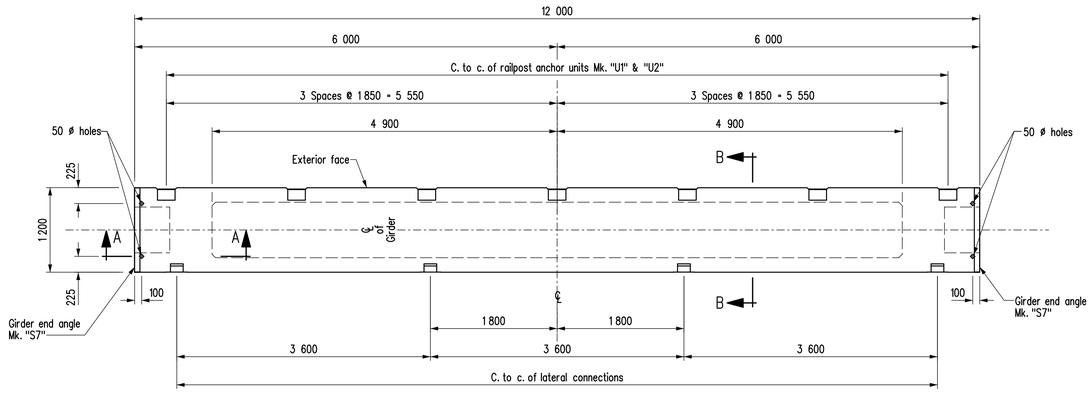
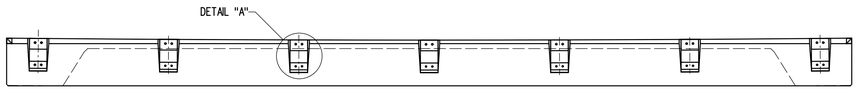
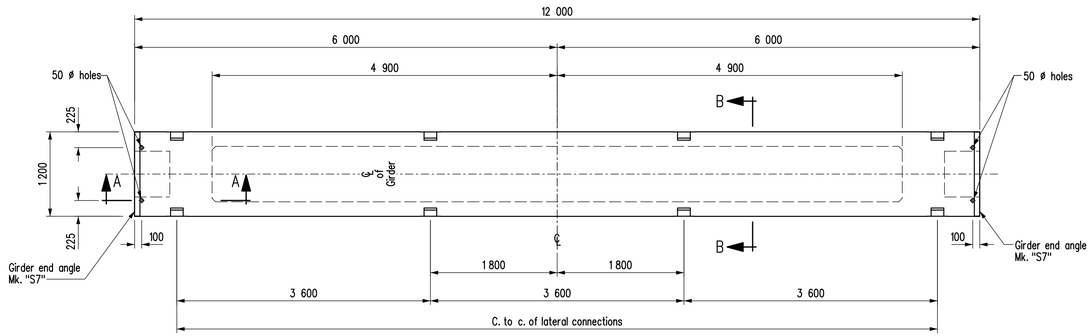



PLAN

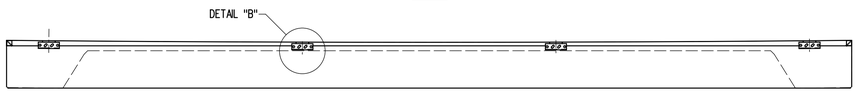



EXTERIOR ELEVATION

## EXTERIOR GIRDER MK. "G1"

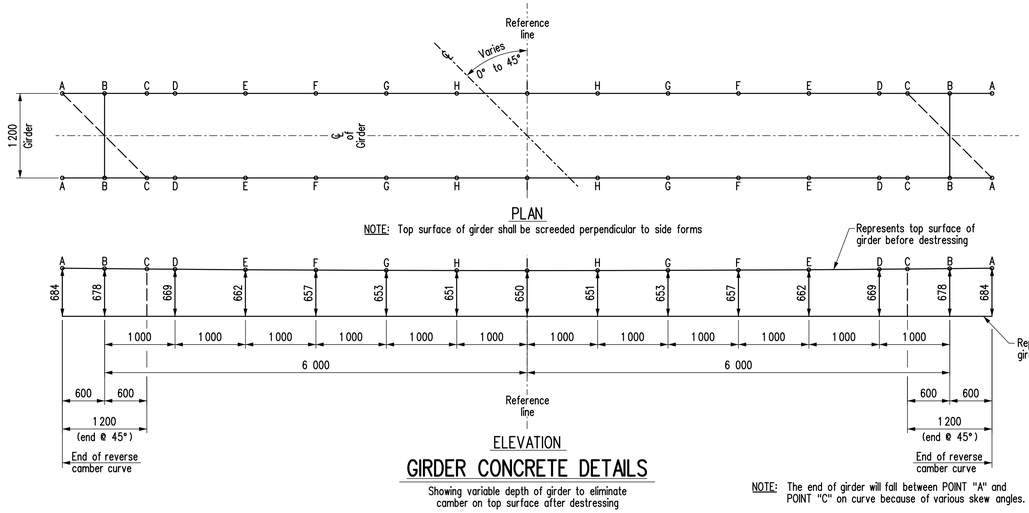


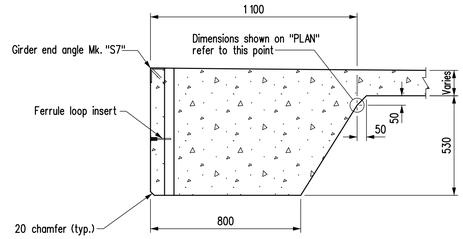

PLAN




ELEVATION

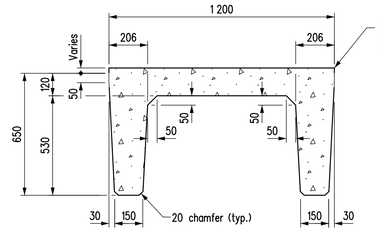
## INTERIOR GIRDER MK. "G2"



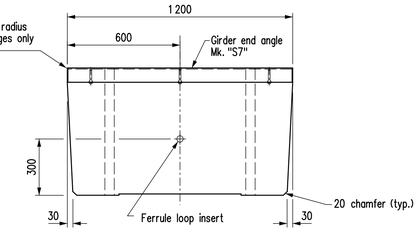

SECTION A-A

Typical at both ends of girders
Scale 1:15



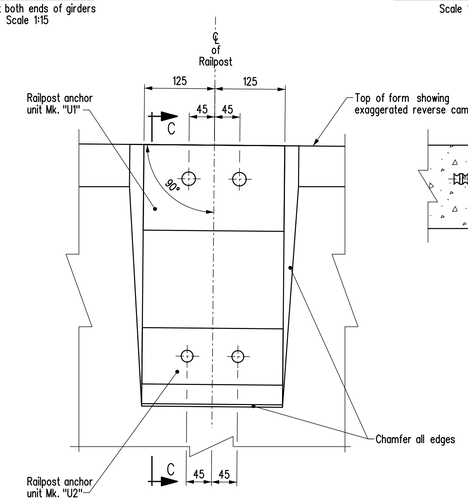

SECTION B-B

Scale 1:15

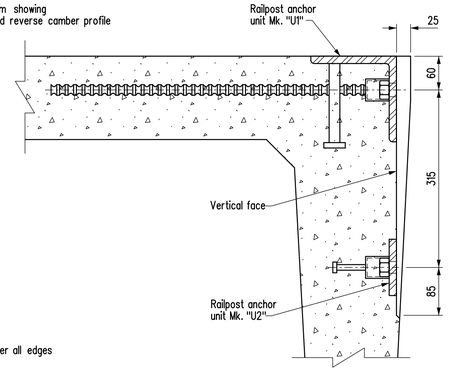



END VIEW

Scale 1:15



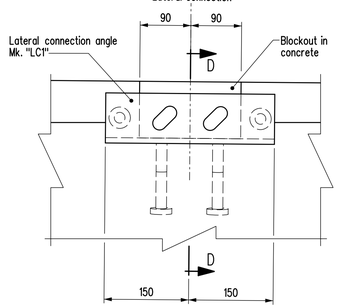

ELEVATION



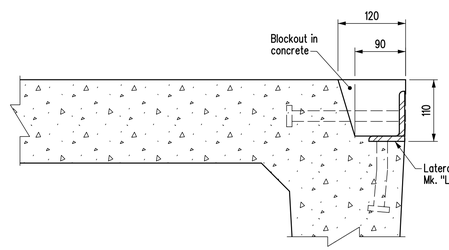

SECTION C-C

## DETAIL "A"

Scale 1:5




ELEVATION




SECTION D-D

## DETAIL "B"

Scale 1:5

NOTES:

1. Design in accordance with AASHTO LRFD Bridge Design Specifications, Seventh Edition, 2014.
2. Design Vehicular Live Load: Modified AASHTO HSS-25
   AASHTO LRFD "HL-93"
3. Design distribution factor = 0.5 lanes/girder.
4. Concrete strength: @ transfer, f'ci = 35 MPa
   @ 28 days, f'c = 45 MPa
5. Prestressing steel: 13 mm ø low relaxation strands
   Minimum ultimate strength, fpu = 1 860 MPa
   Jacking force/strand, fpj = 128.5 kN/strand
6. Girder dimensioning tolerances: Length 3 mm ±
   Cross section 2 mm ±
7. Approximate mass per girder = 12 000 kg

| REVISIONS | | |
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| DATE | BY | DESCRIPTION |

| DESIGN SEAL | RECORD SEAL |
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| Original signed and sealed by Andy Pankratz July 02, 2020 | |

# PRECAST PRESTRESSED CHANNEL GIRDER DETAILS

Manitoba Infrastructure
Water Management and Structures

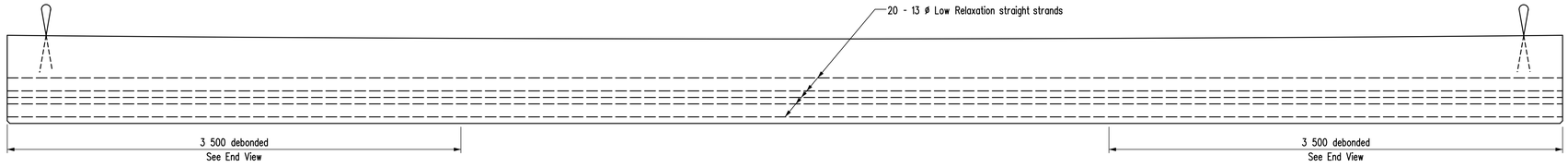
APPROVED BY:
Original signed by John Logan
January 31, 2021
DIRECTOR OF STRUCTURES
DATE

| | | |
|---|---|---|
| DESIGN | BY: | A.H.P. |
| | CHECKED: | A.H.P. |
| DETAILS | BY: | K.P. |
| | CHECKED: | A.H.P. |

SCALE: 1 : 40

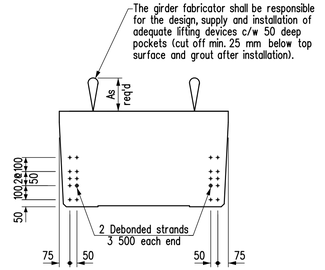
SHEET No. 1 of 5

STD No. PPCC_PR_9.6_12m_GD02



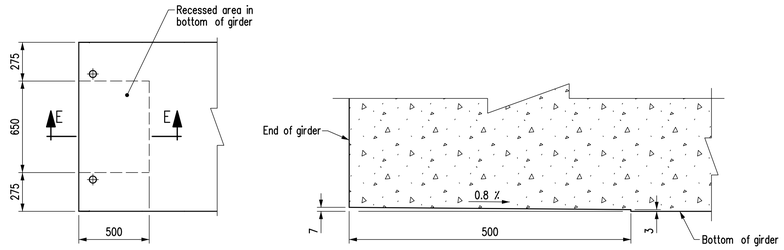

ELEVATION

## GIRDER STRAND LAYOUT




END VIEW

Typical layout of 20 - 13 ø
Low Relaxation straight strands




PART PLAN

Typical at both ends of girders




SECTION E-E

Scale 1:5

## BEARING RECESS DETAILS

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# PRECAST PRESTRESSED CHANNEL GIRDER DETAILS

DESIGN SEAL

Original signed and sealed by Andy Pankratz July 2, 2020

RECORD SEAL

Manitoba
Infrastructure
Water Management and Structures

APPROVED BY:
Original signed by John Logan
January 31, 2021
DIRECTOR OF STRUCTURES

DATE

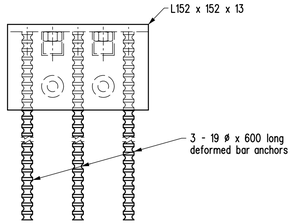
DESIGN BY: A.H.P.
CHECKED: A.H.P.

DETAILS BY: K.P.
CHECKED: A.H.P.

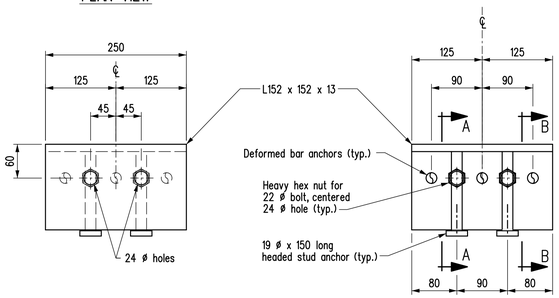
SCALE: 1 : 20 or as shown

SHEET No. 2 of 5

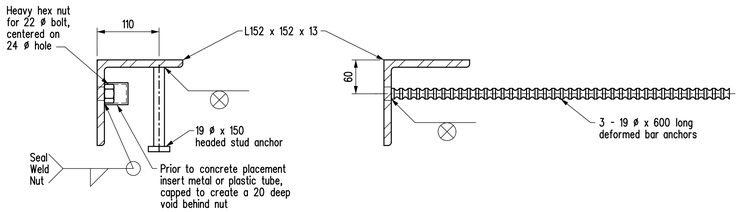
STD No. PPCC_PR_9.6_12m_GD02




PLAN VIEW

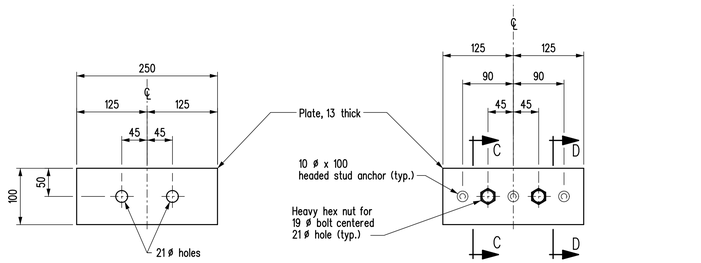



FRONT VIEW REAR VIEW

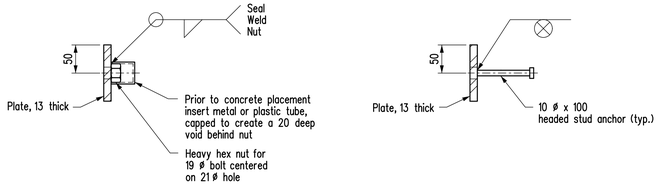



SECTION A-A SECTION B-B

## RAILPOST ANCHOR UNIT Mk. "U1"

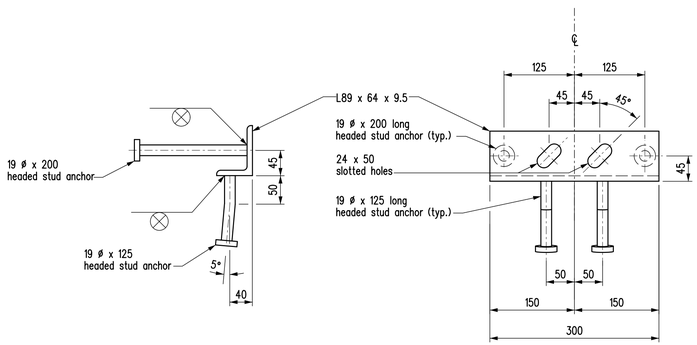



FRONT VIEW REAR VIEW



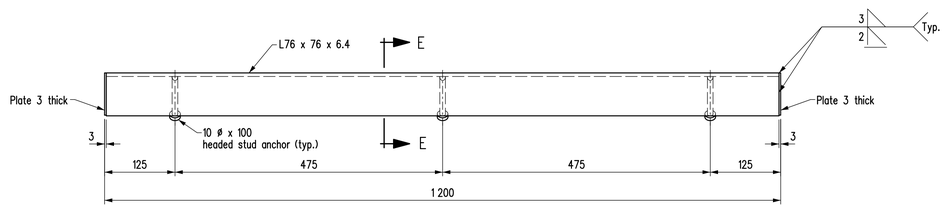

SECTION C-C SECTION D-D

## RAILPOST ANCHOR UNIT Mk. "U2"

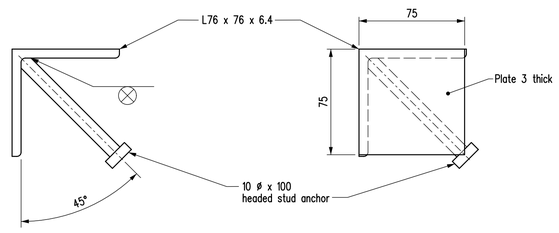



SIDE VIEW ELEVATION

## LATERAL CONNECTION ANGLE Mk. "LC1"




PLAN




SECTION E-E
Scale 1:2

END VIEW
Scale 1:2

## GIRDER END ANGLE Mk. "S7"

# BILL OF MISCELLANEOUS METAL

for 12 m LONG GIRDERS
9 600 ROADWAY WIDTH - 2 SPANS

| MARK No. | No. | DESCRIPTION | CORROSION PROTECTION | SIZE | LENGTH | REMARKS |
|---|---|---|---|---|---|---|
| U1 | 28 | Railpost anchor unit | Hot dip galvanized | | | |
| | | Each unit is fabricated from: | | | | |
| | | 1 - Angle | | L152x152x13 | 250 | As detailed |
| | | 2 - Heavy hex. Nuts | | for 22 dia. bolt | | Grade DH or 2H |
| | | 2 - Studs | | 19 dia. | 150 | Headed stud anchors, ASTM A108 |
| | | 3 - Bars | | for 19 dia. bolt | 600 | Deformed bar anchors, |
| | | 2 - Tubes | | | | Metal or plastic capped - As detailed |
| | | | | | | |
| U2 | 28 | Railpost anchor unit | Hot dip galvanized | | | |
| | | Each unit is fabricated from: | | | | |
| | | 1 - Plate | | PL 13x100 | 250 | As detailed |
| | | 2 - Heavy hex. Nuts | | for 19 dia. bolt | | Grade DH or 2H |
| | | 3 - Studs | | 10 dia. | 100 | Headed stud anchors, ASTM A108 |
| | | 2 - Tubes | | | | Metal or plastic capped - As detailed |
| | | | | | | |
| LC1 | 112 | Lateral connection angle | Hot dip galvanized | | | |
| | | Each unit is fabricated from: | | | | |
| | | 1 - Angle | | L89x64x9.5 | 300 | As detailed |
| | | 2 - Studs | | 19 dia. | 200 | Headed stud anchors, ASTM A108 |
| | | 2 - Studs | | 19 dia. | 125 | Headed stud anchors, ASTM A108 |
| | | | | | | |
| S7 | 32 | Girder end angle | Hot dip galvanized | | | |
| | | Each unit is fabricated from: | | | | |
| | | 1 - Angle | | L76x76x6.4 | 1 194 | As detailed |
| | | 2 - Plates | | PL 3x75 | 75 | As detailed |
| | | 3 - Studs | | 10 dia. | 100 | Headed stud anchors, ASTM A108 |
| | | | | | | |
| | 32 | Ferrule loop insert | Stainless steel | for 13 dia. bolt | | Richmond anchor, Type LF-W with mounting washer |
| | | | | | | |
| TR2 | 16 | Threaded rod | Stainless steel | 13 dia. | 250 | c/w hex. nut |
| | | | | | | |
| R27 | 56 | A325 bolt c/w F436 hardened washer | Hot dip galvanized | 22 dia. | 229 | Heavy hex. no nut, ASTM F3125 |
| R28 | 56 | A325 bolt c/w F436 hardened washer | Hot dip galvanized | 19 dia. | 64 | Heavy hex. no nut, ASTM F3125 |

NOTES:

1. All material in the above Bill shall be supplied by the GIRDER CONTRACTOR.
2. All structural steel shall conform to CAN/CSA G40.21 Grade 300W.
3. All material noted in the above Bill shall be hot dip galvanized after fabrication in accordance with ASTM A123, A153 & A143 for a minimum net retention of 610 g/m$^2$ unless otherwise stated in the specified material ASTM standards. The fabricator and galvanizer shall safeguard against embrittlement using recommended practices from applicable standards.
4. Seal all welds prior to galvanizing.
5. Grade DH or 2H galvanized nuts for A325 bolts shall be overtapped to a minimum amount required for the fastener assembly in accordance with ASTM F3125. The nuts shall be lubricated with a lubricant containing a visible dye. The lubricant shall be clean and dry to the touch.
6. All bolts and inserts in the above Bill shall be Imperial thread.
7. Stainless steel shall conform to the requirements of ASTM A320, Class B8.
8. Contractor shall refer to Manitoba Infrastructure's Approved Products listing.

| REVISIONS | | |
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| DESIGN SEAL | RECORD SEAL |
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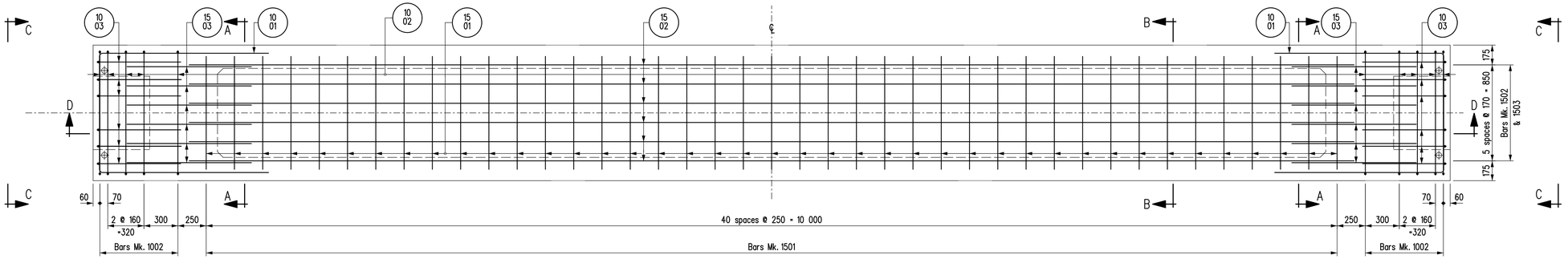
| Original signed and sealed by Andy Pankratz July 2, 2020 | |

# PRECAST PRESTRESSED CHANNEL GIRDER DETAILS

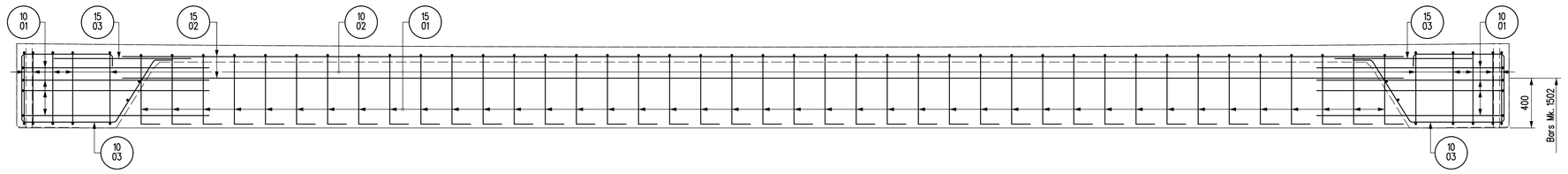
Manitoba Infrastructure
Water Management and Structures

APPROVED BY:
Original signed by John Logan
January 31, 2021
DIRECTOR OF STRUCTURES
DATE

| | | | |
|---|---|---|---|
| DESIGN | BY: A.H.P. | SCALE: 1 : 5 or as shown | SHEET No. 3 of 5 |
| | CHECKED: A.H.P. | | |
| DETAILS | BY: K.P. | | STD No. PPCC_PR_9.6_12m_G002 |
| | CHECKED: A.H.P. | | |



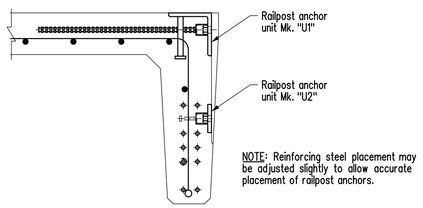

## PLAN OF GIRDER




## ELEVATION OF GIRDER

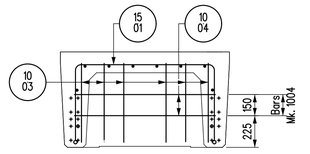



## PART SECTION D-D

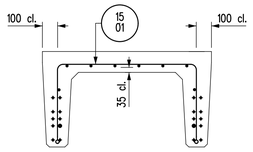



## DETAIL AT RAILPOST ANCHOR

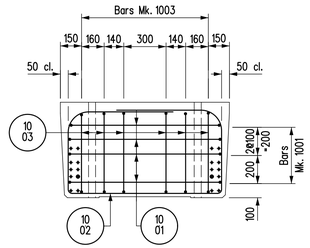
Scale 1:10




## SECTION A-A




## SECTION B-B




## END VIEW C-C

NOTES:

1. Concrete cover shall be 25 mm unless noted otherwise.
2. Reinforcing details are typical for all 12 m girders unless noted otherwise.
3. See Bill of Reinforcing STD PPCC_PR_9.6_12m_GD02 Sht 5 of 5.

| REVISIONS | | |
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| DATE | BY | DESCRIPTION |

| DESIGN SEAL | RECORD SEAL |
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| Original signed and sealed by Andy Pankratz July 2, 2020 | |

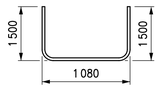
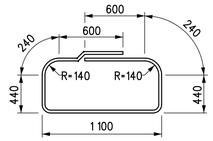
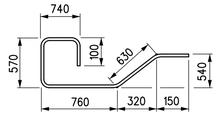
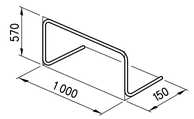
# PRECAST PRESTRESSED CHANNEL GIRDER DETAILS

Manitoba Infrastructure
Water Management and Structures

APPROVED BY:
Original signed by John Logan
January 31, 2021
DIRECTOR OF STRUCTURES
DATE

| | | |
|---|---|---|
| DESIGN | BY: A.H.P. | SCALE: 1:20 |
| | CHECKED: A.H.P. | SHEET No. 4 of 5 |
| DETAILS | BY: K.P./N.J. | or as shown |
| | CHECKED: A.H.P. | STD No. PPCC_PR_9.6_12m_GD02 |

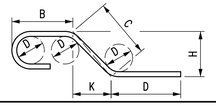
## BILL OF REINFORCING STEEL - 12 M GIRDERS

| MARK | TYPE | PIN DIAMETER | LENGTH | No. of BARS PER GIRDER | BENDING DIAGRAM |
|---|---|---|---|---|---|
| 1001 | BENT | 45 | 4 080 | 8 |   |
| | | | | | |
| 1002 | BENT | 45 | 3 660 | 10 |   |
| 1003 | BENT | 45 | 2 950 | 12 |   |
| 1004 | STR | | 1 000 | 4 | |
| | | | | | |
| 1501 | BENT | 65 | 2 440 | 41 |   |
| 1502 | STR | | 10 300 | 8 | |
| 1503 | STR | | 1 100 | 12 | |

| | |
|---|---|
| Total volume of structural concrete per exterior girder | 4.94 m³ |
| Total volume of structural concrete per interior girder | 4.93 m³ |
| Number of Exterior girders Mk."G1" | 4 |
| Number of Interior girders Mk."G2" | 12 |

NOTES:

1. All dimensions given in bending diagram are out to out, except radii and extensions on 90°, 135° & 180° hooks. Extensions on 90°, 135° & 180° hooks are the "A" or "G" dimensions for standard 90°, 135° & 180° hooks referenced from the RSIC "Manual of Standard Practice". Radii are inside dimensions. All reinforcing steel bends and hooks shall conform to Clause 6.6.2 of C.S.A. A23.1, unless noted otherwise in the BILL OF REINFORCING STEEL.
2. All reinforcing steel shall be deformed steel, unless noted otherwise in the BILL OF REINFORCING STEEL.
3. All reinforcing steel shall conform to CSA G30.18 "Billet Steel Bars for Concrete Reinforcement" Grade 400W, unless noted otherwise in the BILL OF REINFORCING STEEL.
4. Like bars shall be bundled, securely tied and identified as to Mark and Site No. by appropriate means. All other items to be identified in a similar fashion.
5. All bars shall be bent in accordance with the following detail:

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# PRECAST PRESTRESSED CHANNEL GIRDER DETAILS

| DESIGN SEAL | RECORD SEAL |
|---|---|
| Original signed and sealed by Andy Pankratz July 2, 2020 | |

Manitoba Infrastructure
Water Management and Structures

APPROVED BY:
Original signed by John Logan
January 31, 2021
DIRECTOR OF STRUCTURES
DATE

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|---|---|---|
| DESIGN | BY: A.H.P. | SCALE: |
| | CHECKED: A.H.P. | SHEET No. 5 of 5 |
| DETAILS | BY: K.P./N.J. | |
| | CHECKED: A.H.P. | STD No. PPCC_PR_9.6_12m_GD02 |