RIDEAU CANAL
BLACK RAPIDS LOCK 13
UPGRADES 2015

SITE

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M004  MECHANICAL - HYDRAULIC SYSTEM BRACKET DETAILS
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REFERENCE
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10-660-201  UPPER GATE & DETAILS
10-660-202  LOWER GATE & DETAILS
10-660-203  MISCELLANEOUS DETAILS
10-660-205  TOP ANCHORAGE AND EMBEDDED PARTS

DATE PLOTTED: Aug 17, 2015
FILE NAME: Black Rapids 100 Cover.dwg
LAYOUT NAME: Cover
PLOTTED BY: ROWAND
NOTE:
Do not scale drawings.
Verify all dimensions and conditions on site and immediately notify the
Departmental Representative of all discrepancies.

DATE PLOTTED: Aug 13, 2015
FILE NAME: Black Rapids 101 Site Plan.dwg
LAYOUT NAME: Site
PLOTTED BY: ROWAND

Drawing title / Titre du dessin
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Feuille
du
Sheet

Project title / Titre du projet
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Public Works and Government Services Canada
Heritage Canals and Engineering Works
Ontario Region

JUNE 2015

LUC BERIAULT, P.Eng.

EXISTING SITE PLAN
EXISTING CONDITIONS

erala of Public Works and Government Services Canada

Heritage Canals and Engineering Works
Ontario Region

Embroidery

Drawing Number:

Feuille

Drawing Date:

102

Sheet of

JUNE 2015

LUC BERIAULT, P.Eng.

CZESLAW CUDOWSKI, P.Eng.

DAVID ROWAN

102

R.078218.001

EXISTING CONDITIONS

UPGRADES 2015

BLACK RAPIDS LOCK 13

RIDEAU CANAL

102

R.078218.001

EXCEPTED CONDITIONS

PLAN 1:100

GATES NOT SHOWN FOR CLARITY

SECTION 102

NOTE:

Do not scale drawings.
Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

DATE PLOTTED:

Aug 13, 2015

FILE NAME:

Black Rapids 102 Existing Conditions.dwg

LAYOUT NAME:

Existing Conditions

PLOTTED BY:

ROWAND
NEW SILL NOSING,
25
REMOVE EXISTING LADDER,
51
STOP LOG PART ELEVATION

NEW CONDITIONS
Black Rapids 103 New Construction.dwg

Sheet 103

LAYOUT NAME:

DATE PLOTTED:

ISO-B1 (707x1000mm)

PLAN

NEW CONTROL PANEL, DWG. NO. 106

EXISTING STAIR STRUCTURE
REINSTATED, IF STAIRS. DO NOT REMOVE STAIRS DOWN

NEW CONSTRUCTION AND RE-USE EXISTING COVERS

EXISTING UPGRADES 2015
BLACK RAPIDS LOCK 13
DWG. NOS. 107 TO 110

WORK

SEALANT. SEE DETAIL ON DWG.
BREAKER (BACKER ROD) AND FOR NEW TOP

DRAWINGS AND SPECS.
REMOVE, SALVAGE AND
AND CLEAN EXPANSION JOINT
DRAWINGS AND SPECS.
NEW COVER, SEE MECH.
PAD, SEE DWG. NO. 111
NEW NEOPRENE BUMPER
110 (TYP.)
Location dwg. number
SUPPLY AND INSTALL
NEW STACKED
GATE NO. 4
SUPPLY AND INSTALL
NEW STEEL GATES,
GATE NO. 2
REPAIRS ARE COMPLETE
REINSTALL AFTER MASONRY
REQUIRED, REPAINT AND
RAKE AND REPOINT ALL MORTAR
JOINTS, INCLUDING COPING,
SEE DWG. NO. 106. FOR MASONRY
JOINTS, INCLUDING COPING,
SEE DWG. NO. 106

NOTE:

Verify all dimensions and conditions on site and immediately notify the
Departmental Representative of all discrepancies.

Do not scale drawings.
RIDEAU CANAL
BLACK RAPIDS LOCK 13
UPGRADES 2015

MASSAYEY REPAIRS I

Departmental Representative of all discrepancies.
Verify all dimensions and conditions on site and immediately notify the

NOTE:

Do not scale drawings.

See Details, Dwg. No. 106)

5 to 30 millimetres

Full Face Dutchman Repair

Partial Dutchman Repair

Tapered Face of Chamber

Remove

Ladder Access

Face of Gate

Removal

Repair

R.078218.001
GENERAL MASONRY NOTES:

1. DO ALL MASONRY RESTORATION TO MATCH EXISTING STONE FINISH, WHICH ARE IN CONTACT WITH MORTAR WHICH ARE IN CONTACT.

2. PROVIDE ALL NECESSARY ACCESS TO COMPLETE THE WORK.

3. WHERE FACE STONEWORK OR POINTING IS REMOVED, STABILIZE AND PROTECT EXPOSED MASONRY PRIOR TO REPAIR.

4. PROVIDE TEMPORARY BRACING AND SHORING TO REMAIN IN PLACE AT ALL TIMES.

5. NO STONES ARE TO BE REPAIRED OR REPLACED WITHOUT PRIOR INSPECTION AND APPROVAL OF THE DEPARTMENTAL REPRESENTATIVE. ONLY MASONRY FROM WEATHER REMOVED, STABILIZE AND PROTECT EXPOSED MASONRY FROM WEATHER.

6. DIMENSIONS GIVEN ARE NOMINAL DIMENSIONS ARE ACCEPTABLE.

7. DEEP HOLES IN EXISTING STONE SHALL BE CUT AND SHAPED TO MATCH EXISTING STONE FINISH, FULL OR PARTIAL FACE "DUTCHMAN" REPAIRS TO PRESERVE HERITAGE APPEARANCE.

8. WHERE FACE STONEWORK OR POINTING IS REMOVED, STABILIZE AND PROTECT EXPOSED MASONRY PRIOR TO REPAIR.

9. WHERE FACE STONEWORK OR POINTING IS REMOVED, STABILIZE AND PROTECT EXPOSED MASONRY PRIOR TO REPAIR.

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16. WHERE FACE STONEWORK OR POINTING IS REMOVED, STABILIZE AND PROTECT EXPOSED MASONRY PRIOR TO REPAIR.

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18. WHERE FACE STONEWORK OR POINTING IS REMOVED, STABILIZE AND PROTECT EXPOSED MASONRY PRIOR TO REPAIR.

19. WHERE FACE STONEWORK OR POINTING IS REMOVED, STABILIZE AND PROTECT EXPOSED MASONRY PRIOR TO REPAIR.

20. WHERE FACE STONEWORK OR POINTING IS REMOVED, STABILIZE AND PROTECT EXPOSED MASONRY PRIOR TO REPAIR.

NOTE: DEEP HOLES IN EXISTING STONE ARE TO BE FACED AFTER STONE REPAIR IS COMPLETED. WHERE FACE STONEWORK IS REMOVED, STABILIZE AND PROTECT EXPOSED MASONRY PRIOR TO REPAIR. AFTER PLACING GROUT, BEFORE APPLYING FINISH COAT OF MORTAR, SEE "MORTAR JOINT DETAIL" ON DWG. NO. 106, THEN.

MASONRY NOTES:

1. PROVIDE TEMPORARY BRACING AND SHORING TO REMAIN IN PLACE AT ALL TIMES.

2. PROVIDE TEMPORARY BRACING AND SHORING TO REMAIN IN PLACE AT ALL TIMES.

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20. PROVIDE TEMPORARY BRACING AND SHORING TO REMAIN IN PLACE AT ALL TIMES.
**Section 1: Stone Finish Details**

- **Coarse Bush-Hammered Surface**
  - Full length of stone varies
  - Random (15 to 20 grooves per 100mm)
  - Spaced
  - Vary depth (2 to 3mm)

- **Chisel Drafted Margin**

**Elevation - Typical Stone**

- Joint detail with a slightly concave surface

**Mortar Joint Detail**

- 15mm minimum final lift of mortar
- Bring mortar to within 15mm of stone face

- **Expansion Joint Detail**

- Back-pointing (max. 30mm lifts)

- **Existing Joint**
  - Filler to remain

**Material Specifications**

- Anchor Type B, see detail below (typ.)
- Reinforcing
- Face of new concrete plate
- Face of existing concrete
- Reinforcements

**Part Plan**

- 1:50 scale
- Lock 500
- Gate not shown for clarity

**Note:**
- Do not scale drawings.
- Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.
NOTE: GATES NOT SHOWN FOR CLARITY

EXCAVATE 25mm OF CONCRETE BEHIND STONE
CUT EXISTING ANCHOR AT FACE OF EXCAVATED CONCRETE

EXISTING 10" THICK FACING STONE (TYP.)
EXISTING CONCRETE FACING REMOVALS

CAREFULLY REMOVE FACING STONE AS DELINEATED ON ELEVATIONS AND PROTECT ADJACENT STONES FROM DAMAGE (TYP.)

NEW 250mm (10") THICK FACING STONE, SEE SPECS. (TYP.)
FILL GAP WITH GROUT, SEE SPECS.
SEE MORTAR JOINT DETAIL ON DWG. NO. 106 (TYP.)

DRILL HOLE AND SECURE ANCHOR WITH EPOXY, SEE SPECS. (TYP.)
SUPPLY AND INSTALL 2 - 16mm [PP/21*67$,1/(66 STEEL ANCHORS PER STONE

NOTE: SEE PLAN AND ELEVATIONS FOR LOCATIONS OF STONE REPLACEMENTS.

REPAIRS

GATE NO. 1
GATE NO. 2
GATE NO. 3
GATE NO. 4

EXISTING MASONRY WALL

106a

ISSUED FOR TENDER
DMR
JULY 2015

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada
Heritage Canals and Engineering Works
Ontario Region

LUC BERIAULT,
P.Eng.

DATE PLOTTED: Aug 13, 2015
FILE NAME: Black Rapids 106a Masonry Repairs IV.dwg
LAYOUT NAME: Masonry IV
PLOTTED BY: ROWAND

LEGEND:

1. Stone Removed
2. Excavate 25mm of concrete
3. Do not scale drawings.
Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.
SECTION 1:10

102 x 89 x 13 C/W 13mm STIFF. PLATES WELDED TO BRG. PLATE CYLINDER 460 x 460 x 38

BEARING PLATE

MAX. 75mm GROUT

75mm THICK PRECAST CONCRETE COVER (TYP.)

20M DOWELS @ 500

FOR DETAILS OF NEW QUOIN, SEE DWG. NOS. 111 & 112

EXISTING GRANULAR BACKFILL OR NATIVE SOIL

300mm MIN. GRANULAR 'A' COMPACTED TO 95% STANDARD PROCTOR MODIFIED DRY DENSITY

6.4mm PLATE WELDED TO ANGLES 12

4mm GAP L 89 x 64 x 9.5 ON 12mm THICK GROUT PAD L 65 x 65 x 6

300mm MIN. PP'&21&5(7(< ADHESIVE ANCHOR @ 300 WITH 175mm EMBEDMENT

675mm MIN. HEAVY WASHER & HEAVY HEX HEAD NUT, WELD NUT TO BOLT (TYP.)

50

38

25

4mm GAP L 102 x 89 x 13 C/W 13mm STIFF. PLATES WELDED TO ANGLES 12

FOR IMBEDDED ANCHORAGE, SEE DETAILS ON DWG. 110

NOTE:

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

DATE PLOTTED: Aug 13, 2015

FILE NAME: Black Rapids 109 Pit Details III.dwg

LAYOUT NAME: Pit Details III

PLOTTED BY: ROWAND
1. MATERIAL - AISI 4340 ALLOY STEEL.
2. PAINT - BLACK.
3. EDGES TO HAVE 3 mm CHAMFER AS SHOWN.
4. QUANTITY OF TEN (10) REQUIRED.

CZEWSL CUDOWSKI,
P.Eng.

DAVID ROWAN

NOTES:

1. MATERIAL - MILD STEEL.
2. PAINT - WELDABLE PRE-PRIMER (DO NOT PAINT INSIDE OF HOLE).
3. CHAMFER 3 mm AS SHOWN (3 PLACES).
4. QUANTITY OF TWENTY (20) REQUIRED.

ROWAND

CHEEK STRAP PLATE DETAILS

1. MATERIAL - STRONGER AISI 4340 ALLOY STEEL.
2. EDGES TO HAVE 3 mm CHAMFER AS SHOWN.
3. QUANTITY OF TEN (10) REQUIRED - LOWER GATE.
4. CHAMFER 3 mm AS SHOWN (3 PLACES).
5. QUANTITY OF EIGHT (8) REQUIRED.

P.Eng.

LUC BERIAULT

ROCKING WASHER DETAIL

1. MATERIAL - UHMWPE, OIL FILLED.
2. CHAMFER 3 mm AS SHOWN.
3. QUANTITY OF TEN (10) REQUIRED - WALL END WASHER.

ROWAND

WALL END WASHER DETAIL

1. MATERIAL - MILD STEEL.
2. PAINT - BLACK.
3. CHAMFER 3 mm AS SHOWN.
4. QUANTITY OF TWENTY (20) REQUIRED.

LUC BERIAULT

WALL END NUT AND BOLT DETAIL

1. MATERIAL - STRONGER AISI 4340 ALLOY STEEL.
2. PRIMER AND ALKYD ON BOLT HEAD AND NUT ONLY

ROWAND

PICTOGRAPHIC CLASSIFICATION:

P.Eng.

LUC BERIAULT
NOTES ON ALIGNMENT BORING OF GUDGEON PIN

1. VERTICALITY AND CIRCULARITY OF HOLES THROUGH EXISTING GATE PLATES

2. UPON REMOVING EXISTING GUDGEON PIN, MEASURE AND RECORD NON-VERTICALITY AND THE EXTENT OF NON-CIRCULARITY.

3. BUILD UP HOLES WITH WELD METAL SUFFICIENT TO ALLOW TRUE BORING, AS REQUIRED.

4. NEW HOLES MUST BE CIRCULAR AND PERPENDICULAR TO THE GATE WITHIN 0.01 DEGREE.

5. DO NOT START BORING UNTIL DEPARTMENTAL REPRESENTATIVE HAS REVIEWED AND APPROVED THE PERPENDICULARITY ACHIEVED.

6. INSTALL AND SHIM NEW ANCHOR ASSEMBLY FOR HORIZONTALITY BEFORE ALIGNMENT BORING.

7. MEASURE TO WITHIN 0.1 MM, THE ACTUAL ACHIEVED DIAMETER OF THE ALIGNMENT BORED HOLE.

8. PROPER FIELD ALIGNMENT OF AND BOTTOM AS SHOWN, TO ASSURE THE PERPENDICULARITY ACHIEVED.

9. GUDGEON BEARING SHRINK-FITTED TO GATE END EYELETS AND ALIGNMENT BOLT/NUT ASSEMBLIES PP'5(7$,1,1*%2/76.

10. DRILL & TAP 8 - HOLES TO SUIT BRONZE BUSHING.

11. DRILL & TAP 4 - HOLES TO SUIT BRONZE BUSHING.

12. GUDGEON BEARING (TYP.) PP'5(7$,1,1*%2/76.

13. CAP SCREWS (TYP.) DRILL & TAP 8 - HOLES TO SUIT CAP SCREWS c/w S.S. LOCK NUT.

14. TIGHT COMPOUND (TYP.) WASHER (OR USE LOCK NUT FOR LACK OF COMPOUND).

15. 5 METER OF FLEXIBLE EXTENSION CONDUIT IS TO BE PROVIDED TO ALLOW REMOTE APPLICATION OF GREASE FITTING, ADAPTER/GREASE FITTING ASSEMBLY IN ADDITION TO THE NOTED GREASE FITTING, ADAPTER/GREASE FITTING ASSEMBLY.

16. NOTE: ANY INFORMATION ON DRAWINGS WAS FABRICATED TO ALLOW THIRD PARTY INTERCHANGEABILITY.

17. DRAWINGS - PART PLAN - HEEL CASTING

18. PLAN - LOWER LOCK PLATE

19. SECTION A

20. PLAN - BEARING PLATE

21. SECTION A

22. BRONZE BUSHING

23. PLAN - UPPER LOCK PLATE

24. SECTION A

25. PLAN - BASE PLATE

26. SECTION A

27. PINTLE ASSEMBLY DETAILS

28. GUDGEON ASSEMBLY DETAILS
NOTES:
1. MATERIAL - AISI 4340 ALLOY STEEL QUENCHED AND TEMPERED TO ACHIEVE THE FOLLOWING PROPERTIES:
   1. MINIMUM YIELD: 689 MPa.
   2. TENSILE STRENGTH: 862 MPa TO 965 MPa.
   3. CHARPY IMPACT: AT -29 DEGREES CELCIUS, AVERAGE OF THREE TESTS, MINIMUM 27 JOURLES WITH ALL INDIVIDUAL TESTS ABOVE 20 JOURLES.
   4. FERRITIC GRAIN STRUCTURE.
   5. SUBMIT ALL DATA BEFORE PURCHASE.

SHIMMING WASHERS

GUDGEON PIN

GUDGEON BEARING

GUDGEON KEEPER PLATE
1) MATERIAL - AISI 4340 ALLOY STEEL.

2) PAINT, PRIMER + ALKYD - RED (DO NOT PAINT INSIDE OF HOLES).

3) CHAMFER ALL EDGES 2 mm x 2 mm.

4) QUANTITY OF TEN (10) REQUIRED.

5) QUANTITY OF ONE (1) ONLY REQUIRED.

6) SET JAM NUTS FINGER-TIGHT FOR SHIPPING.

7) ALIGNMENT BORE BEARING IN FIELD TO DIAMETER AND CLASS SEVEN (7) NOMINAL BEFORE THREAD (FOUR THREADS PER INCH).

NOTES:
- SHOWN AS PLANNED.
- DRAWN TO SCALE 1:5.
- SHEET R163.
- DRAWING NUMBER/LOCATION DWG. NUMBER:
  - B 1XPpURVXUGHVVLQ
  - A 1XPpURGXGpWDLO
- PLAN - CONNECTING LINK LAYOUT
- ELEVATION
- TURNBUCKLE NUT
- TURNBUCKLE JAM NUT
- TURNBUCKLE WRENCH
- LOWER GATE DETAILS V

NOTE ON THREADING:
- THREAD FORM DETAIL WALL END ROD
- THREAD LENGTH (2 PLACES)
- THREAD FORM DETAIL GATE END ROD
- THREAD FORM DETAIL GATE END ROD - OUTSIDE EYELET
- THREAD FORM DETAIL GATE END ROD - INSIDE EYELET

1. MINIMUM YIELD: 689 MPa.
2. TRANSVERSE STRENGTH: 305 MPa.
3. CHARPY IMPACT AT 28 DEGREES CELSIUS (MINIMUM VALUE): 30 J. AIR CONDITIONED. NO LABORATORY CONDITIONS.
4. PERMANENT GRAIN STRUCTURE.
5. SUMMIT ALL DATA BEFORE PURCHASE.
NOTE:
Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

DATE PLOTTED: Aug 13, 2015
FILE NAME: Black Rapids 120 Upper Gate Details II.dwg
LAYOUT NAME: Upper Gate II
PLOTTED BY: ROWAND

DEPARTMENT OF TRANSPORT
RIDEAU CANAL
BLACK RAPIDS LOCK 13
REHABILITATION 2015

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
Heritage Canals and Engineering Works
Ontario Region
JUNE 2015

R.078218.001

UPPER GATE DETAILS II
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