXAGONAL PILE
ROCK SOCKET CAISSONS - 1067 Ø STEEL SLEEVE, CONCRETE FILLED CAISSON TO TILL

LIST OF ABBREVIATIONS

Table with 4 columns: Symbol, Abbreviation, Full Name, and Unit/Description. Includes terms like A/F, ALT., ALUM., APPROX., B.O., B/O, BOT., B/R, BRG., B.W., C.I.P., C.J., C, C/W, CONC., CONT., CL, CSP, DBL., DIA., DTL., DWG., DWL., EA., E.A., E.F., E.W., EQ., EQ. SP., EL., EXIST, EXP. JT., F.F., GALV., GRAN., HORIZ., IB, I.F., MK., MAX., m, MIN., mm, N.E., N.F., N.I.C., N.T.S., No., N.W., O/C, O/H, OPNG., O/O, FAR FACE, PL., PVC, QTY., R, REINF., SC, SHT., S.E., SRS, STD., STRR, STR., S.U., S.W., THK., TYP., T, T/O, U/N, U.N.O., U/S, VERT., W/P, SAW CUT SHEET, SOUTHEAST, STORM RELIEF SEWER, STANDARD, STRIP, STRAIGHT, SUBSTRUCTURE UNIT, SOUTHWEST, TOP, TOP OF, UNLESS NOTED, UNLESS NOTED OTHERWISE, UNDERSIDE, VERTICAL, WORKING POINT, WITH.

SITE ACCESS

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

SOUTH ACCESS

- TRAVELING NORTH OR 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.

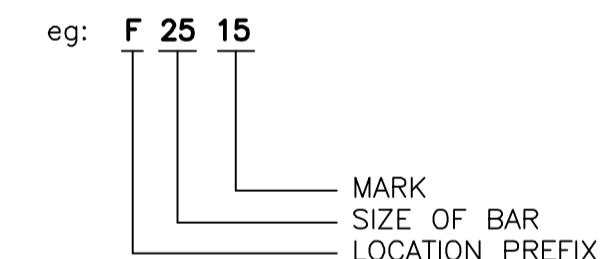
SOUTHWEST ACCESS

- WILKES AVENUE BETWEEN STERLING LYON PARKWAY WEST AND KENASTON BLVD. OPEN FOR CONSTRUCTION ACCESS.
- TRAVELING EAST ON WILKES TO SHAFTESBURY CONTINUING ONTO STERLING LYON PARKWAY, TURN ONTO WILKES AVE. AFTER SHAFTESBURY.
- CONTINUE TRAVELING EAST ON WILKES TO KENASTON BLVD.
- TURN NORTH (LEFT) ON KENASTON BLVD. TO SITE.

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

REINFORCING MARK NUMBERING SYSTEM



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.

METRIC

WHOLE NUMBERS INDICATE MILLIMETRES
DECIMALIZED NUMBERS INDICATE METRES



Project summary and approval section including: LOCATION APPROVED UNDERGROUND STRUCTURES, Stantec Consulting Ltd. logo and address, ENGINEER'S SEAL, THE CITY OF WINNIPEG PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION, KENASTON UNDERPASS, 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.