

LaSalle Causeway

Deck Grating Inspection and Repair Report

PWGSC Project No. R.082857.001

Prepared for:

Public Works Government Services Canada

Prepared by:

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1. INTRODUCTION

The LaSalle Causeway, owned and operated by PWGSC, carries County Road No. 2 across the Cataraqui River within the City of Kingston, providing a critical transportation link between the downtown area on the west side of the river with the Barriefield/CFB Kingston area on the east side of the river. Approximately 23,000 vehicles cross the Causeway daily. The bascule bridge provides marine access to the inner harbour of Kingston, lifting an average of 900 times per year, and access to the southern entrance of the Rideau Canal. Construction was completed on April 15, 1917. The Bascule Bridge is a single leaf Strauss heel trunnion bascule bridge with a roadway width of 7.32m which carries one eastbound and one westbound traffic lane on an open steel deck grating.

In March 2017, Parsons was retained by Public Works and Government Services Canada (PWGSC) to complete an emergency inspection of the steel deck grating on the Bascule Bridge, following an observed hole in the deck grating on February 27, 2017. The hole in the grating was repaired by George A Wright, a sub-contractor to Louis W. Bray who was on site to complete the replacement of span locks contract. The repair consisted of welding a temporary plate over the hole, which was completed on the same day.

This report documents the location and quantity of defects detected during the inspection as well as outlines short term repairs of the steel deck grating and a permanent repair of the hole in the grating.



Figure 1: Key Plan

2. EXISTING CONDITIONS

2.1 Structure Description

The Bascule Bridge is a single leaf Strauss heel trunnion bascule bridge, designed by The Strauss Bascule Bridge Co. of Chicago, and constructed in 1916. The main span of the bridge consists of a Modified Warren through truss with a span length of 48.77 m (160'). The center-to-center truss width is 8.23 m (27') and the center of bottom chord to center of top chord height varies from the east end to the west end from 6.10 m (20') to 7.92 m (26'). The concrete counterweight weighs approximately 500 tonnes (1,100,000 lbs).

The roadway width on the bridge of 7.32 m (24') carries one eastbound and one westbound vehicular traffic lane on an open steel deck grating (Photo 1). A 1.2 m (4') wide timber plank sidewalk is cantilevered on exterior of the south truss. The posted vertical clearance on the bridge is 4.2 m.

The steel grating was replaced was designed in 1973 and built in 1976 based on the as-built contract drawings "LaSalle Causeway – Repairs to Bridges" by C.C. Parker. The steel grating consists of 25mm x 6mm (1" x ¼") transverse cross bars supported on 64mm x 6mm (2 ½" x ¼") longitudinal bearing bars that are supported on small transverse rolled I-beam sills. The longitudinal bearing bars are welded to every second steel sill and the cross-bars are fillet welded to the bearing bars in one alternating corner at each intersection. The opening size of the grating is approximately 57mm (2 ¼") x 54mm (2 1/8"). There are 63 grating panels on the bascule bridge, 7 panels transversely (A-G) and 9 panels longitudinally (0-16, based on the nodes of the truss starting from the east). The longitudinal panel joints are centered on the steel sills and the transverse panel joints are separated by an angle at approximately 318mm (1' – 1/2") spacing. Both the cross-bars and the bearing bars were originally serrated to provide traction for vehicular traffic.

2.2 Data Collection and Review

The following reference material was reviewed and used in the inspection of the bridge and preparation of this report:

1. "LaSalle Causeway – Repairs to Bridges" As-Built Drawings, PWGSC Project Number 81254, prepared by C.C. Parker and Associates Limited, March 1973.
2. "LaSalle Causeway 2016 Annual Comprehensive Detailed (Bascule) & General Inspection Report", PWGSC Project No. R.055058.002, prepared by Parsons, March 2017.

3. INSPECTION METHODOLOGY

On March 8, 2017, Maurice Mansfield, CEng, P.Eng., Amir Tehranian E.I.T., and Cara Waddell, E.I.T. from Parsons conducted the steel deck grating inspection during a night time closure of the bridge. The bridge was closed between 9:00pm and 6:00am and the traffic was detoured to conduct the inspection. The inspection included hammer sounding of the deck grating system to determine if there are any loose bars or broken welds, mapping of all defects and removal of the temporary steel plate to further investigate the cause of the steel failure which created the hole in the deck grating. Two samples of the bearing bars were removed from the piece of grating that failed for further investigation.

4. SUMMARY OF SIGNIFICANT FINDINGS

The steel deck grating of the Bascule Bridge at the LaSalle Causeway is in fair condition with localized areas in poor condition. Appendix A includes various photographs showing the condition of the steel deck grating. Refer to steel deck grating deterioration drawings in Appendix B for the location and type of deterioration.

4.1 Serrated Wearing Surface

The steel deck grating has serrated edges to provide traction to vehicular traffic. The serrated edge on the grating has been completely worn away on both the cross bars and the bearing bars within the wheel tracks in each vehicular lane (Photo 2). In addition, the bearing bars are worn up to an additional 3mm in between cross-bars. This deterioration is typical as the steel grating is over 41 years old and has 23000 vehicles crossings a day. The steel grating no longer provides the same slip resistance as designed due to the wearing of the serrated surface. This could increase vehicle braking distances in poor weather conditions.

4.2 Coating

The as-built drawings do not indicate what protective coating was originally applied to the grating. However presumably there was some form of coating. The coating of the grating has typically worn away and the steel grating has light corrosion on the vertical faces of the cross bars and bearing bars and medium corrosion along the north and south curb face (Photo 3). Portions of the steel grating were over sprayed when they were coating the steel sills during the coating contract in 2010.

4.3 Debris

It was noted that there is concrete and debris in the grating in several locations over the transverse sills at the east abutment (Photo 4). This may have been placed to protect the corroded transverse sills and prevent salt-laden water from collecting on the transverse sills. When in fact, the salt-laden water infiltrates the concrete which increases the rate of deterioration of the steel below.

4.4 Impact Damage

Most of the deterioration on the bridge has been caused by impact damage and has caused numerous transverse cross bars to either bend and deform or completely break off at the bearing bar interface (Photos 5 to 7). The deformed/ broken bars can be contributed to impact damage from vehicular traffic as the bars are generally deformed in the direction of traffic. There is one localized area in the middle of the deck grating that has multiple broken and bent transverse cross-bars and bent longitudinal bearing bars (Photo 8). This could have been caused due to impact with a defective vehicle component or impact from a snow plow.

4.4.1 East Abutment

The condition of the grating at the east abutment is worse than the rest of the bridge with significant damage. This is due to the elevation difference between the abutment and the steel grating. The steel grating is 16mm higher than the abutment on the south side and 11mm higher on the north side. On the south side at the curb face, there is a 450mm long steel angle, that is welded to the steel grating to prevent further impact damage (Photo 9). The end cross-bar which protects the end of the of the bearing bars only extends 2250mm from the south curb (Photo 10). There is one location on the south side that multiple cross-bars have been deformed and there is an enlarged opening where a couple of transverse cross-bars and longitudinal bearing bars have broken (Photo 11). In the west bound lane (north side), there is four broken transverse cross-bars which expose the edges of the bearing bars which may cause vehicular damage (Photo 12). During the inspection, Parsons directed Eastern Fluid Power (EFP) to weld a temporary steel plate over the grating at this location to protect vehicles from any damage (Photo 13).

4.5 Grating Failure

As observed on February 27, 2017, a large piece of grating failed and broke off from the remaining grating and the transverse sill beneath (Photo 14). The piece of grating was approximately six openings wide by seven openings long (370mm wide by 420mm long) centered about the interface between panels C and D in bay 10-12 (Photo 15). The piece of grating was centered over one of the transverse sills (Photo 16).

Multiple cracks were observed in the piece that broke free and the bearing bars surrounding the opening. Most of the cracks propagated from the notch for the cross-bars and extended to the base of the metal (Photo 17 to 20). It appears from the wearing of the base of the longitudinal bearing bars at the sill that the welds had failed between the sills and the bearing bars first which caused the portion of the grating to vibrate which placed additional stress on the bearing bars which caused them to crack and fail (Photo 21). There are multiple cross-bars and bearing bars missing which may have completely broken off from the piece and fallen into the river (Photo 22). There are multiple bent transverse cross-bars adjacent to the grating failure but did not appear to be the cause of the grating failure (Photo 23). It should be noted that the longitudinal splice angle that is welded between the bearing bars of the two adjacent panels remained intact and kept the two panels together (Photo 15).

5. RECOMMENDED SHORT-TERM REPAIRS

The following are recommended short term repairs that should be completed within the next year to prevent further deterioration of the steel deck grating. Appendix B includes the drawings for the short-term repairs.

5.1 Impact Damage

At every location where there are broken transverse cross bars or three or more consecutive bent transverse cross bars, an angle should be welded between the two bearing bars similar to the angle provided as a longitudinal splice between adjacent panels. An additional angle will be required every three openings for bent transverse bars. It is anticipated that the 75 additional angles will be required as seen in Drawing 01 in Appendix B.

5.2 East Abutment

The first eight openings from the east end including the existing armouring angle at the south end and the temporary steel plate repair in the west bound lane should be replaced with new grating with an armouring angle. The armouring angle is to prevent any further damage from impact due to the elevation difference. The splice of the new and existing grating panels is to be centered over the first transverse sill from the east and welded to a new trim bar.

The concrete / debris at the east end of the bridge over the transverse sills should be removed to decelerate the corrosion of the steel sills.

The elevation difference between the approach and deck should be rectified under ongoing steel repairs for the span locks.

5.3 Grating Failure

The repair area for the existing opening in the grating would extend beyond the limits of the broken grating to the next transverse sill to the east and west making the repair approximately 915mm long (3') and extend the repair area transversely by 5 additional openings on each side making it approximately 955mm wide. The longitudinal splices will require four new angles welded on each side to the adjoining panels and the transverse splices will require a new trim bar for the existing and new panels to be welded to.

6. CONSTRUCTION DURATION, STAGING AND TRAFFIC MANAGEMENT

A full bridge closure would be required to complete the deck grating repairs. The work is estimated to take five nights between the hours of 9:30pm and 6:00am as specified by the City of Kingston. A detour would be created directing traffic to cross the Cataraqui River by the Highway 401 bridge via Montreal Street and Highway 15.

7. COST ESTIMATE OF SHORT-TERM REPAIRS

The Class 'C' Cost Estimate for the repairs to the steel deck grating on the LaSalle Causeway is \$48,000. The cost estimate includes a 15% contingency allowance and is based on 2017 construction prices, but excludes the detailed repair drawings, engineering oversight and HST. The detailed breakdown of the work items and cost estimate is provided in Table 1. The cost estimate is based on recent construction costs available and Parsons' own databases.

Table 1: Cost Estimate for Short-term Repairs to Deck Grating

LaSalle Causeway - Bascule Bridge - Steel Deck Grating Repairs						
Item No.	Item Description	Unit	Quantity	Unit Rate	Total Cost	% of Total
1	Traffic Control (Bridge Shutdowns)	LS	5	\$2,000	\$10,000	24.24%
2	Removal of Existing Steel Grating	m2	4	\$500	\$2,000	4.85%
3	Installation of New Steel Grating	m2	4	\$3,500	\$14,000	33.94%
4	Installation of New Steel Angle at East Abutment	m	7	\$500	\$3,500	8.48%
5	Installation of Angles for Bent and Broken Cross-Bars	Each	75	\$150	\$11,250	27.27%
5	Remove Concrete/ Debris from Grating	LS	1	\$500	\$500	1.21%
Sub-total					\$41,250	100.00%
Contingency (15%)					\$6,188	
Total Estimated Cost					\$48,000	

8. CONCLUSIONS

Based on the inspection completed on March 8, 2017 by Parsons, the steel deck grating on the Bascule Bridge is in fair condition with localized areas in poor condition. The following short term repairs are recommended to be completed within the next year:

- Replace the steel grating from 450mm from the east abutment;
- Install a steel angle along the east end of the deck to prevent further impact damage due to the elevation difference;
- Correct elevation difference at east abutment;
- Replace a portion of the grating at the location of the grating failure;
- Install steel angles at locations of bent or broken transverse cross-bars; and
- Remove the debris / concrete in the grating over the transverse sills at the east abutment.

This repair work is anticipated to be completed during five night closures between 9 pm and 6 am and cost approximately \$48,000.

In the medium term, it is expected that the steel grating will reach the end of its service life. As is, it no longer has any serrated edges along the wheel path, and is starting to exhibit medium corrosion in localized areas. Local repairs due to fractures and broken welds can be expected as it nears the end of its service life.

It is recommended that capital allowances are made to replace the entire steel deck grating in the 6 to 10-year timeframe.

9. CLOSURE

We trust that this report contains sufficient information for your present purposes. If you have any questions regarding this report, please contact us.

Yours truly,

PARSONS INC.

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Structural Designer

Reviewed by:
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Senior Structural Engineer – Project Manager

APPENDIX A

SITE INSPECTION PHOTOGRAPHS



Photo 1: General view of the steel grating on the Bascule bridge looking from the east approach.

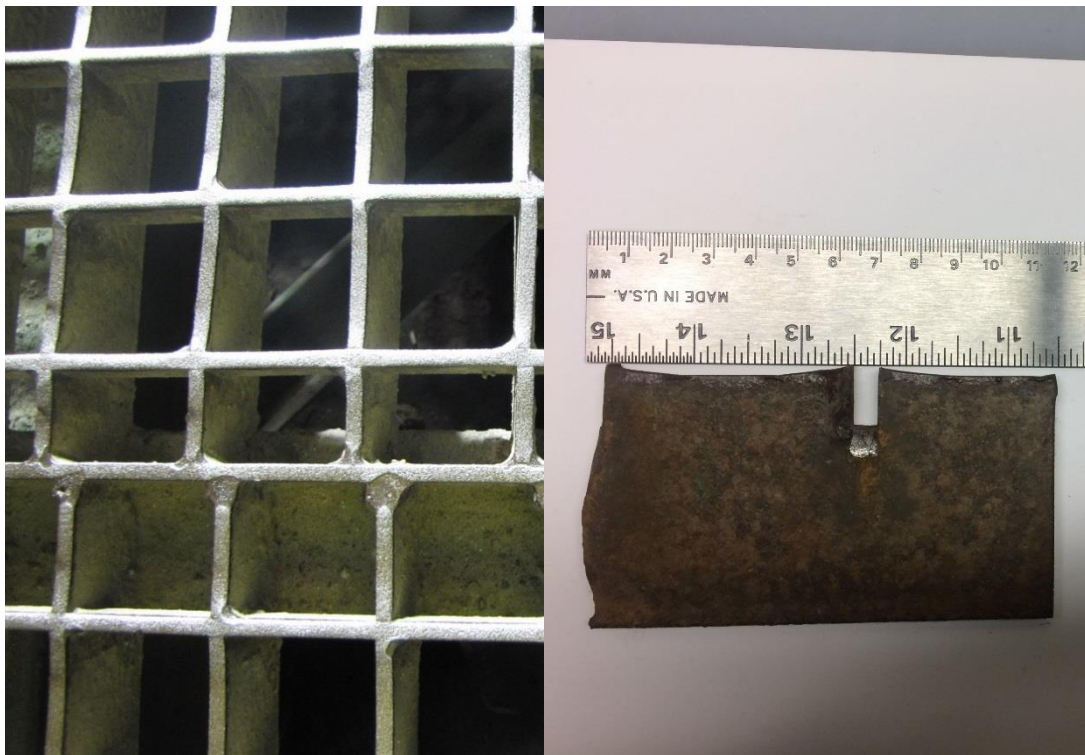


Photo 2: Loss of serrated edge on both cross-bars and bearing bars and profile of bearing bars



Photo 3: Light to medium corrosion of cross bars and bearing bars at the north curb by the west abutment.

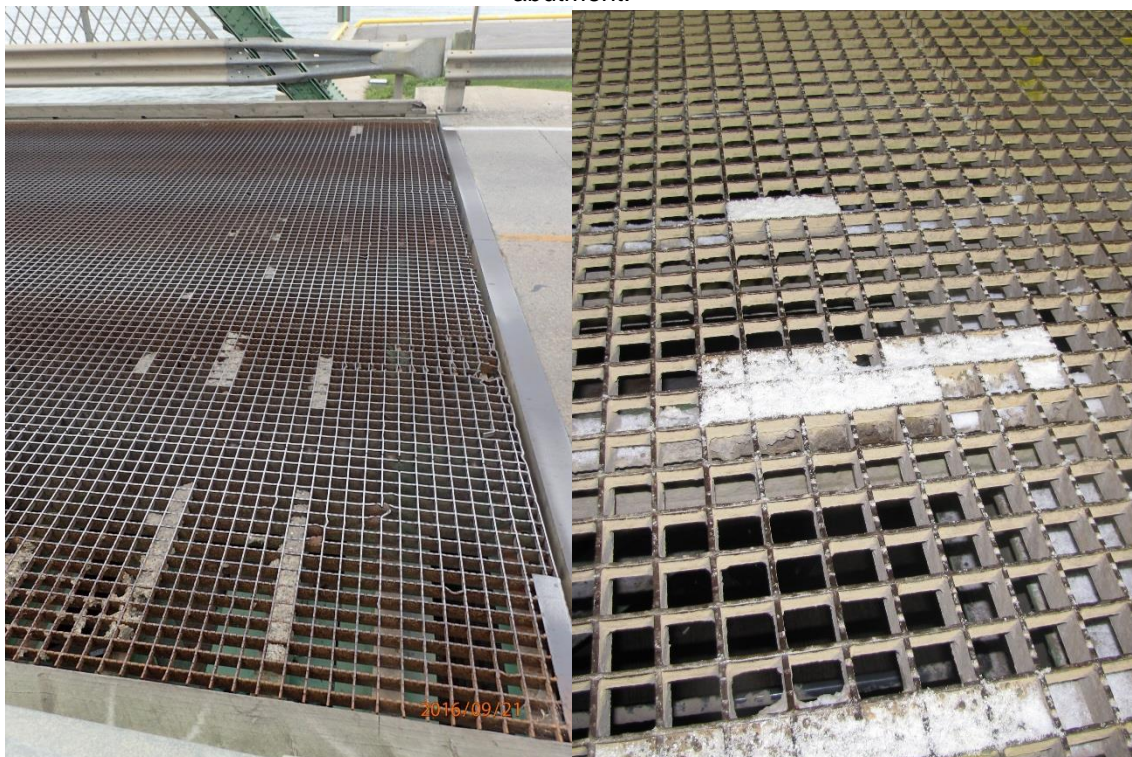


Photo 4: Debris in the grating at the east abutment (Photo on left taken in September 2015)

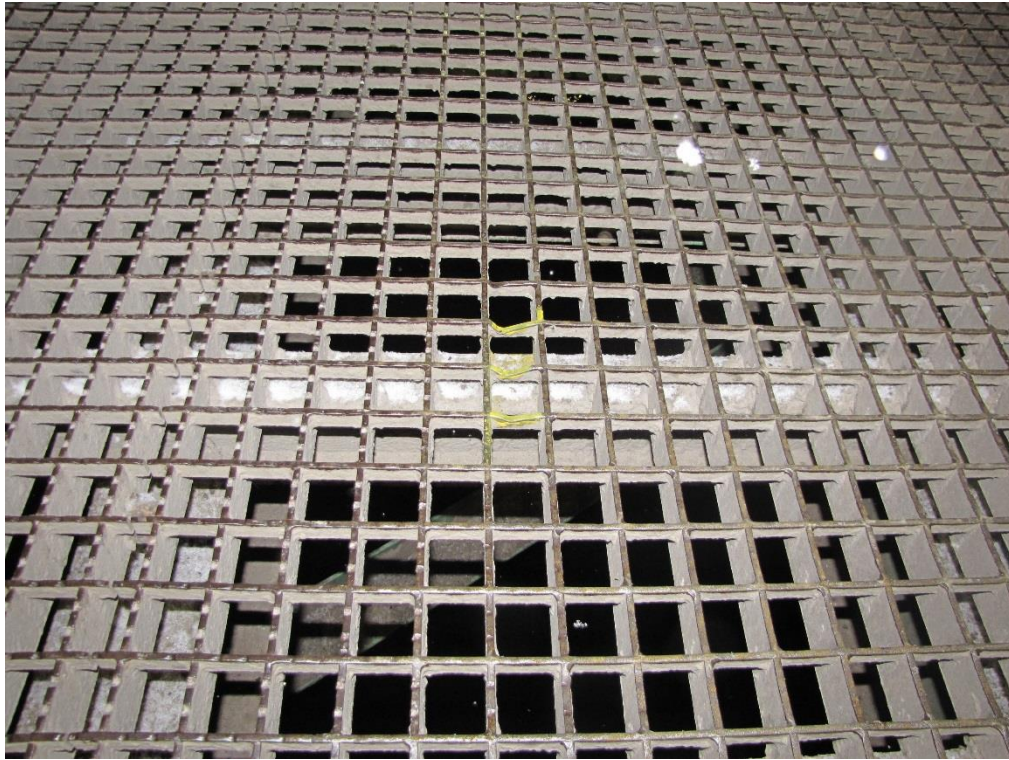


Photo 5: Multiple bent transverse cross-bars (C8-10 at 64-6) – typical at multiple locations

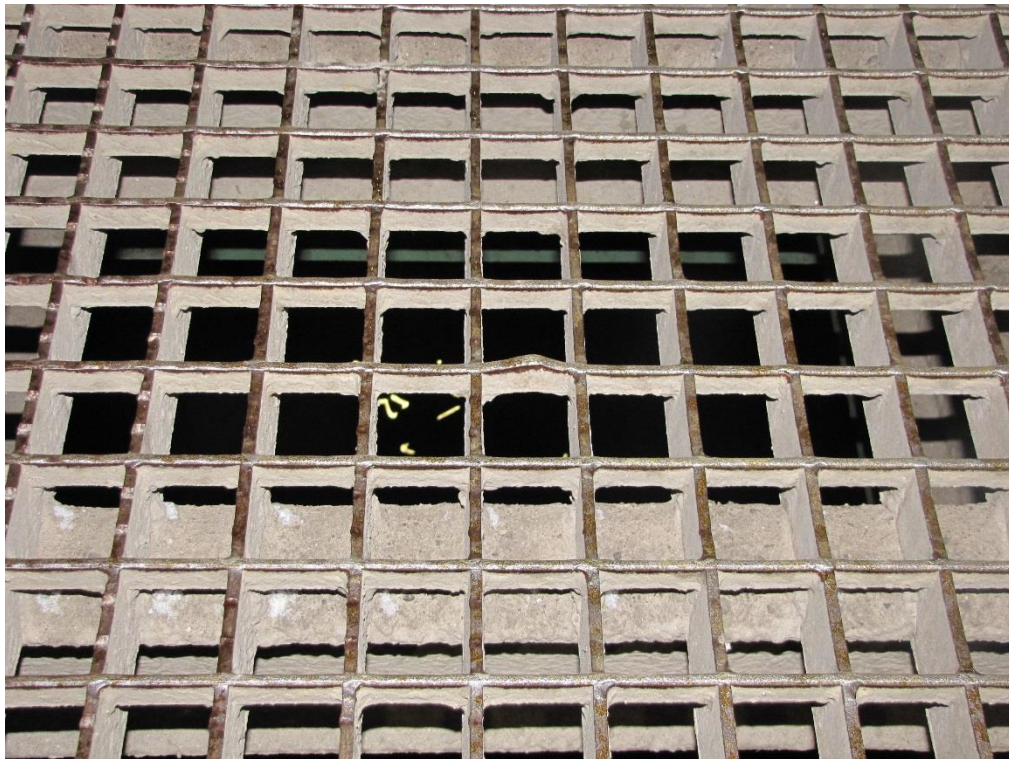


Photo 6: Bent Transverse Cross-Bar (Typical throughout)



Photo 7: Broken Bars at (D14-15 at row 4)

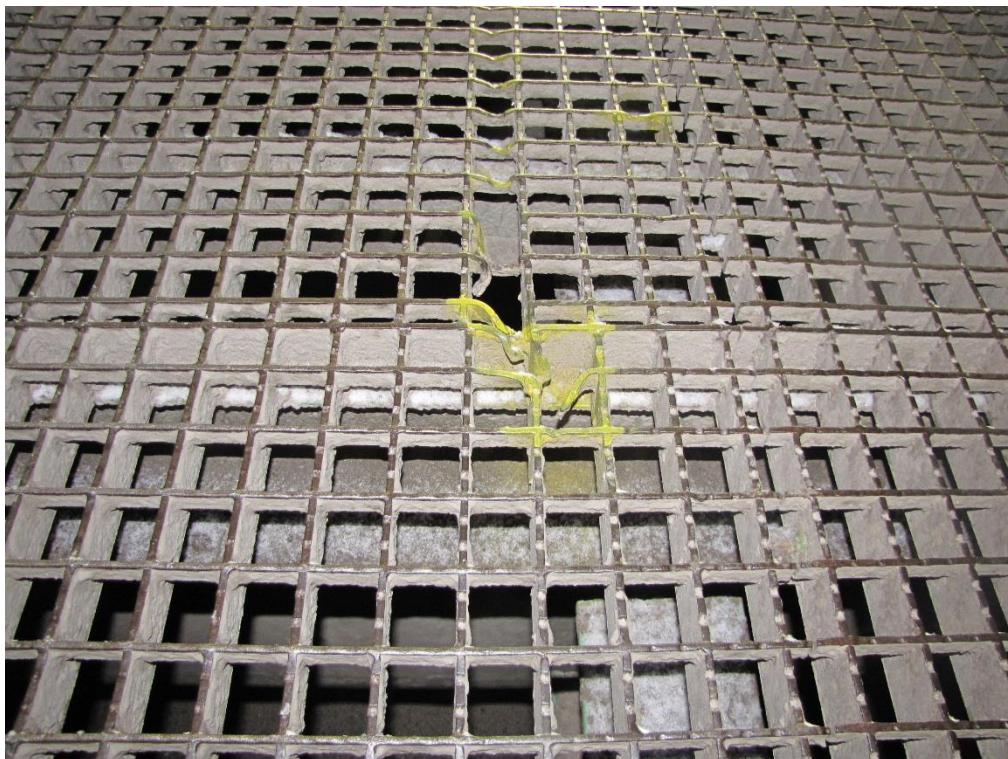


Photo 8: Broken and Bent Transverse Cross-Bars (12-14 at 1-13)



Photo 9: Armouring at south side at east abutment.



Photo 10: End cross-bar terminates 2.2 metres from the south curb.



Photo 11: Broken and bent cross-bars and bearing bars at east abutment



Photo 12: Condition of grating at east abutment prior to temporary repair.

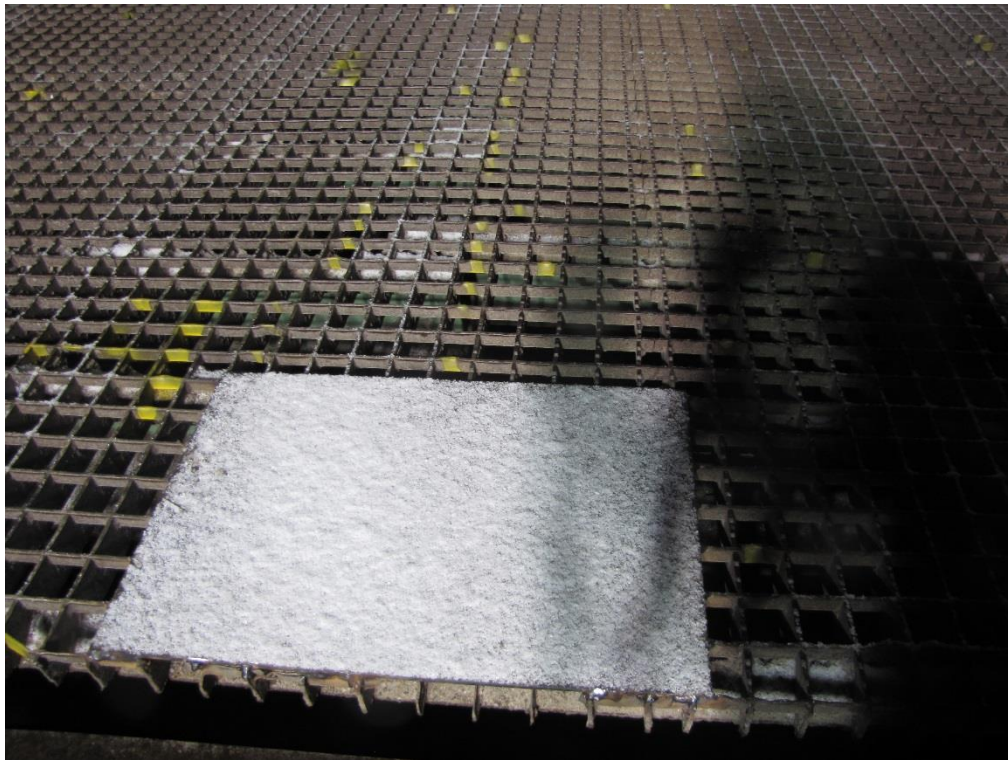


Photo 13: Temporary steel plate repair at east abutment.

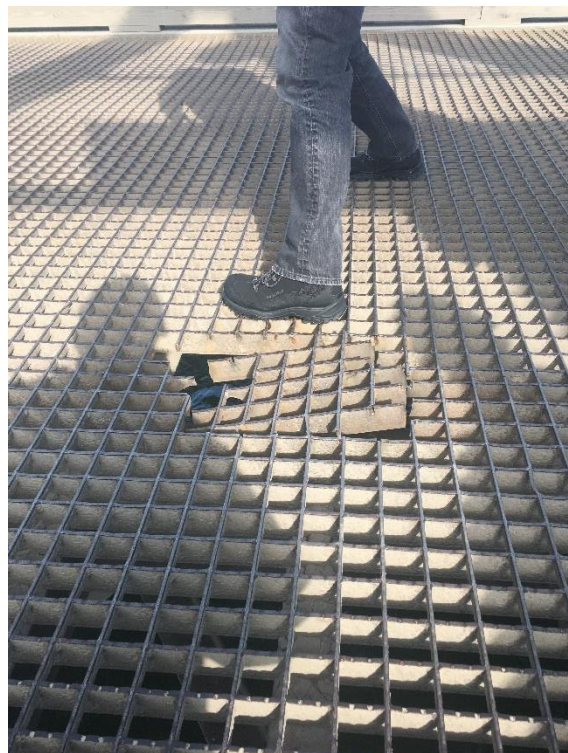


Photo 14: Broken piece of grating at the center of the bridge in the eastbound lane.

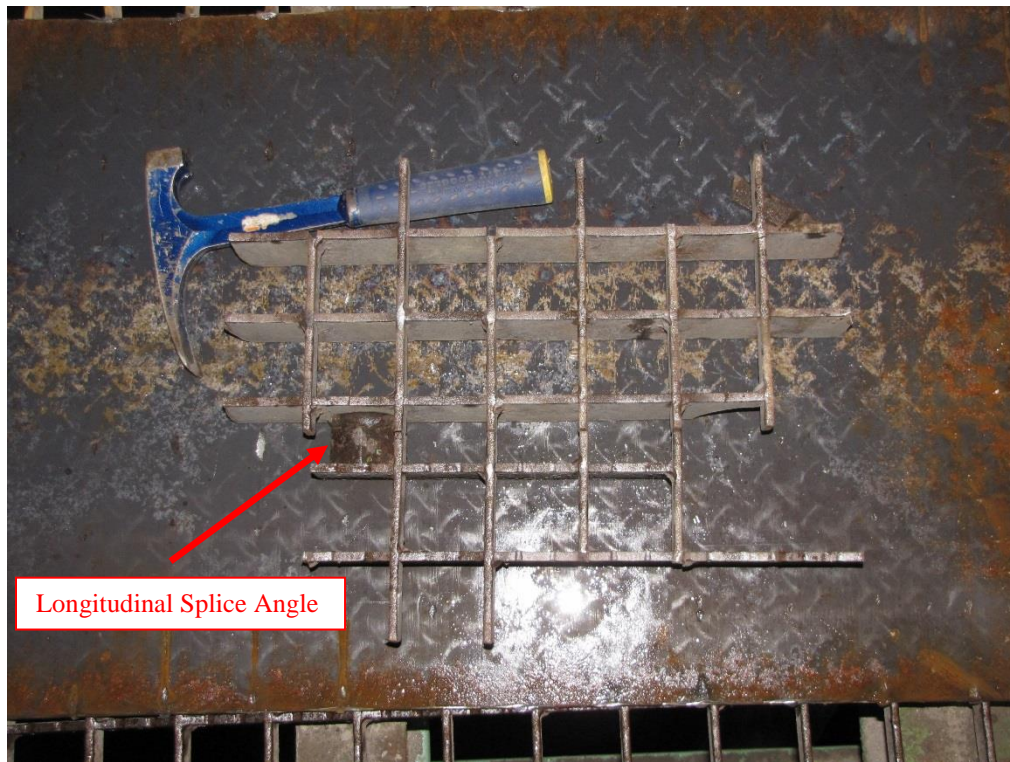


Photo 15: Piece of grating that broke loss.

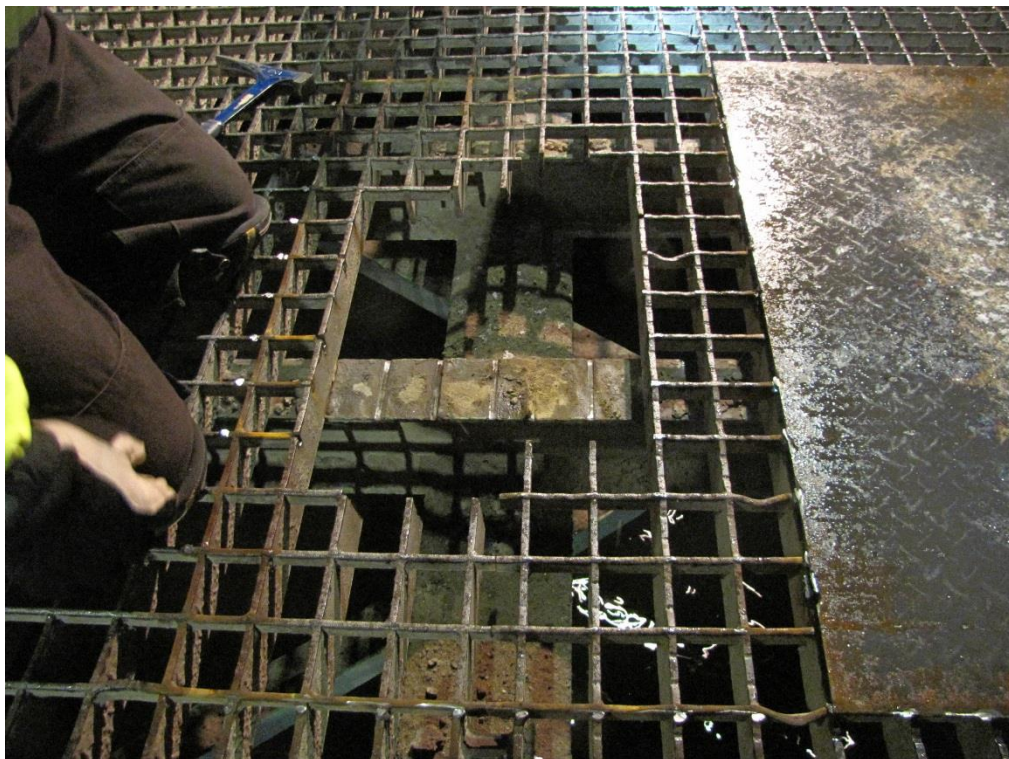


Photo 16: Size of opening in grating over transverse sill.



Photo 17: Crack in bearing bar propagating from notch for cross bar at sill. Adjacent to piece that was broken off.



Photo 18: Crack in Bearing bar propagating from cross bar notch.



Photo 19: Crack in bearing bar propagating from notch in sample taken from piece that failed.



Photo 20: Crack in bearing bar propagating from cross bar notch.



Photo 21: Wearing of base of bearing bars at sill location.

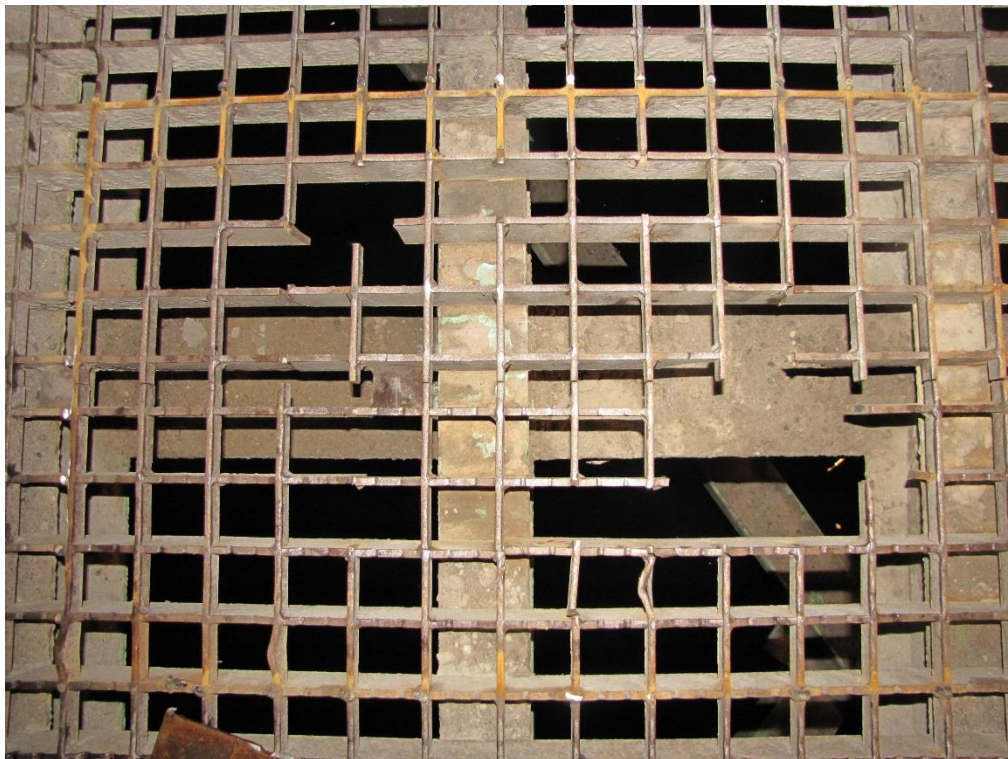


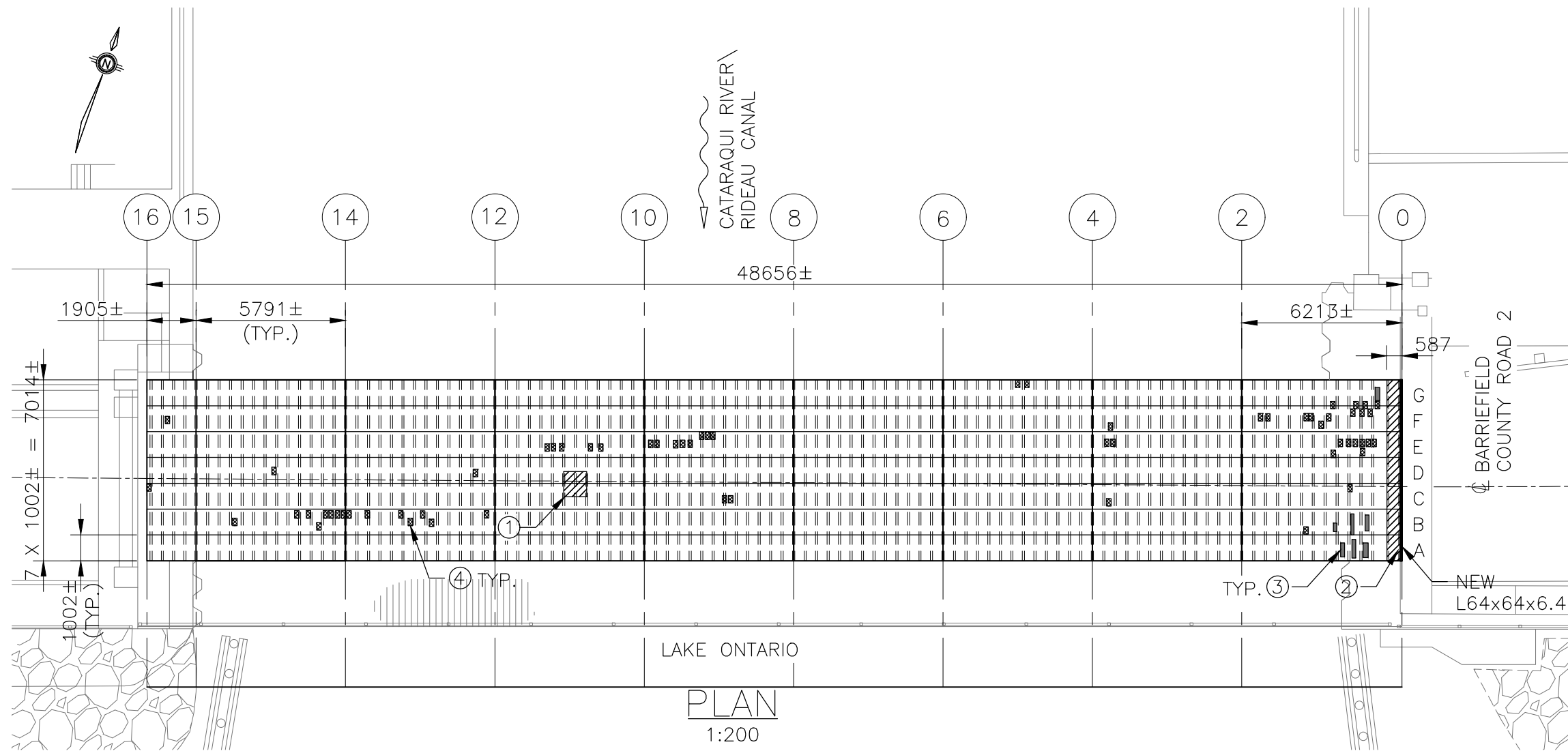
Photo 22: Piece of grating that broke off in opening.



Photo 23: Bent Transverse Bars at location of grating hole

APPENDIX B

**DECK GRATING DETERIORATION DRAWINGS & SUGGESTED SHORT-TERM
REPAIR DETAILS**



RECOMMENDED REPAIRS:

- ① REMOVE AND REPLACE STEEL GRATING AT GRATING FAILURE.
- ② REMOVE AND REPLACE STEEL GRATING AT EAST END.
- ③ REMOVE DEBRIS/CONCRETE FROM GRATING AT EAST END.
- ④ INSTALL ANGLES FOR BENT AND BROKEN CROSS-BARS.

LEGEND:

- NEW STEEL DECK GRATING
- NEW STEEL ANGLE BETWEEN BEARING BARS
- CONCRETE/DEBRIS IN GRATING

PLAN
1:200

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	16	15	14	12	10	8	6	4	2	0
G										
D										
C										
A										

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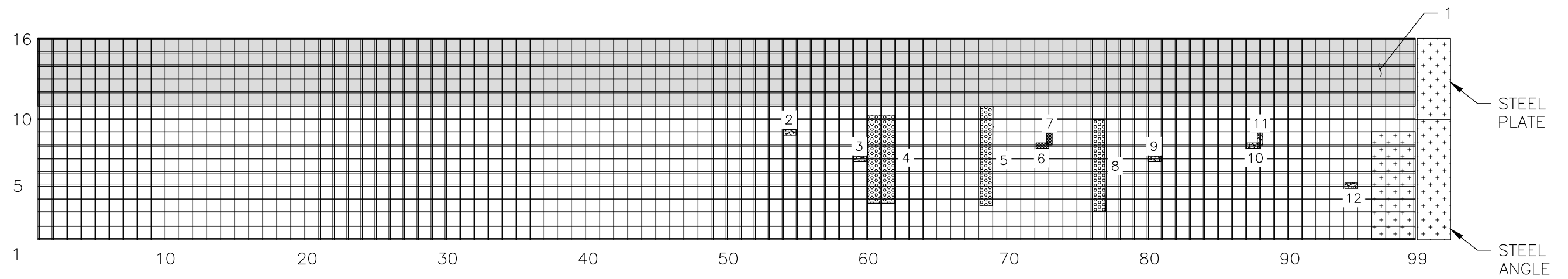
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BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

drawing title
titre du dessin
**GENERAL ARRANGEMENT
RECOMMENDED REPAIRS**

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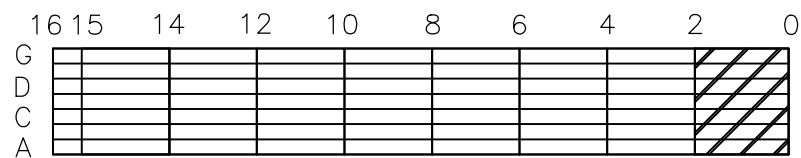
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0-2 - A
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BROKEN LONGITUDINAL BAR
3	BROKEN LONGITUDINAL BAR
4	DEBRIS
5	DEBRIS
6	BENT LONGITUDINAL BAR
7	BENT TRANSVERSE BAR
8	DEBRIS
9	BROKEN LONGITUDINAL BAR
10	BROKEN LONGITUDINAL BAR
11	BROKEN TRANSVERSE BAR
12	BROKEN LONGITUDINAL BAR

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KINGSTON
ONTARIO

DECK GRATING REPAIRS

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BRIDGE GRATING
DETERIORATIONS



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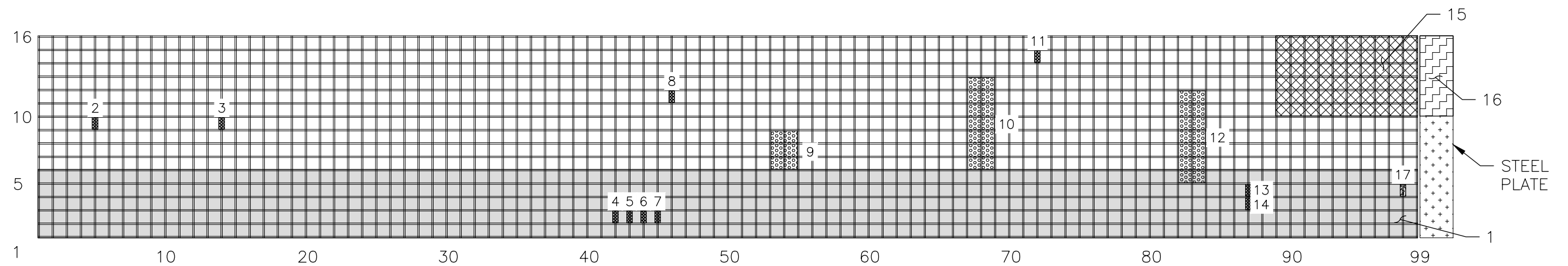
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soumission administrateur de projets

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project date date du projet

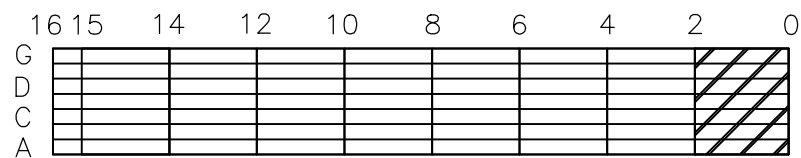
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drawing no. dessine no.



0-2 - B
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR
9	DEBRIS
10	DEBRIS
11	BENT TRANSVERSE BAR
12	DEBRIS
13	BENT TRANSVERSE BAR
14	BENT TRANSVERSE BAR
15	SEVERELY BENT AND BROKEN TRANSVERSE BARS
16	BENT STEEL END PLATE
17	BROKEN TRANSVERSE BAR



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BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

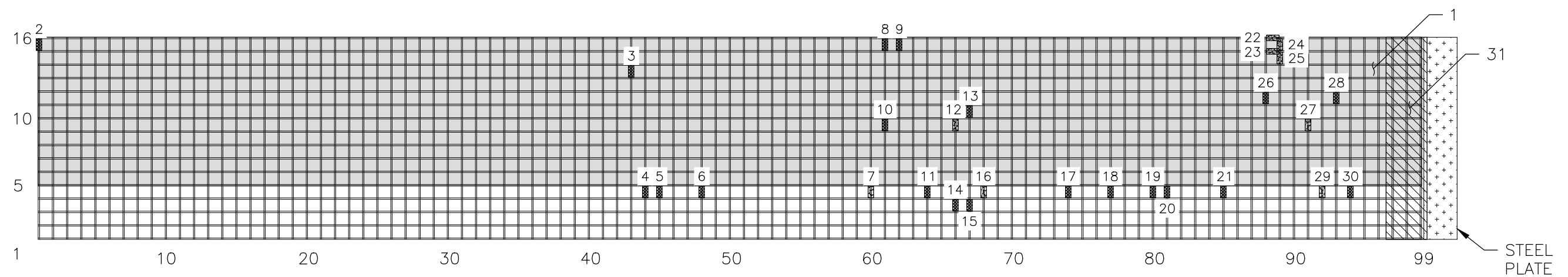
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**BRIDGE GRATING
DETERIORATIONS**



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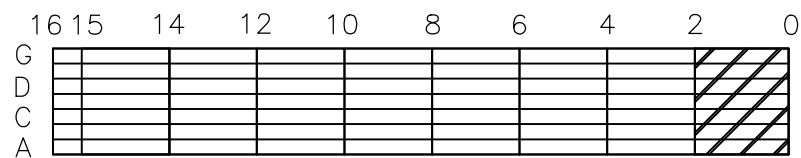
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1:20

DEFECT No.	DESCRIPTION	DEFECT No.	DESCRIPTION
1	ABRASION	17	BENT TRANSVERSE BAR
2	BENT TRANSVERSE BAR	18	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR	19	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR	20	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR	21	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR	22	BROKEN LONGITUDINAL BAR
7	BROKEN TRANSVERSE BAR	23	BROKEN LONGITUDINAL BAR
8	BENT TRANSVERSE BAR	24	BROKEN TRANSVERSE BAR
9	BENT TRANSVERSE BAR	25	BROKEN TRANSVERSE BAR
10	BENT TRANSVERSE BAR	26	BENT TRANSVERSE BAR
11	BENT TRANSVERSE BAR	27	BROKEN TRANSVERSE BAR
12	BROKEN TRANSVERSE BAR	28	BENT TRANSVERSE BAR
13	BENT TRANSVERSE BAR	29	BROKEN TRANSVERSE BAR
14	BENT TRANSVERSE BAR	30	BENT TRANSVERSE BAR
15	BENT TRANSVERSE BAR	31	AREA OF BROKEN TRANSVERSE BARS
16	BROKEN TRANSVERSE BAR		

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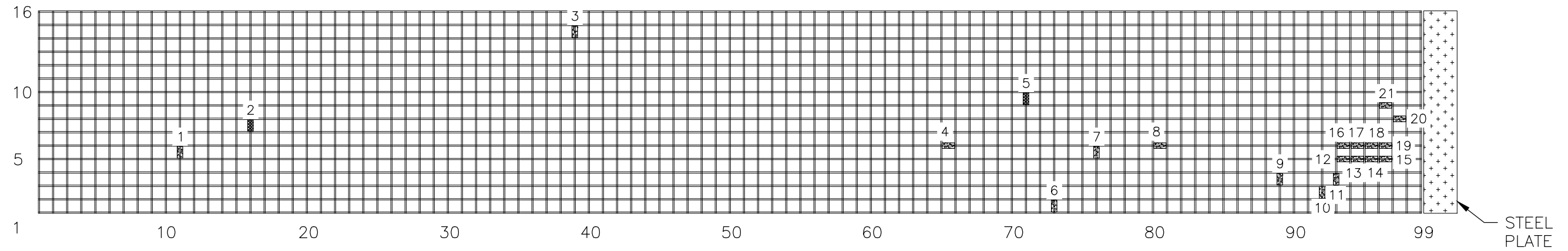
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**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

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**BRIDGE GRATING
DETERIORATIONS**

PARSONS

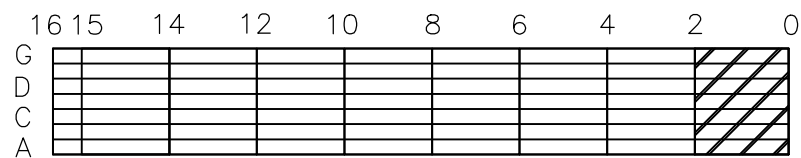
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1:20

DEFECT No.	DESCRIPTION	DEFECT No.	DESCRIPTION
1	BROKEN TRANSVERSE BAR	12	BROKEN LONGITUDINAL BAR
2	BENT TRANSVERSE BAR	13	BROKEN LONGITUDINAL BAR
3	BROKEN TRANSVERSE BAR	14	BROKEN LONGITUDINAL BAR
4	BROKEN LONGITUDINAL BAR	15	BROKEN LONGITUDINAL BAR
5	BENT TRANSVERSE BAR	16	BROKEN LONGITUDINAL BAR
6	BROKEN TRANSVERSE BAR	17	BROKEN LONGITUDINAL BAR
7	BROKEN TRANSVERSE BAR	18	BROKEN LONGITUDINAL BAR
8	BROKEN LONGITUDINAL BAR	19	BROKEN LONGITUDINAL BAR
9	BROKEN TRANSVERSE BAR	20	BROKEN LONGITUDINAL BAR
10	BROKEN TRANSVERSE BAR	21	BROKEN LONGITUDINAL BAR
11	BROKEN TRANSVERSE BAR		

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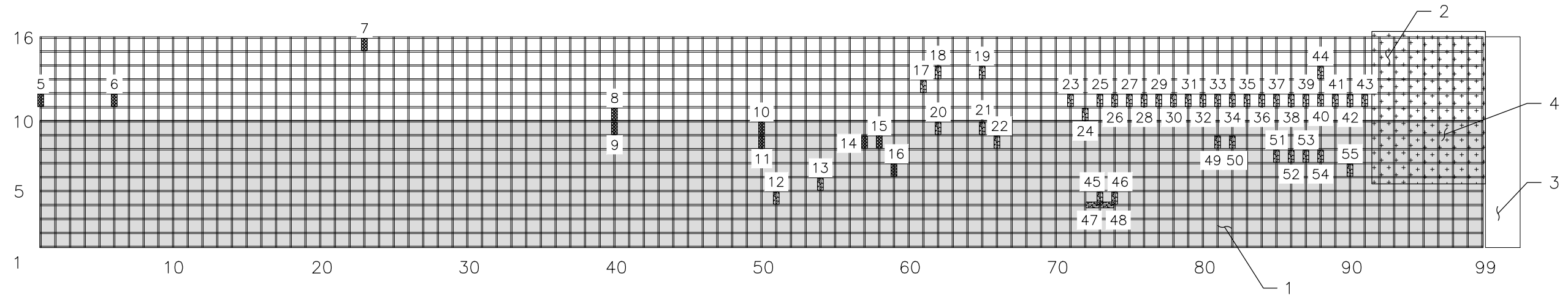
project title
titre du projet
**LASALLE CAUSEWAY
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KINGSTON
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DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	06 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

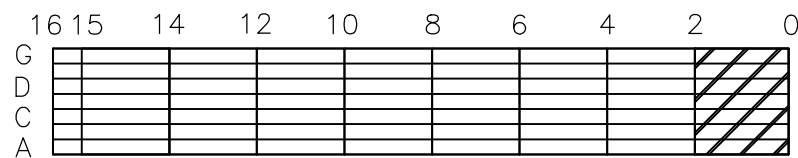


0-2 - E

1:20

DEFECT No.	DESCRIPTION	DEFECT No.	DESCRIPTION	DEFECT No.	DESCRIPTION
1	ABRASION	20	BROKEN TRANSVERSE BAR	39	BROKEN TRANSVERSE BAR
2	TEMPORARY STEEL PLATE	21	BROKEN TRANSVERSE BAR	40	BROKEN TRANSVERSE BAR
3	MISSING STEEL PLATE	22	BROKEN TRANSVERSE BAR	41	BROKEN TRANSVERSE BAR
4	LONGITUDINAL AND TRANSVERSE BARS MISSING	23	BROKEN TRANSVERSE BAR	42	BROKEN TRANSVERSE BAR
5	BENT TRANSVERSE BAR	24	BROKEN TRANSVERSE BAR	43	BROKEN TRANSVERSE BAR
6	BENT TRANSVERSE BAR	25	BROKEN TRANSVERSE BAR	44	BROKEN TRANSVERSE BAR
7	BENT TRANSVERSE BAR	26	BROKEN TRANSVERSE BAR	45	BROKEN TRANSVERSE BAR
8	BENT TRANSVERSE BAR	27	BROKEN TRANSVERSE BAR	46	BROKEN TRANSVERSE BAR
9	BENT TRANSVERSE BAR	28	BROKEN TRANSVERSE BAR	47	BROKEN LONGITUDINAL BAR
10	BENT TRANSVERSE BAR	29	BROKEN TRANSVERSE BAR	48	BROKEN LONGITUDINAL BAR
11	BENT TRANSVERSE BAR	30	BROKEN TRANSVERSE BAR	49	BROKEN TRANSVERSE BAR
12	BROKEN TRANSVERSE BAR	31	BROKEN TRANSVERSE BAR	50	BROKEN TRANSVERSE BAR
13	BROKEN TRANSVERSE BAR	32	BROKEN TRANSVERSE BAR	51	BROKEN TRANSVERSE BAR
14	BENT TRANSVERSE BAR	33	BROKEN TRANSVERSE BAR	52	BROKEN TRANSVERSE BAR
15	BENT TRANSVERSE BAR	34	BROKEN TRANSVERSE BAR	53	BROKEN TRANSVERSE BAR
16	BENT TRANSVERSE BAR	35	BROKEN TRANSVERSE BAR	54	BROKEN TRANSVERSE BAR
17	BROKEN TRANSVERSE BAR	36	BROKEN TRANSVERSE BAR	55	BROKEN TRANSVERSE BAR
18	BROKEN TRANSVERSE BAR	37	BROKEN TRANSVERSE BAR		
19	BROKEN TRANSVERSE BAR	38	BROKEN TRANSVERSE BAR		

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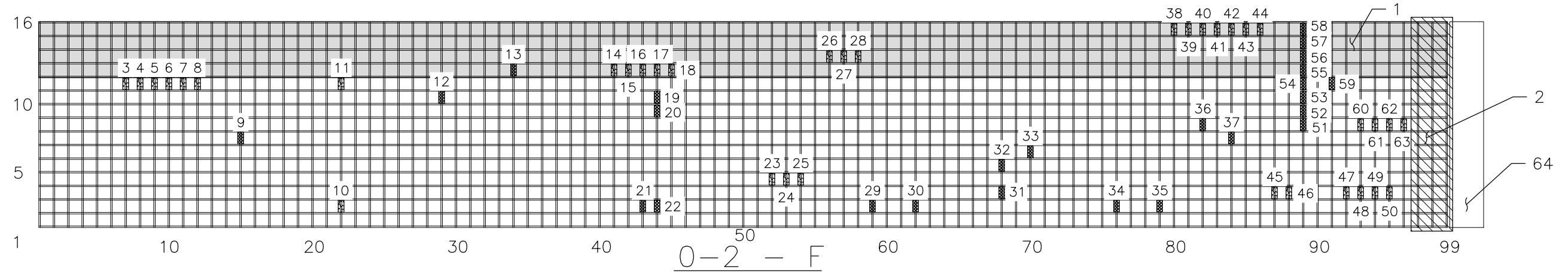
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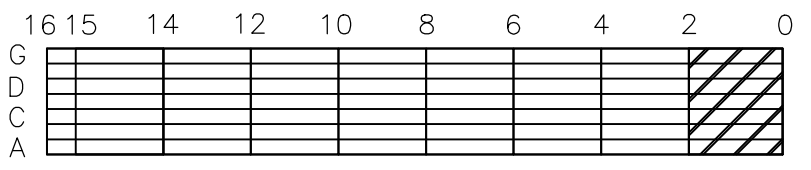
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CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets


17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
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1:20

DEFECT No.	DESCRIPTION	DEFECT No.	DESCRIPTION	DEFECT No.	DESCRIPTION
1	ABRASION	22	BENT TRANSVERSE BAR	43	BROKEN TRANSVERSE BAR
2	AREA OF BROKEN TRANSVERSE BARS	23	BROKEN TRANSVERSE BAR	44	BROKEN TRANSVERSE BAR
3	BROKEN TRANSVERSE BAR	24	BROKEN TRANSVERSE BAR	45	BROKEN TRANSVERSE BAR
4	BROKEN TRANSVERSE BAR	25	BROKEN TRANSVERSE BAR	46	BROKEN TRANSVERSE BAR
5	BROKEN TRANSVERSE BAR	26	BROKEN TRANSVERSE BAR	47	BROKEN TRANSVERSE BAR
6	BROKEN TRANSVERSE BAR	27	BROKEN TRANSVERSE BAR	48	BROKEN TRANSVERSE BAR
7	BROKEN TRANSVERSE BAR	28	BROKEN TRANSVERSE BAR	49	BROKEN TRANSVERSE BAR
8	BROKEN TRANSVERSE BAR	29	BENT TRANSVERSE BAR	50	BROKEN TRANSVERSE BAR
9	BENT TRANSVERSE BAR	30	BENT TRANSVERSE BAR	51	BENT TRANSVERSE BAR
10	BROKEN TRANSVERSE BAR	31	BENT TRANSVERSE BAR	52	BENT TRANSVERSE BAR
11	BROKEN TRANSVERSE BAR	32	BENT TRANSVERSE BAR	53	BENT TRANSVERSE BAR
12	BENT TRANSVERSE BAR	33	BENT TRANSVERSE BAR	54	BENT TRANSVERSE BAR
13	BENT TRANSVERSE BAR	34	BENT TRANSVERSE BAR	55	BENT TRANSVERSE BAR
14	BROKEN TRANSVERSE BAR	35	BENT TRANSVERSE BAR	56	BENT TRANSVERSE BAR
15	BROKEN TRANSVERSE BAR	36	BENT TRANSVERSE BAR	57	BENT TRANSVERSE BAR
16	BROKEN TRANSVERSE BAR	37	BENT TRANSVERSE BAR	58	BENT TRANSVERSE BAR
17	BROKEN TRANSVERSE BAR	38	BROKEN TRANSVERSE BAR	59	BENT TRANSVERSE BAR
18	BROKEN TRANSVERSE BAR	39	BROKEN TRANSVERSE BAR	60	BROKEN TRANSVERSE BAR
19	BENT TRANSVERSE BAR	40	BROKEN TRANSVERSE BAR	61	BROKEN TRANSVERSE BAR
20	BENT TRANSVERSE BAR	41	BROKEN TRANSVERSE BAR	62	BROKEN TRANSVERSE BAR
21	BENT TRANSVERSE BAR	42	BROKEN TRANSVERSE BAR	63	BROKEN TRANSVERSE BAR
				64	MISSING STEEL PLATE



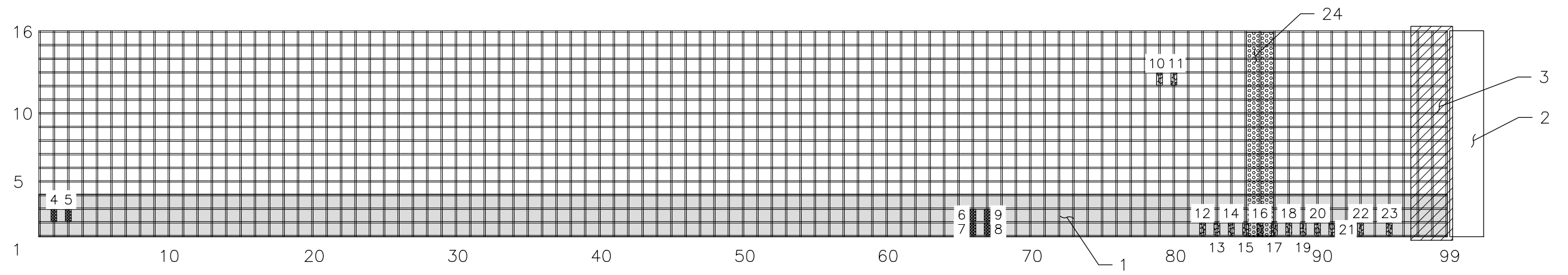

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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	08 OF 65 drawing no.	dessine no.

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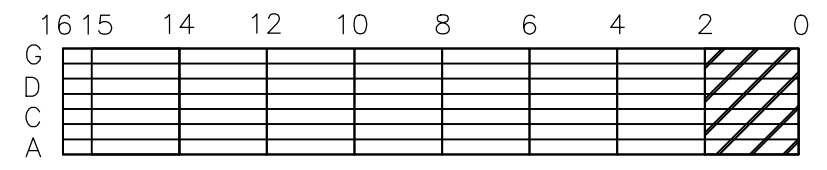



0-2 - G

1:20

DEFECT No.	DESCRIPTION	DEFECT No.	DESCRIPTION
1	ABRASION	13	BROKEN TRANSVERSE BAR
2	MISSING STEEL PLATE	14	BROKEN TRANSVERSE BAR
3	AREA OF BENT TRANSVERSE BARS	15	BROKEN TRANSVERSE BAR
4	BENT TRANSVERSE BAR	16	BROKEN TRANSVERSE BAR
5	BENT TRANSVERSE BAR	17	BROKEN TRANSVERSE BAR
6	BENT TRANSVERSE BAR	18	BROKEN TRANSVERSE BAR
7	BENT TRANSVERSE BAR	19	BROKEN TRANSVERSE BAR
8	BENT TRANSVERSE BAR	20	BROKEN TRANSVERSE BAR
9	BENT TRANSVERSE BAR	21	BROKEN TRANSVERSE BAR
10	BROKEN TRANSVERSE BAR	22	BROKEN TRANSVERSE BAR
11	BROKEN TRANSVERSE BAR	23	BROKEN TRANSVERSE BAR
12	BROKEN TRANSVERSE BAR	24	DEBRIS

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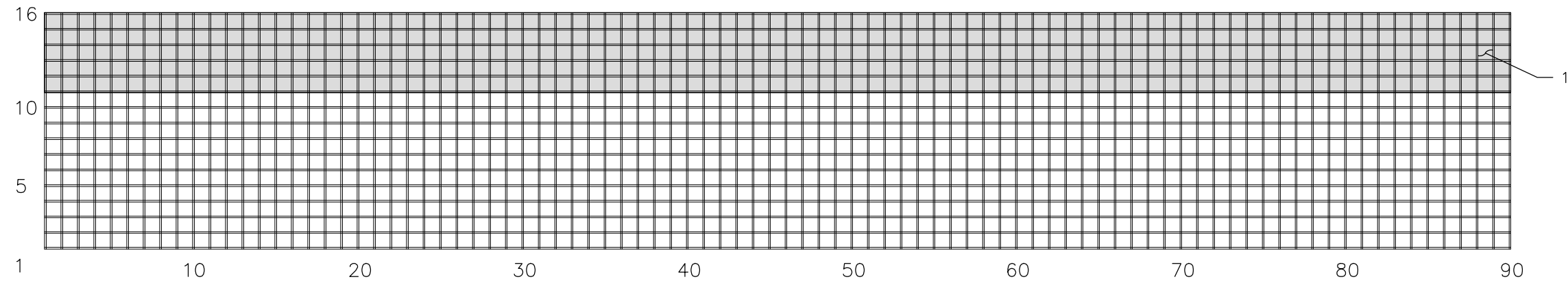


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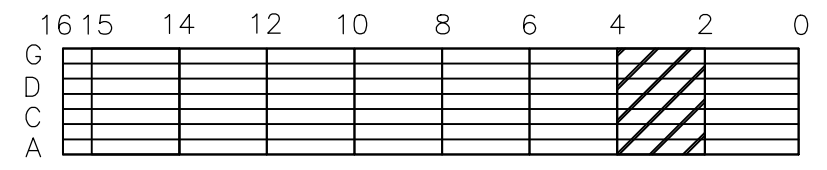

JS drawn by / dessine par	17-03-27 project date / date du projet
CW designed by / conc par	R.082857.001 project no. / no. du projet
MM approved by / approuve par	09 OF 65 drawing no. / dessine no.
tender / soumission	project manager / administrateur de projets



2-4 - A
1:20

DEFECT No.	DESCRIPTION
1	ABRASION

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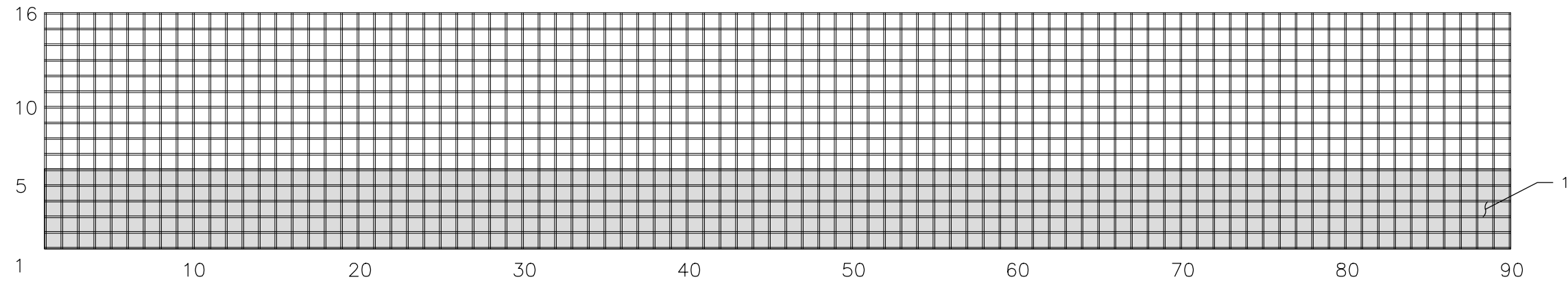
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titre du dessin
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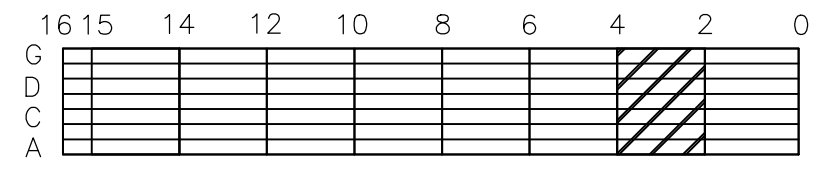
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MM approved by	approuve par
tender soumission	project manager administrateur de projets


17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
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2-4 - B
1:20

DEFECT No.	DESCRIPTION
1	ABRASION



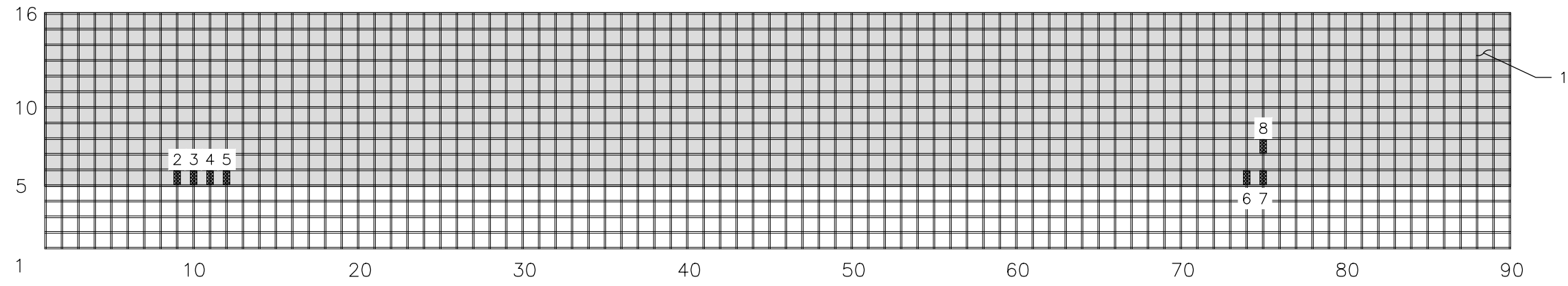

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JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	11 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

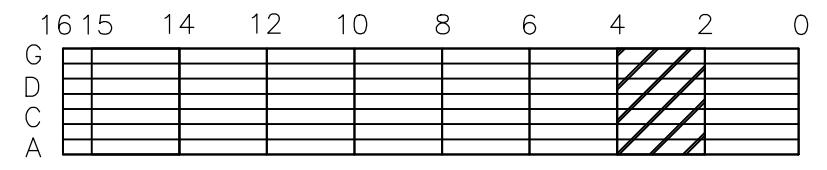
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2-4 - C
1:20


DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR

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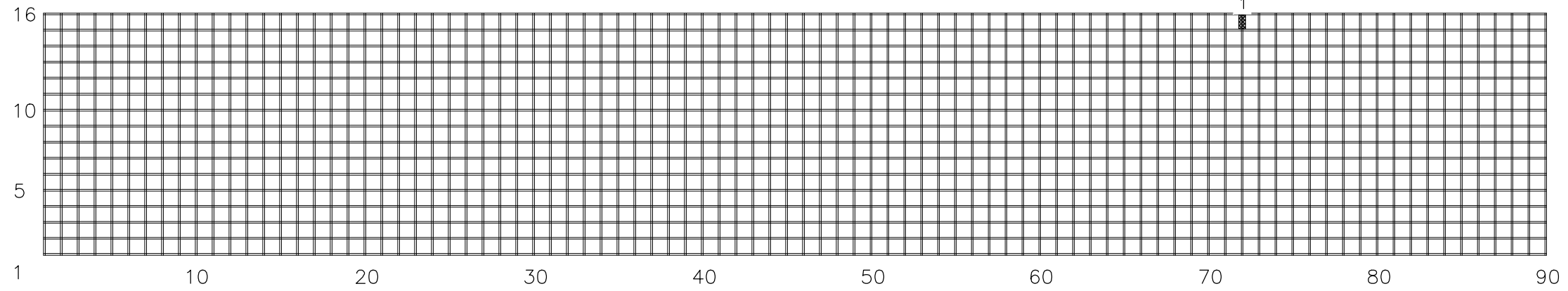



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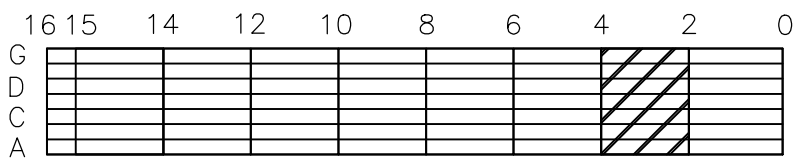
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**BRIDGE GRATING
 DETERIORATIONS**


JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	12 OF 65 drawing no.	dessine no.
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2-4 - D
1:20

DEFECT No.	DESCRIPTION
1	BENT TRANSVERSE BAR



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titre du projet
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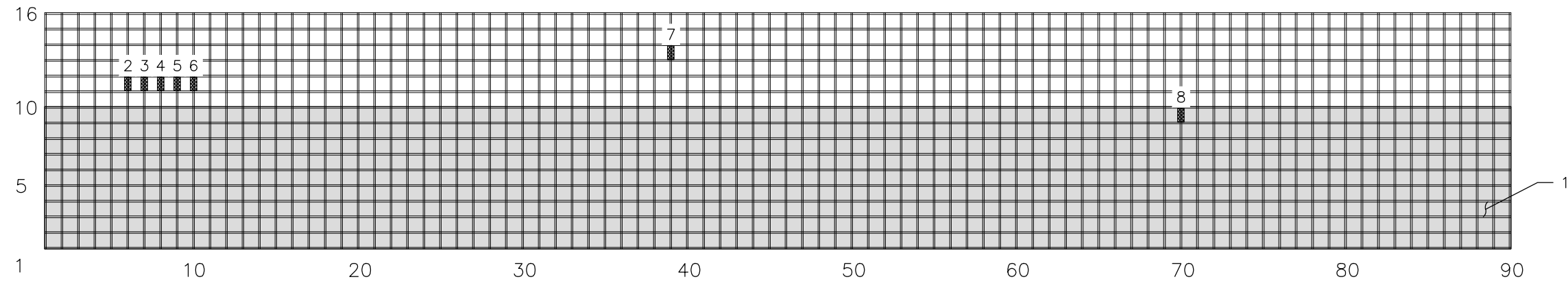
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**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
13 OF 65 drawing no.	dessine no.

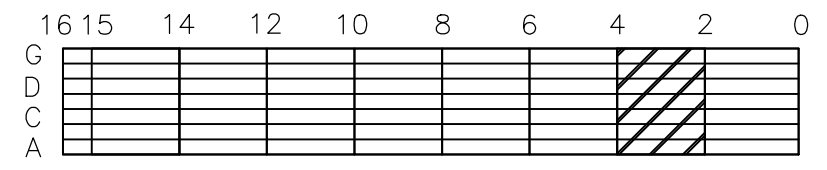
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2-4 - E
1:20


DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR

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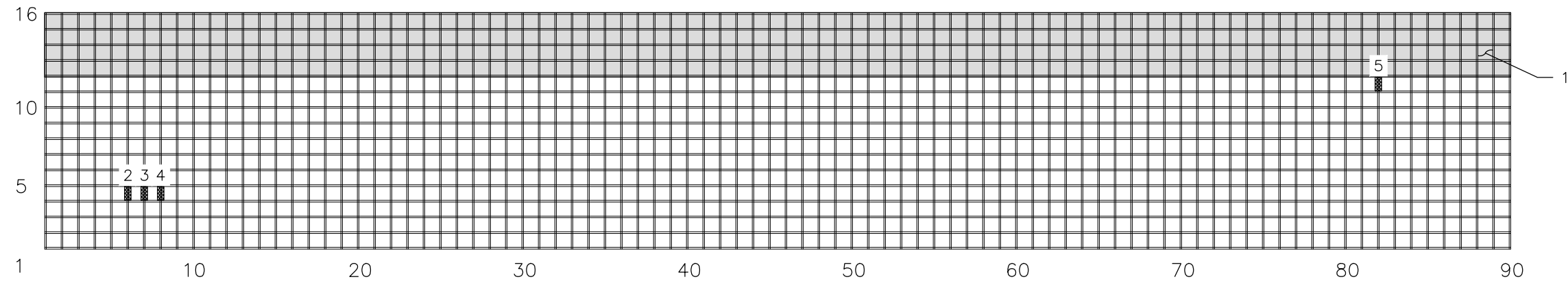



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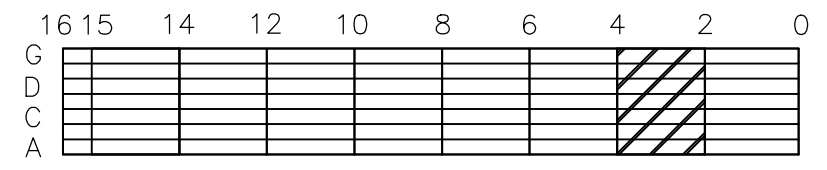
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MM approved by	approuve par	14 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		




2-4 - F
1:20


DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR

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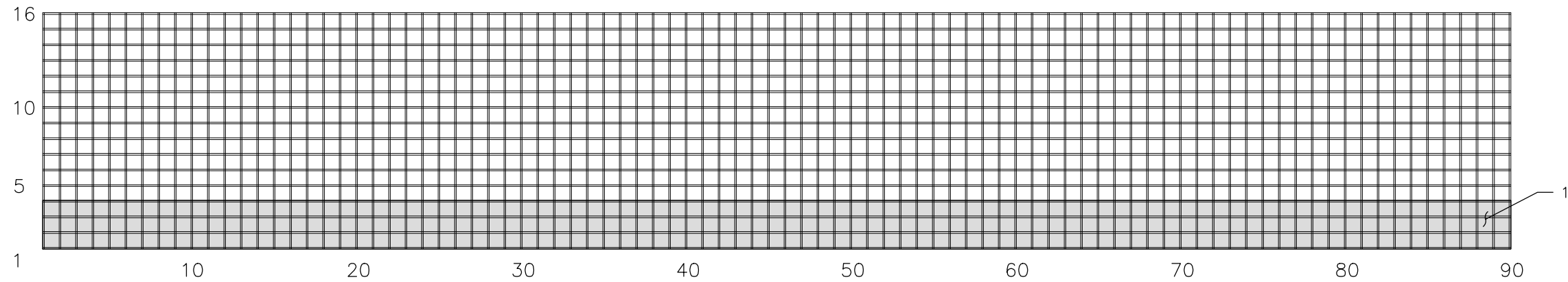



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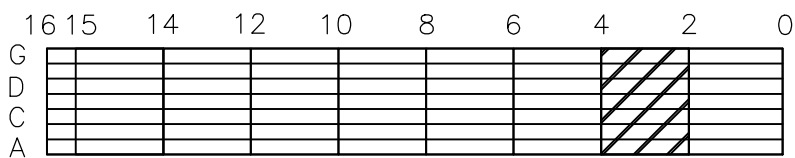
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MM approved by	approuve par	15 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		



2-4 - G

1:20

DEFECT No.	DESCRIPTION
1	ABRASION



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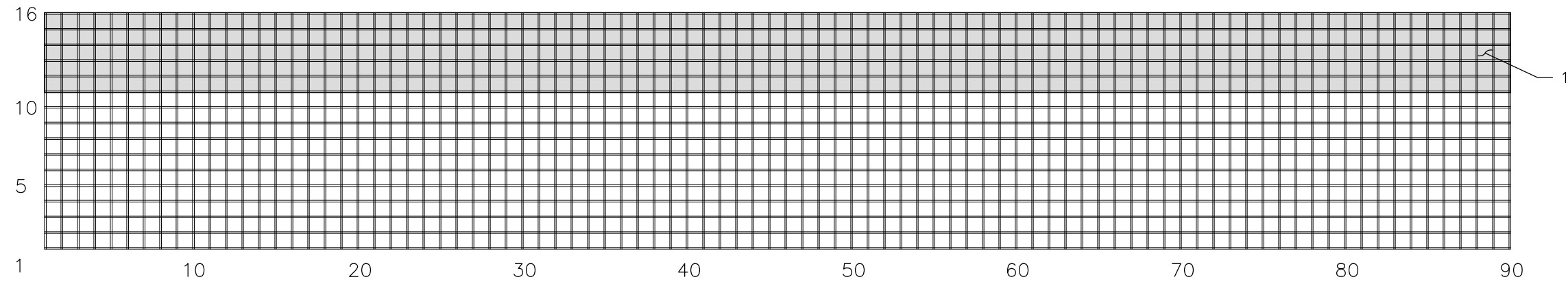
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**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

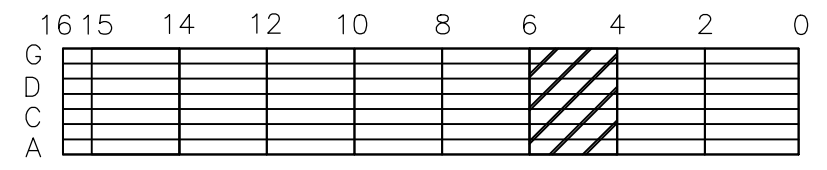
17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
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4-6 - A
1:20

DEFECT No.	DESCRIPTION
1	ABRASION



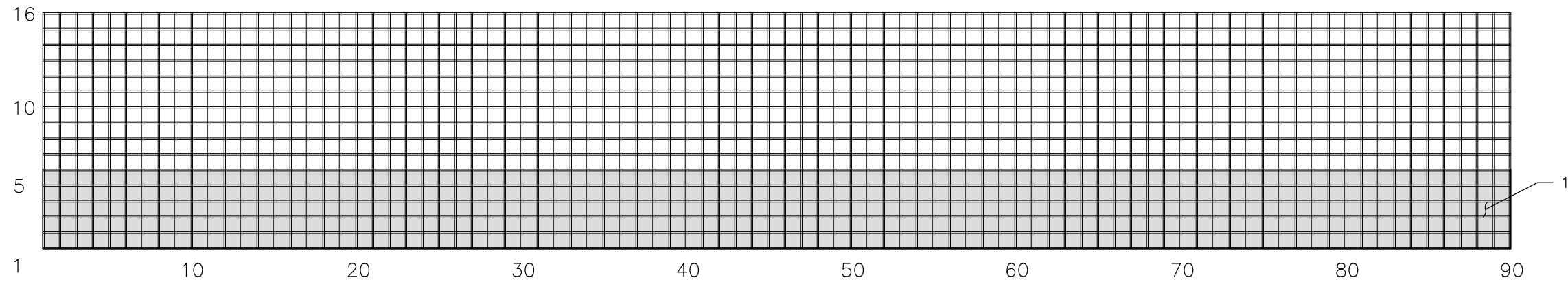

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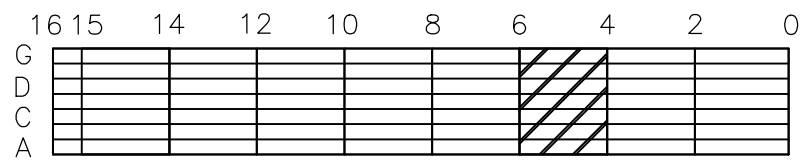
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MM approved by	approuve par	18 OF 65 drawing no.	dessine no.
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1:20

DEFECT No.	DESCRIPTION
1	ABRASION



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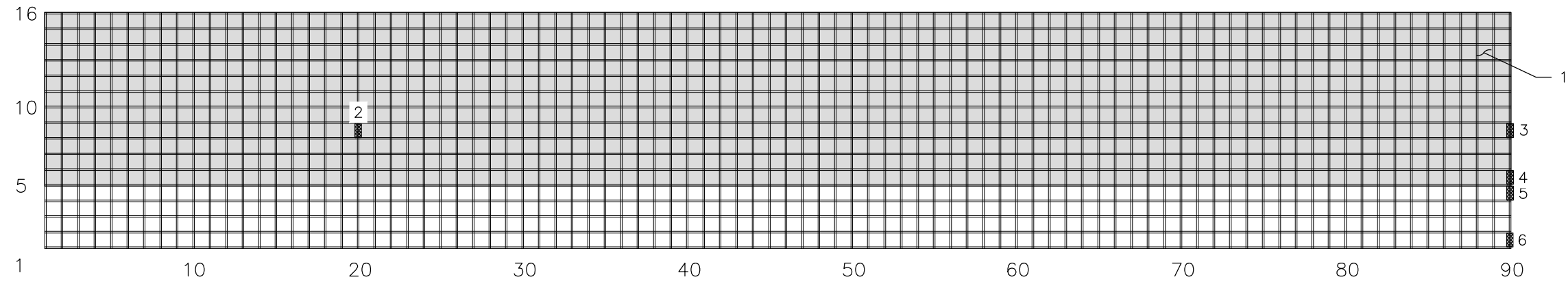
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JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
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17-03-27 project date	date du projet
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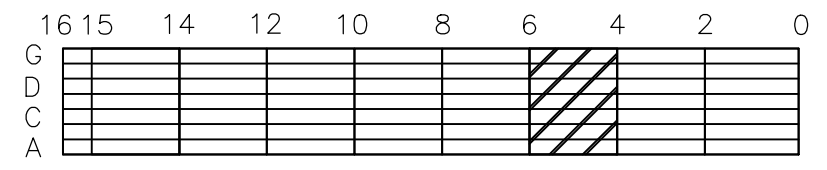
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4-6 - C
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR

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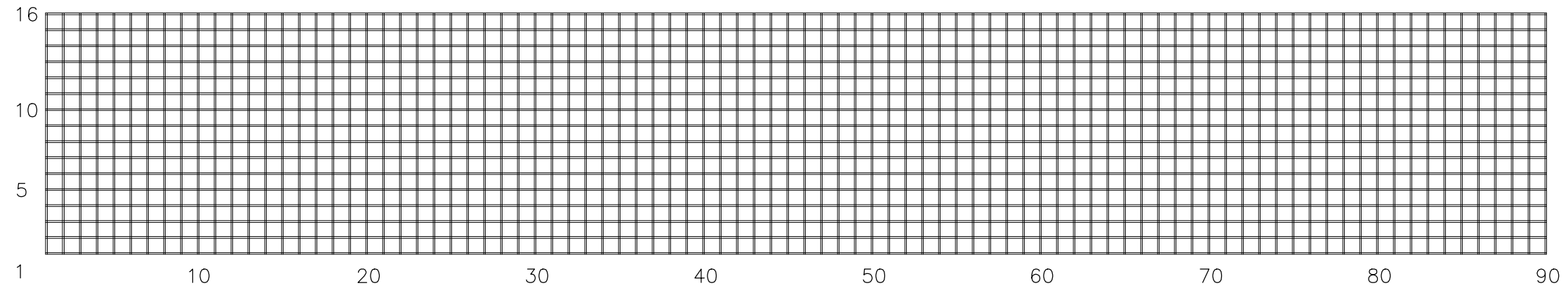
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JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
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1:20



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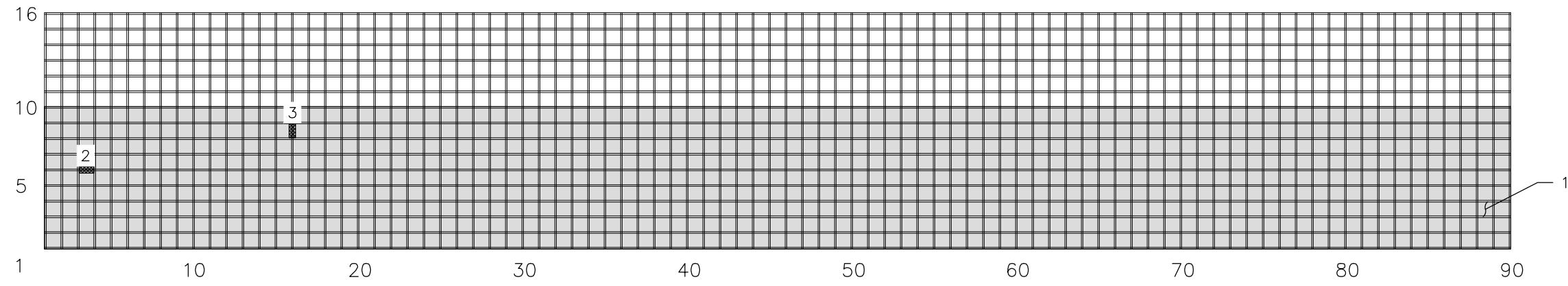
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DETERIORATIONS**

PARSONS

<small>drawn by</small> JS	<small>dessine par</small>	<small>project date</small> 17-03-27	<small>date du projet</small>
<small>designed by</small> CW	<small>conc par</small>	<small>project no.</small> R.082857.001	<small>no. du projet</small>
<small>approved by</small> MM	<small>approuve par</small>	20 OF 65	
<small>tender submission</small>	<small>project manager</small> administrateur de projets	<small>drawing no.</small>	<small>dessine no.</small>

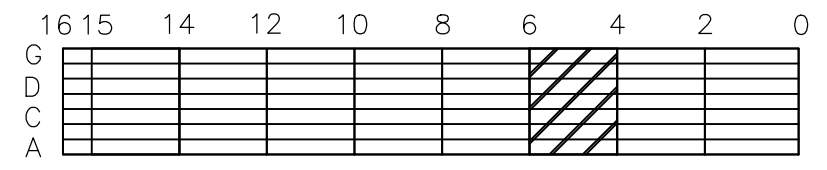
GSC-A3A 95-09



4-6 - E
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT LONGITUDINAL BAR
3	BENT TRANSVERSE BAR

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Travaux publics et
Services gouvernementaux Canada
Services d'architecture et de génie
Région de l'Ontario

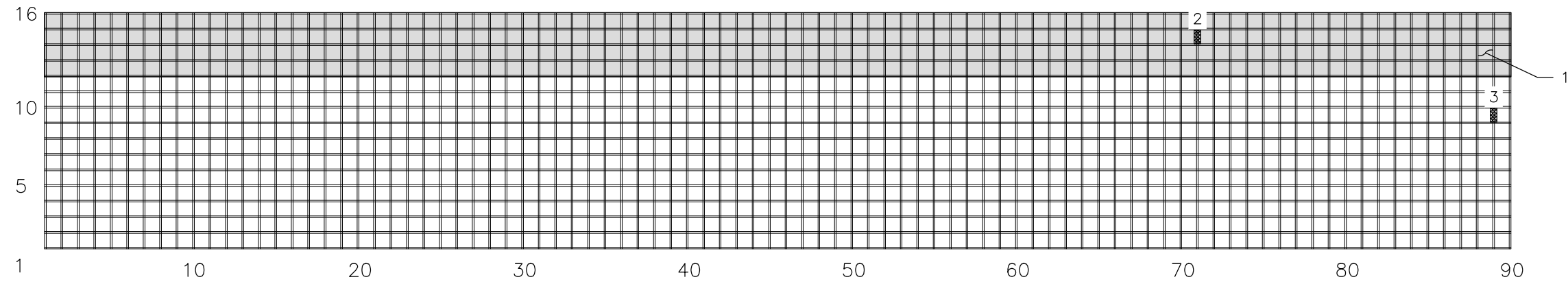
project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

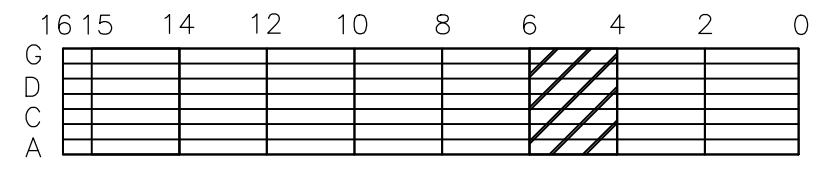
JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	21 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		



4-6 - F
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR

GSC-A3A 95-09

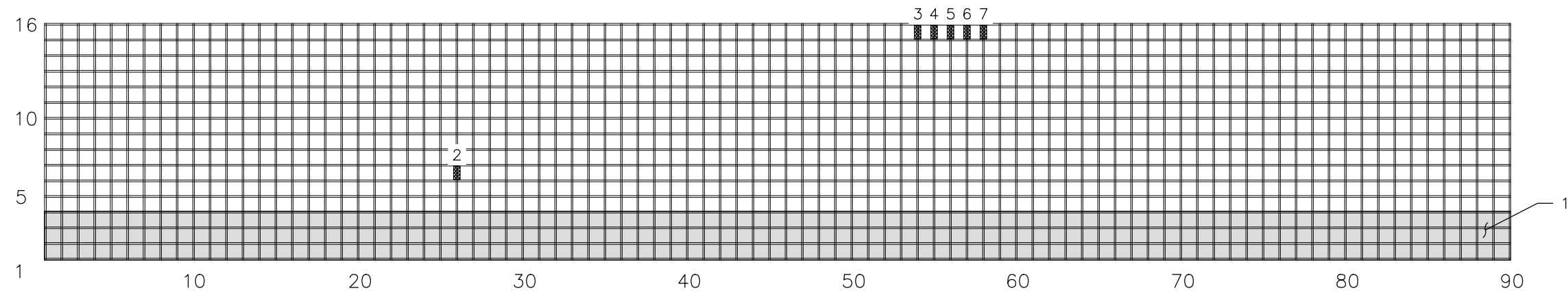


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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**
PARSONS

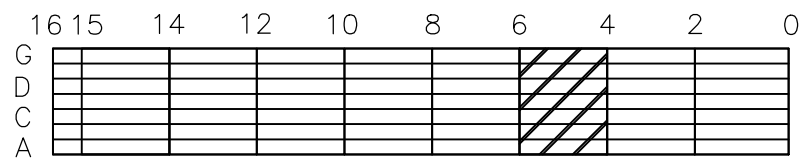
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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	22 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		



4-6 - G

1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR



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project title
titre du projet
LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO

DECK GRATING REPAIRS

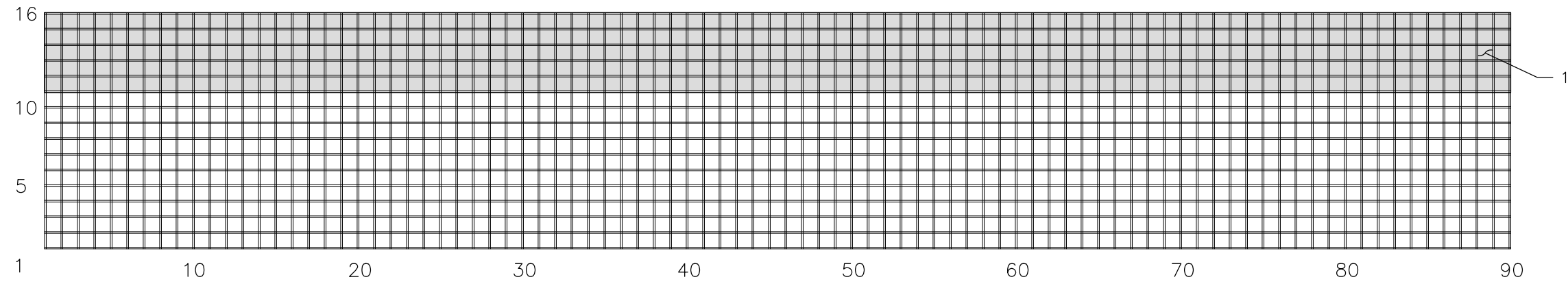
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BRIDGE GRATING
DETERIORATIONS



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

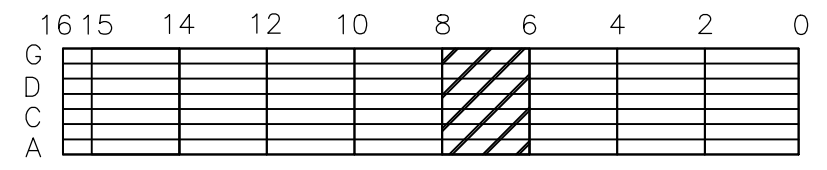
17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
23 OF 65 drawing no.	dessine no.


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6-8 - A
1:20

DEFECT No.	DESCRIPTION
1	ABRASION



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Région de l'Ontario

project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

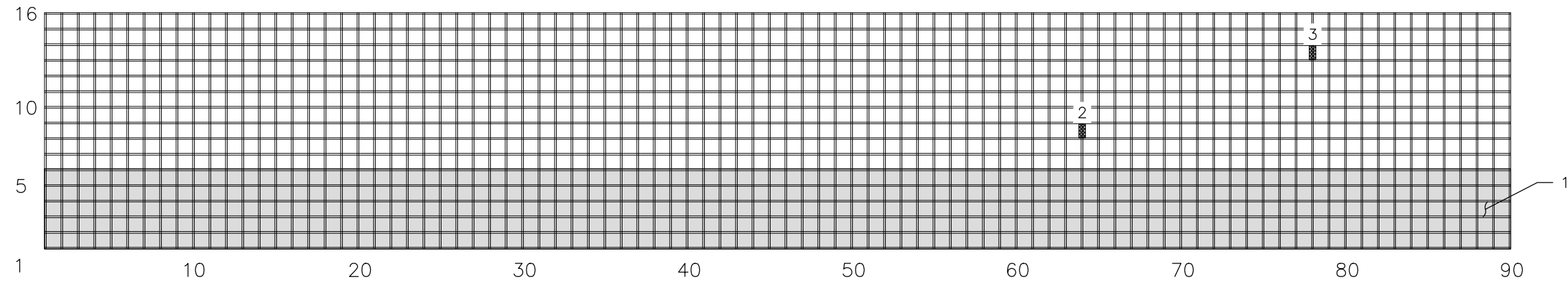
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	24 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

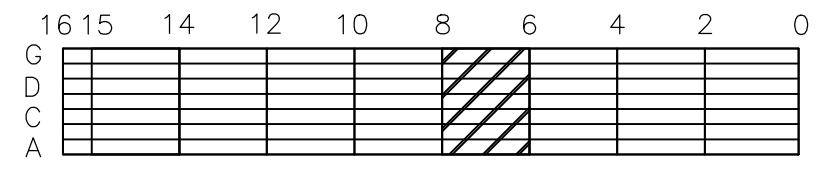
GSC-A3A 95-09



6-8 - B
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR

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Services gouvernementaux Canada
Services d'architecture et de génie
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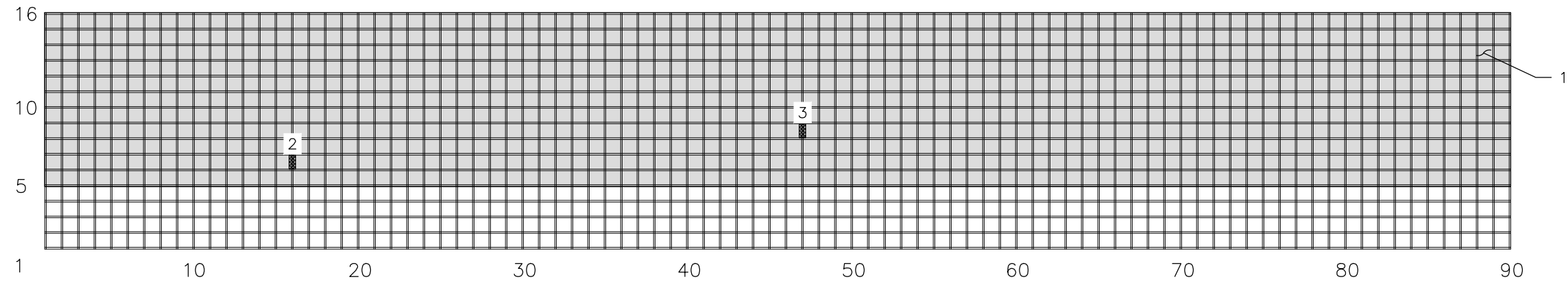
project title
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**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

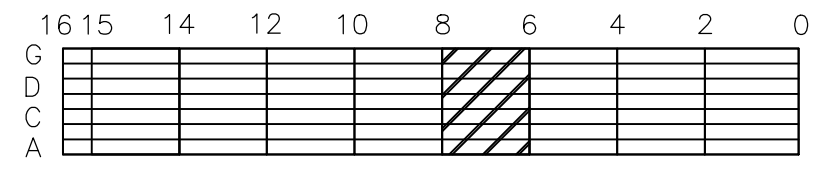
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MM approved by	approuve par	25 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		



6-8 - C
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR

GSC-A3A 95-09



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Ontario Region

Travaux publics et Services gouvernementaux Canada
Services d'architecture et de génie
Région de l'Ontario

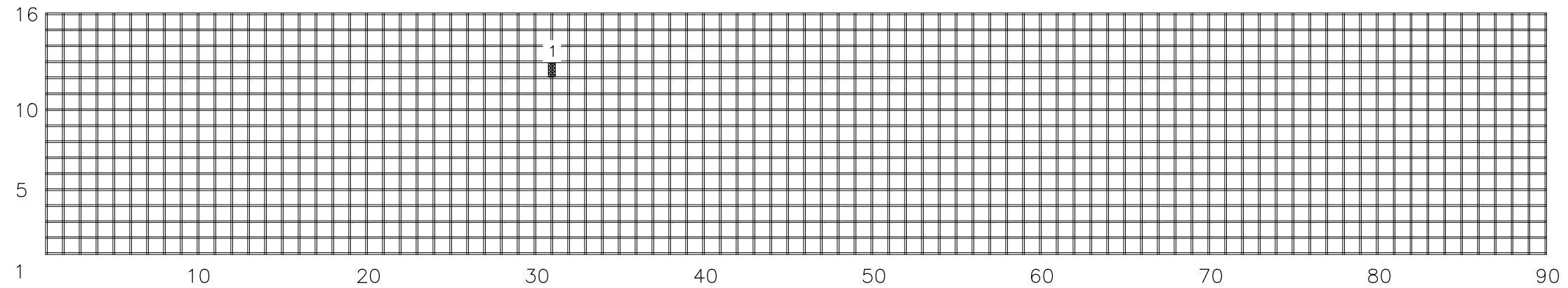
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**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

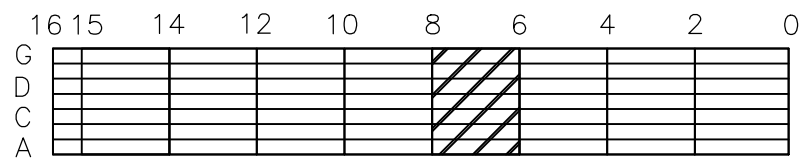
PARSONS

JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	26 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		



6-8 - D
1:20

DEFECT No.	DESCRIPTION
1	BENT TRANSVERSE BAR



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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

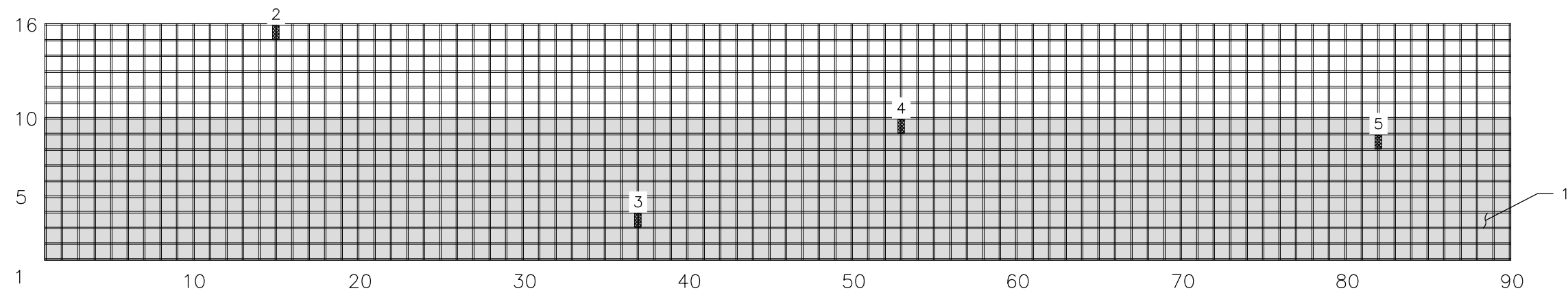
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**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

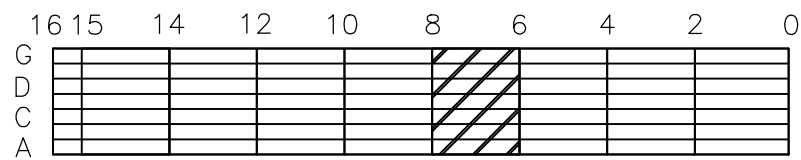
17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
27 OF 65 drawing no.	dessine no.

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6-8 - E
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR



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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

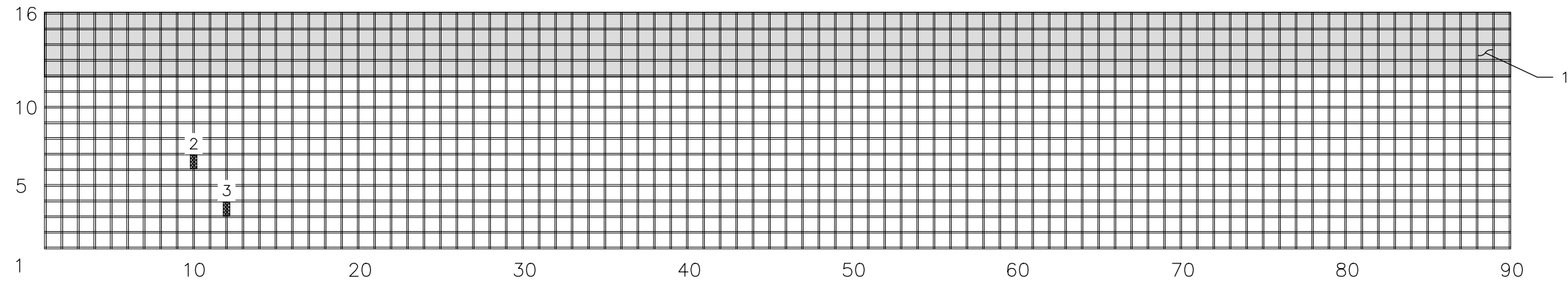
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**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

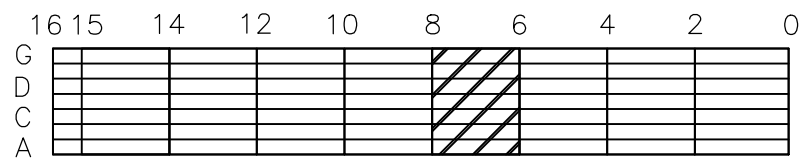
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R.082857.001 project no.	no. du projet
28 OF 65 drawing no.	dessine no.

GSC-A3A 95-09



6-8 - F
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR



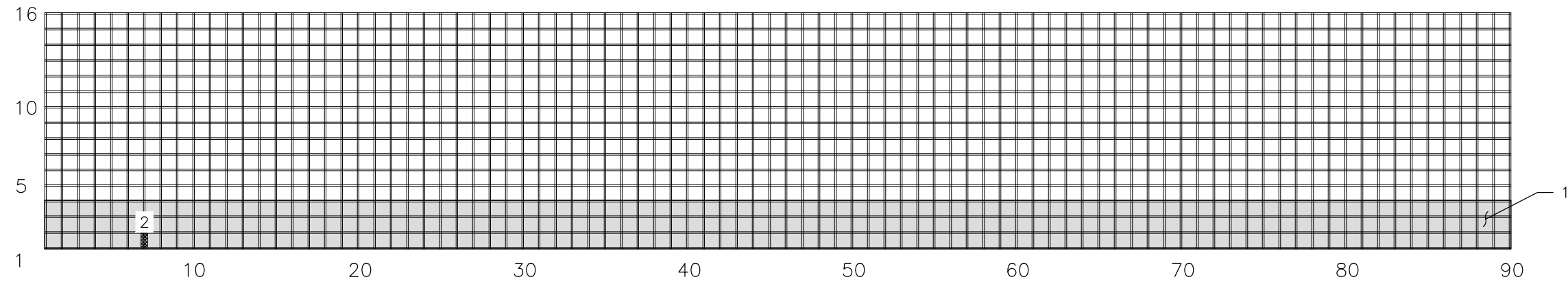
Public Works and
 Government Services Canada
 Architectural and Engineering Services
 Ontario Region
 Travaux publics et
 Services gouvernementaux Canada
 Services d'architecture et de génie
 Région de l'Ontario

project title
 titre du projet
**LASALLE CAUSEWAY
 BASCULE BRIDGE
 KINGSTON
 ONTARIO**
 DECK GRATING REPAIRS

drawing title
 titre du dessin
**BRIDGE GRATING
 DETERIORATIONS**

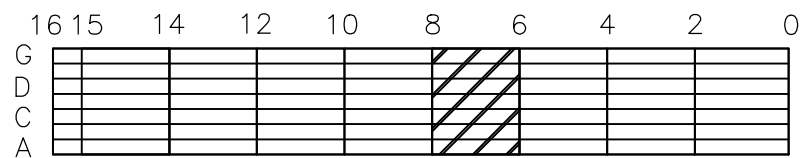
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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	29 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

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6-8 - G
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR



Public Works and
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Services gouvernementaux Canada
Services d'architecture et de génie
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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

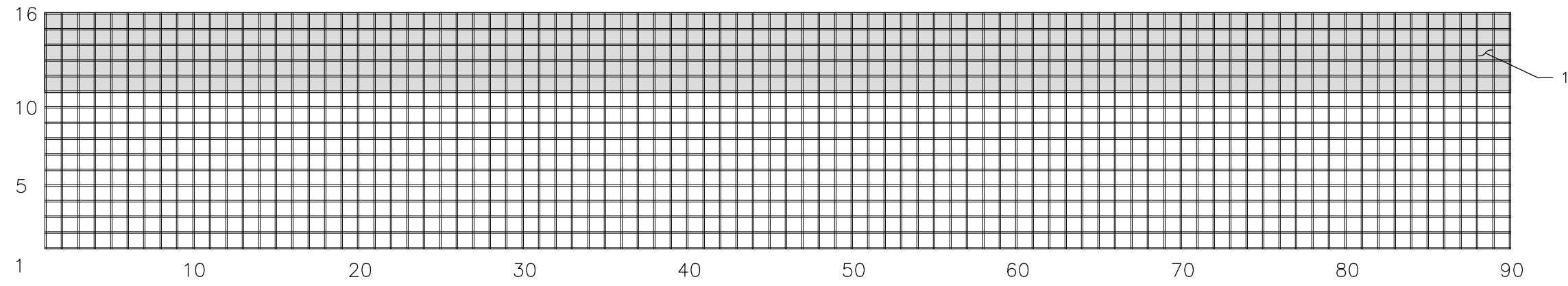
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

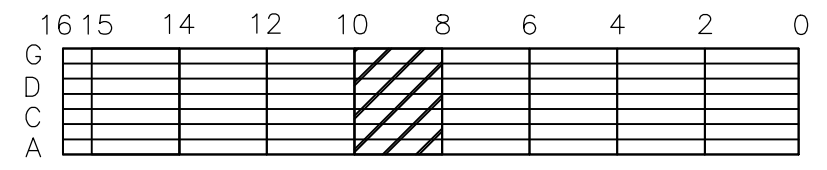
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CW designed by conc par	R.082857.001 project no. no. du projet
MM approved by approuve par	30 OF 65 drawing no. dessine no.
tender soumission	project manager administrateur de projets

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8-10 - A
1:20

DEFECT No.	DESCRIPTION
1	ABRASION



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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

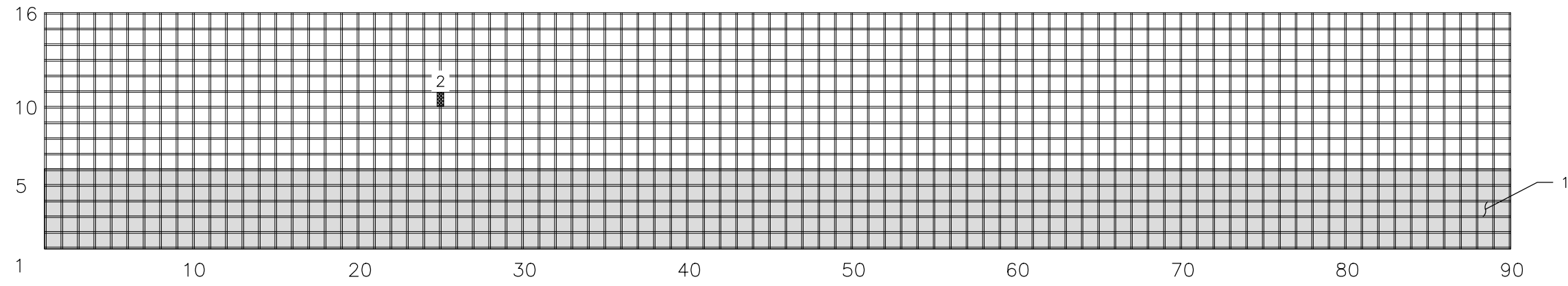
drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

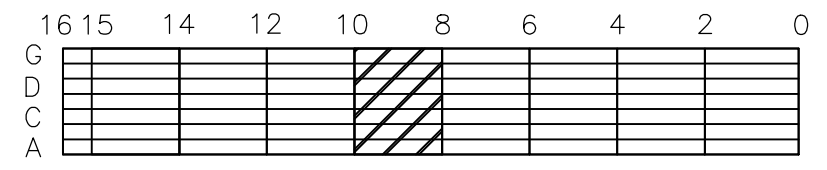
17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
31 OF 65 drawing no.	dessine no.


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8-10 - B
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
4	BENT TRANSVERSE BAR



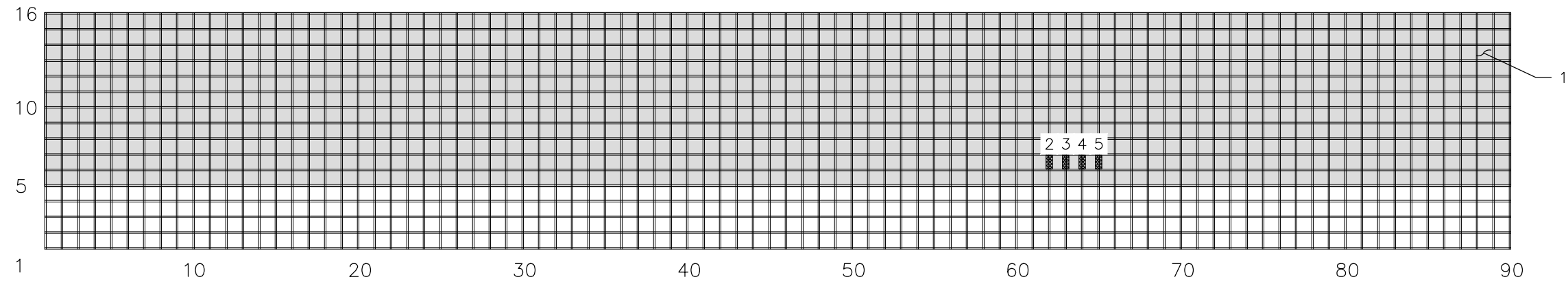

 Public Works and
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 Services gouvernementaux Canada
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project title
 titre du projet
**LASALLE CAUSEWAY
 BASCULE BRIDGE
 KINGSTON
 ONTARIO**
 DECK GRATING REPAIRS

drawing title
 titre du dessin
**BRIDGE GRATING
 DETERIORATIONS**


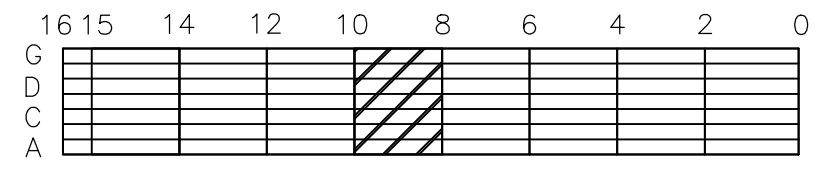
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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	32 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		


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8-10 - C
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR



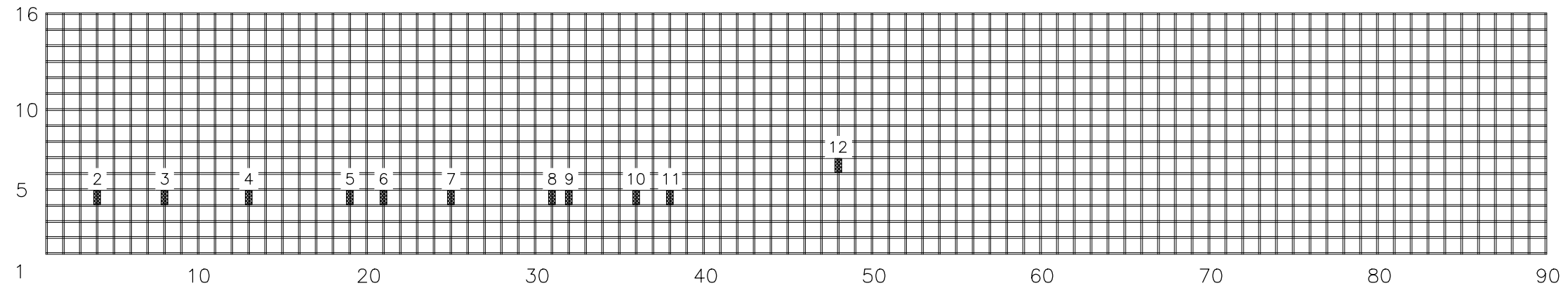
 Public Works and Government Services Canada
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Services d'architecture et de génie
Région de l'Ontario

project title
titre du projet
**LASALLE CAUSEWAY
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KINGSTON
ONTARIO**
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**
PARSONS

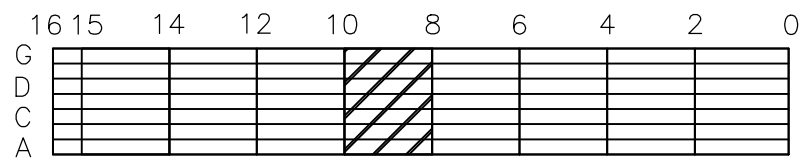
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CW designed by conc par	R.082857.001 project no. no. du projet
MM approved by approuve par	33 OF 65 drawing no. dessine no.
tender soumission	project manager administrateur de projets

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8-10 - D
1:20

DEFECT No.	DESCRIPTION
1	BENT TRANSVERSE BAR
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR
9	BENT TRANSVERSE BAR
10	BENT TRANSVERSE BAR
11	BENT TRANSVERSE BAR
12	BENT TRANSVERSE BAR



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project title
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**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

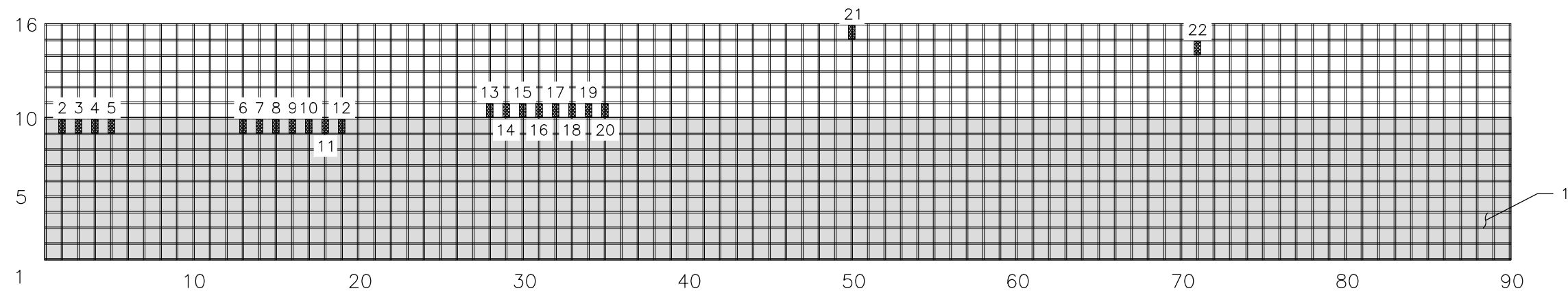
drawing title
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**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

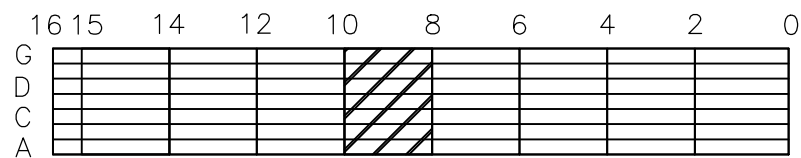
17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
34 OF 65 drawing no.	dessine no.

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8-10 - E
1:20

DEFECT No.	DESCRIPTION	DEFECT No.	DESCRIPTION
1	ABRASION	13	BENT TRANSVERSE BAR
2	BENT TRANSVERSE BAR	14	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR	15	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR	16	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR	17	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR	18	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR	19	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR	20	BENT TRANSVERSE BAR
9	BENT TRANSVERSE BAR	21	BENT TRANSVERSE BAR
10	BENT TRANSVERSE BAR	22	BENT TRANSVERSE BAR
11	BENT TRANSVERSE BAR		
12	BENT TRANSVERSE BAR		



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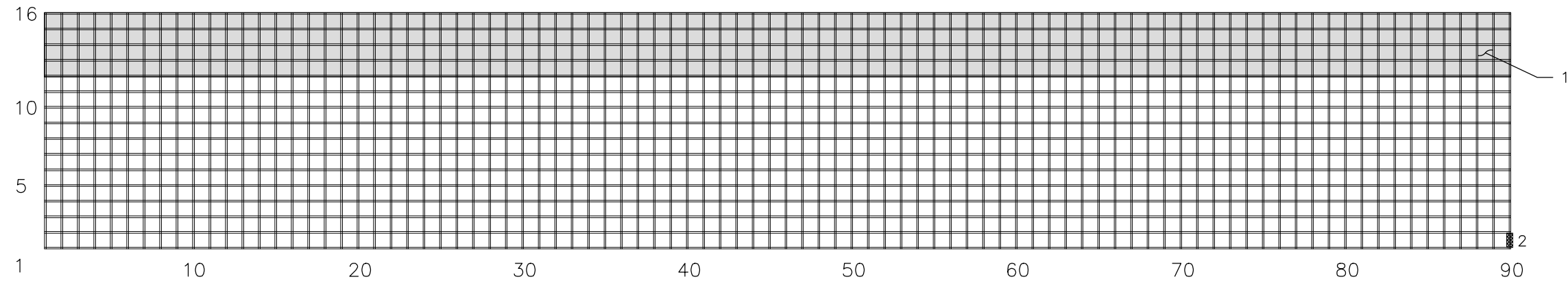
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BASCULE BRIDGE
KINGSTON
ONTARIO**
DECK GRATING REPAIRS

drawing title
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**BRIDGE GRATING
DETERIORATIONS**



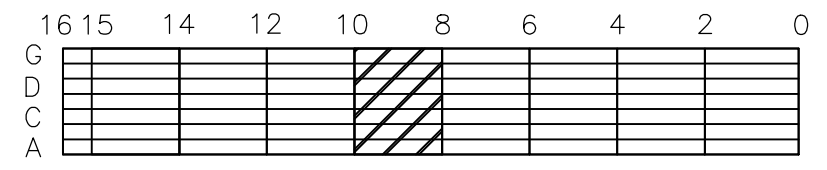
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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	35 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

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8-10 - F
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR



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Région de l'Ontario

project title
titre du projet
LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO

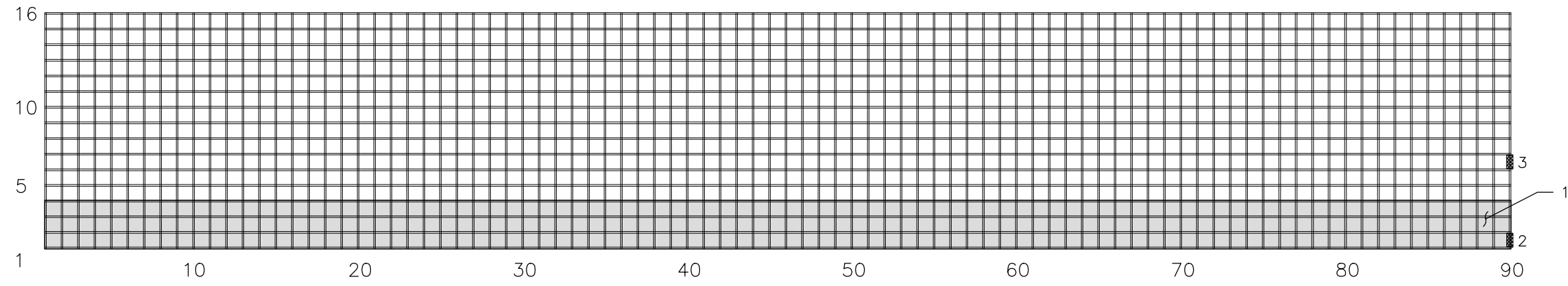
DECK GRATING REPAIRS

drawing title
titre du dessin
BRIDGE GRATING
DETERIORATIONS

PARSONS

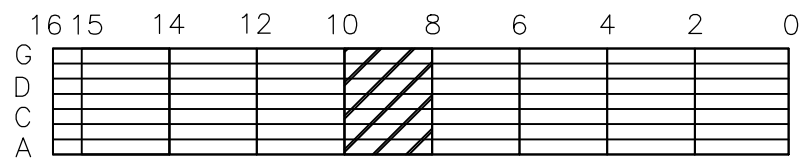
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MM approved by	approuve par	36 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		


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8-10 - G
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR



 Public Works and
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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

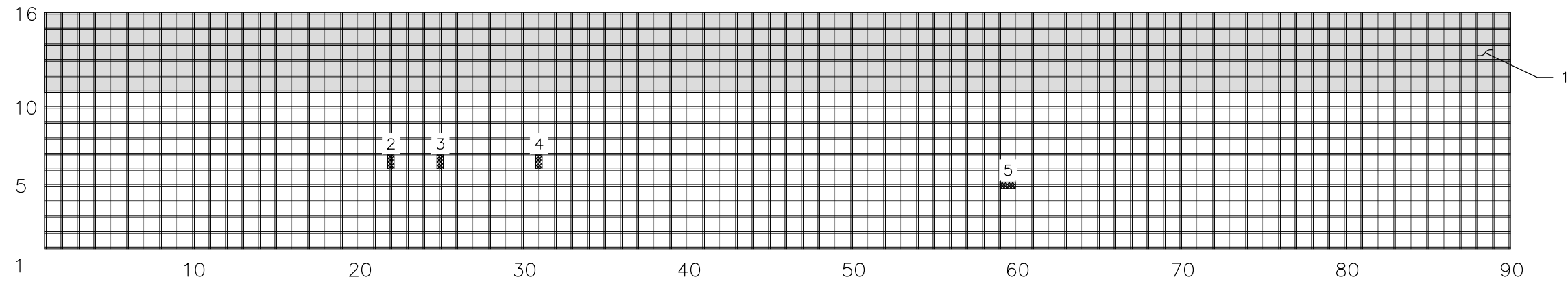
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	37 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

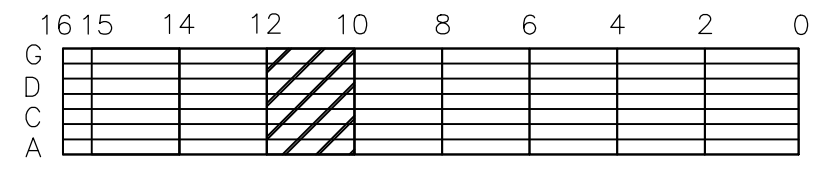
GSC-A3A 95-09



10-12 - A
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT LONGITUDINAL BAR

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Services gouvernementaux Canada
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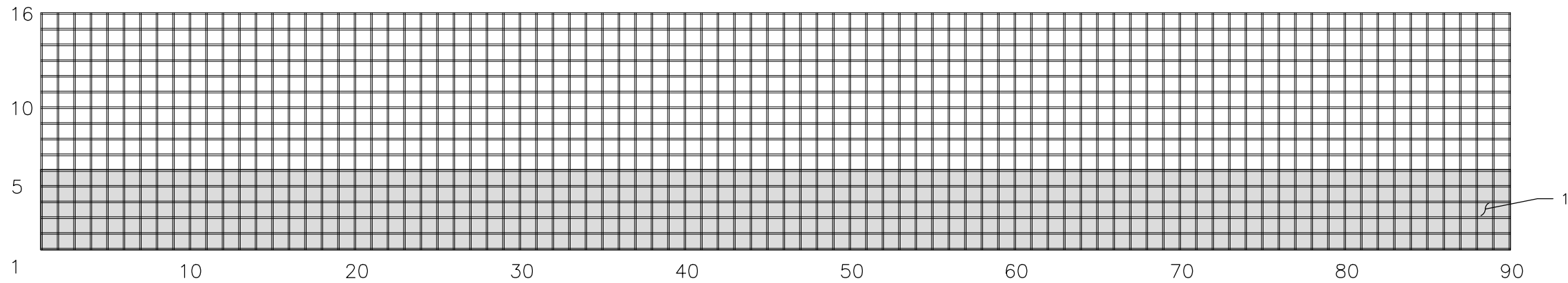
project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

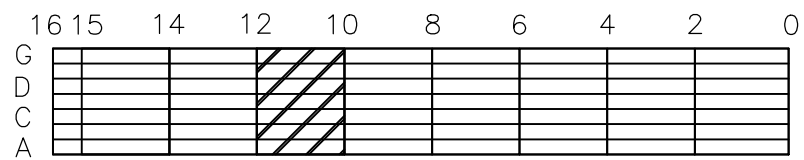
PARSONS

JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	38 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		



10-12 - B
1:20

DEFECT No.	DESCRIPTION
1	ABRASION



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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

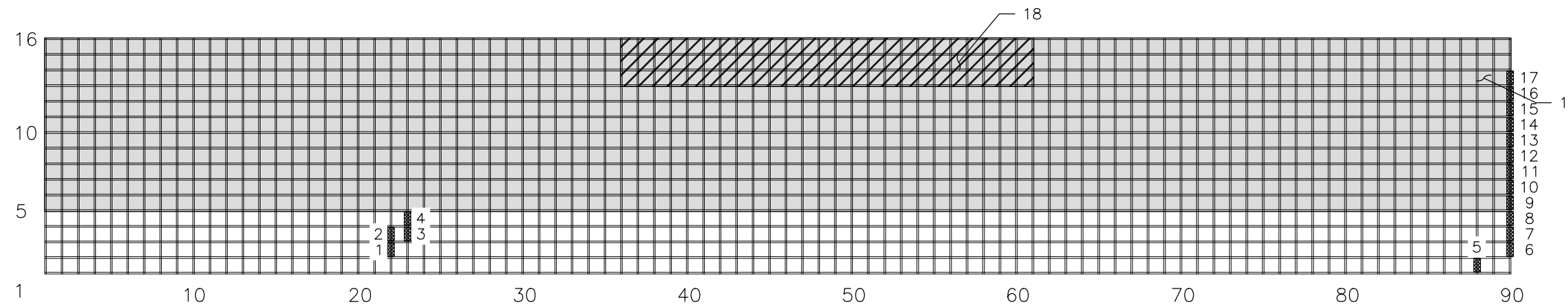
drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

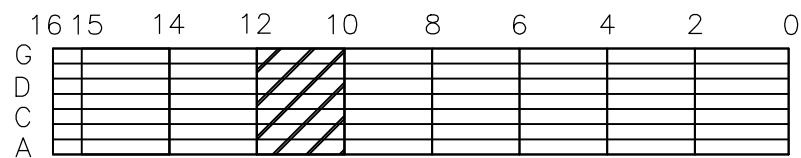
17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
39 OF 65 drawing no.	dessine no.

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10-12 - C
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR
9	BENT TRANSVERSE BAR
10	BENT TRANSVERSE BAR
11	BENT TRANSVERSE BAR
12	BENT TRANSVERSE BAR
13	BENT TRANSVERSE BAR
14	BENT TRANSVERSE BAR
15	BENT TRANSVERSE BAR
16	BENT TRANSVERSE BAR
17	BENT TRANSVERSE BAR
18	TEMPORARY STEEL PLATE



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titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
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ONTARIO**

DECK GRATING REPAIRS

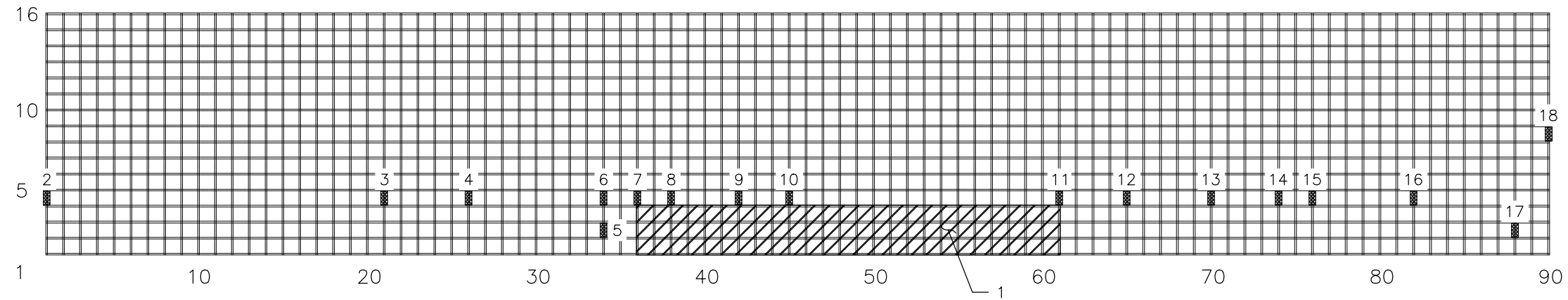
drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

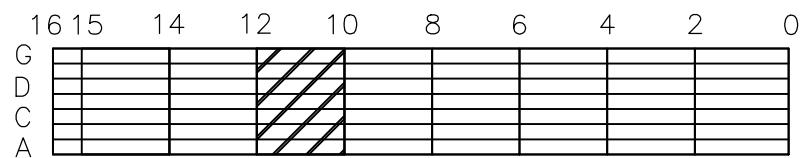
17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
40 OF 65 drawing no.	dessine no.

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10-12 - D
1:20

DEFECT No.	DESCRIPTION
1	TEMPORARY STEEL PLATE
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR
9	BENT TRANSVERSE BAR
10	BENT TRANSVERSE BAR
11	BENT TRANSVERSE BAR
12	BENT TRANSVERSE BAR
13	BENT TRANSVERSE BAR
14	BENT TRANSVERSE BAR
15	BENT TRANSVERSE BAR
16	BENT TRANSVERSE BAR
17	BENT TRANSVERSE BAR
18	BENT TRANSVERSE BAR



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titre du projet
**LASALLE CAUSEWAY
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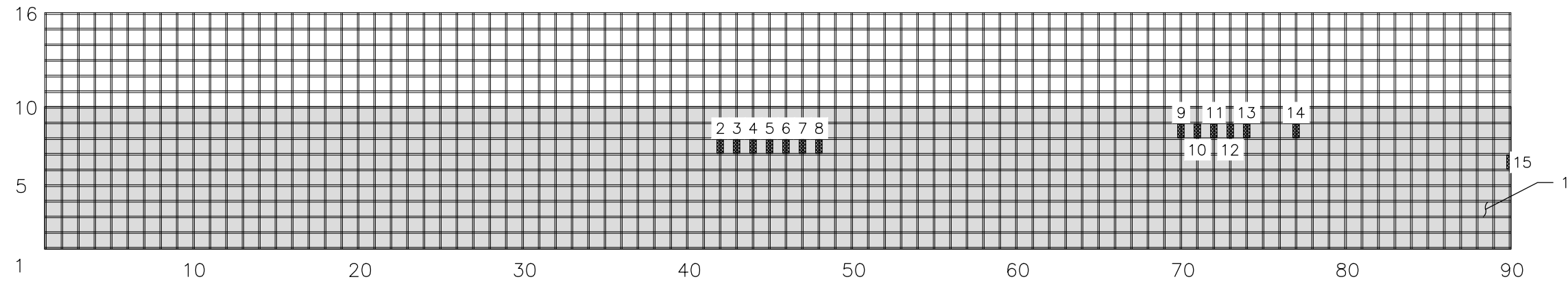
DECK GRATING REPAIRS

drawing title
titre du dessin
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PARSONS

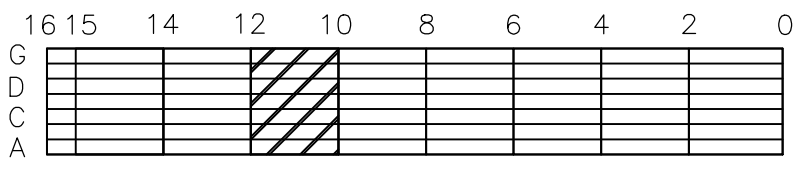
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CW designed by conc par	R.082857.001 project no. no. du projet
MM approved by approuve par	41 OF 65 drawing no. dessine no.

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10-12 - E
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR
9	BENT TRANSVERSE BAR
10	BENT TRANSVERSE BAR
11	BENT TRANSVERSE BAR
12	BENT TRANSVERSE BAR
13	BENT TRANSVERSE BAR
14	BENT TRANSVERSE BAR
15	BENT TRANSVERSE BAR



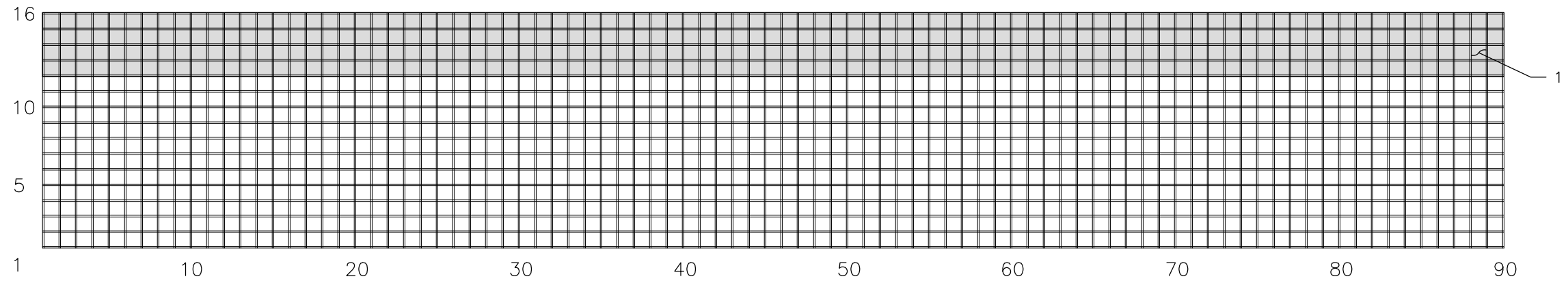
Public Works and
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 Services gouvernementaux Canada
 Services d'architecture et de génie
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project title
 titre du projet
**LASALLE CAUSEWAY
 BASCULE BRIDGE
 KINGSTON
 ONTARIO**
 DECK GRATING REPAIRS

drawing title
 titre du dessin
**BRIDGE GRATING
 DETERIORATIONS**

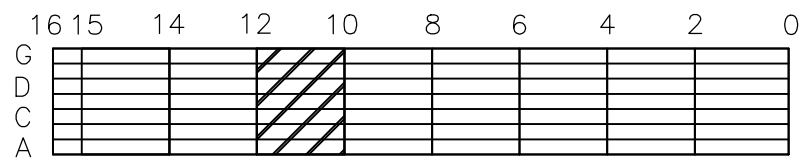
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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	42 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

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DEFECT No.	DESCRIPTION
1	ABRASION

10-12 - F
1:20



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titre du projet
**LASALLE CAUSEWAY
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ONTARIO**

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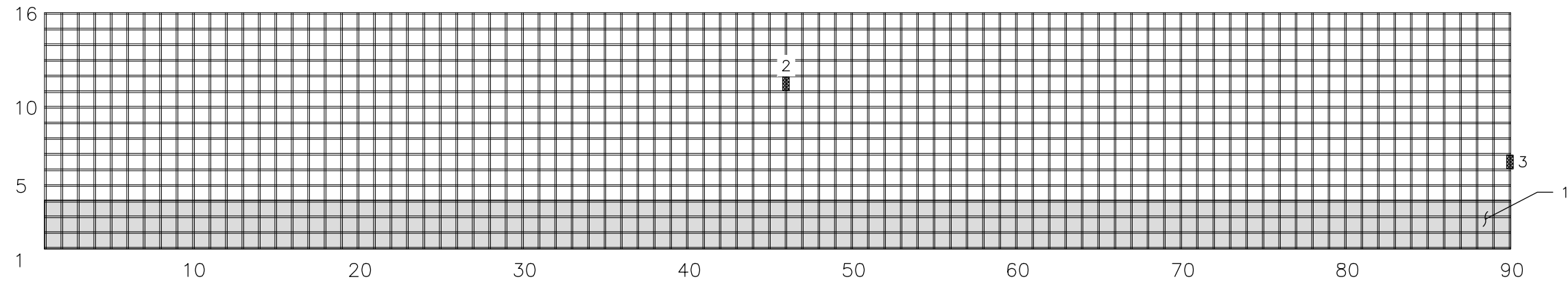
drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

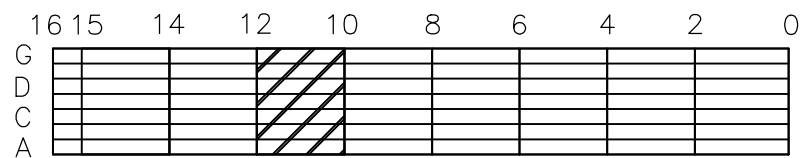
17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
43 OF 65 drawing no.	dessine no.


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10-12 - G
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR



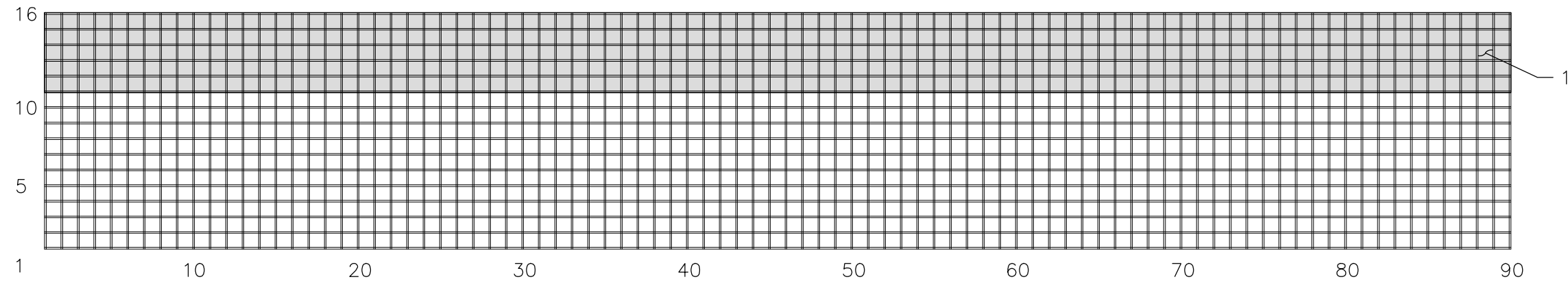
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Ontario Region
Travaux publics et Services gouvernementaux Canada
Services d'architecture et de génie
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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
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DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**
PARSONS

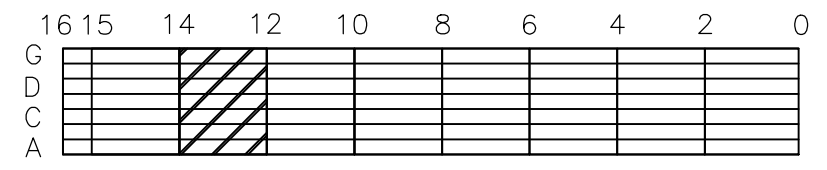
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CW designed by conc par	R.082857.001 project no. no. du projet
MM approved by approuve par	44 OF 65 drawing no. dessine no.
tender soumission	project manager administrateur de projets


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12-14 - A
1:20

DEFECT No.	DESCRIPTION
1	ABRASION



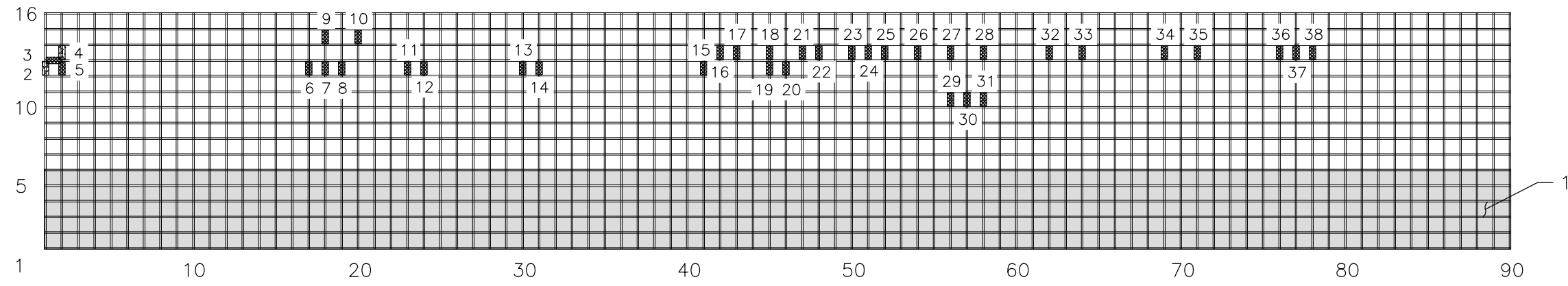
 Public Works and Government Services Canada
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Services d'architecture et de génie
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titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**
PARSONS

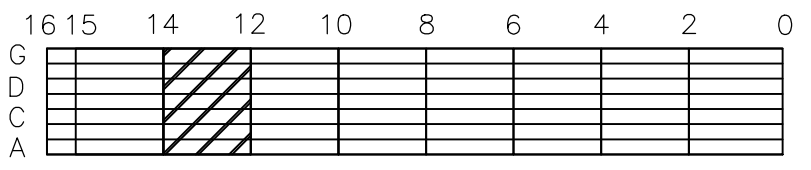
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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	45 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

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12-14 - B
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BROKEN TRANSVERSE BAR
3	BENT LONGITUDINAL BAR
4	BROKEN TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR
9	BENT TRANSVERSE BAR
10	BENT TRANSVERSE BAR
11	BENT TRANSVERSE BAR
12	BENT TRANSVERSE BAR
13	BENT TRANSVERSE BAR
14	BENT TRANSVERSE BAR
15	BENT TRANSVERSE BAR
16	BENT TRANSVERSE BAR
17	BENT TRANSVERSE BAR
18	BENT TRANSVERSE BAR
19	BENT TRANSVERSE BAR



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titre du projet
**LASALLE CAUSEWAY
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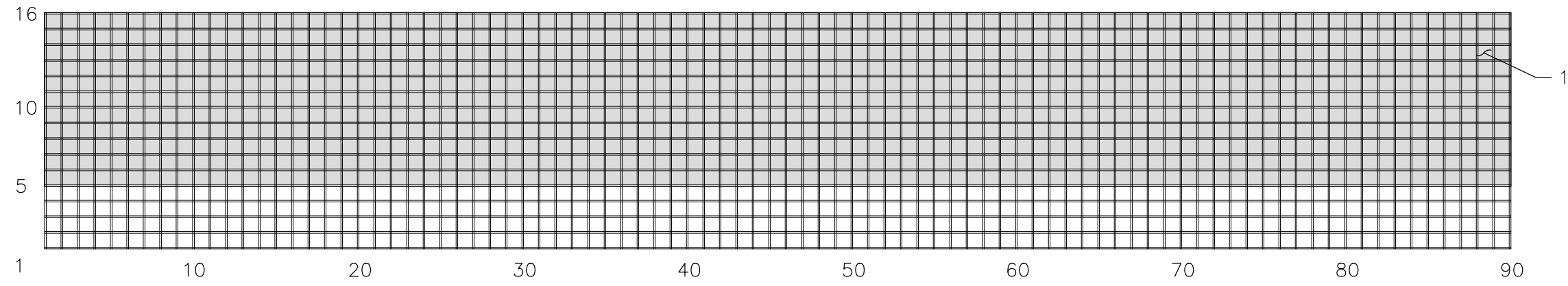
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

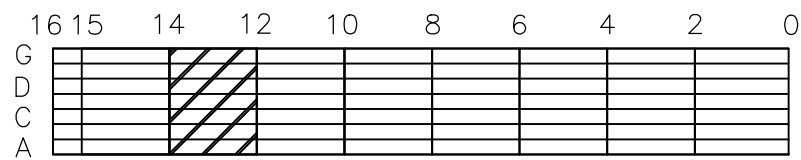
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MM approved by	approuve par	46 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		


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DEFECT No.	DESCRIPTION
1	ABRASION

12-14 - C
1:20



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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

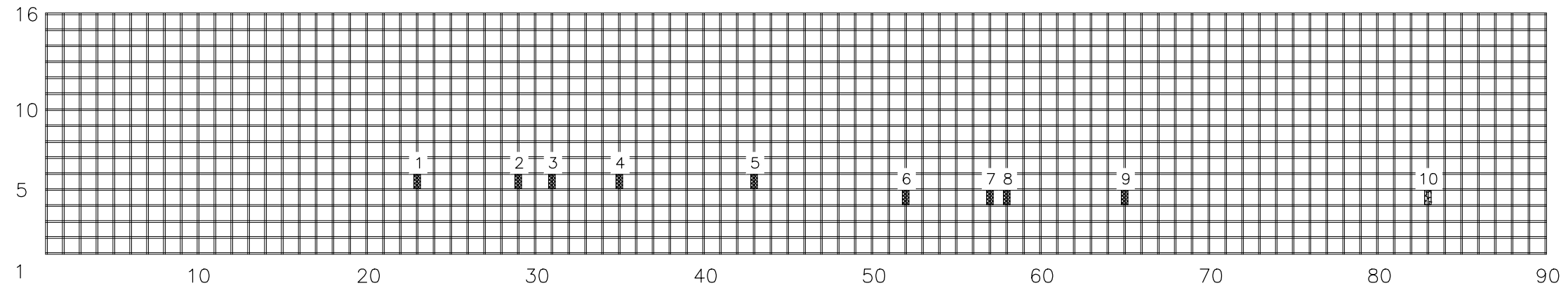
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

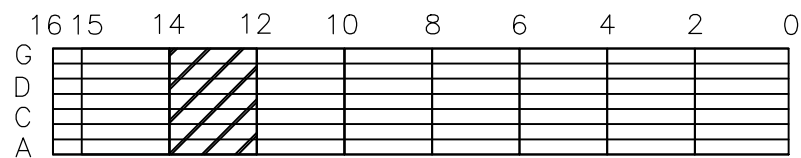
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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	47 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

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12-14 - D
1:20

DEFECT No.	DESCRIPTION
1	BENT TRANSVERSE BAR
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR
9	BENT TRANSVERSE BAR
10	BROKEN TRANSVERSE BAR



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project title
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**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

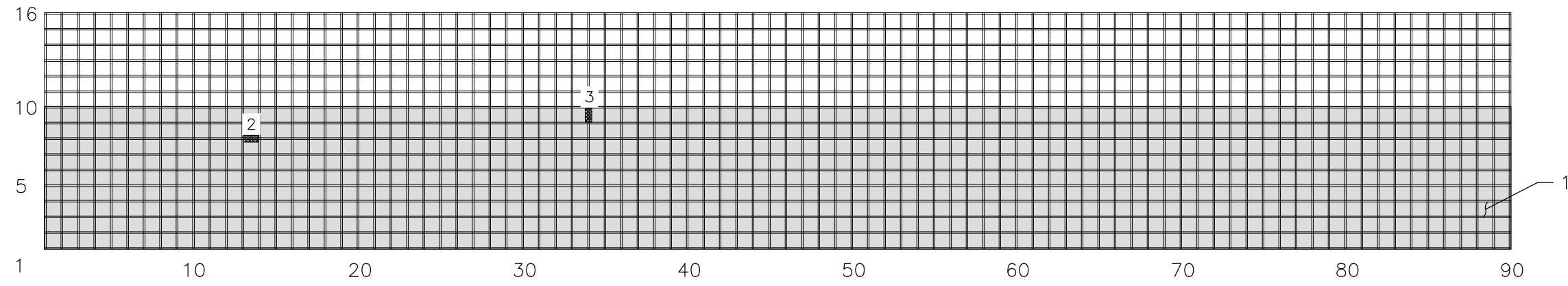
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**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
48 OF 65 drawing no.	dessine no.

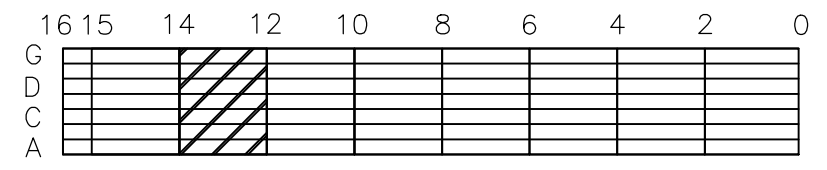
GSC-A3A 95-09



12-14 - E
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT LONGITUDINAL
3	BENT TRANSVERSE

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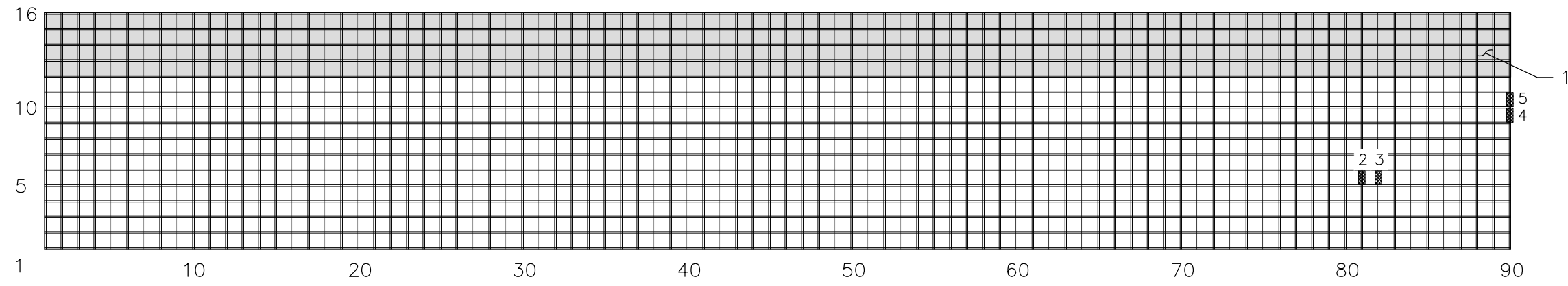
project title
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**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
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DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

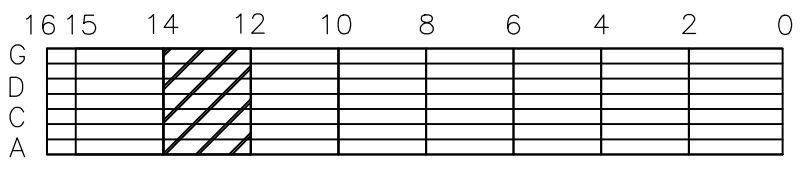
PARSONS


JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	49 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		




12-14 - F
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE
3	BENT TRANSVERSE
4	BENT TRANSVERSE
5	BENT TRANSVERSE



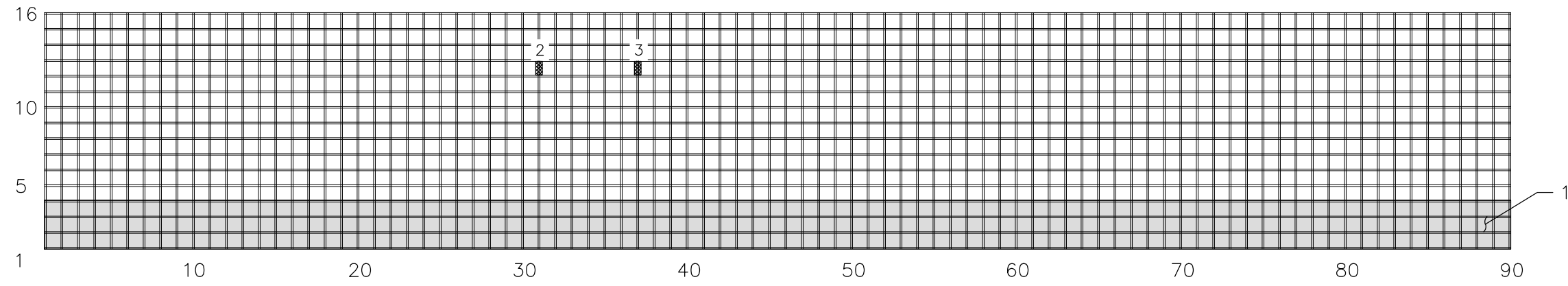

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**LASALLE CAUSEWAY
 BASCULE BRIDGE
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 DECK GRATING REPAIRS

drawing title
 titre du dessin
**BRIDGE GRATING
 DETERIORATIONS**


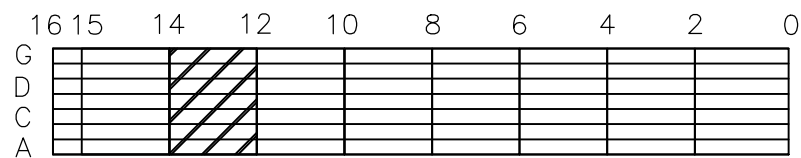
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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	50 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		


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12-14 - G
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE
3	BENT TRANSVERSE



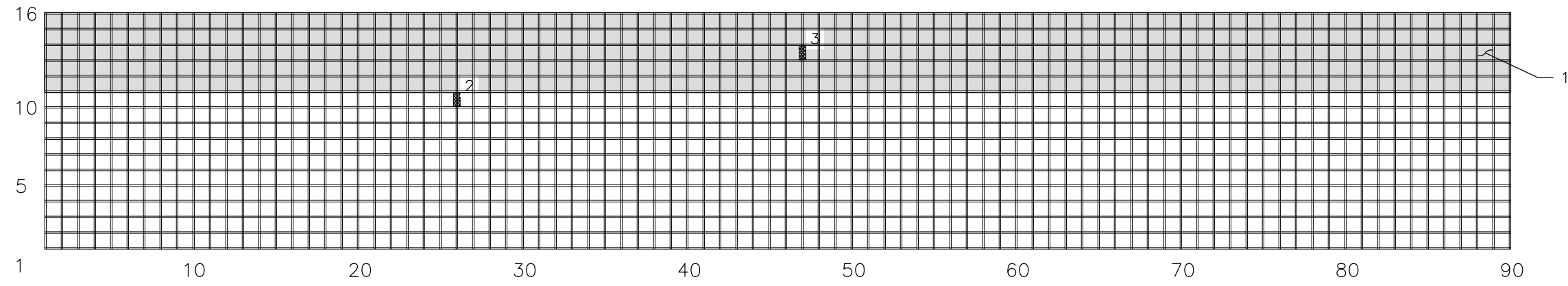

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drawing title
 titre du dessin
**BRIDGE GRATING
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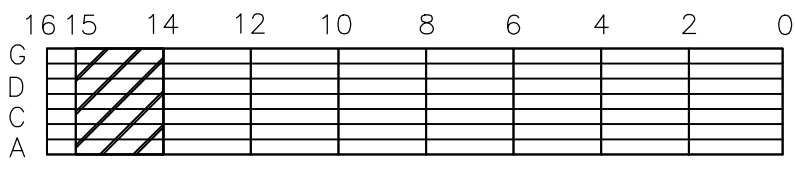

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CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	51 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

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14-15 - A
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR



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ONTARIO**

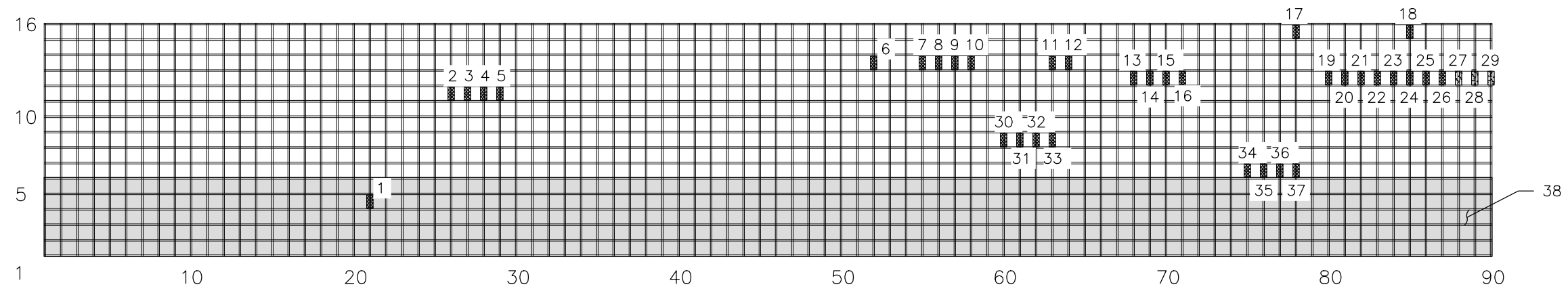
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	52 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

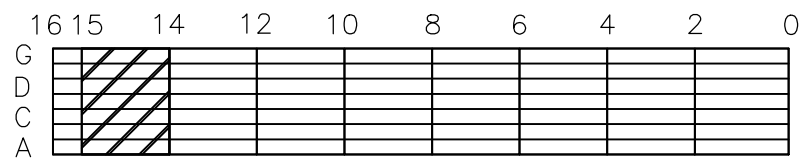
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14-15 - B

1:20

DEFECT No.	DESCRIPTION	DEFECT No.	DESCRIPTION
1	BENT TRANSVERSE BAR	21	BENT TRANSVERSE BAR
2	BENT TRANSVERSE BAR	22	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR	23	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR	24	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR	25	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR	26	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR	27	BROKEN TRANSVERSE BAR
8	BENT TRANSVERSE BAR	28	BROKEN TRANSVERSE BAR
9	BENT TRANSVERSE BAR	29	BROKEN TRANSVERSE BAR
10	BENT TRANSVERSE BAR	30	BENT TRANSVERSE BAR
11	BENT TRANSVERSE BAR	31	BENT TRANSVERSE BAR
12	BENT TRANSVERSE BAR	32	BENT TRANSVERSE BAR
13	BENT TRANSVERSE BAR	33	BENT TRANSVERSE BAR
14	BENT TRANSVERSE BAR	34	BENT TRANSVERSE BAR
15	BENT TRANSVERSE BAR	35	BENT TRANSVERSE BAR
16	BENT TRANSVERSE BAR	36	BENT TRANSVERSE BAR
17	BENT TRANSVERSE BAR	37	BENT TRANSVERSE BAR
18	BENT TRANSVERSE BAR	38	ABRASION
19	BENT TRANSVERSE BAR		
20	BENT TRANSVERSE BAR		



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Services d'architecture et de génie
Région de l'Ontario

project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**



JS
drawn by dessine par

CW
designed by conc par

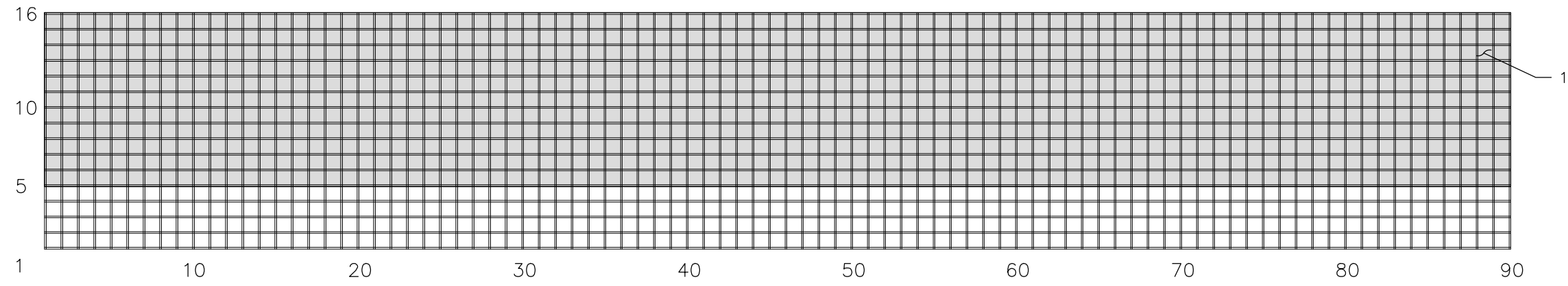
MM
approved by approuve par

tender project manager
soumission administrateur de projets

17-03-27
project date date du projet

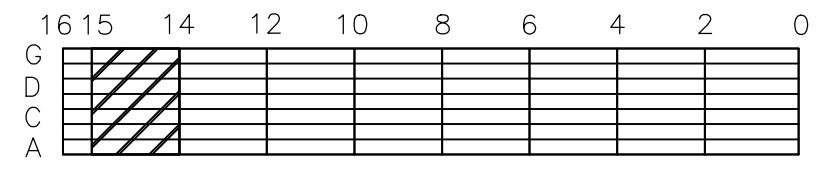
R.082857.001
project no. no. du projet

53 OF 65
drawing no. dessine no.



14-15 - C
1:20

DEFECT No.	DESCRIPTION
1	ABRASION



Public Works and
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Ontario Region

Travaux publics et
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Services d'architecture et de génie
Région de l'Ontario

project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

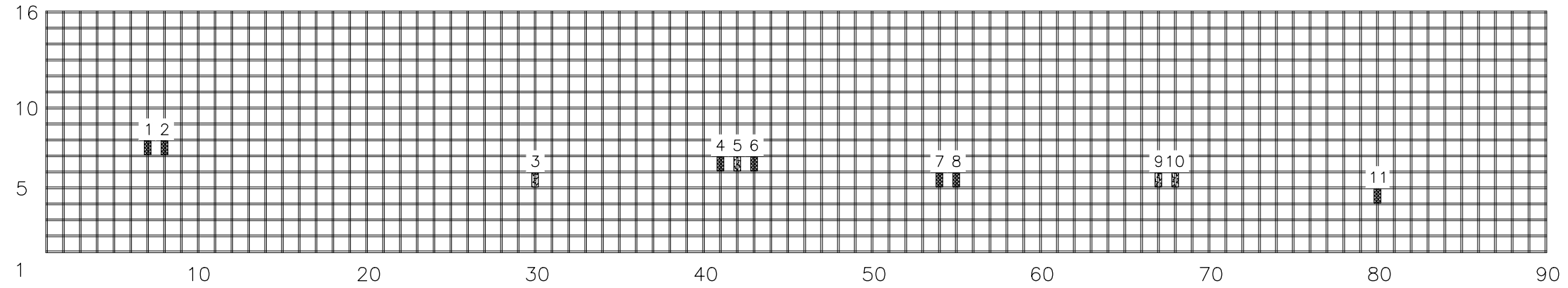
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

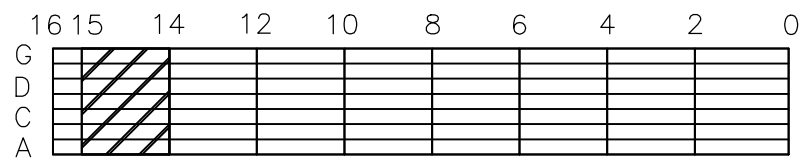
JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	54 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		


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14-15 - D
1:20

DEFECT No.	DESCRIPTION
1	BENT TRANSVERSE BAR
2	BENT TRANSVERSE BAR
3	BROKEN TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BROKEN TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR
9	BROKEN TRANSVERSE BAR
10	BROKEN TRANSVERSE BAR
11	BENT TRANSVERSE BAR



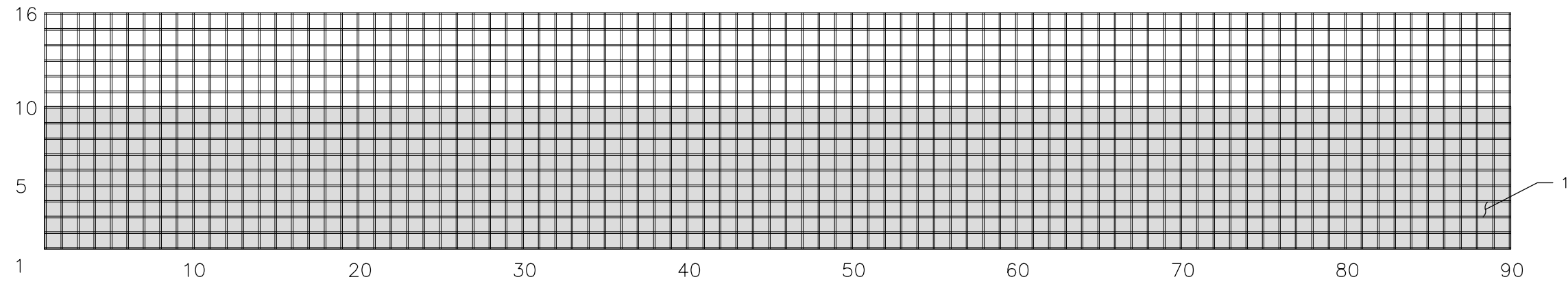

 Public Works and
 Government Services Canada
 Architectural and Engineering Services
 Ontario Region
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 Services gouvernementaux Canada
 Services d'architecture et de génie
 Région de l'Ontario

project title
 titre du projet
**LASALLE CAUSEWAY
 BASCULE BRIDGE
 KINGSTON
 ONTARIO**
 DECK GRATING REPAIRS

drawing title
 titre du dessin
**BRIDGE GRATING
 DETERIORATIONS**

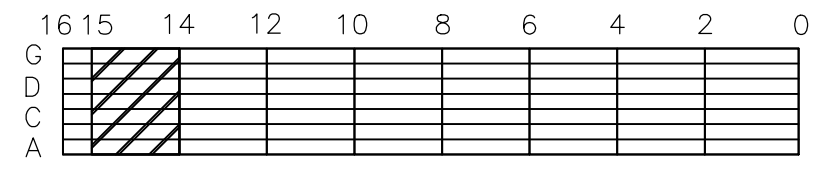

JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	55 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

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14-15 - E
1:20

DEFECT No.	DESCRIPTION
1	ABRASION



Public Works and
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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

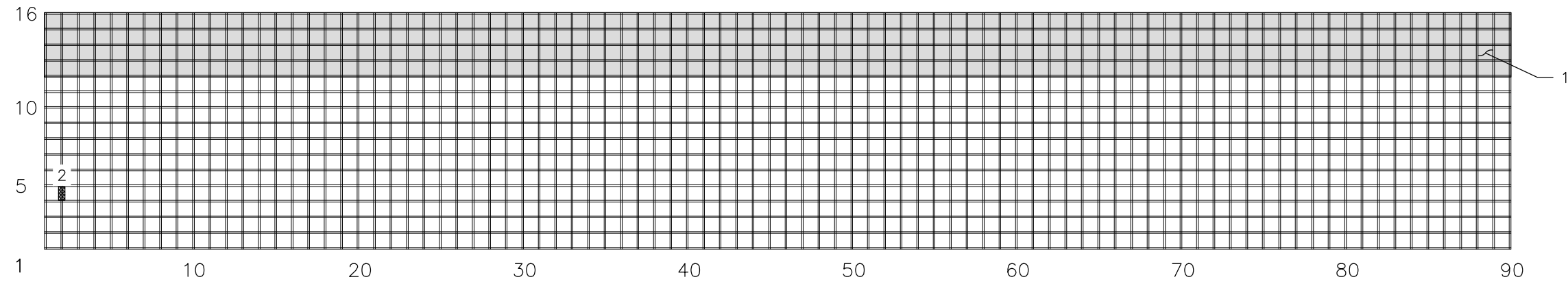
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

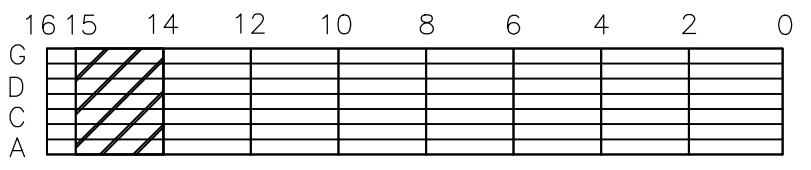
JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	56 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

GSC-A3A 95-09



14-15 - F
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR



Public Works and
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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

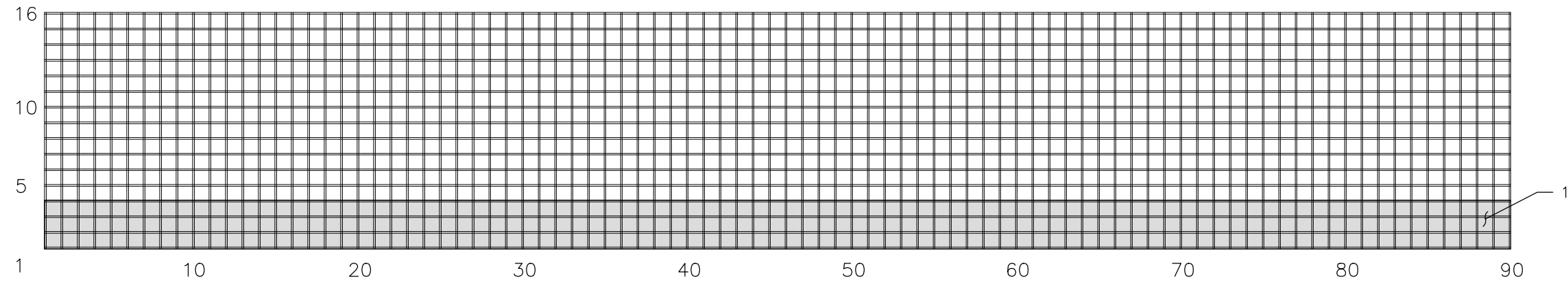
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

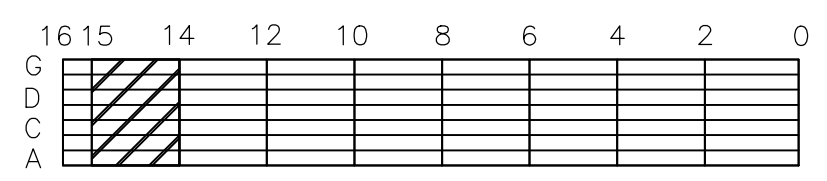
JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	57 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		


GSC-A3A 95-09



14-15 - G
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR



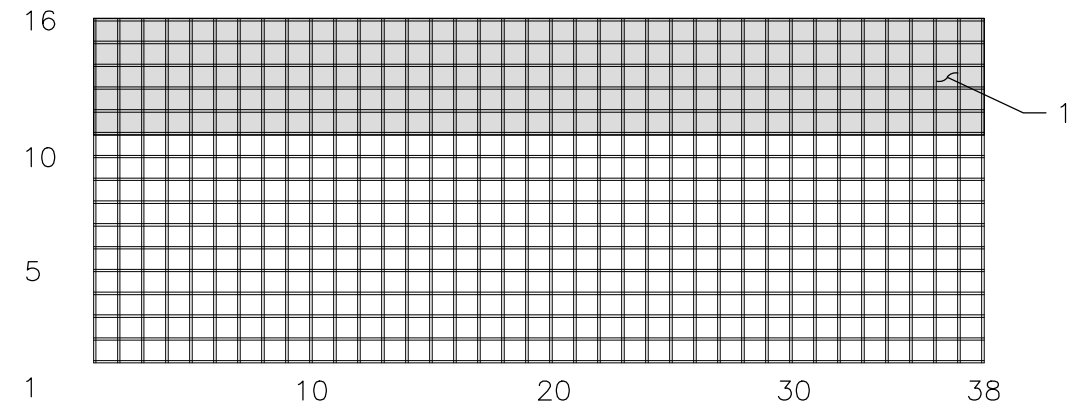
 Public Works and Government Services Canada
Architectural and Engineering Services
Ontario Region
Travaux publics et Services gouvernementaux Canada
Services d'architecture et de génie
Région de l'Ontario

project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**
PARSONS

JS drawn by dessine par	17-03-27 project date date du projet
CW designed by conc par	R.082857.001 project no. no. du projet
MM approved by approuve par	58 OF 65 drawing no. dessine no.
tender soumission	project manager administrateur de projets

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15-16 - A
1:20

DEFECT No.	DESCRIPTION
1	ABRASION

	16	15	14	12	10	8	6	4	2	0
G	▨									
D	▨									
C	▨									
A	▨									

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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

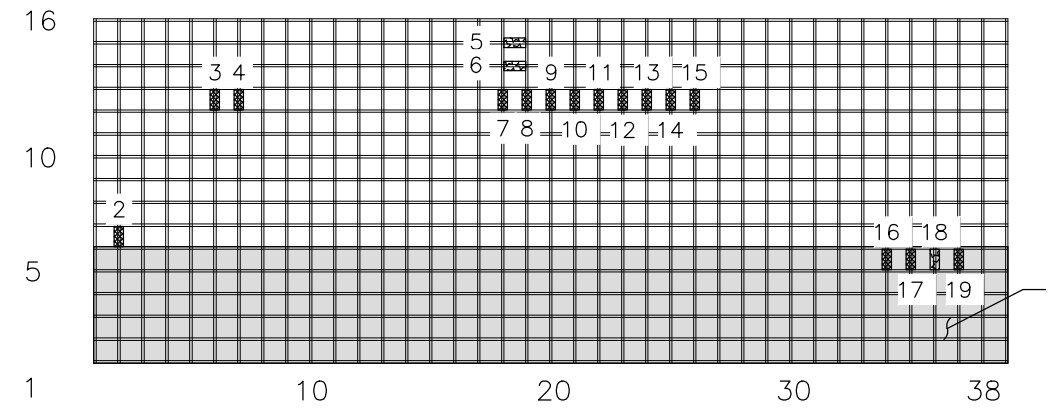
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	59 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

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15-16 - B

1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BROKEN LONGITUDINAL BAR
6	BROKEN LONGITUDINAL BAR
7	BENT TRANSVERSE BAR
8	BENT TRANSVERSE BAR
9	BENT TRANSVERSE BAR
10	BENT TRANSVERSE BAR
11	BENT TRANSVERSE BAR
12	BENT TRANSVERSE BAR
13	BENT TRANSVERSE BAR
14	BENT TRANSVERSE BAR
15	BENT TRANSVERSE BAR
16	BENT TRANSVERSE BAR
17	BENT TRANSVERSE BAR
18	BROKEN TRANSVERSE BAR
19	BENT TRANSVERSE BAR

	16	15	14	12	10	8	6	4	2	0
G	█									
D	█									
C	█									
A	█									



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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

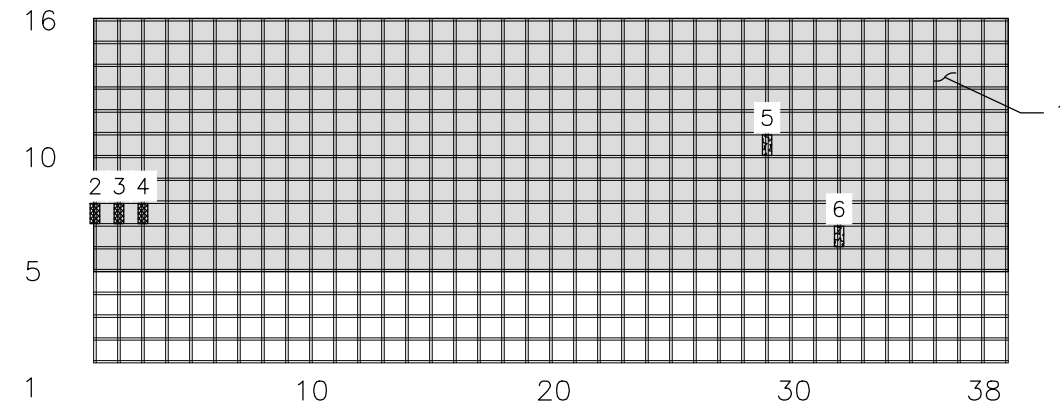
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
60 OF 65 drawing no.	dessine no.



15-16 - C
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BROKEN TRANSVERSE BAR
6	BROKEN TRANSVERSE BAR

	16	15	14	12	10	8	6	4	2	0
G	▨									
D	▨									
C	▨									
A	▨									



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project title
titre du projet
**LASALLE CAUSEWAY
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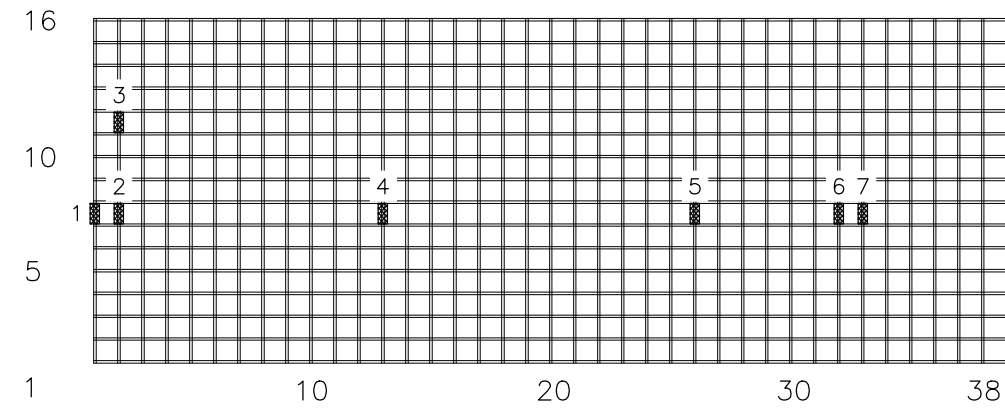
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
61 OF 65 drawing no.	dessine no.



15-16 - D
1:20

DEFECT No.	DESCRIPTION
1	BENT TRANSVERSE BAR
2	BENT TRANSVERSE BAR
3	BENT TRANSVERSE BAR
4	BENT TRANSVERSE BAR
5	BENT TRANSVERSE BAR
6	BENT TRANSVERSE BAR
7	BENT TRANSVERSE BAR

	16	15	14	12	10	8	6	4	2	0
G	█									
D	█									
C	█									
A	█									



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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
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ONTARIO**

DECK GRATING REPAIRS

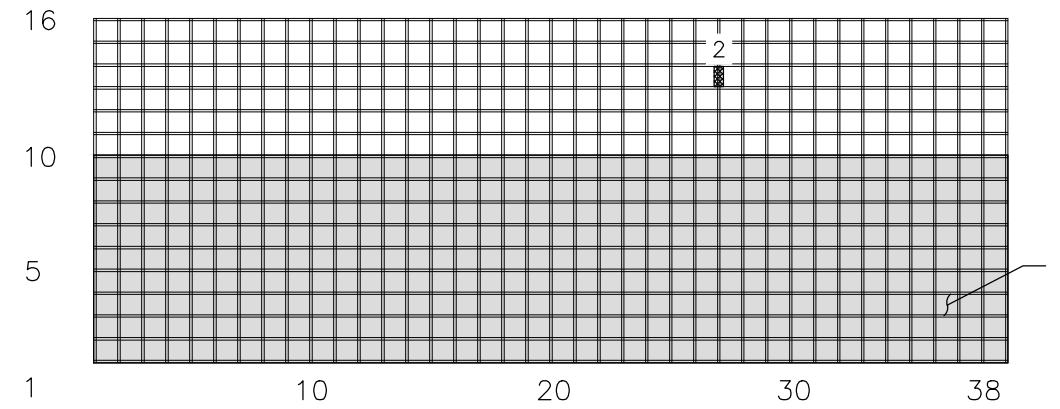
drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
62 OF 65 drawing no.	dessine no.


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15-16 - E
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE

	16	15	14	12	10	8	6	4	2	0
G	▨									
D	▨									
C	▨									
A	▨									

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project title
titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

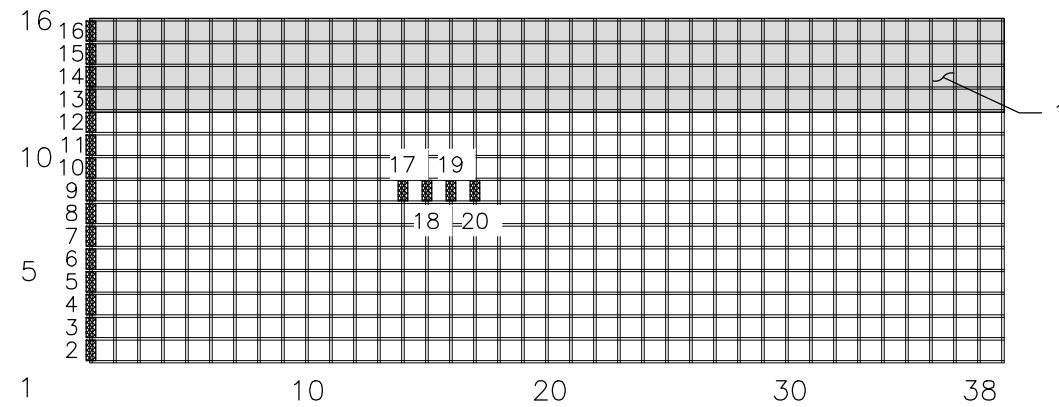
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**

PARSONS

JS drawn by	dessine par	17-03-27 project date	date du projet
CW designed by	conc par	R.082857.001 project no.	no. du projet
MM approved by	approuve par	63 OF 65 drawing no.	dessine no.
tender soumission	project manager administrateur de projets		

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15-16 - F
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE
3	BENT TRANSVERSE
4	BENT TRANSVERSE
5	BENT TRANSVERSE
6	BENT TRANSVERSE
7	BENT TRANSVERSE
8	BENT TRANSVERSE
9	BENT TRANSVERSE
10	BENT TRANSVERSE
11	BENT TRANSVERSE
12	BENT TRANSVERSE
13	BENT TRANSVERSE
14	BENT TRANSVERSE
15	BENT TRANSVERSE
16	BENT TRANSVERSE
17	BENT TRANSVERSE
18	BENT TRANSVERSE
19	BENT TRANSVERSE
20	BENT TRANSVERSE

	16	15	14	12	10	8	6	4	2	0
G	█									
D	█									
C	█									
A	█									



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titre du projet
**LASALLE CAUSEWAY
BASCULE BRIDGE
KINGSTON
ONTARIO**

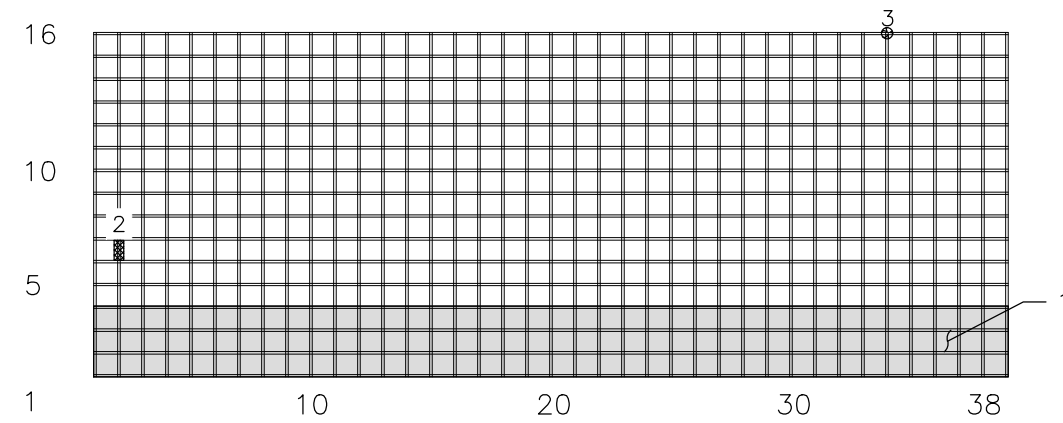
DECK GRATING REPAIRS

drawing title
titre du dessin
**BRIDGE GRATING
DETERIORATIONS**



JS drawn by	dessine par
CW designed by	conc par
MM approved by	approuve par
tender soumission	project manager administrateur de projets

17-03-27 project date	date du projet
R.082857.001 project no.	no. du projet
63 OF 64 drawing no.	dessine no.



15-16 - G
1:20

DEFECT No.	DESCRIPTION
1	ABRASION
2	BENT TRANSVERSE
3	BENT TRANSVERSE

	16	15	14	12	10	8	6	4	2	0
G	▨									
D	▨									
C	▨									
A	▨									



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ONTARIO**

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**BRIDGE GRATING
DETERIORATIONS**



JS
drawn by dessine par

CW
designed by conc par

MM
approved by approuve par

tender project manager
soumission administrateur de projets

17-03-27
project date date du projet

R.082857.001
project no. no. du projet

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drawing no. dessine no.