CAIT-UTC-REG18

Improving Transportation Infrastructure Resilience Against Hurricanes, Other Natural Disasters, and Weathering: Part II - Analysis of Pedestrian Bridges Failures Due to Hurricane Maria

Volume 1

FINAL REPORT
August 2021

Submitted by:

Gustavo Pacheco-Crosetti, PhD, PE
Professor

Héctor J. Cruzado, PhD, PE
Professor

Adriana Murati-Núñez
Undergraduate Student

Transportation Infrastructure Research Center – TIRC
Polytechnic University of Puerto Rico
377 Ponce de Leon Ave, San Juan, PR 00918

External Project Manager

Juan Carlos Rivera, Engineer
Puerto Rico Highway and Transportation Authority

In cooperation with

Rutgers, The State University of New Jersey
And
Puerto Rico
Department of Transportation and Public Works
And
U.S. Department of Transportation
Federal Highway Administration

Disclaimer Statement

The Center for Advanced Infrastructure and Transportation (CAIT) is a Regional UTC Consortium led by Rutgers, The State University. Members of the consortium are Atlantic Cape Community College, Columbia University, Cornell University, New Jersey Institute of Technology, Polytechnic University of Puerto Rico, Princeton University, Rowan University, SUNY - Farmingdale State College, and SUNY - University at Buffalo. The Center is funded by the U.S. Department of Transportation.

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
CAIT-UTC-REG18		

4. Title and Subtitle

Improving Transportation Infrastructure Resilience against Hurricanes, other Natural Disasters, and Weathering: Part II - Analysis of pedestrian bridges failures due to Hurricane Maria

5. Report Date

August 2021

6. Performing Organization Code

CAIT/PUPR

7. Author(s)

Gustavo Pacheco-Crosetti (https://orcid.org/0000-0001-5346-6144)
Héctor J. Cruzado (https://orcid.org/0000-0003-0268-5296)

8. Performing Organization Report No.

CAIT-UTC-REG18

9. Performing Organization Name and Address

Transportation Infrastructure Research Center – TIRC
Polytechnic University of Puerto Rico
377 Ponce de Leon Ave
San Juan, PR 00918

10. Work Unit No.

11. Contract or Grant No.

69A3551847102

12. Sponsoring Agency Name and Address

Center for Advanced Infrastructure and Transportation
Rutgers, The State University of New Jersey
100 Brett Road, Piscataway, NJ 08854

13. Type of Report and Period Covered

Final Report
10/01/2018 – 03/02/2020

14. Sponsoring Agency Code

15. Supplementary Notes

U.S. Department of Transportation/OST-R
1200 New Jersey Avenue, SE
Washington, DC 20590-0001

16. Abstract

After the passage of Hurricane Maria as a strong category 4 storm through Puerto Rico, many different types of structures were affected. The objective of this investigation was to determine whether Hurricane Maria caused damages to pedestrian bridges in Puerto Rico, taking the San Juan Metropolitan Area (SJMA) as a case study. To achieve the project objective, the following tasks were performed: first, a literature review on pedestrian bridges in general was performed; second, several visits were made to the Bridges Office of the Puerto Rico Highway Transportation Authority to search for available information on pedestrian bridges location and condition; third, all the bridges on the SJMA were geolocated; fourth, visits were made to visually inspect the pedestrian bridges; fifth, by comparing the visual inspection findings to the previous inspection findings and old photographs, an assessment of possible damages induced by wind action was performed; and finally, all the documentation process was carried out. It was concluded that, out of the 21 bridges that were inspected, only four could have been affected by Hurricane Maria. It is understood that the main cause of the damages was the presence of traffic signs that were mounted on the bridges. Two of the damaged pedestrian bridges experienced inelastic lateral deflections due to the wind pressure these signs exerted on the bridge structure. On the other two, the transit signs were detached from their bottom supporting bases, probably due to wind induced vibrations; the signs were swinging due to the lack of lower end supports, situation that constituted a safety hazard to the vehicles that passed below the bridge. It is recommended that special considerations are taken when attaching signs to pedestrian bridges and that, after an extreme wind event, preliminary inspections should not only contemplate the main bridge structure, but any flexible elements attached to it. Volume 2 of this project investigates a steel truss pedestrian bridge that experienced permanent lateral deflections due to the hurricane. The main purpose of the research was to determine if the presence of traffic signs mounted on the bridge were the main cause for the inelastic lateral response. A detailed inspection of the bridge was performed, a condition assessment was developed, lab tests were carried out to characterize the material, and FE simulations were executed to capture the response with and without the signs. It was concluded that the signs played a predominant role in the inelastic response, but that there were also other conditions that may have contributed to the plastic deflections.

17. Key Words	18. Distribution Statement
Hurricanes, wind damages, pedestrian bridges, transportation resilience	

19. Security Classification (of this report)	20. Security Classification (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	475	

Form DOT F 1700.7 (8-69)

Acknowledgments

The authors would like to thank the Puerto Rico Highway and Transportation Authority (PRHTA) and the Puerto Rico Department of Transportation and Public Work (PRDOT) for all the information and collaboration they provided during the development of the project.

The authors also thank the Center for Advanced Infrastructure & Transportation (CAIT) at Rutgers University, and the Federal Highway Administration (FHWA), for their support in the development of the project.

Finally, thanks to Polytechnic University of Puerto Rico personnel and the students that participated in this project for their cooperation and assistance.

Table of Content

List of Figures

List of Tables

1 Introduction

Pedestrian bridges are structures that are required to provide pedestrians with a safe passage in areas that are not accessible by walking (i.e., crossing water bodies) or that impose special risks to pedestrian flow (i.e., crossing high volume roadways). As they are obviously used in different situations with different characteristics, pedestrian bridges can be built with different materials (such as reinforced concrete, prestressed concrete, steel, wood, stone, aluminum, among others) and use different structural systems (such as arches, beams and slabs, trusses, suspension cables, or cable-stayed, among others). As these structures are very important for the safety of the public, it is imperative to continuously evaluate their integrity and serviceability, especially after an extreme event like a hurricane.

On September 20, 2017, Hurricane Maria crossed Puerto Rico from its southeast end to its northwest end (see Figure 1.1). The island suffered major damages in diverse structures, such as houses, multistory buildings, vehicular bridges, roads, sport venues, and storage facilities, among many others. The damages caused by Hurricane Maria in Puerto Rico and the Virgin Islands has been estimated to be around $90 billion, making it the third most expensive hurricane in the history of the United States (Pasch, Penny, & Berg, 2019). Due to the intensive and extensive damages produced by Hurricane Maria, it was decided to explore the effects of this extreme event on pedestrian bridges in order to evaluate to what extent they were affected.

The objective of this project was assessing pedestrian bridge damages that may be attributed to Hurricane Maria and determining their causes and possible improvements that may have avoided such damages. The San Juan Metropolitan Area (SJMA) was selected as the case study area. The project had five principal stages: conduct a literature review on pedestrian bridges (the specifications that apply to the design and inspection of pedestrian bridges in Puerto Rico), identify and geolocate the pedestrian bridges in the SJMA, consult and document available drawings and inspections performed in previous years for each pedestrian bridge identified in the SJMA, perform field visits and inspections to each pedestrian bridge, and finally evaluate the findings and assess if the encountered damages were related to the hurricane. This document covers all the stages of the project and presents conclusions and recommendations.

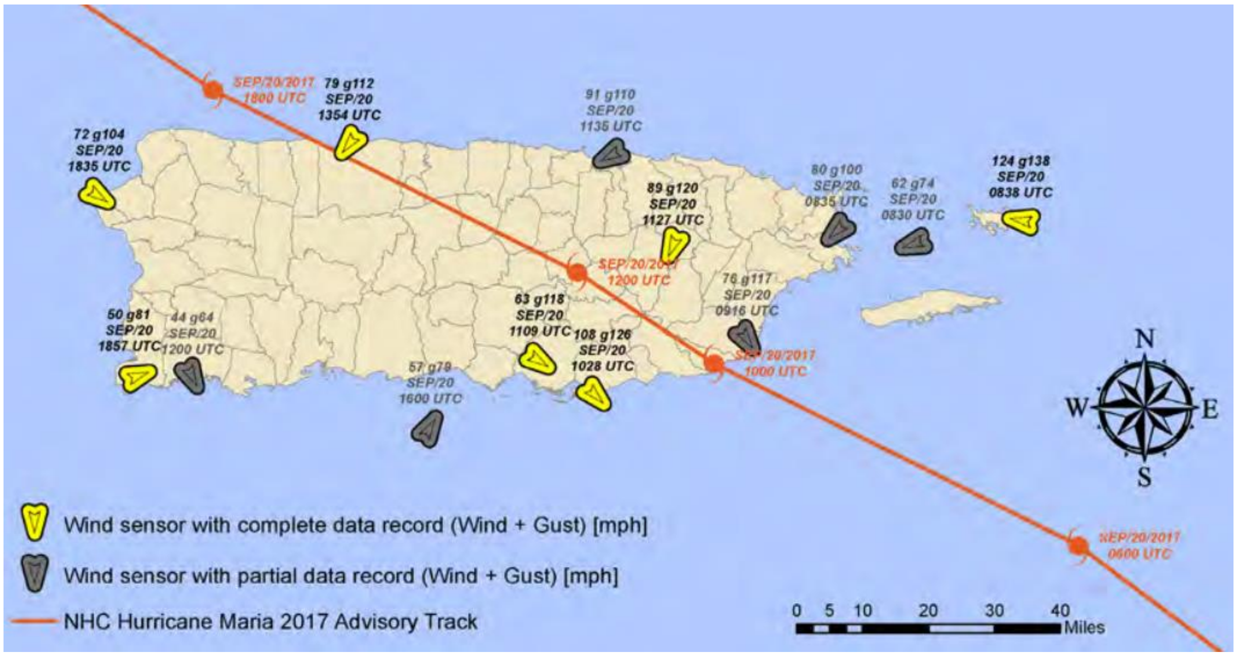


Figure 1.1: Trajectory of Hurricane Maria over Puerto Rico (FEMA, 2018)

2 Literature Review

Two important aspects for a resilient pedestrian bridge construction are the design process and the inspection and condition assessments that allows a proper maintenance. In this chapter, a summary is presented of the specifications that apply to the design and inspection of pedestrian bridges in Puerto Rico.

2.1 Design Specification for Pedestrian Bridges

The design and construction of pedestrian bridges should be done in accordance with the *LRFD Guide Specifications for the Design of Pedestrian Bridges* (AASHTO, 2009). These specifications are meant to be used as a supplement to the *LRFD Bridge Design Specifications* (AASHTO, 2020), which are widely used for the design of vehicular bridges.

Pedestrian bridges are designed to support different loads, such as dead load, pedestrian loading, maintenance vehicle load (unless vehicular access is prevented by permanent physical methods), equestrian load, wind load, and fatigue load, among others. Again, both sets of specifications mentioned in the previous paragraph must be used together in order to determine the applicable loads and their combinations.

Given the objective of this project, the determination of wind loads is of particular interest. The *LRFD Guide Specifications for the Design of Pedestrian Bridges* (AASHTO, 2009) indicates wind loads shall be determined in accordance with the *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals* (AASHTO, 2015), unless otherwise required by the bridge owner. This is done because pedestrian bridges are potentially more flexible than vehicular bridges and because of the possibility of traffic signs being mounted on pedestrian bridges (AASHTO, 2009). The *LRFD Guide Specifications for the Design of Pedestrian Bridges*

(AASHTO, 2009) clearly indicate that signs mounted on pedestrian bridges must be considered when calculating wind loads.

2.2 Inspection Procedures for Pedestrian Bridges

The Puerto Rico Highway and Transportation Authority (PRHTA) used to be in charge of the inspection of pedestrian bridges in Puerto Rico. For these inspections, PRHTA followed the standards of the National Bridge Inventory (NBI). When visual inspections of pedestrian bridges were performed, they focused their assessments mostly to NBI Items 58, 59, and 60, which corresponds to the deck, the superstructure, and the substructure, respectively. A condition assessment was given according to the findings using a rating scale that ranges from nine (9) to zero (0). Table 2.1 presents the Condition Rating Scale used for the bridge Items 58, 59, and 60 and a description of the condition.

Table 2.1: NBI general condition rating guidelines (Federal Highway Administration, 1995)

Code	Description
N	NOT APPLICABLE
9	EXCELLENT CONDITION
8	VERY GOOD CONDITION (No problems noted.)
7	GOOD CONDITION (Some minor problems.)
6	SATISFACTORY CONDITION (Structural elements show some minor deterioration.)
5	FAIR CONDITION (All primary structural elements are sound but may have minor section loss, cracking, spalling or scour.)
4	POOR CONDITION (Advanced section loss, deterioration, spalling or scour.)
3	SERIOUS CONDITION (Loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.)
2	CRITICAL CONDITION (Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until correction action is taken.)
1	“IMMINENT” FAILURE CONDITION (Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed to traffic but corrective action may put back in light service.)
0	FAILED CONDITION (Out of service; beyond corrective action.)

Appendix A presents the forms and procedures used by PRHTA for the documentation of inspections of pedestrian bridges. These documents are:

- Bridge Load Capacity Summary Form
- Critical Finding Memorandum
- Safety Inspection Report
    - Initial Inspection Report
    - Routine Inspection Report
- Standards for Photographs of Existing Bridges
- Standard Element Numbering Procedure
- Quality Assurance / Quality Control Forms
- Scope of Work of Underwater Inspection
- Procedure for Conducting Underwater Inspection
- Failure Critical Inspection Procedures

All inspections were carried out with the most up-to-date forms by PRHTA. These above-mentioned forms were filled out based on findings, giving ratings (as per Table 2.1) and comments. Any rating of 7 or less was accompanied with an explanatory comment. When the rating was 4 or less, in addition to the comment, the inspector had to attach photographs that exemplify the condition and justify the rating.

At some point before the passing of Hurricane Maria through Puerto Rico, the ownership of the pedestrian bridges passed to the municipalities, together with the responsibility of inspecting them. Still, old inspection reports by the PRHTA were collected for this project.

3 Methodology

In order to achieve the objectives of this research, the following list of tasks summarizes the procedure followed to assess the impact of Hurricane Maria on pedestrian bridges in the San Juan Metropolitan Area (SJMA) of Puerto Rico:

- Perform a literature review and collect background data.
  - Visit the offices of the Puerto Rico Highway and Transportation Authority to obtain relevant background data (i.e., inspection reports, photos, drawings, manuals of inspections).
  - Perform a literature review on pedestrian bridges.
  - Study the available inspections reports on pedestrian bridges.
  - Review news reports on bridge damages.
- Identify pedestrian bridges in the SJMA.
  - Obtain a list of bridges in the area.
  - Geo-locate the pedestrian bridges with the platform Google Earth Pro.
  - Assess ownership and accessibility.
- Perform field visit and visual inspection of pedestrian bridges in the area of study.
  - Try to identify possible damages that may have been produced by the hurricane.
  - Complement the visual inspection with interviews of local residents, when possible, to receive their input on the condition of the bridge previous to the hurricane.
  - Document with several high-quality photographs each bridge.

    - Fill in forms with comments on the preliminary findings during the visit. The forms used for field inspections are presented in Appendix B.
- Evaluate the findings and compare them to previous inspections finding by the PRHTA to identify damages that may be attributed to Hurricane Maria.
- Document all information collected and the findings.

It should be pointed out that, for this project, the inspected pedestrian bridges were not rated, since the objective was only to identify the damages that were understood to have been caused by the hurricane. Those damages are described in detail.

4 Pedestrian Bridges in the San Juan Metropolitan Area

As previously mentioned, in the past the Puerto Rico Highway and Transportation Authority (PRHTA) was responsible for the inspections and evaluation of pedestrian bridges, but at some point before Hurricane Maria made landfall in Puerto Rico, that changed. Currently, the responsibility of inspecting and evaluating pedestrian bridges is of the municipality in which the bridge is located. Nonetheless, PRHTA performed visual inspections of many pedestrian bridges and still maintains information about them.

For this project, PRHTA provided inspection reports (which include plans and photos) of 32 pedestrian bridges located in the San Juan Metropolitan Area (SJMA). Out of the 32 pedestrian bridges, four had been removed prior to Hurricane Maria due to deteriorating conditions; one was removed between 2014 and 2017, while three had already been completely removed by April 2014. Interestingly, the four removed bridges were made of steel and were constructed between 1971 and 1978.

The information of the remaining 28 bridges was used to determine their location, as listed in Table 4.1. Also indicated in Table 4.1 is whether the owner of the bridge is a municipality or if it is owned by another type of entity. These bridges were then geolocated using Google Earth Pro, as shown in Figure 4.1.

Out of the 28 bridges, it was decided to inspect only the 21 bridges owned by the municipality. The seven bridges privately owned were not inspected because they would require a permit from the owner. The following two chapters present the findings of the visual inspections of the 21 bridges.

Out of the 21 pedestrian bridges inspected, it was found that four presented damages that may be attributed to Hurricane Maria. These bridges are discussed in Chapter 5, including background information and descriptions of the damages attributed to the hurricane.

Meanwhile, the bridges that did not present damages due to Hurricane Maria are discussed in Chapter 6. Although these bridges did not present damages due to the hurricane, the inspection team documented any deterioration they detected.

Table 4.1: List of Pedestrian Bridges in the SJMA

Bridge No.	Latitude	Longitude	Ownership
0626	18° 23' 46" N	66° 03' 09" W	Municipality
0745	18° 27' 08" N	66° 05' 12" W	Municipality
0748	18° 23' 42" N	66° 02' 50" W	Municipality
0960	18° 23' 35" N	66° 04' 14" W	Municipality
1095	18° 25' 03" N	66° 02' 36" W	Municipality
1137	18° 26' 50" N	66° 02' 59" W	Municipality
1307	18° 26' 47" N	66° 02' 41" W	Municipality
1418	18° 24' 36" N	66° 02' 37" W	Municipality
1478	18° 23' 57" N	66° 06' 17" W	Municipality
1513	18° 21' 04" N	66° 05' 26" W	Municipality
1616	18° 27' 38" N	66° 04' 52" W	Hotel
1736	18° 23' 42" N	66° 02' 41" W	Municipality
1743	18° 23' 48" N	66° 02' 35" W	Municipality
1762	18° 24' 03" N	66° 03' 02" W	University
1774	18° 24' 26" N	66° 04' 21" W	Municipality
1888	18° 26' 41" N	66° 04' 09" W	Hospital
1897	18° 23' 12" N	66° 03' 41" W	University
1926	18° 25' 27" N	66° 04' 14" W	Municipality
1927	18° 25' 29" N	66° 03' 33" W	Airline
2087	18° 26' 37" N	66° 04' 14" W	Municipality
2336	18° 24' 43" N	66° 01' 44" W	Municipality
2351	18° 24' 40" N	66° 06' 08" W	Telecom Co.
2355	18° 24' 30" N	66° 02' 10" W	Municipality
2549	18° 23' 22" N	66° 04' 51" W	Hospital
2566	18° 24' 28" N	66° 03' 32" W	Municipality
2665	18° 27' 55" N	66° 05' 27" W	Municipality
2682	18° 26' 53" N	66° 03' 35" W	Municipality
2683	18° 26' 51" N	66° 03' 21" W	Municipality

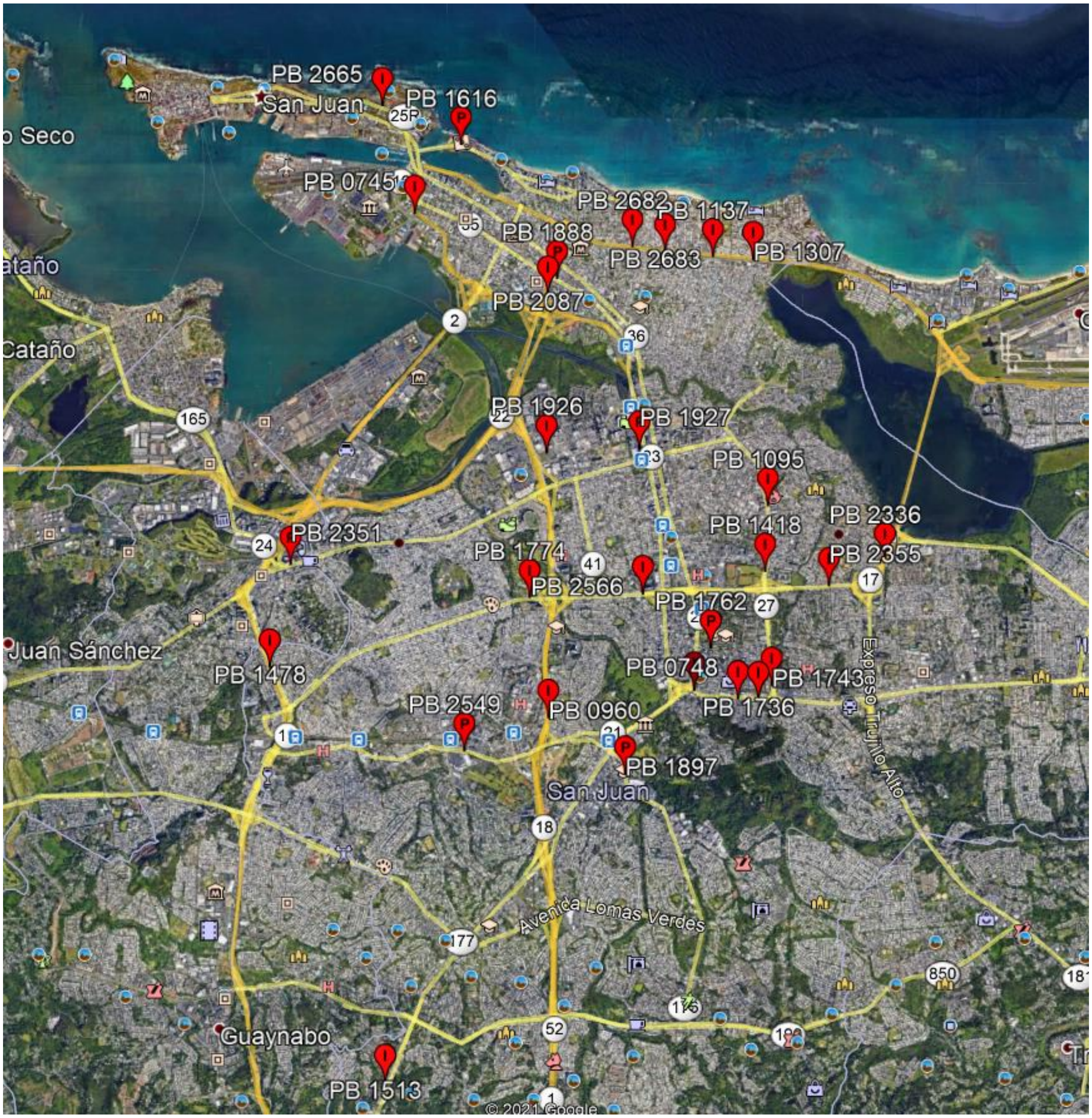


Figure 4.1: Aerial photo of pedestrian bridges in the San Juan Metropolitan Area (Source: Google Earth Pro)

5 Pedestrian Bridges with Damages Possibly Caused by Hurricane Maria

Out of the 21 pedestrian bridges in the San Juan Metropolitan Area (SJMA) inspected for this project, four exhibited damages that may have been caused by Hurricane Maria. These are:

- PB 0960 – Traffic sign detached from mounting assembly and damaged handrail
- PB 1137 – Lateral deflections in the plastic range
- PB 1307 – Lateral deflections in the plastic range
- PB 2336 - Traffic sign detached from mounting assembly

In this chapter, background information is presented on these four pedestrian bridges, as well as the findings of the visual inspections performed for this project. The background information was obtained from information provided by the Puerto Rico Highway and Transportation Authority (PRHTA).

5.1 Pedestrian Bridge 0960

Pedestrian Bridge 0960 (shown in Figure 5.1 and Figure 5.2) was constructed in 1967. It is a slab type bridge made of reinforced concrete. The bridge is located at coordinates 18° 23’ 35” N and 66° 04’ 14” W, connecting Villa Nevarez Urbanization with Quintas de San Ramon Urbanization, which is next to the Puerto Rico Medical Center (see Figure 5.3). The bridge crosses above Las Americas Expressway (PR-18), where by 2005 it had an ADT of 178,900 and a Truck ADT of 4%. Neighbors from the area estimate that the bridge is mostly used by medical students living in Villa Nevarez and working at the Medical Center.

Figure 5.1: South view of PB 0960

Figure 5.2: North view of PB 0960

Figure 5.3: Location of PB 0960 (Source: Google Earth Pro)

5.1.1 PRHTA Inspection Reports

PRHTA provided inspection reports with the following dates, (full reports are presented in Appendix C):

- April 15, 2014
- August 12, 2002
- February 9, 2000
- March 20, 1998
- March 5, 1996
- September 30, 1992

The latest inspection report, dated April 15, 2014, refers to an inspection carried out on December 9, 2008. The report for the 2008 inspection was not available. Table 5.1 presents the ratings given to the bridge’s deck, superstructure, and substructure on two most recent inspections. It can be seen that the deck showed a slight improvement, but the superstructure and substructure kept the same rating.

Table 5.1: PB 0960 ratings from most recent inspections (Source: PRHTA)

Item	Rating	
	December 9, 2008	April 15, 2014
Deck (Item 58)	4	5
Superstructure (Item 59)	4	4
Substructure (Item 60)	5	5

The latest inspection report made the following observations: "The wearing surface shows poor finishing, light scalings and fine to medium transverse cracks. Inadequate ramps for handicaps, holes and much vegetation along the wearing surface and railings. Ramps railings with broken sections from supports and movement. Large spallings with exposed reinforced steel due to traffic impact at beams of second span over route towards Caguas and over reversible lane. Medium horizontal crack at pier cap (East Side)."

5.1.2 Plans of the Bridge

Figure 5.4 and Figure 5.5 reproduce plans of the pedestrian bridge. The plans are dated 1976, but they were copied from the 2014 inspection report.

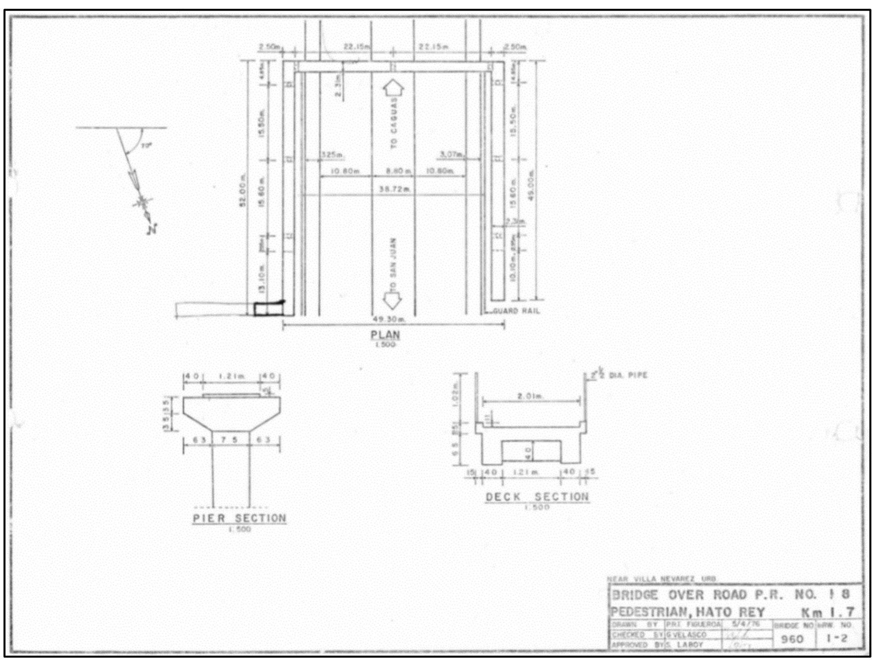


Figure 5.4: PB 0960 plans sheet 1 of 2 (Source: PRHTA)

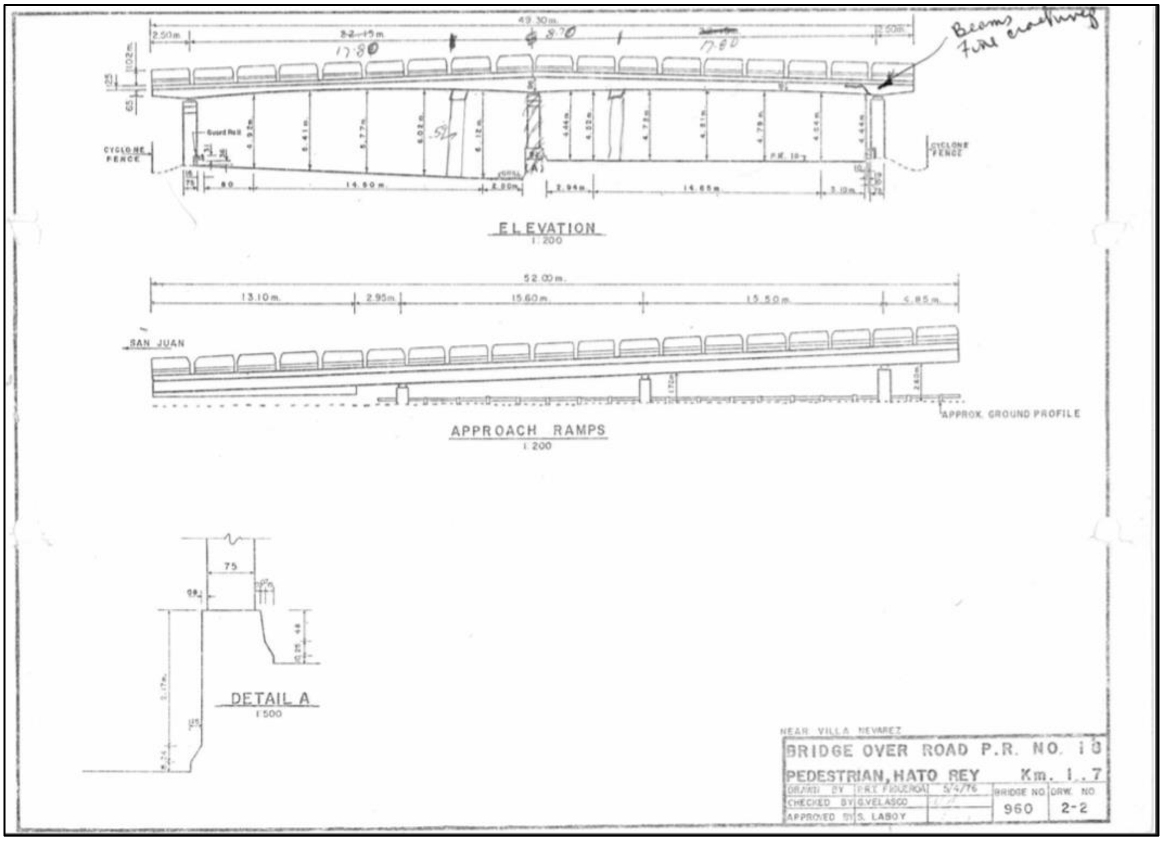


Figure 5.5: PB 0960 plans Sheet 2 of 2 (Source: PRHTA)

5.1.3 Photos of Inspections by PRHTA

Figure 5.6, Figure 5.7 and Figure 5.8 present photos of the bridge from 1972. It can be seen in this pictures that, back then, the bridge did not have chain-link fencing, nor did it have traffic signs attached to it.


Figure 5.6: North side of PB 0960 on July 21, 1972 (Source: PRHTA)

Figure 5.7: Underside of PB 0960 on July 21, 1972 (Source: PRHTA)

Figure 5.8: Walkway of PB 0960 on July 21, 1972 (Source: PRHTA)

5.1.4 Photos Before and After Hurricane Maria

To detect if the bridge suffered any major deformations due to Hurricane Maria, old photographs from PRHTA were compared to pictures taken in 2019. One such comparison can be made between a photo of the walkway from 2000 (Figure 5.9) and a another from 2019 (Figure 5.10). No deformation in the structural elements was detected from the comparison of photographs.

Figure 5.9: Walkway of PB 0960 on September 6, 2000 (Source: PRHTA)

Figure 5.10: Walkway of PB 0960 on March 13, 2019

5.1.5 Inspection by PUPR

The inspection by PUPR was conducted by Civil Engineering undergraduate students Adriana Murati-Núñez and Jonathan Hernández on March 13, 2019. During the inspection, the weather was sunny. The bridge was open to pedestrians.

During the visit, a neighbor approached the inspection team and expressed concern for the safety of the people that use the bridge. One of the concerns was that the sidewalk (at the location indicated in Figure 5.11) used to approach the bridge ramp on the west side has a hole with a depth of more than 1 ft. This hole was covered with a pallet, as shown in Figure 5.12. In the same area, a section of the sidewalk has sunk, as shown in Figure 5.13. Other observations made by the inspection team were the growing vegetation on the chain-link fence of the ramp (see Figure 5.14) and presence of corrosion on the support bases of the chain-link fence (see Figure 5.15).

Figure 5.11: Pedestrian path with the red circle indicating location of tripping hazards (Source: Google Earth Pro)


Figure 5.12: Holes in sidewalk covered with a pallet


Figure 5.13: Sunk section of sidewalk

Figure 5.14: Vegetation in chain-link fencing

Figure 5.15: Corrosion in base support of chain-link fencing

At the time of the inspection, the bridge had attached five signs of different sizes, as it can be appreciated in Figure 5.1 and Figure 5.2. In terms of possible damages caused by Hurricane Maria, it was observed that one of the traffic signs mounted on the bridge was detached at the bottom end from the mounting assembly, as indicated in Figure 5.16. It is theorized that the detachment was due to wind induced vibrations that occurred during the hurricane.


Figure 5.16: Traffic Signs partially detached from support

It was observed that all the traffic signs mounted on the bridge were attached to the handrails, as shown in Figure 5.17. It was noticed that there were cracks at the base of handrails posts (see Figure 5.18), and one section was detached (see Figure 5.19) and bent, affecting the sign (see Figure 5.20). Wind vibrations may have induced the cracks and triggered the bent.

Figure 5.17: Sign mount attached to handrail

Figure 5.18: Cracks at the base of the handrail posts

Figure 5.19: Detached handrail post

Figure 5.20: Deformed sign due to handrail bent

5.2 Pedestrian Bridge 1137

Pedestrian Bridge 1137 (shown in Figure 5.21) was a steel structure constructed in 1968. The bridge was located at coordinates 18° 26’ 49.75” N and 66° 02’ 59.80” W. This Bailey bridge connected Norte Shopping Center and Luis Lloréns Torres public housing complex at the north with the Villa Palmeras sector at the south, as shown in Figure 5.22. The structure is very important for the security of pedestrians, as it crosses over the Román Baldorioty de Castro Expressway, which has a very high vehicular flow (67,300 ADT with the Truck 4% ADT in 2017). As it will be explained later, PB 1137 was removed by PRDOT because it was highly affected by Hurricane Maria. Still, the PUPR team was able to inspect the structure before its removal.

Figure 5.21: Pedestrian Bridge 1137

Figure 5.22: Location of PB 1137 (Source: Google Earth Pro)

5.2.1 PRHTA Inspection Reports

PRHTA provided inspection reports with the following dates, (full reports are presented in Appendix D):

- May 15, 2017
- January 23, 2014
- June 29, 2001
- March 11, 1999
- August 19, 1996
- December 22, 1994
- February 24, 1993
- June 8, 1991
- June 23, 1989
- July 28, 1987

- April 21, 1986
- July 16, 1975
- November 13, 1972

Table 5.2 presents the ratings given to the bridge's deck, superstructure, and substructure on two most recent inspections. It can be seen that the deck had reached a rating of Poor (4), while the substructure kept deteriorating.

Table 5.2: PB 1137 ratings from most recent inspections (Source: PRHTA)

Item	Rating	
	January 23, 2014	May 15, 2017
Deck (Item 58)	5	4
Superstructure (Item 59)	5	5
Substructure (Item 60)	6	5

The latest inspection report made the following observations about the deck: "There is moderate to severe corrosion on the surface, there are several big holes due to corrosion on the decking plates, there is a big section with a detached and skewed corner creating a hole, big patches to repair corroded sections, there are several sections of the deck that have disconnected from its weld points, …" Referring to the superstructure, the report indicates that "several of the lateral bracing components have light, moderate and sever corrosion and loss of section, some of the upper chord sections have moderate loss of section due to corrosion." Finally, the report indicates that the "steel columns are in good condition, light corrosion."

5.2.2 Plans of the Bridge

The oldest set of plans obtained for this bridge were undated and drawn by hand, as shown in Figure 5.23 and Figure 5.24. Also obtained were a plan from 1976 with a 1982 revision (Figure 5.25) and 1987 revision (Figure 5.26), and a set of plans from 2001 (Figure 5.27 to Figure 5.32).

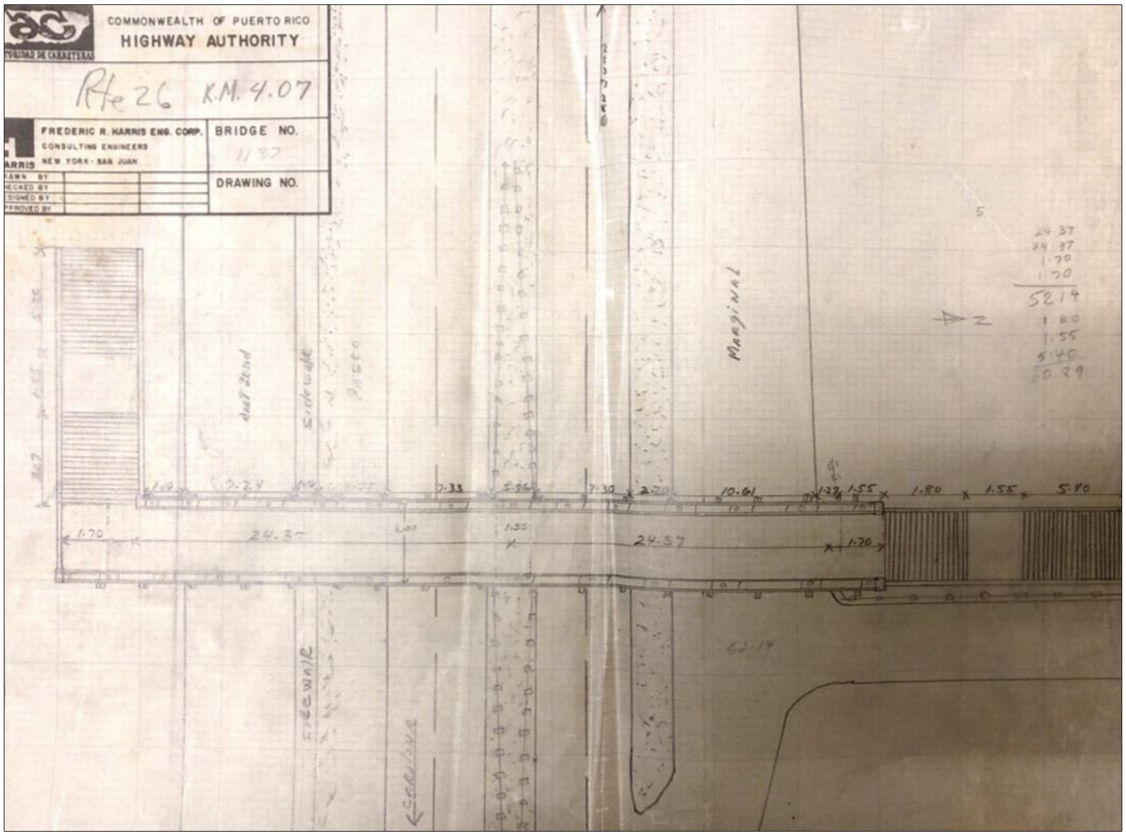


Figure 5.23: PB 1137 undated plan Sheet 1 of 2 (Source: PRHTA)

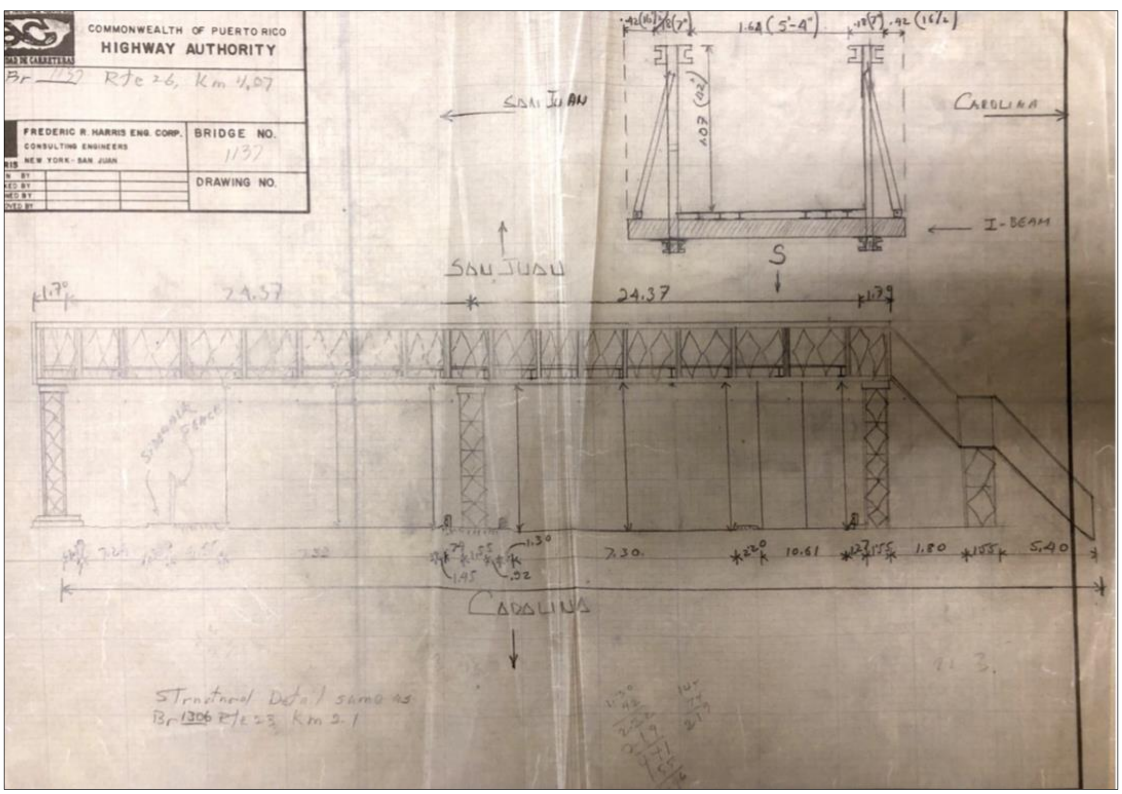


Figure 5.24: PB 1137 undated plan Sheet 1 of 2 (Source: PRHTA)

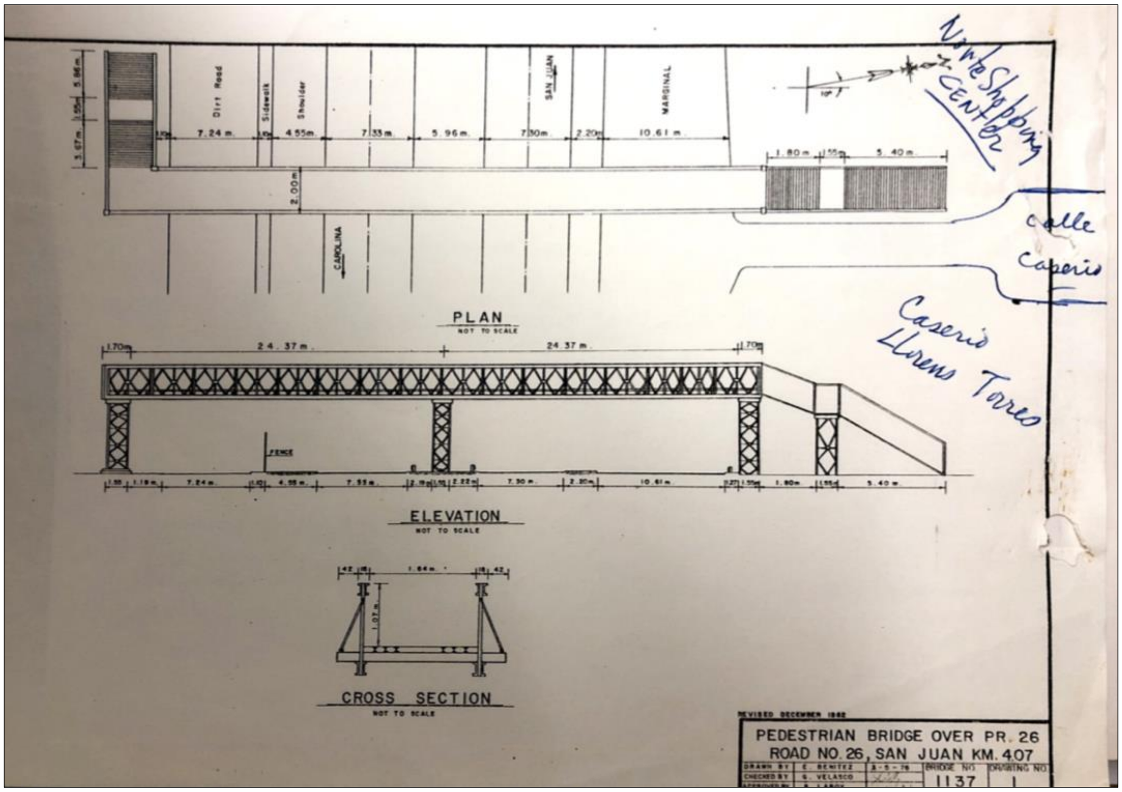


Figure 5.25: PB 1137 plan from 1976 with 1982 revision (Source: PRHTA)

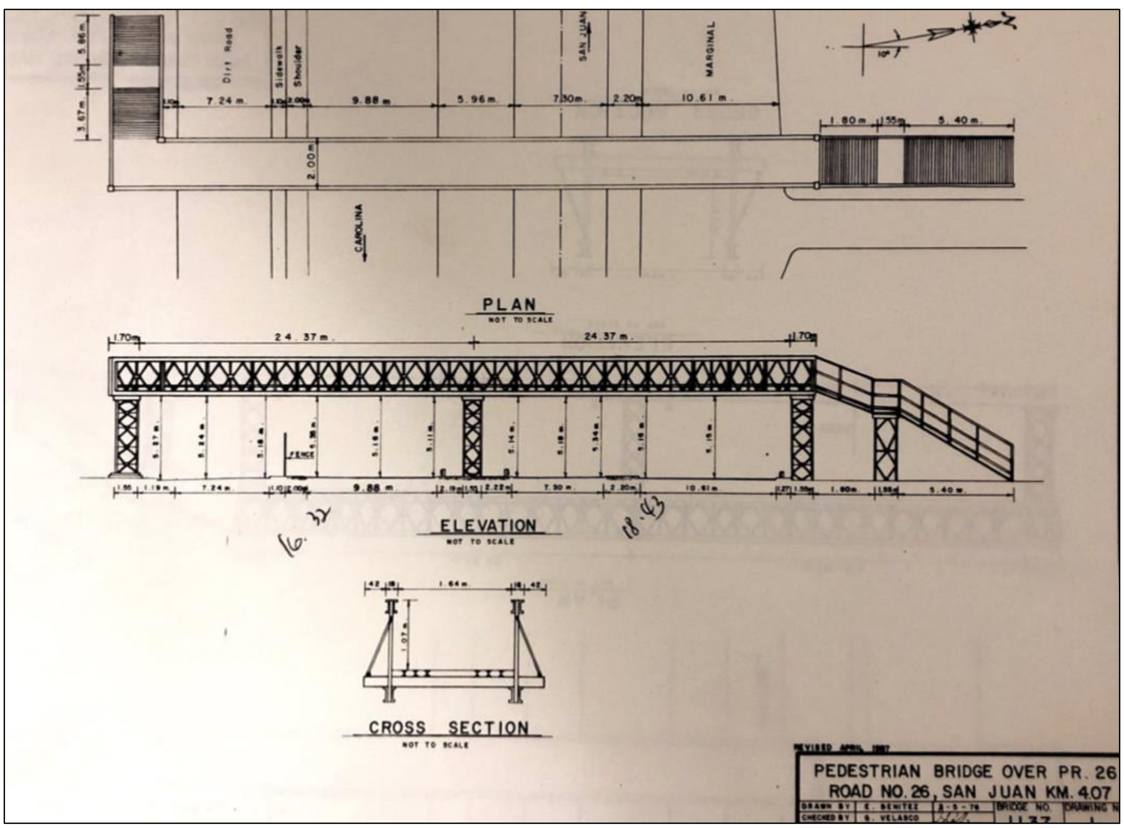


Figure 5.26: PB 1137 plan from 1976 with 1987 revision (Source: PRHTA)

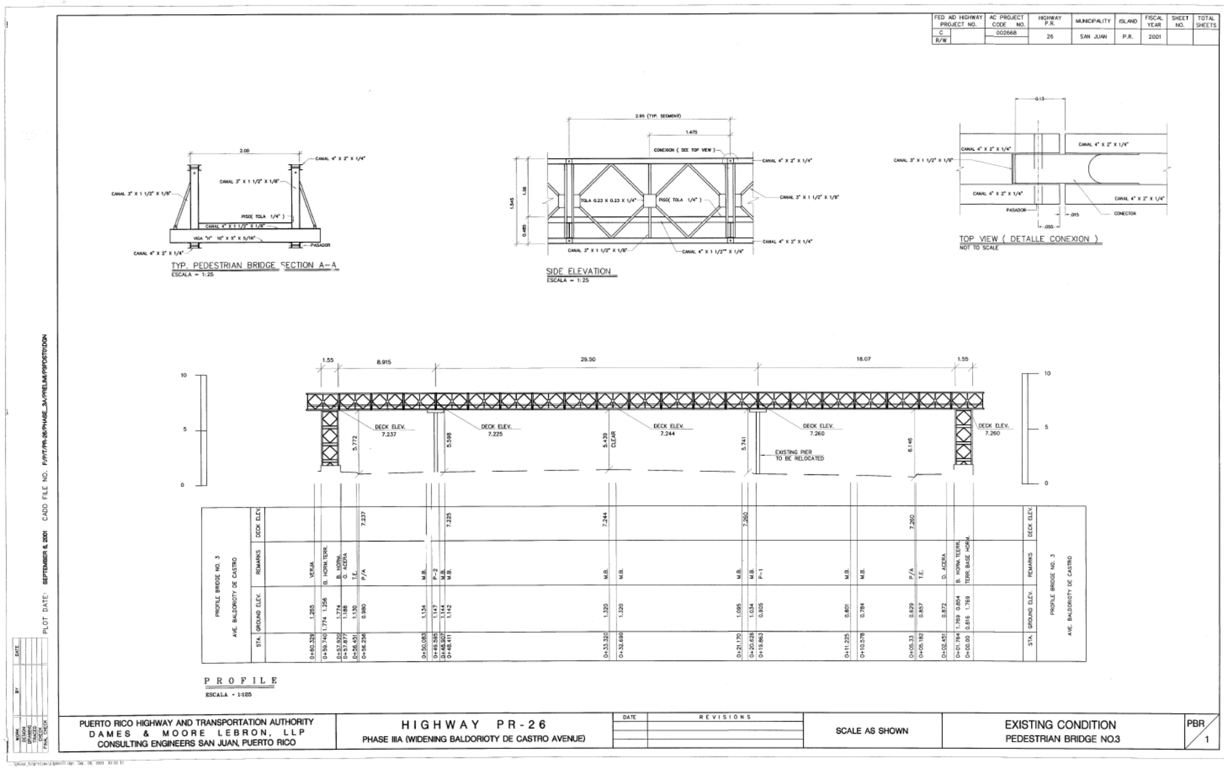


Figure 5.27: PB 1137 plans from 2001 sheet 1 of 6 (Source: PRHTA)

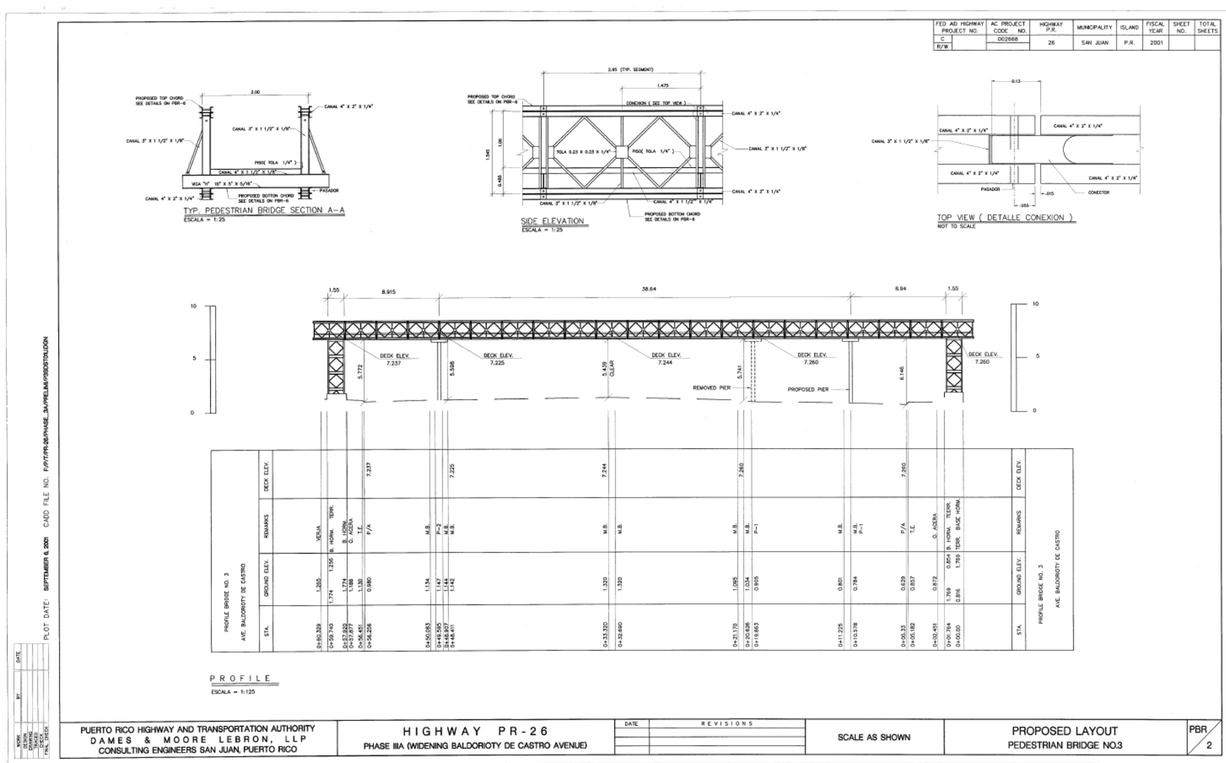


Figure 5.28: PB 1137 plans from 2001 sheet 2 of 6 (Source: PRHTA)

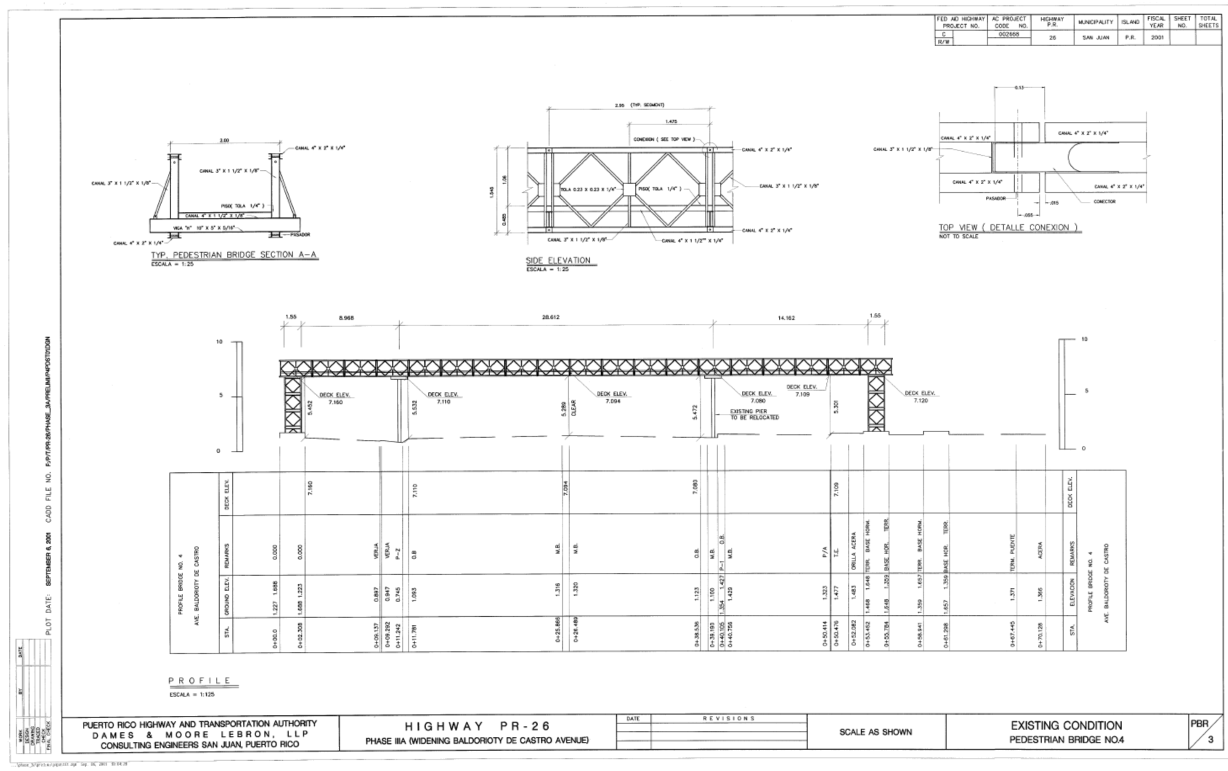


Figure 5.29: PB 1137 plans from 2001 sheet 3 of 6 (Source: PRHTA)

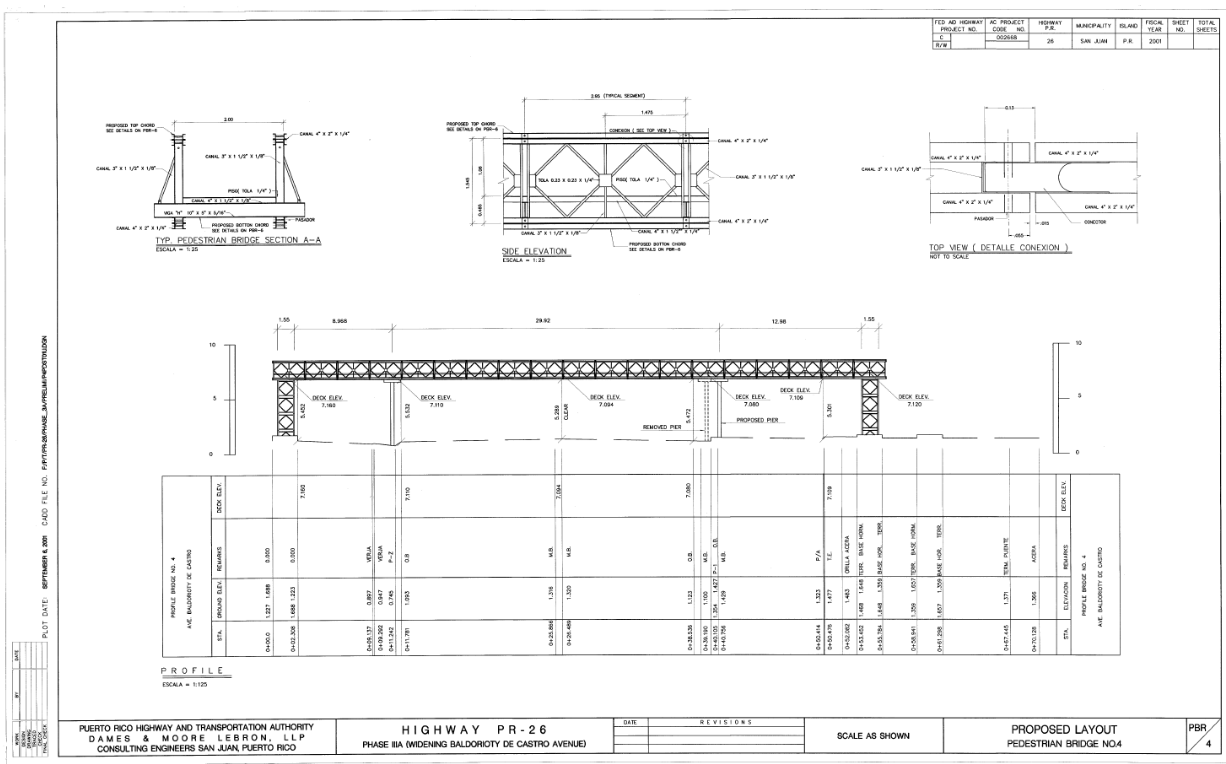


Figure 5.30: PB 1137 plans from 2001 sheet 4 of 6 (Source: PRHTA)

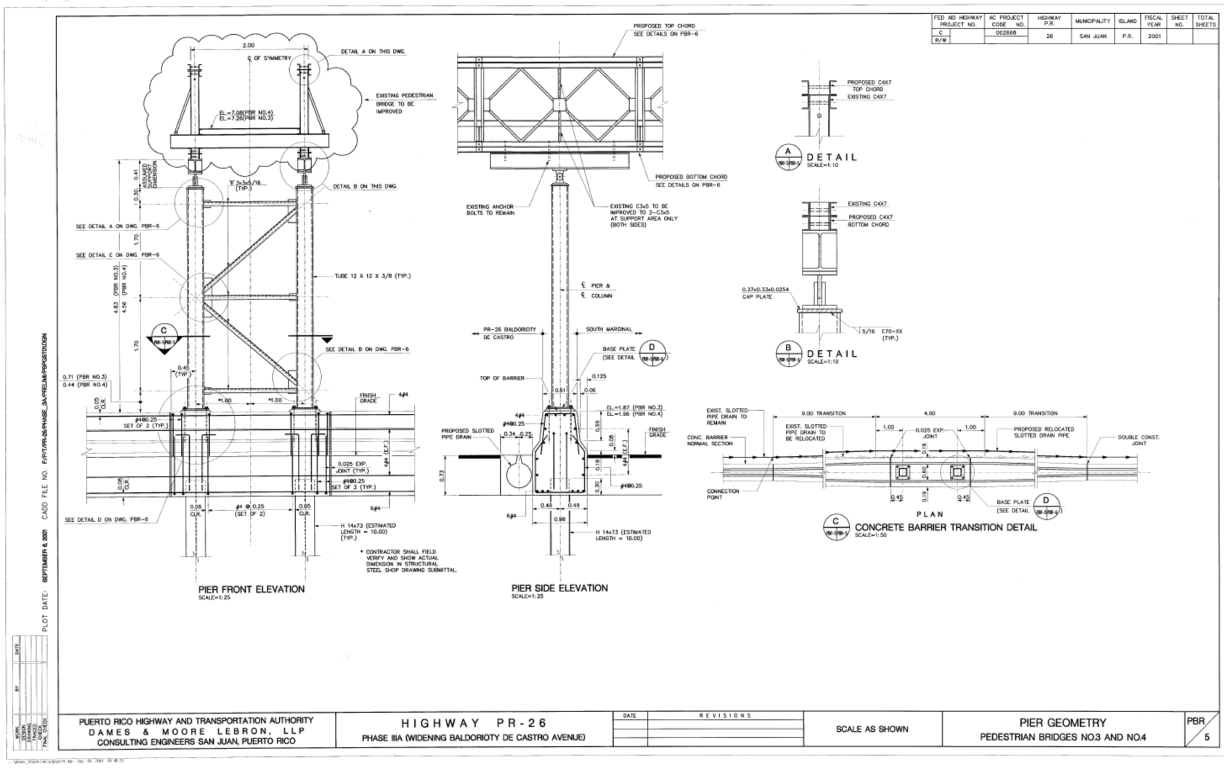


Figure 5.31: PB 1137 plans from 2001 sheet 5 of 6 (Source: PRHTA)

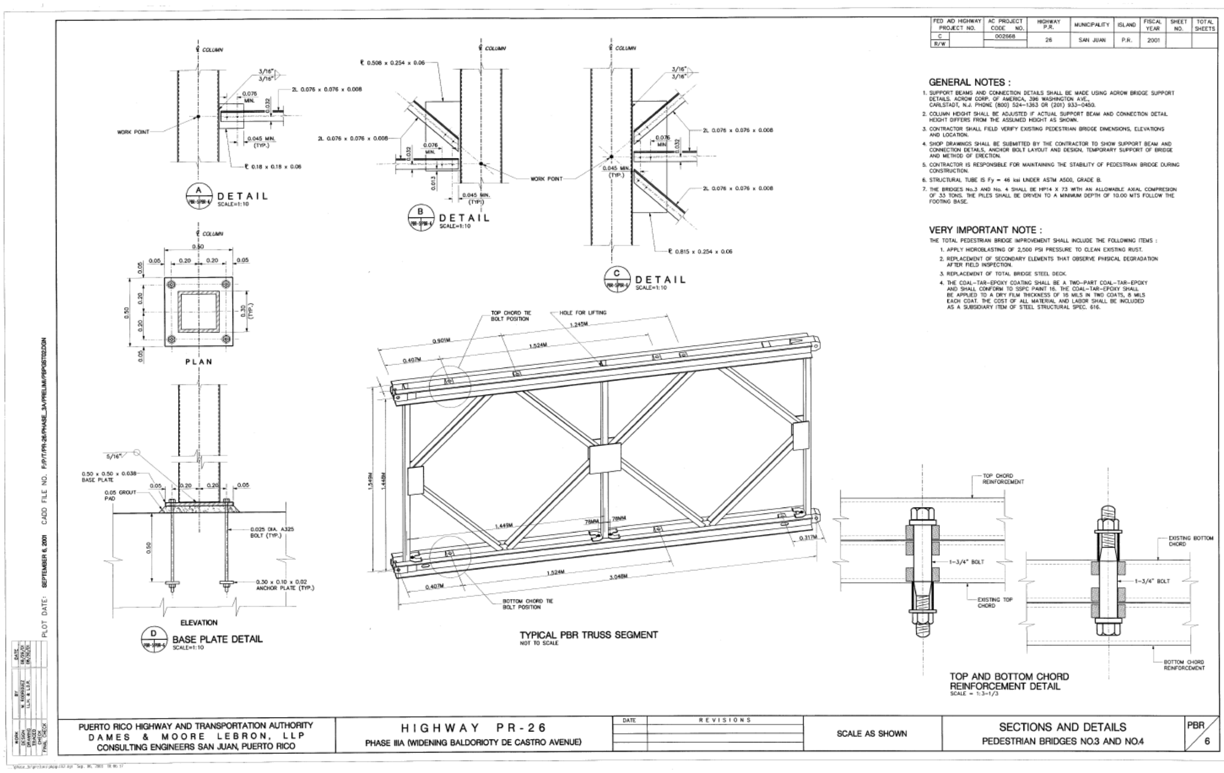


Figure 5.32: PB 1137 plans from 2001 sheet 6 of 6 (Source: PRHTA)

5.2.3 Photos of Inspections by PRHTA

Figure 5.33 presents a set of photos of the bridge taken in 1999. It can be seen in this pictures that, back then, the bridge did not have chain-link fencing, but that it already has at least two traffic signs attached to it.

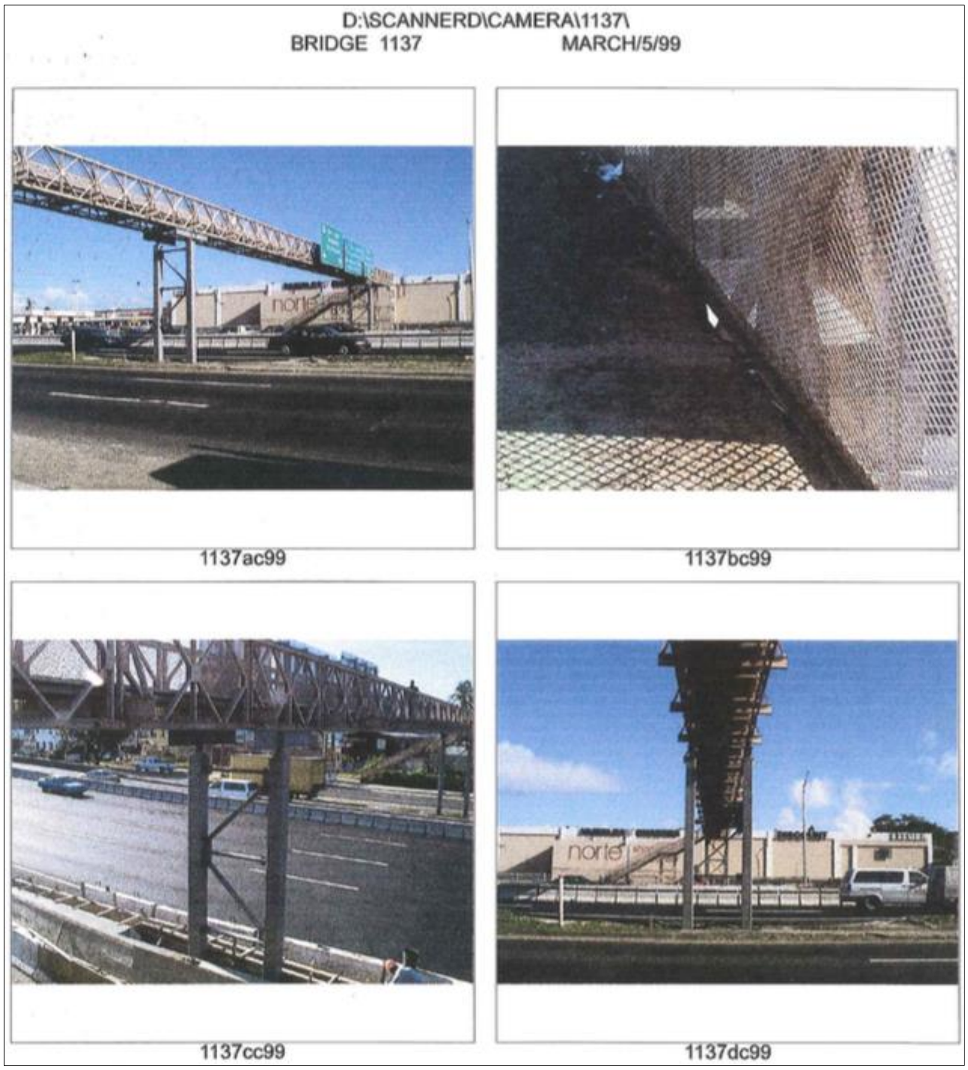


Figure 5.33: Photos taken by PRHTA in 1999 (Source: PRHTA)

5.2.4 Photos Before and After Hurricane Maria

To detect if the bridge suffered any major deformations due to Hurricane Maria, photographs from before and after the hurricane were compared. Examples of these are the comparison that can be made between Figure 5.34 and Figure 5.35, and between Figure 5.36 and Figure 5.37. By the comparing the photographs, it is appreciated that the bridge experienced lateral deflections in the plastic range.

Figure 5.34: Aerial photo of PB 1137 before Hurricane Maria (April 8, 2016) (Source: Google Earth Pro)

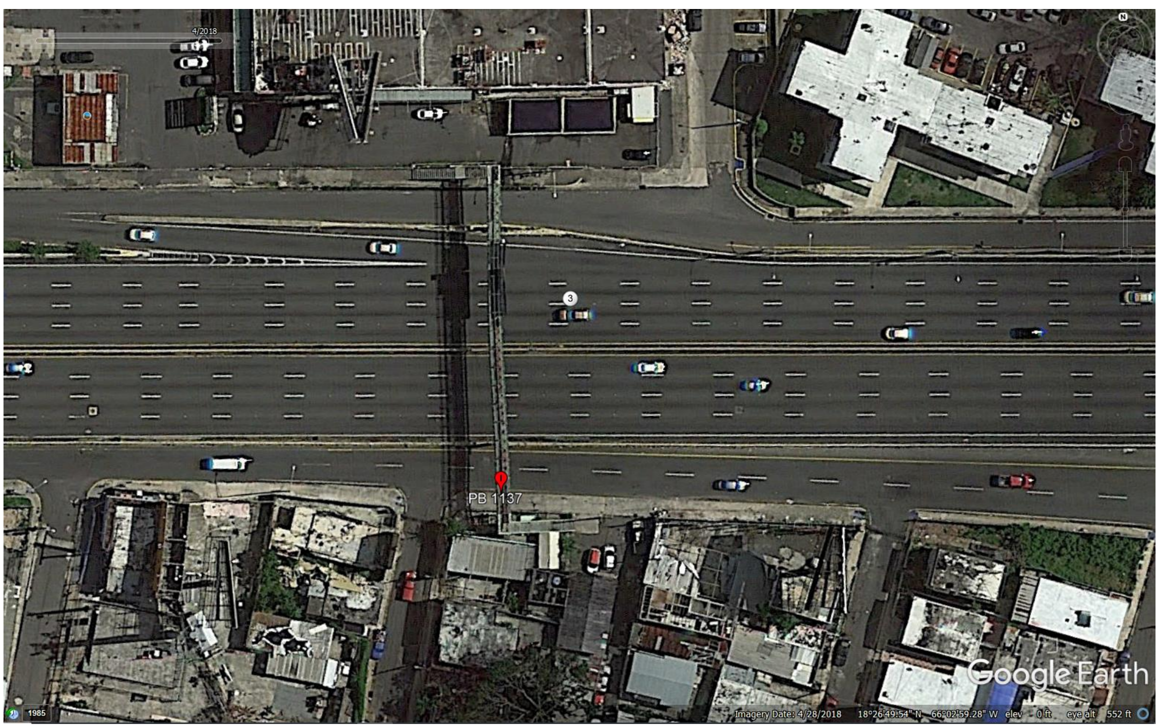


Figure 5.35: Aerial photo of PB 1137 after Hurricane Maria (April 28, 2018) (Source: Google Earth Pro)

Figure 5.36: Underside of PB 1137 before Hurricane Maria (March 5, 1999) (Source: PRHTA)

Figure 5.37: Underside of PB 1137 after Hurricane Maria (November 3, 2018)

5.2.5 Inspection by PUPR

The inspection by PUPR was conducted by Civil Engineering graduate students Nelson Sotelo and Geoffrey Vega, and undergraduate students Adriana Murati-Núñez, Jonathan Hernández and Gustavo Cruz on November 13, 2018. During the inspection, the weather was sunny. The bridge was closed to pedestrians and there were no traffic signs attached to it.

During the visit, it was evident that the bridge had corrosion problems in many components. Corrosion had caused holes in the walkway, as shown in Figure 5.38 and Figure 5.39. Some transveral elements were missing, as shown in Figure 5.40. (Further details about the inspection of this bridge can be found in Volume 2 of this document).

In terms of possible damages caused by Hurricane Maria, it was evident that the bridge had experienced lateral deflections in the plastic range as evidenced by the curvature in the structure that can be appreciated in Figure 5.41 and Figure 5.42. Although the traffic signs that were attached to the bridge had already been removed, the mounting assembly was still present, as shown in Figure 5.43. It was observed that the location of the mounting assembly coincides with the section of the bridge with larger curvature. Therefore, it is theorized that the lateral deflection on the bridge was partly due to the extreme wind loads on the signs during Hurricane Maria. This theory is furthered studied in Volume 2 of this document.

PRDOT deemed Pedestrian Bridge 1137 as unreliable and in danger of collapsing (ElNuevoDia.com, 2019). Therefore, in March 2019, PB 1137 was removed in sections to be later demolished at another site.

Figure 5.38: Some holes in the steel

Figure 5.39: Original piece with all elements

Figure 5.40: Piece without one element

Figure 5.41: Curvature in deck

Figure 5.42: Underside view of lateral deflection

Figure 5.43: Base of the Traffic Sings

5.3 Pedestrian Bridge 1307

Pedestrian Bridge 1307 (shown in Figure 5.44) was a steel structure constructed in 1968. The bridge was located at coordinates 18° 26’ 48.40” N and 66° 02’ 41.89” W. This Bailey bridge connected the Luis Lloréns Torres public housing complex at the north with the Villa Palmeras sector at the south, as shown in Figure 5.45. The pedestrian bridge crosses over the Román Baldorioty de Castro Expressway, which has a very high vehicular flow (67,300 ADT with the Truck 4% ADT in 2017). The reader may notice that PB 1307 is a structure very similar to PB 1137, almost identical. They both are Bailey bridges constructed the same year, with each structure located down the road from the other. PB 1307 was also removed by PRDOT because it was highly affected by Hurricane Maria. Still, the PUPR team was able to inspect the structure before its removal.

Figure 5.44: Pedestrian Bridge 1307

Figure 5.45: Location of PB 1307 (Source: Google Earth Pro)

5.3.1 PRHTA Inspection Reports

PRHTA provided inspection reports with the following dates, (full reports are presented in Appendix E):

- May 15, 2017
- January 24, 2014
- June 30, 2008
- March 14, 2003
- March 12, 2003
- November 17, 2000

- May 8, 1998
- September 24, 1993
- February 28, 1991
- December 3, 1991
- November 17, 1988
- October 23, 1986
- February 2, 1984
- June 18, 1975
- November 13, 1972

Table 5.3 presents the ratings given to the bridge's deck, superstructure, and substructure on two most recent inspections. It can be seen that the bridge maintained a rating of Fair (5) for its major items.

Table 5.3: PB 1307 ratings from most recent inspections (Source: PRHTA)

Item	Rating	
	January 24, 2014	May 15, 2017
Deck (Item 58)	5	5
Superstructure (Item 59)	5	5
Substructure (Item 60)	5	5

The latest inspection report made the following observations about the deck: "Steel surface with severe corrosion, slight loss of sections and slight perforations on the sides of the surface of the decking plates. Several decking plates have detached from their weld points, large sections have been repaired, although there are sections in poor conditions, several small holes due to corrosion and sections of the welded decking plates that leave small gaps between them." Referring to the chain-link fencing, the report indicated: "Severe corrosion of the security mesh, several sections are detached from their points of support. In the stairways there are vertical fencing posts detached from their welding supports.” superstructure, the report indicates that “” Finally, the report indicates that there is “moderate and severe corrosion on all lower members of the structure. There are perforations with loss of sections. Stairs have severe corrosion and perforations with loss of sections. There are railings that have severe corrosion in the anchors or bases, they have lateral movements."

5.3.2 Plans of the Bridge

PRHTA provided a plan drafted originally in 1976 and revised in 1993, as shown in Figure 5.46. Another set of drawings from 1991 were obtained and shown on Figure 5.47 and Figure 5.48. The orientation of the stairways differs between the 1976 and 1991 drawings. It appears that, at some point, the stairways were modified. This is confirmed with photographic evidence.

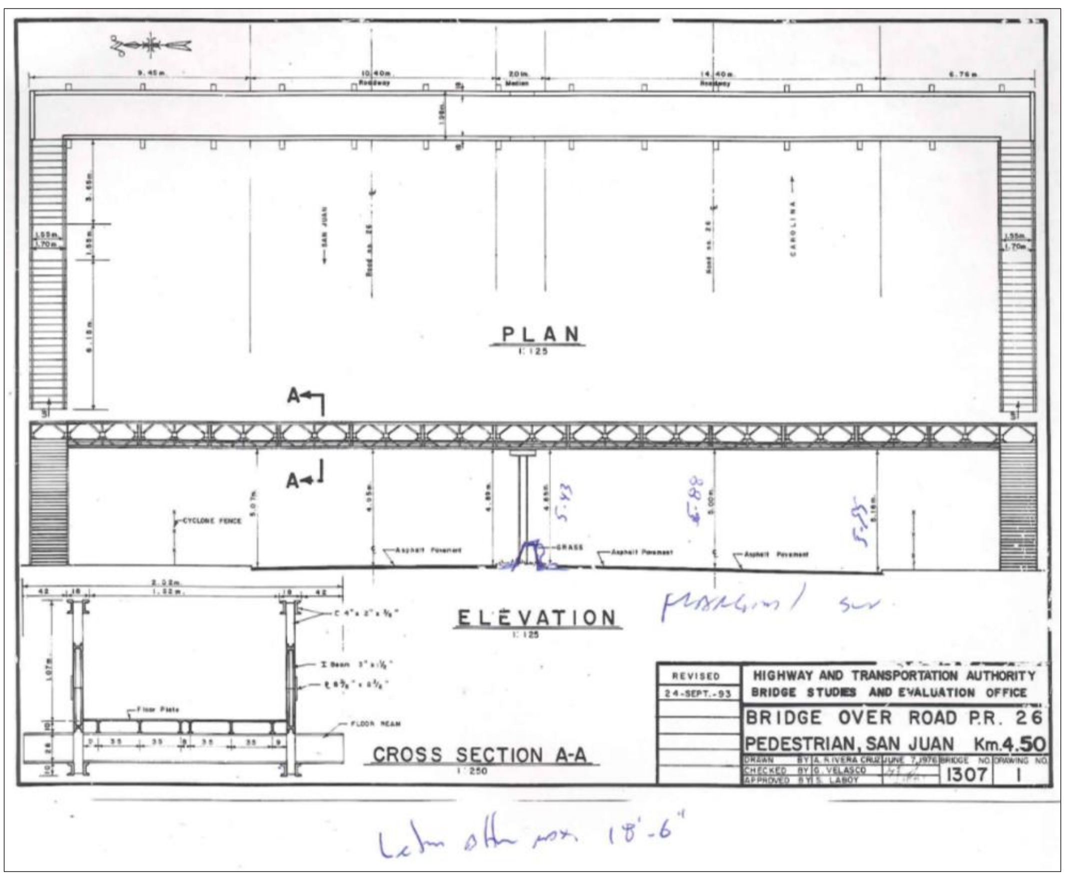


Figure 5.46: PB 1307 plan from 1976 with 1993 revision (Source: PRHTA)

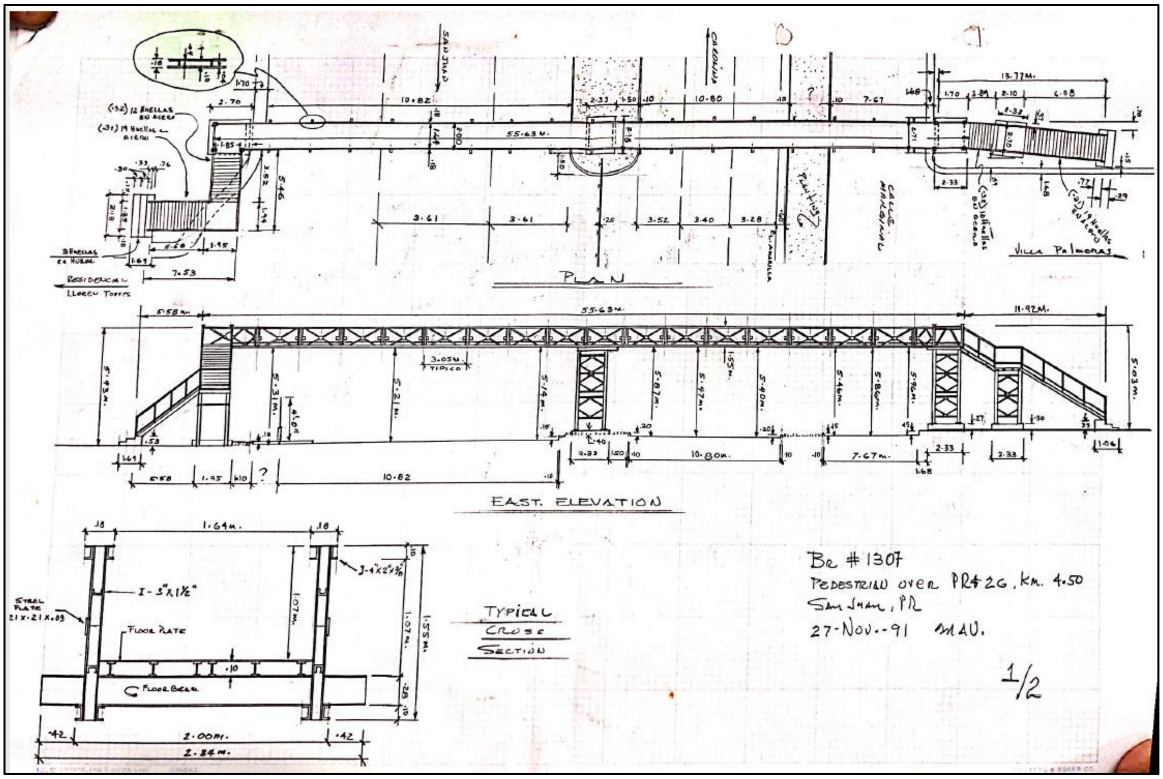


Figure 5.47: PB 1307 plans from 1991 sheet 1 of 2 (Source: PRHTA)

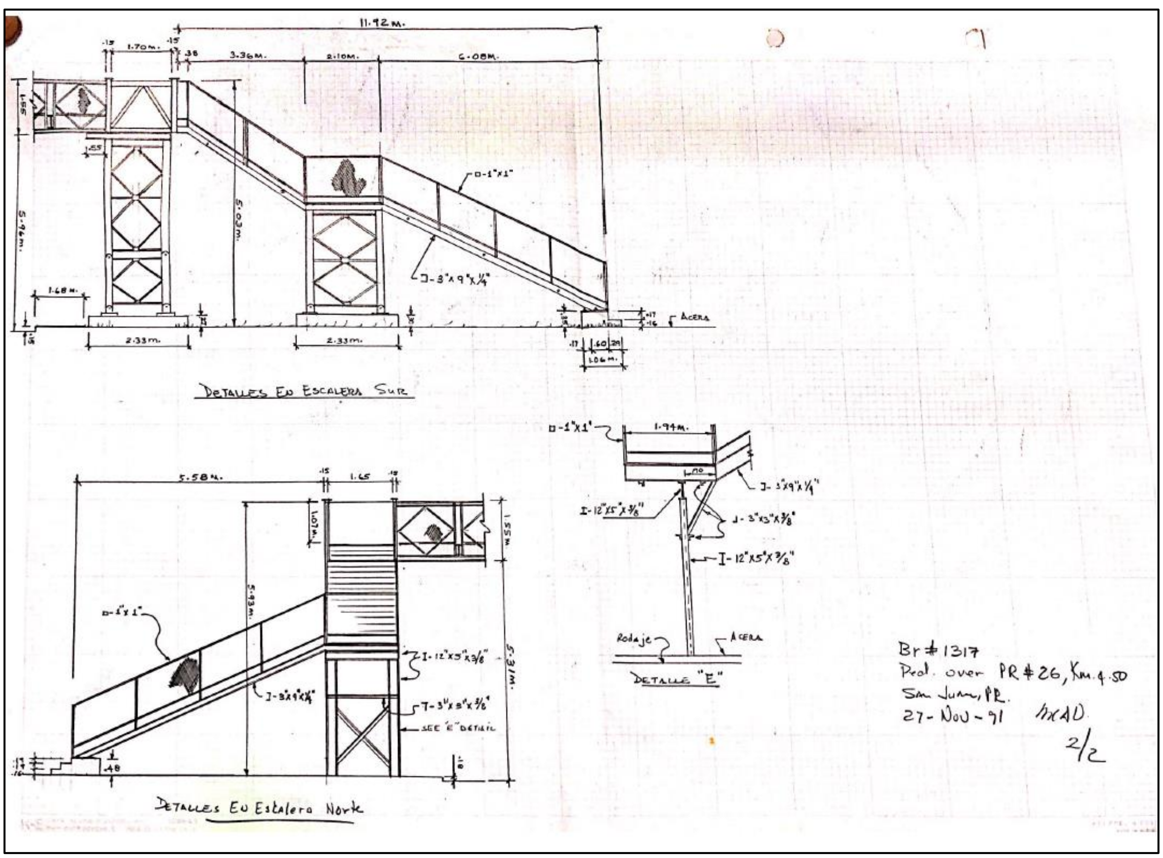


Figure 5.48: PB 1307 plans from 1991 sheet 1 of 2 (Source: PRHTA)

5.3.3 Photos of Inspections by PRHTA

Several photographs were provided by PRHTA. Some undated photographs are shown in Figure 5.49 to Figure 5.52. As explained in the previous section, these photographs show the original orientation of the stairways. It is assumed that these undated photographs are from some point between 1968 and 1990. Figure 5.53 presents a photograph from 1991 which shows the stairways with the modified orientation. Other photographs from 1993 are shown in Figure 5.54 and Figure 5.55. It can be seen in these photos that in 1993, the bridge still did not have chain-link fencing, nor any sign attached to it. A photograph from 2000 (see in Figure 5.56) shows the bridge with traffic signs attached to it, but still with no chain-link fencing.

Figure 5.49: East side view of PB 1307 taken between 1968 and 1990 (Source: PRHTA)

Figure 5.50: Phot of west side view of PB 1307 taken between 1968 and 1990 (Source: PRHTA)

Figure 5.51: Photo of south end of PB 1307 taken between 1968 and 1990 (Source: PRHTA)

Figure 5.52: Underside and north end of PB 1307 taken between 1968 and 1990 (Source: PRHTA)

Figure 5.53: Photo of PB 1307 taken on November 27, 1991 (Source: PRHTA)

Figure 5.54: Photo of deck of PB 1307 taken on September 24, 1993 (Source: PRHTA)

Figure 5.55: Photo of underside of PB 1307 taken on September 24, 1993 (Source: PRHTA)

Figure 5.56: Photo of PB 1307 taken on November 17, 2000 (Source: PRHTA)

5.3.4 Photos Before and After Hurricane Maria

To detect if the bridge suffered any major deformations due to Hurricane Maria, photographs from before and after the hurricane were compared. Examples of these are the comparisons that can be made between Figure 5.57 (taken in 1996) and Figure 5.58 (taken in 2019), and between Figure 5.59 (taken in 1993) and Figure 5.60 (taken in 2019). By the comparing the photographs, it is appreciated that the bridge experienced lateral deflections in the plastic range as evidenced by the curvature exhibited by the deck and the superstructure in the most recent photographs.

Figure 5.57: Deck of PB 1307 before Hurricane Maria (March 18, 1996) (Source: PRHTA)

Figure 5.58: Deck of PB 1307 after Hurricane Maria (February 28, 2019)


Figure 5.59: Underside of PB 1307 before Hurricane Maria (September 24, 1993) (Source: PRHTA)


Figure 5.60: Underside of PB 1307 after Hurricane Maria (February 28, 2019)

5.3.5 Inspection by PUPR

The inspection by PUPR was conducted by Civil Engineering undergraduate students Adriana Murati-Núñez and Jonathan Hernández on February 28, 2019. When the inspection started, the weather was sunny, but it later started raining. The bridge was officially closed to pedestrians, but a hole had been cut through the meshing that was supposed to keep the public out. The traffic signs once attached to the bridge were not present, but the mounting assembly still remained. A neighbor from the area assured that he saw as the bridge “moved from side to side” and as the traffic signs were blown away during Hurricane Maria.

During the inspection, the stairs and deck exhibited corrosion, as shown in Figure 5.61 and Figure 5.62, respectively. It can also be observed in Figure 5.62 that sections of the security messing attached to the guardrail had fallen off. Gaps and holes in the deck were observed as shown in Figure 5.63 and Figure 5.64.

In terms of possible damages caused by Hurricane Maria, PB 1307 exhibited the same damage found on PB 1137, which was a lateral deflection in the plastic range. Although the traffic signs that were attached to the bridge had already been removed or had been blown away, the mounting assembly was still present, as shown in Figure 5.65. It was observed that the location of the mounting assembly coincides with the section of the bridge with larger curvature. Therefore, as with PB 1137, it is theorized that the lateral deflection in PB 1307 was partly due to the extreme wind loads on the signs during Hurricane Maria.

Pedestrian Bridge 1307 was also deemed as unreliable and in danger of collapsing by PRDOT (ElNuevoDia.com, 2019). Therefore, in March 2019, PB 1307 was removed in sections to be later demolished at another site.

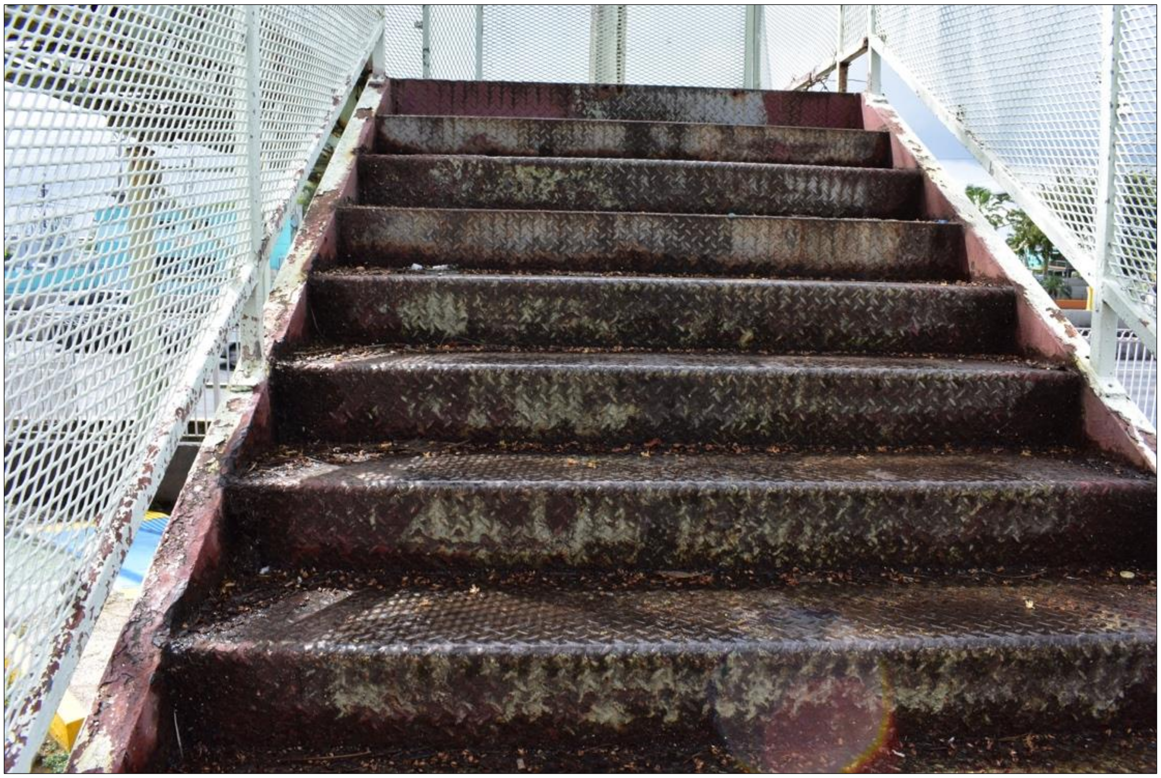


Figure 5.61: Corrosion on stairway

Figure 5.62:Corrsoion on deck and section of guardrail without security meshing

Figure 5.63: Detached plates

Figure 5.64: Hole in plates

Figure 5.65: Lateral deflection at mounting assembly location

5.4 Pedestrian Bridge 2336

Pedestrian Bridge 2336 (shown in Figure 5.66) was constructed in 1994. It is a slab type bridge made of reinforced concrete. Access to the bridge is given by a circular ramp at each end. The bridge located at coordinates 18° 24’ 39” N and 66° 01’ 43” W. It connects Matienzo Cintron Urbanization and the San Juan School of Sports in the West with the Ramos Antonini Public Housing complex and the Mall of San Juan in the East (see Figure 5.67). The bridge crosses above Jesus T. Piñero Expressway (PR-17), which by 2005 had an ADT of 89,200 and a Truck ADT 5%.

Figure 5.66: Pedestrian Bridge 2336 (Source: Google Earth Pro)

Figure 5.67: Location of PB 2336 (Source: Google Earth Pro)

5.4.1 PRHTA Inspection Reports

PRHTA only had available on inspection report for PB 2336. This report is date April 16, 2014. The full report is included in Appendix F. This report refers to a previous inspection carried out on December 10, 2008. Table 5.4 presents the ratings given to the bridge's deck, superstructure, and substructure on two most recent inspections. It can be seen that the ratings of the main items remain unchanged.

Table 5.4: PB 2236 ratings from most recent inspections (Source: PRHTA)

Item	Rating	
	December 10, 2008	April 16, 2014
Deck (Item 58)	6	6
Superstructure (Item 59)	7	7
Substructure (Item 60)	7	7

The latest inspection report made the following observations: "At the present time (04-16-2014) this structure is being reconstructed, construction of additional span at south side by construction of ramp with access to PR-17." It has been determined that the bridge was not being reconstructed, as stated in the inspection report, by examining the photos from the same report and historical aerial photography. It is theorized that merely there was a construction of a new ground level ramp to give access to the circular ramp on the east side. It appears that the bridge structure itself was not modified.

The 2014 inspection report also states: "Fine transverse and longitudinal cracks, exposed aggregates and small spallings at wearing surface some holes at cyclone fence of railings."

5.4.2 Plans of the Bridge

Figure 5.68 and Figure 5.69 reproduce plans of the pedestrian bridge. The plans are dated 1994, but they were copied from the 2014 inspection report.

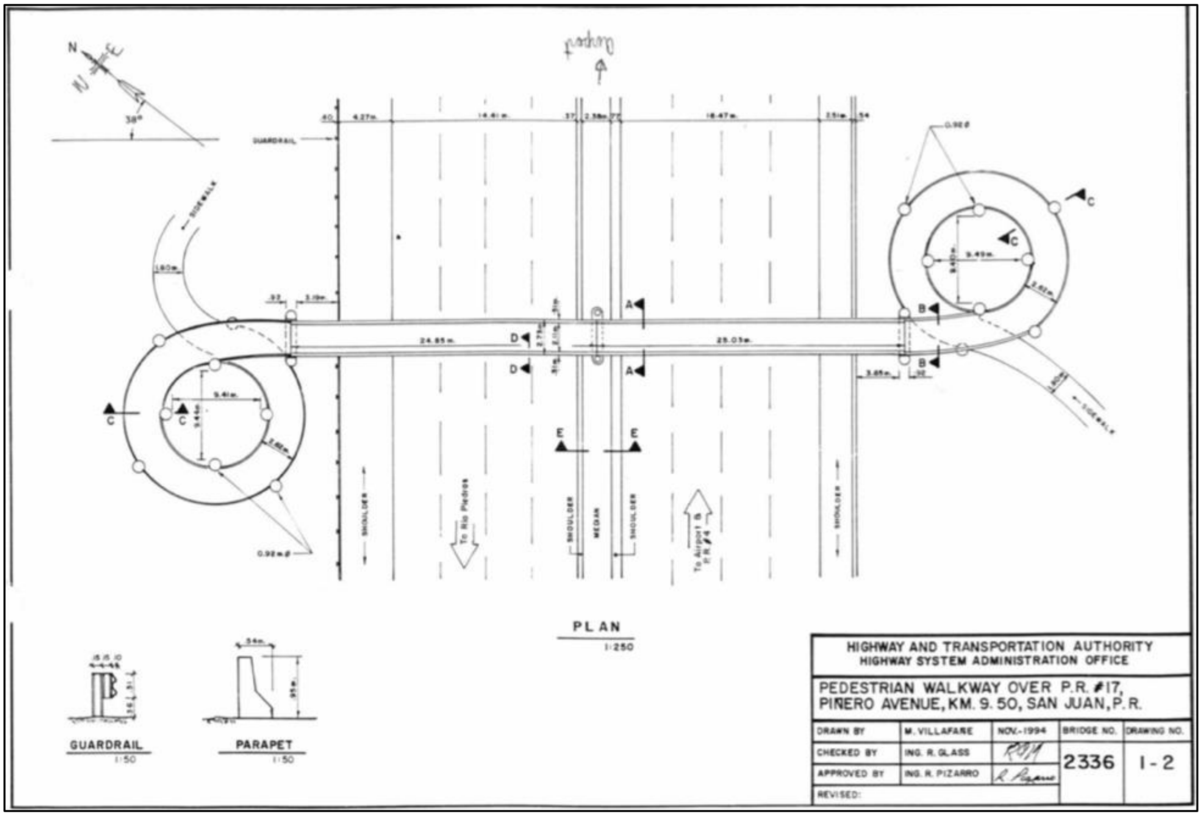


Figure 5.68: PB 2336 plans from 1994 sheet 1 of 2 (Source: PRHTA)

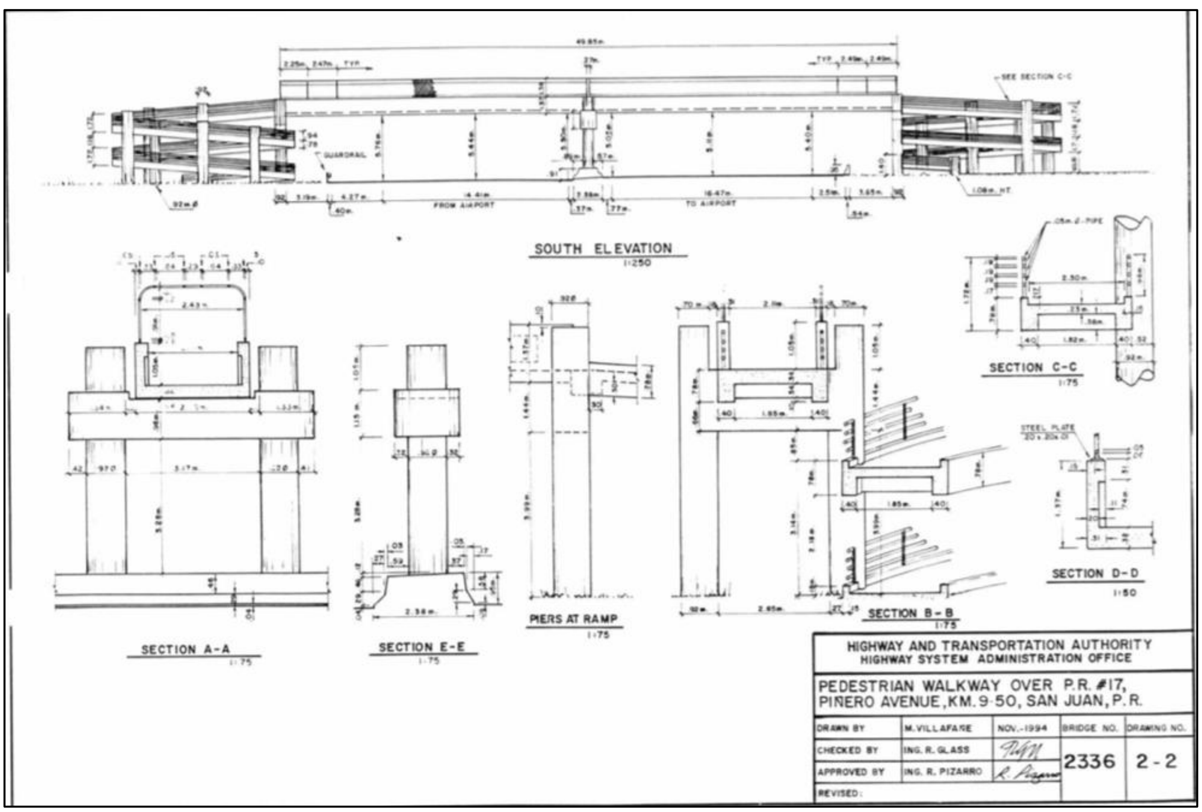


Figure 5.69: PB 2336 plans from 1994 sheet 2 of 2 (Source: PRHTA)

5.4.3 Photos of Inspections by PRHTA

Figure 5.70 presents a set of photographs taken for the inspection report dated April 16, 2014. It can be seen that in 2014, the bridge had traffic signs mounted on it.

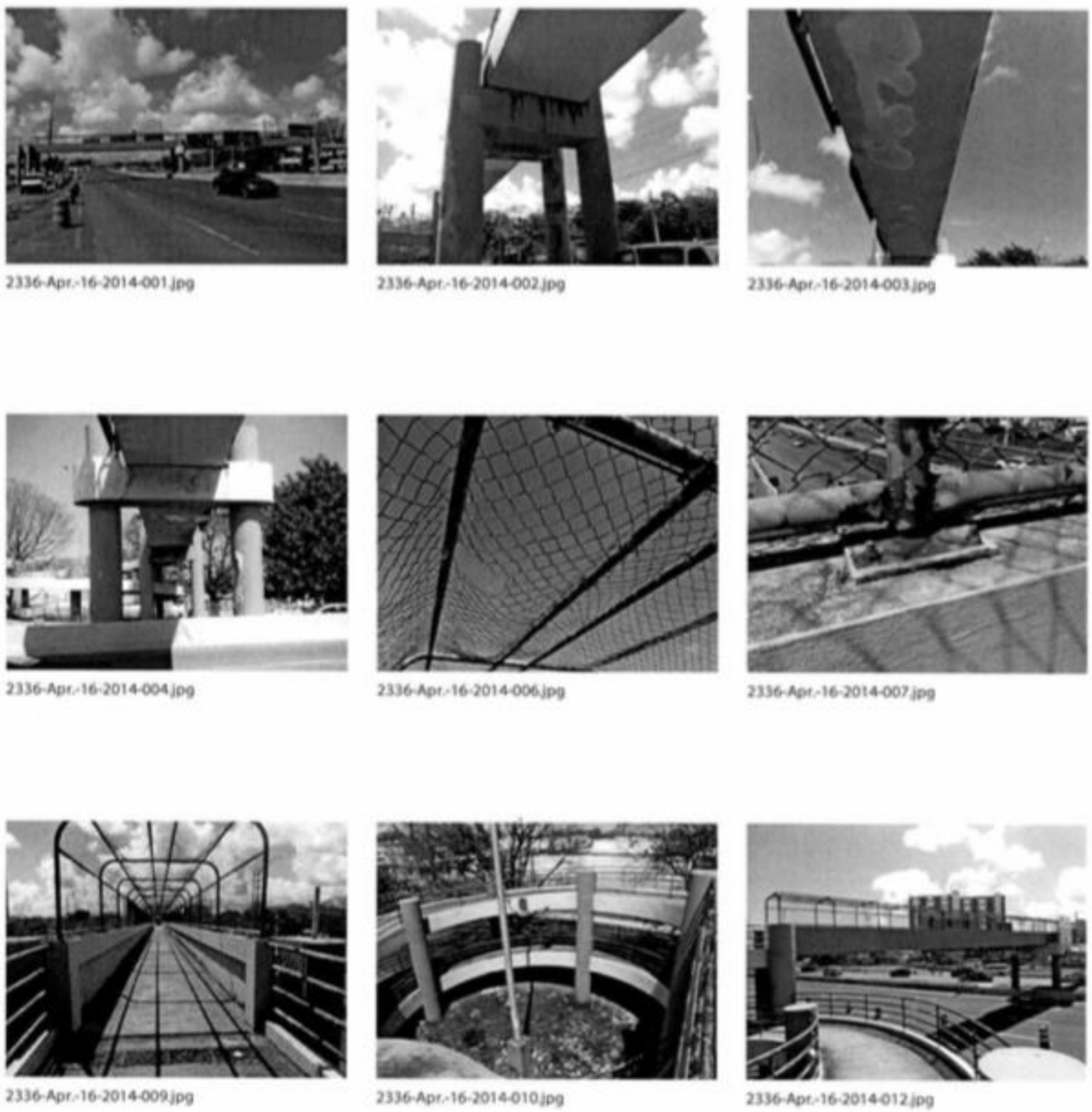


Figure 5.70: Photos of the inspection report dated April 14, 2016 (Source: PRHTA)

5.4.4 Photos Before and After Hurricane Maria

To detect if the bridge suffered any major deformations due to Hurricane Maria, photographs from 2014 by PRHTA were compared to pictures taken in 2019. An example of this is the comparison between Figure 5.71 and Figure 5.72. No deformation in the structural elements was detected from the comparison of photographs.

Figure 5.71 Walkway of PB 2336 on April 16, 2014 (Source: PRHTA)

Figure 5.72: Walkway of PB 2336 on April 12, 2019

5.4.5 Inspection by PUPR

The inspection by PUPR was conducted by Civil Engineering undergraduate students Adriana Murati-Núñez and Jonathan Hernández on April 12, 2019. During the inspection, the weather was sunny. The bridge was open to pedestrians.

The bridge itself did not appear to have any problems. In terms of possible damages caused by Hurricane Maria, it was observed that one of the traffic signs mounted on the bridge (the larger sign inside the red rectangle indicated in Figure 5.73) detached at the bottom end from the mounting assembly (see Figure 5.74) It is theorized that the detachment was due to wind induced vibrations that occurred during the hurricane. It was also observed that the smaller airport sign has only one support (see Figure 5.75), and it was oscillating and twisting.

Figure 5.73: Transit Signs in south side of PB 2336 (Source: Google Earth Pro)

Figure 5.74: Transit sign detached from mounting assembly

Figure 5.75: Small airport sign on top of larger sign

6 Undamaged Pedestrian Bridges

As explained in Chapter 4, a total of 21 pedestrian bridges were inspected for this project, out of which four were determined to have suffered some kind of damage due to Hurricane Maria. These four bridges were covered in Chapter 5.

This chapter presents the remaining 17 pedestrian bridges that were inspected but that did not exhibit damages due to the hurricane. Although these bridges did not present damages due to wind loads, they showed problems commonly associated to lack of maintenance.

6.1 Pedestrian Bridge 0626

Pedestrian Bridge 0626 was built in 1959 and is made of reinforced concrete. It has one span and is approximately 91 feet long. The following findings were made during the visual inspection:

- Presence of mold and silt on access ramps (see Figure 6.1)
- Blocked pluvial drains (see Figure 6.2)
- Corrosion on the railings (see Figure 6.3)
- Missing sections of safety meshing (see Figure 6.4)
- Exposed rebars (Figure 6.5)

Figure 6.1: Mold and silt in the access ramps of PB 0626

Figure 6.2: Blocked pluvial drain in PB 0626

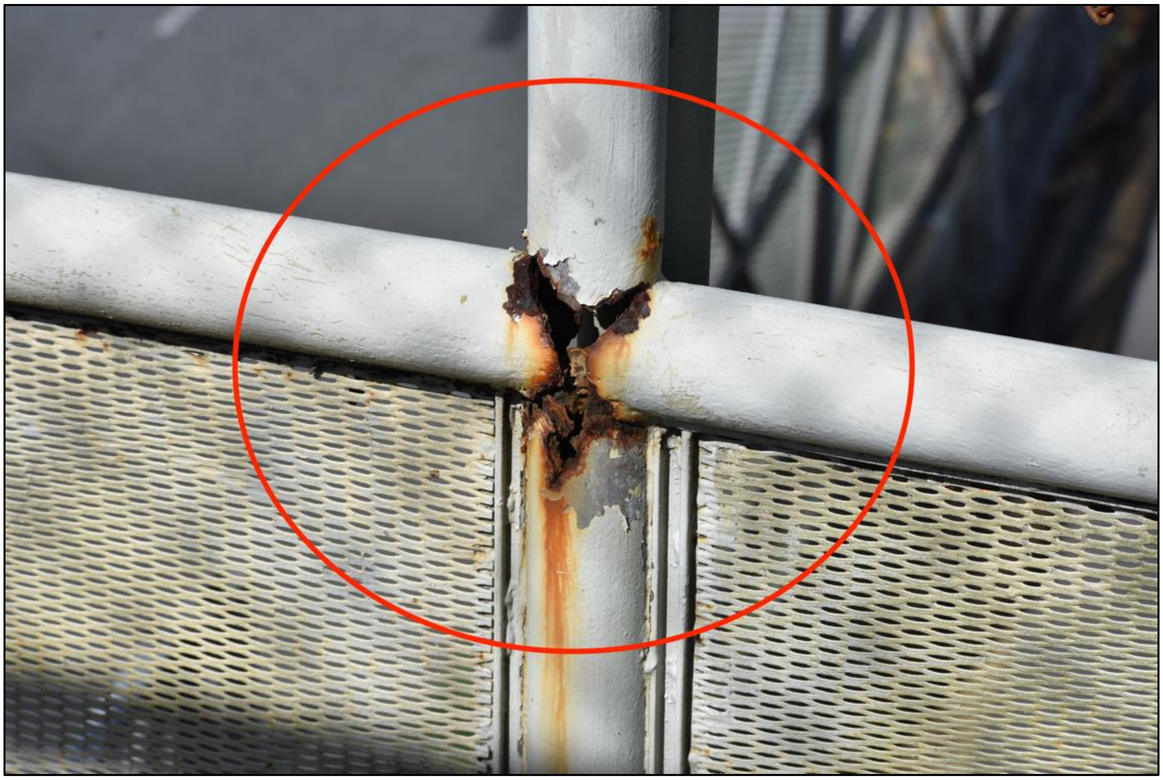


Figure 6.3: Corrosion in the railings of PB 0626

Figure 6.4: Missing section of safety meshing on PB 0626


Figure 6.5: Exposed rebar on PB 0626

6.2 Pedestrian Bridge 0745

Pedestrian Bridge 0745 was built in 1957 and is made of reinforced concrete. It has three spans and is approximately 176 feet long. The following findings were made during the visual inspection:

- Vegetation (see Figure 6.6)
- Blocked pluvial drains (see Figure 6.7)

Figure 6.6: Vegetation in PB 0745

Figure 6.7: Blocked pluvial drains in PB 0745

6.3 Pedestrian Bridge 0748

Pedestrian Bridge 0748 was built in 1958 and is made of reinforced concrete. It has two spans and is approximately 147 feet long. The following findings were made during the visual inspection:

- Broken pluvial drainpipe blocked with vegetation (see Figure 6.8)
- Exposed rebars (see Figure 6.9)

Figure 6.8: Broken drainpipe blocked with vegetation on PB 0748

Figure 6.9: Exposed rebar on PB 0748

6.4 Pedestrian Bridge 1095

Pedestrian Bridge 1095 was built in 1974 and is made of a prestressed concrete beam on top of reinforced concrete columns. It has one span and is approximately 112 feet long. The following findings were made during the visual inspection:

- Presence of mold and silt on the deck (see Figure 6.10)
- Holes in safety fence (see Figure 6.11)

Figure 6.10: Mold and silt on PB 1095

Figure 6.11: Hole in safety fence on PB 1095

6.5 Pedestrian Bridge 1418

Pedestrian Bridge 1418 was built in 1975 and is made of a prestressed concrete beam on top of reinforced concrete columns. It has two spans and is approximately 125 feet long. The following findings were made during the visual inspection

- Mold on the stairways (see Figure 6.12)
- Cracks on concrete (see Figure 6.13)
- Holes in security fence (see Figure 6.14)
- Broken railings (see Figure 6.15)
- Corrosion on railings (see Figure 6.16)
- Exposed steel tendons (see Figure 6.17)

Figure 6.12: Mold on stairways of PB 1418

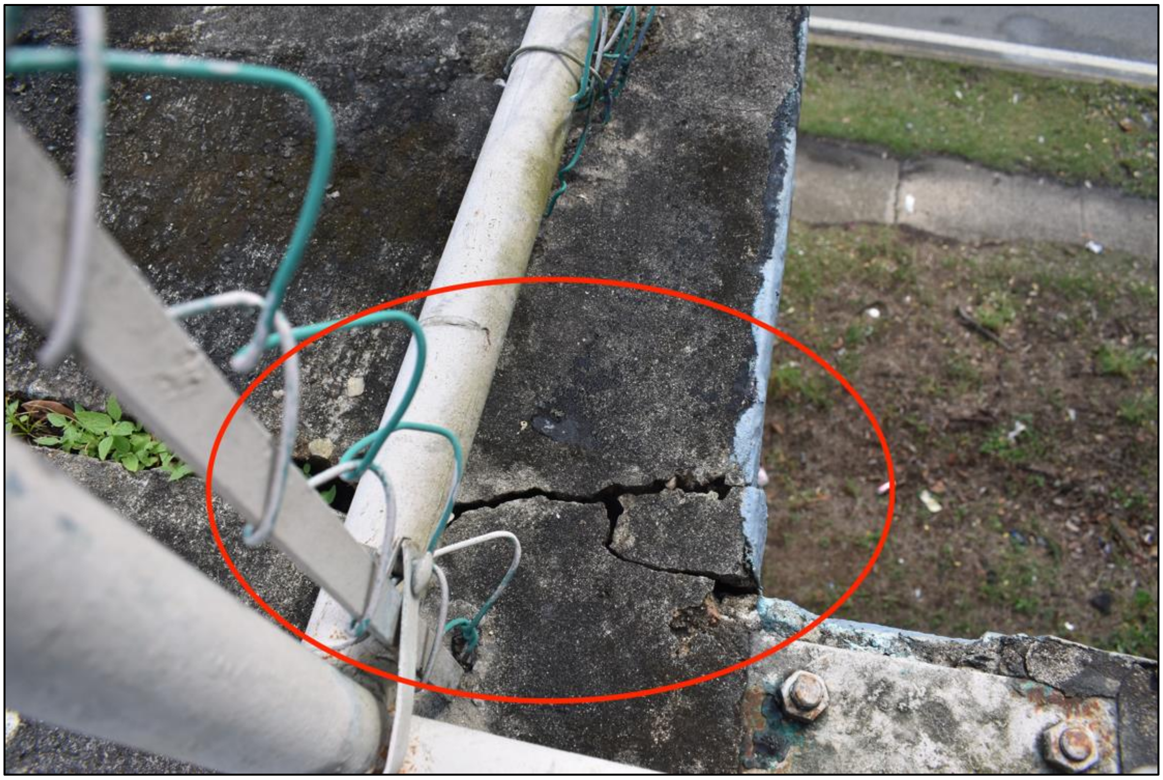


Figure 6.13: Cracks on PB 1418

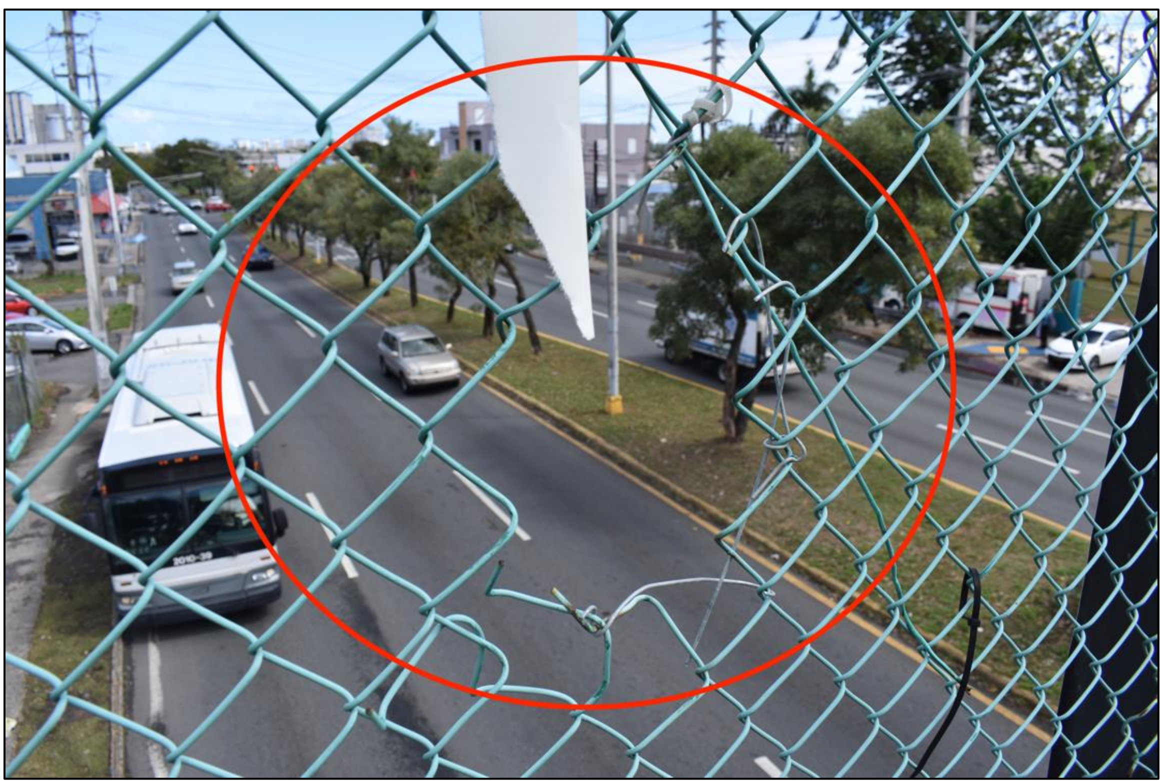


Figure 6.14: Hole in security fence of PB 1418

Figure 6.15: Broken railings on PB 1418

Figure 6.16: Corrosion on railing on PB 1418

Figure 6.17: Exposed steel tendon on PB 1418

6.6 Pedestrian Bridge 1478

Pedestrian Bridge 1478 was built in 1973 and is made of a prestressed concrete beam on top of reinforced concrete columns. It has one span and is approximately 100 feet long. The following findings were made during the visual inspection:

- Exposed rebars (see Figure 6.18)
- Transverse cracks on the deck (see Figure 6.19)

Figure 6.18: Exposed rebars on PB 1478

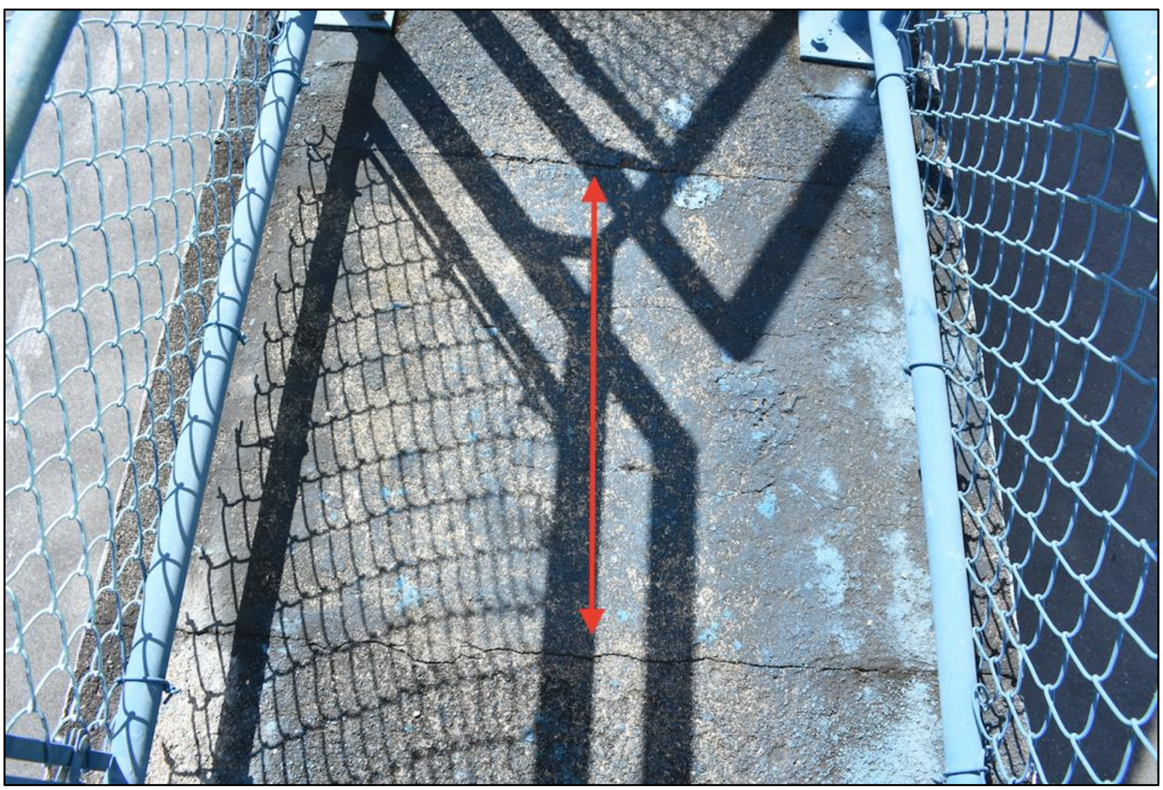


Figure 6.19: Transversal cracks on deck of PB 1478

6.7 Pedestrian Bridge 1513

Pedestrian Bridge 1513 was built in 1975 and is made of prestressed concrete beam on top of reinforced concrete columns. It one span and is approximately 111 feet long. The following finding was made during the visual inspection:

- Mold and silt on one of the stairways (see Figure 6.20)

Figure 6.20: Mold and silt on PB 1513

6.8 Pedestrian Bridge 1736

Pedestrian Bridge 1736 was built in 1981 and is made of a prestressed concrete beam on top of reinforced concrete columns. It has one span and is approximately 113 feet long. The following findings were made during the visual inspection:

- Exposed rebar (see Figure 6.21)
- Mold and silt on stairways (see Figure 6.22)
- Corrosion of security fencing (see Figure 6.23)
- Cracks on stairways (see Figure 6.24)

Figure 6.21: Exposed rebar on PB 1736

Figure 6.22: Mold and silt on stairway of PB 1736

Figure 6.23: Corrosion of security fencing on PB 1736

Figure 6.24: Crack on stairway of PB 1736

6.9 Pedestrian Bridge 1743

Pedestrian Bridge 1743 was built in 1981 and is made of a prestressed concrete beam resting on top of reinforced concrete columns. It has one span and is approximately 111 feet long. The following findings were made during the visual inspection:

- Mold and silt on the stairways (see Figure 6.25)
- Corrosion of security fencing (see Figure 6.26)
- Vegetation growing on one of the piers (see Figure 6.27)

Figure 6.25: Mold and silt on stairway of PB 1743

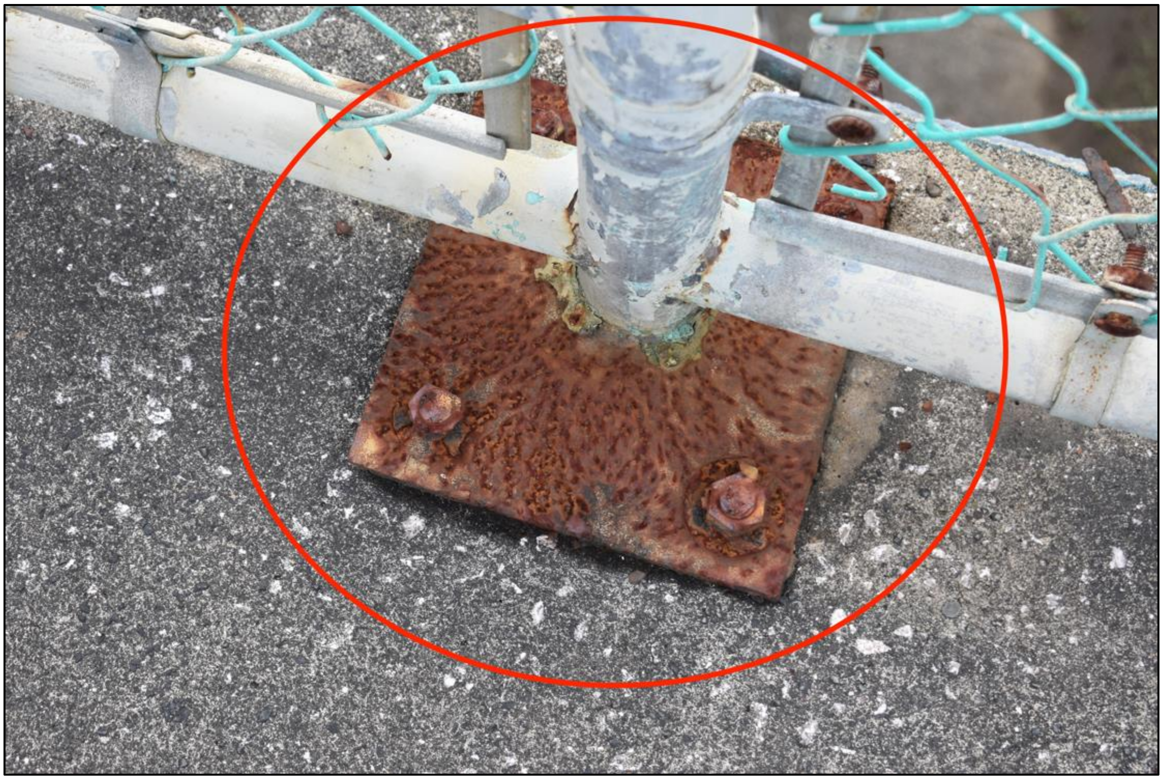


Figure 6.26: Corrosion of security fencing of PB 1743

Figure 6.27: Vegetation on pier of PB 1743

6.10 Pedestrian Bridge 1774

Pedestrian Bridge 1774 was built in 1980 and is made of steel superstructure and a reinforced concrete substructure. It has three spans and is approximately 186 feet long. No findings were made during the visual inspection.

6.11 Pedestrian Bridge 1926

Pedestrian Bridge 1926 was built in 1989 and is made of reinforced concrete substructure. It has one span and is approximately 65 feet long. The following findings were made during the visual inspection:

- Electrical cables block the pathway of pedestrians (see Figure 6.28 and Figure 6.29)
- Mold and silt on deck and stairways (see Figure 6.29)

Figure 6.28: Electrical cables passing closely over PB 1926

Figure 6.29: Electrical cables blacking pathway and mold and silt on PB 1926

6.12 Pedestrian Bridge 2087

Pedestrian Bridge 2087 was built in 1979 and is made of a prestressed concrete beam resting on reinforced concrete columns. It has one span and is approximately 131 feet long. The following findings were made during the visual inspection:

- Exposed rebars (see Figure 6.30 and Figure 6.31)
- Corrosion of guardrail and security fencing (see Figure 6.32 and Figure 6.33)

Figure 6.30: Exposed rebar on PB 2087

Figure 6.31: Exposed rebars on PB 2087

Figure 6.32: Corrosion of guardrail on PB 2087

Figure 6.33: Corrosion of security fencing on PB 2087

6.13 Pedestrian Bridge 2355

Pedestrian Bridge 2355 was built in 1995 and is made of reinforced concrete. It has two spans and is approximately 129 feet long. The following finding was made during the visual inspection:

- Holes on security fence (see Figure 6.34)

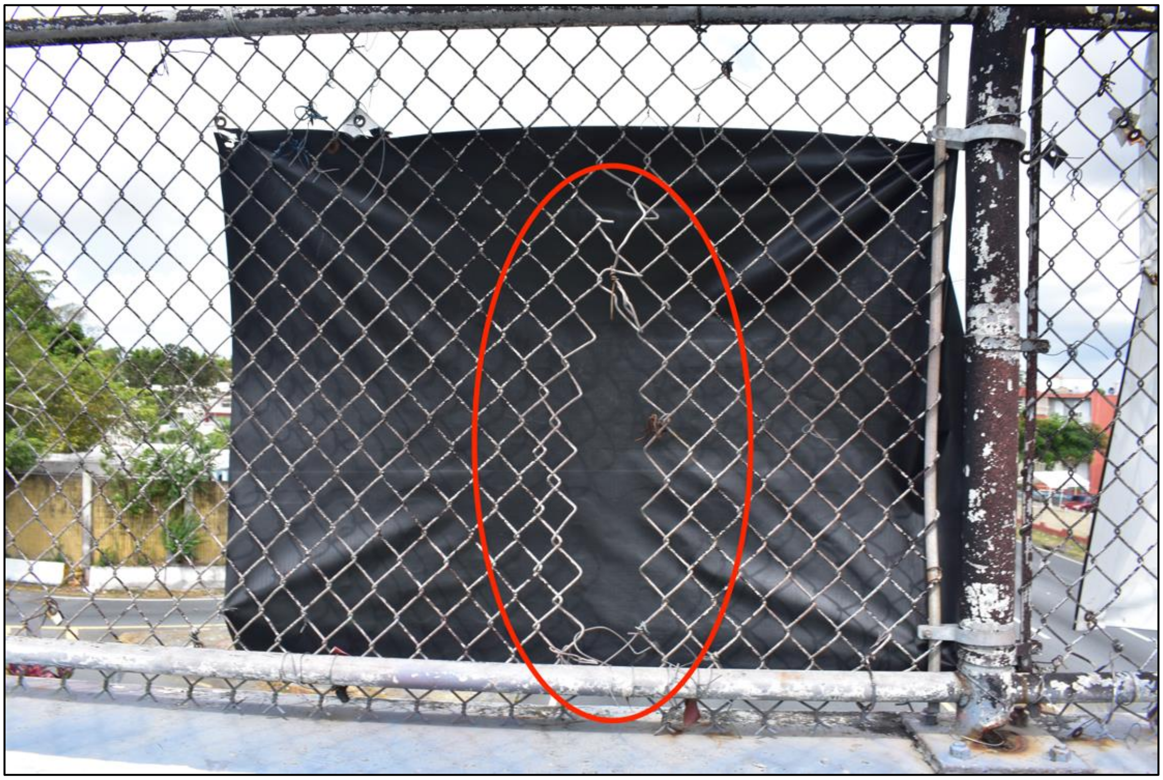


Figure 6.34: Security Fence with holes, Pedestrian Bridge 2355

6.14 Pedestrian Bridge 2566

Pedestrian Bridge 2566 was built in 1998 and is made of prestressed concrete superstructure with a reinforced concrete substructure. It has one spans and is approximately 142 feet long. The following finding was made during the visual inspection:

- Detachments of security mesh from guardrail (see Figure 6.35)
- Vegetation-covered drains (see Figure 6.36)

Figure 6.35: Detachment of security mesh from guardrail on PB 2566

Figure 6.36: Vegetation covered drains on PB 2566

6.15 Pedestrian Bridge 2665

Pedestrian Bridge 2665 was built in 2000 and is made of a prestressed concrete superstructure and a reinforced concrete substructure. It has a main It has one span and is approximately 84 feet long. No findings were made during the visual inspection.

6.16 Pedestrian Bridge 2682

Pedestrian Bridge 2682 was built in 2000 and is made of steel. It has two spans and is approximately 174 feet long. The following findings were made during the visual inspection:

- Damaged to the façade of and signs of corrosion on the central pier (see Figure 6.37)
- Corrosion on the superstructure (see Figure 6.38)
- Detachment of security mesh (see Figure 6.39)

Figure 6.37: Damage to the facade and sings of corrosion on the center pier of PB 2682

Figure 6.38: Corrosion on the superstructure of PB 2682

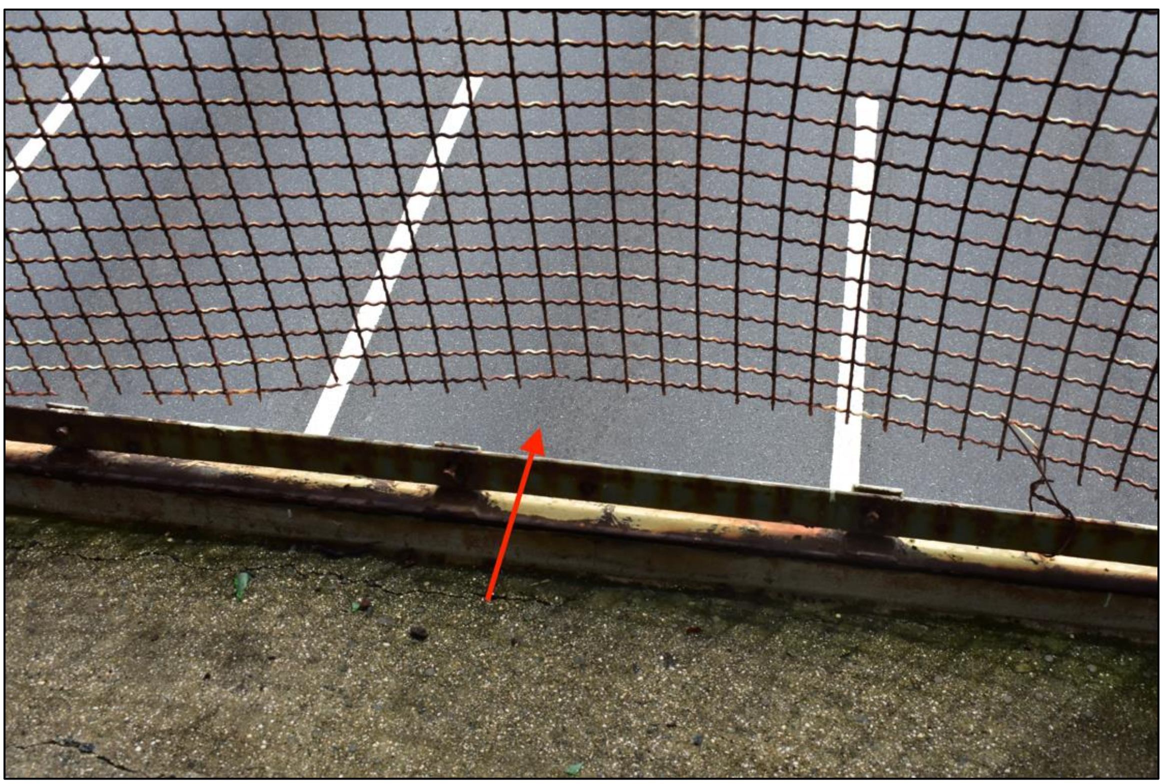


Figure 6.39: Detachment of security mesh on PB 2682

6.17 Pedestrian Bridge 2683

Pedestrian Bridge 2683 was built in 2000 and is made of steel. It has three spans and is approximately 174 feet long. The following findings were made during the visual inspection:

- Corrosion on the superstructure (see Figure 6.40)
- Missing roof panel (see Figure 6.41)
- Detachment of security mesh (see Figure 6.42)

Figure 6.40: Corrosion on the superstructure of PB 2683

Figure 6.41: Missing roof panel on PB 2683

Figure 6.42: Detachment of security mesh on PB 2683

7 Conclusions and Recommendations

Out of the 21 pedestrian bridges inspected for this project, only two experience structural damages. It is apparent that these two bridges were not designed considering that traffic signs were going to be attached to them. Another two bridges were structurally undamaged, but signs attached to them, and their mounting assemblies, exhibited damages that appear to have been caused by the hurricane. The remaining 17 bridges showed no evidence of damages due to the hurricane. Therefore, it is concluded that, in general, pedestrian bridges in the San Juan Metropolitan Area behaved adequately during Hurricane Maria.

The two pedestrian bridges that experienced structural damages and were ultimately removed by PRDOT (PB 1137 and PB 1307) were constructed in 1968, were made of steel trusses, and showed severe deterioration due to corrosion. Prior to Hurricane Maria passing through Puerto Rico, another four bridges made of steel trusses and constructed between 1971 and 1978 had been removed due to deteriorating conditions. The other two pedestrian bridges made of streel trusses and inspected for this project (PB 2682 and PB 2683) were constructed in 2000 and are already showing signs of corrosion, although they did not show any structural damages. When designing a pedestrian bridge, many aspects have to be taken into consideration. It is not suggested here that steel trusses should not be used in Puerto Rico, but that their past performance should be further investigated when this structural system is being considered for new bridges.

Given the findings of this project, the following recommendations are given:

- Attaching signs to pedestrian bridges require the following considerations:
    - If signs are to be attached to existing pedestrian bridges, the structure needs to be adequately reinforced to support additional loads, especially if the

original design of the bridge did not consider signs attached to the structure. This was the case of PB 1137 and PB 1307.

  - Systems used to attach signs to pedestrian bridges have to be carefully design, considering support layout and maintenance, in order to avoid damages and disconnection during high wind events, like it happened to PB 0960 and PB 2336.

- After an extreme wind event, preliminary inspections should not only contemplate the main bridge structure, but any flexible elements attached to it, including signs, guardrails, safety meshing, luminaires, and any other element that, if detached, may imply a safety risk to pedestrian or vehicles
- Teams of routine and emergency inspectors should be established by the municipalities in Puerto Rico. Currently, PRHTA Bridge Department does not inspect pedestrian bridges as they have experienced large reduction in personnel due to budget cuts.

References

AASHTO. (2009). *LRFD Guide Specifications for the Design of Pedestrian Bridges.* Washington, DC: American Association of State Highway and Transportation Officials.

AASHTO. (2015). *LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals* (6th ed.). Washington, DC: American Association of State Highway and Transportation Officials.

AASHTO. (2020). *LRFD Bridge Design Specifications* (9th ed.). Washington, DC: American Association of State Hughway and Transportation Officials.

ElNuevoDia.com. (2019, March 6). El DTOP anuncia la remoción de los puentes peatonales en la avenida Baldorioty de Castro. *El Nuevo Dia*. Retrieved November 14, 2019, from https://www.elnuevodia.com/noticias/locales/nota/eldtopanuncialaremociondelospuentespeatonalesenlaavenidabaldoriotydecastro-2480662/

Federal Highway Administration. (1995). *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridge (Report No. FHWA-PD-96-001).* Washington, DC: Federal Higway Administation.

FEMA. (2018). *Hurricanes Irma and Maria in Puerto Rico: Building Performance Observations, Recommendations, and Technical Guidance.* Washington, DC: FEMA. Retrieved October 15, 2020, from https://www.fema.gov/sites/default/files/2020-07/mat-report_hurricane-irma-maria-puerto-rico_2.pdf

Pasch, R. J., Penny, A. B., & Berg, R. (2019). *National Hurrciane Center Tropical Cyclone Report: Hurricane Maria (AL 152017) 16-30 September 2017.* National Oceanic and Atmospheric Administration (NOAA). Retrieved June 1, 2021, from https://www.nhc.noaa.gov/data/tcr/AL152017_Maria.pdf

Appendix A **Inspections Forms**

A.1 Bridge Load Capacity Summary Form Example

BRIDGE LOAD CAPACITY SUMMARY

BRIDGE DATA

Bridge Number 2364
STR Type Main [Item 43] 119
STR Type App [item 44] 119

POSTING DATA

Current Restrictions
Item 41 A
Is Posting Needed
Proposed Restrictions NONE
Item 70 5
Item 31 5

BASIS FOR ANALYSIS

Design Drawings X
As Built Drawings X
Shop Drawings
Field Measurement
Coupon Testing
OTHER:

LIVE LOAD DISTRIBUION

As Indicated on Plans
AASHTO LFD AS PER ART. 6.40 SECTION 6
AASHTO LRFD
OTHER:

LONGITUDINAL GOVERNING COMPONENT

Main / Approach Span Main
Description BOX CULVERT TOP SLAB (span 1)
Material REINFORCE CONCRETE
Simple / Continuous Span CONTINUOS
Span Length 12.10 ft
Flexure, Shear or Principal Tension FLEXURE

TRANSVERSE GOVERNING COMPONENT

Main / Approach Span
Description
Material
Deck, Box or Substructure
Flexure, Shear or Principal Tension

Longitudinal Capacity – Operating Rating (Tons)

Design Loading
Inventory Rating Factor 17.45 Operating Rating Factor 29.09

Vehicle Type	Vehicle GVW	Inventory Rating	Operating Rating	Span No.	Span Length	M/S or PT	LLDF
HS20	36 Ton	75.35	125.61	1/2	12.1 ft.	M	0.10
HS30	54 Ton	74.99	125.01	1/2	12.1 ft.	M	0.10

Responsible Engineer
Signature:
Name: Anderson Vasquez
Date: Jun 15, 2011
Lic. No. 15541

LIC.#15541 VASQUEZ PARRA LICENCIADO PUERTO RICO

Peer Review by:
Signature: Rubén González Colón
Name: Rubén González Colón
Date: Jun 15, 2011
Lic. No. 15758

Concrete Box Girder Transverse Capacity – Operating (Tons)

Design Loading
Inventory Rating Factor ____ Operating Rating Factor ____

Single Axle ____

Tandem Axle (total 2 Axles) ____

Rating Method	
LFR	X
LRFR	

Engineer comments (Next Page)

A.2 Critical Finding Memorandum Example

ESTADO LIBRE ASOCIADO DE PU... RICO

copiao

AUTORIDAD DE CARRETERAS Y TRANSPORTACION

1 de febrero de 2010

FEB - 3 2010

Ing. Héctor Laureano Pagán
Gerente Programa de Puentes

Manuel Coll Borgo
Jefe Interino
Oficina de Ingeniería de Puentes

RECOMENDACIÓN DE ATENCIÓN A PUENTE: 1200
NIVEL DE PRIORIDAD[1]: 1 (180 días)

SOCAVACIÓN EN PILASTRA #5 DE PUENTE ESTATAL 1200 EN LA CARRETERA PR 3 KILÓMETRO 10.8 SOBRE EL RÍO GRANDE DE LOIZA EN CAROLINA

En la inspección de rutina del puente número 1200, realizada el 8 de diciembre de 2009, por el personal de inspección de la Oficina, se observó lo siguiente:

- La socavación en la pilastra #5 sigue en aumento, 4.40 metros máximo al tope de la zapata y 3.4 metros máximo de pilotes expuesto.
- Esta condición ha aumentado 10 centímetros desde la última medida en noviembre de 2007.
- Algunos de los pilotes expuestos tienen hasta 50% de pérdida de sección debido a corrosión.

Se recomienda lo siguiente:

- Reparar y proteger la pilastra #5.
- De no repararse la condición existente es necesario realizar cálculos estructurales para determinar si la condición actual es estable, y a que profundidad de socavación la estructura del puente sería inestable.

Para información adicional se puede comunicar al que suscribe a la extensión 2900 ó por correo electrónico a mcoll@act.dtop.gov.pr.

6602/mcb

[1]NIVEL DE PRIORIDAD:

1- Requiere atención dentro de seis meses (en este caso especificar tiempo)
2- Requiere atención dentro un año.
3- Requiere atención dentro de tres años.
4- Requiere atención dentro de tres años, pero se considera menos serio, en términos de falla estructural, que la prioridad tres.
5- Requiere atención dentro de cinco años.

c. José Orozco, Director Interino, Área Servicios ingeniería

Autoridad de Carreteras y Transportación • Departamento de Transportación y Obras Públicas
PO Box 42007 • San Juan, Puerto Rico 00940-2007 Tel. (787) 721-8787 Fax (787) 727-5456

A.3 Safety Inspection Report Forms (Initial Inspection) Example

Team Leader: Heriberto González
Bridge Inspector: Micky Santiago

Bridge Evaluator: Heriberto González

Assistants: Juan C. Otero Luis. D. Collazo_ _ _

Driver: Alfredo Erazo

Inspection date: Oct.-22-2008

Weather Conditions: Sunny

Amount of Time on Inspection: 2.5 Hours

Equipment: **X** Bus or Van _ Underwater _ Ladders _ Snooper **X** Camera _ Boat _ Other:

Bridge Number: 2921

Road on Structure: State Highway **Number or Name:** PR-751 **Km.** 0.01

Road Under Structure: N/A **Number or Name:** _ **Km.** _

Ident. Plaque: No **Num.** _

IDENTIFICATION

2. HIGHWAY DISTRICT: 6. Guayama

3. Municipality: Arroyo

4. Place Code: 62192 Bo. Pitahaya

5. Route on Structure: PR-751 **Km.** 0.01 **Route Under Structure:** _ **Km.** _

B: 3 State Highway **C:** 1: Mainline **E:** 0: N.A. **B:** N.A. **C:** 0: None of the Below **E:** 0: N.A.

6. Features Intersected: Waterway Pitahaya Creek **Km.** _ **Description:** _

7. Facility Carried: Highway: PR-751 **Km.** 0.01 **Ramp From:** _

8. Structure Number: 2921

9. Location: 2 Kms. @ North of Arroyo Town (17°-59'-45", 66°-03'-37")

10. Minimum Vertical Clearance: Over: _ **Under:** _

19. Bypass Length: Structure over river

20. Toll: No N.A.

COMMENTS AND/OR RECOMMENDATIONS:

Inspection by: **Micky Santiago** Revised and Approved by: **Heriberto González**

Bridge Inspector **Team Leader**

STRUCTURE DATA

27 (a). Year Built: 1992 **(b) Year Reconstructed:** _

28 (a). Lanes On Structure (total): 2 **(b) Lanes Under Structure (total):** _

32. Total Approach Width: [1] 9.40 **[2]** 8.35

Position	*L. Shldr.*	*L. Rdwy.*	*Median Shldr.*	*R. Rdwy.*	*R. Shldr.*
Up Sta. [1]	*1.18*	*3.56*		*3.56*	*1.10*
Down Sta. [2]	*1.18*	*3.46*		*3.46*	*0.25*

33. Median: No open

34. Skew: Yes **A:** 2.43 **B:** 4.98

35. Flare: No **C:** _ **D:** _

36. Traffic Safety Features:

Bridge railings: meets acceptable standards

Transitions: meets acceptable standards

Approach Guardrail: meets acceptable standards

Approach Guardrail Ends: meets acceptable standards

38. Navigation Control: [N] Not waterway

39. Navigation Vertical Clearance: _

40. Navigation Horizontal Clearance: _

42 Type Service

On Structure [1] Highway

Under Structure: [5] Waterway

43. Structure Materials: [1] Concrete **Type:** [19] Culvert (incl. Frame Culvert)

44. Structure Type Approach Materials: -- **Type:** --

45. Number of Span (main): 2

46. Number of Span (appr.) Down Station: _ **Up Station:** _

47. Total Horizontal Clearance (Inventory Route) L: 8.88 **R:** _

48. Length of Maximum Span: 4.91

49. Structure Length: 9.79 front to front abutments

50. Sidewalk L: _ **R:** _

51. Bridge Roadway Width: 7.02

52. Deck Width (out to out): 8.88

_ **Truss or plate girders (inside face to inside face members):** _____ m. _

Other: _____ m.

53. Minimum Vertical Clearance Over Bridge Roadway: Unlimited

54. Minimum Vertical Underclearances: _

55. Minimum Lateral Underclearances on Right: _

56. Minimum Lateral Underclearances on Left: _

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

58. DECK

58.1 Wearing Surface: Material: Steel **Condition:** 5 Thickness cm.

Deterioration: 10 to 25 % Drainage: Inadequate Ponding: Yes Safety: Yes

58.2 Slab or Plate: Material: Steel **Condition:** 5

Cracking: None

Spalling: Top: No Bottom: No

Scaling: Top: No Bottom: No

Efflorescence: No Exudation: No Rust Stains: No Corrosion: Moderate

58.3 Movement: Deck to backwall: cm. Deck to approach slab: cm.

	Material	Cond. Rating	Height Loss (cm)	Joints	Drainage	Alignment	Corrosion	Paint	Safety	Cracking	Spalling	Scaling
58.4 Curb	N/A	–		–	–	–	–	–	–	–	–	–
58.5 Median	N/A	–		–	–	–	–	–	–	–	–	–
58.6 Sidewalks	N/A	–		–	–	–	–	–	–	–	–	–
58.7 Parapets	N/A	–		–	–	–	–	–	–	–	–	–
58.8 Railing	Steel	6		Good	Good	Good	Moderate	–	Yes	–	–	–

58.9 Lighting Standards: Material: N/A Condition: N/A Functioning: N/A

58.10 Utilities:

Type: Size: Safety: _

58.11 Joints: Condition: N/A

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

58.12 Drains and Scuppers:

Material: None Condition: N Functioning: N/A

Comments:

58.1- Ligera y moderada corrosión en superficie, algunas pequeñas perforaciones por corrosión en las tolas.

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

59. SUPERSTRUCTURE

59.1 Bearing Devices: Type: Fixed/Mov. Out of Plumb: No Paint: None

Condition: 5

59.2 Bridge seats, pedestal, grout pads, abutments or pier seat where beams bear directly on conc.

Condition: N Cracking: No Spalling: None Scaling: None

Crushing: No

59.3 Steel beams: N/A Type: N/A

Condition: N/A Corrosion: N/A Paint: N/A

59.4 Concrete: N/A Type: N/A

Condition: N Cracking: No Spalling: Small Scaling: None

59.5 Truss: Ped. Bailey **Condition:** 5 Paint: Fair Corrosion: Moderate Members: N/A

59.6 Drainage: Type: N/A **Condition:** N/A Functioning: N/A

59.7 Hinges: **Condition:** N/A Functioning: N/A Movement: N/A

59.8 Deflection: N/A

59.9 Vibrations: N/A

60.0 SUBSTRUCTURE:

			Material	Cond. Rating	Cracking	Spalling	Scaling	Corrosion	Paint	Movement	Erosion	Undermining
Abutments	60.1.1	Wingwalls	N/A	N	–	–	–	–	–	–	–	–
	60.1.2	Breast-Backwall	N/A	N	–	–	–	–	–	–	–	–
	60.1.3	Footing	N/A	N	–	–	–	–	–	–	–	–
	60.1.4	Piles	N/A	N	–	–	–	–	–	–	–	–
Piers or Non Pile Bents	60.2.1	Caps	N/A	N	–	–	–	–	–	–	–	–
	60.2.2	Bracing	N/A	N	–	–	–	–	–	–	–	–
	60.2.3	Columns	Steel	6	–	–	–	Moderate	–	No	No	No
	60.2.4	Footing	Concrete	7	F	Small	–	–	–	No	No	No
	60.2.5	Piles	N/A	N	–	–	–	–	–	–	–	–
Rocker Bents	60.3.1	Caps	N/A	N	–	–	–	–	–	–	–	–
	60.3.2	Bracing	N/A	N	–	–	–	–	–	–	–	–
	60.3.3	Piles	N/A	N	–	–	–	–	–	–	–	–
Pile Bents	60.4.1	Caps	N/A	N	–	–	–	–	–	–	–	–
	60.4.2	Bracing	N/A	N	–	–	–	–	–	–	–	–
	60.4.3	Piles	N/A	N	–	–	–	–	–	–	–	–

Comments:

59.5- Varios de los componentes laterales de los "bracing" tienen ligera, moderada corrosión y pérdida de sección, algunas secciones en el "upper chord" tienen moderada pérdida de sección por corrosión.

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

61. CHANNEL AND PROTECTION **Condition:** N

61.1 Channel Scour: N/A

61.2 Embankment Erosion: N/A

		Type	Material	Condition Rating	Functioning
61.3	Protective Device		N/A	N	–
61.4	Fender System		N/A	N	–
61.5	Rip Rap		N/A	N	–
61.6	Spur Dikes, Jetties		N/A	N	–

61.7 Obstruction: N/A

61.8 Channel Change: N/A **Detrimental:** N/A

61.9 Adequate Waterway: N/A

61.10 Surrounding Area: Flooding: N/A if yes explain:

Erosion: N/A if yes explain:

61.11 Location of piers and/or abutment detrimental: N/A if yes explain:

61.12 Other features that may affect structure:

Comments:

62. CULVERT AND RETAINING WALL

	Material	Condition Rating	Functioning	Cracking	Spalling	Scaling	Corrosion	Settlement	Alignment	Scour
62.1 Barrel	N/A	N	–	–	–	–	–	–	–	–
62.2 Head Walls	N/A	N	–	–	–	–	–	–	–	–
62.3 Cut-off wall	N/A	N	–	–	–	–	–	–	–	–
62.4 Retaining wall	N/A	N	–	–	–	–	–	–	–	–

Comments:

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

71. WATER ADEQUACY: N/A N/A

72. APPROACH ROADWAY

72.1 Alignment: 6

72.2 Slab or Pavement **Condition:** N Material: Other

Cracking: No Spalling: None Scaling: None Uneven: No

Rough: No Settlement: No Movement: Approach slab-backwall: No Breaking up: No

Excessive deformation: No

Safety: Hazardous: No

Drainage: Inadequate: No

Movement: Pavement-approach slab: No

Embankment: **Condition:** N Functioning: Yes Erosion: No

Construction: Flimsy: No Integrity impaired: No

72.3 Undesirable Impact: No

72.4 Joints: No Type: None Inadequate: N/A Satisfactory Alignment: N/A

72.5 Guardrail Type: None Material: N/A Functioning: N/A

Condition: N Alignment Horizontal: N/A Vertical: N/A

Joints Functioning: N/A Safety Securely Attached: N/A Pedestrian Hazards: N/A

Comments:

90. INSPECTION DATE: Jan 23, 2014

93. CRITICAL FEATURE INSPECTION DATE

Fracture Critical:

Underwater:

Other Special Inspection:

102. DIRECTION OF TRAFFIC: Highway traffic not carried

106. YEAR RECONSTRUCTED:

107. DECK STRUCTURE TYPE: Steel Plate (includes orthotropic)

108. WEARING SURFACE/PROTECTIVE SYSTEM

Type wearing surface: Other

Type Membrane: None

Deck protection: None

111. PIER OR ABUTMENT PROTECTION (FOR NAVIGATION): N/A

113. SCOUR CRITICAL BRIDGES: N

116. MINUMUM NAVIGATION VERTICAL CLEARANCE:

AUXILIARY ITEMS

Signs: Type: Route Orientation Material: Alum. Condition: 5

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

Core Elements

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0

Non Core Elements

Elem. No.	Elements Description	Pag.		State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0

Smart Flags

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0

A.4 Safety Inspection Report Forms (Routine Inspection)

36

B. Routine Inspection Report

Team Leader: Arturo Cáceres

Bridge Inspector: Angel T. López

Bridge Evaluator: Arturo Cáceres

Assistants: José R. Vázquez Ramón Rodriguez _ _ _

Driver: Alfredo Erazo

Inspection date: 1 OCTUBRE 2010

Weather Conditions: Sunny

Amount of Time on Inspection: 1.5 Hours

Equipment: X Bus or Van _ Underwater _ Ladders _ Snooper X Camera
_ Boat _ Other:

Bridge Number: 2921

Road on Structure: State Highway Number or Name: PR-751 Km. 0.01

Road Under Structure: N/A Number or Name: _ Km. _

Ident. Plaque: No Num. _

36. Traffic Safety Features:

Bridge railings: meets acceptable standards

Transitions: meets acceptable standards

Approach Guardrail: meets acceptable standards

Approach Guardrail Ends: meets acceptable standards

41. Posting: Condition: A (Open) Sign Type: N/A Posting Load: N/A

Comments and/or Recommendations:

Inspection by: Angel T. López Revised and Approved by: Arturo Cáceres

Bridge Inspector Team Leader

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

58. DECK

58.1 Wearing Surface: Material: Steel *Condition:* 5 Thickness cm.

Deterioration: 10 to 25 % Drainage: Inadequate Ponding: Yes Safety: Yes

58.2 Slab or Plate: Material: Steel *Condition:* 5

Cracking: None

Spalling: Top: No Bottom: No

Scaling: Top: No Bottom: No

Efflorescence: No Exudation: No Rust Stains: No Corrosion: Moderate

58.3 Movement: Deck to backwall: cm. Deck to approach slab: cm.

	Material	Cond. Rating	Height Loss (cm)	Joints	Drainage	Alignment	Corrosion	Paint	Safety	Cracking	Spalling	Scaling
58.4 Curb	N/A	–		–	–	–	–	–	–	–	–	–
58.5 Median	N/A	–		–	–	–	–	–	–	–	–	–
58.6 Sidewalks	N/A	–		–	–	–	–	–	–	–	–	–
58.7 Parapets	N/A	–		–	–	–	–	–	–	–	–	–
58.8 Railing	Steel	6		Good	Good	Good	Moderate	–	Yes	–	–	–

58.9 Lighting Standards: Material: N/A Condition: N/A Functioning: N/A

58.10 Utilities:

Type: Size: Safety: _

58.11 Joints: **Condition:** N/A

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

58.12 Drains and Scuppers:

Material: None Condition: N Functioning: N/A

Comments:

58.1- Ligera y moderada corrosión en superficie, algunas pequeñas perforaciones por corrosión en las tolas.

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

59. SUPERSTRUCTURE

59.1 Bearing Devices: Type: Fixed/Mov. Out of Plumb: No Paint: None

Condition: 5

59.2 Bridge seats, pedestal, grout pads, abutments or pier seat where beams bear directly on conc.

Condition: N Cracking: No Spalling: None Scaling: None

Crushing: No

59.3 Steel beams: N/A Type: N/A

Condition: N/A Corrosion: N/A Paint: N/A

59.4 Concrete: N/A Type: N/A

Condition: N Cracking: No Spalling: Small Scaling: None

59.5 Truss: Ped. Bailey **Condition:** 5 Paint: Fair Corrosion: Moderate Members: N/A

59.6 Drainage: Type: N/A **Condition:** N/A Functioning: N/A

59.7 Hinges: **Condition:** N/A Functioning: N/A Movement: N/A

59.8 Deflection: N/A

59.9 Vibrations: N/A

60.0 SUBSTRUCTURE:

			Material	Cond. Rating	Cracking	Spalling	Scaling	Corrosion	Paint	Movement	Erosion	Undermining
Abutments	60.1.1	Wingwalls	N/A	N	–	–	–	–	–	–	–	–
	60.1.2	Breast-Backwall	N/A	N	–	–	–	–	–	–	–	–
	60.1.3	Footing	N/A	N	–	–	–	–	–	–	–	–
	60.1.4	Piles	N/A	N	–	–	–	–	–	–	–	–
Piers or Non Pile Bents	60.2.1	Caps	N/A	N	–	–	–	–	–	–	–	–
	60.2.2	Bracing	N/A	N	–	–	–	–	–	–	–	–
	60.2.3	Columns	Steel	6	–	–	–	Moderate	–	No	No	No
	60.2.4	Footing	Concrete	7	F	Small	–	–	–	No	No	No
	60.2.5	Piles	N/A	N	–	–	–	–	–	–	–	–
Rocker Bents	60.3.1	Caps	N/A	N	–	–	–	–	–	–	–	–
	60.3.2	Bracing	N/A	N	–	–	–	–	–	–	–	–
	60.3.3	Piles	N/A	N	–	–	–	–	–	–	–	–
Pile Bents	60.4.1	Caps	N/A	N	–	–	–	–	–	–	–	–
	60.4.2	Bracing	N/A	N	–	–	–	–	–	–	–	–
	60.4.3	Piles	N/A	N	–	–	–	–	–	–	–	–

Comments:

59.5- Varios de los componentes laterales de los "bracing" tienen ligera, moderada corrosión y pérdida de sección, algunas secciones en el "upper chord" tienen moderada pérdida de sección por corrosión.

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

61. CHANNEL AND PROTECTION **Condition:** N

61.1 Channel Scour: N/A

61.2 Embankment Erosion: N/A

		Type	Material	Condition Rating	Functioning
61.3	Protective Device		N/A	N	–
61.4	Fender System		N/A	N	–
61.5	Rip Rap		N/A	N	–
61.6	Spur Dikes, Jetties		N/A	N	–

61.7 Obstruction: N/A

61.8 Channel Change: N/A **Detrimental:** N/A

61.9 Adequate Waterway: N/A

61.10 Surrounding Area: Flooding: N/A if yes explain:

Erosion: N/A if yes explain:

61.11 Location of piers and/or abutment detrimental: N/A if yes explain:

61.12 Other features that may affect structure:

Comments:

62. CULVERT AND RETAINING WALL

	Material	Condition Rating	Functioning	Cracking	Spalling	Scaling	Corrosion	Settlement	Alignment	Scour
62.1 Barrel	N/A	N	–	–	–	–	–	–	–	–
62.2 Head Walls	N/A	N	–	–	–	–	–	–	–	–
62.3 Cut-off wall	N/A	N	–	–	–	–	–	–	–	–
62.4 Retaining wall	N/A	N	–	–	–	–	–	–	–	–

Comments:

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

71. WATER ADEQUACY: N/A N/A

72. APPROACH ROADWAY

72.1 Alignment: 6

72.2 Slab or Pavement **Condition:** N Material: Other

Cracking: No Spalling: None Scaling: None Uneven: No

Rough: No Settlement: No Movement: Approach slab-backwall: No Breaking up: No

Excessive deformation: No

Safety: Hazardous: No

Drainage: Inadequate: No

Movement: Pavement-approach slab: No

Embankment: **Condition:** N Functioning: Yes Erosion: No

Construction: Flimsy: No Integrity impaired: No

72.3 Undesirable Impact: No

72.4 Joints: No Type: None Inadequate: N/A Satisfactory Alignment: N/A

72.5 Guardrail Type: None Material: N/A Functioning: N/A

Condition: N Alignment Horizontal: N/A Vertical: N/A

Joints Functioning: N/A Safety Securely Attached: N/A Pedestrian Hazards: N/A

Comments:

90. INSPECTION DATE: Jan 23, 2014

93. CRITICAL FEATURE INSPECTION DATE

Fracture Critical:

Underwater:

Other Special Inspection:

102. DIRECTION OF TRAFFIC: Highway traffic not carried

106. YEAR RECONSTRUCTED:

107. DECK STRUCTURE TYPE: Steel Plate (includes orthotropic)

108. WEARING SURFACE/PROTECTIVE SYSTEM

Type wearing surface: Other

Type Membrane: None

Deck protection: None

111. PIER OR ABUTMENT PROTECTION (FOR NAVIGATION): N/A

113. SCOUR CRITICAL BRIDGES: N

116. MINUMUM NAVIGATION VERTICAL CLEARANCE:

AUXILIARY ITEMS

Signs: Type: Route Orientation Material: Alum. Condition: 5

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

Core Elements

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0

Non Core Elements

Elem. No.	Elements Description	Pag.		State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0

Smart Flags

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0

A.5 Standards for Photographs of Existing Bridges

Abril 2005

Por:

Manuel Coll Borgo

Estandarización de las Fotos de los Puentes Existentes

A. Alcance y Objetivos

Evaluar la condición y la toma de decisiones sobre un puente existente es una tarea muy usual y típica realizada por los Ingenieros tanto de la Oficina de Ingeniería de Puentes como de otras oficinas de la Agencia. Una de las partes mas útiles del archivo de puentes son las fotografías del puente tomadas en cada inspección que este archivo incluye. Antes de que la tecnología digital estuviera disponible, las fotos que se podían tomar en un puente eran limitadas debido al costo y espacio de almacenamiento disponibles, por lo tanto, la parte visual del puente en el archivo era limitada. Con las cámaras de tecnología digital y la computadora estas barreras se han eliminado.

El objetivo de este documento es ayudar a establecer un patrón estándar de fotografía para los puentes inspeccionados de tal manera que se pueda observar todo el puente mediante las fotos tomadas durante la inspección. Esto, aprovechando lo económico y relativamente sencillo que es tomar y archivar fotos con las cámaras digitales.

B. Procedimiento

El procedimiento descrito a continuación es uno general que se debe aplicar para cada puente individualmente. Básicamente el patrón de fotos va a consistir de dos partes. Primero, se tomarán las fotos generales de tal manera que se puedan ver todas las partes del puente con o sin daños y luego se tomaran fotos más específicas de las áreas donde se observa deterioro y otras partes importantes del puente. El procedimiento se puede describir en tres pasos generales descritos a continuación:

1. Se debe documentar en una tabla el número de la foto y la parte del puente que se está fotografiando. Debe haber espacio para poner comentarios, como por ejemplo, dónde se ubicó el fotógrafo para tomar la foto de tal manera que se tome la foto igual en la próxima inspección. Esta debe ir acompañada de un dibujo de planta donde indique donde se tomó cada foto. La tabla básicamente hay que hacerla la primera vez que se estandaricen las fotografías del puente, pero a medida que aparezcan partes deterioradas en el puente y se tomen fotos de esas áreas éstas se deben añadir a este documento. El documento se debe colocar en el archivo y también se debe mantener una copia digital de este documento en el mismo directorio donde se almacenen las fotos.

2. **Fotos Generales del Puente** - Se debe incluir por lo menos una foto de cada parte importante del puente. Si se necesitan más fotos para cubrir una parte del puente, esto se debe documentar en la tabla de la parte (1). Las partes principales que se deben incluir típicamente para cada tramo (span) del puente incluyen, entre otras cosas, lo siguiente:

a. Placa de identificación del puente si la tiene.
b. Letreros de restricciones de pesos, geometría y pórticos para limitar altura si los incluye el puente
c. Superficie de Rodaje o vista superior del tramo. Se deben incluir las losas de entrada del puente (Aproach Slabs).
d. Vista Lateral del Tramo (ambos lados), por ejemplo, cuando el puente atraviesa un canal, vista desde aguas arriba y vista desde aguas abajo.
e. Vista inferior del tramo con énfasis en la losa y las vigas. Ésta es la más difícil de tomar y por lo general tomará más de una fotografía. Hay que tomar en cuenta que también es la más importante y es bien importante documentar todas las fotos bien para que se tomen iguales en la próxima visita.
f. Fotos de las pilastras y sus fundaciones si se ven. Se deben tomar por lo menos dos fotos por pilastra, una de cada lado de la pilastra para poder observar la condición de ésta en su totalidad.
g. Fotos de los estribos y asientos (bearings) del puente. En puentes típicos, esto tomaría al menos tres fotos. Una para cada lado incluyendo vista de la pared lateral (wing wall) y por lo menos una foto donde se vea el estribo de frente y los asientos.

3. **Fotos Particulares del Puente** - Si el puente presenta zonas de deterioro y tiene detalles importantes que se deben retratar, estas fotos se deben enumerar y documentar en la tabla de la parte (1) luego de las fotos generales del puente. De esta manera los comentarios del informe de inspección pueden hacer referencia a estas fotos. La tabla debe documentar bien la localización de la foto para poder identificar bien en otras inspecciones el lugar, sobre todo, por si se hacen reparaciones entre inspecciones.

C. Comentarios Adicionales

Las fotos (c), (d) y (e) de las fotografías generales (parte (2)) deben tomarse para cada tramo (span), pero se debe evaluar para cada puente particular si una foto puede incluir más de un tramo con suficiente claridad. Por ejemplo, en puentes pequeños de dos tramos, a lo mejor una sola foto lateral puede incluir la vista de los dos tramos del puente y de los dos estribos, por lo que se podrían reducir cuatro fotos de las descritas arriba en una sola. De hacerlo así, esto se debe documentar en la descripción de la foto en la tabla de la parte (1).

Por otra parte, debido a la geometría y localización de cada puente particular no siempre será posible tomar una foto de las vistas que se describen en la parte (2). En ese caso, se deben tomar una o más fotos en otro ángulo pero de tal manera que se pueda ver lo descrito. No se debe dejar de tomar una foto de una parte del puente a menos que ésta esté debajo del agua.

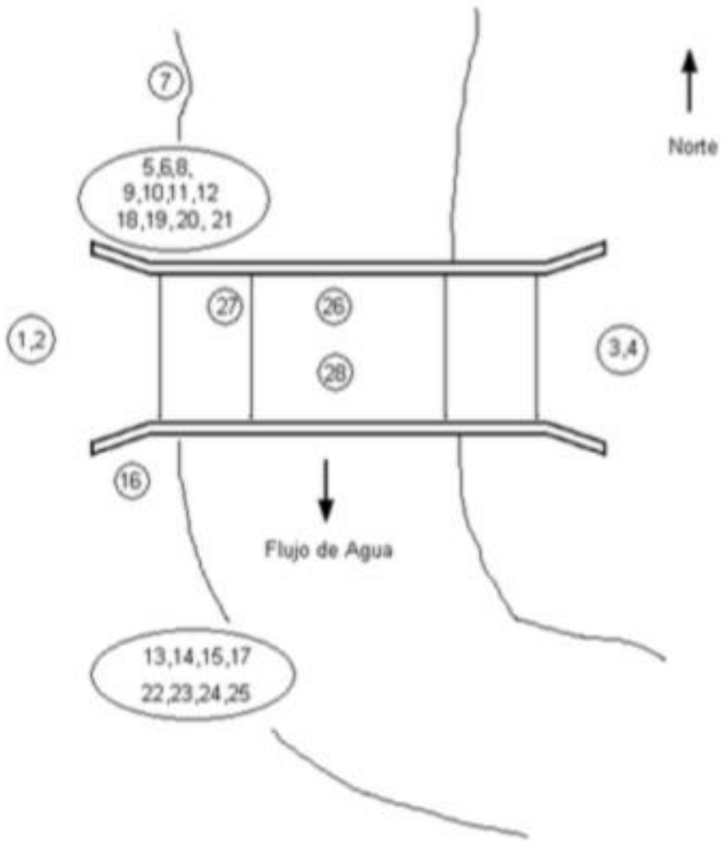
D. Ejemplo: Puente No. 1496 en Guayanilla

Tabla de Descripción de Fotos

Foto	Descripción	Comentarios
Fotos Generales del Puente		
# 1	Losa de entrada lado oeste	
# 2	Superficie de rodaje lado oeste	
# 3	Losa de entrada lado este	
# 4	Superficie de rodaje lado este	
# 5	Tramo oeste: Vista lateral desde el norte	
# 6	Tramo este: Vista lateral desde el norte	
# 7	Vista aguas arriba del puente y el canal	Aguas arriba del canal del lado norte
# 8	Muro lateral norte del estribo oeste	
# 9	Muro lateral norte del estribo este	
# 10	Estribo oeste: vista frontal	
# 11	Estribo este: vista frontal	
# 12	Pilastra: vista desde lado oeste	
# 13	Pilastra: Vista desde lado este	Se tomó la foto desde el lado oeste del río, pero en ángulo, de tal manera que se observe el lado que no se ve en la foto #13
# 14	Tramo oeste: Vista lateral desde el sur	
# 15	Tramo este: Vista lateral desde el sur	
# 16	Muro lateral sur del estribo oeste	
# 17	Muro lateral sur del estribo este	
# 18	Losa tramo oeste: Vista por debajo	
# 19	Losa tramo este: Vista por debajo	
# 20	Gaviones estribo oeste	
# 21	Gaviones estribo este	
# 22	Detalle de Zapata expuesta	
# 23	Muro caído en estribo oeste	Esta condición existía antes de la

Foto	Descripción	Comentarios
Fotos Generales del Puente		
		reparación de puente con Gaviones.
# 24	Socavación en Gaviones del estribo este	
# 25	Grieta en muro lateral sur del estribo este	
# 26	Abrasión de la superficie de rodaje Tiro central de losa	La losa se tiró en tres paños.
# 27	Abrasión de la superficie de rodaje Tiro de losa oeste	
# 28	Grietas en tiro central de losa	En los otros tiros también hay grietas, pero menos marcadas.

Diagrama de Localización desde donde se tomo la Fotografía



Nota: Para el diagrama se puede usar el boceto ("as built drawing") del Puente.

Foto #1

Foto #2


Foto #3


Foto #4

A.6 Standard Element Numbering Procedure

Elements in Longitudinal Direction: Elements that run in the direction of traffic such as Main Girders, Beams or stringers shall be numbered from left to right when pointing to the direction of traffic or when pointing to the direction of the increasing kilometer sings when traffic goes both ways.

Elements in Transverse Direction: Elements that run transverse to the direction of traffic such as Abutments Piers or Floor Beams shall be numbered in the direction of traffic or pointing to the direction of the increasing kilometer sings when traffic goes both ways. For example pier #1 will be the first one when entering the bridge, for bridges with one direction of traffic, and in the case of two way traffic pier #1 will have the lesser kilometer point.

A.7 Quality Assurance / Quality Control Forms

INSPECTION REPORT SUMMARY & QC SHEET

BRIDGE:

TEAM LEADER:

INSP. DATE:

1. Inspection Type and Dates:

NBI	Type	Performed? (Yes / No / NA)	Freq (MONTHS)	Previous Insp. DATE (MONTH/YEAR)	Next Insp. DATE (MONTH/YEAR)
ITEM 90	Routine Inspection				
ITEM 93 A	FC Inspection				
ITEM 93 B	Underwater Insp.				
ITEM 93 C	Other:				

2. NBI Condition Rating Summary:

	Item 58	Item 59	Item 60	Item 61	Item 62	Item 113
Previous Inspection						
Current Inspection						

Other Checks: (Y, N, NA)

Review Comments:

_ Scour Critical (items 113 & 60)
_ AASHTO Core's & NBI CD consistent
_ Smart Flags (scour, steel plate, fire damage, etc)
_ Channel Profile/Clearance Table
_ FC & Underwater Members Tables
_ Asphalt Overlay Thickness
_ Drawings
_ Photos
_ Critical Finding
_ Inspector & Team Leader Signature

Reviewer: ______________________

Safety Eng.: ______________________

INSPECTION REPORT SUMMARY SHEET
QUALITY ASSURANCE

BRIDGE:
TEAM LEADER:
INSP. DATE:

1. Inspection Type and Dates:

NBI	Type	Performed? (Yes / No / NA)	Freq (MONTHS)	Previous Insp. DATE (MONTH/YEAR)	Next Insp. DATE (MONTH/YEAR)
ITEM 90	Routine Inspection				
ITEM 93 A	FC Inspection				
ITEM 93 B	Underwater Insp.				
ITEM 93 C	Other:				

2. NBI Condition Rating Summary:

	Item 58	Ite m 59	Item 60	Item 61	Ite m 62	Item 113
Previous Inspection						
Current Inspection Team Leader						
Current Inspection Safety Engineer						

Other Checks: (Y, N, NA)

Review Comments:

_ Scour Critical (items 113 & 60)
_ AASHTO Core's & NBI CD consistent
_ Smart Flags (scour, steel plate, fire damage, etc)
_ Channel Profile/Clearance Table
_ FC & Underwater Members Tables
_ Asphalt Overlay Thickness
_ Drawings
_ Photos
_ Critical Finding
_ Inspector & Team Leader Signature

Team Leader: ____________________

Safety Eng.: ____________________

Bridge No.

Date:

Rating Engineer/Consultant:

LOAD RATING REPORT

QUALITY CONTROL FORM

Rating Report Item	Yes/No, NA or Checked
Does report includes data used for rating (Drawings/Field Measurements/NDT's)	
Are Dead load calculations presented	
Are Live load distribution factors computed/presented	
Is Transverse section data and reinforcement presented	
Report explains reasons to (or not to) consider deterioration.	
Report explains reasons to rate (or not to) Substructure	
Report shows spans and explains boundary conditions (support types, continuity)	
Design Load / Legal Loads are clearly presented	
Verify Input data of model for consistency	
Report Includes Load Rating Results:	
○ At inventory level	
○ At Operating level	
○ Legal loads	
Verify output data is consistent with report results and with the rating summary sheet report.	
Verify items 63 to 66 be reported from summary sheet.	
Verify items 41 and 70 are correctly coded in summary sheet.	

Comments:

- Write comments to rating engineer here.
- Comment example: Section data used is missing in rating report.

Reviewer Name:

Reviewer Signature:

Bridge No.

Date:

Rating Engineer/Consultant:

LOAD RATING REPORT

QUALITY ASURANCE FORM

Rating Report Item	Yes/No, Comments
Does report includes data used for rating (Drawings/Field Measurements/NDT's)	
Are Dead load calculations presented	
Are Live load distribution factors computed/presented	
Is Transverse section data and reinforcement presented	
Report explains reasons to (or not to) consider deterioration.	
Report explains reasons to rate (or not to) Substructure	
Report shows spans and explains boundary conditions (support types, continuity)	
Design Load / Legal Loads are clearly presented	
Verify Input data of model for consistency	
Report Includes Load Rating Results:	
○ At inventory level	
○ At Operating level	
○ Legal loads	
Verify output data is consistent with report results and with the rating summary sheet report.	
Verify items 63 to 66 be reported from summary sheet.	
Verify items 41 and 70 are correctly coded in summary sheet.	

Comments:

- Write comments to rating engineer here.
- Comment example: Section data used is missing in rating report.

Reviewer Name:

Reviewer Signature:

Consultant:

Bridge No.

Date:

SCOUR EVALUATION PHASE 1

QUALITY CONTROL FORM

Scour Evaluation Report Item	Yes/No, N/A or Checked
Does report includes project description and location?	
Does report includes summary of significant findings?	
Does report includes conclusions and recommendations?	
Does report includes photos showing exiting conditions?	
Does report includes data used for scour evaluation (Drawings/Field Measurements/NDT's)?	
Does report includes sources of data collection presented (i.e. H-H report, scour report, soil survey, etc …)?	
Does report includes stream characteristics?	
Does report includes overall stream stability (lateral, vertical, potential response)?	
Does report includes abutments characteristics and conditions?	
Does report includes piers characteristics and conditions?	
Does report includes name of engineers responsible for each discipline, engineer registration numbers, and name of reviewing engineer?	
Does report is signed and sealed by a professional engineer?	
Verify data presented is consistent with the conclusions and recommendations.	

Comments:

Reviewer Name:

Reviewer Signature:

Consultant:

Bridge No.

Date:

SCOUR EVALUATION PHASE 2

QUALITY CONTROL FORM

Scour Evaluation Report Item	**Yes/No, N/A or Checked**
Does report includes summary of significant findings?	
Does report includes conclusions and recommendations?	
Does H-H report include field survey and cross sections signed and sealed by a surveyor?	
Does H-H and Scour report was performed based on Scope of Work guide for H-H report (Appendix A of the SOW)?	
Does H-H report include sources of hydrologic data and/or peak flow value?	
Does Scour report include a grain size analysis?	
Does Scour report recommend at least three (3) countermeasures?	
If any, is increase in existing water surface elevation due to countermeasures within limits of the PB # 13 regulation?	
Does the scour report include analysis for the Design Scour Flood Event?	
Does the scour report include analysis for the Check Scour Flood Event?	
Does the scour report include scour results for long term, contraction, local, and total scour?	
Does the scour report include plot of bridge foundation elements and computed scour depths?	
Does plot of bridge foundation indicate if foundations are known? In the case of deep foundation, does it indicate tips elevation?	
Does report includes name of engineers responsible for each discipline, engineer registration numbers, and name of reviewing engineer?	
Does report is signed and sealed by a professional engineer?	
Verify data presented is consistent with the conclusions and recommendations.	

Comments:

Reviewer Name:

Reviewer Signature:

Consultant:

Bridge No.

Date:

SCOUR EVALUATION PHASE 3

QUALITY CONTROL FORM

Scour Evaluation Report Item	Yes/No, N/A or Checked
Does report includes summary of significant findings?	
Does report includes conclusions and recommendations?	
Does report includes data for the geotechnical and structural scour assessment (Drawings/Field Measurements/NDT's)?	
Are live loads capacities evaluated in accordance with the PRHTA's current load rating guidelines?	
Does report includes estimated capacity of each foundation unit under scour conditions defined in Phase 2?	
Does report indicates method used to estimate capacity of foundation units for unknown foundations?	
Does report includes name of engineers responsible for each discipline, engineer registration numbers, and name of reviewing engineer?	
Does report is signed and sealed by a professional engineer?	
Verify data presented is consistent with the conclusions and recommendations.	

Comments:

Reviewer Name:

Reviewer Signature:

Consultant:

Bridge No.

Date:

SCOUR EVALUATION PHASE 4

QUALITY CONTROL FORM

Scour Evaluation Report Item	**Yes/No, N/A or Checked**
Does report includes summary of significant findings?	
Does report includes conclusions and recommendations?	
Does report includes POA based on Scour Critical Bridge – POA format?	
Does POA include at least three (3) alternate countermeasures?	
Does POA include a conceptual plan for recommended alternative countermeasure?	
Does report includes name of engineers responsible for each discipline, engineer registration numbers, and name of reviewing engineer?	
Does report is signed and sealed by a professional engineer?	
Verify data presented is consistent with the conclusions and recommendations.	

Comments:

Reviewer Name:

Reviewer Signature:

A.8 Scope of Work of Underwater Inspection

SCOPE OF WORK

UNDERWATER INSPECTION

I. PROJECT DESCRIPTION

The purpose of this work is to perform an adequate level of underwater inspections to bridges on marine and freshwater areas in Puerto Rico. An adequate inspection level detects damaged structure members, section loss, timber decay or attack by marine borers, scour, and undermining of footings or concrete walls.

II. GENERAL DESCRIPTION

The Consultant will provide all labor, equipment and materials necessary to complete the inspections and reports.

The bridges that will require an underwater inspection are included in **Appendix A**. For each structure the PRHTA will provide, when available, site descriptions, plans or sketches, previous inspection reports, and access information.

If during the period of contract, any new procedures or regulations regarding Underwater Inspection are added or modified, they shall be added to the work performed by the Consultant with no additional cost for the PRHTA.

III. INSPECTION PERSONAL QUALIFICATIONS AND REQUIREMENTS

A. Qualification requirements for the Engineer in charge of the inspection and report preparation:

1. Be a registered professional engineer licensed to practice in Puerto Rico.
2. Have a minimum of five years experience in underwater structure inspection assignments.
3. Meet the qualifications of a bridge inspection team leader in accordance with the National Bridge Inspection Standards (NBIS), 23 CFR 650.309(b).
4. Within five years prior to the inspection completion, successfully complete an approved comprehensive bridge inspection training course or bridge inspection refresher training course in accordance with NBIS, 23 CFR 650.309(b) or 650.313(g), respectively.
5. Be on site at all times coordinating the inspections.

B. Qualification requirements for the Diver(s) performing the inspection:

1. Meet the qualifications of underwater bridge inspection diver per NBIS 23 CFR 650.309 (b).

2. Have all the required licensing to practice commercial diving in Puerto Rico.

IV. CODES, REGULATIONS, STANDARDS AND PROCEDURES

Inspect in accordance with the practices and procedures contained in the following regulations and operational guidelines. Consider the following:

- Geographical location of the site,
- Climatic conditions,
- Tides,
- Currents,
- River levels, and
- Site-specific constraints.

FHWA Guidelines

Bridge Inspector's Reference Manual, October 2002, (Report No. FHWA NHI 03-001 and
03-002)
Underwater Inspection of Bridges, (Report No. FHW A-DP-80-1)
Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, (Report No. FHWA-PD-96-001)
Manual of Uniform Traffic Control Devices, December 2009 or latest edition.

AASHTO Specifications and Guidelines
Manual for Bridge Evaluation, 2 nd Edition, with current interims.

National Bridge Inspection Standards
Title 23, Code of Federal Regulations, Part 650, subpart C, latest rule applicable.

Commercial Diving Operations
Title 29, Code of Federal Regulations, Part 1910, subpart T, latest revision.

U.S. Coast Guard Navigation Rules
U.S. Coast Guard pamphlet CG-169, May 1, 1977, Rule 27, or latest revision.

Puerto Rico Highway and Transportation Authority Specifications
Standard Specification for Road and Bridge Construction, 2005 edition.

Units

Use English units of measurement.

Bridge Member Identification

Use the member identification convention consistent with PRHTA provided documents and the Bridge Safety Inspection Manual, Department of Transportation and Public Works, Puerto Rico Highway and Transportation Authority, July 2011

V. TERMS AND DEFINITIONS

PRHTA - Puerto Rico Highway and Transportation Authority

Consultant - The individual, partnership, firm, corporation, or any acceptable combination thereof, contracting with the PRHTA for performance of the work included in this contract.

Professional Registration - Prepare all work under the direct supervision of the registered professional engineers who are in responsible charge for the services. These Engineers currently registered in Puerto Rico will sign, seal and certify the accuracy of each final work product.

Correspondence - On all correspondence include the PRHTA's assigned Project name and numbers.

Identified Substructure Unit (ISU) - Each structure description lists the substructure members for inspection.

Documents and Reports - Print reports with solid black letters that are double-spaced on white, 8.5-inch x 11-inch bond or "Xerox Copy" paper. Fold larger paper sizes to 8.5 -inch by 11-inch.

Submit a digital copy of final reports complete with color photographs and sketches. Provide this report in Adobe Acrobat (pdf) or other approved format.

Report Copies –Provide (2) hard copies and (1) digital copy.

Covers - Include the following information on the cover of all documents and reports:

a. Name of document or report.
b. Date.
c. Indicate whether draft or final.
d. Project Name.

e. State and Federal Project Number(s).
f. Prepared for: Puerto Rico Highway and Transportation Authority
g. Prepared by: (Company Name)

Revisions - Modify work products in response to direction from the PRHTA. Consider corrections, adjustments, or modifications necessitated by the review/approval process, which do not substantially affect the scope, complexity, or character of the services, as a normal part of the Consultant services.

Errors and Omissions - Submit the completed work products to the PRHTA. Prior to submitting correct all significant errors or omissions within the work products. The PRHTA will not accept errors or omissions in the work product.

Comment Resolution - Provide a written response with subsequent submittals that address all written and oral PRHTA comments. Clearly explain all changes from previous submittals.

VI. PROJECT WORK TASKS

Structure Inspection

The inspections include but are not limited to the following:

1. Identify and list each member of the underwater inspection or Substructure Unit.

2. Include a drawing with the UW inspection elements (ISU's) identified at the beginning of the inspection report.

3. Document inspection procedure for UW inspection of the bridge and include the procedure as part of the UW inspection report.

4. As defined in the FHWA Manual, Underwater Inspection of Bridges: A complete Level I underwater inspection on 100% of ISU's from the mud line to the water surface.

5. Identify and document the High Watermark.

6. Visually inspect the ISUS's from the High Watermark down to the current water level of the above water portion of ISU's using the diver in the water or inspector from a workboat.

7. Assign a Condition Rating to each member according to the FHWA Recording and Coding Guide.

8. Identify the AASHTO Core elements and assign condition state quantities. Document the quantities per ISU's and in total.

9. As defined in the FHWA Manual, Underwater Inspection of Bridges: A Level II underwater inspection on 10% of ISU's below the water surface.

10. As defined in the FHWA Manual, Underwater Inspection of Bridges: A Level III underwater in depth inspection identified in the Scope of Work -or- where deemed necessary by the Engineer in Charge. Immediately notify the PRHTA Contract Manager when a Level III inspection is deemed necessary and the reasons for this determination. Based on the information provided, the PRHTA may require a more detailed inspection.

11. Assess the riprap condition at embankments and intermediate piers.

12. Document all deficiencies with photos and additional sketches.

13. Document typical conditions, with colored photographs and/or sketches including debris build up.

14. Locate, describe and quantify all structural defects with colored photographs and/or sketches including damaged members, remaining section, timber decay or attack by marine borers. Use clear water box when necessary.

15. Measure all local scour and scour undermining of footings, concrete walls or around piles by width, length and depth. Reference the scour elevations from the as-built drawings and locate in relation to adjacent substructure unit. Measure and locate the maximum water depth at each substructure unit.

16. Identify stream or channel bed material.

Documentation and Reporting

Submit draft and final reports for each structure to the PRHTA for review and approval.

VII. CONSULTANT RESPONSIBILITY

General

1. Comply with all laws, ordinances, rules, regulations and orders of any public authority bearing on the performance of the work.
2. Establish a safe environment for work site personnel.

Scheduling

Prepare a proposed schedule thirty (30) calendar days prior to starting underwater inspections. Update detailed structure inspection dates and approximate times at least two (2) weeks prior to the actual start date. When schedule revisions arise, immediately submit a revised schedule to the PRHTA Project Manager. No inspection shall begin prior to schedule approval.

Identify the optimal time for underwater inspections. Balance underwater inspection schedule between the low flow and the higher flows produced by and seasonal rains.

Debris Removal

Remove sufficient debris such as trees, brush and other miscellaneous objects that inhibit inspection efforts or cause unsafe conditions.

The Consultant may review existing inspection records to identify debris accumulation history when such data is available.

Work Zone Traffic Control

Use inspection procedures which minimize traffic disruption. Omit traffic control, when underwater inspections are completely off the roadway and behind existing railing. Develop and submit to the PRHTA for approval a TCP, when a TCP is needed.

Provide a safe and expeditious movement of traffic around and through the inspection/work site. Implement the approved TCP and utilize traffic control devices when the underwater inspection affects the movement or safety of traffic or the safety of the work force.

Employ the Traffic Maintenance in accordance to the most recent Manual on Uniform Traffic Control Devices (MUTCD). Obtain an approved and signed TCP prior to submitting or commencing work on PRHTA right of way. During the work maintain a copy of the PRHTA approved traffic control plan on site.

Inspection Coordination

Prior to performing the inspections coordinate the inspection efforts with the PRHTA, all applicable Federal, State, and Local Agencies including law enforcement.

Coordinate activities with Marine Transport Authority managers and schedule inspections to avoid conflicts with ferry vessel (*Aqua Expreso*) arrivals and departures.

Permits

Obtain all permits required for these inspections including, but not limited to, any required by the U.S Army Corps of Engineers , Natural Resources Department and U.S. Coast Guard.

Inspection Procedures

Determine how to safely access each structure. Develop an access plan for each structure. Assess site conditions prior to diving. Document unsafe diving conditions by providing color photos and a written explanation of why the site is unsafe.

Contact the PRHTA Project Manager every regular business day or immediately as necessary with inspection updates. Immediately notify the PRHTA Project Manager or on-site PRHTA Inspector of any significant inspection findings.

Do not block or restrict stream navigation. Provide adequate notification to water traffic during dive operations and provide safety vessel as necessary.

VIII. MANAGEMENT

Schedule(s)

Adhere to the Project Duration to meet the PRHTA's long-term goals and commitments. Expend all effort necessary to stay on schedule.

Project Coordination

Coordinate all project correspondence through or with the concurrence of the PRHTA's Project Manager.

FHWA Communication

The PRHTA shall conduct all project related communications with FHWA.

PRHTA Activities

The PRHTA's Project Manager coordinates the Consultants activities with those of various functional groups within the PRHTA. These groups include Traffic, Safety & Utilities; Highway Construction; Bridge Engineering Office; and Contracts.

For quality assurance purposes, the PRHTA may have an inspector on site for some or all inspection activities.

Release of Information

The PRHTA's Project Manager must approve the release of any project related information.

IX. QUALITY CONTROL PROGRAM

The Quality Control Program shall include the following elements:

1. Quality Reviews: The Consultants shall conduct quality reviews to make certain their own organization is in compliance with the requirements cited in this scope of services. Quality reviews shall be conducted to evaluate the adequacy of materials, documentation, processes, procedures, training, guidance, and staffing included in the execution of this contract.
2. Quality Control Plan: The Consultant shall include a quality control plan in the technical proposal furnished to the PRHTA. The quality control plan shall detail the procedures, evaluation criteria, and instruction to his organization to assure conformance with the contract. No work shall be initiated until the Consultant's quality control plan is approved by the PRHTA. Significant changes to the work requirements may require the Consultant to revise the quality control plan. It shall be the responsibility of the Consultant to maintain a plan current with the work requirements. The Plan shall include, but not be limited to, the following areas.

   a. Organization - A description is required of the Consultant's quality control organization and its functional relationship to the part of the organization performing the work under the contract. The authority, autonomy, and responsibilities of the quality control organization shall be detailed as well as the names and qualifications of personnel in the quality control organization.

   b. Quality Control – The Consultants methods use to monitor and assure compliance with the contract requirements for services and products shall be detailed.

   c. Quality Assurance - The Consultant's methods used to monitor and assure compliance with the quality control requirements shall be detailed.

d. Quality Records - The types of records which will be generated and maintained by the Consultant during the execution of a quality control program shall be outlined.

e. Control of Subcontractors and Vendors - The methods used by the Consultant to control the quality of the subcontractors shall be detailed.

f. Quality Control Certification - An officer of the Consultant firm will be required to sign and seal a certification that will accompany each submittal stating that the drawings, reports, etc. have been prepared and checked in accordance with PRHTA Specifications.

The Consultant shall maintain adequate records of the quality control actions performed (including subcontractors and vendors) in providing services and products under this contract. All records shall indicate the nature and number of observations made, the number and type of deficiencies found, and the corrective actions taken. Deficiencies identified through the consultant's QC and/or QA processes shall be reported to the PRHTA and immediately corrected. Failure to make satisfactory and timely correction to deficiencies, identified by the consultant or by the PRHTA, shall result in withholding of payments, pending satisfactory corrections being made. These records shall be available to the PRHTA upon request during the contract term. All records shall be kept at the primary job site. All records are subject to audit review.

X. BRIDGE INSPECTION REPORTS

Requirements

Submit a concise, complete and separate report for each structure with the following:

1. Executive Summary - Identify critical findings and locations of significant observations and deficiencies. Provide critical findings and maintenance work recommendations. Include the site time, inspection date, type of dive and safety vessels used, and crew size in a summary table.

2. Introduction - Include a description of the structural members inspected, inspection method, Inspection access method, traffic control, equipment used, and list the name and date of Agencies and individuals contacted.

3. Inspection Findings - Include detailed observations and a brief narrative with an overall condition summary for the members inspected. Provide inspection findings for each member.

    - Describe, quantify, and locate all defects.

    - Discuss nondestructive testing methods. Provide all test results.

- Assign a Condition Rating to each member according to the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, (Report No. FHWA-PD-96-001)

4. Special Conditions - Discuss all hydrological data including debris, scour, streambed material, and water conditions. Discuss access method, traffic control, and nondestructive testing methods used. Provide all test results.

5. Sketches - Provide plan and elevation views of piers and abutments drawn to scale. On these sketches:

    - Show the streambed spot water depth map; the flow direction; and north arrow.

    - Locate scour holes and points of maximum scour depth with approximate dimensions (length, width and depth below normal streambed); reference the horizontal location to the nearest substructure unit; and vertical distance from the deck to water surface.

    - Locate all deficiencies.

    - Show deck elevation to water surface measurement.

6. Typed Daily Dive Reports - Include crew size and crew names, the time the diver's actually spent inspecting the structure, tide table record with time and location references, maximum dive depth at each identified substructure unit, maximum current, visibility, ambient and water temperatures. Provide typed Daily Inspection Logs.

7. Color photos documenting the typical member condition and all defects, diver access methods include staging and boat launch areas, substructure members above and below the water, in-place traffic control, rip rap condition, and debris before and after removal.

Draft Reports

Submit all draft Structure Reports complete with color photos and sketches to the Bridge Engineering Office for review. Provide a digital copy and one hard copy.

Final Reports

Submit final Structure Reports complete with color photos, sketches and Engineers seal. Provide a digital copy and two bound paper copies.

XI. METHOD OF COMPENSATION

The method of payment for the Consultant contract will be on per bridge basis.
In the sealed Economical Proposal submitted by the Consultant a task breakdown shall be included per bridge.
A lump sum item for debris removal shall be included per bridge. This lump sum shall be negotiated on a per bridge basis when needed.

A.9 Procedure for Conducting Underwater Inspection

The Federal Highway Administration **(FHWA)**, through the National Bridge Inspection Standards **(NBIS)**, and through guidance provided in Technical Advisories, specifies that underwater members shall be inspected to the extent necessary to determine with certainty that their condition has not compromised the structural safety of the bridge.The NBIS recognizes seven types of bridge inspections: routine, initial, damage, in-depth, underwater, special, and fracture critical.

Underwater inspection **(UWI)** is the evaluation carried out on those bridges where the submerged portions of the structure have a history of at least four feet of water depth throughout the year, or, where the elements are submerged in less than four feet of water, but the evaluation thereof by the method of wading, would be unsafe.A summary of the procedure to perform the UWI is presented below, complying with the NBIS' minimum requirements for the safety and proper inspection of all highway bridges.Also, the UWI procedure must comply with the safety standards set by the Occupational Safety and Health Administration's **(OSHA)**, as well as any other local, federal or more restrictive applicable regulation.

Procedure for Conducting the Underwater Inspection

1. Select the Underwater Inspection Team

Bridge owner must select the UWI team. The UWI team is composed of individuals who meet the requirements for bridge inspection specified by the NBIS and the minimum requirements of diving required by OSHA regulations, for commercial diving operations (29 CFR 1910 Subpart T).

Members of the team that participated in the inspection of this bridge are included in Table I:"Inspection Data" of the "Underwater Bridge Inspection Report", for Bridge No. 0542, prepared by Behar Ybarra & Associates, LLP and Bolt Underwater Services.

2. Site Reconnaissance and Data Collection

Through data collection or an on-site reconnaissance, the dive inspection team leader should:

- **a.** Determine the approximate water depth, from the drawings or from field measurements.
- **b.** Determine the approximate velocity of the water.
- **c.** Perform a hazard analysis.
- **d.** Do a pre-dive checklist.
- **e.** Determine if due to the work of inspection, traffic may be affected.
- **f.** Obtain all data related to the structure to prepare for an inspection.
- **g.** Prepare an UWI operation plan.
- **h.** Review previous reports so that they can help to determine the rate of deterioration of the previously observed defects.
- **i.** Review the previously established measures against scour.

3. Determine the Level of Inspection

Bridge owner and/or UWI team must determine the level of inspection required. Three levels of inspection have been adopted for UWIs, these are summarized below as:

Level I: Visual, tactile inspection.

Level II: Detailed inspection with partial cleaning.

Level III: Highly detailed, inspection with Non-Destructive Testing or Partially Destructive Testing.

A routine UWI normally includes a 100% Level I inspection and a 10% Level II inspection. It may also include additional Level II inspections and Level III inspections, as necessary.

For the evaluation of this bridge, Level I inspection were performed on 100% of the submerged portions of each identified substructure unit. Level II cleanings and Level III inspection were not required for this bridge.

4. Establish the Inspection Frequency

UWI team shall establish the inspection frequency. UWI shall be done at least every 60 months or more frequently if conditions warrant. However, the NBIS has specified certain factors that shall be considered in establishing the frequency of inspections and normal levels of inspection effort.

The UWI for Bridge No. 0542 was completed on August15, 2012. The recommended next UWI should be done no later than 60 months from this date.

5. Bridge Data

a. **Bridge Type**
   Cast in place concrete bridgewith6 spans
b. **Location –** Refer to Figure 1: "Bridge Location Map".

6. Identify the SubstructureUnit Located in Water

The inspector must recognize the various types of substructure configurations, likely locations and types of commonly encountered defects, and understand the causes and mechanisms of deterioration.The types of structures include pile bents, piers, abutments, caissons, cofferdams and foundation seals, protection devices and culverts.The ISU'sin water, requiring Level I inspectionand a 10% of Level II, are presented below:

a. **ISU:** Columns 1 and 2 of Bents 2 through 6
b. **ISU:** Channel

7. Select the Underwater Inspection Method and Technique

The UWI team shall select the inspection method.There are currently three methods used to conduct UWI, these are:

a. **Wading** - requires only a probing rod and boots to be effective.
b. **Scuba Diving** - A method that allows a more detailed examination of substructure conditions at the mudline.
c. **Surface-Supplied Air Diving**: A diving mode in which the diver in the water is supplied from the dive location with compressed air for breathing. This method may involve the use of sophisticated diving equipment. This inspection method is well suited when adverse conditions will be encountered.

For this bridge, the Wading and Scuba Diving methods and techniques have been employed.

8. Perform the Routine Inspection and Determine the Deterioration of Structural Material

A routine inspection is a regularly scheduled inspection consisting of observations and measurements needed to determine the physical and functional condition of the bridge, to identify any changes from initial or previously recorded conditions, and to ensure that the structure continues satisfying the present service requirements. The routine inspection may indicate that an in-depth inspection is needed in some areas to confirm the Level I and Level II findings, or to gain additional data so that the structural conditions can be evaluated with certainty.

The UWI team shall determine the deterioration of the structural material, primarily concerned with ratings of the five inventory and appraisal NBI items: Item 60-Substructure, Item 61-Channel and Channel Protection, Item 62-Culverts, Item 71-Waterway Adequacy, and Item 113-Scour Critical Bridges (see section 10).

Deterioration of structural material depends mainly on the type of material. For concrete, there are four main types of deterioration: cracking, scaling, spalling, and chemical attack. Steel foundation elements located in water, can suffer distress in the form of corrosion. Typical problems found in masonry structures include cracking, scaling, and deteriorated pointing. The deterioration of structural materials found onBridge No. 0542 includes concrete scaling, and spalling with exposed steel; for detailed deficiencies and locations refer to Table 3.

9. Underwater Inspection Equipment and Safety Measures

a. **Vehicular Traffic** –The vehicular traffic was not impacted during the inspection. Traffic Control Devices and/orMaintenance of Traffic were not needed for UWI of this bridge.
b. **Access** –The access to many small bridges can be accomplished from the adjacent shore; for larger waterways, a boat will be necessary. In this case the bridge was accessed by the adjacent shore.
c. **Divers Equipment**–There are several divers equipment including: exposure suits, commercial scuba equipment, and communication equipment, among others. For the evaluation of this bridge, diving equipment was used. For additional equipment employed in the evaluation of this bridge, refer to Table 1: "Inspection Data".
d. **Inspection Tools** – There are two types of inspection tools; hand tools and power tools.For this bridge,both types of tools have been used.
e. **Images**–Color photographs taken during the UWI are included in the report, refer to Appendix B.

10. Inspect the Scour

UWI team must evaluate bridge for scour (Refer to NBIS-Item 113-Scour Critical Bridges). UWI team shall accomplished two main objectives in inspecting bridge for scour: To accurately record the present condition of the bridge and the stream and to identify conditions indicative of potential problems with scour and stream stability, for further review and evaluation by others. For bridges that are scour critical, bridge owners must prepare a plan of action to monitor known and potential deficiencies and to address critical findings.

A basic scour investigation should include sounding and probing the channel bottom adjacent to the structure, and determining channel cross sections in the area of the bridge.

For information related to scouring,refer to"Underwater Bridge Inspection Report", for Bridge No. 0542, made by Behar Ybarra & Associates, LLP and Bolt Underwater Services.

11. Critical Findings - Critical findings shall be identified by the UWI team and shall be addressed in a timely manner. The FHWA shall be periodically notified of the actions taken to resolve or monitor critical findings.The underwater inspection team found some incidental issues on Bridge No. 0542. There are:

a. There are struts running between Piles No. 1 & 2, of Bents No. 3 through 5, 6 feet, approximately, below the waterline.

12. Determine the Condition Rating and Core Element Level Condition Rating

UWI team shall determine the condition rating and the core element level condition rating. The NBI rating system assigns a numerical rating from "9" to "0" for substructure units; an element based rating system breaks the substructure units into Commonly Recognized **(CoRe)** Structural Elements, and determines the quantity of submerged piles that should be classified in various condition states.In general, the condition states range from "1" to "5".

The CoRe Structural Elements are a group of structural elements endorsed by the American Association of State Highway Transportation Officials (AASHTO) as a means of providing a uniform basis for data collection for any bridge management system. Each element is also assigned an environment rating from "1" to "4" representing the aggressiveness of operating practices and the local environment in which the element is located.

For NBIS ratings refer to Table 2: "NBIS Overall Condition Rating" of the "Underwater Bridge Inspection Report", for Bridge No. 0542, made by Behar Ybarra & Associates, LLP and Bolt Underwater Services.[1 2]

[1] Bridges with fracture critical members and complex bridges shall be inspected according to those procedures.

[2] The Procedure for Conducting the Underwater Inspection shall comply with the NBIS and OSHA requirements and any other more restrictive local or federal requirement.The Underwater Inspection Report for Bridge No. 0542, done by Behar Ybarra& Associates, LLP/Bolt Underwater Services on July 2013, as well as, previous inspection's reports for this bridge, provided by the Puerto Rico Highway and Transportation Authority, have been used as reference also.

A.10 Failure Critical Inspection Procedures

Inspection procedures begin with proper advanced planning. Important planning aspects usually based on an office review of the structural plans, fracture critical inspection records, and aerial views of the location, include:

• Identify all fracture critical members on both the superstructure and substructure including all primary gusset plate locations.

• Note the particular members in the structure that may require special field attention, such as built-up tension members composed of few individual pieces.

• Determine equipment necessary to access the fracture critical members, such as a SNOOPER® truck, ladders, bucket truck, boom lift, boat, etc.

• Identify all personal protective equipment necessary to inspect the structure such as hard hat, vest, steel toed boots, flashlight, respirator, or eye protection.

• Many structures designed for urban situations with necessary complex alignment geometries result in FCMs. Proper inspection of these bridges may require closing a traffic lane or require a night time inspection due to high average daily traffic. Coordinate safe traffic control in advance with the local District and Area offices and their Safety Review Team.

• Identify and make available any necessary special tools and equipment that may be required in addition to the normal inspection gear.

- Tools for cleaning:
  - Shop-vac to remove loose debris
  - Brushes – both wire and synthetic
  - Needle scaler
  - Chipping hammer
  - Compressed air

- Non-destructive test equipment
    - Penetrant Testing - Used for crack verification and crack tip location.
    - Magnetic Particle Testing – Used for crack verification and crack tip location
    - ULtrasonic Testing – Used to detect subsurface cracks and evaluate remaining thickness at locations that have experienced section loss. All pin-and-hanger connections are evaluated using this method.

The actual field inspection of all FCMs consists of a hands-on visual inspection of all fracture critical members. The inspector notes any:
• Visual cracks and records the crack length, direction, and location, describing what member the crack is in and where on the member the crack is located. Marks are made on the member documenting crack limits and the date crack observations were made. A picture is taken of each crack and placed in the picture report.
• Corrosion resulting in section loss of the fracture critical member, or resulting in pack rust between built-up members. At least one picture showing the worst location of this type of deficiency is placed in the picture report.
• Weld terminations, plug welds, or intersecting welds in a tension area.
• Interrupted back-up bars used for built-up-member fabrication.
• Arc strikes, scars from assembly cables or chains, or other physical damage.
• Cross-section changes which may cause a sudden increase in the stress pattern.
• Each type of AASHTO defined fatigue detail and all known problematic details that exists on the member. A picture of each is taken and placed in the picture report.

After the field inspection has been performed, a report is written to document the inspection plan and the current condition of the FCMs. This written report is supplemented by a picture report. The picture report contains an example of each type of fatigue detail, the overall layout of the structure, a picture of every crack, and the location of moderate to severe section loss. The format of the report is as follows:
Methods:
• The equipment used to perform hands on inspection of all FCMs, including required safety equipment.
• Who performed the inspection?
• How long was required to perform the inspection?
• When the inspection was performed (night/day – date).
• Site specific details requiring special attention (fatigue details, problematic details, primary gusset plates, dangerous conditions).

• List special equipment necessary to clean and verify cracks and quantify section loss, including non-destructive evaluation techniques used.
• Equipment setup and access points

Traffic Control:
• The agency or contract firm that provided the traffic control.
• Lane closure information.
• Advanced notification time required to obtain ROW access

Structure Description:
• Year Built, Structure Type, Length of Structure
• Structure Orientation.
• Identification of each FCM which are then grouped by the appropriate AASHTO fatigue category.
• List of fatigue details and problematic welded detail.

Inspection Summary:
• Describe the general condition of the structure.
• List all cracks, on the structure, in a table showing length, location, and direction.
• List all section loss dimension and locations. This value should be recorded as remaining thickness.
• List all pack rust locations that are causing bowing of the built-up members or causing bolts or rivet to shear.

Recommendations:
• Repair and/or preventative maintenance recommendations based on the information shown in the inspection summary.
• Items to be updated on the NBI as a result of the fracture critical inspection. Item 59 - Superstructure Rating (0-9)

- Item 60 - Substructure Rating (0-9)
- Item 92A - Fracture Critical Inspection Frequency (0-24)
- Item 93A - Fracture Critical Inspection Date (Month/Year)

Appendix A includes an example layout of a typical fracture critical inspection report outlining items that are documented from the inspection.

Maintenance and Preservation

Although rare, routine FC inspections occasionally reveal defects or deterioration in fracture critical elements. In those cases, the inspectors who observe and document the defects work closely with the engineers in the Bridge Maintenance group, located in DOT Bridge Division, to develop appropriate repair procedures and details.

When damage is limited to a few isolated locations, DOT personnel often perform repair work themselves. There are several Certified Bridge Welders on staff in the Bridge Maintenance group who are capable of performing a variety of routine repairs to steel structures. When damage is more substantial or widespread, DOT engineers develop repair procedures and details for use by a qualified steel repair contractor.

Repairing damage to fracture critical elements is given a high priority, particularly when the deterioration appears to be rapidly advancing or when it could potentially lead to failure of the element and consequently to the bridge itself. Routine maintenance is also an important aspect of preserving fracture critical elements. Repairs are typically far more effective and less expensive when a problem is addressed before it advances to the point that the load-carrying capacity of the structure is compromised. For example, cleaning and coating steel that exhibits minor surface corrosion can prevent deterioration from worsening to the point that more substantial structural repairs are necessary.

Appendix B Forms for Field Inspections

Bridge Number:

Location	
Team	
Insp. Date	
Previous Insp. Date	

Structure Type and Materials

Number of Spans	
Main Span Material	
Deck Protection	

Structure Length	
Structure Width	

Deck

Material	
Deterioration	
Drainage	
Safety	

Slab or Plate

Material	
Condition	
Corrosion	

Superstructure

Type	
Paint	
Condition	

Steel beams

Type	
Condition	
Corrosion	
Paint	

Concrete

Type	
Condition	
Cracking	

Truss

Paint	
Corrosion	
Members	

Comments

Appendix C **Inspection by PRHTA of PB 0960**

C.1 April 15, 2014

INSPECTION REPORT SUMMARY & QC SHEET

BRIDGE: 960

TEAM LEADER: Eng. Arturo Cáceres Febus

INSP. DATE: 4/15/14

1. Inspection Type and Dates:

NBI	Type	Performed? (Yes / No / NA)	Freq (MONTHS)	Previous Insp. DATE (MONTH/YEAR)	Next Insp. DATE (MONTH/YEAR)
ITEM 90	Routine Inspection	Yes	48	12/9/08	4/15/18
ITEM 93 A	FC Inspection	N	—	—	—
ITEM 93 B	Underwater Insp.	N	—	—	—
ITEM 93 C	Other:	N	—	—	—

2. NBI Condition Rating Summary:

	Item 58	Item 59	Item 60	Item 61	Item 62	Item 113
Previous Inspection	4	4	5	N	N	N
Current Inspection	5	4	5	N	N	N

Other Checks: (Y, N, NA)

Review Comments:

_ Scour Critical (items 113 & 60)
_ AASHTO Core's & NBI CD consistent
_ Smart Flags (scour, steel plate, fire damage, etc)
_ Channel Profile/Clearance Table
_ FC & Underwater Members Tables
_ Asphalt Overlay Thickness
_ Drawings
_ Photos
_ Critical Finding
_ Inspector & Team Leader Signature

Reviewer: ____________

Safety Eng.: ____________

YourState Department of Transportation

Bureau of Bridges and Structures
Bridge Maintenance

Bridge Inspection Report

Bridge Key: 009601 Agency ID: 009601 Sufficiency Rating: -2.0

IDENTIFICATION

State 1:	72 Puerto Rico	Struc Num 8:	009601
Facility Carried 7:	PR 18	Location 9:	0.5 KM N INT PR21 & PR18
Rte.(On/Under)5A:	One Route Under	Rte. Signing Prefix 5B:	1 Interstate Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00018
Directional Suffix 5E:	1 North	% Responsibility :	NA
SHD District 2:	-1	County Code 3:	SAN JUAN
Place Code 4:	SAN JUAN ZONA URBANA	Kilometer Post 11:	01.7 km
Feature Intersected 6:	PEDESTRIAN WALKWAY		
Latitude 16:	18d 23' 24"	Longitude 17:	066d 04' 36"
Border Bridge Code 98:	Unknown (P)		
Border Bridge Number 99:	Unknown		

INSPECTION

Frequency 91:	48 months	Inspection Date 90:	4/15/2014	Next Inspection:	04/15/2018
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	48 months	Element Inspection Date:	01/01/1901	Next Elem. Insp. Due:	01/01/1901

CLASSIFICATION

Defense Highway 100:	2 On Non-Interstate STRA	Parallel Structure 101:	Unknown (NBI)
Direction of Traffic 102:	0 Not hwy traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	0 Not on NHS	NBIS Length 112:	Unknown (NBI)
Toll Facility 20:	3 On free road	Functional Class 26:	12 Urban Fwy/Expwy
Historical Significance 37:	Not Applicable (P)		
Owner 22:	-1 Unknown (P)		
Custodian 21:	-1 Unknown (P)		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: -1 Number of Spans Main Unit 45: -1

Main Span Material/Design 43A/B:

2 Concrete Continuous 04 Tee Beam

Deck Type 107:	Unknown (NBI)
Wearing Surface 108A:	Unknown (NBI)
Membrane 108B:	Unknown (NBI)
Deck Protection 108C:	Unknown (NBI)

CONDITION

Deck 58:	5 Fair	Super 59:	4 Poor	Sub 60:	5 Fair
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:	N N/A (NBI)		

LOAD RATING AND POSTING

Inventory Rating Method 65:	Unknown (NBI)	Operating Rating Method 63:	Unknown (NBI)
Inventory Rating 66:	MS-.6	Operating Rating 64:	MS-0.6
Design Load 31:	7 Pedestrian	Posting 70:	Unknown (NBI)
Posting status 41:	Not Applicable (P)		

AGE AND SERVICE

Year Built 27:	1967	Year Reconstructed 106:	Unknown
Type of Service on 42A:	3 Pedestrian-bicyle		
Type of Service under 42B:	1 Highway		
Lanes on 28A: Unknown	Lanes Under 28B: 9	Detour Length 19:	0.0 km
ADT 29: 178,900	Truck ADT 109: 4 %	Year of ADT 30:	2005

APPRAISAL

Bridge Rail 36A:	N N/A or not required	Approach Rail 36C:	N N/A or not required
Transition 36B:	N N/A or not required	Approach Rail Ends 36D:	N N/A or not required
Str. Evaluation 67:	N	Deck Geometry 68:	N Not applicable (NBI)
Underclearance, Vertical and Horizontal 69:	4 Tolerable		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	Not Applicable
Scour Critical 113:	Not Applicable (P)		

GEOMETRIC DATA

Length Max Span 48:	22.20 m	Structure Length 49:	49.30 m
Curb/Sdwlk Wdth L 50A:		Curb/Sidewalk Width R 50B:	
Width Curb to Curb 51:	2.10 m	Width Out to Out 52:	
Approach Roadway Width 32: (w/ shoulders)	44.30 m	Median 33:	Unknown (NBI)
Deck Area:			
Skew 34:	-1.00 °	Structure Flared 35:	Unknown (NBI)
Minimum Vertical Clearance Over Bridge 53:			
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct		
Minimum Vertical Underclearance 54B:	04.84 m		
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct		
Minimum Lateral Undrclearance R 55:	03.30 m		
Minimum Lateral Undrclearance L 56:	02.60 m		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 0	Type of Work 75:	35 Rehabilitate-gen.
Roadway Cost 95:	$ 0	Length of Improvment 76:	00.00 m
Total Cost 96:	$ 42,115	Future ADT 114:	216,469
Year of Cost Estimate 97:	2014	Year of Future ADT 115:	2020

NAVIGATION DATA

Navigation Control 38:	_ Unknown (NBI)		
Vertical Clearance 39:		Horizontal Clearance 40:	
Pier Protection 111:	Not Applicable (P)	Lift Bridge Vertical Clearance 116:	

ELEMENT CONDITION STATE DATA

BRIDGE NOTES

Bridge Inspection Report

PAST INSPECTION

Inspection Date: 04/15/2014 Type: 1 Regular NBI

Inspector: -1 Pontis User Key: Pontis - Pontis Poi

Scope:

NBI: ☑ Other: ☐ Element: ☐

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

THE WEARING SURFACE SHOWS POOR FINISHING, LIGHT SCALINGS AND FINE TO MEDIUM TRANSVERSE CRACKS. INADEQUATE RAMPS FOR HANDICAPS. HOLES AND MUCH VEGETATION ALONG THE WEARING SURFACE AND RAILINGS. RAMPS RAILINGS WITH BROKEN SECTIONS FROM SUPPORTS AND MOVEMENT. LARGE SPALLINGS WITH EXPOSED REINFORCED STEEL DUE TO TRAFFIC IMPACT AT BEAMS OF SECOND SPAN OVER ROUTE TOWARDS CAGUAS AND OVER REVERSIBLE LANE. MEDIUM HORIZONTAL CRACK AT PIER CAP (EAST SIDE).

INSPECTOR WORK CANDIDATES

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

Team Leader: Arturo Cáceres
Bridge Inspector: Micky Santiago
Bridge Evaluator: Arturo Cáceres
Assistants: John Dávila _ _ _ _
Driver: Juan C. Otero
Inspection date: Abril-15-2014
Weather Conditions: Sunny
Amount of Time on Inspection: 0.5 Hours
Equipment: **X** Bus or Van _ Underwater _ Ladders _ Snooper **X** Camera _ Boat
_ Other:

Bridge Number: 0960

Road on Structure: N/A **Number or Name:** _ **Km.** _
Road Under Structure: State Highway **Number or Name:** PR-18 **Km.** 1.7
Ident. Plaque: No **Num.** _
36. Traffic Safety Features:
Bridge railings: not applicable or safety not reuired
Transitions: not applicable or safety not reuired
Approach Guardrail: not applicable or safety not reuired
Approach Guardrail Ends: not applicable or safety not reuired
41. Posting: **Condition:** A - Open **Sign Type:** _ **Posting Load:** _
COMMENTS AND/OR RECOMMENDATIONS:

ACF 4/23/14.

Inspection by: **Micky Santiago**
Bridge Inspector

Revised and Approved by: **Arturo Cáceres**
Bridge Evaluator

BR-0960 1

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

58. DECK

58.1 Wearing Surface: Material: Concrete ***Condition:*** 5 Thickness cm.

Deterioration: 0 to 10 % Drainage: Adequate Ponding: No Safety: Yes

58.2 Slab or Plate: Material: Concrete ***Condition:*** 6

Cracking: Fine (0.0 to 0.5 mm)

Spalling: Top: Small Bottom: No

Scaling: Top: Light Bottom: No

Efflorescence: No Exudation: No Rust Stains: Yes Corrosion: Moderate

58.3 Movement: Deck to backwall: cm. Deck to approach slab: cm.

	Material	Cond. Rating	Height Loss (cm)	Joints	Drainage	Alignment	Corrosion	Paint	Safety	Cracking	Spalling	Scaling
58.4 Curb	N/A	--		--	--	--	--	--	--	--	--	--
58.5 Median	N/A	--		--	--	--	--	--	--	--	--	--
58.6 Sidewalks	N/A	--		--	--	--	--	--	--	--	--	--
58.7 Parapets	N/A	--		--	--	--	--	--	--	--	--	--
58.8 Railing	Steel	4		--	Good	Poor	--	--	No	--	--	--

58.9 Lighting Standards: Material: N/A Condition: N/A Functioning: N/A

58.10 Utilities:

Type: Size: Safety: _

Type: Size: Safety: _

Type: Size: Safety: _

58.11 Joints: Condition: N/A

Type: Expansion Functioning: No Leaking: N/A Cracking: N Spalling: N Armor: No

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

58.12 Drains and Scuppers:

Material: Other Condition: N Functioning: N/A

Comments:

58.1- Superficie con desprendimientos del resanado, leve “scaling”, grietas finas y medianas transversales. Rampas de acceso mas bajas que la superficie del puente, escalon no es apropiado para uso de impedidos. Huecos en la superfice sobre area de pilastras y mucha vegetación sobre la estructura y “railings”.

58.8- “Railing” en area de las rampas con secciones partidas de sus bases e inclinadas hacia el interior de la rampa, mucha vegetación sobre el “railing”.

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

59. SUPERSTRUCTURE

59.1 Bearing Devices: Type: Fixed/Mov. Out of Plumb: No Paint: None

Condition: 6

59.2 Bridge seats, pedestal, grout pads, abutments or pier seat where beams bear directly on conc.

Condition: 6 Cracking: No Spalling: None Scaling: None

Crushing: No

59.3 Steel beams: N/A Type: N/A

Condition: N Corrosion: None Paint: None

59.4 Concrete: T-beams Type: Cont.

Condition: 4 Cracking: Medium (0.5 to 1.0 mm) Spalling: Large Scaling: None

59.5 Truss: N/A Paint: None Corrosion: None Members: N/A

59.6 Drainage: Type: **Condition:** N Functioning: No

59.7 Hinges: **Condition:** N Functioning: N/A Movement: N/A

59.8 Deflection: Normal

59.9 Vibrations: Minimal

60.0 SUBSTRUCTURE:

			Material	Cond. Rating	Cracking	Spalling	Scaling	Corrosion	Paint	Movement	Erosion	Undermining
Abutments	60.1.1	Wingwalls	N/A	N	--	--	--	--	--	--	--	--
	60.1.2	Breast-Backwall	Concrete	5	M	Small	L	--	Fair	No	No	No
	60.1.3	Footing	N/A	N	--	--	--	--	--	--	--	--
	60.1.4	Piles	N/A	N	--	--	--	--	--	--	--	--
Piers or Non Pile Bents	60.2.1	Caps	Concrete	5	F	Small	L	--	--	No	No	No
	60.2.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.2.3	Columns	Concrete	6	F	Small	L	--	--	No	No	No
	60.2.4	Footing	N/A	N	--	--	--	--	--	--	--	--
	60.2.5	Piles	N/A	N	--	--	--	--	--	--	--	--
Rocker Bents	60.3.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.3.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.3.3	Piles	N/A	N	--	--	--	--	--	--	--	--
Pile Bents	60.4.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.4.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.4.3	Piles	N/A	N	--	--	--	--	--	--	--	--

Comments:

59.4- Vigas sobre ruta @ Caguas y carril reversible impactadas, "spallings" grandes y mucho acero expuesto en vigas "span" #2 (sobre carril reversible), otros "spallings"en vigas sobre carriles @ Caguas, fuertes impactos, "spallings" y acero expuesto.

60.2- Grieta mediana horizontal en "cap" de pilastra lado este.

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

61. CHANNEL AND PROTECTION **Condition:** N

61.1 Channel Scour: N/A

61.2 Embankment Erosion: N/A

		Type	Material	Condition Rating	Functioning
61.3	Protective Device		N/A	N	--
61.4	Fender System		N/A	N	--
61.5	Rip Rap		N/A	N	--
61.6	Spur Dikes, Jetties		N/A	N	--

61.7 Obstruction: N/A

61.8 Channel Change: N/A **Detrimental:** N/A

61.9 Adequate Waterway: N/A

61.10 Surrounding Area: Flooding: N/A if yes explain:

Erosion: N/A if yes explain:

61.11 Location of piers and/or abutment detrimental: N/A if yes explain:

61.12 Other features that may affect structure:

Comments:

62. CULVERT AND RETAINING WALL

	Material	Condition Rating	Functioning	Cracking	Spalling	Scaling	Corrosion	Settlement	Alignment	Scour
62.1 Barrel	N/A	N	--	--	--	--	--	--	--	--
62.2 Head Walls	N/A	N	--	--	--	--	--	--	--	--
62.3 Cut-off wall	N/A	N	--	--	--	--	--	--	--	--
62.4 Retaining wall	N/A	N	--	--	--	--	--	--	--	--

Comments:

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

71. WATER ADEQUACY: N/A N/A

72. APPROACH ROADWAY

72.1 Alignment: 6

72.2 Slab or Pavement **Condition:** N Material: Other

Cracking: No Spalling: None Scaling: None Uneven: No

Rough: No Settlement: No Movement: Approach slab-backwall: No Breaking up: No

Excessive deformation: No

Safety: Hazardous: No

Drainage: Inadequate: No

Movement: Pavement-approach slab: No

Embankment: **Condition:** N Functioning: Yes Erosion: No

Construction: Flimsy: No Integrity impaired: No

72.3 Undesirable Impact: No

72.4 Joints: No Type: None Inadequate: N/A Satisfactory Alignment: N/A

72.5 Guardrail Type: None Material: N/A Functioning: N/A

Condition: N Alignment Horizontal: N/A Vertical: N/A

Joints Functioning: N/A Safety Securely Attached: N/A Pedestrian Hazards: N/A

Comments:

90. INSPECTION DATE: Abril-15-2014

93. CRITICAL FEATURE INSPECTION DATE

Fracture Critical:

Underwater:

Other Special Inspection:

102. DIRECTION OF TRAFFIC: Highway traffic not carried

106. YEAR RECONSTRUCTED:

107. DECK STRUCTURE TYPE: Concrete Cast-in-Place

108. WEARING SURFACE/PROTECTIVE SYSTEM

Type wearing surface: Concrete

Type Membrane: None

Deck protection: None

111. PIER OR ABUTMENT PROTECTION (FOR NAVIGATION): N/A

113. SCOUR CRITICAL BRIDGES: N

116. MINUMUM NAVIGATION VERTICAL CLEARANCE:

AUXILIARY ITEMS

Signs: Type: Route Orientation Material: Alum. Condition: 6

Type: N/A

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

RATING *ITEM 58 TO 60:*

N: Not applicable

9: Excellent Condition

8: Very Good Condition: no problem noted.

7: Good Condition: some minor problems.

6: Satisfactory Condition: structural element show some minor deterioration.

5: Fair Condition: all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.

4: Poor condition: advanced section loss, deterioration, spalling, or scour.

3: Serious condition: loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.

2: Critical condition: advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.

1: "Imminent" failure condition: major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed

0: Failed condition: out of service: beyond corrective action.

RATING *ITEM 61:*

N: Not applicable. Use when bridge is not over a waterway (channel)

9: There are no noticeable noteworthy deficiencies which affect the condition of the channel

8: Banks are protected or well vegetated. River control devices such as spur dikes and embankment protection are not required or are in a stable condition.

7: Bank protection is in need of minor repairs. River control devices and embankment protection have a little minor damage. Banks and/or channel have minor amounts of drift.

6: Bank is beginning to slump. River control devices and embankment protection have widespread minor damage. There is minor stream bed movement evident. Debris is restricting the channel slightly.

5: Bank protection is being eroded. River control devices and/or embankment have major damage. Trees and brush restrict the channel.

4: Bank and embankment protection is severely undermined. River control devices have severe damage. Large deposits of debris are in the channel.

3: Bank protection has failed. River control devices have been destroyed. Stream bed aggradations, degradation, or lateral movement has changed the channel to now threaten the bridge and/or approach roadway.

2: The channel has changed to the extent the bridge is near a state of collapse.

1: Bridge closed because of channel failure. Corrective action may put back in light service.

0: Bridge closed because of channel failure. Replacement necessary.

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

RATING ITEM 62:

N: Not applicable. Use if structure is not a culvert.

9: No deficiencies.

8: No noticeable or noteworthy deficiencies which affect the condition of the culvert. Insignificant scrape marks caused by drift.

7: Shrinkage cracks, light scaling, and insignificant spalling which does not expose reinforcing steel. Insignificant damage caused by drift with no misalignment and not requiring corrective action. Some minor scouring has occurred near curtain walls, wingwalls, or pipes. Metal culverts have a smooth symmetrical curvature with superficial corrosion and no pitting.

6: Deterioration or initial disintegration, minor chloride contamination, cracking with some leaching, or spalls on concrete or masonry walls and slabs. Local minor scouring at curtain walls, wingwalls, or pipes. Metal culverts have a smooth curvature, non-symmetrical shape, significant corrosion, or moderate pitting.

5: Moderate to major deterioration or disintegration, extensive cracking and leaching, or spalls on concrete or masonry walls and slabs. Minor settlement or misalignment. Noticeable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have significant distortion and deflection in one section, significant corrosion, or deep pitting.

4: Large spalls, heavy scaling, wide cracks, considerable efflorescence, or opened construction joint permitting loss of backfill. Considerable settlement or misalignment. Considerable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have significant distortion and deflection throughout, extensive corrosion or deep pitting.

3: Any condition described in Code 4 but which is excessive in scope. Severe movement or differential settlement of the segments, or loss of fill. Holes may exist in walls or slabs. Integral wingwalls nearly severed from culvert. Severe scour or erosion at curtain walls, wingwalls, or pipes. Metal culverts have extreme distortion and deflection in one section, extensive corrosion, or deep pitting with scattered perforations.

2: Integral wingwalls collapsed severe settlement of roadway due to loss of fill. Section of culvert may have failed and can no longer support embankment. Complete undermining at curtain walls and pipes. Corrective action required to maintain traffic. Metal culverts have extreme distortion and deflection throughout with extensive perforations due to corrosion.

1: Bridge closed. Corrective action may put back in light service.

0: Bridge closed. Replacement necessary.

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

RATING ITEM 113:

N: Bridge not over waterway.

U: Bridge with "unknown" foundation that has not been evaluated for scour. Until risk can be determined, a plan of action should be developed and implemented to reduce the risk to users from a bridge failure during and immediately after a flood event (see HEC 23).

T: Bridge over "tidal" waters that has not been evaluated for scour, but considered low risk. Bridge will be monitored with regular inspection cycle and with appropriate underwater inspections until an evaluation is performed ("Unknown" foundations in "tidal" waters should be coded U.)

9: Bridge foundations (including piles) on dry land well above flood water elevations.

8: Bridge foundations determined to be stable for assessed or calculated scour conditions. Scour is determined to be above top of footing. (Example A) by assessment i.e., bridge foundation are on rock formations that have been determined to resist scour within the service life of the bridge), by calculation or by installation of properly designed countermeasures (see HEC 23).

7: Countermeasures have been installed to mitigate an existing problem with scour and to reduce the risk of bridge failure during a flood event. Instructions contained in a plan of action have been implemented to reduce the risk to users from a bridge failure during or immediately after a food event.

6: Scour calculation/evaluation has not been made. (Use only to describe case where bridge has not yet been evaluated for scour potential.)

5: Bridge foundations determined to be stable for assessed or calculated scour conditions. Scour is determined to be within the limits of footing or piles (Exam. B) By assessment i.e., bridge foundations are on rock formations that have been determined to resist scour within the service life of the bridge), by calculations or by installation of properly designed countermeasures (see HEC 23).

4: Bridge foundations determined to be stable for assessed or calculated scour conditions; field review indicates action is required to protect exposed foundation (see HEC 23).

3: Bridge is scour critical; bridge foundations determined to be unstable for assessed or calculated scour conditions: Scour within limits of footing or piles. (Example B) or Scour below spread-footing base or piles tips. (Example C)

2: Bridge is scour critical; field review indicates that extensive scour has occurred at bridge foundations, which are determined to be unstable by: (a comparison of calculated scour and observed scour during the bridge inspection) or (an engineering evaluation of the observed scour condition reported by the bridge inspector in Item 60)

1: Bridge is scour critical; field review indicates that failure of piers/abutments is imminent. Bridge is closed to traffic. Failure is imminent based on: (a comparison of calculated scour and observed scour during the bridge inspection) or (an engineering evaluation of the observed scour condition reported by the bridge inspector in Item 60).

0: Bridge is scour critical. Bridge has failed and is closed to traffic.

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

Core Elements

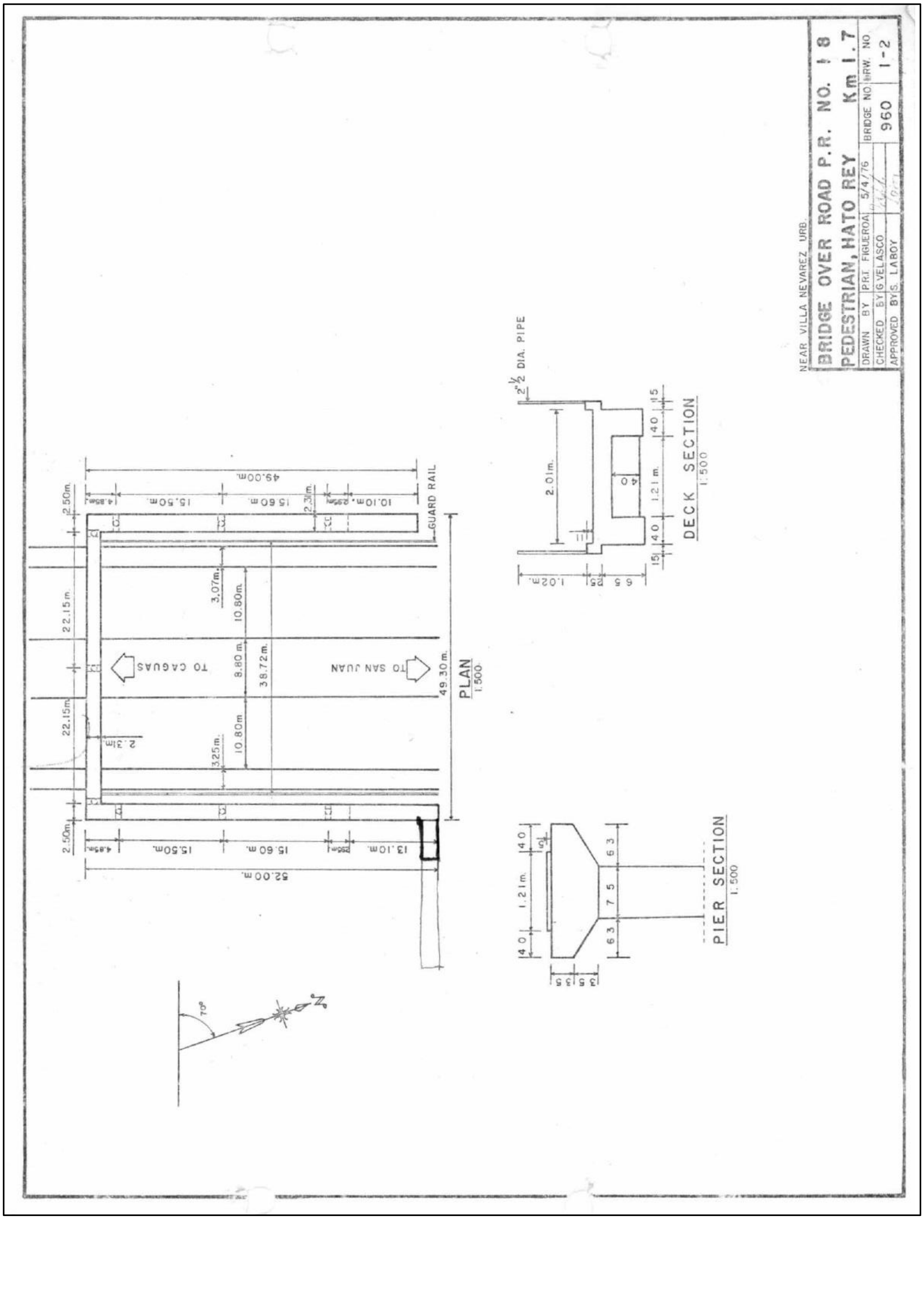
Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0

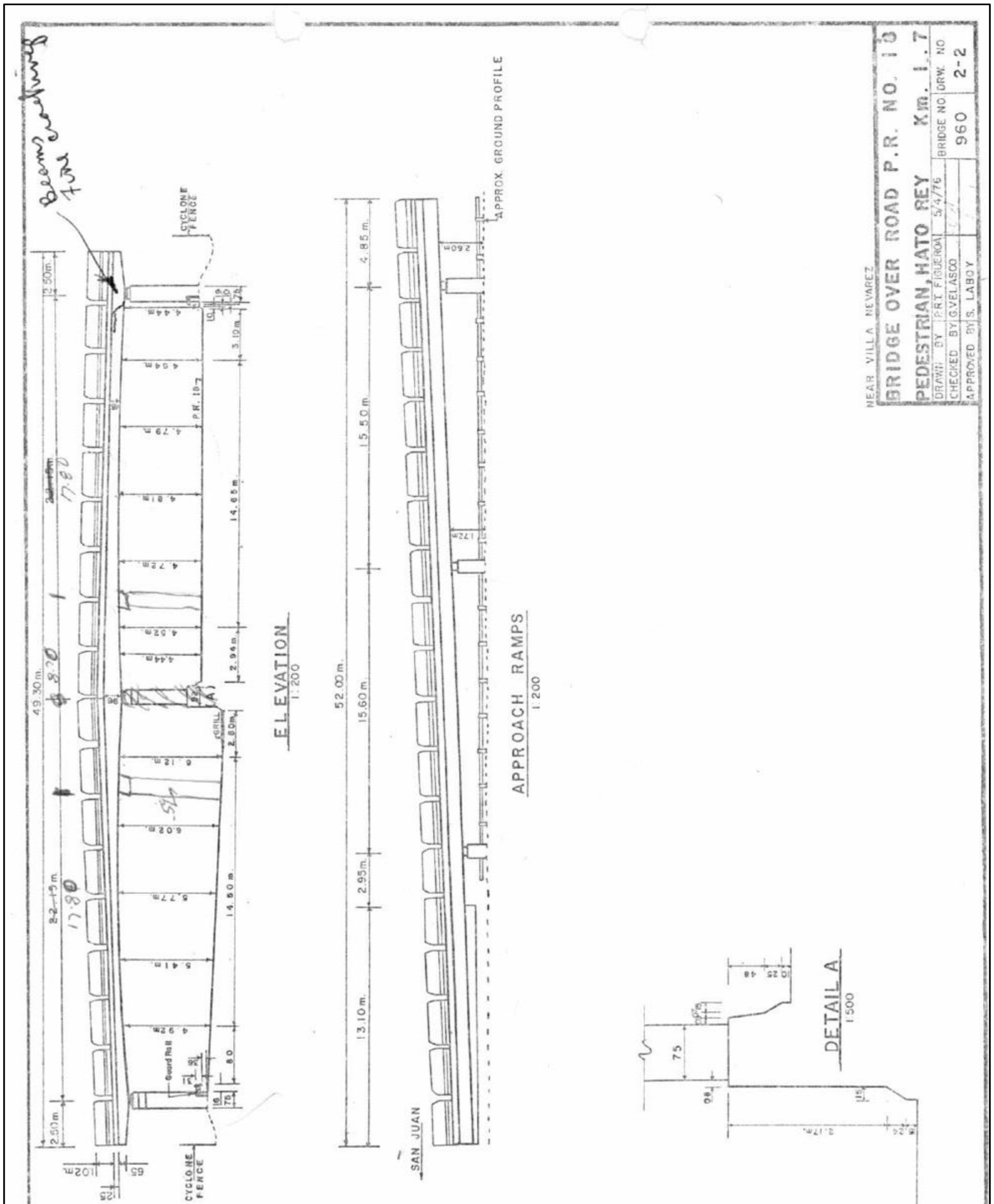
Non Core Elements

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0

Smart Flags

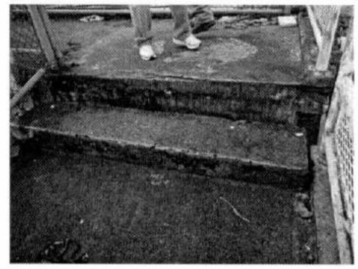
Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0


NEAR VILLA NEVAREZ URB.
BRIDGE OVER ROAD P.R. NO. 18
PEDESTRIAN, HATO REY Km 1.7
DRAWN BY P.R.T. FIGUEROA 5/4/76
CHECKED BY G VELASCO
APPROVED BY S. LABOY
BRIDGE NO. 960
DRW. NO 1-2
PLAN
1:500
TO CAGUAS
TO SAN JUAN
GUARD RAIL
49.00m.
52.00m.
49.30m.
38.72m.
DECK SECTION
1:500
2½ DIA. PIPE
PIER SECTION
1:500


NEAR VILLA NEVAREZ
BRIDGE OVER ROAD P.R. NO. 18
PEDESTRIAN, HATO REY
Km. 1.7
DRAWN BY P.R.T. FIGUEROA 5/4/76
CHECKED BY G. VELASCO
APPROVED BY S. LABOY
BRIDGE NO 960
DRW. NO 2-2
ELEVATION
1:200
APPROACH RAMPS
1:200
DETAIL A
1:500
APPROX. GROUND PROFILE
CYCLONE FENCE
SAN JUAN
52.00 m.
49.30 m.

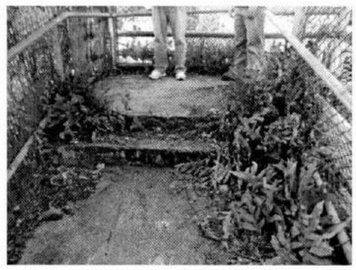
0960-Apr.-15-2014-001.jpg

0960-Apr.-15-2014-002.jpg

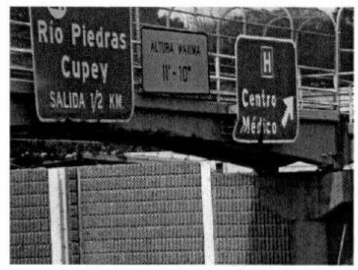


0960-Apr.-15-2014-003.jpg

0960-Apr.-15-2014-008.jpg



0960-Apr.-15-2014-010.jpg



0960-Apr.-15-2014-012.jpg

0960-Apr.-15-2014-015.jpg

0960-Apr.-15-2014-017.jpg

0960-Apr.-15-2014-018.jpg

C.2 August 12, 2002

YourState Department of Transportation

Bureau of Bridges and Structures
Bridge Maintenance

Bridge Inspection Report

Bridge Key: 009601 Agency ID: 009601 Sufficiency Rating: -1.0

IDENTIFICATION

State 1: 72 Puerto Rico
Struc Num 8: 009601
Facility Carried 7: PR 18
Location 9: 0.5 KM N INT PR21 & PR18
Rte.(On/Under)5A: One Route Under
Rte. Signing Prefix 5B: 2 U.S. Numbered
Level of Service 5C: 1 Mainline
Rte. Number 5D: 10000
Directional Suffix 5E: 1 North
% Responsibility : NA
SHD District 2: SAN JUAN
County Code 3: San Juan
Place Code 4: 76770
Kilometer Post 11: 01,7 km
Feature Intersected 6: PEDESTRIAN WALKWAY
Latitude 16: 18d 23' 24"
Longitude 17: 066d 04' 36"
Border Bridge Code 98: Unknown (P)
Border Bridge Number 99: NA

INSPECTION

Frequency 91: 24 months Inspection Date 90: 8/12/2002 Next Inspection: 08/12/2004
FC Frequency 92A: NA FC Inspection Date 93A: NA Next FC Inspection: NA
UW Frequency 92B: NA UW Inspection Date 93B: NA Next UW Inspection: NA
SI Frequency 92C: NA SI Date 93C: NA Next SI: NA
Element Frequency: 24 months Element Inspection Date: 08/12/2002 Next Elem. Insp. Due: 08/12/2004

CLASSIFICATION

Defense Highway 100: 2 Over/under STRAHNET
Parallel Structure 101: No || bridge exists
Direction of Traffic 102: 0 Not hwy traffic
Temporary Structure 103: Unknown (NBI)
Highway System 104: 0 Not on NHS
NBIS Length 112: Long Enough
Toll Facility 20: 3 On free road
Functional Class 26: 12 Urban Fwy/Expwy
Historical Significance 37: 5 Not eligible for NRHP
Owner 22: 0101 State Highway Agency
Custodian 21: 01 01 State Highway Agency

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 2
Main Span Material/Design 43A/B:
2 Concrete Continuous 04

Deck Type 107: 1 Concrete-Cast-in-Place
Wearing Surface 108A: 1 Monolithic Concrete
Membrane 108B: 0 None
Deck Protection 108C: None

CONDITION

Deck 58: 6 Satisfactory Super 59: 5 Fair Sub 60: 6 Satisfactory
Culvert 62: N N/A (NBI) Channel/Channel Protection 61: N N/A (NBI)

LOAD RATING AND POSTING

Inventory Rating Method 65: 2 AS Allowable Stress Operating Rating Method 63:2 AS Allowable Stress
Inventory Rating 66: MS44.4 Operating Rating 64: MS44.4
Design Load 31: 7 Pedestrian Posting 70: 5 At/Above Legal Loads
Posting status 41: A Open, no restriction

AGE AND SERVICE

Year Built 27: 1967 Year Reconstructed 106: Unknown
Type of Service on 42A: 3 Pedestrian-bicyle
Type of Service under 42B: 1 Highway
Lanes on 28A: Unknown Lanes Under 28B: 9 Detour Length 19: 00 km
ADT 29: 178,900 Truck ADT 109: 4 % Year of ADT 30: 2000

APPRAISAL

Bridge Rail 36A: N N/A or not required
Approach Rail 36C: N N/A or not required
Transition 36B: N N/A or not required
Approach Rail Ends 36D: N N/A or not required
Str. Evaluation 67: Unknown (NBI)
Deck Geometry 68: Unknown (NBI)
Underclearance, Vertical and Horizontal 69: Unknown (NBI)
Waterway Adequacy 71: N Not applicable
Approach Alignment 72: 6 Equal Min Criteria
Scour Critical 113: N Not Over Waterway

GEOMETRIC DATA

Length Max Span 48: 22.20 m Structure Length 49: 49.30 m
Curb/Sdwlk Wdth L 50A: 0.00 m Curb/Sidewalk Width R 50B: 0.00 m
Width Curb to Curb 51: 2.10 m Width Out to Out 52: 2.30 m
Approach Roadway Width 32: (w/ shoulders) 44.30 m Median 33: 0 No median
Deck Area:
Skew 34: 0.00 ° Structure Flared 35: 0 No flare
Minimum Vertical Clearance Over Bridge 53: 99.99 m
Minimum Vertical Underclearance Reference 54A: H Hwy beneath struct
Minimum Vertical Underclearance 54B: 04.44 m
Minimum Lateral Underclearance Reference R 55A: H Hwy beneath struct
Minimum Lateral Undrclearance R 55: 03.30 m
Minimum Lateral Undrclearance L 56: 02.60 m

PROPOSED IMPROVEMENTS

Bridge Cost 94: $ 0
Roadway Cost 95: $ 0
Total Cost 96: $ 12,000
Year of Cost Estimate 97: 2000
Type of Work 75: 35 Rehabilitate-gen.
Length of Improvment 76: 49.30 m
Future ADT 114: 216,469
Year of Future ADT 115: 2020

NAVIGATION DATA

Navigation Control 38: N NA-no waterway
Vertical Clearance 39: 0.00 m Horizontal Clearance 40: 0.00 m
Pier Protection 111: Unknown (NBI) Lift Bridge Vertical Clearance 116:

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	12/3	Bare Concrete Deck	sq.m.	1,539	0 %	0	100 %	1,539	0 %	0	0 %	0	0 %	0
2	110/3	R/Conc Open Girder	m.	99	91 %	90	9 %	9	0 %	0	0 %	0	0 %	0
2	210/3	R/Conc Pier Wall	m.	18	100 %	18	0 %	0	0 %	0	0 %	0	0 %	0
2	234/3	R/Conc Cap	m.	26	100 %	26	0 %	0	0 %	0	0 %	0	0 %	0
2	358/3	Deck Cracking SmFlag	ea.	1	100 %	1	0 %	0	0 %	0	0 %	0	0 %	0

INSP002_Inspect_Report_Metric Agency ID: 009601 Mon 10/7/2002 11:16:15
Page 1 of 3

Bridge Inspection Report

Str Unit	Elem/Env	Description	Element Notes
2	12/3	Concrete Deck - Bare	
2	110/3	Reinforced Conc Open Girder/Bea	
2	210/3	Reinforced Conc Pier Wall	
2	234/3	Reinforced Conc Cap	
2	358/3	Deck Cracking	

BRIDGE NOTES

CULVERT

PAST INSPECTION

Inspection Date: 08/12/2002 Type: 1 Regular NBI

Inspector: Pontis Pontis User Key: Pontis - Pontis Poı

Scope:
NBI: ☑ Other: ☐ Element: ☑
Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

PONTIS inspection comments -
Structure 009601 -
Date 2002-08-12 -
Previous comments > < none >

PAST INSPECTION

Inspection Date: 02/01/2000 Type: 1 Regular NBI

Inspector: -1 Pontis User Key: Pontis - Pontis Poı

Scope:
NBI: ☑ Other: ☐ Element: ☐
Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

INSPECTOR WORK CANDIDATES

C.3 February 9, 2000

PAGE 1 OF 7

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

ENGINEER: HERIBERTO GONZALEZ
ASISTANTS: LUIS QUINONEZ
: ALFREDO ERAZO
: RAMON RODRIGUEZ
: JAIME RIVAS
:
EVALUATION DATE: 09-FEB-2000

BRIDGE No.: 00960 FEDERAL SYSTEM

ROAD No.: PR 18 KM. No. : 0001.700

EQUIPMENT
BUS X LADDERS
BOAT CAMERA X
UNDERWATER SNOOPER #
SNOOPER OPERATOR
PLAQUE ID
YES NO No.
FILM No.

===========IDENTIFICATION===========

1- STATE :	Commonwealth of Puerto Rico		721
2- HIGHWAY AGENCY DISTRICT :	SAN JUAN		01
3- COUNTY (PARISH) CODE :	SAN JUAN		127
4- PLACE CODE :	SAN JUAN URBAN ZONE		76770
5- INVENTORY ROUTE :	2-1-1-00001-0		221100001
6- FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY	
7- FACILITY CARRIED BY STRUCTURE :	P.R. - 18	PR 18	
8- STRUCTURE NUMBER :	BRIDGE 960 1 OF 1		009601
9- LOCATION :	0.5 KM N INT PR21 & PR18	0.5 KM N INT PR21 & PR18	
10- INVENTORY ROUTE, MINIMUM VERTICAL CLEARANCE :	4.44 MT (14' - 7")		0444
11- KILOMETERPOINT :	1.70		0001700
12- BASE HIGHWAY NETWORK :			1
13- LRS INVENTORY ROUTE, SUBROUTE NUMBER :			000000001800
16- LATITUDE :	18 DEGREES 23.4 MINUTES		18232400
17- LONGITUDE :	66 DEGREES 04.6 MINUTES		066043600
19- BYPASS, DETOUR LENGTH (NEAREST KILOMETER) :	STRUCTURE OVER HIGHWAY		000

===========CLASSIFICATION===========

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	INTERSTATE	12

===========AGE AND SERVICE===========

27- YEAR BUILT :	1967	1967
28- LANES ON AND UNDER STRUCTURE :	0 LANES ON / 9 LANES UNDER	0009
29- A.D.T. OF INVENTORY ROUTE :	169,700	169700
30- YEAR OF A.D.T. :	1998	1998

==========STRUCTURE DATA============

31- DESIGN LOAD :	PEDESTRIAN	7
32- APPROACH ROADWAY WIDTH :	44.30 MT (145.30 FT)	0443
33- BRIDGE MEDIAN :	NONE	0
34- SKEW ANGLE :	NO	00
35- STRUCTURE FLARED :	NO	0
36- TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
37- HISTORICAL SIGNIFICANCE :	5	5
38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	N/A	0000
40- NAVIGATION HORIZONTAL CLEARANCE :	N/A	00000
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
42- TYPE OF SERVICE :	PEDESTRIAN OVER HIGHWAY	31
43- STRUCTURE TYPE, MAIN :	CONCRETE CONTINUOS TEE BEAMS	204
44- STRUCTURE TYPE APPR. :	NONE	000
45- NUMBER OF SPAN IN MAIN UNIT :	2	002
46- NUMBER OF APPROACH SPAN :	NONE	0000

AL SYSTEM

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

DGE No.: 00960

47- INV. ROUTE, TOTAL HORIZ. CLEARANCE : ....17.80mt ~~20.84~~ MT	(68.36 FT)	178 ~~208~~ fa
48- LENGTH OF MAXIMUM SPAN : .... 22.15 MT	(72.65 FT)	00222
49- STRUCTURE LENGTH : .... 49.30 MT	(161.70 FT)	000493
50- CURB OR SIDEWALK WIDTHS : .... N/A		000000

===========STRUCTURE DATA===========

51- BRIDGE ROADWAY WIDTH, CURB TO CURB : .... 2.10 MT	(6.59 FT)	0021
52- DECK WIDTH, OUT TO OUT : .... 2.31 MT	(7.58 FT)	0023
53- MI. VERT. CLEAR. OVER BRIDGE ROADWAY : .... UNLIMITED		9999
54- MINIMUM VERTICAL UNDERCLEARANCE : .... 4.44 MT	(14' - 7")	H0444
55- MINIMUM LATERAL UNDERCLEARANCE ON RIGHT : .... 3.25 MT	(10.8 FT)	H033
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT : .... 2.55 MT	(8.36 FT)	026

==============CONDITION==============

58- DECK: FAIR CONDITION RATING: 6

58.1 WEARING SURFACE: MATERIAL: CONCRETE CONDITION : 5
THICKNESS:
DETERIORATION: X YES NO DRAINAGE: X ADEQUATE INADEQUATE
PONDING: YES X NO SAFETY: X YES NO

58.2 SLAB OR PLATE: MATERIAL: CONCRETE CONDITION 6
X CRACKING: X FINE MEDIUM OPEN
TOP BOTTOM
SPALLING: X | S < 1 in. DEEP x 6 in. & L > 1 in. x 6 in. &
SCALING : X | L to ¼ in., M ¼ in. - ½ in., H ½ in. - 1 in., S > 1

XEFFLORESCENCE EXUDATION RUST STAINS CORROSION: LIGHT MODERATE SEVERE

58.3 MOVEMENT: DECK TO BACKWALL cm. DECK TO APPROACH SLAB cm.

DECK COMMENTS:
DECK SURFACE HAS PLASTER DETACHMENT, SCALING AND FINE TO MEDIUM TRANSVERSAL CRACKS. THERE ARE 4 PERFORATIONS (20 CMS. DIAM.),TWO OVER EACH NEW PIER THAT NEED TO BE SEALED TO PREVENT AN ACCIDENT. HANDICAP RAMP LOWER THAN DECK SURFACE MAKING IMPOSSIBLE ACCESS ON WHEELCHAIR. NORTH-EAST RAMP DISPLACED 10 CMS., ALSO RAILING INCLINED TOWARD DECK.

	(58.4) CURBS	(58.5) MEDIAN	(58.6) SIDEWALKS	(58.7) PARAPETS	(58.8) RAILING
MATERIAL					G/STEEL
CONDITION RATING	---	---	---	---	4
HEIGHT LOSS (cm)					
JOINTS	---	---	---	---	---
DRAINAGE					OK
ALIGNMENT	---	---	---	---	PO
CORROSION (L-M-S)					
PAINT: G-GOOD, F-FAIR, P-POOR, N-NONE U-USELESS TO PAINT	---	---	---	---	N
SAFETY	---	---	---	---	NO
CRACKING (F-M-O)					
SPALLING (S-L)	---	---	---	---	---
SCALING (L-M-H-S)					

58.9 LIGHTING STANDARDS: MATERIAL: CONDITION: FUNCTIONING: YES NO
58.10 UTILITIES: TYPE: SIZE: SAFETY:
58.11 JOINTS: EXPANSION CONSTRUCTION CONDITION: FUNCTIONING: YES NO
LEAKING: YES NO CRACKING: FINE MEDIUM OPEN SPALLING: SMALL LARGE
58.12 DRAINS AND SCUPPERS: MATERIAL: CONDITION: FUNCTIONING: YES NO

59- SUPERSTRUCTURE: FAIR CONDITION RATING: 5

59.1 BEARING DEVICES: TYPE: 6 FIXED MOVABLE OUT OF PLUMB
PAINT: GOOD FAIR POOR NONE USELESS TO PAINT
CONDITION: FUNCTIONING: YES NO

59.2 BRIDGE SEATS,PEDESTAL,GROUT PADS,ABUTMENTS OR PIER SEATS WHERE BEAMS BEAR DIRECTLY ON CONCRETE
CONDITION: 6 CRACKING: X F M O SPALLING: X S L
SCALING: L M H S CRUSHING:

59.3 STEEL-BEAMS: TYPE: DIMENSIONS(height;width;thickness):
CONDITION: CORROSION: L M S PAINT: G F P N U

59.4 CONCRETE-BOX BEAMS, I-BEAMS, SLAB, T-BEAM, TYPE: T-BEAM
CONDITION: 5 CRACKING: X F M O SPALLING: S X L
SCALING: L M H S

59.5 TRUSSES: TYPE: CONDITION: CORROSION: L M S
DAMAGE: DEFORMATION: PAINT: G F P N U
A=TRUSS B=UPPER & LOWER LATERAL BRACING C=PORTALS D=FLOOR BEAMS E*=STRINGERS

59.6 DRAINAGE: TYPE: CONDITION: FUNCTIONING: YES NO

59.7 HINGES: CONDITION: FUNCTIONING: YES NO MOVEMENT: YES NO
ALIGNMENT: GOOD BAD PAINT: G F P N U

59.8 DEFLECTIONS: X NORMAL EXCESSIVE cms.

59.9 VIBRATIONS: X MINIMAL MODERATE EXCESSIVE

SUPERSTRUCTURE COMMENTS:
BEAMS TOWARD CAGUAS LANES WITH BIG DETACHMENTS OF CONCRETE DUE TO TRUCK IMPACT.

60- SUBSTRUCTURE: SATISFACTORY RATING: 6

	ABUTMENTS				PIERS OR NON PILES BENTS					PILES BENTS		
	60.1.1 WINGWALL	60.1.2 BREAST & BACKWALL	60.1.3 FOOTING	60.1.4 PILES	60.2.1 CAPS	60.2.2 BRACING	60.2.3 COLUMNS	60.2.4 FOOTINGS	60.2.5 PILES	60.4.1 CAPS	60.4.2 BRACING	60.4.3 PILES
MATERIAL					CONCRETE		CONCRETE					
CONDITION RATING					5		6					
CRACKING (F-M-O)					F		F					
SPALLING (S-L)					S		S					
SCALING (L-M-H-S)					L		L					
CORROSION (L-M-S)												
PAINT (G-F-P-N-U)					N		N					
MOVEMENT					NO		NO					
EROSION					NO		NO					
UNDERMINING					NO		NO					

60- SUBSTRUCTURE COMMENTS:
EAST PIER CAP HAS MEDIUM HORIZONTAL CRACK.

61- CHANNEL & CHANNEL PROTECTION : N/A RATING : N CHANNEL COMMENTS:

61.1 CHANNEL SCOUR(EXTENT) :

61.2 EMBANKMENT EROSION(EXTENT) :

	TYPE	MATERIAL	CONDITION RATING	FUNCTIONING	
				YES	NO
61.3 PROTECTIVE DEVICE					
61.4 FENDER SYSTEM					
61.5 RIP RAP					
61.6 SPUR DIKES, JETTIES					

61.7 OBSTRUCTION (DEBRIS, GROWTHS):

61.8 CHANNEL CHANGE: YES NO

DETRIMENTAL: YES NO IF YES, EXPLAIN

61.9 ADEQUATE WATERWAY: YES NO IF NO, EXPLAIN

61.10 SURROUNDING AREA: FLOODING: YES NO IF YES, EXPLAIN

EROSION: YES NO IF YES, EXPLAIN

61.11 LOCATION OF PIERS AND/OR ABUTMENTS: DETRIMENTAL: YES NO

IF YES, EXPLAIN

61.12 OTHER FEATURES THAT MAY AFFECT STRUCTURE:

62- CULVERT AND RETAINING WALLS :N/A RATING :N CULVERT COMMENTS:

	62.1BARREL	62.2HEADWALL	62.3CUT-OFFWALL	62.4RETAINING WALL
MATERIAL				
CONDITION RATING				
FUNCTIONING(Y-N)				
CRACKING(F-M-O)				
SPALLING (S-L)				
SCALING(L-M-H-S)				
CORROSION(L-M-S)				
SETTLEMENT(Y-N)				
ALIGNMENT(Y-N)				
PAINT(G-F-P-N-U)				

63- METHOD USED TO DETERMINE OPERATING RATING .. 2

64- OPERATING RATING : .... PEDESTRIAN 800

65- METHOD USED TO DETERMINE INVENTORY RATING .. 2

66- INVENTORY RATING : .... PEDESTRIAN 800

7- STRUCTURAL EVALUATION : 5

WEARING SURFACE HAS DETACHMENT OF CONCRETE PLASTER. THERE ARE 4 PERFORATION 20 CMS. DIAM. ON DECK THAT NEED TO BE SEALED. ACCESS RAMP LOWER THAN DECK SURFACE. RAMP RAILING BROKEN FROM BASE AND INCLINED TOWARD DECK.

68- DECK GEOMETRY : .... N/A

N/A.

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : .... 4 N

MEETS MINIMUM TOLERABLE LIMITS TO BE LEFT IN PLACE AS IS.

70- BRIDGE POSTING : .... N/A. 5

71- WATERWAY ADEQUACY : .... N

N/A.

REMOTE - GREATER THAN 100 YEARS. SLIGHT - 11 TO 100 YEARS. OCASSIONAL - 3 TO 10 YEARS. FREQUENT - LESS THAN 3 YEARS.
INSIGNIFICANT - MINOR INCONVENIENCE. HIGHWAY PASSABLE IN A MATTER OF HOURS. SIGNIFICANT - TRAFFIC DELAYS OF UP TO SEVERAL DAYS
SEVERE - LONG TERM DELAYS TO TRAFFIC WITH RESULTING HARDSHIP

72- APPROACH ROADWAY ALIGNMENT :.. 6

N/A.

72.2 SLAB OR PAVEMENT CONDITION : 6 MATERIAL : RAMPS
CRACKING: F N O SPALLING: L S SCALING: L M X H S UNNEVEN: YES NO ROUGH: YES NO
SETTLEMENT: YES NO MOVEMENT: APPROACH SLAB-BACKWALL: YES NO BREAKING UP: EXCESSIVE DEFORMATION:
SAFETY: HAZARDOUS YES NO DRAINAGE: INADEQUATE: YES NO PONDING: YES NO
MOVEMENT: PAVEMENT-APPROACH SLAB: YES NO EMBANKMENT: CONDITION:
FUNCTIONING: YES NO EROSION: YES NO IF YES, EXPLAIN
CONSTRUCTION: FLIMSY: YES NO
INTEGRITY IMPAIRED: YES NO IF YES, EXPLAIN
72.3 UNDESIRABLE IMPACT: YES NO
72.4 JOINTS: TYPE: INADEQUATE: YES NO SATISFACTORY ALIGNMENT: YES NO
MATERIAL: CONDITION: FUNCTIONING: YES NO
72.5 GUARDRAIL: TYPE:
ALIGNMENT: HORIZONTAL: GOOD BAD VERTICAL: GOOD BAD JOINTS: FUNCTIONING: YES NO
SAFETY: SECURELY ATTACHED: YES NO PEDESTRIAN HAZARDS: YES NO

72- APPROACH ROADWAY - COMMENTS:

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

=======PROPOSED IMPROVEMENT=======

75- TYPE OF WORK : .... REHABILITATION 352
76- LENGTH OF STRUCTURE IMPROVEMENT : .... 49.30 MT (161.70 FT) 000493

============INSPECTIONS============

89- RESERVED .... --
90- INSPECTION DATE : FEBRUARY-09-2000 0200
91- DESIGNATED INSPECTION FRECUENCY : .... 24 MONTHS 24
92- CRITICAL FEATURE INSPECTION : .... N/A. N N N
93- CRITICAL FEAT. INSPECT. DATE: .... N/A
FRACTURE CRITICAL UNDERWATER OTHER

==========IMPROVEMENT COST==========

000000 000000 ~~000000~~
94- BRIDGE IMPROVEMENT COST : .... N/A
95- ROADWAY IMPROVEMENT COST : .... N/A 000012
96- TOTAL PROJECT COST : .... (49.30X2.31X$1035X10%)=$11,787 2000
97- YEAR OF IMPROVEMENT COST ESTIMATED : 2000

==CLASSIFICATION AND STRUCTURE DATA==

--
98- BORDER BRIDGE : .... --
99- BORDER BRIDGE STRUCTURE NUMBER : x82
100- STRAHNET HIGHWAY DESIGNATION : .... DEFENSE HIGHWAY N
101- PARALLEL STRUCTURE DESIGNATION : .... NO PARALLEL STRUCTURE 0
102- DIRECTION OF TRAFFIC : .... TRAFFIC NOT CARRIED
103- TEMPORARY STRUCTURE DESIGNATION : .... N/A 0
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE : .... N.H.S. 0
105- FEDERAL LANDS HIGHWAYS : 0000
106- YEAR RECONSTRUCTION : .... NO RECONSTRUCTION 1
107- DECK STRUCTURE TYPE : .... CONCRETE CAST IN PLACE 100
108- WEARING SURF./ PROTECT. SYSTEM : .... CONCRETE NONE NONE 04
109- AVERAGE DAILY TRUCK TRAFFIC : .... 4 % 0
110- DESIGNATED NATIONAL NETWORK : .... NOT PART OF NETWORK
111- PIER OR ABUT. PROTECTION (NAVIGATION) : .... N/A Y
112- NBIS BRIDGE LENGTH : .... YES N
113- SCOUR CRITICAL BRIDGE : .... BRIDGE OVER HIGHWAY 239277
114- FUTURE AVERAGE DAILY TRAFFIC : 239,277 2018
115- YR. OF FUTURE A.D.T. : 2018
116- MINIM. NAVIG. VERT. CLEARANCE : .... N/A
VERTICAL LIFT BRIDGE : ....
117- SUFFICIENCY RATING : ....
125- PRIORITY RATING: 09-FEB-2000 020900
127- EVALUATION DATE : ....
130- CRITICAL FRACTURE INSP. DATE : ....

ENGINEER :HERIBERTO GONZALEZ

SYSTEM

DGE NO. :00960

AUXILIARY ITEMS
1-SIGNS
TYPE:
MATERIAL:
CONDITION:

REMARKS:

THE REHABILITATION CONSIST IN REPAIR ALL DEFICIENCIES DESCRIBED ON THE ITEM #67.

C.4 March 20, 1998

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

PAGE 1 OF 7

ENGINEER: HERIBERTO GONZALEZ
ASSISTANTS: LUIS QUINONEZ
: ALFREDO ERAZO
:
:
:
EVALUATION DATE: MAR-20-1998

BRIDGE No.: 00960 FEDERAL SYSTEM

ROAD No.: PR 18 KM. No. : 0001.700

EQUIPMENT
BUS X LADDERS
BOAT CAMERA X
UNDERWATER SNOOPER #
SNOOPER OPERATOR
PLAQUE ID
YES NO No.
FILM No.

============IDENTIFICATION===========

1- STATE :	Commonwealth of Puerto Rico	721
2- HIGHWAY AGENCY DISTRICT :	SAN JUAN	01
3- COUNTY (PARISH) CODE :	SAN JUAN	127
4- PLACE CODE :	SAN JUAN URBAN ZONE	76770
5- INVENTORY ROUTE :	2-1-1-00001-0	211000010
6- FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY
7- FACILITY CARRIED BY STRUCTURE :	P.R. - 18	PR 18
8- STRUCTURE NUMBER :	BRIDGE 960 1 OF 1	009601
9- LOCATION :	0.5 KM N INT PR21 & PR18	0.5 KM N INT PR21 & PR18
10- INVENTORY ROUTE, MINIMUM VERTICAL CLEARANCE :	4.44 MT (14' - 7")	0444
11- KILOMETERPOINT :	1.70	0001700
12- BASE HIGHWAY NETWORK :		1
13- LRS INVENTORY ROUTE, SUBROUTE NUMBER :		000000001800
16- LATITUDE :	18 DEGREES 23.4 MINUTES	18232400
17- LONGITUDE :	66 DEGREES 04.6 MINUTES	066043600
19- BYPASS, DETOUR LENGTH (NEAREST KILOMETER) :	STRUCTURE OVER HIGHWAY	000

============CLASSIFICATION===========

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	INTERSTATE	11

============AGE AND SERVICE==========

27- YEAR BUILT :	1967	1967
28- LANES ON AND UNDER STRUCTURE :	0 LANES ON / ~~8~~ 18 LANES UNDER	~~0008~~ 0018
29- A.D.T. OF INVENTORY ROUTE :	169,700	169700
30- YEAR OF A.D.T. :	1996	1996

==========STRUCTURE DATA=============

31- DESIGN LOAD :	PEDESTRIAN	7
32- APPROACH ROADWAY WIDTH :	44.30 MT (145.30 FT)	044 ~~4~~ 3 Ja
33- BRIDGE MEDIAN :	NONE	0
34- SKEW ANGLE :	NO	00
35- STRUCTURE FLARED :	NO	0
36- TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
37- HISTORICAL SIGNIFICANCE :	5	5
38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	N/A	0000
40- NAVIGATION HORIZONTAL CLEARANCE :	N/A	00000
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
42- TYPE OF SERVICE :	PEDESTRIAN OVER HIGHWAY	31
43- STRUCTURE TYPE, MAIN :	CONCRETE CONTINUOS TEE BEAMS	204
44- STRUCTURE TYPE APPR. :	NONE	000
45- NUMBER OF SPAN IN MAIN UNIT :	~~2~~ 3	~~002~~ 003
46- NUMBER OF APPROACH SPAN :	NONE	0000

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

BRIDGE No.: 00960

47- INV. ROUTE, TOTAL HORIZ. CLEARANCE : .... 20.84 MT (68.36 FT) 208
48- LENGTH OF MAXIMUM SPAN : .... ~~22.15 MT~~ 1180 (72.65 FT) 0022 12
49- STRUCTURE LENGTH : .... 49.30 MT (161.70 FT) 00049 13
50- CURB OR SIDEWALK WIDTHS : .... N/A 000000

============STRUCTURE DATA============

51- BRIDGE ROADWAY WIDTH, CURB TO CURB :.................................. 2.10 MT (6.59 FT) 0021
52- DECK WIDTH, OUT TO OUT : ....2.31 MT (7.58 FT) 0023
53- MI. VERT. CLEAR. OVER BRIDGE ROADWAY : .... UNLIMITED 9999
54- MINIMUM VERTICAL UNDERCLEARANCE : .... 4.44 MT (14' - 7") H0444
55- MINIMUM LATERAL UNDERCLEARANCE ON RIGHT : .... 3.25 MT (10.8 FT) H033
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT : .... 2.55 MT (8.36 FT) 026

===============CONDITION===============

58- DECK: SATISFACTORY RATING: 6

58.1 WEARING SURFACE: MATERIAL: CONCRETE CONDITION : 6
THICKNESS:
DETERIORATION: X YES NO DRAINAGE: ADEQUATE INADEQUATE
PONDING: YES X NO SAFETY: YES NO

58.2 SLAB OR PLATE: MATERIAL: CONCRETE CONDITION 6
X CRACKING: X FINE MEDIUM OPEN

	TOP	BOTTOM	
SPALLING:	X		S < 1 in. DEEP x 6 in. & L > 1 in. x 6 in. &
SCALING :	X		L to ¼ in., M ¼ in. - ½ in., H ½ in. - 1 in., S > 1

XEFFLORESCENCE EXUDATION RUST STAINS CORROSION: LIGHT MODERATE SEVERE

58.3 MOVEMENT: DECK TO BACKWALL cm. DECK TO APPROACH SLAB cm.

DECK COMMENTS:
DETACHMENTS OF CONCRETE WITH EXPOSED RE INFORCEMENT, FINE TRANSVERSAL CRACKS WITH EFFLORESCENCES
.

	(58.4) CURBS	(58.5) MEDIAN	(58.6) SIDEWALKS	(58.7) PARAPETS	(58.8) RAILING
MATERIAL					G/STEEL
CONDITION RATING					7
HEIGHT LOSS (cm)					
JOINTS					OK
DRAINAGE					
ALIGNMENT					OK
CORROSION (L-M-S)					L
PAINT: G-GOOD, F-FAIR, P-POOR, N-NONE U-USELESS TO PAINT					F
SAFETY					YES
CRACKING (F-M-O)					
SPALLING (S-L)					
SCALING (L-M-H-S)					

58.9 LIGHTING STANDARDS: MATERIAL: CONDITION: FUNCTIONING: YES NO
58.10 UTILITIES: TYPE: SIZE: SAFETY:
58.11 JOINTS: EXPANSION CONSTRUCTION CONDITION: FUNCTIONING: YES NO
LEAKING: YES NO CRACKING: FINE MEDIUM OPEN SPALLING: SMALL LARGE
58.12 DRAINS AND SCUPPERS: MATERIAL: CONDITION: FUNCTIONING: YES NO

59- SUPERSTRUCTURE: SATISFACTORY   RATING: 6

59.1 BEARING DEVICES: TYPE   FIXED   MOVABLE   OUT OF PLUMB
PAINT: GOOD   FAIR   POOR   NONE   USELESS TO PAINT
CONDITION: FUNCTIONING: YES   NO

59.2 BRIDGE SEATS, PEDESTAL, GROUT PADS, ABUTMENTS OR PIER SEATS WHERE BEAMS BEAR DIRECTLY ON CONCRETE
CONDITION: 6   CRACKING: X F   M   O   SPALLING: X S   L
SCALING: L   M   H   S   CRUSHING:

59.3 STEEL-BEAMS: TYPE: DIMENSIONS(height;width;thickness):
CONDITION: CORROSION: L   M   S   PAINT: G   F   P   N   U

59.4 CONCRETE-BOX BEAMS, I-BEAMS, SLAB, T-BEAM, TYPE: T-BEAM
CONDITION: 5   CRACKING: X F   M   O   SPALLING: S   X L
SCALING: L   M   H   S

59.5 TRUSSES: TYPE: CONDITION: CORROSION: L   M   S
DAMAGE: DEFORMATION: PAINT: G   F   P   N   U
A=TRUSS B=UPPER & LOWER LATERAL BRACING C=PORTALS D=FLOOR BEAMS E*=STRINGERS

59.6 DRAINAGE: TYPE: CONDITION: FUNCTIONING: YES   NO

59.7 HINGES: CONDITION: FUNCTIONING: YES   NO   MOVEMENT: YES   NO
ALIGNMENT: GOOD   BAD   PAINT: G   F   P   N   U

59.8 DEFLECTIONS: X NORMAL   EXCESSIVE   cms.

59.9 VIBRATIONS: X MINIMAL   MODERATE   EXCESSIVE

SUPERSTRUCTURE COMMENTS:
BEAMS TOWARD CAGUAS LANES WITH BIG DET
ACHMENTS OF CONCRETE DUE TO TRUCK IMPA
CT.

60- SUBSTRUCTURE: SATISFACTORY   RATING: 6

	ABUTMENTS				PIERS OR NON PILES BENTS					PILES BENTS		
	60.1.1 WINGWALL	60.1.2 BREAST & BACKWALL	60.1.3 FOOTING	60.1.4 PILES	60.2.1 CAPS	60.2.2 BRACING	60.2.3 COLUMNS	60.2.4 FOOTINGS	60.2.5 PILES	60.4.1 CAPS	60.4.2 BRACING	60.4.3 PILES
MATERIAL					CONCRETE		CONCRETE					
CONDITION RATING					F		6					
CRACKING (F-M-O)					S		F					
SPALLING (S-L)							S					
SCALING (L-M-H-S)												
CORROSION (L-M-S)												
PAINT (G-F-P-N-U)					F		F					
MOVEMENT					NO		NO					
EROSION							NO					
UNDERMINING							NO					

60- SUBSTRUCTURE COMMENTS:

61- CHANNEL & CHANNEL PROTECTION : N/A   RATING : N   CHANNEL COMMENTS:
61.1 CHANNEL SCOUR(EXTENT) :
61.2 EMBANKMENT EROSION(EXTENT) :

	TYPE	MATERIAL	CONDITION RATING	FUNCTIONING YES	FUNCTIONING NO
61.3 PROTECTIVE DEVICE					
61.4 FENDER SYSTEM ----					
61.5 RIP RAP					
61.6 SPUR DIKES,JETTIES					

61.7 OBSTRUCTION (DEBRIS, GROWTHS):
61.8 CHANNEL CHANGE: YES NO
DETRIMENTAL: YES NO IF YES, EXPLAIN
61.9 ADEQUATE WATERWAY: YES NO IF NO, EXPLAIN
61.10 SURROUNDING AREA: FLOODING: YES NO IF YES, EXPLAIN
EROSION: YES NO IF YES, EXPLAIN
61.11 LOCATION OF PIERS AND/OR ABUTMENTS: DETRIMENTAL: YES NO
IF YES, EXPLAIN
61.12 OTHER FEATURES THAT MAY AFFECT STRUCTURE:

62- CULVERT AND RETAINING WALLS :N/A   RATING :N   CULVERT COMMENTS:

	62.1BARREL	62.2HEADWALL	62.3CUT-OFFWALL	62.4RETAINING WALL
MATERIAL				
CONDITION RATING				
FUNCTIONING(Y-N)				
CRACKING(F-M-O)				
SPALLING (S-L)				
SCALING(L-M-H-S)				
CORROSION(L-M-S)				
SETTLEMENT(Y-N)				
ALIGNMENT(Y-N)				
PAINT(G-F-P-N-U)				

63- METHOD USED TO DETERMINE OPERATING RATING .. 2
64- OPERATING RATING : .... PEDESTRIAN 800
65- METHOD USED TO DETERMINE INVENTORY RATING .. 2
66- INVENTORY RATING : .... PEDESTRIAN 800

...7- STRUCTURAL EVALUATION : ....

WEARING SURFACE HAVE CONCRETE LOSE WITH EXPOSED STEEL. BOTTOM SLAB HAVE FINE TRANSVERSAL CRACKS WITH EFFLORECENCES. BEARING HAVE LIGHT CORROSION. BEAMS AT CAGUAS WAY HAVE BIG SPALLING WITH EXPOSED STEEL BY IMPACT. RAMP AT MEDICAL CENTER SIDE HAVE LARGE SPALLING WITH EXPOSED STEEL.

68- DECK GEOMETRY : ....

N/A.

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : ....

MEETS MINIMUM TOLERABLE LIMITS TO BE LEFT IN PLACE AS IS.

5

70- BRIDGE POSTING : .... N/A.

71- WATERWAY ADEQUACY : .... N

N/A.

REMOTE - GREATER THAN 100 YEARS. SLIGHT - 11 TO 100 YEARS. OCASSIONAL - 3 TO 10 YEARS. FREQUENT - LESS THAN 3 YEARS.
INSIGNIFICANT - MINOR INCONVENIENCE. HIGHWAY PASSABLE IN A MATTER OF HOURS. SIGNIFICANT - TRAFFIC DELAYS OF UP TO SEVERAL DAYS
SEVERE - LONG TERM DELAYS TO TRAFFIC WITH RESULTING HARDSHIP

72- APPROACH ROADWAY ALIGNMENT : .... N

N/A.

72.2 SLAB OR PAVEMENT CONDITION : 6 MATERIAL : RAMPS
CRACKING: F N O SPALLING: L S SCALING: L M X H S UNNEVEN: YES NO ROUGH: YES NO
MOVEMENT: APPROACH SLAB-BACKWALL: YES NO BREAKING UP: EXCESSIVE DEFORMATION:
SETTLEMENT: YES NO DRAINAGE: INADEQUATE: YES NO PONDING: YES NO
SAFETY: HAZARDOUS YES NO EMBANKMENT: CONDITION:
MOVEMENT: PAVEMENT-APPROACH SLAB: YES NO
FUNCTIONING: YES NO EROSION: YES NO IF YES, EXPLAIN
CONSTRUCTION: FLIMSY: YES NO
INTEGRITY IMPAIRED: YES NO IF YES, EXPLAIN
72.3 UNDESIRABLE IMPACT: YES NO INADEQUATE: YES NO SATISFACTORY ALIGNMENT: YES NO
72.4 JOINTS: TYPE: MATERIAL: CONDITION: FUNCTIONING: YES NO
72.5 GUARDRAIL: TYPE: JOINTS: FUNCTIONING: YES NO
ALIGNMENT: HORIZONTAL: GOOD BAD VERTICAL: GOOD BAD
SAFETY: SECURELY ATTACHED: YES NO PEDESTRIAN HAZARDS: YES NO

72- APPROACH ROADWAY - COMMENTS:

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

SYSTEM
NO. :00960

========PROPOSED IMPROVEMENT========

TYPE OF WORK : .... REHABILITATION		352
LENGTH OF STRUCTURE IMPROVEMENT : .... 49.30 MT	(161.70 FT)	00049 13 JA

=============INSPECTIONS=============

RESERVED	--
INSPECTION DATE : MARCH-20-1998	0398
DESIGNATED INSPECTION FRECUENCY : .... 24 MONTHS	24
CRITICAL FEATURE INSPECTION : .... N/A.	N N N
CRITICAL FEAT. INSPECT. DATE: .... N/A	
FRACTURE CRITICAL UNDERWATER OTHER	

===========IMPROVEMENT COST===========

	000009
94- BRIDGE IMPROVEMENT COST : .... N/A	000000
95- ROADWAY IMPROVEMENT COST : .... N/A	000012
96- TOTAL PROJECT COST : .... (49.30X2.31X$1035X10%)=$11,787	1998
97- YEAR OF IMPROVEMENT COST ESTIMATED : 1998	

==CLASSIFICATION AND STRUCTURE DATA==

98- BORDER BRIDGE :	--
99- BORDER BRIDGE STRUCTURE NUMBER :	--
100- STRAHNET HIGHWAY DESIGNATION : .... DEFENSE HIGHWAY	1
101- PARALLEL STRUCTURE DESIGNATION : .... NO PARALLEL STRUCTURE	N
102- DIRECTION OF TRAFFIC : .... TRAFFIC NOT CARRIED	0 JA
103- TEMPORARY STRUCTURE DESIGNATION : .... N/A	
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE : .... N.H.S.	1
105- FEDERAL LANDS HIGHWAYS :	0
106- YEAR RECONSTRUCTION : .... NO RECONSTRUCTION	0000
107- DECK STRUCTURE TYPE : .... CONCRETE CAST IN PLACE	1
108- WEARING SURF./ PROTECT. SYSTEM : .... CONCRETE NONE NONE	100
109- AVERAGE DAILY TRUCK TRAFFIC : .... 4 %	04
110- DESIGNATED NATIONAL NETWORK : .... NOT PART OF NETWORK	0
111- PIER OR ABUT. PROTECTION (NAVIGATION) : .... N/A	
112- NBIS BRIDGE LENGTH : .... YES	Y
113- SCOUR CRITICAL BRIDGE : .... BRIDGE OVER HIGHWAY	N
114- FUTURE AVERAGE DAILY TRAFFIC : 239,277	239277
115- YR. OF FUTURE A.D.T. : 2016	2016
116- MINIM. NAVIG. VERT. CLEARANCE : .... N/A	
VERTICAL LIFT BRIDGE :	
117- SUFFICIENCY RATING :	.
125- PRIORITY RATING:	
127- EVALUATION DATE : MAR-20-1998	032098
130- CRITICAL FRACTURE INSP. DATE :	

ENGINEER :HERIBERTO GONZALEZ

AUXILIARY ITEMS
1-SIGNS
TYPE:
MATERIAL:
CONDITION:

REMARKS:
THE REHABILITATION CONSIST IN REPAIR ALL DEFICIENCIES DESCRIBED ON THE ITEM #67.

C.5 March 15, 1996

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REPORT
------ ------

PAGE 1 OF 3
DATE : 03/15/96
TIME : 09:56:53

FEDERAL SYSTEM — BRIDGE NO. : 00960 - ROAD NO. : PR 18 — KM. NO. : 001.700

============IDENTIFICATION============

1- STATE :	Commonwealth of Puerto Rico	721
2- STATE HIGHWAY DEPARTMENT :	SAN JUAN	01
3- COUNTY (PARISH) CODE :	SAN JUAN	127
4- PLACE CODE :	SAN JUAN URBAN ZONE	76770
5- INVENTORY ROUTE :	2-1-1-00001-0	211000010
6- FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY
7- FACILITY CARRIED BY STRUCTURE :	P.R. - 18	PR 18
8- STRUCTURE NUMBER :	BRIDGE 960 1 OF 1	009601
9- LOCATION :	0.5 KM N INT PR21 & PR18	0.5 KM N INT PR21 & PR18
10- INV. ROUTE, MIN. CLEAR. (0.01m) :	4.44 MT (14' - 7")	1407
11- MILEPOINT :	1.70	001700
16- LATITUDE :	18 DEGREES 23.4 MINUTES	18234
17- LONGITUDE :	66 DEGREES 04.6 MINUTES	066046
19- BYPASS, DETOUR LENGTH (NEAREST MILE) :	STRUCTURE OVER HIGHWAY	00

============CLASSIFICATION============

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	INTERSTATE	11

============AGE AND SERVICE===========

27- YEAR BUILT :	1967	1967
28- LANES ON AND UNDER STRUCTURE :	0 LANES ON / 9 LANES UNDER	0009
29- A.D.T. OF INVENTORY ROUTE :	222,800	222800
30- YEAR OF A.D.T. :	1993	93

===========STRUCTURE DATA=============

31- DESING LOAD :	PEDESTRIAN	7
32- APPROACH ROADWAY WIDTH :	44.30 MT (145.30 FT)	145
33- BRIDGE MEDIAN :	NONE	0
34- SKEW ANGLE :	NO	00
35- STRUCTURE FLARED :	NO	0
36- TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
37- HISTORICAL SIGNIFICANCE :	5	5
38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	N/A	000
40- NAVIGATION HORIZONTAL CLEARANCE :	N/A	0000
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
42- TYPE OF SERVICE :	PEDESTRIAN OVER HIGHWAY	31
43- STRUCTURE TYPE, MAIN :	CONCRETE CONTINUOS TEE BEAMS	204
44- STRUCTURE TYPE APPR. :	NONE	000
45- NUMBER OF SPAN IN MAIN UNIT :	2	002
46- NUMBER OF APPROACH SPAN :	NONE	0000
47- INV. ROUTE, TOTAL HORIZ. CLEARANCE :	20.84 MT (68.36 FT)	684
48- LENGTH OF MAXIMUM SPAN :	22.15 MT (72.65 FT)	0073
49- STRUCTURE LENGTH :	49.30 MT (161.70 FT)	000162
50- CURB OR SIDEWALK WIDTHS :	N/A	000000

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE

FEDERAL SYSTEM BRIDGE NO. : 00960 - ROAD NO. : PR 18 - KM. NO. : 001.700

============STRUCTURE DATA============

51- BRIDGE ROADWAY WIDTH, CURB TO CURB :.................................... 2.10 MT (6.59 FT) 0066
52- DECK WIDTH, OUT TO OUT : .... 2.31 MT (7.58 FT) 0076
53- MI. VERT. CLEAR. OVER BRIDGE ROADWAY : .... UNLIMITED 9999
54- MINIMUM VERTICAL UNDERCLEARANCE : .... 4.44 MT (14' - 7") H1407
55- MINIMUM LATERAL UDERCLEARANCE ON RIGHT : .... 3.25 MT (10.8 FT) H108
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT : .... 2.55 MT (8.36 FT) 084

===============CONDITION==============

	MATERIAL	CONDITION ANALYSIS	
58- DECK	CONCRETE	SATISFACTORY	
59- SUPERSTRUCTURE	CONCRETE	SATISFACTORY	6
60- SUBSTRUCTURE	CONCRETE	SATISFACTORY	6
61- CHANNEL & CHANNEL PROTECTION	N/A	N/A	6
62- CULVERT....................................	N/A	N/A	N
64- OPERATING RATING :		PEDESTRIAN	N
66- INVENTORY RATING :		PEDESTRIAN	800
			800

67- STRUCTURAL EVALUATION : 6

WEARING SURFACE HAVE CONCRETE LOSE WITH EXPOSED STEEL. BOTTOM SLAB HAVE FINE TRANSVERSAL CRACKS WITH EFFLORECENCES. BEARING HAVE LIGHT CORROSION. BEAMS AT CAGUAS WAY HAVE BIG SPALLING WITH EXPOSED STEEL BY IMPACT. RAMP AT MEDICAL CENTER SIDE HAVE LARGE SPALLING WITH EXPOSED STEEL.

68- DECK GEOMETRY : .... N

N/A.

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : 4

MEETS MINIMUM TOLERABLE LIMITS TO BE LEFT IN PLACE AS IS.

70- BRIDGE POSTING : .... N/A. 5

71- WATERWAY ADEQUACY : .... N

N/A.

72- APPROACH ROADWAY ALIGMENT : .... ~~N~~ 6

N/A.

=======PROPOSED IMPROVEMENT=======

75- TYPE OF WORK : .... REHABILITATION 352
76- LENGTH OF STRUCTURE IMPROVEMENT : .... 49.30 MT (161.70 FT) 000162

PUERTO RICO HIGHWAY AUTHORITY
BIRDGE STUDIES AND EVALUATION OFFICE

FEDERAL SYSTEM   BRIDGE NO. : 00960 - ROAD NO. : PR 18   - KM. NO. : 001.700

=============INSPECTIONS=============

89- RESERVED		--
90- INSPECTION DATE :	MARCH 1996.	0396
91- DESIGNATED INSPECTION FRECUENCY :	24 MONTHS	24
92- CRITICAL FEATURE INSPECTION :	N/A.	N N N
93- CRITICAL FEAT. INSPECT. DATE:	N/A	

===========IMPROVEMENT COST===========

94- BRIDGE IMPROVEMENT COST :	N/A	000009
95- ROADWAY IMPROVEMENT COST :	N/A	000000
96- TOTAL PROJECT COST :	(49.30X2.31X$1035X10%)=$11,787	000012
97- YEAR OF IMPROVEMENT COST ESTIMATED :	1996	96

==CLASSIFICATION AND STRUCTURE DATA==

98- BORDER BRIDGE :		--
99- BORDER BRIDGE STRUCTURE NUMBER :		--
100- DEFENSE HIGHWAY DESIGNATION :	DEFENSE HIGHWAY	1
101- PARALLEL STRUCTURE DESIGNATION :	NO PARALLEL STRUCTURE	N
102- DIRECTION OF TRAFFIC :	TRAFFIC NOT CARRIED	3
103- TEMPORARY STRUCTURE DESIGNATION :	N/A	
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE :	N.H.S.	1
105- RESERVED		--
106- YEAR RECONSTRUCTION :	NO RECONSTRUCTION	0000
107- DECK STRUCTURE TYPE :	CONCRETE CAST IN PLACE	1
108- WEARING SURF./ PROTECT. SYSTEM :	CONCRETE NONE NONE	100
109- AVERAGE DAILY TRUCK TRAFFIC :	4 %	04
110- DESIGNATED NATIONAL NETWORK :	NOT PART OF NETWORK	0
111- PIER OR ABUT. PROTECTION (NAVIGATION) :	N/A	
112- NBIS BRIDGE LENGTH :	YES	Y
113- SCOUR CRITICAL BRIDGE :	BRIDGE OVER HIGHWAY	N
114- FUTURE AVERAGE DAILY TRAFFIC :	369,900	369900
115- YR. OF FUTURE A.D.T. :	2012	12
116- MINIM. NAVIG. VERT. CLEARANCE :	N/A	
117- SUFFICIENCY RATING :	.	.
126- FIELD INSPECTION DATE :	031396	031396
127- INSPECTION EVAL. DATE :	031396	031396
130- CRITICAL FRACTURE INSP. DATE :		
131- EVALUATOR ENGINEER :	L. Fernández	

REMARKS:

THE REHABILITATION CONSIST IN REPAIR ALL DEFICIENCIES DESCRIBED ON THE ITEM #67.

C.6 September 30, 1992

PUERTO RICO HIGHWAY AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE
BRIDGE REPORT
------ ------

PAGE 1 OF 3
DATE : 09/30/93
TIME : 08:43:47

FEDERAL SYSTEM   BRIDGE NO. : 00960 – ROAD NO. : PR 18   – KM. NO. : 004400

============IDENTIFICATION============

1- STATE :	Commonwealth of Puerto Rico	721
2- STATE HIGHWAY DEPARTMENT :	SAN JUAN	01
3- COUNTY (PARISH) CODE :	SAN JUAN	127
4- PLACE CODE :	SAN JUAN URBAN ZONE	76770
5- INVENTORY ROUTE :	2-1-1-00001-0	211000010
6- FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY
7- FACILITY CARRIED BY STRUCTURE :	P.R. – 18	PR 18
8- STRUCTURE NUMBER :	BRIDGE 960 1 OF 1	009601
9- LOCATION :	0.5 KM N INT PR21 & PR18	0.5 KM N INT PR21 & PR18
11- MILEPOINT :	4.40	004400
16- LATITUDE :	18 DEGREES 23.4 MINUTES	18234
17- LONGITUDE :	66 DEGREES 04.6 MINUTES	066046
98- BORDER BRIDGE :		—
99- BORDER BRIDGE STRUCTURE NUMBER :		—

======STRUCTURE TYPE AND MATERIAL======

43- STRUCTURE TYPE, MAIN :	CONCRETE CONTINUOS TEE BEAMS	204
44- STRUCTURE TYPE APPR. :	NONE	000
45- NUMBER OF SPAN IN MAIN UNIT :	2	002
46- NUMBER OF APPROACH SPAN :	NONE	0000
107- DECK STRUCTURE TYPE :	CONCRETE CAST IN PLACE	1
108- WEARING SURF./ PROTECT. SYSTEM :	CONCRETE NONE NONE	100

============AGE AND SERVICE============

19- BYPASS, DETOUR LENGTH (NEAREST MILE) :	STRUCTURE OVER HIGHWAY	00
27- YEAR BUILT :	1967	1967
28- LANES ON AND UNDER STRUCTURE :	0 LANES ON / 9 LANES UNDER	0009
29- A.D.T. OF INVENTORY ROUTE :	200,100	200100
30- YEAR OF A.D.T. :	1990	90
42- TYPE OF SERVICE :	PEDESTRIAN OVER HIGHWAY	31
106- YEAR RECONSTRUCTION :	NO RECONSTRUCTION	0000
109- AVERAGE DAILY TRUCK TRAFFIC :	4 %	04

============GEOMETRIC DATA============

10- INV. ROUTE, MIN. CLEAR. (0.01m) :	4.44 MT (14' – 7")	1407
32- APPROACH ROADWAY WIDTH :	44.30 MT (145.30 FT)	145
33- BRIDGE MEDIAN :	NONE	0
34- SKEW ANGLE :	NO	00
35- STRUCTURE FLARED :	NO	0
47- INV. ROUTE, TOTAL HORIZ. CLEARANCE :	20.84 MT (68.36 FT)	684
48- LENGTH OF MAXIMUM SPAN :	22.15 MT (72.65 FT)	0073
49- STRUCTURE LENGTH :	49.30 MT (161.70 FT)	000162
50- CURB OR SIDEWALK WIDTHS :	N/A	000000
51- BRIDGE ROADWAY WIDTH, CURB TO CURB :	2.10 MT (6.59 FT)	0066
52- DECK WIDTH, OUT TO OUT :	2.31 MT (7.58 FT)	0076
53- MIN. VERT. CLEAR. OVER BRIDGE ROADWAY :	UNLIMITED	9999
54- MINIMUM VERTICAL UNDERCLEARANCE :	4.44 MT (14' – 7")	H1407
55- MINIMUM LATERAL UNDERCLEARANCE ON RIGHT :	3.25 MT (10.8 FT)	H108
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT :	2.55 MT (8.36 FT)	084

PUERTO RICO HIGHWAY AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE

FEDERAL SYSTEM   BRIDGE NO. : 00960 - ROAD NO. : PR 18   - KM. NO. : 004400

============CLASSIFICATION============

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	INTERSTATE	11
37- HISTORICAL SIGNIFICANCE :	5	5
100- DEFENSE HIGHWAY DESIGNATION :	DEFENSE HIGHWAY	1
101- PARALLEL STRUCTURE DESIGNATION :	NO PARALLEL STRUCTURE	N
102- DIRECTION OF TRAFFIC :	TRAFFIC NOT CARRIED	3
103- TEMPORARY STRUCTURE DESIGNATION :	N/A	
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE :	N.H.S.	1
110- DESIGNATED NATIONAL NETWORK :	NOT PART OF NETWORK	0
112- NBIS BRIDGE LENGTH :	YES	Y

===============WATERWAY===============

38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	N/A	000
40- NAVIGATION HORIZONTAL CLEARENCE :	N/A	0000
111- PIER OR ABUT. PROTECTION (NAVIGATION) :	N/A	
116- MINIM. NAVIG. VERT. CLEARANCE :	N/A	

=========PROPOSED IMPROVEMENT=========

75- TYPE OF WORK :	REHABILITATION	352
76- LENGTH OF STRUCTURE IMPROVEMENT :	49.30 MT (161.70 FT)	000162
94- BRIDGE IMPROVEMENT COST :	N/A	000000
95- ROADWAY IMPROVEMENT COST :	N/A	000000
96- TOTAL PROJECT COST :	(49.30X2.31X$825X10%)=$9,395	000009
97- YEAR OF IMPROVEMENT COST ESTIMATED :	1993	93
114- FUTURE AVERAGE DAILY TRAFFIC :	302,148	302148
115- YR. OF FUTURE A.D.T. :	2010	10

========LOAD RATING AND POSTING========

31- DESIGN LOAD :	PEDESTRIAN	7
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
64- OPERATING RATING :	PEDESTRIAN	800
66- INVENTORY RATING :	PEDESTRIAN	800
70- BRIDGE POSTING :	N/A.	N

==============CONDITION==============

	MATERIAL	CONDITION ANALYSIS	
58- DECK	CONCRETE	SATISFACTORY	6
59- SUPERSTRUCTURE	CONCRETE	SATISFACTORY	6
60- SUBSTRUCTURE	CONCRETE	SATISFACTORY	6
61- CHANNEL & CHANNEL PROTECTION	N/A	N/A	N
62- CULVERT	N/A	N/A	N

PUERTO RICO HIGHWAY AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE

FEDERAL SYSTEM   BRIDGE NO. : 00960 - ROAD NO. : PR 18   - KM. NO. : 004400

==============APPRAISALS===============

67- STRUCTURAL EVALUATION : 6

WEARING SURFACE HAVE CONCRETE LOSE WITH EXPOSED STEEL. BOTTOM SLAB HAVE FINE TRANSVERSAL CRACKS WITH EFFLORECENCES. CYCLONE FENCE PROTECTION IN ALL THE STRUCTURE. BEARING HAVE LIGTH CORROSION. BEAMS HAVE IMPACTS OVER THE CAGUAS WAY. RAMP AT MEDICAL CENTER SIDE HAVE LARGE SPALLING WITH EXPOSED STEEL.

68- DECK GEOMETRY : .... N

N/A.

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : 4

MEETS MINIMUM TOLERABLE LIMITS TO BE LEFT IN PLACE AS IS.

71- WATERWAY ADEGUACY : .... N

N/A.

72- APPROACH ROADWAY ALIGNMENT : .... N

N/A.

36- TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
113- SCOUR CRITICAL BRIDGES :	BRIDGE OVER HIGHWAY	N

=========ADDITIONAL COMMENTS:=========

89- RESERVED		—
90- INSPECTION DATE :	SEPTEMBER 3, 1993.	0993
91- DESIGNATED INSPECTION FRECUENCY :	24 MONTHS	24
92- CRITICAL FEATURE INSPECTION :	N/A.	N N N
93- CRITICAL FEAT. INSPECT. DATE:	N/A	—
105- RESERVED		
117- SUFFICIENCY RATING :		
126- FIELD INSPECTION DATE :	090393	090393
127- INSPECTION EVAL. DATE :	090393	090393
130- CRITICAL FRACTURE INSP. DATE :		
131- EVALUATOR ENGINEER :	Jaime Arroyo Rosario	

REMARKS:

THE REHABILITATION CONSIST IN REPAIR ALL DEFICIENCIES DESCRIBED ON THE ITEM #67.

Appendix D **Inspection by PRHTA of PB 1137**

D.1 May 15, 2017

INSPECTION REPORT SUMMARY & QC SHEET

BRIDGE: 1137

TEAM LEADER: Angel Lopez

INSP. DATE: 15 mayo 2017

1. Inspection Type and Dates:

NBI	Type	Performed? (Yes / No / NA)	Freq (MONTHS)	Previous Insp. DATE (MONTH/YEAR)	Next Insp. DATE (MONTH/YEAR)
ITEM 90	Routine Inspection	Yes	—	Jan 2019	—
ITEM 93 A	FC Inspection				
ITEM 93 B	Underwater Insp.				
ITEM 93 C	Other:				

2. NBI Condition Rating Summary:

	Item 58	Item 59	Item 60	Item 61	Item 62	Item 113
Previous Inspection	5	5	6	—	—	—
Current Inspection	4	5	5	—	—	—

Other Checks: (Y, N, NA)

Review Comments:

/ Scour Critical (items 113 & 60)
/ AASHTO Core's & NBI CD consistent
/ Smart Flags (scour, steel plate, fire damage, etc)
/ Channel Profile/Clearance Table
/ FC & Underwater Members Tables
/ Asphalt Overlay Thickness
/ Drawings
/ Photos
/ Critical Finding
/ Inspector & Team Leader Signature

Reviewer: ____________________

Safety Eng.: ____________________

Scan: MAYO - 31 - 2017 (Loíc)

YourState Department of Transportation

Bureau of Bridges and Structures
Bridge Maintenance

Structure Inventory and Appraisal Sheet

Bridge Key: 011371 | Agency ID: 011371 | Sufficiency Rating: -1.0

IDENTIFICATION

State 1:	72 Puerto Rico	Struc Num 8:	011371
Facility Carried 7:	PR 26	Location 9:	BALDORIOTY DE CASTRO AVE.
Rte.(On/Under)5A:	One Route Under	Rte. Signing Prefix 5B:	2 U.S. Numbered
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00003
Directional Suffix 5E:	0 N/A (NBI)	% Responsibility:	NA
SHD District 2:	Unknown	County Code 3:	San Juan
Place Code 4:	76770	Kilometer Post 11:	04.1 km
Feature Intersected 6:	PEDESTRIAN WALKWAY		
Latitude 16:	18d 27' 18"	Longitude 17:	066d 03' 18"
Border Bridge Code 98:	Unknown (P)		
Border Bridge Number 99:	Unknown		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: -1 Number of Spans Main Unit 45: -1

Main Span Material/Design 43A/B:

3 Steel 09

Deck Type 107:	Unknown (NBI)
Wearing Surface 108A:	Unknown (NBI)
Membrane 108B:	Unknown (NBI)
Deck Protection 108C:	Unknown (NBI)

AGE AND SERVICE

Year Built 27:	1968	Year Reconstructed 106:	Unknown		
Type of Service on 42A:	3 Pedestrian-bicyle				
Type of Service under 42B:	1 Highway				
Lanes on 28A: Unknown	Lanes Under 28B: 5			Detour Length 19:	0.0 km
ADT 29:	67,300	Truck ADT 109:	4 %	Year of ADT 30:	2002

GEOMETRIC DATA

Length Max Span 48:	23.60 m	Structure Length 49:	61.00 m
Curb/Sdwlk Wdth L 50A:		Curb/Sidewalk Width R 50B:	
Width Curb to Curb 51:	1.80 m	Width Out to Out 52:	
Approach Roadway Width 32: (w/ shoulders)	24.60 m	Median 33:	Unknown (NBI)
Deck Area:			
Skew 34:	-1.00 °	Structure Flared 35:	Unknown (NBI)
Minimum Vertical Clearance Over Bridge 53:			
Minimum Vertical Underclearance Reference 54A:			H Hwy beneath struct
Minimum Vertical Underclearance 54B:			05.11 m
Minimum Lateral Underclearance Reference R 55A:			H Hwy beneath struct
Minimum Lateral Undrclearance R 55:			01.20 m
Minimum Lateral Undrclearance L 56:			02.20 m

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	5/15/2017	Next Inspection:	05/15/2019
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	01/01/1901	Next Elem. Insp. Due:	01/01/1901

CLASSIFICATION

Defense Highway 100:	0 Not a STRAHNET hwy	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	0 Not hwy traffic	Temporary Structure 103:	Unknown (NBI)
Highway System 104:	0 Not on NHS	NBIS Length 112:	Unknown (NBI)
Toll Facility 20:	3 On free road	Functional Class 26:	14 Urban Other Princ
Historical Significance 37:	Unknown (NBI)		
Owner 22:	-1 Unknown (P)		
Custodian 21:	-1 Unknown (P)		

CONDITION

Deck 58: 4 Poor Super 59: 5 Fair Sub 60: 5 Fair

Culvert 62: N N/A (NBI) Channel/Channel Protection 61: N N/A (NBI)

LOAD RATING AND POSTING

Inventory Rating Method 65:	Unknown (NBI)	Operating Rating Method 63:	Unknown (NBI)
Inventory Rating 66:	MS-.6	Operating Rating 64:	MS-0.6
Design Load 31:	7 Pedestrian	Posting 70:	Unknown (NBI)
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	N N/A or not required	Approach Rail 36C:	N N/A or not required
Transition 36B:	N N/A or not required	Approach Rail Ends 36D:	N N/A or not required
Str. Evaluation 67:	Unknown (NBI)	Deck Geometry 68:	Unknown (NBI)
Underclearance, Vertical and Horizontal 69:	Unknown (NBI)		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	6 Equal Min Criteria
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	NA	Type of Work 75:	Unknown (P)
Roadway Cost 95:	Unknown	Length of Improvment 76:	
Total Cost 96:	Unknown	Future ADT 114:	92,073
Year of Cost Estimate 97:	Unknown	Year of Future ADT 115:	2018

NAVIGATION DATA

Navigation Control 38:	_ Unknown (NBI)		
Vertical Clearance 39:		Horizontal Clearance 40:	
Pier Protection 111:	Unknown (NBI)	Lift Bridge Vertical Clearance 116:	

ELEMENT CONDITION STATE DATA

INSP001_Inspection_SIA_Metric

Wed 5/31/2017 13:19:23
Page 1 of 1

BRIDGE INVENTORY MANAGEMENT OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

Team Leader: Angel T. López

Bridge Inspector: Angel T. López

Bridge Evaluator: Manuel Coll

Assistants: José R. Vázquez _ _ _ _

Driver: José A. Ortíz

Inspection date: May, 15, 2017

Weather Conditions: Sunny

Amount of Time on Inspection: 1 Hours

Equipment: X Bus or Van _ Underwater _ Ladders _ Snooper X Camera _ Boat
_ Other:

Bridge Number: 1137

Road on Structure: N/A Number or Name: Km.

Road Under Structure: State Highway Number or Name: PR-26 Km. 4.1

Ident. Plaque: No Num.

36-Traffic Safety Features:

Bridge railings: not applicable or safety not reuired

Transitions: not applicable or safety not reuired

Approach Guardrail: not applicable or safety not reuired

Approach Guardrail Ends: not applicable or safety not reuired

41- Posting: Condition: A-Open Sign type: _ Posting Load:

Type of Inspection: Regular/routine inspection

COMMENTS AND/OR RECOMMENDATIONS:

(61.00mts de largo)

Inspection by: Angel T. López
Bridge Inspector

Revised and Approved by: Manauel Coll
Bridge Evaluator

R-1137

1

BRIDGE INVENTORY MANAGEMENT OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

58. DECK

58.1 Wearing Surface: Material: Steel *Condition:* 4 Thickness cm.

Deterioration: 50 to 75 % Drainage: Inadequate Ponding: No Safety: No

58.2 Slab or Plate: Material: Steel *Condition:* 4

Cracking: None

Spalling: Top: No Bottom: No

Scaling: Top: No Bottom: No

Efflorescence: No Exudation: No Rust Stains: No Corrosion: Severe

58.3 Movement: Deck to backwall: cm. Deck to approach slab: cm.

	Material	Cond. Rating	Height Loss (cm)	Joints	Drainage	Alignment	Corrosion	Paint	Safety	Cracking	Spalling	Scaling
58.4 Curb	N/A	--		--	--	--	--	--	--	--	--	--
58.5 Median	N/A	--		--	--	--	--	--	--	--	--	--
58.6 Sidewalks	N/A	--		--	--	--	--	--	--	--	--	--
58.7 Parapets	N/A	--		--	--	--	--	--	--	--	--	--
58.8 Railing	Steel	5		Good	Good	Good	Severe	Poor	Yes	--	--	--

58.9 Lighting Standards: Material: N/A Condition: N/A Functioning: N/A

58.10 Utilities:

Type: Size: Safety: _

58.11 Joints: Condition: N/A

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

58.12 Drains and Scuppers:

Material: None Condition: N Functioning: N/A

Comments:

58.1- Hay moderada y severa corrosión en la superficie, hay varias perforaciones grandes por corrosión en las tolas, hay una sección grande con la esquina suelta e inclinada formando un hueco, grandes parchos para reparar secciones corroídas, hay varias secciones de las tolas que están sueltas de sus puntos de soldaduras, varias de los parchos que son en aluminio tiene los tornillos de anclajes sueltos, esto puede causar accidente. Muchas de las secciones fueron pintadas con óxido rojo para protección del acero, la superficie de la estructura está en pobres condiciones.

BRIDGE INVENTORY MANAGEMENT OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

59. SUPERSTRUCTURE

59.1 Bearing Devices: Type: Fixed/Mov. Out of Plumb: No Paint: None

Condition: 5

59.2 Bridge seats, pedestal, grout pads, abutments or pier seat where beams bear directly on conc.

Condition: N Cracking: No Spalling: None Scaling: None

Crushing: No

59.3 Steel beams: N/A Type: N/A

Condition: N/A Corrosion: N/A Paint: N/A

59.4 Concrete: N/A Type: N/A

Condition: N Cracking: No Spalling: Small Scaling: None

59.5 Truss: Ped. Bailey Condition: 5 Paint: Fair Corrosion: Moderate Members: N/A

59.6 Drainage: Type: N/A Condition: N/A Functioning: N/A

59.7 Hinges: Condition: N/A Functioning: N/A Movement: N/A

59.8 Deflection: N/A

59.9 Vibrations: N/A

60.0 SUBSTRUCTURE:

			Material	Cond. Rating	Cracking	Spalling	Scaling	Corrosion	Paint	Movement	Erosion	Undermining
Abutments	60.1.1	Wingwalls	N/A	N	--	--	--	--	--	--	--	--
	60.1.2	Breast-Backwall	N/A	N	--	--	--	--	--	--	--	--
	60.1.3	Footing	N/A	N	--	--	--	--	--	--	--	--
	60.1.4	Piles	N/A	N	--	--	--	--	--	--	--	--
Piers or Non Pile Bents	60.2.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.2.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.2.3	Columns	Steel	5	--	--	--	Severe	Poor	No	No	No
	60.2.4	Footing	Concrete	7	F	Small	--	--	--	No	No	No
	60.2.5	Piles	N/A	N	--	--	--	--	--	--	--	--
Rocker Bents	60.3.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.3.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.3.3	Piles	N/A	N	--	--	--	--	--	--	--	--
Pile Bents	60.4.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.4.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.4.3	Piles	N/A	N	--	--	--	--	--	--	--	--

Comments:

59.5- Varios de los componentes laterales de los "bracing" tienen ligera, moderada y severa corrosión y pérdida de sección, algunas secciones en el "upper chord" tienen moderada pérdida de sección por corrosión,

60.2.3- Columnas en acero en buenas condiciones, ligera corrosión.

BRIDGE INVENTORY MANAGEMENT OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

61. CHANNEL AND PROTECTION Condition: N

61.1 Channel Scour: N/A

61.2 Embankment Erosion: N/A

		Type	Material	Condition Rating	Functioning
61.3	Protective Device		N/A	N	--
61.4	Fender System		N/A	N	--
61.5	Rip Rap		N/A	N	--
61.6	Spur Dikes, Jetties		N/A	N	--

61.7 Obstruction: N/A

61.8 Channel Change: N/A Detrimental: N/A

61.9 Adequate Waterway: N/A

61.10 Surrounding Area: Flooding: N/A if yes explain:

Erosion: N/A if yes explain:

61.11 Location of piers and/or abutment detrimental: N/A if yes explain:

61.12 Other features that may affect structure:

Comments:

62. CULVERT AND RETAINING WALL

	Material	Condition Rating	Functioning	Cracking	Spalling	Scaling	Corrosion	Settlement	Alignment	Scour
62.1 Barrel	N/A	N	--	--	--	--	--	--	--	--
62.2 Head Walls	N/A	N	--	--	--	--	--	--	--	--
62.3 Cut-off wall	N/A	N	--	--	--	--	--	--	--	--
62.4 Retaining wall	N/A	N	--	--	--	--	--	--	--	--

Comments:

BRIDGE INVENTORY MANAGEMENT OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

71. WATER ADEQUACY: N/A N/A

72. APPROACH ROADWAY

72.1 Alignment: 6

72.2 Slab or Pavement Condition: N Material: Other

Cracking: No Spalling: None Scaling: None Uneven: No

Rough: No Settlement: No Movement: Approach slab-backwall: No Breaking up: No

Excessive deformation: No

Safety: Hazardous: No

Drainage: Inadequate: No

Movement: Pavement-approach slab: No

Embankment: Condition: N Functioning: Yes Erosion: No

Construction: Flimsy: No Integrity impaired: No

72.3 Undesirable Impact: No

72.4 Joints: No Type: None Inadequate: N/A Satisfactory Alignment: N/A

72.5 Guardrail Type: None Material: N/A Functioning: N/A

Condition: N Alignment Horizontal: N/A Vertical: N/A

Joints Functioning: N/A Safety Securely Attached: N/A Pedestrian Hazards: N/A

Comments:

90. INSPECTION DATE: May, 15, 2017

93. CRITICAL FEATURE INSPECTION DATE

Fracture Critical:

Underwater:

Other Special Inspection:

102. DIRECTION OF TRAFFIC: Highway traffic not carried

106. YEAR RECONSTRUCTED:

107. DECK STRUCTURE TYPE: Steel Plate (includes orthotropic)

108. WEARING SURFACE/PROTECTIVE SYSTEM

Type wearing surface: Other

Type Membrane: None

Deck protection: None

111. PIER OR ABUTMENT PROTECTION (FOR NAVIGATION): N/A

113. SCOUR CRITICAL BRIDGES: N

116. MINUMUM NAVIGATION VERTICAL CLEARANCE:

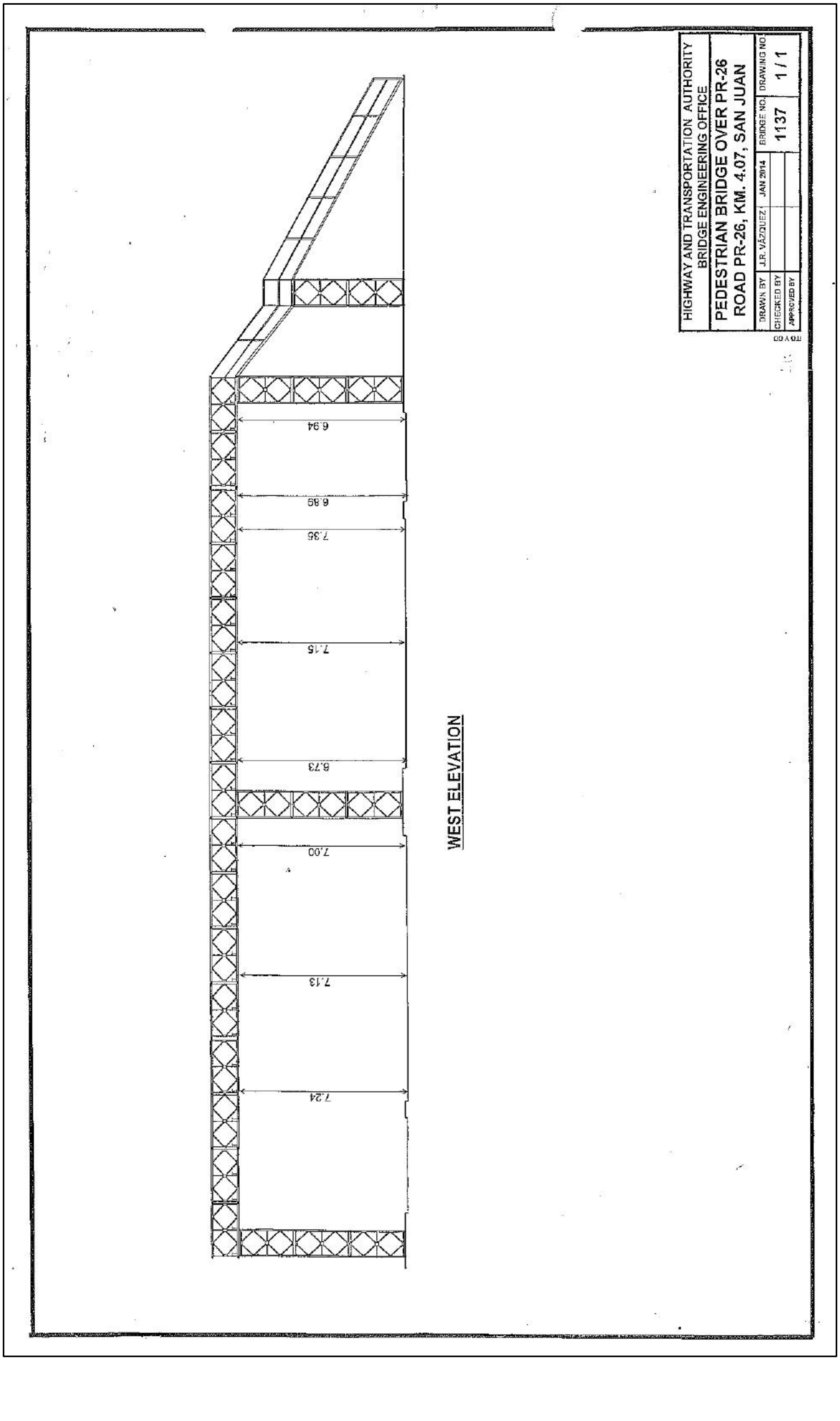
AUXILIARY ITEMS

Signs: Type: Route Orientation Material: Alum. Condition: 5

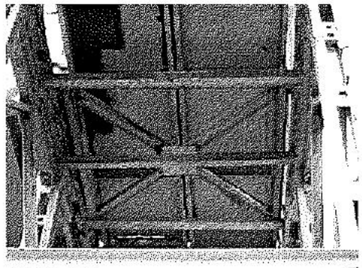
BRIDGE INVENTORY MANAGEMENT OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

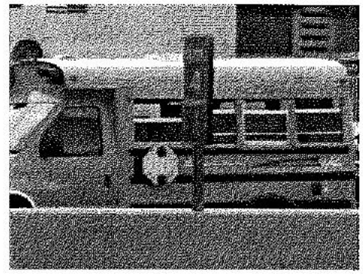
Core Elements											
Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0

BR-1137

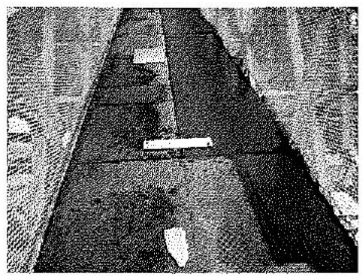

HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE
PEDESTRIAN BRIDGE OVER PR-26
ROAD PR-26, KM. 4.07, SAN JUAN
DRAWN BY
J.R. VÁZQUEZ
JAN 2014
CHECKED BY
APPROVED BY
BRIDGE NO.
1137
DRAWING NO.
1/1
WEST ELEVATION
6.94
6.89
7.35
7.15
6.73
7.00
7.13
7.24

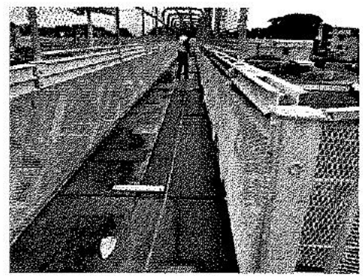

1137-may-15-2017-001.jpg


1137-may-15-2017-004.jpg


1137-may-15-2017-009.jpg

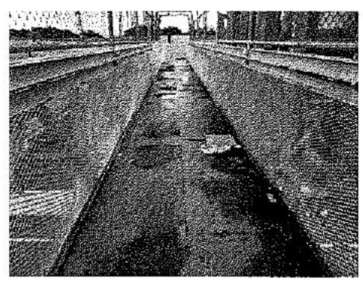

1137-may-15-2017-016.jpg


1137-may-15-2017-017.jpg


1137-may-15-2017-018.jpg


1137-may-15-2017-020.jpg


1137-may-15-2017-030.jpg


1137-may-15-2017-032.jpg

D.2 January 23, 2014

INSPECTION REPORT SUMMARY & QC SHEET

BRIDGE: 1137 (Pedestrian)

TEAM LEADER: Eng. Arturo Cáceres Febus

INSP. DATE: 1/23/14

1. Inspection Type and Dates:

NBI	Type	Performed? (Yes / No / NA)	Freq (MONTHS)	Previous Insp. DATE (MONTH/YEAR)	Next Insp. DATE (MONTH/YEAR)
ITEM 90	Routine Inspection	Yes	24	12/10/2008	1/23/16
ITEM 93 A	FC Inspection	N	—	—	—
ITEM 93 B	Underwater Insp.	N	—	—	—
ITEM 93 C	Other:	N	—	—	—

2. NBI Condition Rating Summary:

	Item 58	Item 59	Item 60	Item 61	Item 62	Item 113
Previous Inspection	5	5	6	N	N	N
Current Inspection	5	5	6	N	N	N

Other Checks: (Y, N, NA)

Review Comments:

- Scour Critical (items 113 & 60)
- AASHTO Core's & NBI CD consistent
- Smart Flags (scour, steel plate, fire damage, etc)
- Channel Profile/Clearance Table
- FC & Underwater Members Tables
- Asphalt Overlay Thickness
- Drawings
- Photos
- Critical Finding
- Inspector & Team Leader Signature

Reviewer:

Safety Eng.:

Bridge Inspection Report

Bridge Key: 011371 Agency ID: 011371 Sufficiency Rating: -1.0

IDENTIFICATION

State 1:	72 Puerto Rico	Struc Num 8:	011371
Facility Carried 7:	PR 26	Location 9:	BALDORIOTY DE CASTRO AVE.
Rte.(On/Under)5A:	One Route Under	Rte. Signing Prefix 5B:	2 U.S. Numbered
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00026
Directional Suffix 5E:	0 N/A (NBI)	% Responsibility :	NA
SHD District 2:	SAN JUAN	County Code 3:	SAN JUAN
Place Code 4:	SAN JUAN ZONA URBANA	Kilometer Post 11:	04.1 km
Feature Intersected 6:	PEDESTRIAN WALKWAY		
Latitude 16:	18d 27' 18"	Longitude 17:	066d 03' 18"
Border Bridge Code 98:	Unknown (P)		
Border Bridge Number 99:	Unknown		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	1/23/2014	Next Inspection:	01/23/2016
FC Frequency 92A:	NA	FC Inspection Date 93A:	1/23/2014	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	01/01/1901	Next Elem. Insp. Due:	01/23/2014

CLASSIFICATION

Defense Highway 100:	0 Not a STRAHNET hwy	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	0 Not hwy traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	0 Not on NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	14 Urban Other Princ
Historical Significance 37:	5 Not eligible for NRHP		
Owner 22:	01 State Highway Agency		
Custodian 21:	01 State Highway Agency		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 2

Main Span Material/Design 43A/B:

3 Steel 09

Deck Type 107:	5 Steel Plate
Wearing Surface 108A:	9 Other
Membrane 108B:	0 None
Deck Protection 108C:	None

CONDITION

Deck 58:	5 Fair	Super 59:	5 Fair	Sub 60:	6 Satisfactory
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:	N N/A (NBI)		

LOAD RATING AND POSTING

Inventory Rating Method 65:	Unknown (NBI)	Operating Rating Method 63:	Unknown (NBI)
Inventory Rating 66:	MS-.6	Operating Rating 64:	MS-0.6
Design Load 31:	7 Pedestrian	Posting 70:	Unknown (NBI)
Posting status 41:	Unknown (NBI)		

AGE AND SERVICE

Year Built 27:	1968	Year Reconstructed 106:	Unknown		
Type of Service on 42A:	3 Pedestrian-bicyle				
Type of Service under 42B:	1 Highway				
Lanes on 28A:	Unknown	Lanes Under 28B:	5	Detour Length 19:	0.0 km
ADT 29:	67,300	Truck ADT 109:	4 %	Year of ADT 30:	2005

APPRAISAL

Bridge Rail 36A:	Unknown (NBI)	Approach Rail 36C:	Unknown (NBI)
Transition 36B:	Unknown (NBI)	Approach Rail Ends 36D:	Unknown (NBI)
Str. Evaluation 67:	Unknown (NBI)	Deck Geometry 68:	Unknown (NBI)
Underclearance, Vertical and Horizontal 69:	Unknown (NBI)		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	Unknown (NBI)
Scour Critical 113:	Unknown (NBI)		

GEOMETRIC DATA

Length Max Span 48:	24.37 m	Structure Length 49:	53.14 m
Curb/Sdwlk Wdth L 50A:	0.00 m	Curb/Sidewalk Width R 50B:	0.00 m
Width Curb to Curb 51:	1.64 m	Width Out to Out 52:	2.84 m
Approach Roadway Width 32: (w/ shoulders)	24.60 m	Median 33:	0 No median
Deck Area:	150.92 m²		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Minimum Vertical Clearance Over Bridge 53:			99.99 m
Minimum Vertical Underclearance Reference 54A:			H Hwy beneath struct
Minimum Vertical Underclearance 54B:			06.73 m
Minimum Lateral Underclearance Reference R 55A:			H Hwy beneath struct
Minimum Lateral Undrclearance R 55:			01.20 m
Minimum Lateral Undrclearance L 56:			02.20 m

PROPOSED IMPROVEMENTS

Bridge Cost 94:	NA	Type of Work 75:	Unknown (P)
Roadway Cost 95:	Unknown	Length of Improvment 76:	
Total Cost 96:	Unknown	Future ADT 114:	92,073
Year of Cost Estimate 97:	Unknown	Year of Future ADT 115:	2020

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.00 m	Horizontal Clearance 40:	0.00 m
Pier Protection 111:	Unknown (NBI)	Lift Bridge Vertical Clearance 116:	0.00 m

ELEMENT CONDITION STATE DATA

BRIDGE NOTES

Bridge Inspection Report

PAST INSPECTION

Inspection Date: 01/23/2014 Type: 1 Regular NBI

Inspector: -1 Pontis User Key: Pontis - Pontis Poı

Scope:

NBI: ☑ Other: ☐ Element: ☐

Underwater: ☐ Fracture Critical: ☑

INSPECTION NOTES

LIGHT TO MODERATE CORROSION AND SOME HOLES BY CORROSION AT STEEL PLATES. LATERAL COMPONENTS OF BRACINGS SHOWS LIGHT TO MODERATE CORROSION AND SECTION LOSS. MODERATE SECTION LOSS BY CORROSION AT UPPER CHORDS.

INSPECTOR WORK CANDIDATES

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

Team Leader: Arturo Cáceres
Bridge Inspector: José R. Vázquez
Bridge Evaluator: Arturo Cáceres
Assistants: Juan C. Otero _ _ _ _
Driver: Gabriel Diaz
Inspection date: Jan 23, 2014
Weather Conditions: Sunny
Amount of Time on Inspection: 1 Hours
Equipment: **X** Bus or Van _ Underwater _ Ladders _ Snooper **X** Camera _ Boat
_ Other:

Bridge Number: 1137

Road on Structure: N/A **Number or Name:** **Km.**
Road Under Structure: State Highway **Number or Name:** PR-26 **Km.** 4.07
Ident. Plaque: No **Num.**
Traffic Safety Features:

Bridge railings: not applicable or safety not reuired
Transitions: not applicable or safety not reuired
Approach Guardrail: not applicable or safety not reuired
Approach Guardrail Ends: not applicable or safety not reuired

41- Posting: Condition: A-Open Sign type: _ Posting Load:
Type of Inspection: Regular/routine inspection
COMMENTS AND/OR RECOMMENDATIONS:

Inspection by: **José R. Vázquez**
Bridge Inspector

Revised and Approved by: por **Arturo Cáceres**
Team Leader

BR-1137 1

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

58. DECK

58.1 Wearing Surface: Material: Steel   ***Condition:*** 5   Thickness   cm.

Deterioration: 10 to 25 %   Drainage: Inadequate   Ponding: Yes   Safety: Yes

58.2 Slab or Plate: Material: Steel   ***Condition:*** 5

Cracking: None

Spalling: Top: No   Bottom: No

Scaling: Top: No   Bottom: No

Efflorescence: No   Exudation: No   Rust Stains: No   Corrosion: Moderate

58.3 Movement: Deck to backwall: cm.   Deck to approach slab: cm.

	Material	Cond. Rating	Height Loss (cm)	Joints	Drainage	Alignment	Corrosion	Paint	Safety	Cracking	Spalling	Scaling
58.4 Curb	N/A	--		--	--	--	--	--	--	--	--	--
58.5 Median	N/A	--		--	--	--	--	--	--	--	--	--
58.6 Sidewalks	N/A	--		--	--	--	--	--	--	--	--	--
58.7 Parapets	N/A	--		--	--	--	--	--	--	--	--	--
58.8 Railing	Steel	6		Good	Good	Good	Moderate	--	Yes	--	--	--

58.9 Lighting Standards: Material: N/A   Condition: N/A   Functioning: N/A

58.10 Utilities:

Type: Size: Safety: _

58.11 Joints: **Condition:** N/A

Type: N/A   Functioning: N/A   Leaking: N/A   Cracking: N   Spalling: N   Armor: No

58.12 Drains and Scuppers:

Material: None Condition: N   Functioning: N/A

Comments:

58.1- Ligera y moderada corrosión en superficie, algunas pequeñas perforaciones por corrosión en las tolas.

59. SUPERSTRUCTURE

59.1 Bearing Devices: Type: Fixed/Mov. Out of Plumb: No Paint: None

Condition: 5

59.2 Bridge seats, pedestal, grout pads, abutments or pier seat where beams bear directly on conc.

Condition: N Cracking: No Spalling: None Scaling: None

Crushing: No

59.3 Steel beams: N/A Type: N/A

Condition: N/A Corrosion: N/A Paint: N/A

59.4 Concrete: N/A Type: N/A

Condition: N Cracking: No Spalling: Small Scaling: None

59.5 Truss: Ped. Bailey **Condition:** 5 Paint: Fair Corrosion: Moderate Members: N/A

59.6 Drainage: Type: N/A **Condition:** N/A Functioning: N/A

59.7 Hinges: **Condition:** N/A Functioning: N/A Movement: N/A

59.8 Deflection: N/A

59.9 Vibrations: N/A

60.0 SUBSTRUCTURE:

			Material	Cond. Rating	Cracking	Spalling	Scaling	Corrosion	Paint	Movement	Erosion	Undermining
Abutments	60.1.1	Wingwalls	N/A	N	–	–	–	–	–	–	–	–
	60.1.2	Breast-Backwall	N/A	N	–	–	–	–	–	–	–	–
	60.1.3	Footing	N/A	N	–	–	–	–	–	–	–	–
	60.1.4	Piles	N/A	N	–	–	–	–	–	–	–	–
Piers or Non Pile Bents	60.2.1	Caps	N/A	N	–	–	–	–	–	–	–	–
	60.2.2	Bracing	N/A	N	–	–	–	–	–	–	–	–
	60.2.3	Columns	Steel	6	–	–	–	Moderate	–	No	No	No
	60.2.4	Footing	Concrete	7	F	Small	–	–	–	No	No	No
	60.2.5	Piles	N/A	N	–	–	–	–	–	–	–	–
Rocker Bents	60.3.1	Caps	N/A	N	–	–	–	–	–	–	–	–
	60.3.2	Bracing	N/A	N	–	–	–	–	–	–	–	–
	60.3.3	Piles	N/A	N	–	–	–	–	–	–	–	–
Pile Bents	60.4.1	Caps	N/A	N	–	–	–	–	–	–	–	–
	60.4.2	Bracing	N/A	N	–	–	–	–	–	–	–	–
	60.4.3	Piles	N/A	N	–	–	–	–	–	–	–	–

Comments:

59.5- Varios de los componentes laterales de los “bracing” tienen ligera, moderada corrosión y pérdida de sección, algunas secciones en el “upper chord” tienen moderada pérdida de sección por corrosión.

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

61. CHANNEL AND PROTECTION **Condition:** N

61.1 Channel Scour: N/A

61.2 Embankment Erosion: N/A

		Type	Material	Condition Rating	Functioning
61.3	Protective Device		N/A	N	--
61.4	Fender System		N/A	N	--
61.5	Rip Rap		N/A	N	--
61.6	Spur Dikes, Jetties		N/A	N	--

61.7 Obstruction: N/A

61.8 Channel Change: N/A **Detrimental:** N/A

61.9 Adequate Waterway: N/A

61.10 Surrounding Area: Flooding: N/A if yes explain:

Erosion: N/A if yes explain:

61.11 Location of piers and/or abutment detrimental: N/A if yes explain:

61.12 Other features that may affect structure:

Comments:

62. CULVERT AND RETAINING WALL

	Material	Condition Rating	Functioning	Cracking	Spalling	Scaling	Corrosion	Settlement	Alignment	Scour
62.1 Barrel	N/A	N	--	--	--	--	--	--	--	--
62.2 Head Walls	N/A	N	--	--	--	--	--	--	--	--
62.3 Cut-off wall	N/A	N	--	--	--	--	--	--	--	--
62.4 Retaining wall	N/A	N	--	--	--	--	--	--	--	--

Comments:

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

71. WATER ADEQUACY: N/A N/A

72. APPROACH ROADWAY

72.1 Alignment: 6

72.2 Slab or Pavement **Condition:** N Material: Other

Cracking: No Spalling: None Scaling: None Uneven: No

Rough: No Settlement: No Movement: Approach slab-backwall: No Breaking up: No

Excessive deformation: No

Safety: Hazardous: No

Drainage: Inadequate: No

Movement: Pavement-approach slab: No

Embankment: **Condition:** N Functioning: Yes Erosion: No

Construction: Flimsy: No Integrity impaired: No

72.3 Undesirable Impact: No

72.4 Joints: No Type: None Inadequate: N/A Satisfactory Alignment: N/A

72.5 Guardrail Type: None Material: N/A Functioning: N/A

Condition: N Alignment Horizontal: N/A Vertical: N/A

Joints Functioning: N/A Safety Securely Attached: N/A Pedestrian Hazards: N/A

Comments:

90. INSPECTION DATE: Jan 23, 2014

93. CRITICAL FEATURE INSPECTION DATE

Fracture Critical:

Underwater:

Other Special Inspection:

102. DIRECTION OF TRAFFIC: Highway traffic not carried

106. YEAR RECONSTRUCTED:

107. DECK STRUCTURE TYPE: Steel Plate (includes orthotropic)

108. WEARING SURFACE/PROTECTIVE SYSTEM

Type wearing surface: Other

Type Membrane: None

Deck protection: None

111. PIER OR ABUTMENT PROTECTION (FOR NAVIGATION): N/A

113. SCOUR CRITICAL BRIDGES: N

116. MINUMUM NAVIGATION VERTICAL CLEARANCE:

AUXILIARY ITEMS

Signs: Type: Route Orientation Material: Alum. Condition: 5

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

Core Elements

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0

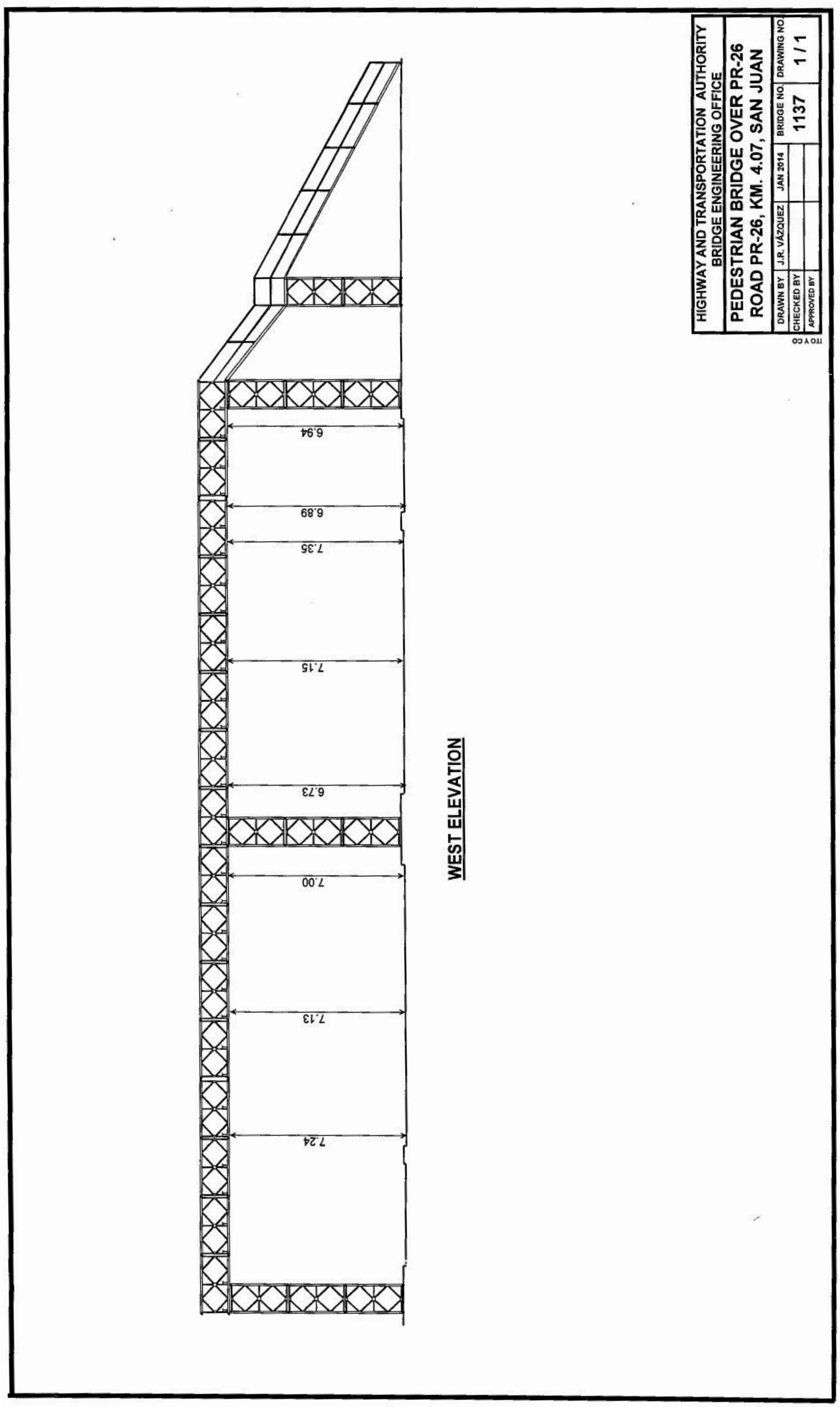
Non Core Elements

Elem. No.	Elements Description	Pag.		State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0

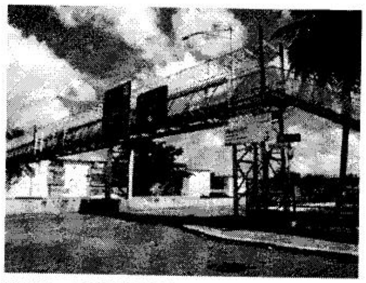
Smart Flags

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
											0
											0
											0

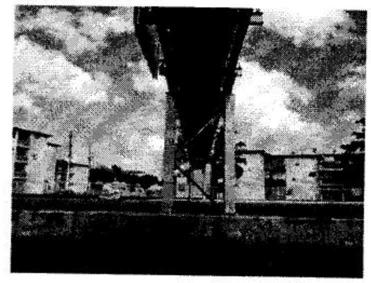
BR-1137 6



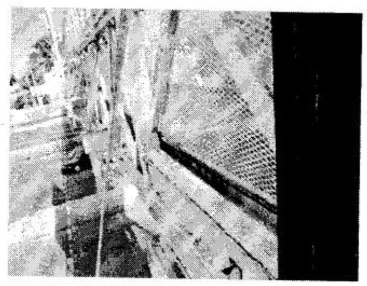
HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE
PEDESTRIAN BRIDGE OVER PR-26
ROAD PR-26, KM. 4.07, SAN JUAN
DRAWN BY J.R. VÁZQUEZ JAN 2014
CHECKED BY
APPROVED BY
BRIDGE NO. 1137
DRAWING NO. 1 / 1
WEST ELEVATION
6.94
6.89
7.35
7.15
6.73
7.00
7.13
7.24

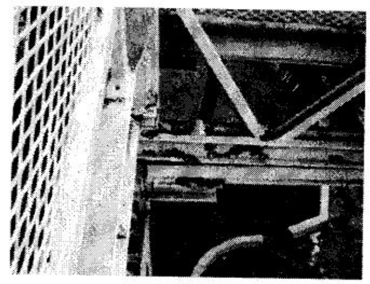

1137-Jan-23-2014-001.jpg

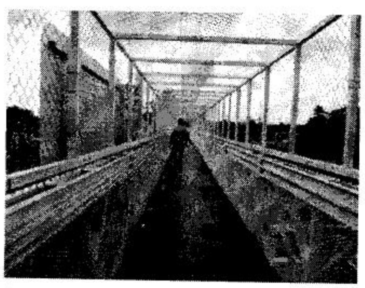

1137-Jan-23-2014-002.jpg

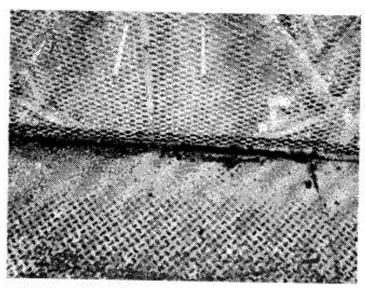

1137-Jan-23-2014-005.jpg

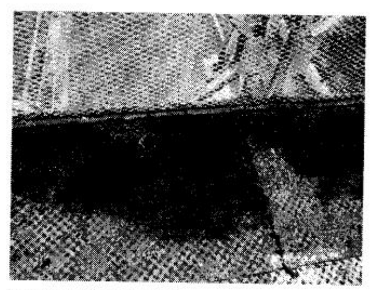

1137-Jan-23-2014-006.jpg


1137-Jan-23-2014-009.jpg


1137-Jan-23-2014-014.jpg


1137-Jan-23-2014-015.jpg


1137-Jan-23-2014-017.jpg


1137-Jan-23-2014-019.jpg

D.3 June 29, 2001

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

PAGE 1 OF 7

ENGINEER: EDUARDO MARQUEZ
ASSISTANTS: M. SANTIAGO
: JAIME RIVAS
: JUAN OTERO
: JORGE VIERA
:
EVALUATION DATE: 29/JUNE/01

BRIDGE No.: 01137 FEDERAL SYSTEM
ROAD No.: PR 26 KM. No. : 0004.070

EQUIPMENT

BUS X	LADDERS
BOAT	CAMERA X
UNDERWATER	SNOOPER #
SNOOPER OPERATOR	

PLAQUE ID
YES X NO No.
FILM No.

============IDENTIFICATION============

1- STATE :	Commonwealth of Puerto Rico	721
2- HIGHWAY AGENCY DISTRICT :	SAN JUAN	01
3- COUNTY (PARISH) CODE :	SAN JUAN	127
4- PLACE CODE :	SAN JUAN URBAN	76770
5- INVENTORY ROUTE :	2-2-1-00003-0	221000030
6- FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY
7- FACILITY CARRIED BY STRUCTURE :	PR 26	PR 26
8- STRUCTURE NUMBER :	1137 (1 OF 1)	011371
9- LOCATION :	BALDORIOTY DE CASTRO AVE.	BALDORIOTY DE CASTRO AVE.
10- INVENTORY ROUTE, MINIMUM VERTICAL CLEARANCE :	5.11m(16'-9")	0510
11- KILOMETERPOINT :	4.07	0004070
12- BASE HIGHWAY NETWORK :		0
13- LRS INVENTORY ROUTE, SUBROUTE NUMBER :		
16- LATITUDE :	18 DEG 27.3 MIN	18271800
17- LONGITUDE :	66 DEG 03.3 MIN	066031800
19- BYPASS, DETOUR LENGTH (NEAREST KILOMETER) :	STRUCTURE OVER HWY.	000

============CLASSIFICATION============

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	URBAN INTERSTATE	14

============AGE AND SERVICE==========

27- YEAR BUILT :	1968	1968
28- LANES ON AND UNDER STRUCTURE :	00 ON ; 05 UNDER	0005
29- A.D.T. OF INVENTORY ROUTE :	67,300	067300
30- YEAR OF A.D.T. :	1999	1999

===========STRUCTURE DATA=============

31- DESIGN LOAD :	PEDESTRIAN	7
32- APPROACH ROADWAY WIDTH :	24.59m(80.65ft)	0246
33- BRIDGE MEDIAN :	NONE	0
34- SKEW ANGLE :	NO	00
35- STRUCTURE FLARED :	NO	0
36- TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
37- HISTORICAL SIGNIFICANCE :	5	5
38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	NO	0000
40- NAVIGATION HORIZONTAL CLEARANCE :	NO	00000
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
42- TYPE OF SERVICE :	PEDESTRIAN OVER HWY.	31
43- STRUCTURE TYPE, MAIN :	STEEL TRUSS DECK	309
44- STRUCTURE TYPE APPR. :	NONE	000
45- NUMBER OF SPAN IN MAIN UNIT :	002	002
46- NUMBER OF APPROACH SPAN :	NONE	0000

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE No.: 01137 BRIDGE REINSPECTION & EVALUATION REPORT

18.4 mt

47- INV. ROUTE, TOTAL HORIZ. CLEARANCE : .... ~~L=23.59m(77.39ft) R=23.6m(77.4ft)~~ 184
48- LENGTH OF MAXIMUM SPAN : .... 23.6m(77.4ft) 00236
49- STRUCTURE LENGTH : .... 52.14m(171.01ft) 000521
50- CURB OR SIDEWALK WIDTHS : .... NONE 000000

============STRUCTURE DATA============

51- BRIDGE ROADWAY WIDTH, CURB TO CURB :................................. 1.64m(5.37ft) 0016
52- DECK WIDTH, OUT TO OUT : ....2.00m(6.56ft) 0020
53- MI. VERT. CLEAR. OVER BRIDGE ROADWAY : .... UNLIMITED 9999
54- MINIMUM VERTICAL UNDERCLEARANCE : .... 5.11m(16'-9") H0511
55- MINIMUM LATERAL UNDERCLEARANCE ON RIGHT : .... 1.19m(3.9ft) H012
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT : .... 2.22m(7.28ft) 022

===============CONDITION===============

58- DECK: FAIR CONDITION RATING: 5

58.1 WEARING SURFACE: MATERIAL: STEEL CONDITION : 5

THICKNESS:

DETERIORATION: YES X NO DRAINAGE: X ADEQUATE INADEQUATE

PONDING: YES X NO SAFETY: X YES NO

58.2 SLAB OR PLATE: MATERIAL: STEEL CONDITION 5

CRACKING: FINE MEDIUM OPEN

TOP BOTTOM

SPALLING: S < 1 in. DEEP x 6 in. & L > 1 in. x 6 in. &

SCALING : L to ¼ in., M ¼ in. - ½ in., H ½ in. - 1 in., S > 1

EFFLORESCENCE EXUDATION RUST STAINS XCORROSION: XLIGHT MODERATE SEVERE

58.3 MOVEMENT: DECK TO BACKWALL cm. DECK TO APPROACH SLAB cm.

DECK COMMENTS:

58.1 LITE AND MODERATE CORROSION IN ALL THE STRUCTURE.

	(58.4) CURBS	(58.5) MEDIAN	(58.6) SIDEWALKS	(58.7) PARAPETS	(58.8) RAILING
MATERIAL					STEEL
CONDITION RATING					6
HEIGHT LOSS (cm)					
JOINTS					OK
DRAINAGE					OK
ALIGNMENT					OK
CORROSION (L-M-S)					L
PAINT: G-GOOD, F-FAIR, P-POOR, N-NONE U-USELESS TO PAINT					F
SAFETY					YES
CRACKING (F-M-O)					
SPALLING (S-L)					
SCALING (L-M-H-S)					

58.9 LIGHTING STANDARDS: MATERIAL: NO CONDITION: FUNCTIONING: YES NO

58.10 UTILITIES: TYPE: NO SIZE: SAFETY:

58.11 JOINTS: EXPANSION CONSTRUCTION CONDITION: FUNCTIONING: YES NO

LEAKING: YES NO CRACKING: FINE MEDIUM OPEN SPALLING: SMALL LARGE

58.12 DRAINS AND SCUPPERS: MATERIAL: CONDITION: FUNCTIONING: YES NO

FEDERAL SYSTEM

PUERTO RICO HIGHWAY AUTHORITY

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE REINSPECTION & EVALUATION REPORT

BRIDGE No.: 01137

59- SUPERSTRUCTURE: FAIR CONDITION   RATING: 5

59.1 BEARING DEVICES: TYPE: FIXED   MOVABLE   OUT OF PLUMB
PAINT: GOOD   FAIR   POOR   NONE   USELESS TO PAINT
CONDITION: FUNCTIONING: YES   NO

59.2 BRIDGE SEATS,PEDESTAL,GROUT PADS,ABUTMENTS OR PIER SEATS WHERE BEAMS BEAR DIRECTLY ON CONCRETE
CONDITION: CRACKING: F   M   O   SPALLING: S   L
SCALING: L   M   H   S   CRUSHING:

59.3 STEEL-BEAMS: TYPE: DIMENSIONS(height;width;thickness):
CONDITION: CORROSION: L   M   S   PAINT: G   F   P   N   U

59.4 CONCRETE-BOX BEAMS, I-BEAMS, SLAB, T-BEAM, TYPE:
CONDITION: CRACKING: F   M   O   SPALLING: S   L
SCALING: L M H S

59.5 TRUSSES: TYPE: BAILEY   CONDITION: 5   CORROSION: X L X M   S
DAMAGE: DEFORMATION: PAINT: G   F   P   N   U
A=TRUSS B=UPPER & LOWER LATERAL BRACING C=PORTALS D=FLOOR BEAMS E*=STRINGERS

59.6 DRAINAGE: TYPE: CONDITION: FUNCTIONING: YES   NO

59.7 HINGES: CONDITION: FUNCTIONING: YES   NO   MOVEMENT: YES   NO
ALIGNMENT: GOOD   BAD   PAINT: G   F   P   N   U

59.8 DEFLECTIONS: X NORMAL   EXCESSIVE   cms.

59.9 VIBRATIONS: X MINIMAL   MODERATE   EXCESSIVE

SUPERSTRUCTURE COMMENTS:

59.5 LITE ABRASION BY CORROSION.

60- SUBSTRUCTURE: SATISFACTORY COND.   RATING: 6

	ABUTMENTS				PIERS OR NON PILES BENTS					PILES BENTS		
	60.1.1 WINGWALL	60.1.2 BREAST & BACKWALL	60.1.3 FOOTING	60.1.4 PILES	60.2.1 CAPS	60.2.2 BRACING	60.2.3 COLUMNS	60.2.4 FOOTINGS	60.2.5 PILES	60.4.1 CAPS	60.4.2 BRACING	60.4.3 PILES
MATERIAL							STEEL	CONCRETE				
CONDITION RATING							6	6				
CRACKING (F-M-O)								F				
SPALLING (S-L)								S				
SCALING (L-M-H-S)								L				
CORROSION (L-M-S)												
PAINT (G-F-P-N-U)							F	F				
MOVEMENT							NO	NO				
EROSION							NO	NO				
UNDERMINING							NO	NO				

60- SUBSTRUCTURE COMMENTS:

BRIDGE No.: 01137

BRIDGE REINSPECTION & EVALUATION REPORT

61- CHANNEL & CHANNEL PROTECTION : N/A RATING : N CHANNEL COMMENTS:

61.1 CHANNEL SCOUR(EXTENT) :

61.2 EMBANKMENT EROSION(EXTENT) :

	TYPE	MATERIAL	CONDITION RATING	FUNCTIONING YES	FUNCTIONING NO
61.3 PROTECTIVE DEVICE					
61.4 FENDER SYSTEM ----			---- ----	-- --	-- ---
61.5 RIP RAP					
61.6 SPUR DIKES,JETTIES			---- ----	-- --	-- ---

61.7 OBSTRUCTION (DEBRIS, GROWTHS):

61.8 CHANNEL CHANGE: YES NO

DETRIMENTAL: YES NO IF YES, EXPLAIN

61.9 ADEQUATE WATERWAY: YES NO IF NO, EXPLAIN

61.10 SURROUNDING AREA: FLOODING: YES NO IF YES, EXPLAIN

EROSION: YES NO IF YES, EXPLAIN

61.11 LOCATION OF PIERS AND/OR ABUTMENTS: DETRIMENTAL: YES NO

IF YES, EXPLAIN

61.12 OTHER FEATURES THAT MAY AFFECT STRUCTURE:

62- CULVERT AND RETAINING WALLS :N/A RATING :N CULVERT COMMENTS:

	62.1BARREL	62.2HEADWALL	62.3CUT-OFFWALL	62.4RETAINING WALL
MATERIAL				
CONDITION RATING	----- ----	------ -----	------- -------	--------- --------
FUNCTIONING(Y-N)				
CRACKING(F-M-O)	----- ----	------ -----	------- -------	--------- --------
SPALLING (S-L)				
SCALING(L-M-H-S)	----- ----	------ -----	------- -------	--------- --------
CORROSION(L-M-S)				
SETTLEMENT(Y-N)	----- ----	------ -----	------- -------	--------- --------
ALIGNMENT(Y-N)				
PAINT(G-F-P-N-U)	----- ----	------ -----	------- -------	--------- --------

63- METHOD USED TO DETERMINE OPERATING RATING .. ALLOWABLE STRESS 2

64- OPERATING RATING : .... PEDESTRIAN 800

65- METHOD USED TO DETERMINE INVENTORY RATING .. ALLOWABLE STRESS 2

66- INVENTORY RATING : .... PEDESTRIAN 800

67- STRUCTURAL EVALUATION : 5

SEVERE CORROSION & LIGHT SECTION LOSS AT WEARING SURFACE DUE TO PONDING.
FINE CRACKS,SMALL SPALLINGS & LIGHT SCALINGS AT COLUMNS FOOTINGS.PONDING AT
STAIRS & REST AREA.

68- DECK GEOMETRY : .... N

N/A

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : 3

(5.11 mt) (1.19mt, 2.23mt)

BASICALLY INTOLERABLE REQUIRING HIGH PRIORITY OF CORRECTIVE ACTION.

70- BRIDGE POSTING : .... N/A 5

71- WATERWAY ADEQUACY : .... N

N/A

REMOTE - GREATER THAN 100 YEARS. SLIGHT - 11 TO 100 YEARS. OCASSIONAL - 3 TO 10 YEARS. FREQUENT - LESS THAN 3 YEARS.
INSIGNIFICANT - MINOR INCONVENIENCE. HIGHWAY PASSABLE IN A MATTER OF HOURS. SIGNIFICANT - TRAFFIC DELAYS OF UP TO SEVERAL DAYS
SEVERE - LONG TERM DELAYS TO TRAFFIC WITH RESULTING HARDSHIP

72- APPROACH ROADWAY ALIGNMENT : 6

N/A

72.2 SLAB OR PAVEMENT CONDITION : MATERIAL :
CRACKING: F N O SPALLING: L S SCALING: L M H S UNNEVEN: YES NO ROUGH: YES NO
SETTLEMENT: YES NO MOVEMENT: APPROACH SLAB-BACKWALL: YES NO BREAKING UP: EXCESSIVE DEFORMATION:
SAFETY: HAZARDOUS YES NO DRAINAGE: INADEQUATE: YES NO PONDING: YES NO
MOVEMENT: PAVEMENT-APPROACH SLAB: YES NO EMBANKMENT: CONDITION:
FUNCTIONING: YES NO EROSION: YES NO IF YES, EXPLAIN
CONSTRUCTION: FLIMSY: YES NO
INTEGRITY IMPAIRED: YES NO IF YES, EXPLAIN
72.3 UNDESIRABLE IMPACT: YES NO
72.4 JOINTS: TYPE: INADEQUATE: YES NO SATISFACTORY ALIGNMENT: YES NO
72.5 GUARDRAIL: TYPE: MATERIAL: CONDITION: FUNCTIONING: YES NO
ALIGNMENT: HORIZONTAL: GOOD BAD VERTICAL: GOOD BAD JOINTS: FUNCTIONING: YES NO
SAFETY: SECURELY ATTACHED: YES NO PEDESTRIAN HAZARDS: YES NO

72- APPROACH ROADWAY - COMMENTS:

FEDERAL SYSTEM | PUERTO RICO HIGHWAY AUTHORITY | PAGE 6 OF 7

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE NO. :01137 | BRIDGE REINSPECTION & EVALUATION REPORT

========PROPOSED IMPROVEMENT========

75- TYPE OF WORK : .... REHABILITATION NEEDED 352
76- LENGTH OF STRUCTURE IMPROVEMENT : .... 52.14 MTS.(171.01 FT.) 000521

=============INSPECTIONS=============

89- RESERVED .... --
90- INSPECTION DATE : .... JUNE 2001 0601
91- DESIGNATED INSPECTION FRECUENCY : EVERY-24-MONTHS 24
92- CRITICAL FEATURE INSPECTION : .... NOT NEEDED N N N
93- CRITICAL FEAT. INSPECT. DATE: .... N/A
FRACTURE CRITICAL UNDERWATER OTHER

===========IMPROVEMENT COST===========

94- BRIDGE IMPROVEMENT COST : .... N/A 000000
95- ROADWAY IMPROVEMENT COST : .... N/A 000000
96- TOTAL PROJECT COST : .... (2.00)(52.14)(825)(0.15)=$12,905 000013
97- YEAR OF IMPROVEMENT COST ESTIMATED : 2001 2001

==CLASSIFICATION AND STRUCTURE DATA==

98- BORDER BRIDGE : .... --
99- BORDER BRIDGE STRUCTURE NUMBER : .... --
100- STRAHNET HIGHWAY DESIGNATION : .... IS A DH 0
101- PARALLEL STRUCTURE DESIGNATION : .... N/A N
102- DIRECTION OF TRAFFIC : .... NOT CARRIED TRAFFIC 0
103- TEMPORARY STRUCTURE DESIGNATION : .... N/A
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE : .... NHS 0
105- FEDERAL LANDS HIGHWAYS : 0
106- YEAR RECONSTRUCTION : .... N/A 0000
107- DECK STRUCTURE TYPE : .... STEEL PLATE 5
108- WEARING SURF./ PROTECT. SYSTEM : .... NONE 000
109- AVERAGE DAILY TRUCK TRAFFIC : .... 4%(EST) 04
110- DESIGNATED NATIONAL NETWORK : .... PART OF NNT 1
111- PIER OR ABUT. PROTECTION (NAVIGATION) : .... N/A
112- NBIS BRIDGE LENGTH : .... YES Y
113- SCOUR CRITICAL BRIDGE : .... N/A N
114- FUTURE AVERAGE DAILY TRAFFIC : 92,073 092073
115- YR. OF FUTURE A.D.T. : 2018 2018
116- MINIM. NAVIG. VERT. CLEARANCE : .... N/A
VERTICAL LIFT BRIDGE :
117- SUFFICIENCY RATING : ....
125- PRIORITY RATING: ....
127- EVALUATION DATE : 29/JUNE/01 062901
130- CRITICAL FRACTURE INSP. DATE : ....

ENGINEER :EDUARDO MARQUEZ

FEDERAL SYSTEM | PUERTO RICO HIGHWAY AUTHORITY | PAGE 7 OF 7

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE NO. :01137 | BRIDGE REINSPECTION & EVALUATION REPORT

AUXILIARY ITEMS
1-SIGNS
TYPE:
MATERIAL:
CONDITION:

REMARKS:
REHABILITATION CONSISTS ON REPAIRING THE DEFICIENCIES DISCUSSED ON ITEM 67.

D.4 March 11, 1999

PUERTO RICO HIGHWAY AUTHORITY — PAGE 1 OF 7

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE REINSPECTION & EVALUATION REPORT

ENGINEER: HERIBERTO GONZALEZ
ASSISTANTS: LUIS QUINONEZ
: JAIME RIVAS
: ALFREDO ERAZO
:
:

BRIDGE No.: 01137 FEDERAL SYSTEM

ROAD No.: PR 26 KM. No. : 0004.070

EVALUATION DATE: 11-MAR-1999

EQUIPMENT	
BUS X	LADDERS
BOAT	CAMERA X
UNDERWATER	SNOOPER #
SNOOPER OPERATOR	
PLAQUE ID	
YES X NO	No.
FILM No.	

============IDENTIFICATION===========

1- STATE :	Commonwealth of Puerto Rico	721
2- HIGHWAY AGENCY DISTRICT :	SAN JUAN	01
3- COUNTY (PARISH) CODE :	SAN JUAN	127
4- PLACE CODE :	SAN JUAN URBAN	76770
5- INVENTORY ROUTE :	2-~~1~~ 2-1-00003-0	2~~1~~ 2 1000030
6- FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY
7- FACILITY CARRIED BY STRUCTURE :	PR 26	PR 26
8- STRUCTURE NUMBER :	1137 (1 OF 1)	011371
9- LOCATION :	BALDORIOTY DE CASTRO AVE.	BALDORIOTY DE CASTRO AVE.
10- INVENTORY ROUTE, MINIMUM VERTICAL CLEARANCE :	5.11m(16'-9")	0510
11- KILOMETERPOINT :	4.07	0004070
12- BASE HIGHWAY NETWORK :		~~1~~ 0
13- LRS INVENTORY ROUTE, SUBROUTE NUMBER :		blank ~~000000002600~~
16- LATITUDE :	18 DEG 27.3 MIN	18271800
17- LONGITUDE :	66 DEG 03.3 MIN	066031800
19- BYPASS, DETOUR LENGTH (NEAREST KILOMETER) :	STRUCTURE OVER HWY.	000

============CLASSIFICATION===========

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	URBAN INTERSTATE	11

============AGE AND SERVICE==========

27- YEAR BUILT :	1968	1968
28- LANES ON AND UNDER STRUCTURE :	00 ON ; 05 UNDER	0005
29- A.D.T. OF INVENTORY ROUTE :	67,300	067300
30- YEAR OF A.D.T. :	1996	1996

===========STRUCTURE DATA=============

31- DESIGN LOAD :	PEDESTRIAN	7
32- APPROACH ROADWAY WIDTH :	24.59m(80.65ft)	024~~7~~ 6
33- BRIDGE MEDIAN :	NONE	0
34- SKEW ANGLE :	NO	00
35- STRUCTURE FLARED :	NO	0
36- TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
37- HISTORICAL SIGNIFICANCE :	5	5
38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	NO	0000
40- NAVIGATION HORIZONTAL CLEARANCE :	NO	00000
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
42- TYPE OF SERVICE :	PEDESTRIAN OVER HWY.	31
43- STRUCTURE TYPE, MAIN :	STEEL TRUSS DECK	309
44- STRUCTURE TYPE APPR. :	NONE	000
45- NUMBER OF SPAN IN MAIN UNIT :	002	002
46- NUMBER OF APPROACH SPAN :	NONE	0000

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE No.: 01137 BRIDGE REINSPECTION & EVALUATION REPORT

47- INV. ROUTE, TOTAL HORIZ. CLEARANCE : .... 18.4 ~~1[illegible]~~ m rt .... L=23.59m(77.39ft) R=23.6m(77.4ft) JR ~~[illegible]~~ 184 ~~237~~ 40 JR
48- LENGTH OF MAXIMUM SPAN : .... 23.6m(77.4ft) 0023~~5~~6
49- STRUCTURE LENGTH : .... 52.14m(171.01ft) 000521
50- CURB OR SIDEWALK WIDTHS : .... NONE 000000

============STRUCTURE DATA============

51- BRIDGE ROADWAY WIDTH, CURB TO CURB : .... 1.64m(5.37ft) 0016
52- DECK WIDTH, OUT TO OUT : ....2.00m(6.56ft) 0020
53- MI. VERT. CLEAR. OVER BRIDGE ROADWAY : .... UNLIMITED 9999
54- MINIMUM VERTICAL UNDERCLEARANCE : .... 5.11m(16'-9") H051~~0~~1 JR
55- MINIMUM LATERAL UNDERCLEARANCE ON RIGHT : .... 1.19m(3.9ft) H012
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT : .... 2.22m(7.28ft) 022

===============CONDITION===============

58- DECK: FAIR CONDITION RATING: 5

58.1 WEARING SURFACE: MATERIAL: STEEL CONDITION : 5
THICKNESS:
DETERIORATION: YES X NO DRAINAGE: X ADEQUATE INADEQUATE
PONDING: YES X NO SAFETY: X YES NO

58.2 SLAB OR PLATE: MATERIAL: STEEL CONDITION 5
CRACKING: FINE MEDIUM OPEN
TOP BOTTOM
SPALLING: |S < 1 in. DEEP x 6 in. & L > 1 in. x 6 in. &
SCALING : |L to ¼ in., M ¼ in. - ½ in., H ½ in. - 1 in., S > 1 |

EFFLORESCENCE EXUDATION RUST STAINS XCORROSION: XLIGHT MODERATE SEVERE

58.3 MOVEMENT: DECK TO BACKWALL cm. DECK TO APPROACH SLAB cm.

DECK COMMENTS:
STRUCTURE WAS PAINTED. STEEL SHOWS LIGH
T TO MODERATE
CORROSION.

	(58.4) CURBS	(58.5) MEDIAN	(58.6) SIDEWALKS	(58.7) PARAPETS	(58.8) RAILING
MATERIAL					STEEL
CONDITION RATING					6
HEIGHT LOSS (cm)					
JOINTS					OK
DRAINAGE					
ALIGNMENT					OK
CORROSION (L-M-S)					L
PAINT:G-GOOD, F-FAIR, P-POOR, N-NONE U-USELESS TO PAINT					F
SAFETY					YES
CRACKING (F-M-O)					
SPALLING (S-L)					
SCALING (L-M-H-S)					

58.9 LIGHTING STANDARDS: MATERIAL: NO CONDITION: FUNCTIONING: YES NO
58.10 UTILITIES: TYPE: NO SIZE: SAFETY:
58.11 JOINTS: EXPANSION CONSTRUCTION CONDITION: FUNCTIONING: YES NO
LEAKING: YES NO CRACKING: FINE MEDIUM OPEN SPALLING: SMALL LARGE
58.12 DRAINS AND SCUPPERS: MATERIAL: CONDITION: FUNCTIONING: YES NO

BRIDGE No.: 01137

59- SUPERSTRUCTURE: FAIR CONDITION RATING: 5 SUPERSTRUCTURE COMMENTS:

59.1 BEARING DEVICES: TYPE: FIXED MOVABLE OUT OF PLUMB
PAINT: GOOD FAIR POOR NONE USELESS TO PAINT
CONDITION: FUNCTIONING: YES NO

59.2 BRIDGE SEATS, PEDESTAL, GROUT PADS, ABUTMENTS OR PIER SEATS WHERE BEAMS BEAR DIRECTLY ON CONCRETE
CONDITION: CRACKING: F M O SPALLING: S L
SCALING: L M H S CRUSHING:

59.3 STEEL-BEAMS: TYPE: DIMENSIONS(height;width;thickness):
CONDITION: CORROSION: L M S PAINT: G F P N U

59.4 CONCRETE-BOX BEAMS, I-BEAMS, SLAB, T-BEAM, TYPE:
CONDITION: CRACKING: F M O SPALLING: S L
SCALING: L M H S

59.5 TRUSSES: TYPE: BAILEY CONDITION: 5 CORROSION: X L X M S
DAMAGE: DEFORMATION: . PAINT: G F P N U
A=TRUSS B=UPPER & LOWER LATERAL BRACING C=PORTALS D=FLOOR BEAMS E*=STRINGERS

59.6 DRAINAGE: TYPE: CONDITION: FUNCTIONING: YES NO

59.7 HINGES: CONDITION: FUNCTIONING: YES NO MOVEMENT: YES NO
ALIGNMENT: GOOD BAD PAINT: G F P N U

59.8 DEFLECTIONS: X NORMAL EXCESSIVE cms.

59.9 VIBRATIONS: X MINIMAL MODERATE EXCESSIVE

60- SUBSTRUCTURE: SATISFACTORY COND. RATING: 6

	ABUTMENTS				PIERS OR NON PILES BENTS					PILES BENTS		
	60.1.1 WINGWALL	60.1.2 BREAST & BACKWALL	60.1.3 FOOTING	60.1.4 PILES	60.2.1 CAPS	60.2.2 BRACING	60.2.3 COLUMNS	60.2.4 FOOTINGS	60.2.5 PILES	60.4.1 CAPS	60.4.2 BRACING	60.4.3 PILES
MATERIAL							STEEL	CONCRETE				
CONDITION RATING							6	6				
CRACKING (F-M-O)								F				
SPALLING (S-L)								S				
SCALING (L-M-H-S)								L				
CORROSION (L-M-S)												
PAINT (G-F-P-N-U)							F	F				
MOVEMENT							NO	NO				
EROSION							NO	NO				
UNDERMINING							NO	NO				

60- SUBSTRUCTURE COMMENTS:

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE No.: 01137 BRIDGE REINSPECTION & EVALUATION REPORT

61- CHANNEL & CHANNEL PROTECTION : N/A RATING : N CHANNEL COMMENTS:

61.1 CHANNEL SCOUR(EXTENT) :

61.2 EMBANKMENT EROSION(EXTENT) :

	TYPE	MATERIAL	CONDITION RATING	FUNCTIONING YES	FUNCTIONING NO
61.3 PROTECTIVE DEVICE					
61.4 FENDER SYSTEM					
61.5 RIP RAP					
61.6 SPUR DIKES, JETTIES					

61.7 OBSTRUCTION (DEBRIS, GROWTHS):

61.8 CHANNEL CHANGE: YES NO

DETRIMENTAL: YES NO IF YES, EXPLAIN

61.9 ADEQUATE WATERWAY: YES NO IF NO, EXPLAIN

61.10 SURROUNDING AREA: FLOODING: YES NO IF YES, EXPLAIN

EROSION: YES NO IF YES, EXPLAIN

61.11 LOCATION OF PIERS AND/OR ABUTMENTS: DETRIMENTAL: YES NO

IF YES, EXPLAIN

61.12 OTHER FEATURES THAT MAY AFFECT STRUCTURE:

62- CULVERT AND RETAINING WALLS :N/A RATING :N CULVERT COMMENTS:

	62.1BARREL	62.2HEADWALL	62.3CUT-OFFWALL	62.4RETAINING WALL
MATERIAL				
CONDITION RATING				
FUNCTIONING(Y-N)				
CRACKING(F-M-O)				
SPALLING (S-L)				
SCALING(L-M-H-S)				
CORROSION(L-M-S)				
SETTLEMENT(Y-N)				
ALIGNMENT(Y-N)				
PAINT(G-F-P-N-U)				

63- METHOD USED TO DETERMINE OPERATING RATING .. 2

64- OPERATING RATING : .... PEDESTRIAN 800

65- METHOD USED TO DETERMINE INVENTORY RATING .. 2

66- INVENTORY RATING : .... PEDESTRIAN 800

67- STRUCTURAL EVALUATION : 5

SEVERE CORROSION & LIGHT SECTION LOSS AT WEARING SURFACE DUE TO PONDING.
FINE CRACKS, SMALL SPALLINGS & LIGHT SCALINGS AT COLUMNS FOOTINGS. PONDING AT
STAIRS & REST AREA.

68- DECK GEOMETRY : .... N

N/A

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : 3

BASICALLY INTOLERABLE REQUIRING HIGH PRIORITY OF CORRECTIVE ACTION.

70- BRIDGE POSTING : .... N/A 5

71- WATERWAY ADEQUACY : .... N

N/A

REMOTE - GREATER THAN 100 YEARS. SLIGHT - 11 TO 100 YEARS. OCASSIONAL - 3 TO 10 YEARS. FREQUENT - LESS THAN 3 YEARS.
INSIGNIFICANT - MINOR INCONVENIENCE. HIGHWAY PASSABLE IN A MATTER OF HOURS. SIGNIFICANT - TRAFFIC DELAYS OF UP TO SEVERAL DAYS
SEVERE - LONG TERM DELAYS TO TRAFFIC WITH RESULTING HARDSHIP

72- APPROACH ROADWAY ALIGNMENT : .... N 6

N/A

72.2 SLAB OR PAVEMENT CONDITION : MATERIAL :
CRACKING: F N O SPALLING: L S SCALING: L M H S UNNEVEN: YES NO ROUGH: YES NO
SETTLEMENT: YES NO MOVEMENT: APPROACH SLAB-BACKWALL: YES NO BREAKING UP: EXCESSIVE DEFORMATION:
SAFETY: HAZARDOUS YES NO DRAINAGE: INADEQUATE: YES NO PONDING: YES NO
MOVEMENT: PAVEMENT-APPROACH SLAB: YES NO EMBANKMENT: CONDITION:
FUNCTIONING: YES NO EROSION: YES NO IF YES, EXPLAIN
CONSTRUCTION: FLIMSY: YES NO
INTEGRITY IMPAIRED: YES NO IF YES, EXPLAIN
72.3 UNDESIRABLE IMPACT: YES NO
72.4 JOINTS: TYPE: INADEQUATE: YES NO SATISFACTORY ALIGNMENT: YES NO
72.5 GUARDRAIL: TYPE: MATERIAL: CONDITION: FUNCTIONING: YES NO
ALIGNMENT: HORIZONTAL: GOOD BAD VERTICAL: GOOD BAD JOINTS: FUNCTIONING: YES NO
SAFETY: SECURELY ATTACHED: YES NO PEDESTRIAN HAZARDS: YES NO

72- APPROACH ROADWAY - COMMENTS:

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE NO. :01137

BRIDGE REINSPECTION & EVALUATION REPORT

========PROPOSED IMPROVEMENT========

75- TYPE OF WORK :	REHABILITATION NEEDED	352
76- LENGTH OF STRUCTURE IMPROVEMENT :	52.14 MTS.(171.01 FT.)	000521

=============INSPECTIONS=============

89- RESERVED		--
90- INSPECTION DATE :	MARCH-11-1999	0399
91- DESIGNATED INSPECTION FRECUENCY :	EVERY-24-MONTHS	24
92- CRITICAL FEATURE INSPECTION :	NOT NEEDED	N N N
93- CRITICAL FEAT. INSPECT. DATE:	N/A	
FRACTURE CRITICAL UNDERWATER OTHER		

===========IMPROVEMENT COST===========

94- BRIDGE IMPROVEMENT COST :	N/A	000000
95- ROADWAY IMPROVEMENT COST :	N/A	000000
96- TOTAL PROJECT COST :	(2.00)(52.14)(825)(0.15)=$12,905	00001~~6~~13
97- YEAR OF IMPROVEMENT COST ESTIMATED :	1999	1999

==CLASSIFICATION AND STRUCTURE DATA==

98- BORDER BRIDGE :		--
99- BORDER BRIDGE STRUCTURE NUMBER :		--
100- STRAHNET HIGHWAY DESIGNATION :	IS A DH	1
101- PARALLEL STRUCTURE DESIGNATION :	N/A	N
102- DIRECTION OF TRAFFIC :	NOT CARRIED TRAFFIC	0
103- TEMPORARY STRUCTURE DESIGNATION :	N/A	
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE :	NM NHS	~~1~~ 0
105- FEDERAL LANDS HIGHWAYS :		0
106- YEAR RECONSTRUCTION :	N/A	0000
107- DECK STRUCTURE TYPE :	STEEL PLATE	5
108- WEARING SURF./ PROTECT. SYSTEM :	NONE	000
109- AVERAGE DAILY TRUCK TRAFFIC :	4%(EST)	04
110- DESIGNATED NATIONAL NETWORK :	PART OF NNT	1
111- PIER OR ABUT. PROTECTION (NAVIGATION) :	N/A	
112- NBIS BRIDGE LENGTH :	YES	Y
113- SCOUR CRITICAL BRIDGE :	N/A	N
114- FUTURE AVERAGE DAILY TRAFFIC :	92,073	092073
115- YR. OF FUTURE A.D.T. :	2016	2016
116- MINIM. NAVIG. VERT. CLEARANCE :	N/A	
VERTICAL LIFT BRIDGE :		
117- SUFFICIENCY RATING :		
125- PRIORITY RATING:		
127- EVALUATION DATE :	11-MAR-1999	031199
130- CRITICAL FRACTURE INSP. DATE :		

ENGINEER :HERIBERTO GONZALEZ

BRIDGE NO. :01137

BRIDGE REINSPECTION & EVALUATION REPORT

AUXILIARY ITEMS

1-SIGNS

TYPE:

MATERIAL:

CONDITION:

REMARKS:

REHABILITATION CONSISTS ON REPAIRING THE DEFICIENCIES DISCUSSED ON ITEM 67.

D.5 August 19, 1996

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REPORT

PAGE 1 OF 3
DATE : 08/19/96
TIME : 13:59:19

FEDERAL SYSTEM   BRIDGE NO. : 01137 - ROAD NO. : PR 26   - KM. NO. : 004.070

============IDENTIFICATION============

1- STATE :	Commonwealth of Puerto Rico	721
2- STATE HIGHWAY DEPARTMENT :	SAN JUAN	01
3- COUNTY (PARISH) CODE :	SAN JUAN	127
4- PLACE CODE :	SAN JUAN URBAN	76770
5- INVENTORY ROUTE :	2-1-1-00003-0	211000030
6- FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY
7- FACILITY CARRIED BY STRUCTURE :	PR 26	PR 26
8- STRUCTURE NUMBER :	1137 (1 OF 1)	011371
9- LOCATION :	BALDORIOTY DE CASTRO AVE.	BALDORIOTY DE CASTRO AVE.
10- INV. ROUTE, MIN. CLEAR. (0.01m) :	5.11m(16'-9")	1609
11- MILEPOINT :	4.07	004070
16- LATITUDE :	18 DEG 27.3 MIN	18273
17- LONGITUDE :	66 DEG 03.3 MIN	066033
19- BYPASS, DETOUR LENGTH (NEAREST MILE) :	STRUCTURE OVER HWY.	00

============CLASSIFICATION============

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	URBAN INTERSTATE	11

============AGE AND SERVICE==========

27- YEAR BUILT :	1968	1968
28- LANES ON AND UNDER STRUCTURE :	00 ON ; 05 UNDER	0005
29- A.D.T. OF INVENTORY ROUTE :	114,900	114900
30- YEAR OF A.D.T. :	1995	95

===========STRUCTURE DATA============

31- DESING LOAD :	PEDESTRIAN	7
32- APPROACH ROADWAY WIDTH :	24.59m(80.65ft)	081
33- BRIDGE MEDIAN :	NONE	0
34- SKEW ANGLE :	NO	00
35- STRUCTURE FLARED :	NO	0
36- TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
37- HISTORICAL SIGNIFICANCE :	5	5
38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	NO	000
40- NAVIGATION HORIZONTAL CLEARANCE :	NO	0000
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
42- TYPE OF SERVICE :	PEDESTRIAN OVER HWY.	31
43- STRUCTURE TYPE, MAIN :	STEEL TRUSS DECK	309
44- STRUCTURE TYPE APPR. :	NONE	000
45- NUMBER OF SPAN IN MAIN UNIT :	002	002
46- NUMBER OF APPROACH SPAN :	NONE	0000
47- INV. ROUTE, TOTAL HORIZ. CLEARANCE :	L=23.59m(77.39ft) R=23.6m(77.4ft)	774
48- LENGTH OF MAXIMUM SPAN :	23.6m(77.4ft)	0077
49- STRUCTURE LENGTH :	52.14m(171.01ft)	000171
50- CURB OR SIDEWALK WIDTHS :	NONE	000000

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE

FEDERAL SYSTEM BRIDGE NO. : 01137 - ROAD NO. : PR 26 - KM. NO. : 004.070

============STRUCTURE DATA============

51- BRIDGE ROADWAY WIDTH, CURB TO CURB :	1.64m(5.37ft)	0054
52- DECK WIDTH, OUT TO OUT :	2.00m(6.56ft)	0066
53- MI. VERT. CLEAR. OVER BRIDGE ROADWAY :	UNLIMITED	9999
54- MINIMUM VERTICAL UNDERCLEARANCE :	5.11m(16'-9")	H1609
55- MINIMUM LATERAL UDERCLEARANCE ON RIGHT :	1.19m(3.9ft)	H039
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT :	2.22m(7.28ft)	073

===============CONDITION==============

	MATERIAL	CONDITION ANALYSIS	
58- DECK	STEEL	FAIR CONDITION	5
59- SUPERSTRUCTURE	STEEL	FAIR CONDITION	5
60- SUBSTRUCTURE	STEEL	SATISFACTORY COND.	6
61- CHANNEL & CHANNEL PROTECTION	N/A	N/A	N
62- CULVERT	N/A	N/A	N
64- OPERATING RATING :		PEDESTRIAN	800
66- INVENTORY RATING :		PEDESTRIAN	800

67- STRUCTURAL EVALUATION : 5

PEDESTRIAN HAS LIGHT CORROSION & LIGHT SECTION LOSS. BRIDGE WAS PAINTED.

68- DECK GEOMETRY : ....

N/A

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : 3

BASICALLY INTOLERABLE REQUIRING HIGH PRIORITY OF CORRECTIVE ACTION.

70- BRIDGE POSTING : .... N/A

71- WATERWAY ADEQUACY : .... N

N/A

72- APPROACH ROADWAY ALIGMENT : .... N

N/A

========PROPOSED IMPROVEMENT========

75- TYPE OF WORK :	REHABILITATION NEEDED	352
76- LENGTH OF STRUCTURE IMPROVEMENT :	52.14 MTS.(171.01 FT.)	000171

PUERTO RICO HIGHWAY AUTHORITY

BIRDGE STUDIES AND EVALUATION OFFICE

FEDERAL SYSTEM   BRIDGE NO. : 01137 - ROAD NO. : PR 26   - KM. NO. : 004.070

=============INSPECTIONS==============

89- RESERVED		--
90- INSPECTION DATE :	AUGUST 16,1996	0896
91- DESIGNATED INSPECTION FRECUENCY :	EVERY-24-MONTHS	24
92- CRITICAL FEATURE INSPECTION :	NOT NEEDED	N N N
93- CRITICAL FEAT. INSPECT. DATE:	N/A	

===========IMPROVEMENT COST===========

94- BRIDGE IMPROVEMENT COST :	N/A	000000
95- ROADWAY IMPROVEMENT COST :	N/A	000000
96- TOTAL PROJECT COST :	(2.00)(52.14)(1035)(0.15)=$16,189	000016
97- YEAR OF IMPROVEMENT COST ESTIMATED :	1996	96

==CLASSIFICATION AND STRUCTURE DATA==

98- BORDER BRIDGE :		--
99- BORDER BRIDGE STRUCTURE NUMBER :		--
100- DEFENSE HIGHWAY DESIGNATION :	IS A DH	1
101- PARALLEL STRUCTURE DESIGNATION :	N/A	N
102- DIRECTION OF TRAFFIC :	NOT CARRIED TRAFFIC	0
103- TEMPORARY STRUCTURE DESIGNATION :	N/A	
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE :	NHS	1
105- RESERVED		--
106- YEAR RECONSTRUCTION :	N/A	0000
107- DECK STRUCTURE TYPE :	STEEL PLATE	5
108- WEARING SURF./ PROTECT. SYSTEM :	NONE	000
109- AVERAGE DAILY TRUCK TRAFFIC :	4%(EST)	04
110- DESIGNATED NATIONAL NETWORK :	PART OF NNT	1
111- PIER OR ABUT. PROTECTION (NAVIGATION) :	N/A	
112- NBIS BRIDGE LENGTH :	YES	Y
113- SCOUR CRITICAL BRIDGE :	N/A	N
114- FUTURE AVERAGE DAILY TRAFFIC :	136,100	136100
115- YR. OF FUTURE A.D.T. :	2012	12
116- MINIM. NAVIG. VERT. CLEARANCE :	N/A	
117- SUFFICIENCY RATING :	.	.
126- FIELD INSPECTION DATE :	081696	081696
127- INSPECTION EVAL. DATE :	081696	081696
130- CRITICAL FRACTURE INSP. DATE :		
131- EVALUATOR ENGINEER :		

REMARKS:

REHABILITATION CONSISTS ON REPAIRING THE DEFICIENCIES DISCUSSED ON ITEM 67.

D.6 December 22, 1994

PUERTO RICO HIGHWAY AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE
BRIDGE REPORT
------ ------

PAGE 1 OF 3
DATE : 12/22/94
TIME : 18:46:21

FEDERAL SYSTEM BRIDGE NO. : 01137 - ROAD NO. : PR 26 - KM. NO. : 004.070

	============IDENTIFICATION============		
1-	STATE :	Commonwealth of Puerto Rico	721
2-	STATE HIGHWAY DEPARTMENT :	SAN JUAN	01
3-	COUNTY (PARISH) CODE :	SAN JUAN	127
4-	PLACE CODE :	SAN JUAN URBAN	76770
5-	INVENTORY ROUTE :	2-1-1-00003-0	211000030
6-	FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY
7-	FACILITY CARRIED BY STRUCTURE :	PR 26	PR 26
8-	STRUCTURE NUMBER :	1137 (1 OF 1)	011371
9-	LOCATION :	BALDORIOTY DE CASTRO AVE.	BALDORIOTY DE CASTRO AVE.
10-	INV. ROUTE, MIN. CLEAR. (0.01m) :	5.11m(16′-9")	1609
11-	MILEPOINT :	4.07	004070
16-	LATITUDE :	18 DEG 27.3 MIN	18273
17-	LONGITUDE :	66 DEG 03.3 MIN	066033
19-	BYPASS, DETOUR LENGTH (NEAREST MILE) :	STRUCTURE OVER HWY.	00
	============CLASSIFICATION============		
20-	TOLL :	ON FREE ROAD	3
21-	MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22-	OWNER :	D.T.P.W.	01
26-	FUNCTIONAL CLASS. OF INVENTORY ROUTE :	URBAN INTERSTATE	11
	============AGE AND SERVICE==========		
27-	YEAR BUILT :	1968	1968
28-	LANES ON AND UNDER STRUCTURE :	00 ON ; 05 UNDER	0005
29-	A.D.T. OF INVENTORY ROUTE :	109,500	109500
30-	YEAR OF A.D.T. :	1993	93
	===========STRUCTURE DATA=============		
31-	DESING LOAD :	PEDESTRIAN	7
32-	APPROACH ROADWAY WIDTH :	24.59m(80.65ft)	081
33-	BRIDGE MEDIAN :	NONE	0
34-	SKEW ANGLE :	NO	00
35-	STRUCTURE FLARED :	NO	0
36-	TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
37-	HISTORICAL SIGNIFICANCE :	5	5
38-	NAVIGATION CONTROL :	N/A	N
39-	NAVIGATION VERTICAL CLEARANCE :	NO	000
40-	NAVIGATION HORIZONTAL CLEARANCE :	NO	0000
41-	STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
42-	TYPE OF SERVICE :	PEDESTRIAN OVER HWY.	31
43-	STRUCTURE TYPE, MAIN :	STEEL TRUSS DECK	309
44-	STRUCTURE TYPE APPR. :	NONE	000
45-	NUMBER OF SPAN IN MAIN UNIT :	002	002
46-	NUMBER OF APPROACH SPAN :	NONE	0000
47-	INV. ROUTE, TOTAL HORIZ. CLEARANCE :	L=23.59m(77.39ft) R=23.6m(77.4ft)	774
48-	LENGTH OF MAXIMUM SPAN :	23.6m(77.4ft)	0077
49-	STRUCTURE LENGTH :	52.14m(171.01ft)	000171
50-	CURB OR SIDEWALK WIDTHS :	NONE	000000

PUERTO RICO HIGHWAY AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE

FEDERAL SYSTEM BRIDGE NO. : 01137 - ROAD NO. : PR 26 - KM. NO. : 004.070

============STRUCTURE DATA============

51- BRIDGE ROADWAY WIDTH, CURB TO CURB	1.64m(5.37ft)	0054
52- DECK WIDTH, OUT TO OUT	2.00m(6.56ft)	0066
53- MI. VERT. CLEAR. OVER BRIDGE ROADWAY	UNLIMITED	9999
54- MINIMUM VERTICAL UNDERCLEARANCE	5.11m(16'-9")	H1609
55- MINIMUM LATERAL UDERCLEARANCE ON RIGHT	1.19m(3.9ft)	H039
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT	2.22m(7.28ft)	073

===============CONDITION===============

	MATERIAL	CONDITION ANALYSIS	
58- DECK	STEEL	FAIR CONDITION	5
59- SUPERSTRUCTURE	STEEL	FAIR CONDITION	5
60- SUBSTRUCTURE	STEEL	SATISFACTORY COND.	6
61- CHANNEL & CHANNEL PROTECTION	N/A	N/A	N
62- CULVERT	N/A	N/A	N
64- OPERATING RATING		PEDESTRIAN	800
66- INVENTORY RATING		PEDESTRIAN	800

67- STRUCTURAL EVALUATION : 5

SEVERE CORROSION & LIGHT SECTION LOSS AT WEARING SURFACE DUE TO PONDING.
FINE CRACKS,SMALL SPALLINGS & LIGHT SCALINGS AT COLUMNS FOOTINGS.PONDING AT STAIRS & REST AREA.

68- DECK GEOMETRY : .... N

N/A

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : 3

BASICALLY INTOLERABLE REQUIRING HIGH PRIORITY OF CORRECTIVE ACTION.

70- BRIDGE POSTING : .... N/A N

71- WATERWAY ADEQUACY : .... N

N/A

72- APPROACH ROADWAY ALIGMENT : .... ~~N~~ P

N/A

========PROPOSED IMPROVEMENT========

75- TYPE OF WORK	REHABILITATION NEEDED	352
76- LENGTH OF STRUCTURE IMPROVEMENT	52.14 MTS.(171.01 FT.)	000171

PUERTO RICO HIGHWAY AUTHORITY

HIGHWAY SYSTEM ADMINISTRATION OFFICE

FEDERAL SYSTEM BRIDGE NO. : 01137 - ROAD NO. : PR 26 - KM. NO. : 004.070

=============INSPECTIONS=============

89- RESERVED		--
90- INSPECTION DATE :	DECEMBER 1994	1294
91- DESIGNATED INSPECTION FRECUENCY :	EVERY-24-MONTHS	24
92- CRITICAL FEATURE INSPECTION :	NOT NEEDED	N N N
93- CRITICAL FEAT. INSPECT. DATE:	N/A	

===========IMPROVEMENT COST===========

94- BRIDGE IMPROVEMENT COST :	N/A	000000
95- ROADWAY IMPROVEMENT COST :	N/A	000000
96- TOTAL PROJECT COST :	(2.00)(52.14)(825)(0.15)=$12,905	000013
97- YEAR OF IMPROVEMENT COST ESTIMATED :	1994	94

==CLASSIFICATION AND STRUCTURE DATA==

98- BORDER BRIDGE :		--
99- BORDER BRIDGE STRUCTURE NUMBER :		--
100- DEFENSE HIGHWAY DESIGNATION :	IS A DH	1
101- PARALLEL STRUCTURE DESIGNATION :	N/A	N
102- DIRECTION OF TRAFFIC :	NOT CARRIED TRAFFIC	0
103- TEMPORARY STRUCTURE DESIGNATION :	N/A	
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE :	NHS	1
105- RESERVED		--
106- YEAR RECONSTRUCTION :	N/A	0000
107- DECK STRUCTURE TYPE :	STEEL PLATE	5
108- WEARING SURF./ PROTECT. SYSTEM :	NONE	000
109- AVERAGE DAILY TRUCK TRAFFIC :	4%(EST)	04
110- DESIGNATED NATIONAL NETWORK :	PART OF NNT	1
111- PIER OR ABUT. PROTECTION (NAVIGATION) :	N/A	
112- NBIS BRIDGE LENGTH :	YES	Y
113- SCOUR CRITICAL BRIDGE :	N/A	N
114- FUTURE AVERAGE DAILY TRAFFIC :	136,100	136100
115- YR. OF FUTURE A.D.T. :	2012	12
116- MINIM. NAVIG. VERT. CLEARANCE :	N/A	
117- SUFFICIENCY RATING :	.	.
126- FIELD INSPECTION DATE :	121294	121294
127- INSPECTION EVAL. DATE :	121294	121294
130- CRITICAL FRACTURE INSP. DATE :		
131- EVALUATOR ENGINEER :		

REMARKS:

REHABILITATION CONSISTS ON REPAIRING THE DEFICIENCIES DISCUSSED ON ITEM 67.

D.7 February 24, 1993

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REPORT

PAGE 1 OF 3
DATE : 02/24/93
TIME : 12:16:09

FEDERAL SYSTEM BRIDGE NO. : 01137- ROAD NO. : PR 26 -KM. NO. : 004070

1- STATE :	Commonwealth of Puerto Rico		721
2- STATE HIGHWAY DEPARTMENT :	SAN JUAN		01
3- COUNTY (PARISH) CODE :	SAN JUAN		127
4- PLACE CODE :	SAN JUAN URBAN		76770
5- INVENTORY ROUTE :	2-1-1-00003-0		211000030
6- FEATURES INTERSECTED :	PEDESTRIAN WALWAY	PEDESTRIAN WALKWAY	
7- FACILITY CARRIED BY STRUCTURE :	PR 26	PR 26	
8- STRUCTURE NUMBER :	1137 (1 OF 1)		011371
9- LOCATION :	BALDORIOTY DE CASTRO AVE.	BALDORIOTY DE CASTRO AVE.	
10- INV. ROUTE, MIN. VERT. CLEAR. (0.01m) :	5.11m(16'-9")		1609
11- MILEPOINT :	4.07		004070
16- LATITUDE :	18 DEG 27.3 MIN		18273
17- LONGITUDE :	66 DEG 03.3 MIN		066033
19- BYPASS, DETOUR LENGTH (NEAREST MILE) :	STRUCTURE OVER HWY.		00
20- TOLL :	ON FREE ROAD		3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.		01
22- OWNER :	D.T.P.W.		01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	URBAN INTERSTATE		11
27- YEAR BUILT :	1968		1968
28- LANES ON AND UNDER STRUCTURE :	00 ON ; 05 UNDER		0005
29- A. D. T. OF INVENTORY ROUTE :	95,400		095400
30- YEAR OF A. D. T. :	1990		90
31- DESIGN LOAD :	PEDESTRIAN		7
32- APPROACH ROADWAY WIDTH :	24.59m(80.65ft)		081
33- BRIDGE MEDIAN :	NONE		0
34- SKEW :	NO		00
35- STRUCTURE FLARED :	NO		0
36- TRAFFIC SAFETY FEATURES :	N-N-N-N		NNNN
37- HISTORICAL SIGNIFICANCE :	5		5
38- NAVIGATION CONTROL :	N/A		N
39- NAVIGATION VERTICAL CLEARANCE :	NO		000
40- NAVIGATION HORIZONTAL CLEARENCE :	NO		0000
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN		A
42- TYPE OF SERVICE :	PEDESTRIAN OVER HWY.		31
43- STRUCTURE TYPE, MAIN :	STEEL TRUSS DECK		309
44- STRUCTURE TYPE APPR. :	NONE		000
45- NUMBER OF SPAN IN MAIN UNIT :	002		002
46- NUMBER OF APPROACH SPAN :	NONE		0000
47- INV. ROUTE, TOTAL HORIZ. CLEARANCE :	L=23.59m(77.39ft) R=23.6m(77.4ft)		774
48- LENGTH OF MAXIMUM SPAN :	23.6m(77.4ft)		0077
49- STRUCTURE LENGTH :	52.14m(171.01ft)		000171
50- CURB OF SIDEWALK WIDTHS :	NONE		000000
51- BRIDGE ROADWAY WIDTH, CURB-TO-CURB :	1.64m(5.37ft)		0054
52- DECK WIDTH, OUT-TO-OUT :	2.00m(6.56ft)		0066
53- MIN. VERT. CLEAR. OVER BRIDGE ROADWAY :	UNLIMITED		9999
54- MINIMUM VERTICAL UNDERCLEARANCE :	5.11m(16'-9")		H1609
55- MINIMUM LATERAL UNDERCLEARANCE ON RIGHT :	1.19m(3.9ft)		H039
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT :	2.22m(7.28ft)		073

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REPORT

FEDERAL SYSTEM   BRIDGE NO. : 01137- ROAD NO. : PR 26   -KM. NO. : 004070

		MATERIAL	CONDITION ANALYSIS	
58-	DECK	STEEL	SATISFACTORY COND.	6
59-	SUPERSTRUCTURE	STEEL	SATISFACTORY COND.	6
60-	SUBSTRUCTURE	STEEL	SATISFACTORY COND.	6
61-	CHANNEL & CAHNNEL PROTECTION	N/A	N/A	N
62-	CULVERT	N/A	N/A	N
64-	OPERATING RATING	PEDESTRIAN	PEDESTRIAN	600
66-	INVENTORY RATING	PEDESTRIAN	PEDESTRIAN	600

67- STRUCTURAL EVALUATION : THIS BRIDGE WAS REHABILITATED IN 1992 AND ITS CONDITION IS SATISFACTORY. SOUTH STAIR HAS A LITTLE DEFLECTION IN FIRST LEVEL. ON WALKWAY THERE'S PONDING.OTHER PARTS OF STRUCTURE ARE PAINTED AND IN ACEPTABLE CONDITION. 6

68- DECK GEOMETRY : N

N/A

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : 3

BASICALLY INTOLERABLE REQUIRING HIGH PRIORITY OF CORRECTIVE ACTION.

70- BRIDGE POSTING : N

N/A

71- WATERWAY ADEQUACY : N

N/A

72- APPROACH ROADWAY ALIGNMENT : N

N/A

75-	TYPE OF WORK :	NO IMPROVEMENT NEEDED	000
76-	LENGTH OF STRUCTURE IMPROVEMENT :	N/A	000000
89-	RESERVED		---
90-	INSPECTION DATE :	FEBRUARY-24-1993	0293
91-	DESIGNATED INSPECTION FRECUENCY :	EVERY-24-MONTHS	24
92-	CRITICAL FEATURE INSPECTION :	NOT NEEDED	N N N
93-	CRITICAL FEATURE INSPECTION DATE :	N/A	

PUERTO RICO HIGHWAY AUTHORITY

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE REPORT

FEDERAL SYSTEM BRIDGE NO. : 01137- ROAD NO. : PR 26 KM. NO. : 004070

94- BRIDGE IMPROVEMENT COST :	---	000000
95- ROADWAY IMPROVEMENT COST :	---	000000
96- TOTAL PROJECT COST :	---	000000
97- YEAR OF IMPROVEMENT COST ESTIMATED :	---	00
98- BORDER BRIDGE :		---
99- BORDER BRIDGE STRUCTURE NUMBER :		--
100- DEFENSE HIGHWAY DESIGNATION :	IS A DH	1
101- PARALLEL STRUCTURE DESIGNATION :	N/A	N
102- DIRECTION OF TRAFFIC :	NOT CARRIED TRAFFIC	0
103- TEMPORARY STRUCTURE DESIGNATION :	N/A	-
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE :	INTERSTATE	1
105- RESERVED		--
106- YEAR RECONSTRUCTED :	REHABILITATE IN 1992	1992
107- DECK STRUCTURE TYPE :	STEEL PLATE	5
108- WEARING SURF./ PROTECT. SYSTEM :	NONE	000
109- AVERAGE DAILY TRUCK TRAFFIC :	6%	04
110- DESIGNATED NATIONAL NETWORK :	PART OF NN	1
111- PIER OR ABUT. PROTECTION (NAVIGATION) :	N/A	-
112- NBIS BRIDGE LENGTH :	YES	Y
113- SCOUR CRITICAL BRIDGES :	N/A	N
114- FUTURE AVERAGE DAILY TRAFFIC :	143,990	143990
115- YR. OF FUTURE A.D.T. :	2010	10
116- MINIM. NAVIG. VERT. CLEARANCE :	N/A	---
117- SUFFICIENCY RATING :		
126- FIELD INSPECTION DATE :	021293	021293
127- INSPECTION EVAL. DATE :	022493	022493
130- CRITICAL FRACTURE INSP. DATE :		
131- EVALUATOR ENGINEER :		

REMARKS:

THIS BRIDGE WAS REHABILITATED LAST YEAR(1992) AND NO IMPROVEMENT IS NEEDED.

COMMONWEALTH OF PUERTO RICO
HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE

APPRAISAL OF ITEM 68

BRIDGE NO. 1137 ROAD NO. PR-26 KM. NO. 4.07

Year	ADT	Sec.	T W	T W Adequate or Inadequate	T W Inadequate By	TW + SH	TW + SH Adequate or Inadequate	TW + SH Inadequate By
1990	95,400		Actual =					
			For ADT =					
			N/A	PEDESTRIAN				
2010	143,990		Reqd. For ADT =					
			Rec. PRHA =					

√ Adequate
x Inadequate

D.8 June 18, 1991

BRIDGE STUDIES AND EVALUATION OFFICE

PUERTO RICO HIGHWAY AUTHORITY

Page 1 of 5

1 1 3 7	0 0 2 6	0 0 4.0 7
Bridge No.	Road No.	Km.No.

BRIDGE INVENTORY

IDENTIFICATION

Code Position

25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

1. State Code ______ Commonwealth of Puerto Rico — 7 2 1
2. State Highway Department District ______ San Juan — 0 1
3. County (Parish) Code ______ San Juan — 1 2 7
4. Place Code ______ Urban. — 7 6 7 7 0
5. Inventory Route ______ 2-1-1-00003-0 — 2 1 1 0 0 0 0 3 0
6. Features Intersected ______ Pedestrian walkway
   P e d e S T R I A N W a L K w a y
7. Facility Carried by Structure ______ P.R-26
   P R 2 6
8. Structure Number ______ 1137 1 of 1 — 0 0 0 0 0 0 0 0 0 0 1 1 3 7 1
9. Location ______ Baldorioty de Castro avenue
   B a L d o R I o T y D e C a s T R o A v e.

10. Inventory Route, Minimum Vertical Clearance (0.01 m) ______ 5.11m(16.76) — 1 6 0 9
11. Milepoint ______ 4.07 — 0 0 4 0 7 0
16. Latitude ______ 18 Degrees 27.3 Minutes — 1 8 2 7 3
17. Longitude ______ 66 Degrees 03.3 Minutes — 0 6 6 0 3 3
19. By Pass, Detour Length (Nearest mile) ______ Structure over Highway — 0 0

CLASSIFICATION

20. Toll ______ Toll Free — 3
21. Maintenance Responsibility ______ D.T.P.W. — 0 1
22. Owner ______ State Highway Dept. — 0 1
26. Functional Classification of Inventory Route ______ Urban InterState — 1 1

6	5	4	3	2	1

AGE AND SERVICE

No.	Item	Entry	Code
27	Year Built	1968	1968
28.	Lanes on the Structure	0 and Under the Structure 5	0005
29.	Average Daily Traffic	93,500	093500
30.	Year of Average Daily Traffic	1989	89

STRUCTURE DATA

No.	Item	Entry	Code
31.	Design Load	Pedestrian	7
32.	Approach Roadway Width	24.59m (80.65)	081
33.	Bridge Median	[x] None [ ] Open [ ] Closed [ ] Closed NM	0
34.	Skew		00
35.	Structure Flared	[ ] Yes [x] No	0
36.	Traffic Safety Features		NNNN
37.	Historical Significance		5
38.	Navigation Control	[ ] Yes [ ] No [x] NA	N
39.	Navigation Vertical Clearance	[ ] Yes [x] No	000
40.	Navigation Horizontal Clearance	[ ] Yes [x] No	0000
41.	Structure, Open, Posted, or Closed to Traffic	open	A
42.	Type of Service	Pedestrian over Highway	31
43.	Structure Type, Main	Steel Truss Deck	309
44.	Structure Type, Approach Spans	none	000
45.	Number of Spans in Main Unit	2	002
46.	Number of Approach Spans	none	0000
47.	Inventory Route, Total Horizontal Clearance	L = 23.59m (77.39) R = 23.60m (77.40)	774
48.	Length of Maximum Span	23.60m (77.40)	0077
49.	Structure Length	52.14m (171.01)	000171
50.	Curb or Sidewalk Widths	L = none R = none	000000
51.	Bridge Roadway Width, Curb-to-Curb	1.64m (5.37)	0054
52.	Deck Width, Out-to-Out	2.00m (6.56)	0066
53.	Minimum Vertical Clearance Over Bridge Roadway	Unlimited	9999
54.	Minimum Vertical Underclearance	[x] H 5.11m (16'-9") [ ] R [ ] N	H1609
55.	Minimum Lateral Underclearance on Right	[x] H 1.19m (3.90ft) [ ] R [ ] N	H039
56.	Minimum Lateral Underclearance on Left	2.22m (7.28)	073

BRIDGE STUDIES AND EVALUATION OFFICE

3	2	1

CONDITIONS RATINGS

	Material	Condition	
58. Deck	Steel	Fair condition	5
59. Superstructure	Steel	Fair condition	5
60. Substructure	Steel & Conc.	Fair condition	5
61. Channel and Channel Protection	N/A	N/A	N
62. Culverts			N
64. Operating Rating	Pedestrian		8 0 0
66. Inventory Rating	[illegible]		8 0 0

APPRAISAL RATING

Deficiencies

67. Structural Evaluation Steel plates are deteriorated and corroded. Severe corrosion [illegible] and ladder. Beams with severe corrosion. Horizontal columns have severe corrosion. **5**

68. Deck Geometry N/A **N**

69. Underclearances, Vertical and Horizontal [illegible] **5**

70. Bridge Posting N/A **N**

71. Waterway Adequacy **N**

72. Approach Roadway Alignment **N**

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

PROPOSED IMPROVEMENTS

75. Type of Work ______ Rehabilitation ______ | 3 | 5 | 2 |
76. Length of Structure Improvement ______ 52.14 m (171.0 ft) ______ | 0 | 0 | 0 | 1 | 7 | 1 |

INSPECTIONS

89. (Reserved) ______ — ______ | — |
90. Inspection Date ______ June 15, 1991 ______ | 0 | 6 | 9 | 1 |
91. Designated Inspection Frequency ______ 24 months ______ | 2 | 4 |
92. Critical Feature Inspection
    A. Fracture Critical Details ______ | N | | |
    B. Underwater Inspection ______ N/A ______ | N | | |
    C. Other Special Inspection ______ | N | | |
93. Critical Feature Inspection Date
    A. Fracture Critical Details ______ | | | | |
    B. Underwater Inspection ______ N/A ______ | | | | |
    C. Other Special Inspection ______ | | | | |

IMPROVEMENT COSTS

94. Bridge Improvement Cost ______ — ______ | 0 | 0 | 0 | 0 | 0 | 0 |
95. Roadway Improvement Cost ______ — ______ | 0 | 0 | 0 | 0 | 0 | 0 |
96. Total Project Cost ______ $10,000 ______ | 0 | 0 | 0 | 0 | 1 | 0 |
97. Year of Improvement Cost Estimated ______ 1991 ______ | 9 | 1 |

CLASSIFICATION AND STRUCTURE DATA

98. Border Bridge ______ — ______ | | | | | |
99. Border Bridge Structure Number ______ — ______ | | | | | | | | | | | | | | | |
100. Defense Highway Designation ______ DH ______ | 1 |
101. Parallel Structure Designation ______ [illegible] ______ | N |
102. Direction of Traffic ______ [illegible] ______ | 2 |
103. Temporary Structure Designation ______ — ______ | — |
104. Highway System of the Inventory Route ______ [illegible] ______ | 1 |
105. (Reserved) ______ — ______ | — |

6	5	4	3	2	1

CLASSIFICATION AND STRUCTURE DATA (Cont.)

Item	Entry	Code
106. Year Reconstructed	Not Reconstructed	0000
107. Deck Structure Type	Steel Plate	5
108. Wearing Surface/Protective System	None	800
109. Average Daily Truck Traffic	4%	04
110. Designated National Network	PDNN	1
111. Pier or Abutment Protection (for Navigation)	—	—
112. NBIS Bridge Length	Yes	Y
113. Scour Critical Bridges	N/A	N
114. Future Average Daily Traffic	100,000	100000
115. Year of Future Average Daily Traffic	2010	10
116. Minimum Navigation Vertical Clearance	N/A	- - -
Vertical Lift Bridge	N/A	

Remarks:

The rehabilitation of the bridge [illegible]
[illegible]

BRIDGE NO. 1139

ROAD NO. [illegible] KM. [illegible]

APPRAISAL OF ITEM 68

BRIDGE STUDIES AND
EVALUATION OFFICE

YEAR	ADT	Sec.	TW	TW Adequate or Inadequate	TW Inadequate By	TW + SH	TW+SH Adequate or Inadequate	TW + SH Inadequate By
1985			Actual ≡					
			For ADT ≡					
1995			Reqd. For ADT ≡					
			Rec. PRHA ≡					

✓ Adequate

X Inadequate

BRIDGE STUDIES AND EVALUATION OFFICE
PUERTO RICO HIGHWAY AUTHORITY

GENERAL EVALUATION

This bridge is basically in ___2___ structural condition [2]

excellent	4	fair	2	very poor	0
adequate	3	poor	1		

The load carrying capacity is ___0___ [0]

adequate	3	minimally adequate	2	inadequate	1	not required (don't print)	0

The recommended modifications will make it ______ [1]

adequate	2	minimally adequate	1	no required (don't print)	0
				0 when previous is	2

The bridge should be replaced. [0]

Yes (print)	1	not required (don't print)	0

It requires ___2 0 0 5___ [2 2 0] (A)(B)

routine inspection every 24 months — (A) = 2 (B) = 24
frequent inspection every (B) months to monitor abnormal and/or suspected deficiencies — (A) = 1 (B) = months
frequent inspection every (B) months to determine the cause of and remedies for existing defects — (A) = 0 (B) = months

It requires ___2___ [2]

- routine maintenance [3]
- minor repairs and routine maintenance [2]
- urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and rountine maintenance [1]
- emergency repairs to eliminate danger to the public and routine maintenance [0]

The deck geometry is ___0___
For present ADT, the travelled way is ___0___
For future (2010) ADT, the travelled way is ___0___
For PRHA (2010) recommendations, the travelled way is ___0___
For present ADT, the shoulders are ___0___
The future (2010) ADT, the shoulders are ___0___
For PRHA (2010) recommendations, the shoulders are ___0___

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	0	0	0	0
	Travelled way			Shoulders		

satisfactory	3	unsatisfactory	2	cannot be evaluated because of lack of information	1
not required (don't print)	1				

The (A) approach alignment is (B) [0 0] (A)(B)

(A) =	vertical	1	horizontal	0	horizontal and vertical	2
(B) =	satifactory	3	minimally tolerable	2	poor and represents a danger to the public	1
	not required (don't print)	0				

Load Post for inventory rating shown in Item 64 [0]

Yes	1	No (don't print)	0

Post for vertical underclearance shown in Items 54 and 69 [0]

Yes	1	No (don't print)	0

FOR "REMARKS" SEE BRIDGE FILE.

PERSONNEL	By	Date
Structural Inspection	[illegible signature]	5/23/91
Review of Field Data	[illegible signature]	
Transfers of Data		
Condition Analysis		
Appraisal	[illegible signature]	6/19/91

D.9 June 23, 1989

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 5

PUERTO RICO HIGHWAY AUTHORITY
IBM–370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Card No.	Bridge No.	Road No.
	1137	0026

BRIDGE INVENTORY

Km. No. 4.07

IDENTIFICATION

Code Positions 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Item		Entry	Code
1.	State	Commonwealth of Puerto Rico	10 721
2.	Highway District	San Juan	13 01
3.	Municipality	San Juan	15 063
4.	City/Town	San Juan	18 0063
5.	Inventory Route	2-4-1-00003-0	22 2110000030
6.	Features Intersected	Pedestrian Walkway	31 PEDESTRIAN WALKWAY
7.	Facility Carried by Structure[56]	PR → 26	
8.	Structure No.	1137	74 0111371
9.	Location [10]	Baldorioty de Castro Avenue	
10.	Inventory Route, Minimum Vertical Clearance (0.01 m)	5.11	10 0511
11.	Kilometer Point (0.01 km)	4.07	14 00407
12.	Road Section Number (DOD)	25	19 00025–
13.	Bridge Description	WH NSTS PS	24 ––
14.	Defense Milepoint (0.01 mi)	2.62	26 0262
15.	Defense Section Length (miles) (0.1 mile)	8.10	30 081
16.	Latitude: 18 Degrees 27.3 Minutes		33 18273
17.	Longitude: 66 Degrees 03.3 Minutes		38 066033
18.	Physical Vulnerability	Steel Truss	44 4
19.	By Pass, Detour Length (Nearest mile)	Structure over highway	45 00
20.	Toll	Toll Free	47 3
21.	Custodian	W.T.P.W.	48 1
22.	Owner	State Highway Department	49 1
23.	F.A.P. No.[50]	Unknown	

CLASSIFICATION

Item		Entry	Code
24.	Fed. Aid System	Interstate, Urban	10 02
25.	Administrative	State	12 1
26.	Functional	Interstate, Urban	13 41

BRIDGE STUDIES AND EVALUATION OFFICE

STRUCTURE DATA

9 8 7 6 5 4 3 2 1

27. Year Built	1968	18 6800
28. Lanes on Str. 0 Under	5	19 0005
29. ADT – Inventory Route	100,000 (estimated)	23 100000
30. Year	1985	29 85
31. Design Load	Pedestrian	31 7
32. Approach Roadway width including shoulders (0.01 m)	24.59m	32 2496
33. Median ☑ None ☐ Open ☐ Closed		35 0
34. Skew	none	36 00
35. Structure Flared ☐ Yes ☑ No.		38 0
36. Traffic Safety Features		39 NNNN
37. Historical Significance		43 5
38. Navigation Control ☐ Yes ☑ No		46 0
39. Navigation Vertical Clearance (0.1 m) ☐ Yes ☑ No		47 000
40. Navigation Horizontal Clearance (0.1 m) ☐ Yes ☑ No		50 0000
41. Structure, Open or Closed to Traffic	Open	54 A
42. Type Service	Pedestrian over highway	55 31
43. Structure Type-Main	Steel Truss Deck	57 309
44. Structure Type-Approach Spans	None	60 000
45. No. of Spans-Main	2	10 002
46. No. of Spans-Approaches	None	13 0000
47. Total Horizontal Clearance (0.01 m) L = 23.59 R = 23.60M		17 2316
48. Max. Span Length (0.01 m)	23.60M	20 02316
49. Structure Length (0.01 m)	52.14m	24 000521
50. Sidewalk Widths (0.01 m) Left none Right none		30 000000
51. Bridge Roadway Width (curb-curb) (0.01 m)	1.64m	36 00116
52. Deck Width (out-out) (0.01 m)	2.00 m	40 00200
53. Vertical Clearance over Bridge Roadway-Minimum (0.01 m)	Unlimited	44 9999
54. Vertical Underclearance – Minimum (0.01 m)	5.11m	48 0511
55. Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m) L = 1.27 R = 1.19		52 0117
56. Lateral Underclearance on Left (Inner) Sides – Minimum (0.01 m) L = 2.22 R = 2.19		55 0227
57. Wearing Surface	steel	59 7

BRIDGE STUDIES AND EVALUATION OFFICE

CONDITION

9	8 7 6 5 4 3 2 1		

Item	Material	Condition Analysis	Code
58. Deck	Steel	Fair condition	59 6
59. Superstructure	Steel	" "	60 6
60. Substructure	Steel	" "	61 6
61. Channel & Channel Protection	N/A	N/A	62 N
62. Culvert & Retaining Walls			63 N
63. Estimated Remaining Life		10 years	64 1 0
64. Operating Rating		Pedestrian	66 8 0 0
65. Approach Alignment		N.A.	69 N
66. Inventory Rating		Pedestrian	70 8 0 0

APPRAISAL

Deficiencies

67. Structural Condition Ponding, holes & rust stains at deck steel plates. Severe corrosion at angles. Moderate corrosion at some structural members. Moderate corrosion at columns. Fine cracks, small spallings & light scalings at footings. Stairs railings are broken due to moderate corrosion — 10 6

68. Deck Geometry N/A — 11 N

69. Underclearances-Vert. & Lateral (5.11m) Condition equal to present desirable criteria — 12 8

70. Safe Load Capacity — 13 N

71. Waterway Adequacy N.A. — 14 N

72. Approach Alignment — 15 N

PROPOSED IMPROVEMENTS

Item	Entry	Code
73. Year Needed	1989	16 8 9
Completed		
Described		
74. Type of Service	Pedestrian	18 3
75. Type of Work	Rehabilitation	19 3 4 2
76. Improvement Length (0.1 m)	N/A	22 0 0 0 0 0 0
77. Design Loading		28 0

BRIDGE STUDIES AND EVALUATION OFFICE

[9] [8] [7] [6] [5] [4] [3] [2] [1]

78. Roadway Width (0.01m) .... N/A .... 29 [0][0][0][0]
79. Number of Lanes .... 33 [0][0]
80. ADT .... 130,080 .... 35 [1][3][0][0][8][0]
81. Year of Estimated ADT .... 1995 .... 41 [9][5]
82. Year of Proposed Adjacent Roadway Improvements .... N/A .... 43 [0][0]
83. Prop. Adj. Rdwy Improvements-Type .... 45 [0]

COST OF IMPROVEMENTS

84 Total (dollars)$ .... $ 5,000 .... 46 [0][0][0][0][5] *
Estimated Design Time (months) .... —

SUMMARY OF IMPROVEMENT COSTS

85. Preliminary Engineering (Dollars) .... — .... 51 [0][0][0] *
86. Demolition Cost (Dollars) .... — .... 54 [0][0][0] *
87. Substructure (Dollars) .... — .... 57 [0][0][0][0][0] *
88. Superstructure (Dollars) .... — .... 62 [0][0][0][0][0] *
89. Blank .... 67 [–] *
90. Date of Last Inspection .... August 18, 1989 .... 68 [0][8][1][8][8][9] *
91. Rehabilitate Existing Structure (Dollars) .... 5,000 .... 74 [0][0][5] *
92. Detour and Traffic Maintenance (Dollars) .... — .... 77 [0][0][0] *
93. Approaches (Dollars) .... 80 [0][0][0] *
Approach Embankment (Dollars) ....
Approach Pavement (Dollars) ....
Approach Guardrail (Dollars) ....
*(Code to nearest thousand dollars) ....

REMARKS The rehabilitation consists on repair all deficiencies discussed on item 67

BRIDGE STUDIES AND EVALUATION OFFICE

GENERAL EVALUATION

This bridge is basically in 2 structural condition — 16 [2]

excelent 4	fair 2	very poor 0
good 3	poor 1	

The load carrying capacity is 0 — 17 [0]

adequate 3	minimally adequate 2	inadequate 1	not required (don't print) 0

The recommended modifications will make it 1 — 18 [1]

adequate 2	minimally adequate 1	not required (don't print) 0
		0 when previous is 2

The bridge should be replaced. — 19 [0]

Yes (print) 1	Not required (don't print) 0

It requires 2 0 24 — 20 [2 24]

routine inspection every 24 months — [Ⓐ = 2 | Ⓑ = 24]

frequent inspection every Ⓑ months to monitor abnormal and/or suspected deficiencies — [Ⓐ = 1 | Ⓑ = months]

frequent inspection every Ⓑ months to determine the cause of and remedies for existing defects — [Ⓐ = 0 | Ⓑ = months]

Ⓐ Ⓑ

It requires 2 — 23 [2]

routine maintenance — 3

minor repairs and routine maintenance — 2

urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and routine maintenance — 1

emergency repairs to eliminate danger to the public and routine maintenance — 0

The deck geometry is 0

For present ADT, the travelled way is 0

For future (1995) ADT, the travelled way is 0

For PRHA (1995) recommendations, the travelled way is 0

For present ADT, the shoulders are 0

For future (1995) ADT, the shoulders are 0

For PRHA (1995) recommendations, the shoulders are 0

24

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	0	0	0	0
	Travelled way			Shoulders		

satisfactory 3	unsatisfactory 2	cannot be evaluated because of lack of information 1
not required (don't print) 0		

The Ⓐ approach alignment is Ⓑ — 31 [0 0] ⒶⒷ

Ⓐ vertical 1	horizontal 0	horizontal and vertical 2
Ⓑ satisfactory 3	minimally tolerable 2	poor and represents a danger to the public 1
not required (don't print) 0		

Load Post for inventory rating shown in Item 64 — 33 [0]

Yes 1	No (don't print) 0

Post for vertical underclearance shown in Items 54 & 69 — 34 [0]

Yes 1	No (don't print) 0

For "Remarks" see bridge file.

PERSONNEL	By	Date		By	Date
Structural Inspection	Vazquez	6/23/89	Condition Analysis	[signature]	8/18/89
Review of Field Data	[signature]	6/26/89	Appraisal		
Transfer of Data			IBM MT/SC file		
			IBM-370 file		

BRIDGE NO. 1137

ROAD NO. 26 KM. 4.07

APPRAISAL OF ITEM 68

BRIDGE STUDIES AND
EVALUATION OFFICE

YEAR	ADT	Sec.	TW	TW Adequate or Inadequate	TW Inadequate By	TW + SH	TW+SH Adequate or Inadequate	TW + SH Inadequate By
1985	N/A		Actual = —			—		
			For ADT = —	—	—	—	—	—
1995	N/A		Reqd. For ADT = —	—	—	—	—	—
			Rec. PRHA = —	—	—	—	—	—

✓ Adequate

X Inadequate

D.10 July 28, 1987

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 5

PUERTO RICO HIGHWAY AUTHORITY
IBM--370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

·I No.	Bridge No.	Road No.
	1137	0026

BRIDGE INVENTORY

Km. No. 4.07

IDENTIFICATION

Code Positions

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Item	Entry	Code position	Code
1. State	Commonwealth of Puerto Rico	10	7 2 1
2. Highway District	San Juan	13	0 1
3. Municipality	San Juan	15	0 6 3
4. City/Town	San Juan	18	0 0 6 3
5. Inventory Route	2-1-1- 00003-0	22	2 1 1 0 0 0 0 3 0
6. Features Intersected	Pedestrian Walkway	31	P E D E S T R I A N W A L K W A Y
7. Facility Carried by Structure[56]	PR-26		
8. Structure No.	1137 1 of 1	74	0 1 1 3 7 1
9. Location[10]	Baldorioty de Castro Avenue		
10. Inventory Route, Minimum Vertical Clearance (0.01 m)	5.11	10	0 5 1 1
11. Kilometer Point (0.01 km)	4.07	14	0 0 4 0 7
12. Road Section Number (DOD)	25	19	0 0 2 5 -
13. Bridge Description	NH NSTS	24	- -
14. Defense Milepoint (0.01 mi)	2.62	26	0 2 6 2
15. Defense Section Length (miles) (0.1 mile)	8.10	30	0 8 1
16. Latitude:	18 Degrees 27.3 Minutes	33	1 8 2 7 3
17. Longitude:	66 Degrees 03.3 Minutes	38	0 6 6 0 3 3
18. Physical Vulnerability	Steel Truss	44	4
19. By Pass, Detour Length (Nearest mile)	Structure over highway	45	0 0
20. Toll	Toll Free	47	3
21. Custodian	D.T.P.W.	48	1
22. Owner	State Highway Department	49	1
23. F.A.P. No.[60]	Unknown		

CLASSIFICATION

Item	Entry	Code position	Code
24. Fed. Aid System	Interstate, Urban	10	0 2
25. Administrative	State	12	1
26. Functional	Interstate, Urban	13	4 1

BRIDGE STUDIES AND EVALUATION OFFICE

Page 2 of 5

RUCTURE DATA

9 8 7 6 5 4 3 2 1

27.	Year Built	1968	15 6800
28.	Lanes on Str. 0 Under 5		19 0005
29.	ADT – Inventory Route	100,000 (estimated)	23 100000
30.	Year	1985	29 85
31.	Design Load	Pedestrian	31 7
32.	Approach Roadway width including shoulders (0.01 m)	24.59m	32 246
33.	Median ☑ None ☐ Open ☐ Closed		35 0
34.	Skew	none	36 00
35.	Structure Flared ☐ Yes ☑ No.		38 0
36.	Traffic Safety Features		39 NNNN
37.	Historical Significance		43 5
38.	Navigation Control ☐ Yes ☑ No		46 0
39.	Navigation Vertical Clearance (0.1 m) ☐ Yes ☑ No		47 000
40.	Navigation Horizontal Clearance (0.1 m) ☐ Yes ☑ No		50 0000
41	Structure, Open or Closed to Traffic	open	54 A
42.	Type Service	Pedestrian over highway	55 31
43.	Structure Type-Main	Steel truss deck	57 309
44.	Structure Type-Approach Spans	None	60 000
45.	No. of Spans-Main	2	10 002
46.	No. of Spans-Approaches	None	13 0000
47.	Total Horizontal Clearance (0.01 m) L = 23.59m R = 23.60m		17 236
48.	Max. Span Length (0.01 m)	23.60 m face to face	20 0236
49.	Structure Length (0.01 m)	52.14m	24 000521
50.	Sidewalk Widths (0.01 m) Left none Right none		30 000000
51.	Bridge Roadway Width (curb-curb) (0.01 m)	1.64m	36 0016
52.	Deck Width (out-out) (0.01 m)	2.00m	40 0020
53.	Vertical Clearance over Bridge Roadway-Minimum (0.01 m)	Unlimited	44 9999
54.	Vertical Underclearance – Minimum (0.01 m)	5.11m	48 0511
55.	Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m) L = 1.27m R = 1.19m		52 012
56.	Lateral Underclearance on Left (Inner) Sides – Minimum (0.01 m) L = 2.22m R = 2.19m		55 022
57.	Wearing Surface	steel	58 7

BRIDGE STUDIES AND EVALUATION OFFICE

NDITION

9	8	7	6	5	4	3	2	1

	Material	Condition Analysis	
58. Deck	Steel	Fair condition	59 [6]
59. Superstructure	Steel	Fair condition	60 [6]
60. Substructure	Steel	Generally Good Condition	61 [7]
61. Channel & Channel Protection	N.A.	N.A.	62 [N]
62. Culvert & Retaining Walls		N.A.	63 [N]
63. Estimated Remaining Life		10 years	64 [1 0]
64. Operating Rating		Pedestrian	66 [8 0 0]
65. Approach Alignment		NA	69 [N]
66. Inventory Rating		Pedestrian	70 [8 0 0]

APPRAISAL

Deficiencies

67. Structural Condition . Light corrosion at steel plate. The structure was painted recently. Fine crackings, small spallings and light corrosion at footings and columns repectively. 10 [7]

68. Deck Geometry . . . N.A. 11 [N]

69. Underclearances-Vert. & Lateral . (5.11m) Condition equal to present desirable criteria. 12 [8]

70. Safe Load Capacity . . . 13 [N]

71. Waterway Adequacy . . . 14 [N]

72. Approach Alignment . . . Not Applicable 15 [N]

PROPOSED IMPROVEMENTS

73. Year Needed . . . 1987 16 [8 7]

Completed . . .

Described . . .

74. Type of Service . . . Pedestrian 18 [3]

75. Type of Work . . . Rehabilitation 19 [3 7 2]

76. Improvement Length (0.1 m) . . . N.A. 22 [0 0 0 0 0 0]

77. Design Loading . . . 28 [0]

Page 4 of 5

BRIDGE STUDIES AND EVALUATION OFFICE

9 8 7 6 5 4 3 2 1

78. Roadway Width (0.01m) N.A. 29 0 0 0 0
79. Number of Lanes 33 0 0
80. ADT 130,080 35 1 3 0 0 8 0
81. Year of Estimated ADT 1995 41 9 5
82. Year of Proposed Adjacent Roadway Improvements N.A. 43 0 0
83. Prop. Adj. Rdwy Improvements-Type 45 0

COST OF IMPROVEMENTS

84 Total (dollars)$ $3,000.00 46 0 0 0 0 3 *
Estimated Design Time (months) —

SUMMARY OF IMPROVEMENT COSTS

85. Preliminary Engineering (Dollars) — 51 0 0 0 *
86. Demolition Cost (Dollars) — 54 0 0 0 *
87. Substructure (Dollars) — 57 0 0 0 0 0 *
88. Superstructure (Dollars) — 62 0 0 0 0 0 *
89. Blank 67
90. Date of Last Inspection August 25, 1987 68 0 8 2 5 8 7 *
91. Rehabilitate Existing Structure (Dollars) $3,000.00 74 0 0 3 *
92. Detour and Traffic Maintenance (Dollars) — 77 0 0 0 *
93. Approaches (Dollars) — 80 0 0 0 *
Approach Embankment (Dollars)
Approach Pavement (Dollars)
Approach Guardrail (Dollars)
*(Code to nearest thousand dollars)

REMARKS The rehabilitation consists in repair the deficiencies described on item no. 67

IDGE STUDIES AND EVALUATION FICE

GENERAL EVALUATION

This bridge is basically in 3 structural condition 16 3

excelent	4	fair	2	very poor	0
good	3	poor	1		

The load carrying capacity is 0 17 0

adequate	3	minimally adequate	2	inadequate	1	not required (don't print)	0

The recommended modifications will make it 0 18 0

adequate	2	minimally adequate	1	not required (don't print)	0
				0 when previous is	2

The bridge should be replaced. 19 0

Yes (print)	1	Not required (don't print)	0

It requires 2@24 20 2 24

routine inspection every 24 months [(A) = 2 | (B) = 24]

frequent inspection every (B) months to monitor abnormal and/or suspected deficiencies [(A) = 1 | (B) = months]

frequent inspection every (B) months to determine the cause of and remedies for existing defects [(A) = 0 | (B) = months]

(A) (B)

It requires 2 23 2

routine maintenance	3
minor repairs and routine maintenance	2
urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and routine maintenance	1
emergency repairs to eliminate danger to the public and routine maintenance	0

The deck geometry is 0

For present ADT, the travelled way is 0

For future (1995) ADT, the travelled way is 0

For PRHA (1995) recommendations, the travelled way is 0

For present ADT, the shoulders are 0

For future (1995) ADT, the shoulders are 0

For PRHA (1995) recommendations, the shoulders are 0

24

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	0	0	0	0
	Travelled way			Shoulders		

satisfactory	3	unsatisfactory	2	cannot be evaluated because of lack of information	1
not required (don't print)	0				

The (A) approach alignment is (B) 31 0 0

(A) (B)

(A)	vertical	1	horizontal 0		horizontal and vertical 2	
(B)	satisfactory	3	minimally tolerable	2	poor and represents a danger to the public	1
	not required (don't print)	0				

Load Post for inventory rating shown in Item 64 33 0

Yes	1	No (don't print)	0

Post for vertical underclearance shown in Items 54 & 69 34 0

Yes	1	No (don't print)	0

For "Remarks" see bridge file.

PERSONNEL	By	Date		By	Date
Structural Inspection	Ricci	7/28/87	Condition Analysis	A. Cacres	8/25/87
Review of Field Data	Pizarro	7/30/87	Appraisal		
Transfer of Data			IBM MT/SC file		
			IBM--370 file		

RIDGE NO. 1137

ROAD NO. 26 KM. 4.07

APPRAISAL OF ITEM 68

BRIDGE STUDIES AND
EVALUATION OFFICE

YEAR	ADT	Sec.	TW	TW Adequate or Inadequate	TW Inadequate By	TW + SH	TW+SH Adequate or Inadequate	TW + SH Inadequate By
1985	N.A.		Actual ≡					
			For ADT ≡					
	N.A.							
1995	N.A.		Reqd. For ADT ≡					
			Rec. PRHA ≡					

✓ Adequate

X Inadequate

D.11 April 21, 1986

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 5

PUERTO RICO HIGHWAY AUTHORITY
IBM–370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

... d No.	Bridge No.	Road No.
☐	1137	0026

BRIDGE INVENTORY

Km. No. 4.07

IDENTIFICATION

Code Positions

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

1. State .... Commonwealth of Puerto Rico ...... 10 | 7 | 2 | 1
2. Highway District .... San Juan .... 13 | 0 | 1
3. Municipality .... San Juan .... 15 | 0 | 6 | 3
4. City/Town .... San Juan .... 18 | 0 | 0 | 6 | 3
5. Inventory Route .... 2-1-1-0003-0 .... 22 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 3 | 0
6. Features Intersected .... Pedestrian Walkway ....
   .... 31 | P | E | D | E | S | T | R | I | A | N | | W | A | L | K | W | A | Y
7. Facility Carried by Structure[58] .... PR-26 ....
8. Structure No. .... 1137 ... 1 of 1 .... 74 | 0 | 1 | 1 | 3 | 7 | 1
9. Location[10] .... Baldorioty de Castro Avenue ....
   ....
10. Inventory Route, Minimum Vertical Clearance (0.01 m) .... 5.11 .... 10 | 0 | 5 | 1 | 1
11. Kilometer Point (0.01 km) .... 14 | 0 | 0 | 4 | 0 | 7
12. Road Section Number (DOD) .... 25 .... 19 | 0 | 0 | 2 | 5 | –
13. Bridge Description .... D.H. ... N.S.T.S. .... 24 | – | –
14. Defense Milepoint (0.01 ml) .... 2.62 .... 26 | 0 | 2 | 6 | 2
15. Defense Section Length (miles) (0.1 mile) .... 0.1 .... 30 | 0 | 0 | 1
16. Latitude: ... 18 ...... Degrees . 27.3 . Minutes .... 33 | 1 | 8 | 2 | 7 | 3
17. Longitude: ... 66 ...... Degrees . 03.3 . Minutes .... 38 | 0 | 6 | 6 | 0 | 3 | 3
18. Physical Vulnerability .... Steel Truss .... 44 | 1
19. By Pass, Detour Length (Nearest mile) .... Structure over highway .... 45 | 0 | 0
20. Toll .... Toll Free .... 47 | 3
21. Custodian .... DTPW .... 48 | 1
22. Owner .... State Highway Department .... 49 | 1
23. F.A.P. No.[50] .... Unknown ....

CLASSIFICATION

24. Fed. Aid System .... Interstate, Urban .... 10 | 0 | 2
25. Administrative .... State .... 12 | 1
26. Functional .... Interstate .... 13 | 1 | 1

BRIDGE STUDIES AND EVALUATION OFFICE

STRUCTURE DATA

9	8	7	6	5	4	3	2	1

No.	Item	Entry	Col.	Code
27.	Year Built	1968	15	6800
28.	Lanes on Str.	0 . . . . Under 5	19	0005
29.	ADT – Inventory Route	70,000 ESTIMATE	23	070000
30.	Year	1985	29	85
31.	Design Load	PEDESTRIAN	31	Z
32.	Approach Roadway width including shoulders (0.01 m)	2.4059 m	32	246
33.	Median	☒ None ☐ Open ☐ Closed	35	0
34.	Skew	None	36	00
35.	Structure Flared	☐ Yes ☒ No.	38	0
36.	Traffic Safety Features		39	NNNN
37.	Historical Significance		43	5
38.	Navigation Control	☐ Yes ☒ No	46	0
39.	Navigation Vertical Clearance (0.1 m)	☐ Yes ☒ No	47	000
40.	Navigation Horizontal Clearance (0.1 m)	☐ Yes ☒ No	50	0000
41	Structure, Open or Closed to Traffic	OPEN	54	A
42.	Type Service	PEDESTRIAN over highway	55	31
43.	Structure Type-Main	Steel Truss deck	57	309
44.	Structure Type-Approach Spans	None	60	000
45.	No. of Spans-Main	2	10	002
46.	No. of Spans-Approaches	None	13	0000
47.	Total Horizontal Clearance (0.01 m)	L = 23.57 R. = 23.60	17	236
48.	Max. Span Length (0.01 m)	23.60 face to face	20	0236
49.	Structure Length (0.01 m)	52.14 m	24	000521
50.	Sidewalk Widths (0.01 m) Left — Right		30	000000
51.	Bridge Roadway Width (curb-curb) (0.01 m)	1.64	36	0016
52.	Deck Width (out-out) (0.01 m)	2.00	40	0020
53.	Vertical Clearance over Bridge Roadway-Minimum (0.01 m)	UNLIMITED	44	9999
54.	Vertical Underclearance – Minimum (0.01 m)	5.11	48	0511
55.	Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m)	L = 1.21 R = 1.19	52	012
56.	Lateral Underclearance on Left (Inner) Sides – Minimum (0.01 m)	L = 2.22 R = 2.19	53	022
57.	Wearing Surface	Steel	69	7

BRIDGE STUDIES AND EVALUATION OFFICE

CONDITION

		Material	Condition Analysis	9 8 7 6 5 4 3 2 1
58.	Deck	STEEL	GENERALLY Good Condition	59 7
59.	Superstructure	STEEL	" " "	60 7
60.	Substructure	STEEL	" " "	61 7
61.	Channel & Channel Protection	N.A.	N/A	62 N
62.	Culvert & Retaining Walls	N.A.		63 N
63.	Estimated Remaining Life		15 YEARS	64 75
64.	Operating Rating		PEDESTRIAN	66
65.	Approach Alignment		NA	69 N
66.	Inventory Rating		PEDESTRIAN	70

APPRAISAL

		Deficiencies	
67.	Structural Condition	MINOR MAINTENANCE IS REQUIRED. SAND BLASTING AND PAINTING	10 7
68.	Deck Geometry	N/A	11 N
69.	Underclearances-Vert. & Lateral	Condition equal to PRESENT DESIRABLE CRITERIA	12 7
70.	Safe Load Capacity	N/A	13 N
71.	Waterway Adequacy		14 N
72.	Approach Alignment		15 N

PROPOSED IMPROVEMENTS

73.	Year Needed	1986	16 86
	Completed		
	Described		
74.	Type of Service	PEDESTRIAN	18
75.	Type of Work	REHABILITATION	19
76.	Improvement Length (0.1 m)	N/A	22 0 0
77.	Design Loading		28

BRIDGE STUDIES AND EVALUATION OFFICE

9 8 7 6 5 4 3 2 1

78. Roadway Width (0.01m) .... NA 29 0 0 0 0
79. Number of Lanes .... NA 33 0 0
80. ADT .... 138080 .... 35 1 3 8 0 8 0
81. Year of Estimated ADT .... 1985 .... 41 8 5
82. Year of Proposed Adjacent Roadway Improvements .... NA 43 0 0
83. Prop. Adj. Rdwy Improvements-Type 45 0

COST OF IMPROVEMENTS

84 Total (dollars)$ .... 10,000.00 .... 46 0 0 0 1 0 *
Estimated Design Time (months) ....

SUMMARY OF IMPROVEMENT COSTS

85. Preliminary Engineering (Dollars) .... 51 0 0 0 *
86. Demolition Cost (Dollars) .... NA .... 54 0 0 0 *
87. Substructure (Dollars) .... 57 0 0 0 0 0 *
88. Superstructure (Dollars) .... 62 0 0 0 0 0 *
89. Blank .... Blank .... 67 – *
90. Date of Last Inspection 68 0 4 2 1 8 6 *04-21-86
91. Rehabilitate Existing Structure (Dollars) .... 10,000 .... 74 0 1 0 *
92. Detour and Traffic Maintenance (Dollars) .... NA .... 77 0 0 0 *
93. Approaches (Dollars) .... NA .... 80 0 0 0 *
Approach Embankment (Dollars) ....
Approach Pavement (Dollars) ....
Approach Guardrail (Dollars) ....
*(Code to nearest thousand dollars) ....

REMARKS

REHABILITATION CONSIST OF
MAINTENANCE, SAND BLASTING AND PAINTING

BRIDGE NO. ____________

ROAD NO. ____________ KM. ____________

APPRAISAL OF ITEM 68

BRIDGE STUDIES AND EVALUATION OFFICE

YEAR	ADT	Sec.	TW	TW Adequate or Inadequate	TW Inadequate By	TW + SH	TW+SH Adequate or Inadequate	TW + SH Inadequate By
1985	na	X	Actual =	X	X		X	X
			For ADT =					
1995	na		Reqd. For ADT =					
			Rec. PRHA =					

✓ Adequate

X Inadequate

BRIDGE STUDIES AND EVALUATION OFFICE

GENERAL EVALUATION

This bridge is basically in 3 structural condition — 16 [3]

excelent 4	fair 2	very poor 0
good 3	poor 1	

The load carrying capacity is — 17 [0]

adequate 3	minimally adequate 2	inadequate 1	not required (don't print) 0

The recommended modifications will make it — 18 [0]

adequate 2	minimally adequate 1	not required (don't print) 0
		0 when previous is 2

The bridge should be replaced. — 19 [0]

Yes (print) 1	Not required (don't print) 0

It requires — 20 [2 | 2 | 4] Ⓐ Ⓑ

routine inspection every 24 months	Ⓐ = 2 | Ⓑ = 24
frequent inspection every Ⓑ months to monitor abnormal and/or suspected deficiencies	Ⓐ = 1 | Ⓑ = months
frequent inspection every Ⓑ months to determine the cause of and remedies for existing defects	Ⓐ = 0 | Ⓑ = months

It requires — 23 [3]

routine maintenance	3
minor repairs and routine maintenance	2
urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and routine maintenance	1
emergency repairs to eliminate danger to the public and routine maintenance	0

The deck geometry is 0
For present ADT, the travelled way is 0
For future (1995) ADT, the travelled way is 0
For PRHA (1995) recommendations, the travelled way is 0
For present ADT, the shoulders are 0
For future (1995) ADT, the shoulders are 0
For PRHA (1995) recommendations, the shoulders are 0

24

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	0	0	0	0
	Travelled way			Shoulders		

satisfactory 3	unsatisfactory 2	cannot be evaluated because of lack of information 1
not required (don't print) 0		

The Ⓐ approach alignment is Ⓑ — 31 [0 | 0] ⒶⒷ

Ⓐ=	vertical 1	horizontal 0	horizontal and vertical 2
Ⓑ=	satisfactory 3	minimally tolerable 2	poor and represents a danger to the public 1
	not required (don't print) 0		

Load Post for inventory rating shown in Item 64 — 33 [0]

Yes 1	No (don't print) 0

Post for vertical underclearance shown in Items 54 & 69 — 34 [0]

Yes 1	No (don't print) 0

For "Remarks" see bridge file.

PERSONNEL	By	Date		By	Date
Structural Inspection			Condition Analysis	[illegible signature]	
Review of Field Data			Appraisal		
Transfer of Data			IBM MT/SC file		
			IBM–370 file		4/24/86

BRIDGE STUDIES AND EVALUATION OFFICE

PUERTO RICO HIGHWAY AUTHORITY
IBM – 370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Card No. Bridge No. Road No.

ROUTE UNDER STRUCTURE

Km. No. ______

Code Positions

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

IDENTIFICATION

5. Inventory Route . . . . 10 [ ] 0
6. Features Intersected . . . . 19 [ ]
8. Structure No. . . . . 44 0 [ ]
10. Inventory Route, Minimum Vertical Clearance (0.01 m) . . . . 50 [ ]
11. Kilometer Point (0.01 km) . . . . 54 [ ]
12. Road Section Number (DOD) . . . . 59 [ ]
13. Bridge Description . . . . 64 [ ]
14. Defense Milepoint (0.01 m) . . . . 66 [ ]
15. Defense Section Length (miles) (0.1 mile) . . . . 70 [ ]
19. By Pass, Detour Length (Nearest mile) . . . . 73 [ ]

CLASSIFICATION

24. Fed. Aid System . . . . 75 [ ]
25. Administrative . . . . 77 [ ]
26. Functional . . . . 78 [ ]

STRUCTURE DATA

29. ADT – Inventory Route . . . . 10 [ ] 0
30. Year . . . . 16 [ ]
47. Total Horizontal Clearance (0.01 m) . . . L = ... R = ... 18 [ ]

D.12 July 16, 1975

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 5

PUERTO RICO HIGHWAY AUTHORITY
IBM–370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Card No.	Bridge No.	Road No.
	1137	0000

BRIDGE INVENTORY

Km. No. n.a

IDENTIFICATION

Code Positions

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

1. State . . . . . Commonwealth of Puerto Rico . . . . . [10] 7 2 1
2. Highway District . . . . . San Juan . . . . . [13] 0 1
3. Municipality . . . . . San Juan . . . . . [15] 0 6 3
4. City/Town . . . . . San Juan . . . . . [18] 0 0 6 3
5. Inventory Route . . . . . 15.8 to 5.000000 to 0 . . . . . [22] 1 8 0 0 0 0 0 0 0
6. Features Intersected . . . . . P.R. 26 . . . . .
   . . . . . [31] P R 2 6
7. Facility Carried by Structure[56] . . . Pedestrian Walkway . . . . .
8. Structure No. . . . . . 1137 one of one . . . . . [74] 0 1 1 3 7 1
9. Location [10] . . . . . Baldorioty de Castro Avenue . . . . .
   . . . . .
10. Inventory Route, Minimum Vertical Clearance (0.01 m) . . . Unlimited . . . . . [10] 9 9 9 9
11. Kilometer Point (0.01 km) . . . . . n.a . . . . . [14] 0 0 0 0 0
12. Road Section Number (DOD) . . . . . NDH . . . . . [19] 0 0 0 0 5
13. Bridge Description . . . . . NDH. ODH. N575. P . . . . . [24] 5 5
14. Defense Milepoint (0.01 mi) . . . . . NDH . . . . . [26] 0 0 0 0
15. Defense Section Length (miles) (0.1 mile) . . . . . NDH . . . . . [30] 0 0 0
16. Latitude: . . . . . 18 . . Degrees . . 27.3 . Minutes . . . . . [33] 1 8 2 7 3
17. Longitude: . . . . . 66 . Degrees . 03.3 . Minutes . . . . . [38] 0 6 6 0 3 3
18. Physical Vulnerability . . . . . Steel Truss . . . . . [44] 4
19. By Pass, Detour Length (Nearest mile) . . . Walk Across Highway . . . . . [45] 0 0
20. Toll . . . . . No toll for road or bridge . . . . . [47] 3
21. Custodian . . . . . DTPW . . . . . [48] 2
22. Owner . . . . . State Highway Department . . . . . [49] 1
23. F.A.P. No.[50] . . . . . Unknown . . . . .

CLASSIFICATION

24. Fed. Aid System . . . . . Fed. aid urban . . . . . [10] 4
25. Administrative . . . . . STATE . . . . . [12] 1
26. Functional . . . . . Urban principal arterial . . . . . [13] 4 3

BRIDGE STUDIES AND EVALUATION OFFICE

Page 2 of 5

STRUCTURE DATA

9 8 7 6 5 4 3 2 1

Item	Entry	Code
27. Year Built	1968	15 6 8 0 0
28. Lanes on Str. 0 Under 8		19 0 0 0 8
29. ADT – Inventory Route	N/A	23 0 0 0 0 0 0
30. Year	N/A	29 0 0
31. Design Load	Pedestrian	31 0
32. Approach Roadway width including shoulders (0.01 m)	NMG2	32 0 1 6
33. Median	☑ None ☐ Open ☐ Closed	35 0
34. Skew	None	36 0 0
35. Structure Flared	☐ Yes ☑ No.	38 0
36. Traffic Safety Features		39 N N N N
37. Blank		43 b b b
38. Navigation Control	☐ Yes ☑ No	46 0
39. Navigation Vertical Clearance (0.1 m)	☐ Yes ☑ No	47 0 0 0
40. Navigation Horizontal Clearance (0.1 m)	☐ Yes ☑ No	50 0 0 0 0
41. Structure, Open or Closed to Traffic	Open	54 A
42. Type Service	Pedestrian over Highway	55 3 1
43. Structure Type-Main	Steel Truss Deck	57 3 0 9
44. Structure Type-Approach Spans	None	60 0 0 0
45. No. of Spans-Main	Two	10 0 0 0 2
46. No. of Spans-Approaches	None	13 0 0 0 0
47. Total Horizontal Clearance (0.01 m)	L = 1.62 R.=	17 0 1 6
48. Max. Span Length (0.01 m)	24.37	20 0 2 4 3
49. Structure Length (0.01 m)	52.14	24 0 0 0 5 2 1
50. Sidewalk Widths (0.01 m) Left — Right —		30 0 0 0 0 0 0
51. Bridge Roadway Width (curb-curb) (0.01 m)	1.62	36 0 0 1 6
52. Deck Width (out-out) (0.01 m)	1.62	40 0 0 1 6
53. Vertical Clearance over Bridge Roadway-Minimum (0.01 m)	Unlimited	44 9 9 9 9
54. Vertical Underclearance – Minimum (0.01 m)	5.19	48 0 5 1 9
55. Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m)	L = 1.27 R = 1.19	52 0 1 2
56. Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m)	L = 1.30 R = 1.45	55 0 1 3
57. Wearing Surface	Steel Plate	58 7

BRIDGE STUDIES AND EVALUATION OFFICE

9	8	7	6	5	4	3	2	1

CONDITION

	Material	Condition Analysis	
58. Deck	steel	Good Cond. NRN	59 [8]
59. Superstructure	steel	Minor I.R.W.F.	60 [7]
60. Substructure	steel	Minor I.R.W.F.	61 [7]
61. Channel & Channel Protection		N.A.	62 [N]
62. Culvert & Retaining Walls		N.A.	63 [N]
63. Estimated Remaining Life		15 years	64 [1 5]
64. Operating Rating		Pedestrian Walkway	66 [8 0 0]
65. Approach Alignment		N.A.	69 [N]
66. Inventory Rating		Pedestrian Walkway	70 [8 0 0]

APPRAISAL

	Deficiencies	
67. Structural Condition	Moderate corrosion at whole bridge	10 [2]
68. Deck Geometry	N.A.	11 [N]
69. Underclearances-Vert. & Lateral	(5.19m) Superior to present desirable criteria	12 [9]
70. Safe Load Capacity	N.A	13 [N]
71. Waterway Adequacy	N.A.	14 [N]
72. Approach Alignment	N.A.	15 [N]

PROPOSED IMPROVEMENTS

73. Year Needed	1980	16 [8 0]
Completed		
Describe		
74. Type of Service	Pedestrian over highway	18 [3]
75. Type of Work	Rehabilitation	19 [3 7 2]
76. Improvement Length (0.1 m)	N.A.	22 [0 0 0 0 0 0]
77. Design Loading		28 [0]

BRIDGE STUDIES AND EVALUATION OFFICE

9 8 7 6 5 4 3 2 1

NA

78. Roadway Width (0.01 m) . . . . 29 [0 0 0 0]
79. Number of Lanes . . . . 33 [0 0]
80. ADT . . . . 35 [0 0 0 0 0 0]
81. Year of Estimated ADT . . . . 41 [0 0]
82. Year of Proposed Adjacent Roadway Improvements . . . . 43 [0 0]
83. Prop. Adj. Rdwy Improvements-Type . . . . 45 [0]

COST OF IMPROVEMENTS

84. Total (dollars) $ 3,000 . . . . 46 [0 0 0 0 3] *

Estimated Design Time (months) . . . .

SUMMARY OF IMPROVEMENT COSTS

85. Preliminary Engineering (Dollars) . . . . 51 [0 0 0] *
86. Demolition Cost (Dollars) . . . . 54 [0 0 0] *
87. Substructure (Dollars) . . . . 57 [0 0 0 0 0] *
88. Superstructure (Dollars) . . . . 62 [0 0 0 0 0] *
89. Blank . . . . 67 [0] *
90. Rehabilitate Existing Structure (Dollars) . . . 3,000 . . . . 68 [0 0 3] *
91. Detour and Traffic Maintenance (Dollars) . . . . 71 [0 0 0] *
92. Approaches (Dollars) . . . . 74 [0 0 0] *

Approach Embankment (Dollars)

Approach Pavement (Dollars)

Approach Guardrail (Dollars)

(* Code to nearest thousand dollars)

93. Date of Last Inspection . . . . July 16, 1975 . . . . 10 [0 7 1 6 7 5]

REMARKS

1) Rehabilitation (Item 90) should include; a) Removal of rust from structural steel by means of wire brush or any other acceptable method and the protection of it with paint; b) The replacement of any structural elements, if necessary.

BRIDGE STUDIES AND EVALUATION OF E

GENERAL EVALUATION

This bridge is basically in 3 structural condition — 16 [3]

excelent 4	fair 2	very poor 0
good 3	poor 1	

The load carrying capacity is — 17 [0]

adequate 3	minimally adequate 2	inadequate 1	not required (don't print) 0

The recommended modifications will make it — 18 [0]

adequate 2	minimally adequate 1	not required (don't print) 0
		0 when previous is 2

The bridge should be replaced. — 19 [0]

Yes (print) 1	Not required (don't print) 0

It requires 1;12 — 20 [1] [12] Ⓐ Ⓑ

routine inspection every 24 months — Ⓐ = 2 Ⓑ = 24

frequent inspection every Ⓑ months to monitor abnormal and/or suspected deficiencies — Ⓐ = 1 Ⓑ = months

frequent inspection every Ⓑ months to determine the cause of and remedies for existing defects — Ⓐ = 0 Ⓑ = months

It requires 2 — 23 [2]

- routine maintenance — 3
- minor repairs and routine maintenance — 2
- urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and routine maintenance — 1
- emergency repairs to eliminate danger to the public and routine maintenance — 0

The deck geometry is 0

For present ADT, the travelled way is 0

For future (1990) ADT, the travelled way is 0

For PRHA (1990) recommendations, the travelled way is 0

For present ADT, the shoulders are 0

For future (1990) ADT, the shoulders are 0

For PRHA (1990) recommendations, the shoulders are 0

24

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	0	0	0	0
	Travelled way			Shoulders		

satisfactory 3	unsatisfactory 2	cannot be evaluated because of lack of information 1
not required (don't print) 0		

The Ⓐ approach alignment is Ⓑ — 31 [0] [0] ⒶⒷ

Ⓐ=	vertical 1	horizontal 0	horizontal and vertical 2
Ⓑ=	satisfactory 3	minimally tolerable 2	poor and represents a danger to the public 1
	not required (don't print) 0		

Load Post for inventory rating shown in Item 66 — 33 [0]

Yes 1	No (don't print) 0

Post for vertical underclearance shown in Items 54 & 69 — 34 [0]

Yes 1	No (don't print) 0

For "Remarks" see bridge file.

PERSONNEL	By	Date		By	Date
Structural Inspection	L. Pérez	Jul 16/75	Condition Analysis	N.Z.	1-15-76
Review of Field Data	J. Cepero	Jul 16/75	Appraisal	G. Velasco	1-26-76
Transfer of Data	T. Cecilio	Jan 14/76	IBM MT/SC file	A. Perdomo	3-30-76
			IBM–370 file		

BRIDGE NO. ____________

ROAD NO. ____________ KM. ____________

APPRAISAL OF ITEM 68

BRIDGE STUDIES AND
EVALUATION OFFICE

YEAR	ADT	Sec.	TW	TW Adequate or Inadequate	TW Inadequate By	TW + SH	TW+SH Adequate or Inadequate	TW + SH Inadequate By
1970			Actual ≡					
			For ADT ≡					
1990			Reqd. For ADT ≡					
			Rec. PRHA ≡					

✓ Adequate

X Inadequate

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 1

PUERTO RICO HIGHWAY AUTHORITY
IBM – 370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Card No.	Bridge No.	Road No.
	1137	0026

ROUTE UNDER STRUCTURE

Km. No. 4.07

Code Positions

IDENTIFICATION 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

	Item	Entry	Code
5.	Inventory Route	P.R. 26 . 2 0 3 0 1 0 00026 0 0	10 231000260
6.	Features Intersected	Pedestrian Walkway Bridge 1137	19 BRIDGE 1137
8.	Structure No.	1137 one of one	44 011371
10.	Inventory Route, Minimum Vertical Clearance (0.01 m)	5.19	50 0519
11.	Kilometer Point (0.01 km)	4.07	54 00407
12.	Road Section Number (DOD)	25	59 00250
13.	Bridge Description	NDA. ORH. NSTS P	64 00
14.	Defense Milepoint (0.01 m)	2.62	66 0262
15.	Defense Section Length (miles) (0.1 mile)	8.1	70 081
19.	By Pass, Detour Length (Nearest mile)	Marginal Road	73 00

CLASSIFICATION

	Item	Entry	Code
24.	Fed. Aid System	Fed aid urban	75 14
25.	Administrative	STATE	77 1
26.	Functional	Urban Principal Arterial	78 43

STRUCTURE DATA

	Item	Entry	Code
29.	ADT – Inventory Route	36,550	10 036550
30.	Year	1970	16 70
47.	Total Horizontal Clearance (0.01 m)	L = 10.61 R = 7.30	18 073

D.13 November 13, 1972

HARRIS

COMMONWEALTH OF PUERTO RICO
HIGHWAY AUTHORITY
IBM–370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Page 1 of 4

C. Palacio

Card No.	Bridge No.	Road No.
	1137	b̸b̸b̸b̸

BRIDGE INVENTORY

Km. No. b̸b̸

IDENTIFICATION

Code Positions

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

1. State . . . . .Commonwealth of Puerto Rico . . . . . . 10 [7 2 1]
2. Highway District . . . . San Juan . . . . 13 . [0 1]
3. Municipality . . . . San Juan . . . . 15 [0 6 3]
4. City/Town . . . . San Juan. 1b̸8b̸0b̸b̸b̸b̸b̸0 . . . . . . 18 [0 0 6 3]
5. Inventory Route . . C. Palacio . . Pedestrian . Walkway . . 22 [1 8 0 b̸ b̸ b̸ b̸ b̸ 0]
6. Features Intersected . . P.R. 26 . . . .
. . . . 31 [P R 2 6]
7. Facility Carried by Structure? 56 Pedestrian walkway . . . .
8. Structure No. . . . . . . 1137 . . . 1 of 1 . . . . 74 [0 1 1 3 7 1]

Cambia 9. Location 110 By Gem. Shopping. center, Ave. Baldorioty de Castro, . . .
. . . . In San Juan . . . .

Cambio 10. Inventory Route, Minimum Vertical Clearance (0.01 m) . . . . Unlimited . . . . . 10 [9 9 9 9]
11. Kilometer Point (0.01 km) . . . . . . N.A. . . . . 14 [b̸ b̸ b̸ b̸ b̸]
12. Road Section Number (DOD) . . Not defense highway . . . . 19 [0 0 0 0 0]
13. Bridge Description . . . NDHDDH . . . NSTS . . P . . . . 24 [b̸ b̸]
14. Defense Milepoint (0.01 m) . . Not defense highway . . . . . . 26 [0 0 0 0]
15. Defense Section Length (miles) (0.1 mile) . Not defense highway . . . 30 [0 0 0]
16. Latitude: . . 18 . . . Degrees . . 27.0 . . Minutes . . . . 33 [1 8 2 7 0]
17. Longitude: . 66 . . . Degrees . 03.1 . . . Minutes . . . . 38 [0 6 6 0 3 1]
18. Physical Vulnerability . . Steel . Truss . . . . 44 . . [9]
19. By Pass, Detour Length (Nearest mile) . Walk . across . highway . . . . 45 [0 0]
20. Toll . . . . . . No. Toll for road or bridge . . . . 47 . [3]
21. Custodian . . . . State . . . . 48 . . [1]
22. Owner . . . . State Highway Department . . . . 49 . . [1]
23. F.A.P. No. . . 50 . . . .

CLASSIFICATION

24. Fed. Aid System . . . . N.A. . . . . 10 [b̸ b̸]
25. Administrative . . . State . . . . 12 [1]
26. Functional . . . . (Pedestrian . walkway) . . N.A. . . . . 13 [b̸ b̸]

STRUCTURE DATA B - 1137K

9 8 7 6 5 4 3 2 1

27. Year Built . . . 1968 . . . 15 6 8 0 0
28. Lanes on Str. . . . 0 . . . Under . 8 . . . 19 0 0 0 8
29. ADT – Inventory Route . . N.A . . . 23 0 0 0 0 0 0
30. Year . . . N.A . . . 29 0 0
31. Design Load . . . Pedestrian . . . 31 7
32. Approach Roadway width including shoulders (0.01 m) . N.A . . . 32 5 6 6
33. Median . . . None . . . Open Closed . . . 35 0
34. Skew . . . No . . . 36 0 0
35. Structure Flared . . . ☐ Yes ☒ No . . . 38 0
36. Hydraulic Structure . . . ☐ Yes ☒ No . . . 39 0
37. Report Available . . . ☐ Yes ☒ No . . . 40 0
38. Navigation Control . . . N.A. ☐ Yes ☐ No . . . 41 0
39. Navigation Vertical Clearance (0.1 m) . . N.A. ☐ Yes ☐ No . . . 42 0 0 0
40. Navigation Horizontal Clearance (0.1 m) . . N.A ☐ Yes ☐ No . . . 45 0 0 0 0
41. Relief Structures . . . None . . . 49 0 0
42. Type Service . . . Pedestrian over highway . . . 51 3 1
43. Structure Type–Main . . . Steel deck Truss . . . 53 3 0 9
44. Structure Type-Approach Spans . . . None . . . 56 0 0 0
45. No. of Spans–Main . . . 2 . . . 10 0 0 0 2
46. No. of Spans–Approaches . . . None . . . 13 0 0 0 0
47. Total Horizontal Clearance (0.01 m) . . . L = . 1.62 . . . R = . . . 17 0 1 6
48. Max. Span Length (0.01 m) . . . 24.37 . . . 20 0 2 4 4
49. Structure Length (0.01 m) . . . 48.74 . . . 24 0 0 0 4 8 7
50. Sidewalk Widths (0.01 m) Left . . 0.00 . . . Right . . 0.00 . . . 30 0 0 0 0 0 0
51. Bridge Roadway Width (curb-curb) (0.01 m) . . . 1.62 . . . 36 0 0 1 6
52. Deck Width (out-out) (0.01 m) . . . 1.62 . . . 40 0 0 1 6
53. Vertical Clearance over Bridge Roadway–Minimum (0.01 m) . Unlimited . . . 44 9 9 9 9
54. Vertical Underclearance – Minimum (0.01 m) . . . 5.19 . . . 48 0 5 1 9
55. Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m) . . L = 1.27 R = 1.19 . . 52 0 1 3
56. Lateral Underclearance on Left (Median) Sides – Minimum (0.01 m) . . L = 1.30 . R = 1.45 . . 55 0 1 3
57. Wearing Surface . . . Steel plate . . . 58 7

HARRIS

CONDITION

9 8 7 6 5 4 3 2 1

	Material	Condition Analysis	
58. Deck	Steel	Minor irmf	59 7
59. Superstructure	Steel	Minor irmf	60 7
60. Substructure	Steel	GCNRN	61 8
61. Channel & Channel Protection	NA		62 N
62. Culvert & Retaining Walls	NA		63 N
63. Estimated Remaining Life	20 years		64 2 0
64. Operating Rating	PEDESTRIAN LOADING		66 8 0 0
65. Approach Alignment	NA		69 N
66. Inventory Rating	PEDESTRIAN LOADING		70 8 0 0

APPRAISAL

Deficiencies

67. Structural Condition . Needs painting . . . 10 7
Some joint bolt safety pins missing

68. Deck Geometry . . . N.A. . . . 11 N

69. Underclearances–Vert. & Lateral V = 5.19 m; Lateral underclearance width 12 6
equals recommended (PRHA) (1990) section width

70. Safe Load Capacity . . . n.a. . . . 13 6

71. Waterway Adequacy . . . N.A . . . 14 N

72. Approach Alignment . . . N.A. . . . 15 N

PROPOSED IMPROVEMENTS

73. Year Needed . . . 1973 . . . 16 7 3

Completed . . .

Describe . . .

74. Type of Service . . . Pedestrian . . . 18 3

75. Type of Work . . . Rehabilitation . . . 19 3 7 1

76. Improvement Length (0.1 m) . . . 52.14 . . . 22 0 0 0 5 2 2

77. Design Loading . . . V. Pedestrian . . . 26 7

HARRIS

9	8	7	6	5	4	3	2	1

78. Roadway Width (0.01 m) . . . 1.62 . . . 29 [0 0 1 6]
79. Number of Lanes . . . N.A. . . . 33 [0 0]
80. ADT . . . N.A. . . . 35 [0 0 0 0 0 0]
81. Year of Estimated ADT . . . N.A. . . . 41 [0 0]
82. Year of Proposed Adjacent Roadway Improvements . . N.A. . . . 43 [0 0]
83. Prop. Adj. Rdwy Improvements—Type . . . N.A. . . . 45 [0]

COST OF IMPROVEMENTS

84. Total (dollars) $ . . . 4,000 . . . 46 [0 0 0 0 4] *

SUMMARY OF IMPROVEMENT COSTS

85. Preliminary Engineering (Dollars) . . . 51 [ ] *
86. Demolition Cost (Dollars) . . . 54 [ ] *
87. Substructure (Dollars) . . . 57 [ ] *
88. Superstructure (Dollars) . . . 62 [ ] *
89. Priority Letter . . . 67 [ ] *
90. Rehabilitate Existing Structure (Dollars) . . . 68 [ ] *
91. Detour and Traffic Maintenance (Dollars) . . . 71 [ ] *
92. Approaches (Dollars) . . . 74 [ ] *

Approach Embankment (Dollars) ____________

Approach Pavement (Dollars) ____________

Approach Guardrail (Dollars) ____________

(*Code to nearest thousand dollars)

Remarks

. . . Rehabilitation should include replacing missing bolts & safety pins and also painting . . .

PERSONNEL	By	Date		By	Date
Structural Inspection	S.M. Rodgers	11/13/72	Condition Analysis	K. Shah	3/29/73
Topographic Survey			Appraisal	"	"
Review of Field Data	K. Shah	3/27/73	IBM MT/SC file		
Transfer of Data	K. Shah	"	IBM—370 file		

REMARKS

Br 1137

~~Travelled way narrow for present (1970) ADT by . Narrow for future (1990) ADT by , and for future PRHA recommended section by~~

~~Roadway (including shoulders) narrow for present (1970) ADT by . Narrow for future (1990) ADT by and for future PRHA recommended section by~~

GENERAL EVALUATION

This bridge is basically in ~~excellent~~ / ~~fair~~ / good / ~~poor~~ / ~~very poor~~ structural condition.

~~The load carrying capacity is minimally adequate inadequate~~

~~The recommended modifications will make it minimally adequate.~~

~~The bridge should be replaced.~~

It requires routine inspection (every 2 years).
~~frequent inspection (every months) to determine the cause of and remedies for existing defects.~~

~~frequent inspection (every months) to monitor abnormal and/or suspected deficiencies.~~

It requires ~~routine maintenance.~~
minor repairs and routine maintenance.
~~emergency repairs to eliminate danger to the public.~~
~~urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition.~~
~~Non-urgent programmed repairs.~~

~~The deck geometry is unsatisfactory. The travelled way is unsatisfactory for present requirements. The shoulders are unsatisfactory for present requirements.~~

~~The travelled way is unsatisfactory for future (1990) ( ) requirements.~~

~~The shoulders are unsatisfactory for future (1990) ( ) requirements.~~

The approach alignment is satisfactory / ~~minimally adequate.~~ / ~~poor and represents a danger to the public.~~

COMMONWEALTH OF PUERTO RICO
HIGHWAY AUTHORITY
IBM-370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

HARRIS

Page 1 of 1

Card No.	Bridge No.	Road No.
	1137	0026

ROUTE UNDER STRUCTURE

Km. No. 4.07

Code Positions

IDENTIFICATION | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

5. Inventory Route . PR 26 . . . 2 6 3 1 6 0 0 0 2 6 0 . . 10 . 2 3 1 0 0 0 2 6 0

6. Features Intersected . . Pedestrian walkway . . C. Palacio . . . .
. . . . . . 19 P E D W A L K C . P A L A C I O

8. Structure No. . . . . 1137 . . . . 1.0P1 . . . . 44 0 1 1 3 7 1

10. Inventory Route, Minimum Vertical Clearance (0.01 m) . . 5.19 . . . . 50 . 0 5 1 9

11. Kilometer Point (0.01 km) . . 4.07 . . . . 54 0 0 4 0 7

12. Road Section Number (DOD) . . 62 . . . . 59 . 0 0 6 2 6

13. Bridge Description . NDHODH . . . NSTS . . . P . . . . 64 . . 6 6

14. Defense Milepoint (0.01 m) . 1.09 . . . . 66 0 1 0 9

15. Defense Section Length (miles) (0.1 mile) . . 1.7 . . . . 70 . 0 1 7

19. By Pass, Detour Length (Nearest mile) . Marginal road . . . . 73 . . 0 1

CLASSIFICATION

24. Fed. Aid System . Other . Federal . Aid, . primary . . urban . . . . 75 . . 0 4

25. Administrative . . . . State . . . . 77 . . . 1

26. Functional . . . . . . Urban . principal . . arterial . . . . 78 . . 4 3

Card 2

STRUCTURE DATA

29. ADT - Inventory Route . . . . . . 36,550 . . . . 10 . 0 3 6 5 5 0

30. Year . . . . 1970 . . . . 16 . 7 0

47. Total Horizontal Clearance (0.01 m) . . . . L 10.61 . . R 7.30 . . . . 18 0 7 3

Appendix E **Inspection by PRHTA of PB 1307**

E.1 May 15, 2017

INSPECTION REPORT SUMMARY & QC SHEET

BRIDGE: 1307

TEAM LEADER: Angel Lopez

INSP. DATE: 15 mayo 2017

1. Inspection Type and Dates:

NBI	Type	Performed? (Yes / No / NA)	Freq (MONTHS)	Previous Insp. DATE (MONTH/YEAR)	Next Insp. DATE (MONTH/YEAR)
ITEM 90	Routine Inspection	yes	—	Jan 2014	—
ITEM 93 A	FC Inspection				
ITEM 93 B	Underwater Insp.				
ITEM 93 C	Other:				

2. NBI Condition Rating Summary:

	Item 58	Item 59	Item 60	Item 61	Item 62	Item 113
Previous Inspection	5	5	5	—	—	—
Current Inspection	5	5	5	—	—	—

Other Checks: (Y, N, NA)

- Scour Critical (items 113 & 60)
- AASHTO Core's & NBI CD consistent
- Smart Flags (scour, steel plate, fire damage, etc)
- Channel Profile/Clearance Table
- FC & Underwater Members Tables
- Asphalt Overlay Thickness
- Drawings
- Photos
- Critical Finding
- Inspector & Team Leader Signature

Review Comments:

Reviewer: ____________

Safety Eng.: ____________

Sgdo: MAYO - 31 - 2017 (Kale)

YourState Department of Transportation

Bureau of Bridges and Structures
Bridge Maintenance

Structure Inventory and Appraisal Sheet

Bridge Key: 013071 Agency ID: 013071 Sufficiency Rating: -1.0

IDENTIFICATION

State 1:	72 Puerto Rico	Struc Num 8:	013071
Facility Carried 7:	PR 26	Location 9:	BALDORIOTY DE CASTRO AVE.
Rte.(On/Under)5A:	One Route Under	Rte. Signing Prefix 5B:	2 U.S. Numbered
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00003
Directional Suffix 5E:	0 N/A (NBI)	% Responsibility :	NA
SHD District 2:	Unknown	County Code 3:	San Juan
Place Code 4:	76770	Kilometer Post 11:	04.5 km
Feature Intersected 6:	PEDESTRIAN WALKWAY		
Latitude 16:	18d 27' 18"	Longitude 17:	066d 03' 06"
Border Bridge Code 98:	Unknown (P)		
Border Bridge Number 99:	Unknown		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: -1 Number of Spans Main Unit 45: -1

Main Span Material/Design 43A/B:

3 Steel 09

Deck Type 107:	Unknown (NBI)
Wearing Surface 108A:	Unknown (NBI)
Membrane 108B:	Unknown (NBI)
Deck Protection 108C:	Unknown (NBI)

AGE AND SERVICE

Year Built 27:	1966	Year Reconstructed 106:	Unknown		
Type of Service on 42A:	3 Pedestrian-bicyle				
Type of Service under 42B:	1 Highway				
Lanes on 28A:	Unknown	Lanes Under 28B:	8	Detour Length 19:	0.0 km
ADT 29:	65,300	Truck ADT 109:	5 %	Year of ADT 30:	2002

GEOMETRIC DATA

Length Max Span 48:	21.70 m	Structure Length 49:	50.25 m
Curb/Sdwlk Wdth L 50A:		Curb/Sidewalk Width R 50B:	
Width Curb to Curb 51:	1.60 m	Width Out to Out 52:	
Approach Roadway Width 32: (w/ shoulders)	29.30 m	Median 33:	Unknown (NBI)
Deck Area:			
Skew 34:	-1.00 °	Structure Flared 35:	Unknown (NBI)

Minimum Vertical Clearance Over Bridge 53:	
Minimum Vertical Underclearance Reference 54A:	H Hwy beneath struct
Minimum Vertical Underclearance 54B:	05.21 m
Minimum Lateral Underclearance Reference R 55A:	H Hwy beneath struct
Minimum Lateral Undrclearance R 55:	01.70 m
Minimum Lateral Undrclearance L 56:	01.50 m

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	5/15/2017	Next Inspection:	05/15/2019
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	01/01/1901	Next Elem. Insp. Due:	01/01/1901

CLASSIFICATION

Defense Highway 100:	0 Not a STRAHNET hwy	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	0 Not hwy traffic	Temporary Structure 103:	Unknown (NBI)
Highway System 104:	0 Not on NHS	NBIS Length 112:	Unknown (NBI)
Toll Facility 20:	3 On free road	Functional Class 26:	12 Urban Fwy/Expwy
Historical Significance 37:	Unknown (NBI)		
Owner 22:	-1 Unknown (P)		
Custodian 21:	-1 Unknown (P)		

CONDITION

Deck 58:	5 Fair	Super 59:	5 Fair	Sub 60:	5 Fair
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:	N N/A (NBI)		

LOAD RATING AND POSTING

Inventory Rating Method 65:	Unknown (NBI)	Operating Rating Method 63:	Unknown (NBI)
Inventory Rating 66:	MS-.6	Operating Rating 64:	MS-0.6
Design Load 31:	7 Pedestrian	Posting 70:	Unknown (NBI)
Posting status 41:	A Open, no restriction		

APPRAISAL

Bridge Rail 36A:	N N/A or not required	Approach Rail 36C:	N N/A or not required
Transition 36B:	N N/A or not required	Approach Rail Ends 36D:	N N/A or not required
Str. Evaluation 67:	Unknown (NBI)	Deck Geometry 68:	Unknown (NBI)
Underclearance, Vertical and Horizontal 69:	Unknown (NBI)		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	8 Equal Min Criteria
Scour Critical 113:	N Not Over Waterway		

PROPOSED IMPROVEMENTS

Bridge Cost 94:	NA	Type of Work 75:	Unknown (P)
Roadway Cost 95:	Unknown	Length of Improvment 76:	
Total Cost 96:	Unknown	Future ADT 114:	92,703
Year of Cost Estimate 97:	Unknown	Year of Future ADT 115:	2020

NAVIGATION DATA

Navigation Control 38:	_ Unknown (NBI)		
Vertical Clearance 39:		Horizontal Clearance 40:	
Pier Protection 111:	Unknown (NBI)	Lift Bridge Vertical Clearance 116:	

ELEMENT CONDITION STATE DATA

INSP001_Inspection_SIA_Metric **Wed 5/31/2017 13:22:12**
Page 1 of 1

MANAGEMENT OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

Team Leader: Angel T. López
Bridge Inspector: Angel T. López
Bridge Evaluator: Manuel Coll
Assistants: José R. Vázquez _ _ _ _
Driver: José A. Ortíz
Inspection date: _ May, 15, 2017
Weather Conditions: Sunny
Amount of Time on Inspection: 1.5 Hours
Equipment: X Bus or Van _ Underwater _ Ladders _ Snooper X Camera _ Boat
_ Other:

Bridge Number: _1307

Road on Structure: N/A Number or Name: _ Km. _
Road Under Structure: State Highway Number or Name: _26 Km. _4.6
Ident. Plaque: No Num. _
36-Traffic Safety Features:

Bridge railings: not applicable or safety not reuired
Transitions: not applicable or safety not reuired
Approach Guardrail: not applicable or safety not reuired
Approach Guardrail Ends: not applicable or safety not reuired

COMMENTS AND/OR RECOMMENDATIONS:
(50.25mts largo)

Inspection by: Angel T. López
Bridge Inspector

Revised and Approved by: Manuel Coll
Bridge Evaluator
30 may 2017

BR-1307

BRIDGE IVENTORY MANAGEMENT OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

58. DECK

58.1 Wearing Surface: Material: Steel *Condition:* 5 Thickness cm.

Deterioration: 50 to 75 % Drainage: Adequate Ponding: No Safety: Yes

58.2 Slab or Plate: Material: Steel *Condition:* 5

Cracking: None

Spalling: Top: No Bottom: No

Scaling: Top: No Bottom: No

Efflorescence: No Exudation: No Rust Stains: Yes Corrosion: Severe

58.3 Movement: Deck to backwall: cm. Deck to approach slab: cm.

	Material	Cond. Rating	Height Loss (cm)	Joints	Drainage	Alignment	Corrosion	Paint	Safety	Cracking	Spalling	Scaling
58.4 Curb	N/A	--		--	--	--	--	--	--	--	--	--
58.5 Median	N/A	--		--	--	--	--	--	--	--	--	--
58.6 Sidewalks	N/A	--		--	--	--	--	--	--	--	--	--
58.7 Parapets	N/A	--		--	--	--	--	--	--	--	--	--
58.8 Railing	Steel	5		Fair	--	Fair	Severe	Poor	Yes	--	--	--

58.9 Lighting Standards: Material: N/A Condition: N/A Functioning: N/A

58.10 Utilities:

Type: Size: Safety: _

Type: Size: Safety: _

Type: Size: Safety: _

58.11 Joints: Condition: N/A

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

58.12 Drains and Scuppers:

Material: None Condition: N Functioning: N/A

Comments:

58.1- Superficie de acero con corrosión severa, pérdidas leves de secciones y leves perforaciones en los laterales de la superficie de las tolas. Varias tolas están sueltas de sus puntos de soldadura, grandes secciones fueron reparadas aunque hay secciones en pobres condiciones, varios huecos pequeños por corrosión y secciones de las de tolas soldadas que dejan un ligero huerco entre ellas.

58.8- Corrosión severa con mallas de protección, varias de ellas están sueltas de sus puntos de apollo. En el área de las escaleras hay varios verticales que están sueltos de sus soldaduras.

59. SUPERSTRUCTURE

59.1 Bearing Devices: Type: Fixed Out of Plumb: No Paint: None
Condition: 5

59.2 Bridge seats, pedestal, grout pads, abutments or pier seat where beams bear directly on conc.
Condition: 5 Cracking: No Spalling: None Scaling: None
Crushing: No

59.3 Steel beams: N/A Type: N/A
Condition: N Corrosion: None Paint: None

59.4 Concrete: N/A Type: N/A
Condition: N Cracking: No Spalling: None Scaling: None

59.5 Truss: Bailey Pedestrian Paint: Poor Corrosion: Severe Members: Stringers Condition: 5

59.6 Drainage: Type: Condition: N Functioning: No

59.7 Hinges: Condition: N Functioning: N/A Movement: N/A

59.8 Deflection: Normal

59.9 Vibrations: Minimal

60.0 SUBSTRUCTURE:

			Material	Cond. Rating	Cracking	Spalling	Scaling	Corrosion	Paint	Movement	Erosion	Undermining
Abutments	60.1.1	Wingwalls	N/A	N	--	--	--	--	--	--	--	--
	60.1.2	Breast-Backwall	N/A	N	--	--	--	--	--	--	--	--
	60.1.3	Footing	N/A	N	--	--	--	--	--	--	--	--
	60.1.4	Piles	N/A	N	--	--	--	--	--	--	--	--
Piers or Non Pile Bents	60.2.1	Caps	Steel	5	--	--	--	Moderate	Poor	No	No	No
	60.2.2	Bracing	Steel	5	--	--	--	Moderate	Poor	No	No	No
	60.2.3	Columns	Steel	5	--	--	--	Moderate	Poor	No	No	No
	60.2.4	Footing	Concrete	6	F	Small	L	--	--	No	No	No
	60.2.5	Piles	N/A	N	--	--	--	--	--	--	--	--
Rocker Bents	60.3.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.3.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.3.3	Piles	N/A	N	--	--	--	--	--	--	--	--
Pile Bents	60.4.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.4.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.4.3	Piles	N/A	N	--	--	--	--	--	--	--	--

Comments:

59.5- Corrosión moderada y severa en todos los miembros inferiores de la estructura. Hay perforaciones con pérdida de secciones. Las escaleras tienen corrosión severa y perforaciones con pérdidas de secciones, Hay "railings" que tienen corrosión severa en los anclajes ó bases, tienen movimientos laterales.

61. CHANNEL AND PROTECTION Condition: N

61.1 Channel Scour: N/A

61.2 Embankment Erosion: N/A

		Type	Material	Condition Rating	Functioning
61.3	Protective Device		N/A	N	--
61.4	Fender System		N/A	N	--
61.5	Rip Rap		N/A	N	--
61.6	Spur Dikes, Jetties		N/A	N	--

61.7 Obstruction: N/A

61.8 Channel Change: N/A

61.9 Adequate Waterway: N/A

61.10 Surrounding: Flooding: N/A if yes explain:

Erosion: N/A if yes explain:

61.11 Location of piers and/or abutment detrimental: N/A if yes explain:

61.12 Other features that may affect structure:

Comments:

62. CULVERT AND RETAINING WALL

	Material	Condition Rating	Functioning	Cracking	Spalling	Scaling	Corrosion	Settlement	Alignment	Scour
62.1 Barrel	N/A	N	--	--	--	--	--	--	--	--
62.2 Head Walls	N/A	N	--	--	--	--	--	--	--	--
62.3 Cut-off wall	N/A	N	--	--	--	--	--	--	--	--
62.4 Retaining wall	N/A	N	--	--	--	--	--	--	--	--

Comments:

71. WATER ADEQUACY: N/A N/A

72. APPROACH ROADWAY

72.1 Alignment: 6

72.2 Slab or Pavement Condition: N Material: Other

Cracking: No Spalling: Small Scaling: None Uneven: No

Rough: No Settlement: No Movement: Approach slab-backwall: No Breaking up: No

Excessive deformation: No

Safety: Hazardous: No

Drainage: Inadequate: No

Movement: Pavement-approach slab: No

Embankment: Condition: N Functioning: No Erosion: No

Construction: Flimsy: No Integrity impaired: No

72.3 Undesirable Impact: No

72.4 Joints: No Type: None Inadequate: N/A Satisfactory Alignment: N/A

72.5 Guardrail Type: None Material: N/A Functioning: N/A

Condition: N Alignment Horizontal: N/A Vertical: N/A

Joints Functioning: N/A Safety Securely Attached: N/A Pedestrian Hazards: N/A

Comments:

90. INSPECTION DATE: _ May, 15, 2017

93. CRITICAL FEATURE INSPECTION DATE

Fracture Critical:

Underwater:

Other Special Inspection:

102. DIRECTION OF TRAFFIC: Highway traffic not carried

106. YEAR RECONSTRUCTED:

107. DECK STRUCTURE TYPE: Steel Plate (includes orthotropic)

108. WEARING SURFACE/PROTECTIVE SYSTEM

Type wearing surface: Steel

Type Membrane: None

Deck protection: None

111. PIER OR ABUTMENT PROTECTION (FOR NAVIGATION): N/A

113. SCOUR CRITICAL BRIDGES: N

116. MINUMUM NAVIGATION VERTICAL CLEARANCE:

AUXILIARY ITEMS

Signs: Type: Height Limits 18'-6" Material: Alum. Condition: 7

Type: N/A

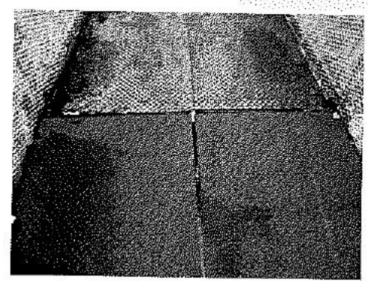
1307-may-15-2017-001.jpg

1307-may-15-2017-003.jpg

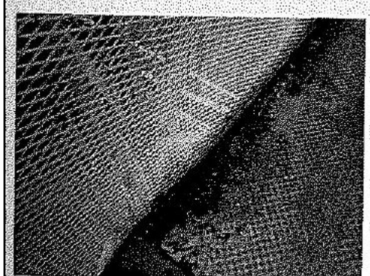
1307-may-15-2017-004.jpg

1307-may-15-2017-013.jpg

1307-may-15-2017-015.jpg



1307-may-15-2017-016.jpg



1307-may-15-2017-017.jpg

1307-may-15-2017-018.jpg

1307-may-15-2017-030.jpg

E.2 January 24, 2014

INSPECTION REPORT SUMMARY & QC SHEET

BRIDGE: 1307 (Pedistrian) *

TEAM LEADER: Eng. Arturo Cáceres Febus

INSP. DATE: 1/24/14

1. Inspection Type and Dates:

NBI	Type	Performed? (Yes / No / NA)	Freq (MONTHS)	Previous Insp. DATE (MONTH/YEAR)	Next Insp. DATE (MONTH/YEAR)
ITEM 90	Routine Inspection	Yes	24	6/30/2008	1/24/16
ITEM 93 A	FC Inspection	N	—	—	—
ITEM 93 B	Underwater Insp.	N	—	—	—
ITEM 93 C	Other:	N	—	—	—

2. NBI Condition Rating Summary:

	Item 58	Item 59	Item 60	Item 61	Item 62	Item 113
Previous Inspection	5	5	5	N	N	Unknown
Current Inspection	5	5	5	N	N	N

Other Checks: (Y, N, NA)

Review Comments:

- Scour Critical (items 113 & 60)
- AASHTO Core's & NBI CD consistent
- Smart Flags (scour, steel plate, fire damage, etc)
- Channel Profile/Clearance Table
- FC & Underwater Members Tables
- Asphalt Overlay Thickness
- Drawings
- Photos
- Critical Finding
- Inspector & Team Leader Signature

Reviewer: ____________

Safety Eng.: ____________

YourState Department of Transportation

Bureau of Bridges and Structures
Bridge Maintenance

Bridge Inspection Report

Bridge Key: 013071 Agency ID: 013071 Sufficiency Rating: -1.0

IDENTIFICATION

State 1:	72 Puerto Rico	Struc Num 8:	013071
Facility Carried 7:	PR 26	Location 9:	BALDORIOTY DE CASTRO AVE.
Rte.(On/Under)5A:	One Route Under	Rte. Signing Prefix 5B:	3 State Hwy
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00026
Directional Suffix 5E:	0 N/A (NBI)	% Responsibility:	NA
SHD District 2:	SAN JUAN	County Code 3:	SAN JUAN
Place Code 4:	SAN JUAN ZONA URBANA	Kilometer Post 11:	04.5 km
Feature Intersected 6:	PEDESTRIAN WALKWAY		
Latitude 16:	18d 27' 18"	Longitude 17:	066d 03' 06"
Border Bridge Code 98:	Not Applicable (P)		
Border Bridge Number 99:	Unknown		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	1/24/2014	Next Inspection:	01/24/2016
FC Frequency 92A:	NA	FC Inspection Date 93A:	1/24/2014	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	01/01/1901	Next Elem. Insp. Due:	01/24/2016

CLASSIFICATION

Defense Highway 100:	0 Not a STRAHNET hwy	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	0 Not hwy traffic	Temporary Structure 103:	Not Applicable (P)
Highway System 104:	0 Not on NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	12 Urban Fwy/Expwy
Historical Significance 37:	5 Not eligible for NRHP		
Owner 22:	01 State Highway Agency		
Custodian 21:	01 State Highway Agency		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: -1 Number of Spans Main Unit 45: 2

Main Span Material/Design 43A/B:

3 Steel 09

Deck Type 107:	5 Steel Plate
Wearing Surface 108A:	0 None
Membrane 108B:	0 None
Deck Protection 108C:	None

CONDITION

Deck 58:	5 Fair	Super 59:	5 Fair	Sub 60:	5 Fair
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:	N N/A (NBI)		

LOAD RATING AND POSTING

Inventory Rating Method 65:	Unknown (NBI)	Operating Rating Method 63:	Unknown (NBI)
Inventory Rating 66:	MS-.6	Operating Rating 64:	MS-0.6
Design Load 31:	7 Pedestrian	Posting 70:	Unknown (NBI)
Posting status 41:	A Open, no restriction		

AGE AND SERVICE

Year Built 27:	1968	Year Reconstructed 106:	Unknown		
Type of Service on 42A:	3 Pedestrian-bicyle				
Type of Service under 42B:	1 Highway				
Lanes on 28A:	Unknown	Lanes Under 28B:	8	Detour Length 19:	0.0 km
ADT 29:	65,300	Truck ADT 109:	5 %	Year of ADT 30:	2000

APPRAISAL

Bridge Rail 36A:	N N/A or not required	Approach Rail 36C:	N N/A or not required
Transition 36B:	N N/A or not required	Approach Rail Ends 36D:	N N/A or not required
Str. Evaluation 67:	Unknown (NBI)	Deck Geometry 68:	Unknown (NBI)
Underclearance, Vertical and Horizontal 69:	Unknown (NBI)		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	6 Equal Min Criteria
Scour Critical 113:	N Not Over Waterway		

GEOMETRIC DATA

Length Max Span 48:	21.70 m	Structure Length 49:	43.01 m
Curb/Sdwlk Wdth L 50A:	0.00 m	Curb/Sidewalk Width R 50B:	0.00 m
Width Curb to Curb 51:	1.62 m	Width Out to Out 52:	2.82 m
Approach Roadway Width 32: (w/ shoulders)	29.30 m	Median 33:	Unknown (NBI)
Deck Area:	121.29 m²		
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Minimum Vertical Clearance Over Bridge 53:			99.99 m
Minimum Vertical Underclearance Reference 54A:			H Hwy beneath struct
Minimum Vertical Underclearance 54B:			07.16 m
Minimum Lateral Underclearance Reference R 55A:			H Hwy beneath struct
Minimum Lateral Undrclearance R 55:			01.70 m
Minimum Lateral Undrclearance L 56:			01.50 m

PROPOSED IMPROVEMENTS

Bridge Cost 94:	NA	Type of Work 75:	Unknown (P)
Roadway Cost 95:	Unknown	Length of Improvment 76:	
Total Cost 96:	Unknown	Future ADT 114:	92,703
Year of Cost Estimate 97:	Unknown	Year of Future ADT 115:	2020

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.00 m	Horizontal Clearance 40:	0.00 m
Pier Protection 111:	1 Not Required	Lift Bridge Vertical Clearance 116:	0.00 m

ELEMENT CONDITION STATE DATA

BRIDGE NOTES

CULVERT

YourState Department of Transportation

Bureau of Bridges and Structures
Bridge Maintenance

Bridge Inspection Report

PAST INSPECTION

Inspection Date: 01/24/2014 Type: 1 Regular NBI

Inspector: -1 Pontis User Key: Pontis - Pontis Poi

Scope:

NBI: ☑ Other: ☐ Element: ☐

Underwater: ☐ Fracture Critical: ☑

INSPECTION NOTES

SEVERE CORROSION, SECTION LOSS AND LIGHT HOLES AT LATERALS OF STEEL PLATE. SOME STEEL PLATES ARE LOOSE FROM WELDING SUPPORTS. SEVERE CORROSION AT WIRE MESH AND LOOSE FROM WELDING SUPPORTS. LOOSE VERTICALS,SEVERE COOROSION, HOLES AND SECTION LOSS AT APPROACHES LADDERS.

INSPECTOR WORK CANDIDATES

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

Team Leader: Arturo Cáceres

Bridge Inspector: Angel T. López

Bridge Evaluator: Arturo Cáceres

Assistants: Juan C. Otero José R. Vázquez _ _ _

Driver: Gabriel Díaz

Inspection date: _ Jan, 24, 2014

Weather Conditions: Sunny

Amount of Time on Inspection: 1.5 Hours

Equipment: X Bus or Van _ Underwater _ Ladders _ Snooper X Camera _ Boat _ Other:

Bridge Number: _1307

Road on Structure: N/A Number or Name: _ Km. _

Road Under Structure: State Highway Number or Name: _26 Km. _4.5

Ident. Plaque: No Num. _

Traffic Safety Features:

Bridge railings: not applicable or safety not reuired

Transitions: not applicable or safety not reuired

Approach Guardrail: not applicable or safety not reuired

Approach Guardrail Ends: not applicable or safety not reuired

COMMENTS AND/OR RECOMMENDATIONS:

Inspection by: Angel T. López
Bridge Inspector

Revised and Approved by: Arturo Cáceres 2/3/14
Team Leader

1

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

58. DECK

58.1 Wearing Surface: Material: Steel *Condition:* 5 Thickness cm.

Deterioration: 50 to 75 % Drainage: Adequate Ponding: No Safety: Yes

58.2 Slab or Plate: Material: Steel *Condition:* 5

Cracking: None

Spalling: Top: No Bottom: No

Scaling: Top: No Bottom: No

Efflorescence: No Exudation: No Rust Stains: Yes Corrosion: Severe

58.3 Movement: Deck to backwall: cm. Deck to approach slab: cm.

	Material	Cond. Rating	Height Loss (cm)	Joints	Drainage	Alignment	Corrosion	Paint	Safety	Cracking	Spalling	Scaling
58.4 Curb	N/A	--		--	--	--	--	--	--	--	--	--
58.5 Median	N/A	--		--	--	--	--	--	--	--	--	--
58.6 Sidewalks	N/A	--		--	--	--	--	--	--	--	--	--
58.7 Parapets	N/A	--		--	--	--	--	--	--	--	--	--
58.8 Railing	Steel	5		Fair	--	Fair	Severe	Poor	Yes	--	--	--

58.9 Lighting Standards: Material: N/A Condition: N/A Functioning: N/A

58.10 Utilities:

Type: Size: Safety: _

Type: Size: Safety: _

Type: Size: Safety: _

58.11 Joints: Condition: N/A

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

58.12 Drains and Scuppers:

Material: None Condition: N Functioning: N/A

Comments:

58.1- Superficie de acero con corrosión severa, pérdidas leves de secciones y leves perforaciones en los laterales de la superficie de las tolas. Varias tolas están sueltas de sus puntos de soldadura.

58.8- Corrosión severa con mallas de protección, varias están sueltas de sus puntos de apollo. En el área de las escaleras hay varios verticales que están sueltos de sus soldaduras.

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

59. SUPERSTRUCTURE

59.1 Bearing Devices: Type: Fixed Out of Plumb: No Paint: None
Condition: 5

59.2 Bridge seats, pedestal, grout pads, abutments or pier seat where beams bear directly on conc.
Condition: 5 Cracking: No Spalling: None Scaling: None
Crushing: No

59.3 Steel beams: N/A Type: N/A
Condition: N Corrosion: None Paint: None

59.4 Concrete: N/A Type: N/A
Condition: N Cracking: No Spalling: None Scaling: None

59.5 Truss: Bailey Pedestrian Paint: Poor Corrosion: Severe Members: Stringers Condition: 5

59.6 Drainage: Type: Condition: N Functioning: No

59.7 Hinges: Condition: N Functioning: N/A Movement: N/A

59.8 Deflection: Normal

59.9 Vibrations: Minimal

60.0 SUBSTRUCTURE:

			Material	Cond. Rating	Cracking	Spalling	Scaling	Corrosion	Paint	Movement	Erosion	Undermining
Abutments	60.1.1	Wingwalls	N/A	N	--	--	--	--	--	--	--	--
	60.1.2	Breast-Backwall	N/A	N	--	--	--	--	--	--	--	--
	60.1.3	Footing	N/A	N	--	--	--	--	--	--	--	--
	60.1.4	Piles	N/A	N	--	--	--	--	--	--	--	--
Piers or Non Pile Bents	60.2.1	Caps	Steel	5	--	--	--	Moderate	Poor	No	No	No
	60.2.2	Bracing	Steel	5	--	--	--	Moderate	Poor	No	No	No
	60.2.3	Columns	Steel	5	--	--	--	Moderate	Poor	No	No	No
	60.2.4	Footing	Concrete	6	F	Small	L	--	--	No	No	No
	60.2.5	Piles	N/A	N	--	--	--	--	--	--	--	--
Rocker Bents	60.3.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.3.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.3.3	Piles	N/A	N	--	--	--	--	--	--	--	--
Pile Bents	60.4.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.4.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.4.3	Piles	N/A	N	--	--	--	--	--	--	--	--

Comments:

59.5- Corrosión moderada y severa en todos los miembros inferiores de la estructura. Hay perforaciones con perdida de secciones. Las escaleras tienen corrosión severa y perforaciones con perdidas de secciones.

3

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

61. CHANNEL AND PROTECTION Condition: N

61.1 Channel Scour: N/A

61.2 Embankment Erosion: N/A

		Type	Material	Condition Rating	Functioning
61.3	Protective Device		N/A	N	--
61.4	Fender System		N/A	N	--
61.5	Rip Rap		N/A	N	--
61.6	Spur Dikes, Jetties		N/A	N	--

61.7 Obstruction: N/A

61.8 Channel Change: N/A

61.9 Adequate Waterway: N/A

61.10 Surrounding: Flooding: N/A if yes explain:

Erosion: N/A if yes explain:

61.11 Location of piers and/or abutment detrimental: N/A if yes explain:

61.12 Other features that may affect structure:

Comments:

62. CULVERT AND RETAINING WALL

	Material	Condition Rating	Functioning	Cracking	Spalling	Scaling	Corrosion	Settlement	Alignment	Scour
62.1 Barrel	N/A	N	--	--	--	--	--	--	--	--
62.2 Head Walls	N/A	N	--	--	--	--	--	--	--	--
62.3 Cut-off wall	N/A	N	--	--	--	--	--	--	--	--
62.4 Retaining wall	N/A	N	--	--	--	--	--	--	--	--

Comments:

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

71. WATER ADEQUACY: N/A N/A

72. APPROACH ROADWAY

72.1 Alignment: 6

72.2 Slab or Pavement Condition: N Material: Other

Cracking: No Spalling: Small Scaling: None Uneven: No

Rough: No Settlement: No Movement: Approach slab-backwall: No Breaking up: No

Excessive deformation: No

Safety: Hazardous: No

Drainage: Inadequate: No

Movement: Pavement-approach slab: No

Embankment: Condition: N Functioning: No Erosion: No

Construction: Flimsy: No Integrity impaired: No

72.3 Undesirable Impact: No

72.4 Joints: No Type: None Inadequate: N/A Satisfactory Alignment: N/A

72.5 Guardrail Type: None Material: N/A Functioning: N/A

Condition: N Alignment Horizontal: N/A Vertical: N/A

Joints Functioning: N/A Safety Securely Attached: N/A Pedestrian Hazards: N/A

Comments:

90. INSPECTION DATE: _ Jan, 24, 2014

93. CRITICAL FEATURE INSPECTION DATE

Fracture Critical:

Underwater:

Other Special Inspection:

102. DIRECTION OF TRAFFIC: Highway traffic not carried

106. YEAR RECONSTRUCTED:

107. DECK STRUCTURE TYPE: Steel Plate (includes orthotropic)

108. WEARING SURFACE/PROTECTIVE SYSTEM

Type wearing surface: Steel

Type Membrane: None

Deck protection: None

111. PIER OR ABUTMENT PROTECTION (FOR NAVIGATION): N/A

113. SCOUR CRITICAL BRIDGES: N

116. MINUMUM NAVIGATION VERTICAL CLEARANCE:

AUXILIARY ITEMS

Signs: Type: Height Limits 18'-6" Material: Alum. Condition: 7

Type: N/A

BRIDGE ENGINEERING OFFICE
INFRASTRUCTURE DIRECTORY
PRHTA

Core Elements

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
											0
											0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0

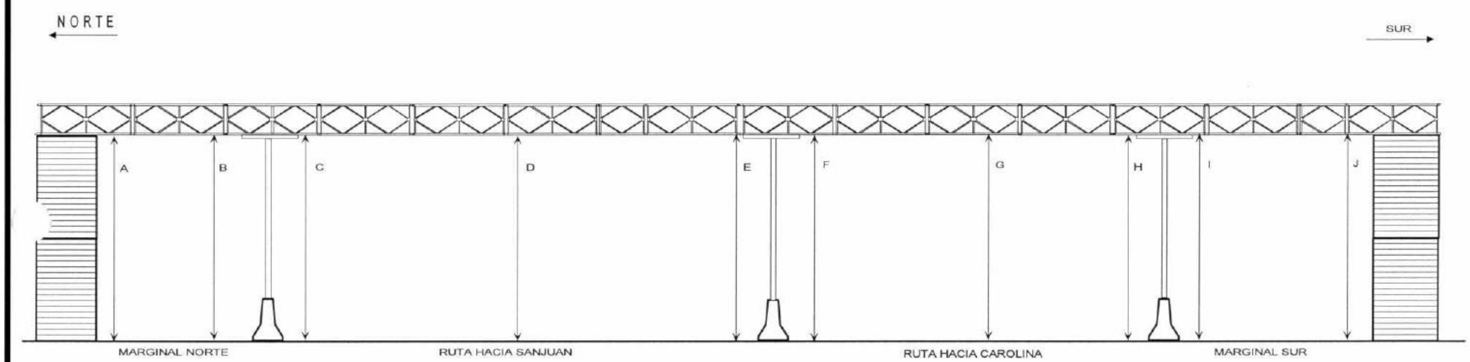
Non Core Elements

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
			3								0
			3								0
			3								0
			3								0
			3								0

Smart Flags

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
											0
											0
			3								0
			3								0
			3								0
			3								0
			3								0

6



A	B	C	D	E	F	G	H	I	J
7.39	7.26	7.30	7.22	7.16	7.19	7.31	7.47	7.57	7.75

VERTICALES

HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

BRIDGE OVER ROAD NO. PR-26
PEDESTRIAN, K.M.4.5 SAN JUAN, P.R.

DRAWING BY	A. LOPEZ	JAN/2014	BRIDGE NO.	DRAWING NO.
CHECKED BY	M.COLL		1307	1/1
APPROVED BY				

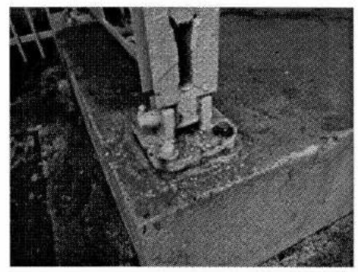
1307-jan-24-2014-001.JPG

1307-jan-24-2014-002.JPG

1307-jan-24-2014-003.JPG

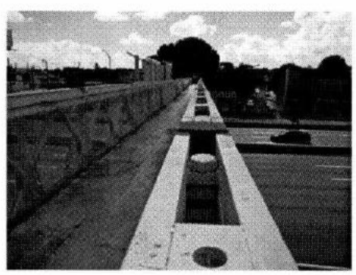
1307-jan-24-2014-006.JPG

1307-jan-24-2014-007.JPG



1307-jan-24-2014-011.JPG

1307-jan-24-2014-017.JPG



1307-jan-24-2014-036.JPG

1307-jan-24-2014-037.JPG

E.3 June 30, 2008

ꓤIDGE ENGINEERING OFFICE
ENGINNERING SERVICE AREA

Team Leader: Mayra I. Zayas
Bridge Inspector: Angel T. López
Bridge Evaluator: Mayra I. Zayas
Assistants: Ramón Rodriguez José R. Vázquez _ _ _
Driver: Jorge L. Viera
Inspection date: _ **30 JUNIO 2008**
Weather Conditions: Sunny
Amount of Time on Inspection: 1.5 Hours
Equipment: **X** Bus or Van _ Underwater _ Ladders _ Snooper **X** Camera _ Boat
_ Other:

Bridge Number: _**1307**

Road on Structure: N/A **Number or Name:** _ **Km.** _
Road Under Structure: State Highway **Number or Name:** _26 **Km.** _4.5
Ident. Plaque: No **Num.** _
Traffic Safety Features:

Bridge railings: not applicable or safety not reuired
Transitions: not applicable or safety not reuired
Approach Guardrail: not applicable or safety not reuired
Approach Guardrail Ends: not applicable or safety not reuired

COMMENTS AND/OR RECOMMENDATIONS:

Inspection by: **Angel T. López**
Bridge Inspector

Revised and Approved by: **Mayra I. Zayas**
Team Leader

1

NRIDGE ENGINEERING OFFICE
ENGINNERING SERVICE AREA

58. DECK

58.1 Wearing Surface: Material: Steel *Condition:* 5 Thickness cm.

Deterioration: 50 to 75 % Drainage: Adequate Ponding: No Safety: Yes

58.2 Slab or Plate: Material: Steel *Condition:* 5

Cracking: None

Spalling: Top: No Bottom: No

Scaling: Top: No Bottom: No

Efflorescence: No Exudation: No Rust Stains: No Corrosion: Severe

58.3 Movement: Deck to backwall: cm. Deck to approach slab: cm.

	Material	Cond. Rating	Height Loss (cm)	Joints	Drainage	Alignment	Corrosion	Paint	Safety	Cracking	Spalling	Scaling
58.4 Curb	N/A	--		--	--	--	--	--	--	--	--	--
58.5 Median	N/A	--		--	--	--	--	--	--	--	--	--
58.6 Sidewalks	N/A	--		--	--	--	--	--	--	--	--	--
58.7 Parapets	N/A	--		--	--	--	--	--	--	--	--	--
58.8 Railing	Steel	5		Fair	--	Fair	Severe	Poor	Yes	--	--	--

58.9 Lighting Standards: Material: N/A Condition: N/A Functioning: N/A

58.10 Utilities:

Type: Size: Safety: _

Type: Size: Safety: _

Type: Size: Safety: _

58.11 Joints: Condition: N/A

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

58.12 Drains and Scuppers:

Material: None Condition: N Functioning: N/A

Comments:

58.1- Corrosión severa con pérdidas de secciones y perforaciones en los laterales de la superficie de las tolas. Varias tolas están sueltas de sus puntos de apollo.

58.8- Corrosión severa con mallas de protección sueltas de sus puntos de apollo.

BRIDGE ENGINEERING OFFICE
ENGINNERING SERVICE AREA

59. SUPERSTRUCTURE

59.1 Bearing Devices: Type: Fixed Out of Plumb: No Paint: None

Condition: 5

59.2 Bridge seats, pedestal, grout pads, abutments or pier seat where beams bear directly on conc.

Condition: 5 Cracking: No Spalling: None Scaling: None

Crushing: No

59.3 Steel beams: N/A Type: N/A

Condition: N Corrosion: None Paint: None

59.4 Concrete: N/A Type: N/A

Condition: N Cracking: No Spalling: None Scaling: None

59.5 Truss: Bailey Pedestrian Paint: Poor Corrosion: Severe Members: Stringers **Condition:** 5

59.6 Drainage: Type: **Condition:** N Functioning: No

59.7 Hinges: Condition: N Functioning: N/A Movement: N/A

59.8 Deflection: Normal

59.9 Vibrations: Minimal

60.0 SUBSTRUCTURE:

			Material	Cond. Rating	Cracking	Spalling	Scaling	Corrosion	Paint	Movement	Erosion	Undermining
Abutments	60.1.1	Wingwalls	N/A	N	--	--	--	--	--	--	--	--
	60.1.2	Breast-Backwall	N/A	N	--	--	--	--	--	--	--	--
	60.1.3	Footing	N/A	N	--	--	--	--	--	--	--	--
	60.1.4	Piles	N/A	N	--	--	--	--	--	--	--	--
Piers or Non Pile Bents	60.2.1	Caps	Steel	5	--	--	--	Moderate	Poor	No	No	No
	60.2.2	Bracing	Steel	5	--	--	--	Moderate	Poor	No	No	No
	60.2.3	Columns	Steel	5	--	--	--	Moderate	Poor	No	No	No
	60.2.4	Footing	Concrete	6	F	Small	L	--	--	No	No	No
	60.2.5	Piles	N/A	N	--	--	--	--	--	--	--	--
Rocker Bents	60.3.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.3.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.3.3	Piles	N/A	N	--	--	--	--	--	--	--	--
Pile Bents	60.4.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.4.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.4.3	Piles	N/A	N	--	--	--	--	--	--	--	--

Comments: 59.5- Corrosión moderada y severa en todos los miembros inferiores de la estructura. Hay perforaciones con mucha perdida de secciones. Las escaleras tienen corrosión severa y perforaciones con perdidas de secciones.

61. CHANNEL AND PROTECTION **Condition:** N

61.1 Channel Scour: N/A

61.2 Embankment Erosion: N/A

		Type	Material	Condition Rating	Functioning
61.3	Protective Device		N/A	N	--
61.4	Fender System		N/A	N	--
61.5	Rip Rap		N/A	N	--
61.6	Spur Dikes, Jetties		N/A	N	--

61.7 Obstruction: N/A

61.8 Channel Change: N/A

61.9 Adequate Waterway: N/A

61.10 Surrounding: Flooding: N/A if yes explain:

Erosion: N/A if yes explain:

61.11 Location of piers and/or abutment detrimental: N/A if yes explain:

61.12 Other features that may affect structure:

Comments:

62. CULVERT AND RETAINING WALL

	Material	Condition Rating	Functioning	Cracking	Spalling	Scaling	Corrosion	Settlement	Alignment	Scour
62.1 Barrel	N/A	N	--	--	--	--	--	--	--	--
62.2 Head Walls	N/A	N	--	--	--	--	--	--	--	--
62.3 Cut-off wall	N/A	N	--	--	--	--	--	--	--	--
62.4 Retaining wall	N/A	N	--	--	--	--	--	--	--	--

Comments:

BRIDGE ENGINEERING OFFICE
ENGINNERING SERVICE AREA

71. WATER ADEQUACY: N/A N/A

72. APPROACH ROADWAY

72.1 Alignment: 6

72.2 Slab or Pavement **Condition:** N Material: Other

Cracking: No Spalling: Small Scaling: None Uneven: No

Rough: No Settlement: No Movement: Approach slab-backwall: No Breaking up: No

Excessive deformation: No

Safety: Hazardous: No

Drainage: Inadequate: No

Movement: Pavement-approach slab: No

Embankment: **Condition:** N Functioning: No Erosion: No

Construction: Flimsy: No Integrity impaired: No

72.3 Undesirable Impact: No

72.4 Joints: No Type: None Inadequate: N/A Satisfactory Alignment: N/A

72.5 Guardrail Type: None Material: N/A Functioning: N/A

Condition: N Alignment Horizontal: N/A Vertical: N/A

Joints Functioning: N/A Safety Securely Attached: N/A Pedestrian Hazards: N/A

Comments:

90. INSPECTION DATE: _ 30 JUNIO 2008

93. CRITICAL FEATURE INSPECTION DATE

Fracture Critical:

Underwater:

Other Special Inspection: 30 JUNIO 2012

102. DIRECTION OF TRAFFIC: Highway traffic not carried

106. YEAR RECONSTRUCTED:

107. DECK STRUCTURE TYPE: Steel Plate (includes orthotropic)

108. WEARING SURFACE/PROTECTIVE SYSTEM

Type wearing surface: Steel

Type Membrane: None

Deck protection: None

111. PIER OR ABUTMENT PROTECTION (FOR NAVIGATION): N/A

113. SCOUR CRITICAL BRIDGES: N

116. MINUMUM NAVIGATION VERTICAL CLEARANCE:

AUXILIARY ITEMS

Signs: Type: Height Limits 18'-6"(5.46mts) Material: Alum. Condition: 7

Type: N/A

E.4 March 14, 2003

YourState Department of Transportation

Bureau of Bridges and Structures
Bridge Maintenance

Bridge Inspection Report

Bridge Key: 013071 Agency ID: 013071 Sufficiency Rating: -1.0

IDENTIFICATION

State 1:	72 Puerto Rico	Struc Num 8:	013071
Facility Carried 7:	PR 26	Location 9:	BALDORIOTY DE CASTRO AVE.
Rte.(On/Under)5A:	One Route Under	Rte. Signing Prefix 5B:	2 U.S. Numbered
Level of Service 5C:	1 Mainline	Rte. Number 5D:	00003
Directional Suffix 5E:	0 N/A (NBI)	% Responsibility:	NA
SHD District 2:	SAN JUAN	County Code 3:	San Juan
Place Code 4:	76770	Kilometer Post 11:	04.5 km
Feature Intersected 6:	PEDESTRIAN WALKWAY		
Latitude 16:	18d 27' 18"	Longitude 17:	066d 03' 06"
Border Bridge Code 98:	Unknown (P)		
Border Bridge Number 99:	NA		

INSPECTION

Frequency 91:	24 months	Inspection Date 90:	3/14/2003	Next Inspection:	03/14/2005
FC Frequency 92A:	NA	FC Inspection Date 93A:	NA	Next FC Inspection:	NA
UW Frequency 92B:	NA	UW Inspection Date 93B:	NA	Next UW Inspection:	NA
SI Frequency 92C:	NA	SI Date 93C:	NA	Next SI:	NA
Element Frequency:	24 months	Element Inspection Date:	03/14/2003	Next Elem. Insp. Due:	03/14/2005

CLASSIFICATION

Defense Highway 100:	0 Not a STRAHNET hwy	Parallel Structure 101:	No || bridge exists
Direction of Traffic 102:	0 Not hwy traffic	Temporary Structure 103:	Unknown (NBI)
Highway System 104:	0 Not on NHS	NBIS Length 112:	Long Enough
Toll Facility 20:	3 On free road	Functional Class 26:	12 Urban Fwy/Expwy
Historical Significance 37:	5 Not eligible for NRHP		
Owner 22:	0101 State Highway Agency		
Custodian 21:	01 01 State Highway Agency		

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: 0 Number of Spans Main Unit 45: 2

Main Span Material/Design 43A/B:

3 Steel 09

Deck Type 107:	5 Steel Plate
Wearing Surface 108A:	9 Other
Membrane 108B:	0 None
Deck Protection 108C:	None

CONDITION

Deck 58:	7 Good	Super 59:	6 Satisfactory	Sub 60:	6 Satisfactory
Culvert 62:	N N/A (NBI)	Channel/Channel Protection 61:	N N/A (NBI)		

LOAD RATING AND POSTING

Inventory Rating Method 65: 2 AS Allowable Stress Operating Rating Method 63: 2 AS Allowable Stress

Inventory Rating 66:	MS44.4	Operating Rating 64:	MS44.4
Design Load 31:	7 Pedestrian	Posting 70:	5 At/Above Legal Loads
Posting status 41:	A Open, no restriction		

AGE AND SERVICE

Year Built 27:	1958	Year Reconstructed 106:	Unknown		
Type of Service on 42A:	3 Pedestrian-bicyle				
Type of Service under 42B:	1 Highway				
Lanes on 28A: Unknown	Lanes Under 28B: 8	Detour Length 19:	00 km		
ADT 29:	65,300	Truck ADT 109:	5 %	Year of ADT 30:	2000

APPRAISAL

Bridge Rail 36A:	N N/A or not required	Approach Rail 36C:	N N/A or not required
Transition 36B:	N N/A or not required	Approach Rail Ends 36D:	N N/A or not required
Str. Evaluation 67:	Unknown (NBI)	Deck Geometry 68:	Unknown (NBI)
Underclearance, Vertical and Horizontal 69:	Unknown (NBI)		
Waterway Adequacy 71:	N Not applicable	Approach Alignment 72:	6 Equal Min Criteria
Scour Critical 113:	N Not Over Waterway		

GEOMETRIC DATA

Length Max Span 48:	21.70 m	Structure Length 49:	55.60 m
Curb/Sdwlk Wdth L 50A:	0.00 m	Curb/Sidewalk Width R 50B:	0.00 m
Width Curb to Curb 51:	1.60 m	Width Out to Out 52:	2.80 m
Approach Roadway Width 32: (w/ shoulders)	29.30 m	Median 33:	0 No median
Deck Area:			
Skew 34:	0.00 °	Structure Flared 35:	0 No flare
Minimum Vertical Clearance Over Bridge 53:			99.99 m
Minimum Vertical Underclearance Reference 54A:			H Hwy beneath struct
Minimum Vertical Underclearance 54B:			05.21 m
Minimum Lateral Underclearance Reference R 55A:			H Hwy beneath struct
Minimum Lateral Undrclearance R 55:			01.70 m
Minimum Lateral Undrclearance L 56:			01.50 m

PROPOSED IMPROVEMENTS

Bridge Cost 94:	$ 0	Type of Work 75:	35 Rehabilitate-gen.
Roadway Cost 95:	$ 0	Length of Improvment 76:	55.60 m
Total Cost 96:	$ 21,000	Future ADT 114:	92,703
Year of Cost Estimate 97:	2003	Year of Future ADT 115:	2020

NAVIGATION DATA

Navigation Control 38:	N NA-no waterway		
Vertical Clearance 39:	0.00 m	Horizontal Clearance 40:	0.00 m
Pier Protection 111:	Unknown (NBI)	Lift Bridge Vertical Clearance 116:	

ELEMENT CONDITION STATE DATA

Str Unit	Elm/Env	Description	Units	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4	% in 5	Qty. St. 5
2	115/3	P/S Conc Stringer	m.	223	0 %	0	60 %	133	0 %	0	40 %	90	0 %	0
2	121/3	P/Stl Thru Truss/Bot	m.	112	0 %	0	70 %	78	0 %	0	30 %	34	0 %	0
2	126/3	P/Stl Thru Truss/Top	m.	112	0 %	0	91 %	102	0 %	0	9 %	10	0 %	0
2	152/3	Paint Stl Floor Beam	m.	46	0 %	0	26 %	12	0 %	0	74 %	34	0 %	0
2	202/3	Paint Stl Column	ea.	3	0 %	0	100 %	3	0 %	0	0 %	0	0 %	0

INSP002_Inspect_Report_Metric Agency ID: 013071 Thu 4/24/2003 08:46:18 Page 1 of 3

Bridge Inspection Report

Str Unit	Elem/Env	Description	Element Notes
2	115/3	P/S Conc Stringer	
2	121/3	Painted Steel Bottom Chord Thru T	
2	126/3	Painted Steel Thru Truss (excl. bot	
2	152/3	Painted Steel Floor Beam	
2	202/3	Painted Steel Column or Pile Exten	corrosion in lower part of the column.

BRIDGE NOTES

CULVERT

PAST INSPECTION

Inspection Date: 03/14/2003 Type: 1 Regular NBI

Inspector: Pontis Pontis User Key: Pontis - Pontis Poi

Scope:

NBI: ☑ Other: ☐ Element: ☑

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

PONTIS inspection comments -
Structure 013071 -
Date 2003-03-14 -
Previous comments > < none >

PAST INSPECTION

Inspection Date: 05/01/1998 Type: 1 Regular NBI

Inspector: -1 Pontis User Key: Pontis - Pontis Poi

Scope:

NBI: ☑ Other: ☐ Element: ☐

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

INSPECTOR WORK CANDIDATES

E.5 November 17, 2000

	PUERTO RICO HIGHWAY AUTHORITY		PAGE 1 OF 7
ENGINEER: HERIBERTO GONZALEZ	BRIDGE STUDIES AND EVALUATION OFFICE	EQUIPMENT	
ASSISTANTS: RAUL VAZQUEZ	BRIDGE REINSPECTION & EVALUATION REPORT	BUS X	LADDERS
: JULIO DE HOSTOS		BOAT	CAMERA X
; LUIS CACHO	BRIDGE No.: 01307 FEDERAL SYSTEM	UNDERWATER	SNOOPER #
:	áááááááááááááááá	SNOOPER OPERATOR	
:	ROAD No.: PR 26 KM. No. : 0004.500	PLAQUE ID	
EVALUATION DATE: 17-NOV-2000		YES X NO	No.
		FILM No.	135

============IDENTIFICATION============

1- STATE :	Commonwealth of Puerto Rico		721
2- HIGHWAY AGENCY DISTRICT :	SAN JUAN		01
3- COUNTY (PARISH) CODE :	SAN JUAN		127
4- PLACE CODE :	SAN JUAN URBAN ZONE		76770
5- INVENTORY ROUTE :	2-2-1-00003-0		221000030
6- FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY	
7- FACILITY CARRIED BY STRUCTURE :	P.R. - 26	PR 26	
8- STRUCTURE NUMBER :	BRIDGE 1307 1 OF 1		013071
9- LOCATION :	BALDORIOTY DE CASTRO AVE.	BALDORIOTY DE CASTRO AVE.	
10- INVENTORY ROUTE, MINIMUM VERTICAL CLEARANCE :	5.21 MT (17' - 1")		0521
11- KILOMETERPOINT :	4.50		0004500
12- BASE HIGHWAY NETWORK :	INVENTORY ROUTE IS ON THE BASE NETWORK		0
13- LRS INVENTORY ROUTE, SUBROUTE NUMBER :			
16- LATITUDE :	18 DEGREES 27.3 MINUTES		18271800
17- LONGITUDE :	66 DEGREES 03.1 MINUTES		066030600
19- BYPASS, DETOUR LENGTH (NEAREST KILOMETER) :	STRUCTURE OVER HIGHWAY		000

============CLASSIFICATION============

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	URBAN INTERSTATE	12

============AGE AND SERVICE==========

27- YEAR BUILT :	1968	1968
28- LANES ON AND UNDER STRUCTURE :	0 LANES ON / 8 LANES UNDER	0008
29- A.D.T. OF INVENTORY ROUTE :	67,300	067300
30- YEAR OF A.D.T. :	1999	1999

===========STRUCTURE DATA=============

31- DESIGN LOAD :	PEDESTRIAN	7
32- APPROACH ROADWAY WIDTH :	29.29 MT (96.07 FT)	0293
33- BRIDGE MEDIAN :	NONE	0
34- SKEW ANGLE :	NONE	00
35- STRUCTURE FLARED :	NO	0
36- TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
37- HISTORICAL SIGNIFICANCE :	5	5
38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	NO	0000
40- NAVIGATION HORIZONTAL CLEARANCE :	NO	00000
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
42- TYPE OF SERVICE :	PEDESTRIAN OVER HIGHWAY	31
43- STRUCTURE TYPE, MAIN :	STEEL TRUSS DECK	309
44- STRUCTURE TYPE APPR. :	NONE	000
45- NUMBER OF SPAN IN MAIN UNIT :	002	002
46- NUMBER OF APPROACH SPAN :	NONE	0000

47- INV. ROUTE, TOTAL HORIZ. CLEARANCE : .... 10.82 MT.(35.49 FT) 108
48- LENGTH OF MAXIMUM SPAN : .... 21.65 MT.(71.01 FT) 00217
49- STRUCTURE LENGTH : .... 55.63 MT.(182.47 FT) 000556
50- CURB OR SIDEWALK WIDTHS : .... NONE 000000

============STRUCTURE DATA============

51- BRIDGE ROADWAY WIDTH, CURB TO CURB :.................................. 1.64 MT.(5.38 FT) 0016
52- DECK WIDTH, OUT TO OUT : ....2.84 MT.(9.32 FT) 0028
53- MI. VERT. CLEAR. OVER BRIDGE ROADWAY : .... UNLIMITED 9999
54- MINIMUM VERTICAL UNDERCLEARANCE : .... 5.21 MT.(17' - 1") H0521
55- MINIMUM LATERAL UNDERCLEARANCE ON RIGHT : .... 1.68 MT.(5.51 FT) H017
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT : .... 1.50 MT.(4.92 FT) 015

===============CONDITION===============

58- DECK: FAIR RATING: 3
58.1 WEARING SURFACE: MATERIAL: STEEL CONDITION : 3
THICKNESS:
DETERIORATION: X YES NO DRAINAGE: X ADEQUATE INADEQUATE
PONDING: YES X NO SAFETY: X YES NO
58.2 SLAB OR PLATE: MATERIAL: STEEL CONDITION 3
CRACKING: FINE MEDIUM OPEN
TOP BOTTOM
SPALLING: S < 1 in. DEEP x 6 in. & L > 1 in. x 6 in. &
SCALING : L to ˜ in., M ˜ in. - ˜ in., H ˜ in. - 1 in., S > 1
EFFLORESCENCE EXUDATION RUST STAINS CORROSION: LIGHT MODERATE SEVERE
58.3 MOVEMENT: DECK TO BACKWALL cm. DECK TO APPROACH SLAB cm.

	(58.4) CURBS	(58.5) MEDIAN	(58.6) SIDEWALKS	(58.7) PARAPETS	(58.8) RAILING
MATERIAL					STEEL
CONDITION RATING					5
HEIGHT LOSS (cm)					
JOINTS					OK
DRAINAGE					
ALIGNMENT					OK
CORROSION (L-M-S)					M
PAINT:G-GOOD,F-FAIR, P-POOR,N-NONE U-USELESS TO PAINT					P
SAFETY					YES
CRACKING (F-M-O)					
SPALLING (S-L)					
SCALING (L-M-H-S)					

DECK COMMENTS:
DECK SURFACE SEVERE CORROSION ON FLOOR STEEL PLATES,PER-FORATIONS DUE CORROSION.BOTTOM SLAB MO DERATED TO SEVERE CORROSION ON MANY RAILING COMPONENTS.

58.9 LIGHTING STANDARDS: MATERIAL: CONDITION: FUNCTIONING: YES NO
58.10 UTILITIES: TYPE: SIZE: SAFETY:
58.11 JOINTS: EXPANSION CONSTRUCTION CONDITION: FUNCTIONING: YES NO
LEAKING: YES NO CRACKING: FINE MEDIUM OPEN SPALLING: SMALL LARGE
58.12 DRAINS AND SCUPPERS: MATERIAL: CONDITION: FUNCTIONING: YES NO

BRIDGE STUDIES AND EVALUATION OFFICE

IDGE No.: 01307 BRIDGE REINSPECTION & EVALUATION REPORT

59- SUPERSTRUCTURE: FAIR RATING: 5

SUPERSTRUCTURE COMMENTS:
MODERATE TO SEVERE CORROSION ON SEVERA
L BRIDGE COMPONENTS.

59.1 BEARING DEVICES: TYPE: FIXED MOVABLE OUT OF PLUMB
PAINT: GOOD FAIR POOR NONE USELESS TO PAINT
CONDITION: FUNCTIONING: YES NO

59.2 BRIDGE SEATS, PEDESTAL, GROUT PADS, ABUTMENTS OR PIER SEATS WHERE BEAMS BEAR DIRECTLY ON CONCRETE
CONDITION: 5 CRACKING: F M O SPALLING: S L
SCALING: L M H S CRUSHING:

59.3 STEEL-BEAMS: TYPE: DIMENSIONS(height;width;thickness):
CONDITION: CORROSION: L M S PAINT: G F P N U

59.4 CONCRETE-BOX BEAMS, I-BEAMS, SLAB, T-BEAM, TYPE:
CONDITION: CRACKING: F M O SPALLING: S L
SCALING: L M H S

59.5 TRUSSES: TYPE: BAILEY PED CONDITION: 5 CORROSION: L X M X S
DAMAGE: DEFORMATION: PAINT: G X F X P N U
A=TRUSS B=UPPER & LOWER LATERAL BRACING C=PORTALS D=FLOOR BEAMS E*=STRINGERS

59.6 DRAINAGE: TYPE: CONDITION: FUNCTIONING: YES NO

59.7 HINGES: CONDITION: FUNCTIONING: YES NO MOVEMENT: YES NO
ALIGNMENT: GOOD BAD PAINT: G F P N U

59.8 DEFLECTIONS: X NORMAL EXCESSIVE cms.

59.9 VIBRATIONS: X MINIMAL MODERATE EXCESSIVE

60- SUBSTRUCTURE: FAIR RATING: 5

	ABUTMENTS				PIERS OR NON PILES BENTS					PILES BENTS		
	60.1.1	60.1.2	60.1.3	60.1.4	60.2.1	60.2.2	60.2.3	60.2.4	60.2.5	60.4.1	60.4.2	60.4.3
	WINGWALL	BREAST & BACKWALL	FOOTING	PILES	CAPS	BRACING	COLUMNS	FOOTINGS	PILES	CAPS	BRACING	PILES
MATERIAL					STEEL	STEEL	STEEL	CONCRETE				
CONDITION RATING					5	5	5	6				
CRACKING (F-M-O)								F				
SPALLING (S-L)								S				
SCALING (L-M-H-S)								L				
CORROSION (L-M-S)					M	M	M					
PAINT (G-F-P-N-U)					P	P	P					
MOVEMENT					NO	NO	NO	NO				
EROSION												
UNDERMINING												

60- SUBSTRUCTURE COMMENTS:

61- CHANNEL & CHANNEL PROTECTION : N/A RATING : N CHANNEL COMMENTS:

61.1 CHANNEL SCOUR(EXTENT) :

61.2 EMBANKMENT EROSION(EXTENT) :

	TYPE	MATERIAL	CONDITION RATING	FUNCTIONING YES	FUNCTIONING NO
61.3 PROTECTIVE DEVICE					
61.4 FENDER SYSTEM ----			----	----	----
61.5 RIP RAP					
61.6 SPUR DIKES, JETTIES			----	----	----

61.7 OBSTRUCTION (DEBRIS, GROWTHS):

61.8 CHANNEL CHANGE: YES NO

DETRIMENTAL: YES NO IF YES, EXPLAIN

61.9 ADEQUATE WATERWAY: YES NO IF NO, EXPLAIN

61.10 SURROUNDING AREA: FLOODING: YES NO IF YES, EXPLAIN

EROSION: YES NO IF YES, EXPLAIN

61.11 LOCATION OF PIERS AND/OR ABUTMENTS: DETRIMENTAL: YES NO

IF YES, EXPLAIN

61.12 OTHER FEATURES THAT MAY AFFECT STRUCTURE:

62- CULVERT AND RETAINING WALLS :N/A RATING :N CULVERT COMMENTS:

	62.1BARREL	62.2HEADWALL	62.3CUT-OFFWALL	62.4RETAINING WALL
MATERIAL				
CONDITION RATING	----- ----	------ -----	------- -------	--------- --------
FUNCTIONING(Y-N)				
CRACKING(F-M-O)	----- ----	------ -----	------- -------	--------- --------
SPALLING (S-L)				
SCALING(L-M-H-S)	----- ----	------ -----	------- -------	--------- --------
CORROSION(L-M-S)				
SETTLEMENT(Y-N)	----- ----	------ -----	------- -------	--------- --------
ALIGNMENT(Y-N)				
PAINT(G-F-P-N-U)	----- ----	------ -----	------- -------	--------- --------

63- METHOD USED TO DETERMINE OPERATING RATING .. 2

64- OPERATING RATING : .... PEDESTRIAN 800

65- METHOD USED TO DETERMINE INVENTORY RATING .. 2

66- INVENTORY RATING : .... PEDESTRIAN 800

67- STRUCTURAL EVALUATION : 3

MODERATE & SEVERE CORROSION AT STEEL PLATES,RAILINGS,UPPER CHORD & STRIN-
GERS.MODERATE CORROSION AT BRACINGS & BETWEEN LOWER CHORDS & FLOORBEAMS.
LIGHT CORROSION AT STEEL COLUMNS & STAIRS.MODERATE CORROSION AT REST AREA.

68- DECK GEOMETRY : .... N

N/A.

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : .... 13 ft

(5.21mt) (1.50mt)
EQUAL TO PRESENT MINIMUM CRITERIA.

70- BRIDGE POSTING : .... N/A. 5

71- WATERWAY ADEQUACY : .... N

N/A.

REMOTE - GREATER THAN 100 YEARS. SLIGHT - 11 TO 100 YEARS. OCASSIONAL - 3 TO 10 YEARS. FREQUENT - LESS THAN 3 YEARS.
INSIGNIFICANT - MINOR INCONVENIENCE. HIGHWAY PASSABLE IN A MATTER OF HOURS. SIGNIFICANT - TRAFFIC DELAYS OF UP TO SEVERAL DAYS
SEVERE - LONG TERM DELAYS TO TRAFFIC WITH RESULTING HARDSHIP

72- APPROACH ROADWAY ALIGNMENT : 6

N/A.

72.2 SLAB OR PAVEMENT CONDITION : MATERIAL :
CRACKING: F N O SPALLING: L S SCALING: L M H S UNNEVEN: YES NO ROUGH: YES NO
SETTLEMENT: YES NO MOVEMENT: APPROACH SLAB-BACKWALL: YES NO BREAKING UP: EXCESSIVE DEFORMATION:
SAFETY: HAZARDOUS YES NO DRAINAGE: INADEQUATE: YES NO PONDING: YES NO
MOVEMENT: PAVEMENT-APPROACH SLAB: YES NO EMBANKMENT: CONDITION:
FUNCTIONING: YES NO EROSION: YES NO IF YES, EXPLAIN
CONSTRUCTION: FLIMSY: YES NO
INTEGRITY IMPAIRED: YES NO IF YES, EXPLAIN
72.3 UNDESIRABLE IMPACT: YES NO
72.4 JOINTS: TYPE: INADEQUATE: YES NO SATISFACTORY ALIGNMENT: YES NO
72.5 GUARDRAIL: TYPE: MATERIAL: CONDITION: FUNCTIONING: YES NO
ALIGNMENT: HORIZONTAL: GOOD BAD VERTICAL: GOOD BAD JOINTS: FUNCTIONING: YES NO
SAFETY: SECURELY ATTACHED: YES NO PEDESTRIAN HAZARDS: YES NO

72- APPROACH ROADWAY - COMMENTS:

ʌAL SYSTEM

ɪIDGE NO. :01307

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

========PROPOSED IMPROVEMENT========

75- TYPE OF WORK : .... REHABILITATION 352
76- LENGTH OF STRUCTURE IMPROVEMENT : .... 55.63 MT.(182.47 FT) 000556

=============INSPECTIONS=============

89- RESERVED .... --
90- INSPECTION DATE : NOVEMBER-17-2000 1100
91- DESIGNATED INSPECTION FRECUENCY : .... 24 MONTHS 24
92- CRITICAL FEATURE INSPECTION : .... N/A N N N
93- CRITICAL FEAT. INSPECT. DATE: .... N/A
FRACTURE CRITICAL UNDERWATER OTHER

===========IMPROVEMENT COST===========

94- BRIDGE IMPROVEMENT COST : .... N/A 000000
95- ROADWAY IMPROVEMENT COST : .... N/A 000000
96- TOTAL PROJECT COST : .... (55.63X2.84X$1315X10%)=$20,776 000021
97- YEAR OF IMPROVEMENT COST ESTIMATED : .... ~~1999~~ 2000 2000

==CLASSIFICATION AND STRUCTURE DATA==

98- BORDER BRIDGE : .... --
99- BORDER BRIDGE STRUCTURE NUMBER : .... --
100- STRAHNET HIGHWAY DESIGNATION : .... DEFENSE HIGHWAY 2
101- PARALLEL STRUCTURE DESIGNATION : .... NO PARALLEL STRUCTURE N
102- DIRECTION OF TRAFFIC : .... TRAFFIC NOT CARRIED 0
103- TEMPORARY STRUCTURE DESIGNATION : .... N/A
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE : .... N.H.S. 0
105- FEDERAL LANDS HIGHWAYS : 0
106- YEAR RECONSTRUCTION : .... NO RECONSTRUCTION 0000
107- DECK STRUCTURE TYPE : .... STEEL PLATE 5
108- WEARING SURF./ PROTECT. SYSTEM : .... OTHER - NONE - NONE 900
109- AVERAGE DAILY TRUCK TRAFFIC : .... 5 % 05
110- DESIGNATED NATIONAL NETWORK : .... PART OF NETWORK 1
111- PIER OR ABUT. PROTECTION (NAVIGATION) : .... N/A
112- NBIS BRIDGE LENGTH : .... YES Y
113- SCOUR CRITICAL BRIDGE : .... N/A N
114- FUTURE AVERAGE DAILY TRAFFIC : 94,893 094893
115- YR. OF FUTURE A.D.T. : 2019 2019
116- MINIM. NAVIG. VERT. CLEARANCE : .... N/A
VERTICAL LIFT BRIDGE :
117- SUFFICIENCY RATING : ....
125- PRIORITY RATING: ....
127- EVALUATION DATE : 17-NOV-2000 111700
130- CRITICAL FRACTURE INSP. DATE : ....

ENGINEER :HERIBERTO GONZALEZ

AUXILIARY ITEMS
1-SIGNS
TYPE: ORIENTACION "SAN JUAN - BAYAMON - RIO PIEDRAS"
MATERIAL: ALUMINIO
CONDITION: 7

REMARKS:
THE REHABILITATION CONSIST IN REPAIR ALL DEFICIENCIES DESCRIBED ON THE
ITEM #67.

E.6 May 8, 1998

s16.66H

PUERTO RICO HIGHWAY AUTHORITY

BRIDGE STUDIES AND EVALUATION OFFICE

BRIDGE REINSPECTION & EVALUATION REPORT

PAGE 1 OF 7

ENGINEER: INEABELLE VELEZ

ASSISTANTS: L.QUIÑONES

: ERAZO

:

:

:

EVALUATION DATE: 8-MAYO-98

BRIDGE No.: 01307 FEDERAL SYSTEM

ROAD No.: PR 26 KM. No. : 0004.500

EQUIPMENT

BUS X	LADDERS
BOAT	CAMERA X
UNDERWATER	SNOOPER #
SNOOPER OPERATOR	

PLAQUE ID

YES X NO No.

FILM No. 135

============IDENTIFICATION============

1- STATE :	Commonwealth of Puerto Rico		721
2- HIGHWAY AGENCY DISTRICT :	SAN JUAN		01
3- COUNTY (PARISH) CODE :	SAN JUAN		127
4- PLACE CODE :	SAN JUAN URBAN ZONE		76770
5- INVENTORY ROUTE :	2-1-1-00003-0		211000030
6- FEATURES INTERSECTED :	PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY	
7- FACILITY CARRIED BY STRUCTURE :	P.R. - 26	PR 26	
8- STRUCTURE NUMBER :	BRIDGE 1307 1 OF 1		013071
9- LOCATION :	BALDORIOTY DE CASTRO AVE.	BALDORIOTY DE CASTRO AVE.	
10- INVENTORY ROUTE, MINIMUM VERTICAL CLEARANCE :	5.21 MT (17' - 1")		0520
11- KILOMETERPOINT :	4.50		0004500
12- BASE HIGHWAY NETWORK :	INVENTORY ROUTE IS ON THE BASE NETWORK		1
13- LRS INVENTORY ROUTE, SUBROUTE NUMBER :			000000002600
16- LATITUDE :	18 DEGREES 27.3 MINUTES		18271800
17- LONGITUDE :	66 DEGREES 03.1 MINUTES		066030600
19- BYPASS, DETOUR LENGTH (NEAREST KILOMETER) :	STRUCTURE OVER HIGHWAY		000

============CLASSIFICATION============

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	URBAN INTERSTATE	11

============AGE AND SERVICE===========

27- YEAR BUILT :	1968	1968
28- LANES ON AND UNDER STRUCTURE :	0 LANES ON / 8 LANES UNDER	0008
29- A.D.T. OF INVENTORY ROUTE :	65,300	065300
30- YEAR OF A.D.T. :	1996	1996

===========STRUCTURE DATA============

31- DESIGN LOAD :	PEDESTRIAN	7
32- APPROACH ROADWAY WIDTH :	29.29 MT (96.07 FT)	0293
33- BRIDGE MEDIAN :	NONE	0
34- SKEW ANGLE :	NONE	00
35- STRUCTURE FLARED :	NO	0
36- TRAFFIC SAFETY FEATURES :	N-N-N-N	NNNN
37- HISTORICAL SIGNIFICANCE :	5	5
38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	NO	0000
40- NAVIGATION HORIZONTAL CLEARANCE :	NO	00000
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
42- TYPE OF SERVICE :	PEDESTRIAN OVER HIGHWAY	31
43- STRUCTURE TYPE, MAIN :	STEEL TRUSS DECK	309
44- STRUCTURE TYPE APPR. :	NONE	000
45- NUMBER OF SPAN IN MAIN UNIT :	002	002
46- NUMBER OF APPROACH SPAN :	NONE	0000

47- INV. ROUTE, TOTAL HORIZ. CLEARANCE : ....(14.40 mt) 10.82 MT.(35.49 FT)		~~1078~~ 144
48- LENGTH OF MAXIMUM SPAN : .... 21.65 MT.(71.01 FT)		00218 7
49- STRUCTURE LENGTH : .... 55.63 MT.(182.47 FT)		000558 6
50- CURB OR SIDEWALK WIDTHS : .... NONE		000000

===========STRUCTURE DATA===========

51- BRIDGE ROADWAY WIDTH, CURB TO CURB :	1.64 MT.(5.38 FT)	0016
52- DECK WIDTH, OUT TO OUT :	2.84 MT.(9.32 FT)	0028
53- MI. VERT. CLEAR. OVER BRIDGE ROADWAY :	UNLIMITED	9999
54- MINIMUM VERTICAL UNDERCLEARANCE :	5.21 MT.(17' - 1")	H052 1
55- MINIMUM LATERAL UNDERCLEARANCE ON RIGHT :	1.68 MT.(5.51 FT)	H017
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT :	1.50 MT.(4.92 FT)	015

==============CONDITION==============

58- DECK: FAIR RATING: 5

58.1 WEARING SURFACE: MATERIAL: STEEL CONDITION :5

THICKNESS: -

DETERIORATION: X YES NO DRAINAGE: X ADEQUATE INADEQUATE

PONDING: YES X NO SAFETY: X YES NO

58.2 SLAB OR PLATE: MATERIAL: STEEL CONDITION 5

CRACKING: FINE MEDIUM OPEN

TOP BOTTOM

SPALLING: |S < 1 in. DEEP x 6 in. & L > 1 in. x 6 in. &

SCALING : |L to ½ in., M ½ in. - ℓ in., H ℓ in. - 1 in., S > 1

EFFLORESCENCE EXUDATION RUST STAINS CORROSION: LIGHT MODERATE SEVERE

58.3 MOVEMENT: DECK TO BACKWALL - cm. DECK TO APPROACH SLAB cm.

DECK COMMENTS:

58.1 Y 58.2)TOLES DE ACERO CON LEVE CORROSION.

58.8)RAILING CON LEVE CORROSION.MODERADA CORROSION EN LAS SECCIONES #9,#10 Y #11 LADO OESTE.

	(58.4) CURBS	(58.5) MEDIAN	(58.6) SIDEWALKS	(58.7) PARAPETS	(58.8) RAILING
MATERIAL					STEEL
CONDITION RATING					5
HEIGHT LOSS (cm)					-
JOINTS					
DRAINAGE					G
ALIGNMENT					G
CORROSION (L-M-S)					M
PAINT:G-GOOD,F-FAIR, P-POOR,N-NONE U-USELESS TO PAINT					F
SAFETY					YES
CRACKING (F-M-O)					-
SPALLING (S-L)					
SCALING (L-M-H-S)					-

58.9 LIGHTING STANDARDS: MATERIAL: - CONDITION: - FUNCTIONING: YES NO

58.10 UTILITIES: TYPE: - SIZE: SAFETY:

58.11 JOINTS: EXPANSION CONSTRUCTION CONDITION: FUNCTIONING: YES NO

LEAKING: YES NO CRACKING: FINE MEDIUM OPEN SPALLING: SMALL LARGE

58.12 DRAINS AND SCUPPERS: MATERIAL: CONDITION: FUNCTIONING: YES NO

59- SUPERSTRUCTURE: FAIR RATING: 5

59.1 BEARING DEVICES: TYPE: FIXED MOVABLE OUT OF PLUMB
PAINT: GOOD FAIR POOR NONE USELESS TO PAINT
CONDITION: FUNCTIONING: YES NO

59.2 BRIDGE SEATS,PEDESTAL,GROUT PADS,ABUTMENTS OR PIER SEATS WHERE BEAMS BEAR DIRECTLY ON CONCRETE
CONDITION: 6 CRACKING: F M O SPALLING: S L
SCALING: L M H S CRUSHING:

59.3 STEEL-BEAMS: TYPE: DIMENSIONS(height;width;thickness):
CONDITION: CORROSION: L M S PAINT: G F P N U

59.4 CONCRETE-BOX BEAMS, I-BEAMS, SLAB, T-BEAM, TYPE:
CONDITION: CRACKING: F M O SPALLING: S L
SCALING: L M H S

59.5 TRUSSES: TYPE: BAILEY CONDITION: 5 CORROSION: L M S
DAMAGE: DEFORMATION: PAINT: G X F P N U
A=TRUSS B=UPPER & LOWER LATERAL BRACING C=PORTALS D=FLOOR BEAMS E*=STRINGERS

59.6 DRAINAGE: TYPE: CONDITION: FUNCTIONING: YES NO

59.7 HINGES: CONDITION: FUNCTIONING: YES NO MOVEMENT: YES NO
ALIGNMENT: GOOD BAD PAINT: G F P N U

59.8 DEFLECTIONS: X NORMAL EXCESSIVE cms.

59.9 VIBRATIONS: X MINIMAL MODERATE EXCESSIVE

SUPERSTRUCTURE COMMENTS:

59.5)UPPER CHORD TIENE LEVE Y MODERADA CORRO SION.MODERADA CORROSION EN LO S PANELES #9,#10 Y #11 DE SUR A NORTE LADO OESTE.

MODERADA CORROSION EN EL LOWER CHORD EN AREA DESCANSO DE FLOOR BEAM.F LOOR BEAM TIENE MODERADA CORROSION EN UNION AL LOWER CHORD.

STRINGERS CON MODERADA CORROSION (EN EL 40% DE ELLOS).

60- SUBSTRUCTURE: FAIR RATING: 5

	ABUTMENTS				PIERS OR NON PILES BENTS					PILES BENTS		
	60.1.1 WINGWALL	60.1.2 BREAST & BACKWALL	60.1.3 FOOTING	60.1.4 PILES	60.2.1 CAPS	60.2.2 BRACING	60.2.3 COLUMNS	60.2.4 FOOTINGS	60.2.5 PILES	60.4.1 CAPS	60.4.2 BRACING	60.4.3 PILES
MATERIAL					STEEL	STEEL	STEEL	CONCRETE				
CONDITION RATING					6	5	6	6				
CRACKING (F-M-O)					-	-	-	-				
SPALLING (S-L)												
SCALING (L-M-H-S)					-	-	-	-				
CORROSION (L-M-S)					L	M	L					
PAINT (G-F-P-N-U)					F	F	-	-				
MOVEMENT					N	N	N	N				
EROSION					N	N	N	N				
UNDERMINING					N	N	N	N				

60- SUBSTRUCTURE COMMENTS:

60.2.2)MODERADA CORROSION CON PERDIDA DE SEC CIONS EN LOS BRACING.

60.2.3)PILASTRA TIENE COLUMNAS CON LEVE CORROSION. ESCALERAS CON LEVE CORROSION. MODERADA CO RROSION EN AREA DE DESCANSO.

60.2.4)FOOTING EN BUENAS CONDICIONES.

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

61- CHANNEL & CHANNEL PROTECTION : N/A RATING : N CHANNEL COMMENTS:

61.1 CHANNEL SCOUR(EXTENT) :

61.2 EMBANKMENT EROSION(EXTENT) :

	TYPE	MATERIAL	CONDITION RATING	FUNCTIONING YES	FUNCTIONING NO
61.3 PROTECTIVE DEVICE					
61.4 FENDER SYSTEM ----					
61.5 RIP RAP					
61.6 SPUR DIKES,JETTIES					

61.7 OBSTRUCTION (DEBRIS, GROWTHS):

61.8 CHANNEL CHANGE: YES NO

DETRIMENTAL: YES NO IF YES, EXPLAIN

61.9 ADEQUATE WATERWAY: YES NO IF NO, EXPLAIN

61.10 SURROUNDING AREA: FLOODING: YES NO IF YES, EXPLAIN

EROSION: YES NO IF YES, EXPLAIN

61.11 LOCATION OF PIERS AND/OR ABUTMENTS: DETRIMENTAL: YES NO

IF YES, EXPLAIN

61.12 OTHER FEATURES THAT MAY AFFECT STRUCTURE:

62- CULVERT AND RETAINING WALLS :N/A RATING :N CULVERT COMMENTS:

	62.1BARREL	62.2HEADWALL	62.3CUT-OFFWALL	62.4RETAINING WALL
MATERIAL				
CONDITION RATING				
FUNCTIONING(Y-N)				
CRACKING(F-M-O)				
SPALLING (S-L)				
SCALING(L-M-H-S)				
CORROSION(L-M-S)				
SETTLEMENT(Y-N)				
ALIGNMENT(Y-N)				
PAINT(G-F-P-N-U)				

63- METHOD USED TO DETERMINE OPERATING RATING .. 2

64- OPERATING RATING : .... PEDESTRIAN 800

65- METHOD USED TO DETERMINE INVENTORY RATING .. 2

66- INVENTORY RATING : .... PEDESTRIAN 800

67- STRUCTURAL EVALUATION : .... 05 [illegible]

LIGTH TO MODERATE CORROSION AT STEEL PLATES,RAILINGS,UPPER CHORD & STRINGERS.MODERATE CORROSION AT BRACINGS & BETWEEN LOWER CHORDS & FLOORBEAMS. LIGHT CORROSION AT STEEL COLUMNS & STAIRS.MODERATE CORROSION AT REST AREA.

68- DECK GEOMETRY : .... 0N [illegible]

N/A.

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : .... 06 [illegible]

EQUAL TO PRESENT MINIMUM CRITERIA.

70- BRIDGE POSTING : .... N/A.

5

71- WATERWAY ADEQUACY : .... N

N/A.

REMOTE - GREATER THAN 100 YEARS. SLIGHT - 11 TO 100 YEARS. OCASSIONAL - 3 TO 10 YEARS. FREQUENT - LESS THAN 3 YEARS.
INSIGNIFICANT - MINOR INCONVENIENCE. HIGHWAY PASSABLE IN A MATTER OF HOURS. SIGNIFICANT - TRAFFIC DELAYS OF UP TO SEVERAL DAYS

SEVERE - LONG TERM DELAYS TO TRAFFIC WITH RESULTING HARDSHIP

72- APPROACH ROADWAY ALIGNMENT : .... ~~N~~ 6 [illegible]

N/A.

72.2 SLAB OR PAVEMENT CONDITION : MATERIAL :
CRACKING: F N O SPALLING: L S SCALING: L M H S UNNEVEN: YES NO ROUGH: YES NO
SETTLEMENT: YES NO MOVEMENT: APPROACH SLAB-BACKWALL: YES NO BREAKING UP: EXCESSIVE DEFORMATION:
SAFETY: HAZARDOUS YES NO DRAINAGE: INADEQUATE: YES NO PONDING: YES NO
MOVEMENT: PAVEMENT-APPROACH SLAB: YES NO EMBANKMENT: CONDITION:
FUNCTIONING: YES NO EROSION: YES NO IF YES, EXPLAIN
CONSTRUCTION: FLIMSY: YES NO
INTEGRITY IMPAIRED: YES NO IF YES, EXPLAIN
72.3 UNDESIRABLE IMPACT: YES NO
72.4 JOINTS: TYPE: INADEQUATE: YES NO SATISFACTORY ALIGNMENT: YES NO
72.5 GUARDRAIL: TYPE: MATERIAL: CONDITION: FUNCTIONING: YES NO
ALIGNMENT: HORIZONTAL: GOOD BAD VERTICAL: GOOD BAD JOINTS: FUNCTIONING: YES NO
SAFETY: SECURELY ATTACHED: YES NO PEDESTRIAN HAZARDS: YES NO

72- APPROACH ROADWAY - COMMENTS:

PUERTO RICO HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE
BRIDGE REINSPECTION & EVALUATION REPORT

========PROPOSED IMPROVEMENT========

75- TYPE OF WORK : .... REHABILITATION
76- LENGTH OF STRUCTURE IMPROVEMENT : .... 55.63 MT.(182.47 FT) 352 00055 16 ft

============INSPECTIONS=============

89- RESERVED ....
90- INSPECTION DATE : .... MAY 8,1998. 0598
91- DESIGNATED INSPECTION FRECUENCY : .... 24 MONTHS 24
92- CRITICAL FEATURE INSPECTION : .... N/A N N N
93- CRITICAL FEAT. INSPECT. DATE: .... N/A
FRACTURE CRITICAL UNDERWATER OTHER

===========IMPROVEMENT COST===========

94- BRIDGE IMPROVEMENT COST : .... N/A 000000
95- ROADWAY IMPROVEMENT COST : .... N/A 000000
96- TOTAL PROJECT COST : .... (55.63X2.84X$1315X10%)=$20,776 000021
97- YEAR OF IMPROVEMENT COST ESTIMATED : 1998 1998

==CLASSIFICATION AND STRUCTURE DATA==

98- BORDER BRIDGE : ....
99- BORDER BRIDGE STRUCTURE NUMBER : ....
100- STRAHNET HIGHWAY DESIGNATION : .... DEFENSE HIGHWAY T2 ft
101- PARALLEL STRUCTURE DESIGNATION : .... NO PARALLEL STRUCTURE N
102- DIRECTION OF TRAFFIC : .... TRAFFIC NOT CARRIED 0
103- TEMPORARY STRUCTURE DESIGNATION : .... N/A
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE : ......................N.N. N.H.S. T0 ft
105- FEDERAL LANDS HIGHWAYS : ....
106- YEAR RECONSTRUCTION : .... NO RECONSTRUCTION 0
107- DECK STRUCTURE TYPE : .... STEEL PLATE 0000
108- WEARING SURF./ PROTECT. SYSTEM : .... OTHER - NONE - NONE 5
109- AVERAGE DAILY TRUCK TRAFFIC : .... 5 % 900
110- DESIGNATED NATIONAL NETWORK : .... PART OF NETWORK 05
111- PIER OR ABUT. PROTECTION (NAVIGATION) : .... N/A 1
112- NBIS BRIDGE LENGTH : .... YES
113- SCOUR CRITICAL BRIDGE : .... N/A Y
114- FUTURE AVERAGE DAILY TRAFFIC : .... 92,703 N
115- YR. OF FUTURE A.D.T. : 2016 092703
116- MINIM. NAVIG. VERT. CLEARANCE : .... N/A 2016
VERTICAL LIFT BRIDGE :
117- SUFFICIENCY RATING : ....
125- PRIORITY RATING: ....
127- EVALUATION DATE : 8-MAYO-98 050898
130- CRITICAL FRACTURE INSP. DATE : ....

ENGINEER :INEABELLE VELEZ

AUXILIARY ITEMS
1-SIGNS
TYPE: ORIENTACION "SAN JUAN - BAYAMON - RIO PIEDRAS"
MATERIAL: ALUMINIO
CONDITION: 7

REMARKS:

THE REHABILITATION CONSIST IN REPAIR ALL DEFICIENCIES DESCRIBED ON THE ITEM #67.

E.7 September 24, 1993

PUERTO RICO HIGHWAY AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE
BRIDGE REPORT

PAGE 1 OF 3
DATE : 09/30/93
TIME : 10:49:44

FEDERAL SYSTEM   BRIDGE NO. : 01307 - ROAD NO. : PR 26   - KM. NO. : 004500

============IDENTIFICATION============

1- STATE : .... Commonwealth of Puerto Rico	721
2- STATE HIGHWAY DEPARTMENT : .... SAN JUAN	01
3- COUNTY (PARISH) CODE : .... SAN JUAN	127
4- PLACE CODE : .... SAN JUAN URBAN ZONE	76770
5- INVENTORY ROUTE : 2-1-1-00003-0	211000030
6- FEATURES INTERSECTED : .... PEDESTRIAN WALKWAY	PEDESTRIAN WALKWAY
7- FACILITY CARRIED BY STRUCTURE : .... P.R. - 26	PR 26
8- STRUCTURE NUMBER : .... BRIDGE 1307 1 OF 1	013071
9- LOCATION : .... BALDORIOTY DE CASTRO AVE.	BALDORIOTY DE CASTRO AVE.
11- MILEPOINT : 4.50	004500
16- LATITUDE : .... 18 DEGREES 27.3 MINUTES	18273
17- LONGITUDE : .... 66 DEGREES 03.1 MINUTES	066031
98- BORDER BRIDGE :	--
99- BORDER BRIDGE STRUCTURE NUMBER :	--

======STRUCTURE TYPE AND MATERIAL=======

43- STRUCTURE TYPE, MAIN : .... STEEL TRUSS DECK	309
44- STRUCTURE TYPE APPR. : .... NONE	000
45- NUMBER OF SPAN IN MAIN UNIT : 002	002
46- NUMBER OF APPROACH SPAN : .... NONE	0000
107- DECK STRUCTURE TYPE : .... STEEL PLATE	5
108- WEARING SURF./ PROTECT. SYSTEM : .... OTHER - NONE - NONE	900

============AGE AND SERVICE============

19- BYPASS, DETOUR LENGTH (NEAREST MILE) : .... STRUCTURE OVER HIGHWAY	00
27- YEAR BUILT : 1968	1968
28- LANES ON AND UNDER STRUCTURE :.............................. 0 LANES ON / 8 LANES UNDER	0008
29- A.D.T. OF INVENTORY ROUTE : 95,400	095400
30- YEAR OF A.D.T. : 1990	90
42- TYPE OF SERVICE : .... PEDESTRIAN OVER HIGHWAY	31
106- YEAR RECONSTRUCTION : .... NO RECONSTRUCTION	0000
109- AVERAGE DAILY TRUCK TRAFFIC : .... 4 %	04

============GEOMETRIC DATA============

10- INV. ROUTE, MIN. CLEAR. (0.01m) : .... 5.21 MT (17' - 1")	1701
32- APPROACH ROADWAY WIDTH : .... 29.29 MT (96.07 FT)	096
33- BRIDGE MEDIAN : .... NONE	0
34- SKEW ANGLE : .... NONE	00
35- STRUCTURE FLARED : .... NO	0
47- INV. ROUTE, TOTAL HORIZ. CLEARANCE : .... 10.82 MT (35.49 FT)	354
48- LENGTH OF MAXIMUM SPAN : .... 21.65 MT (71.01 FT)	0071
49- STRUCTURE LENGTH : .... 55.63 MT (182.47 FT)	000183
50- CURB OR SIDEWALK WIDTHS : .... NONE	000000
51- BRIDGE ROADWAY WIDTH, CURB TO CURB :.................................. 1.64 MT (5.38 FT)	0054
52- DECK WIDTH, OUT TO OUT : .... 2.84 MT (9.32 FT)	0093
53- MIN. VERT. CLEAR. OVER BRIDGE ROADWAY : .... UNLIMITED	9999
54- MINIMUM VERTICAL UNDERCLEARANCE : .... 5.21 MT (17' - 1")	H1701
55- MINIMUM LATERAL UNDERCLEARANCE ON RIGHT : .... 1.68 MT (5.51 FT)	H055
56- MINIMUM LATERAL UNDERCLEARANCE ON LEFT : .... 1.50 MT (4.92 FT)	049

PUERTO RICO HIGHWAY AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE

FEDERAL SYSTEM   BRIDGE NO. : 01307 - ROAD NO. : PR 26   - KM. NO. : 004500

============CLASSIFICATION============

20- TOLL :	ON FREE ROAD	3
21- MAINTENANCE RESPONSABILITY :	D.T.P.W.	01
22- OWNER :	D.T.P.W.	01
26- FUNCTIONAL CLASS. OF INVENTORY ROUTE :	URBAN INTERSTATE	11
37- HISTORICAL SIGNIFICANCE :	5	5
100- DEFENSE HIGHWAY DESIGNATION :	DEFENSE HIGHWAY	1
101- PARALLEL STRUCTURE DESIGNATION :	NO PARALLEL STRUCTURE	N
102- DIRECTION OF TRAFFIC :	TRAFFIC NOT CARRIED	0
103- TEMPORARY STRUCTURE DESIGNATION :	N/A	
104- HIGHWAY SYSTEM OF THE INVENTORY ROUTE :	N.H.S.	1
110- DESIGNATED NATIONAL NETWORK :	PART OF NETWORK	1
112- NBIS BRIDGE LENGTH :	YES	Y

===============WATERWAY===============

38- NAVIGATION CONTROL :	N/A	N
39- NAVIGATION VERTICAL CLEARANCE :	NO	000
40- NAVIGATION HORIZONTAL CLEARENCE :	NO	0000
111- PIER OR ABUT. PROTECTION (NAVIGATION) :	N/A	
116- MINIM. NAVIG. VERT. CLEARANCE :	N/A	

=========PROPOSED IMPROVEMENT=========

75- TYPE OF WORK :	REHABILITATION	352
76- LENGTH OF STRUCTURE IMPROVEMENT :	55.63 MT (182.47 FT)	000183
94- BRIDGE IMPROVEMENT COST :	N/A	000000
95- ROADWAY IMPROVEMENT COST :	N/A	000000
96- TOTAL PROJECT COST :	(55.63X2.84X$1050X5%)=$8,294	000008
97- YEAR OF IMPROVEMENT COST ESTIMATED :	1993	93
114- FUTURE AVERAGE DAILY TRAFFIC :	143,990	143990
115- YR. OF FUTURE A.D.T. :	2010	10

========LOAD RATING AND POSTING=======

31- DESIGN LOAD :	PEDESTRIAN	7
41- STRUCT. OPEN, POSTED OR CLOSED TO TRAFF. :	OPEN	A
64- OPERATING RATING :	PEDESTRIAN	800
66- INVENTORY RATING :	PEDESTRIAN	800
70- BRIDGE POSTING :	N/A.	N

===============CONDITION==============

	MATERIAL	CONDITION ANALYSIS	
58- DECK	STEEL	SATISFACTORY	6
59- SUPERSTRUCTURE	STEEL	GOOD	7
60- SUBSTRUCTURE	STEEL	GOOD	7
61- CHANNEL & CHANNEL PROTECTION	N/A	N/A	N
62- CULVERT	N/A	N/A	N

PUERTO RICO HIGHWAY AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE

FEDERAL SYSTEM   BRIDGE NO. : 01307 - ROAD NO. : FR 26   - KM. NO. : 004500

==============APPRAISALS==============

67- STRUCTURAL EVALUATION : 7
STEEL PLATES, RAILLINGS AND FLOOR BEAMS HAVE LIGHT CORROSION, MODERATE CORROSION IN THE STAIRS.

68- DECK GEOMETRY : .... N

N/A.

69- UNDERCLEARANCE, VERTICAL & HORIZONTAL : 6

EQUAL TO PRESENT MINIMUM CRITERIA.

71- WATERWAY ADEQUACY : .... N

N/A.

72- APPROACH ROADWAY ALIGNMENT : .... N

N/A.

36- TRAFFIC SAFETY FEATURES : .... N-N-N-N   NNNN
113- SCOUR CRITICAL BRIDGES : .... N/A   N

=========ADDITIONAL COMMENTS:=========

89- RESERVED ....   --
90- INSPECTION DATE : .... SEPTEMBER 24, 1993.   0993
91- DESIGNATED INSPECTION FRECUENCY : .... 24 MONTHS   24
92- CRITICAL FEATURE INSPECTION : .... N/A   N N N
93- CRITICAL FEAT. INSPECT. DATE: .... N/A
105- RESERVED ....   --
117- SUFFICIENCY RATING : ....
126- FIELD INSPECTION DATE : 092493   092493
127- INSPECTION EVAL. DATE : 092493   092493
130- CRITICAL FRACTURE INSP. DATE : ....
131- EVALUATOR ENGINEER : Javier Arroyo Rosario

REMARKS:

THE REHABILITATION CONSIST IN REPAIR ALL DEFICIENCIES DESCRIBED ON THE ITEM #67.

E.8 February 28, 1991

BRIDGE STUDIES AND EVALUATION OFFICE
PUERTO RICO HIGHWAY AUTHORITY

Bridge No.	Road No.	Km.No.
1307	0026	00430

BRIDGE INVENTORY

IDENTIFICATION

Code Position

25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

1. State Code ____ Commonwealth of Puerto Rico — 721
2. State Highway Department District San Juan — 01
3. County (Parish) Code San Juan — 127
4. Place Code Urban — 76770
5. Inventory Route 2-1-1-00003-0 — 211000030
6. Features Intersected Pedestrian Walkway
   PEDESTRIAN WALKWAY
7. Facility Carried by Structure P.R. 26
   PR 26
8. Structure Number 1307 1 of 1 — 000000000001307 1
9. Location Baldorioty De Castro Avenue
   BALDORIOTY DE CASTRO AVE
10. Inventory Route, Minimum Vertical Clearance (0.01 m) 4.80 (15.7V) — 1509
11. Milepoint 4.30 — 004300
16. Latitude 18 Degrees 22.3 Minutes — 18223
17. Longitude 66 Degrees 03.1 Minutes — 066031
19. By Pass, Detour Length (Nearest mile) Structure over Highway — 00

CLASSIFICATION

20. Toll Toll Free — 3
21. Maintenance Responsibility D.T.P.W. — 01
22. Owner State Highway Department — 01
26. Functional Classification of Inventory Route Urban Interstate — 11

6	5	4	3	2	1

AGE AND SERVICE

Item			Code
27	Year Built	1968	1968
28.	Lanes on the Structure	0 and Under the Structure 7	0007
29.	Average Daily Traffic	100,000	100000
30.	Year of Average Daily Traffic	1987	87

STRUCTURE DATA

Item			Code
31.	Design Load	Pedestrian	7
32.	Approach Roadway Width	24.80m (8134)	081
33.	Bridge Median	☑ None ☐ Open ☐ Closed ☐ Closed NM	0
34.	Skew	None	00
35.	Structure Flared	☐ Yes ☑ No	0
36.	Traffic Safety Features	N-N-N-N	NNNN
37.	Historical Significance		5
38.	Navigation Control	☐ Yes ☐ No ☒ NA	N
39.	Navigation Vertical Clearance	☐ Yes ☑ No	000
40.	Navigation Horizontal Clearance	☐ Yes ☑ No	0000
41.	Structure, Open, Posted, or Closed to Traffic	Open	A
42.	Type of Service	Pedestrian over Highway	31
43.	Structure Type, Main	Steel truss Deck	309
44.	Structure Type, Approach Spans	None	000
45.	Number of Spans in Main Unit	2	002
46.	Number of Approach Spans	None	0000
47.	Inventory Route, Total Horizontal Clearance	L = 10.4m (34.1) R= 14.4m (47.2)	341
48.	Length of Maximum Span	20.46m (67.11)	0067
49.	Structure Length	43.02m (141.11)	000141
50.	Curb or Sidewalk Widths	L None R None	000000
51.	Bridge Roadway Width, Curb-to-Curb	1.62 M. (5.31)	0053
52.	Deck Width, Out-to-Out	2.82 M. (9.25)	0093
53.	Minimum Vertical Clearance Over Bridge Roadway	Unlimited	9999
54.	Minimum Vertical Underclearance	☒ H 4.8m (15.74) ☐ R ☐ N	H1509
55.	Minimum Lateral Underclearance on Right	☒ H 1.36m (4.46) ☐ R ☐ N	H045
56.	Minimum Lateral Underclearance on Left	0.86m (2.82)	028

CONDITIONS RATINGS

	Material	Condition	
58. Deck	Steel	Poor	4
59. Superstructure	Steel	Poor	4
60. Substructure	Steel	Fair	5
61. Channel and Channel Protection	N/A	—	N
62. Culverts	N/A	—	N
64. Operating Rating	Pedestrian		8 0 0
66. Inventory Rating	Pedestrian		8 0 0

APPRAISAL RATING

	Deficiencies	
67. Structural Evaluation	Deck is deteriorated, corrosion has perforated both ends of the structure. Deck does not meet safety criteria. Ponding is occurring at the field of the bridge where corrosion conditions has developed. Steel slab exhibits rust stain with severe corrosion. Railing don't meet safety criteria, although it is painted. Railing exhibit severe corrosion and wearing down plates at top and bottom. Upper and lower lateral (see reverse)	4
68. Deck Geometry	N/A	N
69. Underclearances, Vertical and Horizontal	Condition better than present minimum criteria	7
70. Bridge Posting	No posting is required	5
71. Waterway Adequacy	N/A highway underpassing	N
72. Approach Roadway Alignment	N/A Pedestrian	N

BRIDGE STUDIES AND EVALUATION OFFICE

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

PROPOSED IMPROVEMENTS

Item	Entry	Code
75. Type of Work	Rehabilitation	3 5 1
76. Length of Structure Improvement	43.02 m = 141.11	0 0 0 1 4 1

INSPECTIONS

Item	Entry	Code
89. (Reserved)	N/A	-
90. Inspection Date	28/II/91	0 2 9 1
91. Designated Inspection Frequency	24 Month	2 4
92. Critical Feature Inspection		
A. Fracture Critical Details	N/A	N -
B. Underwater Inspection	N/A	N -
C. Other Special Inspection	N/A	N -
93. Critical Feature Inspection Date		
A. Fracture Critical Details	N/A	- - - -
B. Underwater Inspection	N/A	- - - -
C. Other Special Inspection	N/A	- - - -

IMPROVEMENT COSTS

Item	Entry	Code
94. Bridge Improvement Cost	$5,000	0 0 0 0 0 5
95. Roadway Improvement Cost		0 0 0 0 0 0
96. Total Project Cost	$5,000	0 0 0 0 0 5
97. Year of Improvement Cost Estimated	1991	9 1

CLASSIFICATION AND STRUCTURE DATA

Item	Entry	Code
98. Border Bridge	N/A	- - - - -
99. Border Bridge Structure Number	N/A	- - - - - - - - - - - - - - -
100. Defense Highway Designation	Yes	1
101. Parallel Structure Designation	N/A	N
102. Direction of Traffic	Highway traffic not carry	0
103. Temporary Structure Designation	N/A	-
104. Highway System of the Inventory Route	Urban Interstate	1
105. (Reserved)	N/A	-

6	5	4	3	2	1

CLASSIFICATION AND STRUCTURE DATA (Cont.)

106. Year Reconstructed	N/A	0000
107. Deck Structure Type	Steel plate	S
108. Wearing Surface/Protective System	N/A	NNN
109. Average Daily Truck Traffic	4%	04
110. Designated National Network	Yes	1
111. Pier or Abutment Protection (for Navigation)	N/A	—
112. NBIS Bridge Length	N/A Pedestrian	N
113. Scour Critical Bridges	N/A	N
114. Future Average Daily Traffic	130,000 est.	130000
115. Year of Future Average Daily Traffic	2009	09
116. Minimum Navigation Vertical Clearance	N/A	— — —
Vertical Lift Bridge	N/A	

Remarks:

Rehabilitation consisting in repairing all the deficiencies exposed on Item #67.

E.9 December 3, 1991

BRIDGE STUDIES AND EVALUATION OFFICE

PUERTO RICO HIGHWAY AUTHORITY

Page 1 of 5

1307	0026	00450
Bridge No.	Road No.	Km.No.

BRIDGE INVENTORY

IDENTIFICATION

Code Position

25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

1. State Code Commonwealth of Puerto Rico 721
2. State Highway Department District San Juan 01
3. County (Parish) Code San Juan 127
4. Place Code San Juan Urban Zone 76770
5. Inventory Route 2-1-1-00003-0 211000030
6. Features Intersected Pedestrian Walkway
   PEDESTRIAN WALKWAY
7. Facility Carried by Structure PR-26
   PR-26
8. Structure Number 1307 1 of 1 13071
9. Location Baldorioty de Castro Avenue
   BALDORIOTY DE CASTRO AVE.
10. Inventory Route, Minimum Vertical Clearance (0.01 m) 5.21m (17.09') (17'-01") 1701
11. Milepoint 4.50 004500
16. Latitude 18 Degrees 27.3 Minutes 1827.3
17. Longitude 66 Degrees 03.1 Minutes 066031
19. By Pass, Detour Length (Nearest mile) Structure over Highway 00

CLASSIFICATION

20. Toll On Free Road 3
21. Maintenance Responsibility H.J.P.R. 01
22. Owner H.J.P.R. 01
26. Functional Classification of Inventory Route Urban Interstate 11

6	5	4	3	2	1

AGE AND SERVICE

27 Year Built 1968 — 1968

28. Lanes on the Structure 0 and Under the Structure 7 — 0007

29. Average Daily Traffic 95,400 — 095400

30. Year of Average Daily Traffic 1990 — 90

STRUCTURE DATA

31. Design Load Pedestrian — 7
32. Approach Roadway Width 29.29m (96.07') — 096
33. Bridge Median ☑ None ☐ Open ☐ Closed ☐ Closed NM — 0
34. Skew None — 00
35. Structure Flared ☐ Yes ☑ No — 0
36. Traffic Safety Features — NNNN
37. Historical Significance — 5
38. Navigation Control ☐ Yes ☐ No ☑ NA — N
39. Navigation Vertical Clearance ☐ Yes ☑ No — 000
40. Navigation Horizontal Clearance ☐ Yes ☑ No — 0000
41. Structure, Open, Posted, or Closed to Traffic Open — A
42. Type of Service Pedestrian over highway — 31
43. Structure Type, Main Steel truss deck — 309
44. Structure Type, Approach Spans None — 000
45. Number of Spans in Main Unit 2 — 002
46. Number of Approach Spans None — 0000
47. Inventory Route, Total Horizontal Clearance ~~L~~=10.82m(35.49') ~~R~~=10.80m(35.42') — 354
48. Length of Maximum Span 21.65 m (71.01') — 0071
49. Structure Length 55.63 m (182.47') — 000183
50. Curb or Sidewalk Widths None L= — R= — — 000000
51. Bridge Roadway Width, Curb-to-Curb 1.64 m (5.38') — 0054
52. Deck Width, Out-to-Out 2.84 m (9.32') — 0093
53. Minimum Vertical Clearance Over Bridge Roadway Unlimited — 9999
54. Minimum Vertical Underclearance ☑ H 5.21m (17.09') ☐ R ☐ N — H1701
55. Minimum Lateral Underclearance on Right ☑ H 1.68m (5.51') ☐ R ☐ N — H055
56. Minimum Lateral Underclearance on Left 1.50m (4.92') — 049

CONDITIONS RATINGS

	Material	Condition	
58. Deck	Steel	Good	7
59. Superstructure			7
60. Substructure			7
61. Channel and Channel Protection	N/A		N
62. Culverts			N
64. Operating Rating	Pedestrian		800
66. Inventory Rating			800

APPRAISAL RATING

	Deficiencies	
67. Structural Evaluation	Joints are leaking. Some number of I beams show loss steel. Condition better than present minimum criteria.	7
68. Deck Geometry	N/A	N
69. Underclearances, Vertical and Horizontal	17'-09" (V.U.); 5.51' (L.U.R.). Basically intolerable, requiring high priority of corrective action.	3
70. Bridge Posting	N/A	N
71. Waterway Adequacy		N
72. Approach Roadway Alignment		N

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

PROPOSED IMPROVEMENTS

75. Type of Work Rehabilitation — 352
76. Length of Structure Improvement 55.63m (182.47') — 000183

INSPECTIONS

89. (Reserved) —
90. Inspection Date December 13, 1991 — 1291
91. Designated Inspection Frequency every 24 months — 24
92. Critical Feature Inspection Not Needed
   A. Fracture Critical Details — N –
   B. Underwater Inspection — N –
   C. Other Special Inspection — N –
93. Critical Feature Inspection Date
   A. Fracture Critical Details —
   B. Underwater Inspection —
   C. Other Special Inspection —

IMPROVEMENT COSTS

94. Bridge Improvement Cost — 000000
95. Roadway Improvement Cost — 000000
96. Total Project Cost 55.63 × 2.84 × 900 × .03 ≈ $4,000 — 000004
97. Year of Improvement Cost Estimated 1991 — 91

CLASSIFICATION AND STRUCTURE DATA

98. Border Bridge N/A
99. Border Bridge Structure Number
100. Defense Highway Designation No — 1
101. Parallel Structure Designation none — N
102. Direction of Traffic Highway traffic not carried. — 0
103. Temporary Structure Designation N/A —
104. Highway System of the Inventory Route Urban Scheduled (NHS) — 1
105. (Reserved) — –

CLASSIFICATION AND STRUCTURE DATA (Cont.)

Item	Entry	Code
106. Year Reconstructed	not reconstructed	0 0 0 0
107. Deck Structure Type	Steel Plate	5
108. Wearing Surface/Protective System	Other - none - none	9 0 0
109. Average Daily Truck Traffic	4% (est)	0 4
110. Designated National Network	yes	1
111. Pier or Abutment Protection (for Navigation)	N/A	—
112. NBIS Bridge Length	yes	Y
113. Scour Critical Bridges	N/A	N
114. Future Average Daily Traffic	143,990	1 4 3 9 9 0
115. Year of Future Average Daily Traffic	2010	1 0
116. Minimum Navigation Vertical Clearance	N/A	0 0 0
Vertical Lift Bridge	N/A	

Remarks: Rehabilitation consists on repairing all deficiencies discussed on item 67. This pedestrian walkway bridge was relocated to Km. 4.50 and painted.

COMMONWEALTH OF PUERTO RICO
HIGHWAY AUTHORITY
BRIDGE STUDIES AND EVALUATION OFFICE

APPRAISAL OF ITEM 68

BRIDGE NO. 1307 ROAD NO. 26 KM. NO. 4.50

Year	ADT	Sec.	T W	T W Adequate or Inadequate	T W Inadequate By	TW + SH	TW + SH Adequate or Inadequate	TW + SH Inadequate By
1990			Actual =					
			For ADT =					
			Not Applicable					
2010			Reqd. For ADT =					
			Rec. PRHA =					

√ Adequate
x Inadequate

BRIDGE STUDIES AND EVALUATION OFFICE
PUERTO RICO HIGHWAY AUTHORITY

GENERAL EVALUATION

This bridge is basically in 3 structural condition [3]

excellent	4	fair	2	very poor	0
adequate	3	poor	1		

The load carrying capacity is 0 [0]

adequate	3	minimally adequate	2	inadequate	1	not required (don't print)	0

The recommended modifications will make it 1 [1]

adequate	2	minimally adequate	1	no required (don't print)	0
				0 when previous is	2

The bridge should be replaced. [0]

Yes (print)	1	not required (don't print)	0

It requires 2 @ 24 [2 24] Ⓐ Ⓑ

routine inspection every 24 months — (A) = 2 (B) = 24
frequent inspection every Ⓑ months to monitor abnormal and/or suspected deficiencies — (A) = 1 (B) = months
frequent inspection every Ⓑ months to determine the cause of and remedies for existing defects — (A) = 0 (B) = months

It requires 2 [2]

routine maintenance [3]
minor repairs and routine maintenance [2]
urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and rountine maintenance [1]
emergency repairs to eliminate danger to the public and routine maintenance [0]

The deck geometry is 0
For present ADT, the travelled way is 0
For future (2010) ADT, the travelled way is 0
For PRHA (2010) recommendations, the travelled way is 0
For present ADT, the shoulders are 0
The future (2010) ADT, the shoulders are 0
For PRHA (2010) recommendations, the shoulders are 0

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	0	0	0	0
	Travelled way			Shoulders		

satisfactory	3	unsatisfactory	2	cannot be evaluated because of lack of information	1
not required (don't print)	1				

The Ⓐ approach alignment is Ⓑ [0 0] Ⓐ Ⓑ

Ⓐ =	vertical	1	horizontal	0	horizontal and vertical	2
Ⓑ =	satifactory	3	minimally tolerable	2	poor and represents a danger to the public	1
	not required (don't print)	0				

Load Post for inventory rating shown in Item 64 [0]

Yes	1	No (don't print)	0

Post for vertical underclearance shown in Items 54 and 69 [0]

Yes	1	No (don't print)	0

FOR "REMARKS" SEE BRIDGE FILE.

PERSONNEL	By	Date
Structural Inspection	[signature]	12/3/91
Review of Field Data		
Transfers of Data		
Condition Analysis		
Appraisal	[signature]	12/12/91

E.10 November 17, 1988

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 5

PUERTO RICO HIGHWAY AUTHORITY
IBM–370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

☐	1307	0026
Card No.	Bridge No.	Road No.

BRIDGE INVENTORY

Km. No. 4.30

IDENTIFICATION

Code Positions

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

1. State . . . . . Commonwealth of Puerto Rico . . . . . [10] 7 2 1
2. Highway District . . . . . San Juan . . . . . [13] 0 1
3. Municipality . . . . . San Juan . . . . . [15] 0 6 3
4. City/Town . . . . . San Juan . . . . . [18] 0 0 6 3
5. Inventory Route . . . . . 2-1-1-00003-0 . . . . . [22] 2 1 1 0 0 0 0 3 0
6. Features Intersected . . . . . Pedestrian Walkway . . . . .
[31] PEDESTRIAN WALKWAY
7. Facility Carried by Structure[56] . . . . . PR-26 . . . . .
8. Structure No. . . . . . 1307 . . . . . one of one . . . . . [74] 0 1 3 0 7 1
9. Location[10] . . . . . Baldorioty De Castro Avenue . . . . .
10. Inventory Route, Minimum Vertical Clearance (0.01 m) . . . . . 4.80 . . . . . [10] 0 4 8 0
11. Kilometer Point (0.01 km) . . . . . 4.30 . . . . . [14] 0 0 4 3 0
12. Road Section Number (DOD) . . . . . 25 . . . . . [19] 0 0 2 5 –
13. Bridge Description . . . . . DH . . . . . NSTS . . . . . PS . . . . . [24] – –
14. Defense Milepoint (0.01 ml) . . . . . 6.37 . . . . . [26] 0 6 3 7
15. Defense Section Length (miles) (0.1 mile) . . . . . 8.10 . . . . . [30] 0 8 1
16. Latitude: . . . . . 18 . . . . . Degrees . . 27.3 . Minutes . . . . . [33] 1 8 2 7 3
17. Longitude: . . . . . 66 . . . . . Degrees . . 03.1 . Minutes . . . . . [38] 0 6 6 0 3 1
18. Physical Vulnerability . . . . . Steel Truss . . . . . [44] 4
19. By Pass, Detour Length (Nearest mile) . . Structure over highway . . . . . [45] 0 0
20. Toll . . . . . Toll Free . . . . . [47] 3
21. Custodian . . . . . D.T.P.W. . . . . . [48] 1
22. Owner . . . . . State Highway Department . . . . . [49] 1
23. F.A.P. No.[60] . . . . . UNKnown . . . . .

CLASSIFICATION

24. Fed. Aid System . . . . . Urban Interstate . . . . . [10] 0 2
25. Administrative . . . . . State . . . . . [12] 1
26. Functional . . . . . Urban Interstate . . . . . [13] 4 1

11

BRIDGE STUDIES AND EVALUATION OFFICE

Page 2 of 5

9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1

STRUCTURE DATA

No.	Item	Entry	Field	Code
27.	Year Built	1968	15	6800
28.	Lanes on Str.	0 ... Under 7	19	0007
29.	ADT – Inventory Route	100,000 (estimated)	23	100000
30.	Year	1985	29	85
31.	Design Load	Pedestrian	31	7
32.	Approach Roadway width including shoulders (0.01 m)	26.8	32	268
33.	Median	☑ None ☐ Open ☐ Closed	35	0
34.	Skew	none	36	00
35.	Structure Flared	☐ Yes ☑ No.	38	0
36.	Traffic Safety Features		39	NNNN
37.	Historical Significance		43	5
38.	Navigation Control	☐ Yes ☑ No	46	0
39.	Navigation Vertical Clearance (0.1 m)	☐ Yes ☑ No	47	000
40.	Navigation Horizontal Clearance (0.1 m)	☐ Yes ☑ No	50	0000
41.	Structure, Open or Closed to Traffic	Open	54	A
42.	Type Service	Pedestrian over highway	55	31
43.	Structure Type-Main	Steel truss – deck	57	309
44.	Structure Type-Approach Spans	None	60	000
45.	No. of Spans-Main	2	10	002
46.	No. of Spans-Approaches	None	13	0000
47.	Total Horizontal Clearance (0.01 m)	L = 20.46 m R = 19.16 m	17	192
48.	Max. Span Length (0.01 m)	20.46 m center of pier to face of abut	20	2205
49.	Structure Length (0.01 m)	43.02 m out to out of abut.	24	000430
50.	Sidewalk Widths (0.01 m) Left	none Right none	30	000000
51.	Bridge Roadway Width (curb-curb) (0.01 m)	1.62 m	36	0016
52.	Deck Width (out-out) (0.01 m)	2.82 m	40	0028
53.	Vertical Clearance over Bridge Roadway-Minimum (0.01 m)	Unlimited	44	9999
54.	Vertical Underclearance – Minimum (0.01 m)	4.80 m	48	0480
55.	Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m)	L = 5.21 m R = 7.90 m	52	052
56.	Lateral Underclearance on Left (Inner) Sides – Minimum (0.01 m)	L = 0.85 R = 0.86 m	55	009
57.	Wearing Surface	Steel	58	7

BRIDGE STUDIES AND EVALUATION OFFICE

CONDITION

9 8 7 6 5 4 3 2 1

	Material	Condition Analysis	
58. Deck	Steel	Fair condition	59 6
59. Superstructure	Steel	Fair condition	60 C
60. Substructure	Steel	Generally good condition	61 7
61. Channel & Channel Protection	N/A		62 N
62. Culvert & Retaining Walls	N/A	N/A	63 N
63. Estimated Remaining Life		10 Years	64 10
64. Operating Rating		Pedestrian	66 800
65. Approach Alignment		N/A	69 N
66. Inventory Rating		Pedestrian	70 800

APPRAISAL

	Deficiencies	
67. Structural Condition	Deck with moderate corrosion generally at corners. Abutments and piers with fine cracks and small spallings	10 6
68. Deck Geometry	N/A	11 N
69. Underclearances-Vert. & Lateral	(4.80m) Condition better than present minimum criteria	12 7
70. Safe Load Capacity	N/A	13 N
71. Waterway Adequacy	N/A	14 N
72. Approach Alignment	N/A	15 N

PROPOSED IMPROVEMENTS

73. Year Needed	1988	16 88
Completed		
Described		
74. Type of Service	Pedestrian	18 3
75. Type of Work	Rehabilitation	19 372
76. Improvement Length (0.1 m)	N/A	22 000000
77. Design Loading	N/A	28 0

BRIDGE STUDIES AND EVALUATION OFFICE

9 8 7 6 5 4 3 2 1

78.	Roadway Width (0.01m)	N/A	0 0 0 0
79.	Number of Lanes		0 0
80.	ADT	130,080	1 3 0 0 8 0
81.	Year of Estimated ADT	1995	9 5
82.	Year of Proposed Adjacent Roadway Improvements	N/A	0 0
83.	Prop. Adj. Rdwy Improvements-Type		0

COST OF IMPROVEMENTS

84	Total (dollars)$	$ 51,000	0 0 0 0 5
	Estimated Design Time (months)	~	

SUMMARY OF IMPROVEMENT COSTS

85.	Preliminary Engineering (Dollars)	N/A	0 0 0
86.	Demolition Cost (Dollars)		0 0 0
87.	Substructure (Dollars)		0 0 0 0 0
88.	Superstructure (Dollars)		0 0 0 0 0
89.	Blank		
90.	Date of Last Inspection	Dec. 8, 1988	1 2 0 8 8 8
91.	Rehabilitate Existing Structure (Dollars)	$51,000	0 0 5
92.	Detour and Traffic Maintenance (Dollars)	N/A	0 0 0
93.	Approaches (Dollars)		0 0 0
	Approach Embankment (Dollars)	~	
	Approach Pavement (Dollars)	~	
	Approach Guardrail (Dollars)	~	
	*(Code to nearest thousand dollars)	~	

REMARKS

Rehabilitation consists in repair all deficiencies described on item # 67.

BRIDGE STUDIES AND EVALUATION OFFICE
GENERAL EVALUATION

This bridge is basically in 2 structural condition — 16 [2]

excelent 4	fair 2	very poor 0
good 3	poor 1	

The load carrying capacity is — 17 [0]

adequate 3	minimally adequate 2	inadequate 1	not required (don't print) 0

The recommended modifications will make it — 18 [2]

adequate 2	minimally adequate 1	not required (don't print) 0
		0 when previous is 2

The bridge should be replaced. — 19 [0]

Yes (print) 1	Not required (don't print) 0

It requires 2 @ 24 — 20 [2][2 4] Ⓐ Ⓑ

- routine inspection every 24 months — [Ⓐ = 2 | Ⓑ = 24]
- frequent inspection every Ⓑ months to monitor abnormal and/or suspected deficiencies — [Ⓐ = 1 | Ⓑ = months]
- frequent inspection every Ⓑ months to determine the cause of and remedies for existing defects — [Ⓐ = 0 | Ⓑ = months]

It requires 2 — 23 [2]

- routine maintenance [3]
- minor repairs and routine maintenance [2]
- urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and routine maintenance [1]
- emergency repairs to eliminate danger to the public and routine maintenance [0]

The deck geometry is 0
For present ADT, the travelled way is 0
For future (1995) ADT, the travelled way is 0
For PRHA (1995) recommendations, the travelled way is 0
For present ADT, the shoulders are 0
For future (1995) ADT, the shoulders are 0
For PRHA (1995) recommendations, the shoulders are 0

24

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	0	0	0	0
	Travelled way			Shoulders		

satisfactory 3	unsatisfactory 2	cannot be evaluated because of lack of information 1
not required (don't print) 0		

The Ⓐ approach alignment is Ⓑ — 31 [0 0] ⒶⒷ

Ⓐ=	vertical 1	horizontal 0	horizontal and vertical 2
Ⓑ=	satisfactory 3	minimally tolerable 2	poor and represents a danger to the public 1
	not required (don't print) 0		

Load Post for inventory rating shown in Item 64 — 33 [0]

Yes 1	No (don't print) 0

Post for vertical underclearance shown in Items 54 & 69 — 34 [0]

Yes 1	No (don't print) 0

For "Remarks" see bridge file.

PERSONNEL	By	Date
Structural Inspection	I. Marquez	11-17-88
Review of Field Data	R. Alvaro	11-18-88
Transfer of Data		

	By	Date
Condition Analysis Appraisal	J. Toribio	12-08-88
IBM MT/SC file		
IBM–370 file		

E.11 October 23, 1986

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 5

PUERTO RICO HIGHWAY AUTHORITY
IBM–370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

☐	1307	0026
d No.	Bridge No.	Road No.

BRIDGE INVENTORY

Km. No. 4.30

IDENTIFICATION

Code Positions

Item	Entry	Code
1. State	Commonwealth of Puerto Rico	10 721
2. Highway District	San Juan	13 01
3. Municipality	San Juan	15 063
4. City/Town	San Juan	18 0063
5. Inventory Route	2-1-1-00003-0	22 2110000030
6. Features Intersected	Pedestrian Walkway	31 PEDESTRIAN WALKWAY
7. Facility Carried by Structure[56]	PR-26	
8. Structure No.	1307 1 of 1	74 0130701
9. Location [10]	Baldorioty De Castro Avenue	
10. Inventory Route, Minimum Vertical Clearance (0.01 m)	4.80 m	10 0480
11. Kilometer Point (0.01 km)	4.30	14 000430
12. Road Section Number (DOD)	25	19 00025-
13. Bridge Description	IOH NSTS PS	24 –
14. Defense Milepoint (0.01 ml)	6.37	26 0637
15. Defense Section Length (miles) (0.1 mile)	8.10	30 081
16. Latitude: 18 Degrees 27.3 Minutes		33 18273
17. Longitude: 66 Degrees 03.1 Minutes		38 066031
18. Physical Vulnerability	Steel truss	44 4
19. By Pass, Detour Length (Nearest mile)	Structure over highway	45 00
20. Toll	Toll free	47 3
21. Custodian	D.T.P.W.	48 1
22. Owner	State Highway Department	49 1
23. F.A.P. No.[50]	Unknown	

CLASSIFICATION

Item	Entry	Code
24. Fed. Aid System	Interstate, urban	10 02
25. Administrative	State	12 1
26. Functional	Interstate	13 41

BRIDGE STUDIES AND EVALUATION OFFICE

STRUCTURE DATA

		9 8 7 6 5 4 3 2 1
27. Year Built	1968	18 6800
28. Lanes on Str. 0 Under 7		19 0007
29. ADT – Inventory Route	100,000 (estimated)	23 100000
30. Year	1985	29 85
31. Design Load	Pedestrian	31 7
32. Approach Roadway width including shoulders (0.01 m)	26.81m	32 268
33. Median ☑ None ☐ Open ☐ Closed		35 0
34. Skew	none	36 00
35. Structure Flared ☐ Yes ☑ No.		38 0
36. Traffic Safety Features		39 NNNN
37. Historical Significance		43 5
38. Navigation Control ☐ Yes ☑ No		46 0
39. Navigation Vertical Clearance (0.1 m) ☐ Yes ☑ No		47 000
40. Navigation Horizontal Clearance (0.1 m) ☐ Yes ☑ No		50 0000
41. Structure, Open or Closed to Traffic	open	54 A
42. Type Service	Pedestrian over highway	55 31
43. Structure Type-Main	Steel truss-deck	57 309
44. Structure Type-Approach Spans	none	60 000
45. No. of Spans-Main	2	10 002
46. No. of Spans-Approaches	None	13 0000
47. Total Horizontal Clearance (0.01 m) L = 20.46m R. = 19.16 M		17 192
48. Max. Span Length (0.01 m)	20.46m	20 0205
49. Structure Length (0.01 m)	43.02 m	24 000430
50. Sidewalk Widths (0.01 m) Left – Right –		30 000000
51. Bridge Roadway Width (curb-curb) (0.01 m)	1.62m	36 0016
52. Deck Width (out-out) (0.01 m)	2.82m	40 0028
53. Vertical Clearance over Bridge Roadway-Minimum (0.01 m)	unlimited	44 9999
54. Vertical Underclearance – Minimum (0.01 m)	4.80m	48 0480
55. Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m) L = 5.21m R. = 7.90m		52 052
56. Lateral Underclearance on Left (Inner) Sides – Minimum (0.01 m) L = 0.85m R. = 0.86m		55 009
57. Wearing Surface	steel	58 7

BRIDGE STUDIES AND EVALUATION OFFICE

CONDITION

9 8 7 6 5 4 3 2 1

	Material	Condition Analysis	
58. Deck	steel	Generally Good Condition	59 [7]
59. Superstructure	steel	Generally Good Condition	60 [7]
60. Substructure	steel	Generally Good Condition	61 [7]
61. Channel & Channel Protection	N.A.	N.A.	62 [N]
62. Culvert & Retaining Walls			63 [N]
63. Estimated Remaining Life		15 years	64 [1 5]
64. Operating Rating		Pedestrian	66 [8 0 0]
65. Approach Alignment		NA	69 [N]
66. Inventory Rating		Pedestrian	70 [8 0 0]

APPRAISAL

	Deficiencies	
67. Structural Condition	all the structure it's been repaired and painted actually	10 [7]
68. Deck Geometry	N. A.	11 [N]
69. Underclearances-Vert. & Lateral	(4.80m) Condition better than present minimum criteria	12 [7]
70. Safe Load Capacity	N. A.	13 [N]
71. Waterway Adequacy	N. A.	14 [N]
72. Approach Alignment	N. A.	15 [N]

PROPOSED IMPROVEMENTS

73. Year Needed	Improvement not needed	16 [0 0]
Completed		
Described		
74. Type of Service	Pedestrian	18 [3]
75. Type of Work	N. A.	19 [0 0 0]
76. Improvement Length (0.1 m)		22 [0 0 0 0 0 0]
77. Design Loading		28 [0]

Page 1 of 1

BRIDGE STUDIES AND EVALUATION OFFICE

[9][8][7][6][5][4][3][2][1]

[0][0][0][0]

78. Roadway Width (0.01m) .... N.A. .... [0][0]

79. Number of Lanes .... [7][3][0][0][8][0]

80. ADT .... 130,080 ....

81. Year of Estimated ADT .... 1995 .... [9][5]

82. Year of Proposed Adjacent Roadway Improvements .... N.A. .... [0][0]

83. Prop. Adj. Rdwy Improvements-Type .... [0]

COST OF IMPROVEMENTS

84. Total (dollars)$ .... — .... [0][0][0][0][0] *

Estimated Design Time (months) ....

SUMMARY OF IMPROVEMENT COSTS

85. Preliminary Engineering (Dollars) .... — .... [0][0][0] *

86. Demolition Cost (Dollars) .... — .... [0][0][0] *

87. Substructure (Dollars) .... — .... [0][0][0][0][0] *

88. Superstructure (Dollars) .... — .... [0][0][0][0][0] *

89. Blank .... [–] *

90. Date of Last Inspection .... Nov. 12, 1986 .... [1][1][1][2][8][6] *

91. Rehabilitate Existing Structure (Dollars) .... — .... [0][0][0] *

92. Detour and Traffic Maintenance (Dollars) .... [0][0][0] *

93. Approaches (Dollars) .... [0][0][0] *

Approach Embankment (Dollars) ....

Approach Pavement (Dollars) ....

Approach Guardrail (Dollars) ....

*(Code to nearest thousand dollars) ....

REMARKS This bridge is in good structural conditions.

BRIDGE STUDIES AND EVALUATION OFFICE

GENERAL EVALUATION

This bridge is basically in 3 structural condition — 16 [3]

excelent	4	fair	2	very poor	0
good	3	poor	1		

The load carrying capacity is 0 — 17 [0]

adequate	3	minimally adequate	2	inadequate	1	not required (don't print)	0

The recommended modifications will make it 0 — 18 [0]

adequate	2	minimally adequate	1	not required (don't print)	0
				0 when previous is	2

The bridge should be replaced. — 19 [0]

Yes (print)	1	Not required (don't print)	0

It requires ' — 20 [2][2][4] Ⓐ Ⓑ

- routine inspection every 24 months — Ⓐ = 2 | Ⓑ = 24
- frequent inspection every Ⓑ months to monitor abnormal and/or suspected deficiencies — Ⓐ = 1 | Ⓑ = months
- frequent inspection every Ⓑ months to determine the cause of and remedies for existing defects — Ⓐ = 0 | Ⓑ = months

It requires — 23 [3]

- routine maintenance — 3
- minor repairs and routine maintenance — 2
- urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and routine maintenance — 1
- emergency repairs to eliminate danger to the public and routine maintenance — 0

The deck geometry is 0
For present ADT, the travelled way is 0
For future (1995) ADT, the travelled way is 0
For PRHA (1995) recommendations, the travelled way is 6
For present ADT, the shoulders are 0
For future (1995) ADT, the shoulders are 0
For PRHA (1995) recommendations, the shoulders are 0

24

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	6	0	0	0
	Travelled way			Shoulders		

satisfactory	3	unsatisfactory	2	cannot be evaluated because of lack of information	1
not required (don't print)	0				

The Ⓐ approach alignment is Ⓑ — 31 [0][0] ⒶⒷ

Ⓐ=	vertical 1	horizontal 0		horizontal and vertical 2		
Ⓑ=	satisfactory 3	minimally tolerable 2		poor and represents a danger to the public	1	
	not required (don't print) 0					

Load Post for inventory rating shown in Item 64 — 33 [0]

Yes	1	No (don't print)	0

Post for vertical underclearance shown in Items 54 & 69 — 34 [0]

Yes	1	No (don't print)	0

For "Remarks" see bridge file.

PERSONNEL	By	Date		By	Date
Structural Inspection	Ricci	10/23/86	Condition Analysis	A. Cáceres	11/12/86
Review of Field Data			Appraisal		
Transfer of Data			IBM MT/SC file		
			IBM–370 file		

BRIDGE NO. 1307

ROAD NO. 26 KM. 4.30

APPRAISAL OF ITEM [illegible]

BRIDGE STUDIES AND
EVALUATION OFFICE

YEAR	ADT	Sec.	T W	T W Adequate or Inadequate	T W Inadequate By	TW + SH	TW + SH Adequate or Inadequate	TW + SH Inadequate By
1985	NA		Actual =					
			For ADT =					
	NA							
1995	NA		Reqd. For ADT =					
			Rec. PRHA =					

✓ Adequate

X Inadequate

E.12 February 2, 1984

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 5

PUERTO RICO HIGHWAY AUTHORITY
IBM--370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Card No.	Bridge No.	Road No.
	1307	0026

BRIDGE INVENTORY

Km. No. 4.29

IDENTIFICATION

Code Positions

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

		Entry	Code
1.	State	Commonwealth of Puerto Rico	1 721
2.	Highway District	San Juan	13 01
3.	Municipality	San Juan	15 063
4.	City/Town	San Juan	18 0063
5.	Inventory Route	Z-1-1-00003-0	22 Z11000030
6.	Features Intersected	Pedestrian Walkway	31 PEDESTRIAN WALKWAY
7.	Facility Carried by Structure[56]	P.R. 26	
8.	Structure No.	1307 1/1	74 0130711
9.	Location[10]	Baldorioty De Castro Avenue	
10.	Inventory Route, Minimum Vertical Clearance (0.01 m)	4.80 m	10 0480
11.	Kilometer Point (0.01 km)	4.29	14 00429
12.	Road Section Number (DOD)	25	19 0025-
13.	Bridge Description	DH. NSTS.	24 --
14.	Defense Milepoint (0.01 ml)	6.37	26 0637
15.	Defense Section Length (miles) (0.1 mile)	8.1	30 081
16.	Latitude:	18 Degrees 27.3 Minutes	33 18273
17.	Longitude:	66 Degrees 03.1 Minutes	38 066031
18.	Physical Vulnerability	Steel truss	44 4
19.	By Pass, Detour Length (Nearest mile)	Structure over highway	45 00
20.	Toll	Toll Free	47 3
21.	Custodian	D.T.P.W.	48 1
22.	Owner	State Highway Department	49 1
23.	F.A.P. No.[50]	Unknown	

CLASSIFICATION

		Entry	Code
24.	Fed. Aid System	Interstate, urban	10 02
25.	Administrative	State	12 1
26.	Functional	Interstate	13 41

BRIDGE STUDIES AND EVALUATION OFFICE

STRUCTURE DATA

		9 8 7 6 5 4 3 2 1
27.	Year Built 1968	15 6 8 0 0
28.	Lanes on Str. .... 0 .... Under 7	19 0 0 0 7
29.	ADT – Inventory Route 67,600	23 0 6 7 6 0 0
30.	Year 1979	29 7 9
31.	Design Load .... Pedestrian	31 7
32.	Approach Roadway width including shoulders (0.01 m) 26.81m	32 2 6 8
33.	Median .... ☑ None ..... ☐ Open ...... ☐ Closed	35 0
34.	Skew .... None	36 0 0
35.	Structure Flared .... ☐ Yes ☑ No.	38 0
36.	Traffic Safety Features	38 N N N N
37.	Historical Significance	43 5
38.	Navigation Control .... ☐ Yes ☑ No	46 0
39.	Navigation Vertical Clearance (0.1 m) .... ☐ Yes ☑ No	47 0 0 0
40.	Navigation Horizontal Clearance (0.1 m) .... ☐ Yes ☑ No	50 0 0 0 0
41.	Structure, Open or Closed to Traffic .... Open	54 A
42.	Type Service .... Pedestrian over highway	55 3 1
43.	Structure Type-Main .... Steel truss - deck	57 3 0 9
44.	Structure Type-Approach Spans .... None	60 0 0 0
45.	No. of Spans-Main 2	10 0 0 2
46.	No. of Spans-Approaches .... None	13 0 0 0 0
47.	Total Horizontal Clearance (0.01 m) .... L = 20.46m R = 19.16m	17 1 9 2
48.	Max. Span Length (0.01 m) 20.46m	20 0 2 0 5
49.	Structure Length (0.01 m) 43.02m	24 0 0 0 4 3 0
50.	Sidewalk Widths (0.01 m) Left ..... – ..... Right .. –	30 0 0 0 0 0 0
51.	Bridge Roadway Width (curb-curb) (0.01 m) .... 1.62 m	36 0 0 1 6
52.	Deck Width (out-out) (0.01 m) .... 2.82 m	40 0 0 2 8
53.	Vertical Clearance over Bridge Roadway-Minimum (0.01 m) .... Unlimited	44 9 9 9 9
54.	Vertical Underclearance – Minimum (0.01 m) .... 4.80 m	48 0 4 8 0
55.	Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m) .... L = 5.21m R = 7.90m	52 0 5 2
56.	Lateral Underclearance on Left (Inner) Sides – Minimum (0.01 m) .... L = 0.55m R = 0.86m	55 0 0 7
57.	Wearing Surface .... Steel	58 7

BRIDGE STUDIES AND EVALUATION OFFICE

9	8	7	6	5	4	3	2	1

CONDITION

	Material	Condition Analysis	Code
58. Deck	steel	Generally Good Condition	59 [7]
59. Superstructure	steel	Generally Good Condition	60 [7]
60. Substructure	steel	Generally Good Condition	61 [7]
61. Channel & Channel Protection	NA	NA	62 [N]
62. Culvert & Retaining Walls			63 [N]
63. Estimated Remaining Life		15	64 [1 5]
64. Operating Rating		Pedestrian	66 [8 0 0]
65. Approach Alignment		NA	69 [N]
66. Inventory Rating		Pedestrian	70 [8 0 0]

APPRAISAL

	Deficiencies	Code
67. Structural Condition	Sandblasting and paint have been applied recently.	10 [7]
68. Deck Geometry	NA	11 [N]
69. Underclearances-Vert. & Lateral	Condition equal to present minimum criteria	12 [6]
70. Safe Load Capacity	NA	13 [N]
71. Waterway Adequacy		14 [N]
72. Approach Alignment		15 [N]

PROPOSED IMPROVEMENTS

		Code
73. Year Needed		16 [0 0]
Completed		
Describe		
74. Type of Service	Pedestrian	18 [3]
75. Type of Work	NA	19 [0 0 0]
76. Improvement Length (0.1 m)	NA	22 [0 0 0 0 0 0]
77. Design Loading		28 [0]

BRIDGE STUDIES AND EVALUATION OFFICE

[9|8|7|6|5|4|3|2|1]

78.	Roadway Width (0.01m)	N/A	29 [0 0 0 0]
79.	Number of Lanes	N/A	33 [0 0]
80.	ADT	130,080	35 [1 3 0 0 8 0]
81.	Year of Estimated ADT	1995	41 [9 5]
82.	Year of Proposed Adjacent Roadway Improvements	N/A	43 [0 0]
83.	Prop. Adj. Rdwy Improvements-Type	N/A	45 [0]

COST OF IMPROVEMENTS

84	Total (dollars)$		46 [0 0 0 0 0] *
	Estimated Design Time (months)		

SUMMARY OF IMPROVEMENT COSTS

85.	Preliminary Engineering (Dollars)		51 [0 0 0] *
86.	Demolition Cost (Dollars)		54 [0 0 0] *
87.	Substructure (Dollars)		57 [0 0 0 0 0] *
88.	Superstructure (Dollars)		62 [0 0 0 0 0] *
89.	Blank		67 [–] *
90.	Date of Last Inspection	June 13, 1983	68 [0 6 1 3 8 3] *
91.	Rehabilitate Existing Structure (Dollars)		74 [0 0 0] *
92.	Detour and Traffic Maintenance (Dollars)		77 [0 0 0] *
93.	Approaches (Dollars)		80 [0 0 0] *
	Approach Embankment (Dollars)		
	Approach Pavement (Dollars)		
	Approach Guardrail (Dollars)		
	*(Code to nearest thousand dollars)		

REMARKS

This bridge is good structural condition.

BRIDGE STUDIES AND EVALUATION OFFICE

GENERAL EVALUATION

This bridge is basically in ___3___ structural condition — 16 [3]

excelent	4	fair	2	very poor	0
good	3	poor	1		

The load carrying capacity is ___0___ — 17 [0]

adequate	3	minimally adequate	2	inadequate	1	not required (don't print)	0

The recommended modifications will make it ______ — 18 [0]

adequate	2	minimally adequate	1	not required (don't print)	0
				0 when previous is	2

The bridge should be replaced. — 19 [0]

Yes (print)	1	Not required (don't print)	0

It requires ___2@24___ — 20 [2][2][4] Ⓐ Ⓑ

routine inspection every 24 months — Ⓐ = 2 | Ⓑ = 24

frequent inspection every Ⓑ months to monitor abnormal and/or suspected deficiencies — Ⓐ = 1 | Ⓑ = months

frequent inspection every Ⓑ months to determine the cause of and remedies for existing defects — Ⓐ = 0 | Ⓑ = months

It requires ___3___ — 23 [3]

- routine maintenance — 3
- minor repairs and routine maintenance — 2
- urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and routine maintenance — 1
- emergency repairs to eliminate danger to the public and routine maintenance — 0

The deck geometry is ___0___

For present ADT, the travelled way is ___0___

For future (1995) ADT, the travelled way is ___0___

For PRHA (1995) recommendations, the travelled way is ___0___

For present ADT, the shoulders are ___0___

For future (1995) ADT, the shoulders are ___0___

For PRHA (1995) recommendations, the shoulders are ___0___

24

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	0	0	0	0
	Travelled way			Shoulders		

satisfactory	3	unsatisfactory	2	cannot be evaluated because of lack of information	1
not required (don't print)	0				

The Ⓐ approach alignment is Ⓑ — 31 [0][0] ⒶⒷ

Ⓐ = vertical	1	horizontal	0	horizontal and vertical	2
Ⓑ = satisfactory	3	minimally tolerable	2	poor and represents a danger to the public	1
not required (don't print)	0				

Load Post for inventory rating shown in Item 64 — 33 [0]

Yes	1	No (don't print)	0

Post for vertical underclearance shown in Items 54 & 69 — 34 [0]

Yes	1	No (don't print)	0

For "Remarks" see bridge file.

PERSONNEL	By	Date		By	Date
Structural Inspection			Condition Analysis	RPS	2 FEB 84
Review of Field Data			Appraisal		
Transfer of Data			IBM MT/SC file		
			IBM--370 file		

BRIDGE NO. 1307

ROAD NO. 26 KM. 4.29

APPRAISAL OF ITEM 68

BRIDGE STUDIES AND
EVALUATION OFFICE

YEAR	ADT	Sec.	TW	TW Adequate or Inadequate	TW Inadequate By	TW + SH	TW+SH Adequate or Inadequate	TW + SH Inadequate By
1982			Actual =					
			For ADT =					
	NA							
1995			Reqd. For ADT =					
			Rec. PRHA =					

✓ Adequate

X Inadequate

E.13 June 18, 1975

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 5

PUERTO RICO HIGHWAY AUTHORITY
IBM–370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Card No.	Bridge No.	Road No.
	1307	0000

BRIDGE INVENTORY

Km. No. N.A

IDENTIFICATION

Code Positions: 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Item	Entry	Code position	Code
1. State	Commonwealth of Puerto Rico	10	721
2. Highway District	San Juan	13	01
3. Municipality	San Juan	15	063
4. City/Town	San Juan	18	0063
5. Inventory Route	18060600000060	22	180000000
6. Features Intersected	P.R. 26	31	PR 26
7. Facility Carried by Structure[56]	Pedestrian walkway		
8. Structure No.	1307 one of one	74	013071
9. Location[10]	East of Bem. shopping Center, Baldorioty de Castro Avenue		
10. Inventory Route, Minimum Vertical Clearance (0.01 m)	Unlimited	10	9999
11. Kilometer Point (0.01 km)	N.A.	14	00000
12. Road Section Number (DOD)	NDH	19	00000
13. Bridge Description	NDH. ODH. NSTSP	24	36
14. Defense Milepoint (0.01 ml)	NDH	26	0000
15. Defense Section Length (miles) (0.1 mile)	NDH	30	000
16. Latitude: 18 Degrees 29.3 Minutes		33	18293
17. Longitude: 66 Degrees 03.1 Minutes		38	066031
18. Physical Vulnerability	Steel Truss	44	4
19. By Pass, Detour Length (Nearest mile)	Walk across highway	45	00
20. Toll	No toll for road or bridge	47	3
21. Custodian	DTPW	48	2
22. Owner	State Highway Department	49	1
23. F.A.P. No.[50]	Unknown		

CLASSIFICATION

Item	Entry	Code position	Code
24. Fed. Aid System	N/A	10	00
25. Administrative	STATE	12	1
26. Functional	NA	13	00

BRIDGE STUDIES AND EVALUATION OFFICE

STRUCTURE DATA

9 8 7 6 5 4 3 2 1

No.	Item	Entry	Code
27.	Year Built	1969	15: 6600
28.	Lanes on Str. 0 . . Under	6	19: 0006
29.	ADT – Inventory Route	N/A	23: 000000
30.	Year	N/A	29: 00
31.	Design Load	Pedestrian	31: 7
32.	Approach Roadway width including shoulders (0.01 m)	1.62	32: 016
33.	Median . . . ☒ None . . . ☐ Open . . . ☐ Closed		35: 0
34.	Skew	None	36: 00
35.	Structure Flared . . . ☐ Yes ☒ No		38: 0
36.	Traffic Safety Features	1-1-0-0	39: 1100
37.	Blank	blank	43: 000
38.	Navigation Control . . . ☐ Yes ☒ No		46: 0
39.	Navigation Vertical Clearance (0.1 m) . . . ☐ Yes ☒ No		47: 000
40.	Navigation Horizontal Clearance (0.1 m) . . . ☐ Yes ☒ No		50: 0000
41.	Structure, Open or Closed to Traffic	Open	54: A
42.	Type Service	Pedestrian over Highway	55: 31
43.	Structure Type-Main	[illegible]	57: 309
44.	Structure Type-Approach Spans	None	60: 000
45.	No. of Spans-Main	Two	10: 002
46.	No. of Spans-Approaches	None	13: 0000
47.	Total Horizontal Clearance (0.01 m) . . . L = . . . R.=	1.62	17: 016
48.	Max. Span Length (0.01 m)	20.42	20: 0204
49.	Structure Length (0.01 m)	43.02	24: 000430
50.	Sidewalk Widths (0.01 m) Left — Right	—	30: 000000
51.	Bridge Roadway Width (curb-curb) (0.01 m)	1.62	36: 0016
52.	Deck Width (out-out) (0.01 m)	1.62	40: 0016
53.	Vertical Clearance over Bridge Roadway-Minimum (0.01 m)	Unlimited	44: 9999
54.	Vertical Underclearance – Minimum (0.01 m)	4.85	48: 0485
55.	Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m)	L = 1.13 R = 7.28	52: 013
56.	Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m)	L = 0.45 R = 0.5	56: 005
57.	Wearing Surface	Steel Plate	58: 7

BRIDGE STUDIES AND EVALUATION OFFICE

CONDITION

9 8 7 6 5 4 3 2 1

	Material	Condition Analysis	
58. Deck	Steel	minor rust	59 7
59. Superstructure	"	" "	60 7
60. Substructure	"	" "	61 7
61. Channel & Channel Protection		NA	62 N
62. Culvert & Retaining Walls		NA	63 N
63. Estimated Remaining Life		15 years	64 15
64. Operating Rating	Pedestrian loading		66 800
65. Approach Alignment		N.A.	69 N
66. Inventory Rating	Pedestrian Loading		70 800

APPRAISAL

	Deficiencies	
67. Structural Condition	Ponding because of poor drainage system; joints are leaking; light corrosion at deck, cross bracings, stringers, etc.	10 2
68. Deck Geometry	N.A.	11 N
69. Underclearances-Vert. & Lateral	(4.85 m) Equal to present minimum criteria	12 6
70. Safe Load Capacity	N.A.	13 N
71. Waterway Adequacy		14 N
72. Approach Alignment		15 N

PROPOSED IMPROVEMENTS

73. Year Needed	~~1976~~ 1980	16 80
Completed		
Describe		
74. Type of Service	Pedestrian	18 2
75. Type of Work	Rehabilitation	19 372
76. Improvement Length (0.1 m)	N.A.	22 000000
77. Design Loading		28 0

BRIDGE STUDIES AND EVALUATION OFFICE

9 8 7 6 5 4 3 2 1

78. Roadway Width (0.01 m) . . . . N/A . . . . 29 [0 0 0 0]
79. Number of Lanes . . . . 33 [0 0]
80. ADT . . . . 35 [0 0 0 0 0 0]
81. Year of Estimated ADT . . . . 41 [0 0]
82. Year of Proposed Adjacent Roadway Improvements . . . . 43 [0 0]
83. Prop. Adj. Rdwy Improvements-Type . . . . 45 [0]

COST OF IMPROVEMENTS

84. Total (dollars) $ . . 8,000 . . (Based on 1976 unit costs) . . 46 [0 0 0 0 8] *

Estimated Design Time (months) . . . .

SUMMARY OF IMPROVEMENT COSTS

85. Preliminary Engineering (Dollars) . . . . 51 [0 0 0] *
86. Demolition Cost (Dollars) . . . . 54 [0 0 0] *
87. Substructure (Dollars) . . . . 57 [0 0 0 0 0] *
88. Superstructure (Dollars) . . . . 62 [0 0 0 0 0] *
89. Blank . . . . 67 [b] *
90. Rehabilitate Existing Structure (Dollars) . . 8,000 . . . . 68 [0 0 8] *
91. Detour and Traffic Maintenance (Dollars) . . . . 71 [0 0 0] *
92. Approaches (Dollars) . . . . 74 [0 0 0] *

Approach Embankment (Dollars)

Approach Pavement (Dollars)

Approach Guardrail (Dollars)

(* Code to nearest thousand dollars)

93. Date of Last Inspection . . . . July 18/75 . . . . 10 [0 7 1 8 7 5]

REMARKS

Rehabilitation (Item 90) consist of:

a) Repair of joints against leakage

b) Improvement of drainage system

c) Removal of rust that appear in the bridge by sand blasting system and the protection of it against future corrosion with paint.

BRIDGE STUDIES AND EVALUATION OFFICE

GENERAL EVALUATION

This bridge is basically in 3 structural condition — 16 [3]

excelent	4	fair	2	very poor	0
good	3	poor	1		

The load carrying capacity is 0 — 17 [0]

adequate	3	minimally adequate	2	inadequate	1	not required (don't print)	0

The recommended modifications will make it — 18 [0]

adequate	2	minimally adequate	1	not required (don't print)	0
				0 when previous is	2

The bridge should be replaced. — 19 [0]

Yes (print)	1	Not required (don't print)	0

It requires 1;12 — 20 [1 | 12] Ⓐ Ⓑ

routine inspection every 24 months — Ⓐ = 2 Ⓑ = 24

frequent inspection every Ⓑ months to monitor abnormal and/or suspected deficiencies — Ⓐ = 1 Ⓑ = months

frequent inspection every Ⓑ months to determine the cause of and remedies for existing defects — Ⓐ = 0 Ⓑ = months

It requires 2 — 23 [2]

routine maintenance — 3

minor repairs and routine maintenance — 2

urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition and routine maintenance — 1

emergency repairs to eliminate danger to the public and routine maintenance — 0

The deck geometry is

For present ADT, the travelled way is

For future (1990) ADT, the travelled way is

For PRHA (1990) recommendations, the travelled way is

For present ADT, the shoulders are

For future (1990) ADT, the shoulders are

For PRHA (1990) recommendations, the shoulders are

N/A

24

Deck	Present	Future	PRHA	Present	Future	PRHA
0	0	0	0	0	0	0
	Travelled way			Shoulders		

satisfactory	3	unsatisfactory	2	cannot be evaluated because of lack of information	1
not required (don't print)	0				

The Ⓐ approach alignment is Ⓑ — 31 [0 | 0] ⒶⒷ

N/A

Ⓐ= vertical	1	horizontal	0	horizontal and vertical	2
Ⓑ= satisfactory	3	minimally tolerable	2	poor and represents a danger to the public	1
not required (don't print)	0				

Load Post for inventory rating shown in Item 66 — 33 [0]

Yes	1	No (don't print)	0

N-A

Post for vertical underclearance shown in Items 54 & 69 — 34 [0]

Yes	1	No (don't print)	0

For "Remarks" see bridge file.

PERSONNEL	By	Date		By	Date
Structural Inspection	L. Perez	Jul 18/75	Condition Analysis	G. Velasco	4/5/76
Review of Field Data	J. Cefero	Jul 31/75	Appraisal	"	"
Transfer of Data	I. Dessio	Mar 3/76	IBM MT/SC file	A. Perdomo	Agosto 1976
			IBM–370 file		

BRIDGE NO. ____________

ROAD NO. ____________ KM. ____________

APPRAISAL OF ITEM 68

BRIDGE STUDIES AND
EVALUATION OFFICE

YEAR	ADT	Sec.	T W		T W Adequate or Inadequate	T W Inadequate By	T W + SH	TW+SH Adequate or Inadequate	TW + SH Inadequate By
1970			Actual ≡						
			For ADT ≡						
1990			Reqd. For ADT ≡						
			Rec. PRHA ≡						

✓ Adequate

X Inadequate

BRIDGE STUDIES AND EVALUATION OFFICE

Page 1 of 1

PUERTO RICO HIGHWAY AUTHORITY
IBM – 370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Card No.	Bridge No.	Road No.
	1307	0026

ROUTE UNDER STRUCTURE

Km. No. 4.29

Code Positions

25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Item	Entry	Code
IDENTIFICATION		
5. Inventory Route	263.61.6000.26.60	10: 2 3 1 0 0 0 2 6 0
6. Features Intersected	Pedestrian Walkway	19: PEDESTRIAN WALKWAY
8. Structure No.	1307	44: 0 1 3 0 7 1
10. Inventory Route, Minimum Vertical Clearance (0.01 m)	4.85	50: 0 4 8 5
11. Kilometer Point (0.01 km)	4.29	54: 0 0 4 2 9
12. Road Section Number (DOD)	25	59: 0 0 2 5 6
13. Bridge Description		64: 0 6
14. Defense Milepoint (0.01 m)	6.37	66: 0 6 3 7
15. Defense Section Length (miles) (0.1 mile)	8.1	70: 0 8 1
19. By Pass, Detour Length (Nearest mile)	At Bridge Site	73: 0 0
CLASSIFICATION		
24. Fed. Aid System	OTHER FH primary urban	75: 0 4
25. Administrative	STATE	77: 1
26. Functional	Urban Principal Arterial	76: 4 3
STRUCTURE DATA		
29. ADT – Inventory Route	50 560	10: 0 5 0 5 6 0
30. Year	1990	16: 9 0
47. Total Horizontal Clearance (0.01 m)	L = 14.39 R = 10.35	18: [illegible]

E.14 November 13, 1972

COMMONWEALTH OF PUERTO RICO
HIGHWAY AUTHORITY
IBM–370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Page 1 of 4 — C. Providencia

Card No. | Bridge No. 1307 | Road No.

BRIDGE INVENTORY

Km. No. ______

Code Positions

IDENTIFICATION

1. State . . . . . Commonwealth of Puerto Rico . . . . 10 — 721
2. Highway District . . . . San Juan . . . . 13 — 01
3. Municipality . . . . San Juan . . . . 15 — 063
4. City/Town . . . . San Juan . . . . 18 — 0063
5. Inventory Route . C. Providencia . Pedestrian walkway . 22
6. Features Intersected . . PR 26 . . . . 31 — PR 26
7. Facility Carried by Structure 56 Pedestrian walkway . . . C. Providencia . . . .
8. Structure No. . . . 1307 . . . 1 of 1 . . . . 74 — 0130711

Card 2

9. Location 10 East of Gem. shopping center, Ave. Baldorioty de Castro . .

Card 3

10. Inventory Route, Minimum Vertical Clearance (0.01 m) . . . Unlimited . . . . 10 — 9999
11. Kilometer Point (0.01 km) . . . . N.A. 14
12. Road Section Number (DOD) . Not defense highway . . . . 19 — 00000
13. Bridge Description . . . . N.P.H.Q.D.H. . N.S.T.S. . P. 24
14. Defense Milepoint (0.01 m) . . . Not defense highway . . . 26 — 0000
15. Defense Section Length (miles) (0.1 mile) . Not defense highway . . . . 30 — 000
16. Latitude: . . 18 . . . Degrees . 27.0 . . Minutes . . . . 33 — 18270
17. Longitude: . . 66 . . . Degrees . . 03.0 . . Minutes . . . . 38 — 066030
18. Physical Vulnerability . Steel Truss . . . . 44 — 4
19. By Pass, Detour Length (Nearest mile) . Walk across highway . . . . 45 — 00
20. Toll . . . . No toll for road or bridge . . . . 47 — 3
21. Custodian . . . . State . . . . 48 — 1
22. Owner . . . . State Highway Department . . . . 49 — 1
23. F.A.P. No. 50 . . . . .

CLASSIFICATION

24. Fed. Aid System . . . . N.A. 10
25. Administrative . . . . State . . . . 12 — 1
26. Functional . . . . Pedestrian walkway . . . N.A. 13

Br. 1306

9 8 7 6 5 4 3 2 1

STRUCTURE DATA

27.	Year Built	1968	15 6 8 0 0
28.	Lanes on Str. 0 Under 6		19 0 0 0 6
29.	ADT – Inventory Route	NA	23 0 0 0 0 0 0
30.	Year	NA	29 0 0
31.	Design Load	Pedestrian	31 7
32.	Approach Roadway width including shoulders (0.01 m)	NA	32 6 6 6
33.	Median None ✓ Open Closed		35 0
34.	Skew	No	36 0 0
35.	Structure Flared ☐ Yes ☒ No		38 0
36.	Hydraulic Structure ☐ Yes ☒ No		39 0
37.	Report Available ☐ Yes ☒ No		40 0
38.	Navigation Control ☐ Yes ☐ No	N.A	41 0
39.	Navigation Vertical Clearance (0.1 m) ☐ Yes ☐ No	NA	42 0 0 0
40.	Navigation Horizontal Clearance (0.1 m) ☐ Yes ☐ No	NA	45 0 0 0 0
41.	Relief Structures	None	49 0 0
42.	Type Service	Pedestrian over highway	51 3 1
43.	Structure Type–Main	Steel deck Truss, Bailey Bridge	53 3 0 9
44.	Structure Type-Approach Spans	None	56 0 0 0
45.	No. of Spans–Main	2	10 0 0 2
46.	No. of Spans–Approaches	None	13 0 0 0 0
47.	Total Horizontal Clearance (0.01 m) L = 1.62 R =		17 0 1 6
48.	Max. Span Length (0.01 m)	20.27	20 0 2 0 3
49.	Structure Length (0.01 m)	39.62	24 0 0 0 3 9 6
50.	Sidewalk Widths (0.01 m) Left 0.0.0 Right 0.0.0		30 0 0 0 0 0 0
51.	Bridge Roadway Width (curb-curb) (0.01 m)	1.62 walkway	36 0 0 1 6
52.	Deck Width (out-out) (0.01 m)	1.62	40 0 0 1 6
53.	Vertical Clearance over Bridge Roadway--Minimum (0.01 m)	Unlimited	44 9 9 9 9
54.	Vertical Underclearance – Minimum (0.01 m)	4.85	48 0 4 8 5
55.	Lateral Underclearance on Right (Outer) Sides – Minimum (0.01 m) L = 1.30 R = 3.28		52 0 1 3
56.	Lateral Underclearance on Left (Median) Sides – Minimum (0.01 m) L = 0.45 R = 0.50		55 0 0 5
57.	Wearing Surface	Steel plate	58 7

HARRIS

M.1307

CONDITION

9 8 7 6 5 4 3 2 1

	Material	Condition Analysis	
58. Deck	Steel	Minor. rmf.	59 7
59. Superstructure	Steel	Minor. rmf.	60 7
60. Substructure	Steel	Minor. rmf.	61 7
61. Channel & Channel Protection	N.A		62 N
62. Culvert & Retaining Walls	N.A.		63 N
63. Estimated Remaining Life	20 years		64 20
64. Operating Rating	PEDESTRIAN LOADING		66 806
65. Approach Alignment	N.A.		69 N
66. Inventory Rating	PEDESTRIAN LOADING		70 800

APPRAISAL

	Deficiencies	
67. Structural Condition	Needs painting	10 7
68. Deck Geometry	N.A.	11 N
69. Underclearances–Vert. & Lateral	V = 4.85 m; Lateral underclearance width equals recommended (P.R.H.A.)(1990) section width	12 6
70. Safe Load Capacity	n.a.	13 5
71. Waterway Adequacy	N.A.	14 N
72. Approach Alignment	N.A	15 N

PROPOSED IMPROVEMENTS

73. Year Needed	1973	16 73
Completed		
Describe		
74. Type of Service	Pedestrian	18 3
75. Type of Work	Rehabilitation	19 371
76. Improvement Length (0.1 m)	43.0	22 000430
77. Design Loading	NA	28 0

HARRIS

B. 13076

9	8	7	6	5	4	3	2	1

78. Roadway Width (0.01 m) . . . . 1.62 . . . . 29 0 0 1 6
79. Number of Lanes . . . . N.A. 33 0 0
80. ADT . . . . N.A. 35 0 0 0 0 0 0
81. Year of Estimated ADT . . . . N.A. 41 0 0
82. Year of Proposed Adjacent Roadway Improvements . . . N.A. 43 0 0
83. Prop. Adj. Rdwy Improvements–Type . . . . N.A. 45 0

COST OF IMPROVEMENTS

84. Total (dollars) $ . . . . 3,000 . . . . 46 0 0 0 0 3 *

SUMMARY OF IMPROVEMENT COSTS

85. Preliminary Engineering (Dollars) . . . . 51 *
86. Demolition Cost (Dollars) . . . . 54 *
87. Substructure (Dollars) . . . . 57 *
88. Superstructure (Dollars) . . . . 62 *
89. Priority Letter . . . . 67 *
90. Rehabilitate Existing Structure (Dollars) . . . . 68 *
91. Detour and Traffic Maintenance (Dollars) . . . . 71 *
92. Approaches (Dollars) . . . . 74 *

Approach Embankment (Dollars) ____________

Approach Pavement (Dollars) ____________

Approach Guardrail (Dollars) ____________

(*Code to nearest thousand dollars)

Remarks

. . . . Rehabilitation required ~~should~~ includes painting . . . .

PERSONNEL

	By	Date		By	Date
Structural Inspection	S.M. Rodgers	11/13/72	Condition Analysis		
Topographic Survey			Appraisal		
Review of Field Data			IBM MT/SC file		
Transfer of Data			IBM–370 file		

B. 9307

REMARKS

Travelled way narrow for present (1970) ADT by . ~~Narrow for future (1990) ADT by~~ , and for future PRHA recommended section by

Roadway (including shoulders) narrow for present (1970) ADT by

Narrow for future (1990) ADT by and for future PRHA recommended section by

GENERAL EVALUATION

This bridge is basically in ~~excellent~~ ~~fair~~ good ~~poor~~ ~~very poor~~ structural condition.

~~The load-carrying capacity is minimally adequate inadequate~~

~~The recommended modifications will make it minimally adequate.~~

~~The bridge should be replaced.~~

It requires routine inspection (every 2 years).
~~frequent inspection (every months) to determine the cause of and remedies for existing defects.~~

~~frequent inspection (every months) to monitor abnormal and/or suspected deficiencies.~~

It requires ~~routine maintenance.~~
minor repairs and routine maintenance.
~~emergency repairs to eliminate danger to the public.~~
~~urgent repairs to prevent further costly deterioration and/or the development of a dangerous condition.~~
~~Non-urgent programmed repairs.~~

The deck geometry is unsatisfactory. The travelled way is unsatisfactory for present requirements. ~~The shoulders are unsatisfactory for present requirements.~~

The travelled way is unsatisfactory for future (1990) ( ) requirements.

The shoulders are unsatisfactory for future (1990) ( ) requirements.

The approach alignment is satisfactory / minimally adequate. / poor and represents a danger to the public.

HARRIS

COMMONWEALTH OF PUERTO RICO
HIGHWAY AUTHORITY
IBM–370 AND IBM MT/SC
ELECTRONIC DATA STORAGE

Page 1 of 1

Card No.	Bridge No.	Road No.
	1307	0026

ROUTE UNDER STRUCTURE

Km. No. 4.29

Code Positions

IDENTIFICATION 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

5. Inventory Route . . PR26 . . . 263616.0002660 . . 10 2 3 1 0 0 0 2 6 0
6. Features Intersected . Pedestrian. walkway. C. Providencia . . . .
. . . . 19 P E D W A L K C P R O V I D E N C I A
8. Structure No. . . 1307 . . . . 1 of 1 . . . . 44 0 1 3 0 7 1
10. Inventory Route, Minimum Vertical Clearance (0.01 m) . . 4.85 . . . . 50 0 4 8 5
11. Kilometer Point (0.01 km) . . . . 4.29 . . . . 54 0 0 4 2 9
12. Road Section Number (DOD) . . . 62 . . . . 59 0 0 6 2 E
13. Bridge Description . . . . NDHODH . . NSTS . . P. . . . . 64 . E E
14. Defense Milepoint (0.01 m) . . 123 . . . . 66 0 1 2 3
15. Defense Section Length (miles) (0.1 mile) . . 1.7 . . . . 70 . 0 1 7
19. By Pass, Detour Length (Nearest mile) . . . 1 mile . . . . 73 . 0 1

CLASSIFICATION

24. Fed. Aid System . Other. Federal Aid, . Primary . urban . . . . 75 . . 0 4
25. Administrative . . . . State . . . . 77 . . . 1
26. Functional . . . . . Urban . principal. arterial . . . . 78 . . 4 3

STRUCTURE DATA

Card 2

29. ADT - Inventory Route . . 36,550 . . . . 10 . 0 3 6 5 5 0
30. Year . . . . 1970 . . . . 16 . 7 0
47. Total Horizontal Clearance (0.01 m) . . . L 14.38 . . . R 10.35 . . . . 18 1 0 4

Appendix F **Inspection by PRHTA of PB 2336**

F.1 April 16, 2014

INSPECTION REPORT SUMMARY & QC SHEET

BRIDGE: 2336

TEAM LEADER: Eng. Arturo Cáceres Febus

INSP. DATE: 4/16/14

1. Inspection Type and Dates:

NBI	Type	Performed? (Yes / No / NA)	Freq (MONTHS)	Previous Insp. DATE (MONTH/YEAR)	Next Insp. DATE (MONTH/YEAR)
ITEM 90	**Routine Inspection**	yes	48	12/10/08	4/16/18
ITEM 93 A	**FC Inspection**	N	—	—	—
ITEM 93 B	**Underwater Insp.**	N	—	—	—
ITEM 93 C	**Other:**	N	—	—	—

2. NBI Condition Rating Summary:

	Item 58	Item 59	Item 60	Item 61	Item 62	Item 113
Previous Inspection	6	7	7	N	N	N
Current Inspection	6	7	7	N	N	N

Other Checks: (Y, N, NA)

Review Comments:

_ Scour Critical (items 113 & 60)
_ AASHTO Core's & NBI CD consistent
_ Smart Flags (scour, steel plate, fire damage, etc)
_ Channel Profile/Clearance Table
_ FC & Underwater Members Tables
_ Asphalt Overlay Thickness
_ Drawings
_ Photos
_ Critical Finding
_ Inspector & Team Leader Signature

Reviewer: ____________

Safety Eng.: ____________

YourState Department of Transportation

Bureau of Bridges and Structures
Bridge Maintenance

Bridge Inspection Report

Bridge Key: 023361 | Agency ID: 023361 | Sufficiency Rating: -2.0

IDENTIFICATION

State 1: 72 Puerto Rico | Struc Num 8: 023361
Facility Carried 7: PR 17 (PIÑERO AV.) | Location 9: 4.48 KM EAST OF PR 18
Rte.(On/Under)5A: One Route Under | Rte. Signing Prefix 5B: 3 State Hwy
Level of Service 5C: 1 Mainline | Rte. Number 5D: 00017
Directional Suffix 5E: 0 N/A (NBI) | % Responsibility: NA
SHD District 2: -1 | County Code 3: SAN JUAN
Place Code 4: 74017 | Kilometer Post 11: 08.2 km
Feature Intersected 6: PEDESTRIAN WALKWAY
Latitude 16: 18d 24' 36" | Longitude 17: 066d 01' 30"
Border Bridge Code 98: Unknown (P)
Border Bridge Number 99: Unknown

STRUCTURE TYPE AND MATERIALS

Number of Approach Spans 46: -1 | Number of Spans Main Unit 45: -1
Main Span Material/Design 43A/B:
5 Prestressed Concrete | 06 Single/Spread Box

Deck Type 107: Unknown (NBI)
Wearing Surface 108A: Unknown (NBI)
Membrane 108B: Unknown (NBI)
Deck Protection 108C: Unknown (NBI)

AGE AND SERVICE

Year Built 27: 1994 | Year Reconstructed 106: Unknown
Type of Service on 42A: 3 Pedestrian-bicyle
Type of Service under 42B: 1 Highway
Lanes on 28A: Unknown | Lanes Under 28B: 8 | Detour Length 19: 0.0 km
ADT 29: 89,200 | Truck ADT 109: 5 % | Year of ADT 30: 2005

GEOMETRIC DATA

Length Max Span 48: 25.00 m | Structure Length 49: 49.90 m
Curb/Sdwlk Wdth L 50A: | Curb/Sidewalk Width R 50B:
Width Curb to Curb 51: 2.10 m | Width Out to Out 52:
Approach Roadway Width 32: (w/ shoulders) 0.00 m | Median 33: Unknown (NBI)
Deck Area:
Skew 34: -1.00 ° | Structure Flared 35: Unknown (NBI)
Minimum Vertical Clearance Over Bridge 53:
Minimum Vertical Underclearance Reference 54A: H Hwy beneath struct
Minimum Vertical Underclearance 54B: 05.03 m
Minimum Lateral Underclearance Reference R 55A: H Hwy beneath struct
Minimum Lateral Undrclearance R 55: 00.80 m
Minimum Lateral Undrclearance L 56: 00.40 m

INSPECTION

Frequency 91: 48 months | Inspection Date 90: 4/16/2014 | Next Inspection: 04/16/2018
FC Frequency 92A: NA | FC Inspection Date 93A: NA | Next FC Inspection: NA
UW Frequency 92B: NA | UW Inspection Date 93B: NA | Next UW Inspection: NA
SI Frequency 92C: NA | SI Date 93C: NA | Next SI: NA
Element Frequency: 48 months | Element Inspection Date: 01/01/1901 | Next Elem. Insp. Due: 01/01/1901

CLASSIFICATION

Defense Highway 100: 0 Not a STRAHNET hwy | Parallel Structure 101: Unknown (NBI)
Direction of Traffic 102: 0 Not hwy traffic | Temporary Structure 103: Not Applicable (P)
Highway System 104: 0 Not on NHS | NBIS Length 112: Unknown (NBI)
Toll Facility 20: 3 On free road | Functional Class 26: 14 Urban Other Princ
Historical Significance 37: Not Applicable (P)
Owner 22: -1 Unknown (P)
Custodian 21: -1 Unknown (P)

CONDITION

Deck 58: 6 Satisfactory | Super 59: 7 Good | Sub 60: 7 Good
Culvert 62: N N/A (NBI) | Channel/Channel Protection 61: N N/A (NBI)

LOAD RATING AND POSTING

Inventory Rating Method 65: Not Applicable (P) | Operating Rating Method 63: Not Applicable (P)
Inventory Rating 66: MS.0 | Operating Rating 64: MS0.0
Design Load 31: 7 Pedestrian | Posting 70: Unknown (NBI)
Posting status 41: Not Applicable (P)

APPRAISAL

Bridge Rail 36A: N N/A or not required | Approach Rail 36C: N N/A or not required
Transition 36B: N N/A or not required | Approach Rail Ends 36D: N N/A or not required
Str. Evaluation 67: N | Deck Geometry 68: N Not applicable (NBI)
Underclearance, Vertical and Horizontal 69: 3 Intolerable - Correct
Waterway Adequacy 71: N Not applicable | Approach Alignment 72: Not Applicable
Scour Critical 113: Not Applicable (P)

PROPOSED IMPROVEMENTS

Bridge Cost 94: $ 0 | Type of Work 75: Not Applicable (P)
Roadway Cost 95: $ 0 | Length of Improvment 76: 00.00 m
Total Cost 96: $ 0 | Future ADT 114: 104,125
Year of Cost Estimate 97: 2014 | Year of Future ADT 115: 2020

NAVIGATION DATA

Navigation Control 38: _ Unknown (NBI)
Vertical Clearance 39: | Horizontal Clearance 40:
Pier Protection 111: Not Applicable (P) | Lift Bridge Vertical Clearance 116:

ELEMENT CONDITION STATE DATA

BRIDGE NOTES

note: AT THE PRESENT TIME (04-16-2014) THIS STRUCTURE IS BEING RECONSTRUCTED. CONSTRUCTION OF ADITIONAL SPAN AT SOUTH SIDE BY CONSTRUCTION OF RAMP WITH ACCESS TO PR-17.

YourState Department of Transportation

Bureau of Bridges and Structures
Bridge Maintenance

Bridge Inspection Report

PAST INSPECTION

Inspection Date: 04/16/2014 Type: 1 Regular NBI

Inspector: -1 Pontis User Key: Pontis - Pontis Po

Scope:

NBI: ☑ Other: ☐ Element: ☐

Underwater: ☐ Fracture Critical: ☐

INSPECTION NOTES

FINE TRANSVERSE AND LONGITUDINAL CRACKS, EXPOSED AGGREGATES AND SMALL SPALLINGS AT WEARING SURFACE. SOME HOLES AT CYCLONE FENCE OF RAILINGS.

INSPECTOR WORK CANDIDATES

INSP002_Inspect_Report_Metric Agency ID: 023361 Wed 4/23/2014 14:47:58
Page 2 of 2

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

Team Leader: Arturo Cáceres
Bridge Inspector: Micky Santiago
Bridge Evaluator: Arturo Cáceres
Assistants: John Dávila _ _ _ _
Driver: Juan C. Otero
Inspection date: Abril-16-2014
Weather Conditions: Sunny
Amount of Time on Inspection: 1 Hours
Equipment: **X** Bus or Van _ Underwater _ Ladders _ Snooper **X** Camera _ Boat
_ Other:

Bridge Number: 2336

Road on Structure: N/A **Number or Name:** _ **Km.** _
Road Under Structure: State Highway **Number or Name:** PR-17 **Km.** 8.2
Ident. Plaque: No **Num.** _

36. Traffic Safety Features:

Bridge railings: not applicable or safety not reuired
Transitions: not applicable or safety not reuired
Approach Guardrail: not applicable or safety not reuired
Approach Guardrail Ends: not applicable or safety not reuired

41. Posting: **Condition:** A - Open **Sign Type:** _ **Posting Load:** _

COMMENTS AND/OR RECOMMENDATIONS:

Actualmente se está trabajando en la estructura, construcción de un "span" adicional en lado sur, por construcción de rampa de acceso a la PR-17.

Inspection by: **Micky Santiago**
Bridge Inspector

ACF 4/23/14
Revised and Approved by: **Arturo Cáceres**
Bridge Evaluator

BR-2336 1

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

58. DECK

58.1 Wearing Surface: Material: Concrete **_Condition:_** 6 Thickness cm.

Deterioration: 0 to 10 % Drainage: Adequate Ponding: Yes Safety: Yes

58.2 Slab or Plate: Material: Concrete **_Condition:_** 7

Cracking: None

Spalling: Top: Small Bottom: No

Scaling: Top: Light Bottom: No

Efflorescence: No Exudation: No Rust Stains: No Corrosion: No

58.3 Movement: Deck to backwall: cm. Deck to approach slab: cm.

	Material	Cond. Rating	Height Loss (cm)	Joints	Drainage	Alignment	Corrosion	Paint	Safety	Cracking	Spalling	Scaling
58.4 Curb	N/A	--		--	--	--	--	--	--	--	--	--
58.5 Median	N/A	--		--	--	--	--	--	--	--	--	--
58.6 Sidewalks	N/A	--		--	--	--	--	--	--	--	--	--
58.7 Parapets	Concrete	7		Good	Good	Good	--	Good	Yes	Fine	--	--
58.8 Railing	Galvanized	7		Good	Good	Good	--	Good	Yes	--	--	--

58.9 Lighting Standards: Material: Aluminium Condition: 7 Functioning: Yes

58.10 Utilities:

Type: Size: Safety: _

Type: Size: Safety: _

Type: Size: Safety: _

58.11 Joints: Condition: 6

Type: Expansion Functioning: Yes Leaking: Yes Cracking: N Spalling: N Armor: No

Type: N/A Functioning: N/A Leaking: N/A Cracking: N Spalling: N Armor: No

58.12 Drains and Scuppers:

Material: Other Condition: N Functioning: N/A

Comments:

58.1- Superficie con algunas grietas finas transversales y longitudinales, agregados expuestos y pequeños "spallings".

58.8- Algunos huecos en las mallas de protección del "railing".

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

59. SUPERSTRUCTURE

59.1 Bearing Devices: Type: Elastometric Out of Plumb: No Paint: None

Condition: 7

59.2 Bridge seats, pedestal, grout pads, abutments or pier seat where beams bear directly on conc.

Condition: 7 Cracking: No Spalling: None Scaling: None

Crushing: No

59.3 Steel beams: N/A Type: N/A

Condition: N Corrosion: None Paint: None

59.4 Concrete: Slab Type: Prest.

Condition: 7 Cracking: No Spalling: None Scaling: None

59.5 Truss: N/A Paint: None Corrosion: None Members: N/A

59.6 Drainage: Type: **Condition: N** Functioning: No

59.7 Hinges: **Condition:** N Functioning: N/A Movement: N/A

59.8 Deflection: Normal

59.9 Vibrations: Minimal

60.0 SUBSTRUCTURE:

			Material	Cond. Rating	Cracking	Spalling	Scaling	Corrosion	Paint	Movement	Erosion	Undermining
Abutments	60.1.1	Wingwalls	N/A	N	--	--	--	--	--	--	--	--
	60.1.2	Breast-Backwall	N/A	N	--	--	--	--	--	--	--	--
	60.1.3	Footing	N/A	N	--	--	--	--	--	--	--	--
	60.1.4	Piles	N/A	N	--	--	--	--	--	--	--	--
Piers or Non Pile Bents	60.2.1	Caps	Concrete	7	F	--	--	--	Good	No	--	--
	60.2.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.2.3	Columns	Concrete	7	F	--	--	--	Good	No	No	No
	60.2.4	Footing	N/A	N	--	--	--	--	--	--	--	--
	60.2.5	Piles	N/A	N	--	--	--	--	--	--	--	--
Rocker Bents	60.3.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.3.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.3.3	Piles	N/A	N	--	--	--	--	--	--	--	--
Pile Bents	60.4.1	Caps	N/A	N	--	--	--	--	--	--	--	--
	60.4.2	Bracing	N/A	N	--	--	--	--	--	--	--	--
	60.4.3	Piles	N/A	N	--	--	--	--	--	--	--	--

Comments:

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

61. CHANNEL AND PROTECTION **Condition:** N

61.1 Channel Scour: N/A

61.2 Embankment Erosion: N/A

		Type	Material	Condition Rating	Functioning
61.3	Protective Device		N/A	N	--
61.4	Fender System		N/A	N	--
61.5	Rip Rap		N/A	N	--
61.6	Spur Dikes, Jetties		N/A	N	--

61.7 Obstruction: N/A

61.8 Channel Change: N/A **Detrimental:** N/A

61.9 Adequate Waterway: N/A

61.10 Surrounding Area: Flooding: N/A if yes explain:

Erosion: N/A if yes explain:

61.11 Location of piers and/or abutment detrimental: N/A if yes explain:

61.12 Other features that may affect structure:

Comments:

62. CULVERT AND RETAINING WALL

	Material	Condition Rating	Functioning	Cracking	Spalling	Scaling	Corrosion	Settlement	Alignment	Scour
62.1 Barrel	N/A	N	--	--	--	--	--	--	--	--
62.2 Head Walls	N/A	N	--	--	--	--	--	--	--	--
62.3 Cut-off wall	N/A	N	--	--	--	--	--	--	--	--
62.4 Retaining wall	N/A	N	--	--	--	--	--	--	--	--

Comments:

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

71. WATER ADEQUACY: N/A N/A

72. APPROACH ROADWAY

72.1 Alignment: 6

72.2 Slab or Pavement **Condition:** N Material: Other

Cracking: No Spalling: None Scaling: None Uneven: No

Rough: No Settlement: No Movement: Approach slab-backwall: No Breaking up: No

Excessive deformation: No

Safety: Hazardous: No

Drainage: Inadequate: No

Movement: Pavement-approach slab: No

Embankment: **Condition:** N Functioning: Yes Erosion: No

Construction: Flimsy: No Integrity impaired: No

72.3 Undesirable Impact: No

72.4 Joints: No Type: None Inadequate: N/A Satisfactory Alignment: N/A

72.5 Guardrail Type: None Material: N/A Functioning: N/A

Condition: N Alignment Horizontal: N/A Vertical: N/A

Joints Functioning: N/A Safety Securely Attached: N/A Pedestrian Hazards: N/A

Comments:

90. INSPECTION DATE: Abril-16-2014

93. CRITICAL FEATURE INSPECTION DATE

Fracture Critical:

Underwater:

Other Special Inspection:

102. DIRECTION OF TRAFFIC: Highway traffic not carried

106. YEAR RECONSTRUCTED:

107. DECK STRUCTURE TYPE: Concrete Cast-in-Place

108. WEARING SURFACE/PROTECTIVE SYSTEM

Type wearing surface: Concrete

Type Membrane: None

Deck protection: None

111. PIER OR ABUTMENT PROTECTION (FOR NAVIGATION): N/A

113. SCOUR CRITICAL BRIDGES: N

116. MINUMUM NAVIGATION VERTICAL CLEARANCE:

AUXILIARY ITEMS

Signs: Type: Route Orientation Material: Alum. Condition: 7

Type: N/A

RATING *ITEM 58 TO 60:*

N: Not applicable

9: Excellent Condition

8: Very Good Condition: no problem noted.

7: Good Condition: some minor problems.

6: Satisfactory Condition: structural element show some minor deterioration.

5: Fair Condition: all primary structural elements are sound but may have minor section loss, cracking, spalling, or scour.

4: Poor condition: advanced section loss, deterioration, spalling, or scour.

3: Serious condition: loss of section, deterioration, spalling, or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.

2: Critical condition: advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.

1: "Imminent" failure condition: major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. Bridge is closed

0: Failed condition: out of service: beyond corrective action.

RATING *ITEM 61:*

N: Not applicable. Use when bridge is not over a waterway (channel)

9: There are no noticeable noteworthy deficiencies which affect the condition of the channel

8: Banks are protected or well vegetated. River control devices such as spur dikes and embankment protection are not required or are in a stable condition.

7: Bank protection is in need of minor repairs. River control devices and embankment protection have a little minor damage. Banks and/or channel have minor amounts of drift.

6: Bank is beginning to slump. River control devices and embankment protection have widespread minor damage. There is minor stream bed movement evident. Debris is restricting the channel slightly.

5: Bank protection is being eroded. River control devices and/or embankment have major damage. Trees and brush restrict the channel.

4: Bank and embankment protection is severely undermined. River control devices have severe damage. Large deposits of debris are in the channel.

3: Bank protection has failed. River control devices have been destroyed. Stream bed aggradations, degradation, or lateral movement has changed the channel to now threaten the bridge and/or approach roadway.

2: The channel has changed to the extent the bridge is near a state of collapse.

1: Bridge closed because of channel failure. Corrective action may put back in light service.

0: Bridge closed because of channel failure. Replacement necessary.

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

RATING ITEM 62:

N: Not applicable. Use if structure is not a culvert.

9: No deficiencies.

8: No noticeable or noteworthy deficiencies which affect the condition of the culvert. Insignificant scrape marks caused by drift.

7: Shrinkage cracks, light scaling, and insignificant spalling which does not expose reinforcing steel. Insignificant damage caused by drift with no misalignment and not requiring corrective action. Some minor scouring has occurred near curtain walls, wingwalls, or pipes. Metal culverts have a smooth symmetrical curvature with superficial corrosion and no pitting.

6: Deterioration or initial disintegration, minor chloride contamination, cracking with some leaching, or spalls on concrete or masonry walls and slabs. Local minor scouring at curtain walls, wingwalls, or pipes. Metal culverts have a smooth curvature, non-symmetrical shape, significant corrosion, or moderate pitting.

5: Moderate to major deterioration or disintegration, extensive cracking and leaching, or spalls on concrete or masonry walls and slabs. Minor settlement or misalignment. Noticeable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have significant distortion and deflection in one section, significant corrosion, or deep pitting.

4: Large spalls, heavy scaling, wide cracks, considerable efflorescence, or opened construction joint permitting loss of backfill. Considerable settlement or misalignment. Considerable scouring or erosion at curtain walls, wingwalls, or pipes. Metal culverts have significant distortion and deflection throughout, extensive corrosion or deep pitting.

3: Any condition described in Code 4 but which is excessive in scope. Severe movement or differential settlement of the segments, or loss of fill. Holes may exist in walls or slabs. Integral wingwalls nearly severed from culvert. Severe scour or erosion at curtain walls, wingwalls, or pipes. Metal culverts have extreme distortion and deflection in one section, extensive corrosion, or deep pitting with scattered perforations.

2: Integral wingwalls collapsed severe settlement of roadway due to loss of fill. Section of culvert may have failed and can no longer support embankment. Complete undermining at curtain walls and pipes. Corrective action required to maintain traffic. Metal culverts have extreme distortion and deflection throughout with extensive perforations due to corrosion.

1: Bridge closed. Corrective action may put back in light service.

0: Bridge closed. Replacement necessary.

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

RATING ITEM 113:

N: Bridge not over waterway.

U: Bridge with "unknown" foundation that has not been evaluated for scour. Until risk can be determined, a plan of action should be developed and implemented to reduce the risk to users from a bridge failure during and immediately after a flood event (see HEC 23).

T: Bridge over "tidal" waters that has not been evaluated for scour, but considered low risk. Bridge will be monitored with regular inspection cycle and with appropriate underwater inspections until an evaluation is performed ("Unknown" foundations in "tidal" waters should be coded U.)

9: Bridge foundations (including piles) on dry land well above flood water elevations.

8: Bridge foundations determined to be stable for assessed or calculated scour conditions. Scour is determined to be above top of footing. (Example A) by assessment i.e., bridge foundation are on rock formations that have been determined to resist scour within the service life of the bridge), by calculation or by installation of properly designed countermeasures (see HEC 23).

7: Countermeasures have been installed to mitigate an existing problem with scour and to reduce the risk of bridge failure during a flood event. Instructions contained in a plan of action have been implemented to reduce the risk to users from a bridge failure during or immediately after a food event.

6: Scour calculation/evaluation has not been made. (Use only to describe case where bridge has not yet been evaluated for scour potential.)

5: Bridge foundations determined to be stable for assessed or calculated scour conditions. Scour is determined to be within the limits of footing or piles (Exam. B) By assessment i.e., bridge foundations are on rock formations that have been determined to resist scour within the service life of the bridge), by calculations or by installation of properly designed countermeasures (see HEC 23).

4: Bridge foundations determined to be stable for assessed or calculated scour conditions; field review indicates action is required to protect exposed foundation (see HEC 23).

3: Bridge is scour critical; bridge foundations determined to be unstable for assessed or calculated scour conditions: Scour within limits of footing or piles. (Example B) or Scour below spread-footing base or piles tips. (Example C)

2: Bridge is scour critical; field review indicates that extensive scour has occurred at bridge foundations, which are determined to be unstable by: (a comparison of calculated scour and observed scour during the bridge inspection) or (an engineering evaluation of the observed scour condition reported by the bridge inspector in Item 60)

1: Bridge is scour critical; field review indicates that failure of piers/abutments is imminent. Bridge is closed to traffic. Failure is imminent based on: (a comparison of calculated scour and observed scour during the bridge inspection) or (an engineering evaluation of the observed scour condition reported by the bridge inspector in Item 60).

0: Bridge is scour critical. Bridge has failed and is closed to traffic.

PUERTO RICO HIGHWAY AND TRANSPORTATION AUTHORITY
BRIDGE ENGINEERING OFFICE

Core Elements

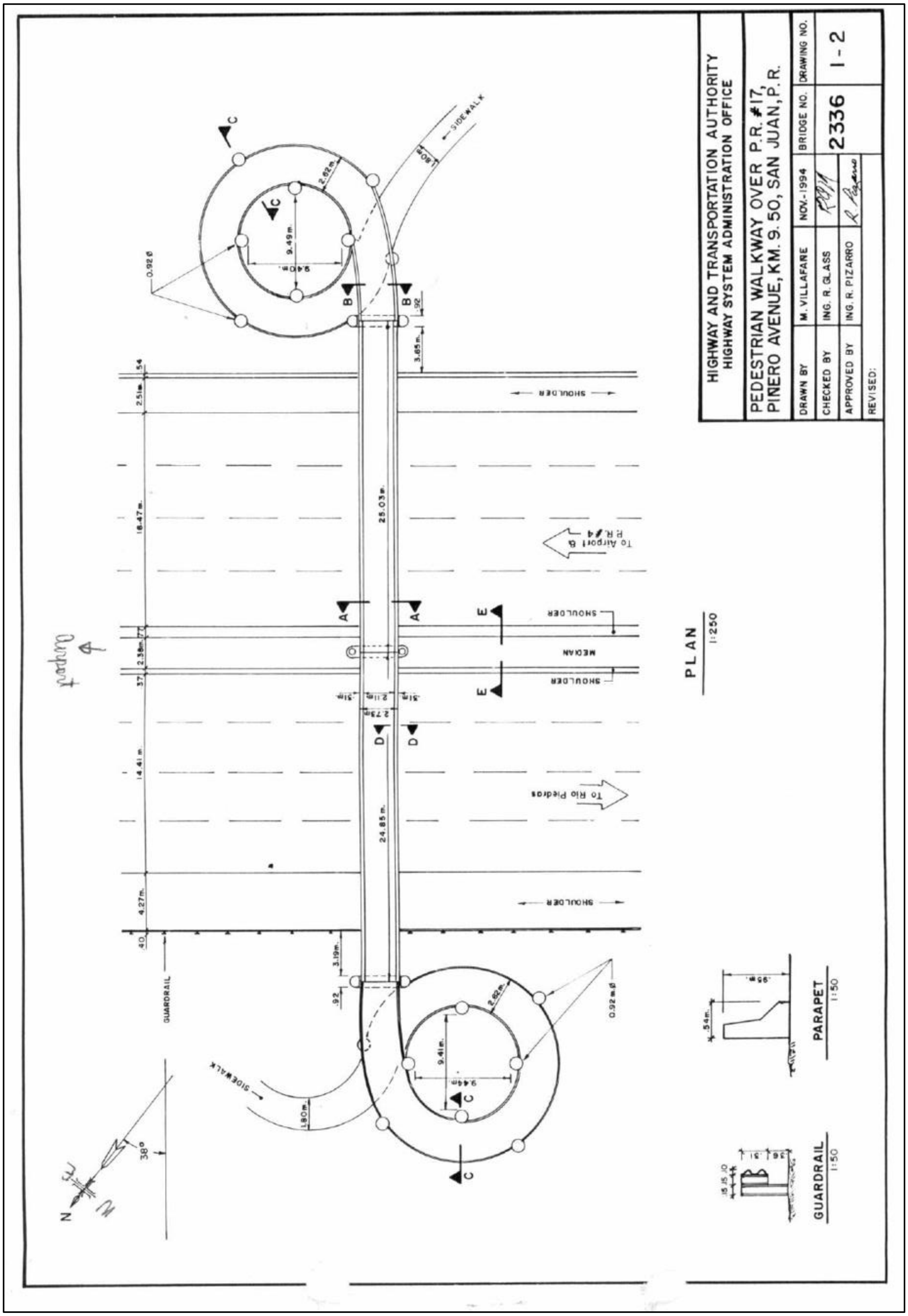
Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0

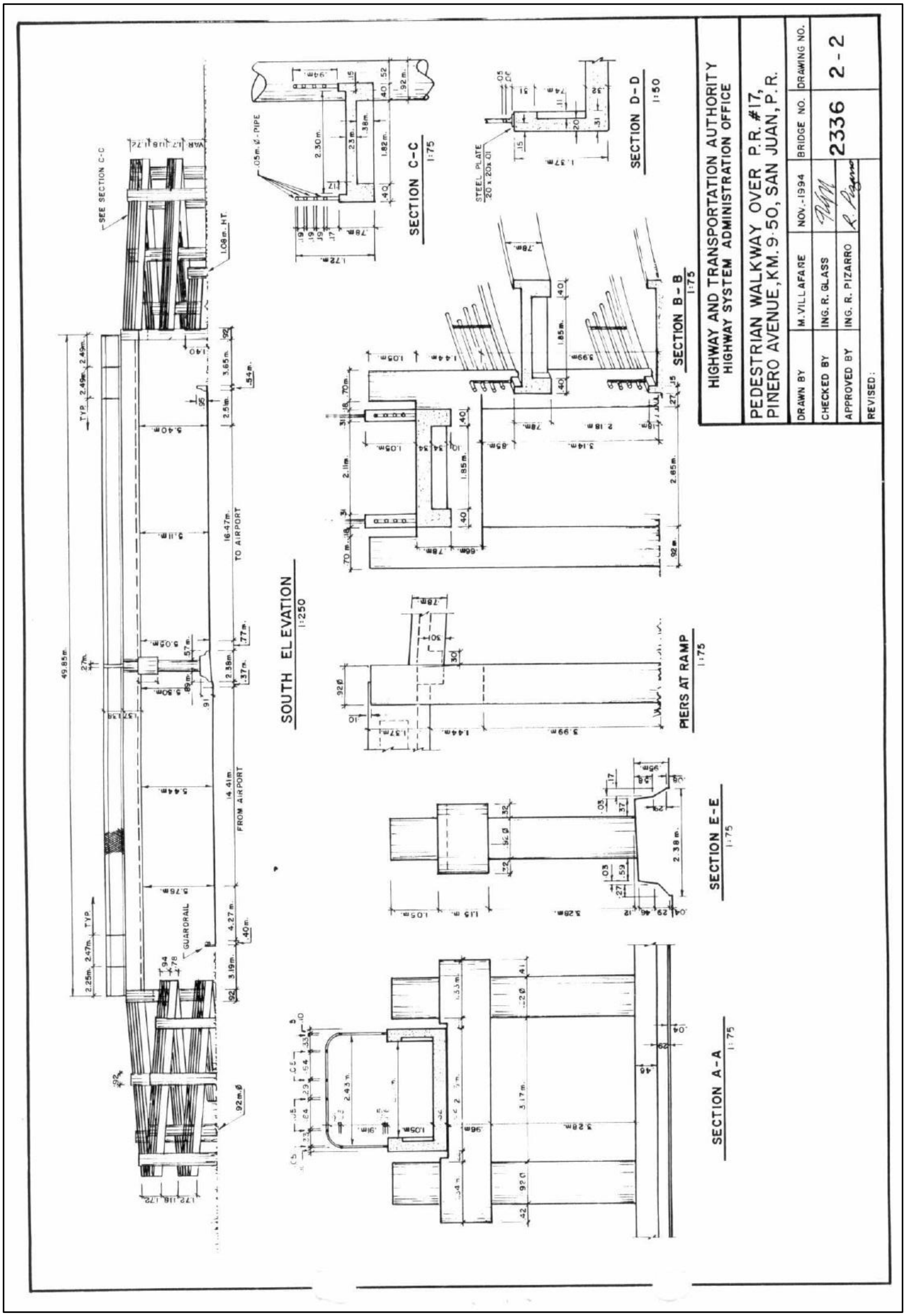
Non Core Elements

Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0

Smart Flags

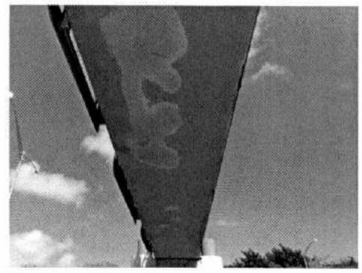
Elem. No.	Elements Description	Pag.	Env.	State Quantity	Units	Quantity Condition State 1	Quantity Condition State 2	Quantity Condition State 3	Quantity Condition State 4	Quantity Condition State 5	Total State Quantity
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0
			3								0


HIGHWAY AND TRANSPORTATION AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE
PEDESTRIAN WALKWAY OVER P.R. #17, PIÑERO AVENUE, KM. 9.50, SAN JUAN, P.R.
DRAWN BY M. VILLAFANE
CHECKED BY ING. R. GLASS
APPROVED BY ING. R. PIZARRO
REVISED:
NOV.-1994
BRIDGE NO. 2336
DRAWING NO. I - 2
PLAN
1:250
GUARDRAIL
1:50
PARAPET
1:50
SIDEWALK
SHOULDER
MEDIAN
To Airport & P.R. #4
To Rio Piedras
0.92 m Ø
2.62 m
9.49 m
9.41 m
25.03 m
24.85 m
16.47 m
14.41 m
4.27 m
2.51 m
3.65 m
3.19 m
2.38 m
2.73 m
1.80 m
38°
N
Airport

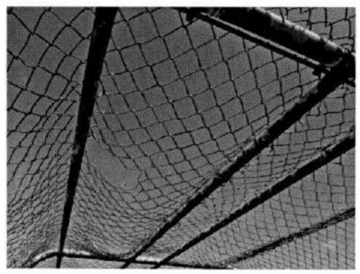

HIGHWAY AND TRANSPORTATION AUTHORITY
HIGHWAY SYSTEM ADMINISTRATION OFFICE
PEDESTRIAN WALKWAY OVER P.R. #17,
PINERO AVENUE, KM. 9.50, SAN JUAN, P.R.
DRAWN BY
M. VILLAFANE
NOV.-1994
CHECKED BY
ING. R. GLASS
APPROVED BY
ING. R. PIZARRO
REVISED:
BRIDGE NO.
2336
DRAWING NO.
2-2
SOUTH ELEVATION
1:250
SECTION A-A
1:75
SECTION E-E
1:75
PIERS AT RAMP
1:75
SECTION B-B
1:75
SECTION C-C
1:75
SECTION D-D
1:50
SEE SECTION C-C
GUARDRAIL
TO AIRPORT
FROM AIRPORT
STEEL PLATE
20 x 20 x .01
.05m Ø - PIPE
1.08m. HT.


2336-Apr.-16-2014-001.jpg

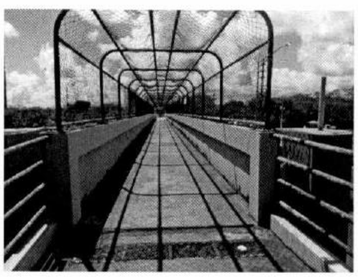

2336-Apr.-16-2014-002.jpg


2336-Apr.-16-2014-003.jpg

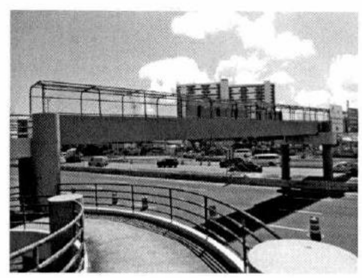

2336-Apr.-16-2014-004.jpg


2336-Apr.-16-2014-006.jpg


2336-Apr.-16-2014-007.jpg


2336-Apr.-16-2014-009.jpg


2336-Apr.-16-2014-010.jpg


2336-Apr.-16-2014-012.jpg

CAIT-UTC-REG18

Improving Transportation Infrastructure Resilience Against Hurricanes, Other Natural Disasters, and Weathering: Part II - Analysis of Pedestrian Bridges Failures Due to Hurricane Maria

Volume 2

FINAL REPORT
August 2021

Submitted by:

Gustavo Pacheco-Crosetti, PhD, PE
Professor

Héctor J. Cruzado, PhD, PE
Professor

Nelson Sotelo-Acevedo
Graduate Student

Transportation Infrastructure Research Center – TIRC
Polytechnic University of Puerto Rico
377 Ponce de Leon Ave, San Juan, PR 00918

External Project Manager
Juan Carlos Rivera, Engineer
Puerto Rico Highway and Transportation Authority

In cooperation with

Rutgers, The State University of New Jersey
And
Puerto Rico
Department of Transportation and Public Works
And
U.S. Department of Transportation
Federal Highway Administration

TABLE OF CONTENT

List of Figures

List of Tables

1 Introduction

On September 20, 2017, Puerto Rico was impacted by Hurricane Maria, causing devastation across the island. After Hurricane Maria, Puerto Rico was left with its communication, electrical power, potable water, and transportation infrastructure severely affected. While for some sectors the restoration of services took days, in other areas it took several months. The damages caused by Hurricane Maria in Puerto Rico and the Virgin Islands was about $90 billion, making it the third most expensive hurricane in the history of the United States (Pasch, Penny, & Berg, 2019). Utilities services were not the only ones affected. Among the irreparable damaged were structures such as houses, buildings, roads, and bridges.

This research project focuses on a pedestrian bridge that used to be located at kilometer 4.1 of the Román Baldorioty de Castro Expressway in San Juan, Puerto Rico. After Hurricane Maria, it was observed that the bridge experienced permanent lateral deflections. Based on preliminary observations, it was theorized that the plastic lateral deflection was the result of the pressure generated by the strong winds on guide signs that were installed on the bridge at some point after the bridge was constructed.

The objective of this project is to assess if the presence of the signs played a key role in the resulting inelastic lateral deflections. To that end, the bridge's general information (geometry and material properties) was obtained in order to develop a structural model of the bridge. This model was subjected to lateral loads consistent with those of the winds cause by Hurricane Maria. Two cases were considered in the analysis of the model: with and without the presence of the guide signs that were present on the bridge during the hurricane. When the results of both cases were compared, it was determined that the signs were an important factor in the lateral deflection of the bridge. There were also other factors observed that may have contributed to the large lateral deflections. Conclusions and recommendations on the impacts of placing signs on pedestrian bridges are presented, together with suggestions that can be considered as preventive measures.

2 Literature Review

To develop the case study, relevant background information was collected, focusing on bridge types and characteristics, bridge modeling, wind loads modelling, steel material behavior (plastic deformations, corrosion), bridge inspection and condition assessment procedures, and bridge design. In this chapter, the topics mentioned were synthesized into two sections. The first section covers the issues of failures and how to identify them, while the second section focuses on pedestrian bridge design.

2.1 Structural Failures on Steel Members

A structure can react in different ways, depending on its current conditions. Therefore, this section covers topics relevant to the structural failure of steel bridges (plastic deformations and corrosion in structural members) and bridge inspection procedures to help identify these and other failures.

2.1.1 Plastic Deformation

When materials are exposed to loads, they suffer deformations. Most of these deformations are in the elastic range and the material returns to its original form when unloaded, but this is not always the case. Materials can also deform in the plastic range, in which the material does not return to its original form when unloaded. In this section, basic concepts of mechanics of materials are reviewed to further explained the subject of plastic deformations.

Stress is a measure of how a force applied to a body is distributed over a particular area. In the case of an axially loaded bar, normal stress is computed with the following equation:

$$\sigma = \frac{P}{A} \tag{1}$$

where:

σ = normal stress

P = axial load

A = cross sectional area of the bar

Typically, a positive sign is used for tensile loads, while a negative sign is used for compressive loads. When using the United States Customary System (USCS), stress is most typically measured in pounds per square inch (psi).

When a body experiences stress, it will generally cause deformations. For an axially loaded bar, a positive normal stress will cause the member to stretch in its longitudinal direction. If the normal stress is negative, the bar will contract in its longitudinal direction. This deformation in the material is known as normal strain and it can be computed using the following formula:

$$\varepsilon = \frac{\delta}{L} \tag{2}$$

where:

ε = normal strain

δ = change in length of the bar

L = length of the bar before it is deformed by being loaded

The interaction between stress and strain in an axially loaded bar can be analyzed to understand the behavior of the material. This interaction is best represented with the stress vs. strain diagram. In the diagram, the vertical axis represents the normal stress of the bar, while the horizontal axis represents the normal strain of the bar.

Figure 2.1 is an illustration of a typical stress vs. strain diagram for steel. The first section of the diagram is known as the linear elastic region. In the linear region, the material will suffer a deformation as the stress is applied, but once the stress is removed, the material will return to its original shape with no permanent deformations. In this section, the stress is proportional to the strain. The slope of the line in this linear elastic region is known as the modulus of elasticity of the material, and has the same stress units, since the strain is dimensionless.

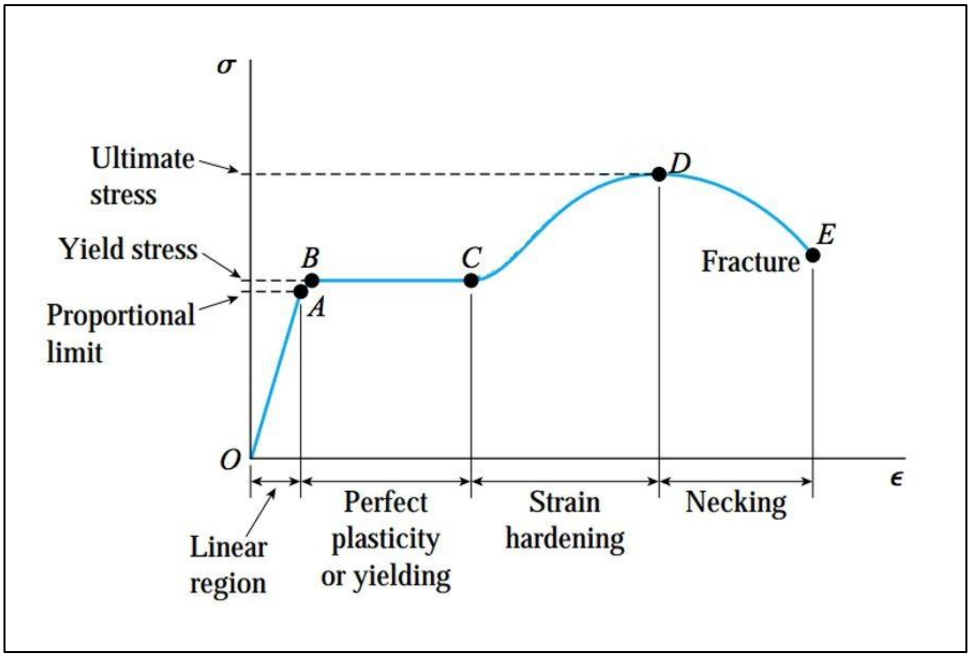


Figure 2.1: Stress vs. Strain Diagram (Gere & Goodno, 2008)

If the stress is continued to be increased, it will reach the proportional limit, and then the material enters the next region which is known as the perfect plasticity or yielding region. In this region, the material's deformation stops being proportional to the stress. The deformation rate increases until reaching the yield point, where the slope becomes practically zero and the material continues its deformation without any increase in stress.

Once the material reaches this region, if the stress is removed, the material does not return to its original shape, therefore a permanent deformation is created.

The following region in the stress vs. strain diagram is known as the strain hardening zone, where the material undergoes changes in its structure, resulting in increased strength resistance. This increase in resistance continues until the ultimate stress point is reached, where the material loses the ability to resist further load. During this process, a necking in the material is observed while it continues to deform until finally reaching the point of fracture.

In terms of the response of a bar element to lateral loads, the idealized elastic-perfectly plastic model for the material stress-strain behavior can be used, in conjunction with the Bernoulli-Navier hypothesis of beam behavior, to obtain the member plastic moment M_p. As presented in the Figure 2.2, M_p is the moment required to produce full plasticization of the cross section, that is to say, all the cross-section points are working at yielding stress.

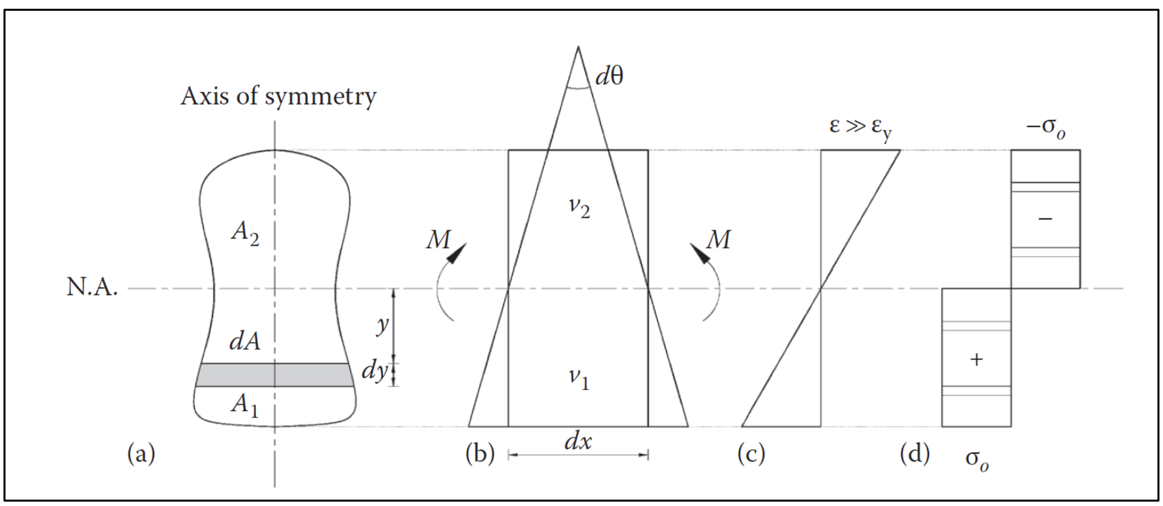


Figure 2.2: Section Plastic Moment: (a) Cross Section; (b) Segment; (c) Strain Distribution; and (d) Stress Distribution (Chen & El-Metwally, 2011)

In this model of concentrated plasticity, it is considered that, once this condition is reached, a plastic hinge is developed at the location of the cross section where M_p is acting, and that the element reached its maximum moment capacity, and the structure could start experiencing large plastic displacements and/or exhibiting failure mechanisms behavior due the plastic hinge formation.

This plastic moment M_p is the maximum moment capacity considered in steel design (that may be reduced due to lateral torsional buckling). It is included as the nominal moment capacity M_n in the interaction equations used for combined actions in beam-column members analysis. Thus, the use of this design equations is an indirect way of observing if such full plasticization condition, due to high strength demands imposed by the loading, is close to be reached in a particular member.

2.1.2 Corrosion in Structural Elements

Corrosion is the destructive attack of metal caused by it reacting to its environment (Roberge, 1999). Corrosion may cause failures to any steel structure to which an adequate maintenance has not been given. These failures may turn into costly damages and may threaten the safety of the public. Corrosion can be present in different environments. For example, steel can experience corrosion while being in direct contact with the atmosphere, with fresh water, with seawater, with soils, with reinforced concrete or with biofilms (Roberge, 1999). This section describes atmospheric corrosion, how it affects the structures, how to identify it, and how to control it.

Atmospheric corrosion occurs when a corrosive material is exposed to air and its contaminants (Roberge, 1999). For this electrochemical corrosion to take place in the atmosphere, the presence of an electrolyte is required, which, having free ions, is a good electrical conductor and allows balancing between the anode and cathode reactions. An anode is an electrode that is positively charged, and a cathode is an electrode that is negatively charged. During the balancing of the reactions the metal loses electrodes in the balancing of the reactions, starting the corrosion process.

According to the damage it produces, corrosion can be classified into three groups (Roberge, 1999):

- Group 1 – Identifiable by visual inspection
- Group 2 – Identifiable with special inspection tools
- Group 3 – Identifiable by microscopic examination

Figure 2.3 presents these three groups, with examples of different types of damages that may occur in each category.

Group 1 consists of uniform corrosion, pitting, crevice corrosion, and galvanic corrosion. Uniform corrosion is characterized by being uniformly distributed on the surface of the material and the material starts thinning until it reaches failure. Pitting is characterized by being in a specific area where cavities form on the surface. This type of corrosion is more difficult to identify; therefore, it is more dangerous than uniform corrosion. Crevice corrosion, in the same way, is a corrosion characterized by being in a specific area. This type of corrosion is formed when there is a stationary solution creating a microenvironment favorable to corrosion. Examples of areas where crevice corrosion can occur are in gaskets, washers, insulating material, surface deposits, loose coatings, threads, and clamps. Finally, the galvanic corrosion occurs when two metals are put in contact with an electrolyte in between. The metal with the noblest corrosion potential then becomes the cathode, while the less noble material is consumed in the anodic solution (Roberge, 1999).

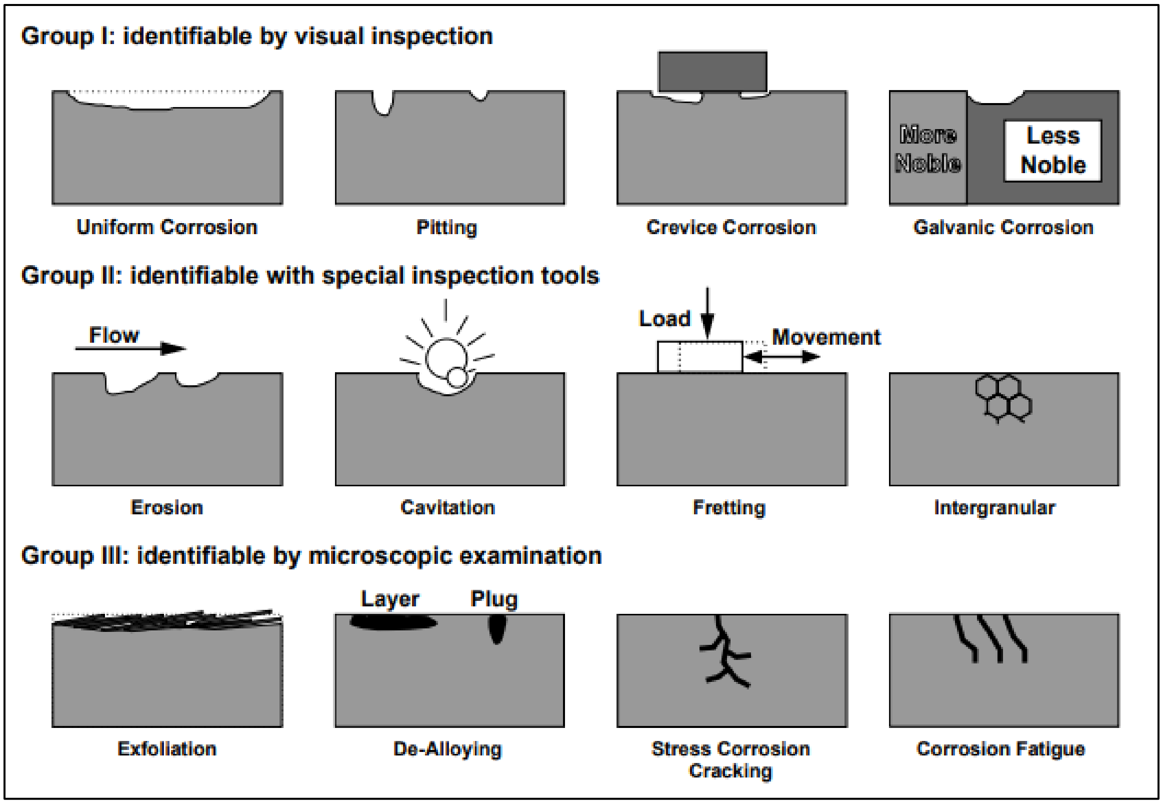


Figure 2.3: Principal Forms of Corrosion (Roberge, 1999)

The modes of failure of Groups 2 and 3 are not discussed here since they are out of the scope of this research because they cannot be identified visually and require additional methods of examination.

To avoid corrosion, it is essential that good prevention methods are carried out. For the prevention of corrosion there are five methods (Roberge, 1999):

- Switch to a more suitable material.
- Modify the material's environment.
- Use protective coatings.
- Apply cathodic or anodic protection.
- Design modifications to the system or component.

However, it is important to remember that the best protection against corrosion is to take it into consideration during the design process. Designs should take into consideration low points where the water accumulates, provide good ventilation and drainage, avoid absorbent materials, provide a good preparation of surface before installing any protective material, and implement a plan of inspection and maintenance.

2.1.3 Bridge Inspection

To facilitate bridge inspection, the *Manual for Bridge Element Inspection* (AASHTO, 2013) can be used as a reference. This manual includes a list of the elements that can be found in bridges with the different types of defects that they may experience. These elements should be evaluated during inspections to determine the condition of the bridge. This manual was used in this research as a reference to make a list of the items to be inspected in order to identify the areas where the bridge defects were located.

The manual divides the elements found in a bridge into two categories. The first is the National Bridges Elements (NBE). This category includes all the structural elements that make up a bridge and are the main elements that support the loads, e.g., columns, beams, trusses, among others. The second is the category Bridge Management Elements (BME). This category focuses on joints, surfaces with wear, and protective layers of materials.

To determine the condition of a bridge, AASHTO (2013) identifies different defects that the components of the NBE and MBE categories may have. For example, a beam can have signs of cracking, corrosion, and loose connections, among others. To evaluate a component being inspected, all the conditions found are rated using a scale of 1 to 4, where 1 represents good and 4 represents severe condition. All these defects are to be evaluated during the field inspection. AASHTO (2013) defines the defects and indicates how to rate their severity. Examples of these are shown in Table 2-1 and Table 2-2.

Table 2-1: Example of Defect Definitions (AASHTO, 2013)

Defect Name (Number)	Used to Report	Materials
Crack (Wearing Surface) (3220)	Cracking in wearing surface elements.	Wearing Surfaces
Effectiveness (Wearing Surface) (3230)	Loss of effectiveness in the protection provided to the deck by the wearing surface elements.	Wearing Surfaces
Chalking (Steel Protective Coatings) (3410)	Chalking in metal protective coatings.	Steel/Metal Protective Coatings
Peeling/Bubbling/Cracking (Steel Protective Coatings) (3420)	Peeling, bubbling, or cracking in metal protective coatings.	Steel/Metal Protective Coatings

Table 2-2: Example of Defect Rating (AASHTO, 2013)

	Condition States			
	1	2	3	4
Defects	GOOD	FAIR	POOR	SEVERE
Delamination/Spall/ Patched Area/Pothole (Wearing Surfaces) (3210)	None.	Delaminated. Spall less than 1 in. deep or less than 6 in. diameter. Patched area that is sound. Partial depth pothole.	Spall 1 in. deep or greater or 6 in. diameter or greater. Patched area that is unsound or showing distress. Full depth pothole.	The wearing surface is no longer effective.
Crack (Wearing Surface) (3220)	Width less than 0.012 in. or spacing greater than 3.0 ft.	Width 0.012–0.05 in. or spacing of 1.0–3.0 ft.	Width of more than 0.05 in. or spacing of less than 1.0 ft.	
Effectiveness (Wearing Surface) (3230)	Fully effective. No evidence of leakage or further deterioration of the protected element.	Substantially effective. Deterioration of the protected element has slowed.	Limited effectiveness. Deterioration of the protected element has progressed.	

To carry out the inspection, it is necessary to define all the components of the bridge and their quantities. For this is important to have available the drawings of the bridge, or an initial field visit may be required to quantify the different elements. Once all the elements and their quantities are defined, it can be proceeded to identify all the faults found in the bridge components by a site inspection.

2.2 Design and Modeling of Pedestrian Bridges

The topic of pedestrian bridge design was researched in order to have the necessary knowledge to perform adequate modeling of this type of structure. This section discusses modular bridges, the design loads of pedestrian bridges, the installation of signs on these structures, and modeling a bridge using a finite element program.

2.2.1 Modular Bridges

Modular bridges are bridges that are designed to be prefabricated and easy to install on site. These bridges are designed with prefabricated concrete or steel, in controlled environments. These bridges can be installed temporarily or permanently. One of the most famous bridges of this type is the Bailey Modular Bridge.

The Bailey Bridge was designed by the British engineer Donald Coleman Bailey during the Second World War. The safe, quick, and efficient way to assemble the bridge gave it the recognition of being the preferred bridge for military use. Once the Second World War ended, other adaptations for urban and rural use for the bridge were found. Currently, there are improved versions of the bridge like the Acrow Bridge in USA and the Mabey Bridge in Great Britain.

The Bailey bridge consists of two principal beams composed of trusses. Perpendicularly to the two main beams there are also transverse beams which reinforce the bridge. The deck rests on the upper part of the transverse beams. For additional horizontal reinforcement, diagonal bars are installed between the two main beams. In the same way, other reinforcing bars are installed between the transverse beams and the trusses to keep the trusses in vertical position. A main beam could consist of one, two or three trusses that are mounted side by side. One can also add additional truss floors to increase the reach or load capacity. Figure 2.4 shows an example of the Bailey bridge.

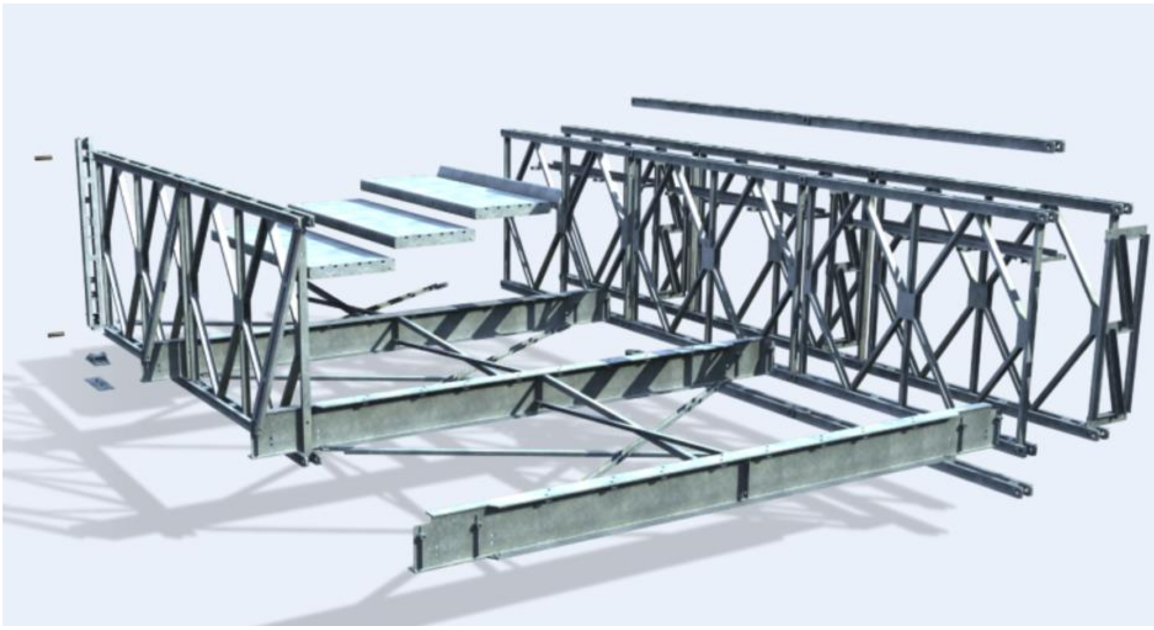


Figure 2.4: Bailey Bridge Model by Mabey (Mabey Bridge, 2019)

2.2.2 Pedestrian Bridge Design

For the design of pedestrian bridges, AASHTO developed the *LRFD Guide Specifications for the Design of Pedestrian Bridges* (AASHTO, 2009). The guide summarizes the design process for pedestrian bridges by citing other design books from AASHTO, the American Welding Society, the American Steel Construction Institute, and others.

Chapter 3 of this guide indicates the loads on the deck of the pedestrian bridge. The first load that is identified is the pedestrian live load of 90 psf. This load is distributed evenly over the length of the pedestrian bridge, and the contemplated load must be for a bridge width equal to or greater than 2 ft.

The guide continues with the vehicular load that must be contemplated in the design of a pedestrian bridges when access to vehicles is not blocked with a permanent structure, such as concrete pedestals, or that the width of the bridge does not allow access of a vehicle. For this project's case study, the vehicular live load is not contemplated since the bridge does not have access for vehicles, not is it wide enough.

The next live load that is identified in the guide is the patch load for equestrian traffic. This patch load has a magnitude of 1,000 pounds distributed over a 4-in by 4-in square.

The next loads discussed in the guide are the ones related to wind. For wind loads, the guide refers directly to the *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals* (AASHTO, 2015), in particular to articles 3.8 and 3.9, which covers wind loads and their effects on structures. These two sections will be discussed in the next section.

Likewise, for wind loads, the guide refers to section 3.8.2 of the *LRFD Bridge Design Specifications* (AASHTO, 2020) which indicates that the design of a pedestrian bridge must contemplate the vertical wind load on a quarter of the bridge on the windward side. The vertical load to be contemplated is 200 psf multiplied by the width of the bridge.

Table 2-3 presents the combination of loads specified in the *LRFD Bridge Design Specifications* (AASHTO, 2020), where:

DD = negative surface friction

DC = dead load of structural components and non-structural accessories

DW = dead load of wear surfaces and utilities

EH = horizontal earth pressure load

EL = cumulative effects of blocked force resulting from the construction process, including secondary forces of post-tensioning

ES = additional ground load

EV = vertical pressure of dead load of landfill

BR = vehicle braking force

CE = vehicular centrifugal force

CR = creep

FR = friction

IM = vehicle dynamic load tolerance

LL = vehicular live load

LS = surcharge for live load

PL = pedestrian live load

SH = contraction

TU = uniform temperature

WA = water load and current pressure

WL = wind live load

WS = wind load in the structure

Regarding Table 2-3, the combinations Strength II, Strength IV and Strength V do not apply according to the *Manual for Bridge Element Inspection* (AASHTO, 2013).

Table 2-3: Load Combinations and Load Factors (AASHTO, 2020)

Load Combination Limit State	*DC* *DD* *DW* *EH* *EV* *ES* *EL*	*LL* *IM* *CE* *BR* *PL* *LS*	*WA*	*WS*	*WL*	*FR*	*TU* *CR* *SH*
STRENGTH I (unless noted)	γ_p	1.75	1.00	—	—	1.00	0.50/1.20
STRENGTH II	γ_p	1.35	1.00	—	—	1.00	0.50/1.20
STRENGTH III	γ_p	—	1.00	1.40	—	1.00	0.50/1.20
STRENGTH IV	γ_p	—	1.00	—	—	1.00	0.50/1.20
STRENGTH V	γ_p	1.35	1.00	0.40	1.0	1.00	0.50/1.20
EXTREME EVENT I	γ_p	γEQ	1.00	—	—	1.00	—
EXTREME EVENT II	γ_p	0.50	1.00	—	—	1.00	—
SERVICE I	1.00	1.00	1.00	0.30	1.0	1.00	1.00/1.20
SERVICE II	1.00	1.30	1.00	—	—	1.00	1.00/1.20
SERVICE III	1.00	0.80	1.00	—	—	1.00	1.00/1.20
SERVICE IV	1.00	—	1.00	0.70	—	1.00	1.00/1.20

2.2.3 Installation of Road Signs

For the installation of road signage in existing structures, a specific design must be developed for the structure that will hold the sign in place. For this purpose, AASHTO developed specifications for structures supporting signs, traffic signals and luminaires (AASHTO, 2015). As mentioned in the previous section, these specifications must be used for the calculation of wind loads on pedestrian bridges, even if the bridge is not supporting signs, traffic signals or luminaries. These specifications consider dead loads (*DL*), ice loads, wind loads (*W*) and fatigue loads. The combinations for these loads are presented in Table 2-4.

Table 2-4: Load Combinations for Structures Supporting Signs (AASHTO, 2015)

Group Load	Load Combination[a]	Percentage of Allowable Stress[b]
I	DL	100
II	$DL + W$	133
III	$DL + Ice + {}^{1}/_{2}\,(W)^{c}$	133
IV	Fatigue	[d]

Regarding wind loads, the design wind pressure is calculated as follows:

$$P_z = 0.00256 K_z K_d G V^2 C_d \tag{3}$$

where:

P_z = design wind pressure in pounds per square feet (psf)

K_z = height and exposure factor

K_d = directionality factor

G = gust effect factor

V = basic wind speed, expressed as a 3-s gust wind speed, at 33 ft above the ground in open terrain, in miles per hours (mph)

C_d = drag coefficient

Equation (3) is based on the formulation developed for and presented in the ASCE/SEI 7 Standard. The AASHTO specifications indicate how to calculate or determine the different parameters of Equation (3).

2.2.4 Bridge Modeling

There are several finite element programs that may be used to model bridges. Among the programs with commercial licenses are Abaqus, ANSYS, LUSAS, Midas, CSiBridge, and SAP2000. These programs include tutorials that help the user to understand how to perform the modeling of bridges.

However, at the time of modeling, a limiting factor is the availability and accessibility of the program. For this reason, open-source programs are also an option. There are different open-source programs to perform non-linear analyzes such as Elmer and OpenSEES.

For the current project, due to its robustness and availability, SAP2000 v21 was selected to perform the comparative analysis of the bridge response to wind loads.

3 Methodology

A brief description of the steps followed to develop this research project is presented in this chapter. Also, some additional considerations to the methodology are mentioned.

3.1 General Procedure

The following list briefly describes the process followed in this project to achieve the research objective:

1. Perform a literature review on the type of bridges to be analyzed.
2. Collect background information and available data on the specific bridge to be studied.
3. Develop an inspection list using the *Manual for Bridge Element Inspection* (AASHTO, 2013).
4. Perform a field visual inspection of the bridge in the field to determine the condition of the elements of the bridge and confirm that there are no existing failures that influenced the bridge deformation. This inspection was carried out using the list that was made in step 3.
5. Obtain the geometry of the bridge performing a detail survey. A total station and a drone survey (that obtains high-quality, orthorectified images) were used.
6. Select a finite element program for the structural analysis. The program selected was SAP2000 v21.
7. With the field data that was obtained, develop a finite element model using the program that was chosen in step 6.

8. Model the bridge without the signage and observe the behavior of the pedestrian bridge to see if it fails when the wind pressures, equivalent to those produced by Hurricane Maria, are applied.
9. Model the bridge with the signage and observe the behavior of the pedestrian bridge to see if it fails when the wind pressures, equivalent to those produced by Hurricane Maria, are applied.
10. Compare the behaviors of the bridge obtained in steps 8 and 9. With the comparison of these results, assess if the signs presence was the main reason for the inelastic deformation that had occurred.
11. Offer recommendations regarding the installation of signs on modular pedestrian bridges.

3.2 Additional Considerations

The condition observed in the pedestrian bridge during the inspection (such as the large amount of corrosion in several elements) and other findings (such as bridge support details, and signs support details) that may have played a role in the lateral deflections are also described in the results analysis and conclusions.

This research will help future assessments to be carried out on different bridges around Puerto Rico to which road signs were added without the proper reinforcement of the original structure.

4 Bridge Information and Previous Studies

During this research phase, the Puerto Rico Highway and Transportation Authority (PRHTA) of the Puerto Rico Department of Transportation and Public Works (PRDOT) was visited to obtain all the available information on the bridge being studied. It was found that the bridge is identified as Pedestrian Bridge (PB) 1137 and that it was constructed in 1968, The following sections include information about its location, and the recovered drawings and inspection reports.

4.1 Location

PB 1137 was located at kilometer 4.1 of the Roman Baldorioty de Castro Expressway, San Juan, Puerto Rico. The bridge connected the Norte Shopping Center and the Luis Lloréns Torres public housing complex located north of the expressway with the Villa Palmeras sector south of the expressway.

Figure 4.1 presents an aerial view of the area. In the figure, the area north of the expressway, that includes the Norte Shopping Center and the Luis Lloréns Torres complex, are shaded blue. The area south of the expressway that includes the sector Villa Palmeras is shaded yellow. The bridge has been shaded red and finally the expressway is marked with a green line.

Figure 4.2 presents a view of the bridge from March 2016, while Figure 4.3 presents a view of the bridge after the damages produced by Hurricane Maria. Notice that at some point between March 2016 and the passage of Hurricane Maria in September 2017, a sign on the bridge was replaced with multiple signs. At the time of the field visit, all the signs had been removed.

Figure 4.1: Aerial View of the Bridge Location (Source: Google Maps)

Figure 4.2: Image of the Bridge from March 2016 (Source: Google Maps)

Figure 4.3: Image of the Bridge from September 2018 (Provided by PRHTA)

4.2 Drawings Recovered from Puerto Rico Department of Transportation

During the visits that were performed to the Department of Transportation, copies of two different set of drawings were obtained. The first set of drawings obtained was from 1976, and the second set of drawings acquired was from 2001. The 2001drawings are presented in Appendix A. Since the bridge was built in 1968, based on the inspection reports, both sets of drawings are as-builts.

The set of drawings from 2001 includes one drawing for the existing condition, one drawing for the proposed layout and one drawing for the sections and details. Since one of the drawings is a proposed layout, is understood that this set of drawings was for a remodeling of the bridge. Even though this set of drawings is for a remodeling of the bridge, the existing condition drawing is still different from the existing condition drawing of 1976. Meaning that between 1976 and 2001 there might had been another bridge remodeling for which information was not obtained.

Comparing the existing layout of the 1976 drawings with the one from the 2001 drawings, the bridge was extended from 52.140 meters to 59.585 meters. Additionally, the proposed layout modifications of the 2001 drawing were confirmed to be completed during the site inspections.

4.3 Previous Inspections from Puerto Rico Department of Transportation

During the visits that were done to the Puerto Rico Department of Transportation, copies of different inspection reports of the bridge were obtained. The inspection reports date from 1972 to the most recent of May 2017, just a few months before Hurricane Maria made landfall in Puerto Rico. A total of 13 reports were obtained. There are two major gaps of inspection reports, either because the reports were not saved or because the report was never prepared. These gaps are from 1975 to 1986 and from 2001 to 2014. Outside of these major gaps, the time between reports ranged from one to three years.

The inspection reports have the structural information of the bridge and the evaluation of the condition of three mayor areas: the deck, the superstructure, and the substructure. The evaluation is based on a 0 to 9 scale system, where 9 represents the best evaluation and 0 represents the poorest evaluation. In addition to the condition evaluation, the inspection also consisted in appraising the structural condition of the structure with the same point system. The inspection reports end with recommendations based on the findings. Table 4-1 summarizes the findings of reports that where recovered. In this table, Item 58 represents the deck, Item 59 represents the superstructure, Item 60 represents the substructure and Item 67 represents the structural condition.

Table 4-1: Summary of Previous Inspection Reports

Year	58	59	60	67	Remarks (as included in the reports)
1972	7	7	8	7	Rehabilitation should include replacing missing bolts and safety pins and also painting
1975	8	7	7	7	Rehabilitation should include: (a) Removal of rust from structural steel by means of wire brush or any other acceptable method and the protection of it with paint; (b) The replacement of any structural element if necessary
1986	7	7	7	7	Rehabilitation consists of Maintenance, sand blasting and painting
1987	6	6	7	7	Rehabilitation consists of repairing light corrosion at steel plate. The structure was painted recently. Fine cracking, small spalling and light corrosion at footing and columns respectfully.
1989	6	6	6	6	Rehabilitation consists of repairing ponding, holes, and rust stains at deck steel plates. Severe corrosion at angles. Moderate corrosion at some structural members. Moderate Corrosion at columns. Fine crack, small spalling, and light scaling at footings. Stair railings are broken due to moderate corrosion.
1991	5	5	5	5	Severe Corrosion
1993	6	6	6	6	This bridge was rehabilitated last year (1992), and no improvement is needed
1994	5	5	6	5	Rehabilitation consists of repairing severe corrosion and light section loss at wearing surface due to ponding. Fine cracks, small spallings and light scaling at columns footings. Ponding at stairs and rest area.
1996	5	5	6	5	Rehabilitation consists of repairing light corrosion and light section loss. Bridge was painted
1999	5	5	6	5	Rehabilitation consists of repairing severe corrosion and light section loss at wearing surface due to ponding. Fine cracks, small spallings and light scaling at columns footings. Ponding at stairs and rest area.
2001	5	5	6	5	Rehabilitation consists of repairing severe corrosion and light section loss at wearing surface due to ponding. Fine cracks, small spallings and light scaling at columns footings. Ponding at stairs and rest area.
2014	5	5	6	/	Light to moderate corrosion and some holes by corrosion at steel plates. Lateral components of bracings show light to moderate corrosion and section loss. Moderate section loss by corrosion at upper chords.
2017	4	5	5	/	There is moderate and severe corrosion on the deck surface, including several large perforations. The deck surface of the structure is in poor condition. Several of the lateral components of the "bracing" have light, moderate and severe corrosion, and loss of section. Some sections in the upper chord have moderate loss due to corrosion. Steel columns in good condition, light corrosion

From Table 4-1 it may be appreciated that the substructure was, in the most cases, considered in a better condition that the deck and the superstructure. It is also appreciated that, as the years passed, the condition of the structure for the three major areas kept on deteriorating. In the recommendations, in 1987 and 1993, the inspection reports mentioned that the bridge was recently rehabilitated. Nonetheless, with the exception of the report of 1993, all the other reports mentioned that corrosion was present, and that it needed to be repaired.

The corrosion emphasis grew per report and, starting with the report of 1994, the section loss due to corrosion was evident. The final report had the deck condition set as 4 and the superstructure and substructure set as 5, which meant that the bridge was in poor condition.

5 Visual Inspection and Condition Evaluation

In this chapter, the performed visual inspections are described and the corresponding findings are discussed. For the condition evaluation, the lateral deformation of the bridge was not considered.

5.1 Site Visits

As part of the inspection of the bridge, different site visits were conducted. On the first visit it was observed that the bridge was closed to pedestrians because of its poor structural condition. An expanded metal mesh was welded against the steel frames of the bridge and a banner indicating the bridge was closed was installed, as shown in Figure 5.1 and Figure 5.2. During this visit, different photos of the bridge were taken and the dimensions of the elements that were accessible were measured. In addition, a Total Station (shown in Figure 5.3 and Figure 5.4) was used to take points along the bridge to delineate the bridge's lateral displacement. When the points taken were traced in AutoCAD, no significant deflection was observed, thus not enough points during the measuring process were collected to capture the deformation. Since the deflection was not captured with the Total Station, it was decided that another method had to be used.

Figure 5.1: Metal Mesh Used to Close Pedestrian Bridge

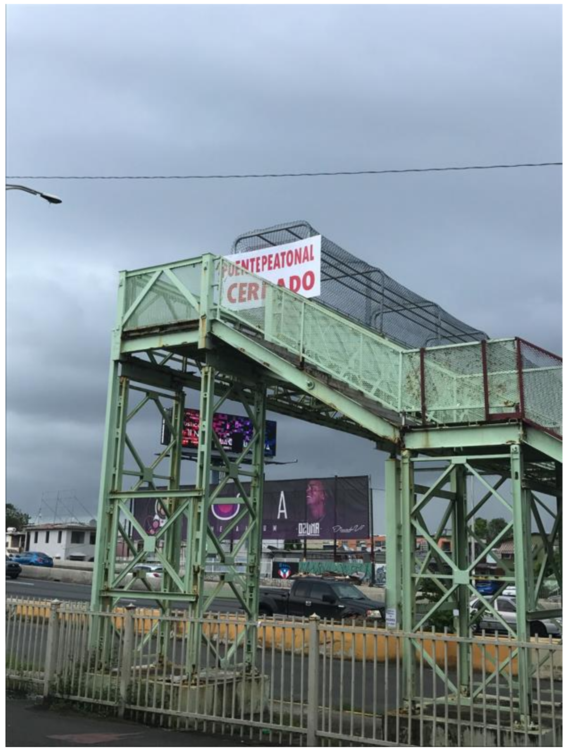


Figure 5.2: Sign Indicating Pedestrian Bridge is Closed


Figure 5.3: Total Station


Figure 5.4: Total Station Positioned to Measure Bridge

During the second inspection, a DJI PHANTOM drone (as shown in Figure 5.5) was used to take aerial photos. The photos taken during this visit (an example is shown in Figure 5.6) were of low quality probably because the drone flight was done rapidly because of security concerns. It was decided that another flight was needed.

Figure 5.5: Drone Operation at Beginning of Flight

Figure 5.6: Aerial Photograph of the Pedestrian Bridge

For the third site visit, the Administration of the Public Housing Residency was visited, and permission was asked to enter the area and to stay several hours. Security was offered during the site inspection. During this final site visit, another drone flight was made, and a series of high quality and high-definition photographs were taken. Also, closer images were taken so that the structural elements could be analyzed for their condition assessment directly from the photos. Every picture taken up-close included two to three truss panels. An example of this is presented in Figure 5.7. More photos taken of the bridge are presented in Appendix B.

Figure 5.7: Up-close Photo of the Bridge

The series of aerial photos that were taken were orthorectified, meaning that the photos were geometrically corrected so that the scale of the photo is uniform. After this procedure, the photos that were taken were assembled to form a map and real measurements were obtained from the aerial photos.

5.2 Form creation for bridge condition evaluation

Using as a basis the *Manual for Bridge Element Inspection* (AASHTO, 2013), a checklist form was created with the elements that could be found in the pedestrian bridge that was being evaluated. The inspection manual also includes different failures that may occur per structural elements, and they were also taken into consideration.

The elements that were to be inspected were determined from Chapter 2 of the manual. The first element that was determined to be inspected was obtained from Table 2.1.1 of the manual, reprinted in this report as Table 5-1. From this table, the steel deck was the only element that was determined to be inspected. In the manual, this element has the identification number 30 and is measured in square feet.

Table 5-1: Decks and Slabs (AASHTO, 2013)

Element	Units	Decks	Slab	Other
Reinforced Concrete Deck/Slab	area, ft^2	12	38	
Prestressed Concrete Deck	area, ft^2	13		
Prestressed Concrete Top Flange	area, ft^2	15		
Reinforced Concrete Top Flange	area, ft^2	16		
Steel Deck—Open Grid	area, ft^2	28		
Steel Deck—Concrete Filled Grid	area, ft^2	29		
Steel Deck—Corrugated/ Orthotropic/Etc.	area, ft^2	30		
Timber Deck/Slab	area, ft^2	31	54	
Other Material Deck/Slab	area, ft^2	60	65	

The second, third and fourth elements that were determined were obtained from Table 2.1.3 of the manual, reprinted in this report as Table 5-2. From this table, the trusses, the floor beams, and the pins were determined. In the manual the truss and the floor beams are measured by length and their identifications numbers are 120 and 152, respectively. The pins identification number is 161 and they are quantified by the total number of units the bridge contains.

Table 5-2: Superstructure (AASHTO, 2013)

Element	Units	Steel	Prestressed Concrete	Reinforced Concrete	Timber	Masonry	Other
Girder/Beam	length, ft	107	109	110	111		112
Closed Web/Box Girder	length, ft	102	104	105			106
Stringer	length, ft	113	115	116	117		118
Truss	length, ft	120			135		136
Arch	length, ft	141	143	144	146	145	142
Floor Beam	length, ft	152	154	155	156		157
Cable—Primary	length, ft	147					
Cable—Secondary	each	148					149
Gusset Plate	each	162					
Pin, Pin and Hanger Assembly, or Both	each	161					

The fifth and sixth elements that were determined to be inspected were obtained from Table 2.1.5 of the manual, reprinted in this report as Table 5-3. From this table the columns and the column tower were determined to be inspected. The columns identification number is 202 and the number of units quantify it. The column tower identification number is 207 and they are measured by height.

Table 5-3: Substructure (AASHTO, 2013)

Element	Units	Steel	Prestressed Concrete	Reinforced Concrete	Timber	Masonry	Other
Columns	each	202	204	205	206		203
Column Tower (Trestle)	length, ft	207			208		
Pier Wall	length, ft			210	212	213	211
Abutment	length, ft	219		215	216	217	218
Pile	each	225	226	227	228		229
Pier Cap	length, ft	231	233	234	235		236
Pile Cap/Footing	length, ft			220			

Finally, the seventh and eighth elements that were determined were obtained from Table 2.2.3 of the manual, reprinted here as Table 5-4. From this table, the wearing surfaces and steel protective coating were determined to be inspected. In the manual these elements have the identification numbers 510 and 515, respectively, and are measured in square feet.

Table 5-4: Wearing Surfaces and Protective Coatings (AASHTO, 2013)

Element	Units	Element Number
Wearing Surfaces	area, ft^2	510
Steel Protective Coating	area, ft^2	515
Concrete Reinforcing Steel Protective System	area, ft^2	520
Concrete Protective Coating	area, ft^2	521

After determining the elements that were to be inspected, Chapter 3 of the manual was used to choose the conditions for which each element would be evaluated. The conditions chosen, with their corresponding identification numbers, where the following: corrosion (1000), connection (1020), distortion (1900), damage (7000), chalking (3410) and effectiveness (3440). These conditions are evaluated in a point system going from 1 to 4, where 1 is good and 4 is severe. An example of this evaluation may be seen in Table 5-5, which illustrates the different defects and how they are categorized. Note that this scale is different from the one used in previous inspections reports presented in the section 4.3, where the evaluation is done from 0 to 9 where, 0 is bad and 9 is very good.

With all the elements and conditions established, a table based on the Table B3.3 of the manual was developed.

Table 5-6 includes all the elements that were decided to be evaluated.

Table 5-5: Condition State Definitions for Steel Deck (AASHTO, 2013)

Defects	Condition States			
	1	2	3	4
	GOOD	FAIR	POOR	SEVERE
Corrosion (1000)	None.	Freckled rust. Corrosion of the steel has initiated.	Section loss is evident or pack rust is present but does not warrant structural review.	The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge.
Cracking (1010)	None.	Crack that has self-arrested or has been arrested with effective arrest holes, doubling plates, or similar.	Identified crack that is not arrested but does not warrant structural review.	
Connection (1020)	Connection is in place and functioning as intended.	Loose fasteners or pack rust without distortion is present but the connection is in place and functioning as intended.	Missing bolts, rivets, or fasteners; broken welds; or pack rust with distortion but does not warrant a structural review.	
Damage (7000)	Not applicable.	The element has impact damage. The specific damage caused by the impact has been captured in Condition State 2 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in Condition State 3 under the appropriate material defect entry.	The element has impact damage. The specific damage caused by the impact has been captured in Condition State 4 under the appropriate material defect entry.

Table 5-6: Element Quantity and Condition State Summary

Element Type	Area	Element Number	Element Description	Unit of Measure	Total Quantity	Condition State 1	Condition State 2	Condition State 3	Condition State 4	Defect #
National Bridge Elements (NBS)	Decks and Slabs	30	Steel Deck	area, ft^2						
		1000	*Corrosion*	area, ft^2						
		1020	*Connection*	area, ft^2						
	Superstructure	120	Truss	length, ft						
		1000	*Corrosion*	length, ft						
		1020	*Connection*	length, ft						
		1900	*Distortion*	length, ft						
		7000	*Damage*	length, ft						
		152	Floor Beam	length, ft						
		1000	*Corrosion*	length, ft						
		1020	*Connection*	length, ft						
		161	Pin	each						
		1000	*Corrosion*	each						
		1020	*Connection*	each						
	Substructure	202	Columns	each						
		1020	*Connection*	each						
		207	Column Tower	length, ft						
		1000	*Corrosion*	length, ft						
		1020	*Connection*	length, ft						
Bridge Management Elements (BMS)	Wearing Surfaces and Protective Coatings	510	Wearing Surfaces	area, ft^2						
		515	Steel Protective Coating	area, ft^2						
		3410	*Chalking*	area, ft^2						
		3440	*Effectiveness*	area, ft^2						

5.3 Assessment

To complete the form presented on

Table 5-6, all the elements had to be quantified and visually given a value condition from 1 to 4. To determine the quantity of the elements, the following computations were made:

- Deck
  - The deck is composed of steel plates.
  - Steel Deck (Element 30): Quantity 204 ft (in length) x 5.5 ft (in width) = 1,122 ft^2
- Superstructure
  - The superstructure is composed of trusses, floor beams and pins.
  - Truss (Element 120) Quantity: 9 ft (in length) x 2 truss (per span) x 20 (spans) = 360 ft
  - Floor Beam (Element 152) Quantity: 9 ft (in length) x 1 beam (per span) x 20 (spans) = 180 ft
  - Pins (Element 161) Quantity: 8 (pins per span) x 20 (spans) = 160 pins
- Substructure
  - The substructure is composed of columns and columns towers.
  - Columns (Element 202) Quantity: 4 in total
  - Column Towers (Element 207) Quantity: 2 in total
- Protective Coating
  - The surface of the structure is completely painted.

- Steel Protective Coating (Element 515) Quantity: (Calculated from "as-built" drawings presented in Appendix A) = 8,490 ft^2
- To determine the area of the structure, Table 5-7 was created.

Table 5-7: Surface Area

Group	Element	Qty	Sections	Total Qty	From Drawing: Nominal Size	From Drawing: Length [in]	Surface [in]	Total Surface [in]	Total Area [sq. in.]	Total Area [sq. ft.]	Total [sq. ft.]
Truss Panel	Longitudinal Channel Top 1	2	40	80	4" x 2" x 1/4"	116	8	16	1856	12.89	1031.11
	Longitudinal Channel Top 2	2	40	80	4" x 2" x 1/4"	116	8	16	1856	12.89	1031.11
	Longitudinal Channel Bottom 1	2	40	80	4" x 2" x 1/4"	116	8	16	1856	12.89	1031.11
	Longitudinal Channel Bottom 2	2	40	80	4" x 2" x 1/4"	116	8	16	1856	12.89	1031.11
	Vertical Channel	3	40	120	3" x 1" x 1/8"	57	5	10	570	3.96	475.00
	Diagonal Channel	2	40	80	3" x 1-1/2" x 1/8"	41	6	12	492	3.42	273.33
	Diagonal Channel	2	40	80	3" x 1-1/2" x 1/8"	41	6	12	492	3.42	273.33
	Diagonal Channel	2	40	80	3" x 1-1/2" x 1/8"	41	6	12	492	3.42	273.33
	Diagonal Channel	2	40	80	3" x 1-1/2" x 1/8"	41	6	12	492	3.42	273.33
	Reinforcing Plate	1	40	40	9" x 9"	9	9	18	162	1.13	45.00
	Reinforcing Plate	2	40	80	9" X 4-1/2"	4.5	9	18	81	0.56	45.00
Floor	Transverse Beam	1	20	20	10" x 5" x 5/16"	108	20	40	4320	30.00	600.00
	Diagonal Bracing Channel	2	20	40	3" x 1-1/2" x 1/8"	51.5	6	12	618	4.29	171.67
	Transverse Bracing Channel	4	20	80	4" x 1-1/2" x 1/8"	75	7	14	1050	7.29	583.33
	Longitudinal Channel	4	20	80	4" x 1-1/2" x 1/4"	116	7	14	1624	11.28	902.22
	Transverse Angle Bracing	2	20	40	3" x 3" x 1/8"	75	6	12	900	6.25	250.00
	Longitudinal Angle Bracing	2	20	40	3" x 3" x 1/8"	60	6	12	720	5.00	200.00
										Total	8490.00

With the quantities established, the bridge was evaluated. The results from the evaluation are presented in Table 5-8. Following is a discussion of how these results were obtained.

Table 5-8: Element Quantity and Condition State Summary Evaluate

Element Type	Area	Element Number	Element Description	Unit of Measure	Total Quantity	Condition State 1	Condition State 2	Condition State 3	Condition State 4	Defect #
National Bridge Elements (NBS)	Decks and Slabs	30	Steel Deck	area, ft^2	1,122					4
		1000	*Corrosion*	area, ft^2	1,122				1,122	4
		1020	*Connection*	area, ft^2	1,122				1,122	4
	Superstructure	120	Truss	length, ft	360					4
		1000	*Corrosion*	length, ft	360			198	162	3,4
		1020	*Connection*	length, ft	360		198	162		2,3
		1900	*Distortion*	length, ft	360	148			212	1,4
		7000	*Damage*	length, ft	360	360				1
		152	Floor Beam	length, ft	180					2
		1000	*Corrosion*	length, ft	180	117	63			1,2
		1020	*Connection*	length, ft	180	144	36			1,2
		161	Pin	each	160					1
		1000	*Corrosion*	each	160	160				1
		1020	*Connection*	each	160	160				1
	Substructure	202	Columns	each	4					1
		1020	*Connection*	each	4	4				1
		207	Column Tower	length, ft	27					4
		1000	*Corrosion*	length, ft	27		27			2
		1020	*Connection*	length, ft	27				27	4
Bridge Management Elements (BMS)	Wearing Surfaces and Protective Coatings	510	Wearing Surfaces	area, ft^2	8,490					N/A
		515	Steel Protective Coating	area, ft^2	8,490					3
		3410	*Chalking*	area, ft^2	8,490		8,490			2
		3440	*Effectiveness*	area, ft^2	8,490			8,490		3

To evaluate the pedestrian bridge, it is important to understand the points system. This is summarized as follows (AASHTO, 2013):

- 1 - Good - No observation is made.
- 2 - Fair - Corrosion has initiated, loose fasteners, distortion not requiring mitigation, the surface is substantially effective.
- 3 - Poor - Section loss is evident, missing elements, distortion that requires mitigation, the surface has limited effectiveness.
- 4 - Severe - The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge.

Based on this points system, the following overall condition was given to the structure:

- Deck - Condition State 4 - It was evaluated in this condition due to the corrosion along the complete deck, causing some holes. Also due to corrosion, some bracing elements had fallen off. Falling elements are a major threat to safety since the bridge is located above a principal roadway of Puerto Rico. Figure 5.8 shows that corrosion had already eaten up part of the steel deck surface (as appreciated by the sunlight passing through the deck) and that diagonal bracings have fallen off. The type of diagonal bracing that is missing in Figure 5.8, can be somewhat appreciated in Figure 5.9, which itself shows an incomplete set of diagonals.


Figure 5.8: Loss of Decking due to Corrosion and Missing Bracing Elements


Figure 5.9: Missing Bracing Elements

- Superstructure - Condition State 4 - Even though the superstructure consists of three different items (the truss, the floor beam, and the pins), the overall condition given to this item was 4 due to the evident corrosion along the truss elements, including section loss. Since the truss was determined in condition state 4, the whole superstructure was determined as this state. This determination was based on if a truss element fails, it will compromise the integrity of the whole structure. In Figure 5.10, Figure 5.11 and Figure 5.12 the uniform corrosion along the truss may be seen. Going even further, in Figure 5.11 and Figure 5.12 some areas have holes in the channel of the truss due to the corrosion. Because of this level of corrosion, the channels were given a condition state 4. In Figure 5.13 and Figure 5.14 a uniform corrosion may be seen on top of the beam and crevice corrosion may be seen where the beam is in contact with the channel. It is evident that corrosion is present, but since the bridge was closed at the time of the inspection, a closer observation was not possible. From afar, section loss of the beams was not evident, so they were evaluated as condition state 2.

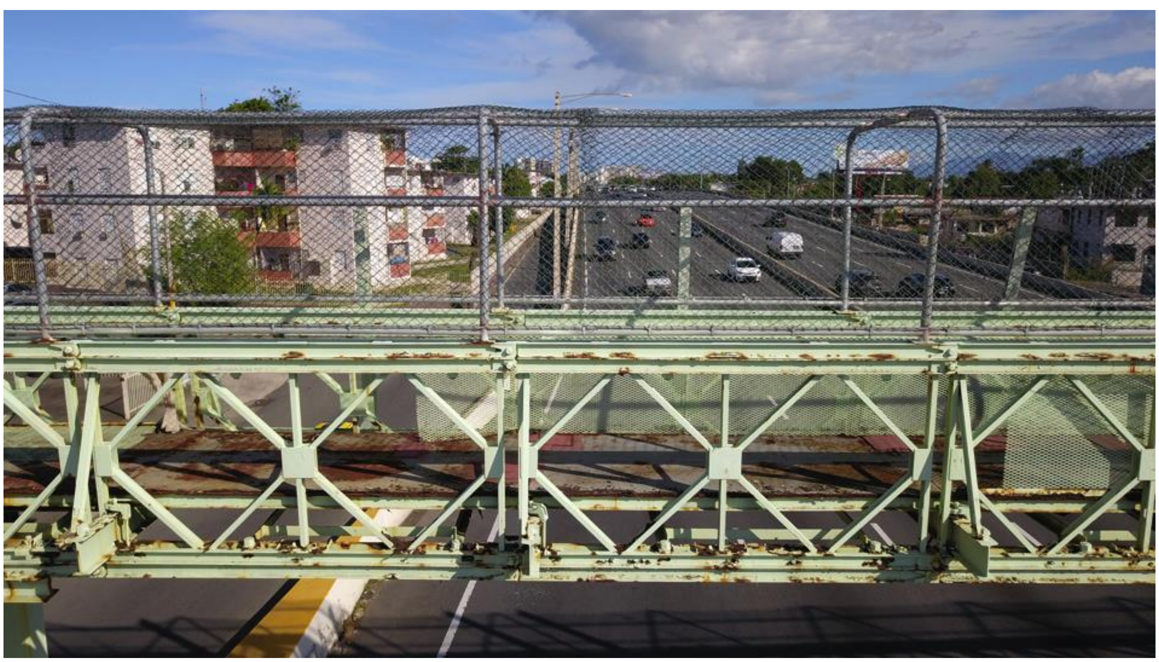


Figure 5.10: Corrosion in Truss Element (Example 1)


Figure 5.11: Corrosion in Truss Element (Example 2)


Figure 5.12: Corrosion in Truss Element (Example 3)


Figure 5.13: Corrosion in Floor Beams (Example 1)


Figure 5.14: Corrosion in Floor Beams (Example 2)

- Substructure - Condition State 4 - The substructure consists of the columns and the column tower. Even though the columns were found in good condition, the column towers were missing connections. Due to the missing connections the overall condition given to the substructure was 4, as in the case of the superstructure. In Figure 5.15 and Figure 5.16 a loose connection and a section loss due to corrosion are presented, respectively.


Figure 5.15: Loose Connection at Column Tower

Figure 5.16: Section Loss due to Corrosion at Column Tower

- Wearing Surfaces - Condition State 3 - This item was evaluated in the condition state 3 because of the limited effectiveness the paint has, due to the evident corrosion in the structure, as it may be appreciated in Figure 5.17.

Figure 5.17: Painting Effectiveness in Corrosion

Appendix E of the element inspection manual indicates different actions that may be taken given a state condition, as follows:

- 1 - Good - Do nothing; Protect.
- 2 - Fair - Do nothing; Protect; Repair.
- 3 - Poor - Do nothing; Protect; Repair; Rehabilitate; Replace.
- 4 - Severe - Do nothing; Protect; Repair; Rehabilitate; Replace.

Based on these indications, it was determined that for the deck, replacement would be the best action due to the section loss of the steel deck, the pedestrian safety could not be assured. On the other hand, it is evident that the superstructure merits a structural review. Once a structural review has been carried out, if the pedestrian bridge may still be used, repair or replacement of the compromised sections would be required. For the substructure, repair and rehabilitation would be needed. Finally, for the wearing surfaces, it would be necessary to repair by removing the corrosion and rehabilitation by application of a new layer of protective coating.

5.4 Comparing Results

With the evaluation of the bridge condition completed, the values obtained were compared with those presented in the latest inspection report recovered from the Department of Transportation of Puerto Rico dated May 2017. To be able to carry the comparison, a relationship needed to be established between the 1-to-4-point system used in this report with the 0-to-9 scale used in PRDOT inspection reports. The relationship established between the two systems is presented in Table 5-9. For example, it was determined that a Good Condition corresponding to the number 1 on the 1-to-4 scale corresponds to a value on 7 to 9 in the 0-to-9 scale.

Table 5-9: Equivalency Between Current and PRDOT Condition State Criteria

Condition	Current Inspection	PRDOT Inspection
Good	1	9 - 7
Fair	2	6 - 5
Poor	3	4 - 3
Severe	4	2 - 0

Having established the relationship between the different rating systems, Table 5-10 presents a comparison between the assessment of the May 2017 inspection report by PRDOT and the evaluation carried out for this project in 2018. It can be seen that for the 2017 inspection the condition state given to the bridge was poor, while for this project the condition state was determined to be sever. It is apparent that the degradation of the bridge due to corrosion was accelerating, and although the current evaluation could have been too strict, it is evident that immediate action was required for the bridge.

Table 5-10: Condition State Comparison

Inspection	Deck	Superstructure	Substructure
2017 (Previous)	4 (Poor)	5 (Fair)	5 (Fair)
2018 (Current)	4 (Severe)	4 (Severe)	4 (Severe)

6 Assessment of Bridge Deflected Geometry

The surveying of the bridge was performed with a DJI Phantom Drone, as mentioned in Chapter 5. The following two sections will describe how the surveying of the bridge was done using the drone.

6.1 Procedure

The use of drones for surveying has become more practical due to the advancement in image processing and GIS/Mapping software. Aerial mapping is now done with the use of drones and the orthorectified images obtained gives accurate surveying dimensions. For the surveying of the pedestrian bridge, a DJI Phantom Drone was used (see Figure 6.1). Using the software PIX4D, first the area in which the mapping will be done must be selected. The selection is done directly from the smart device that is used to fly the drone. Once the area is selected, the photo mapping starts.

Figure 6.1: DJI Phantom Drone (Source: DJI)

During the mapping, the drone flew over the pedestrian bridge taking pictures of the bridge every few feet. Approximately 100 pictures were taken overall. These pictures were then processed with PIX4D software. The software overlayed the pictures taken, creating a map of the area. Then, the same software orthorectifies their dimension creating an accurately dimensioned map. Figure 6.2 illustrates the result of the orthorectified-mapping image obtained from PIX4D.

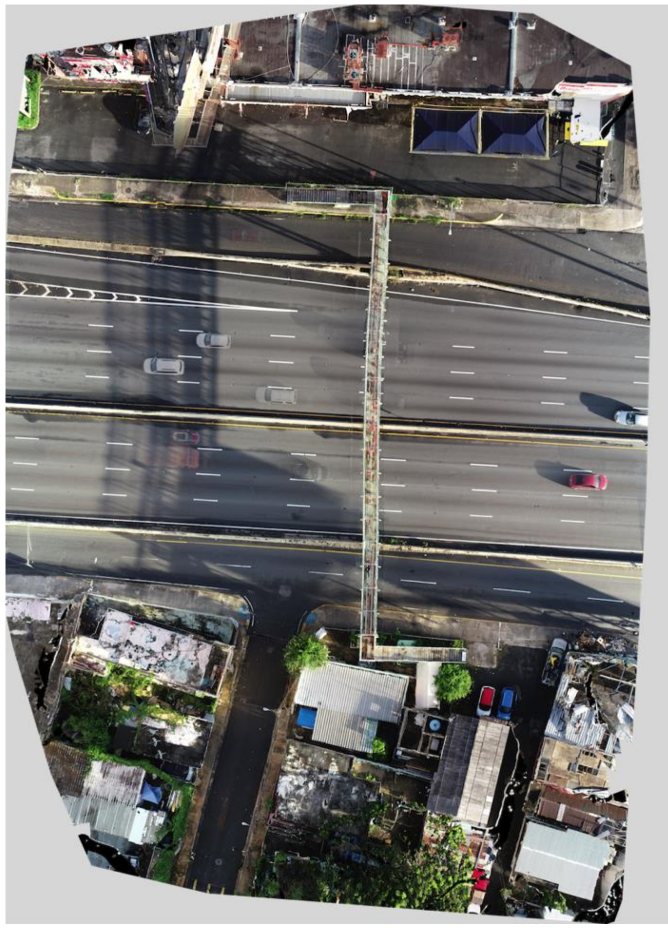


Figure 6.2: Areal Mapping of the Pedestrian Bridge

6.2 Outcomes

With the image obtained from the aerial mapping, measurements of the bridge may be obtained. First, the image was compared to the aerial image that was retrieved from Google Maps. In Figure 6.3, the image from Google Maps is compared to the one obtained from the survey. A red line was overlaid on both images to make the lateral deformation of the bridge after Hurricane Maria more noticeable. To accurately determine the lateral deformation of the bridge, the image obtained from the survey was imported to AutoCAD.

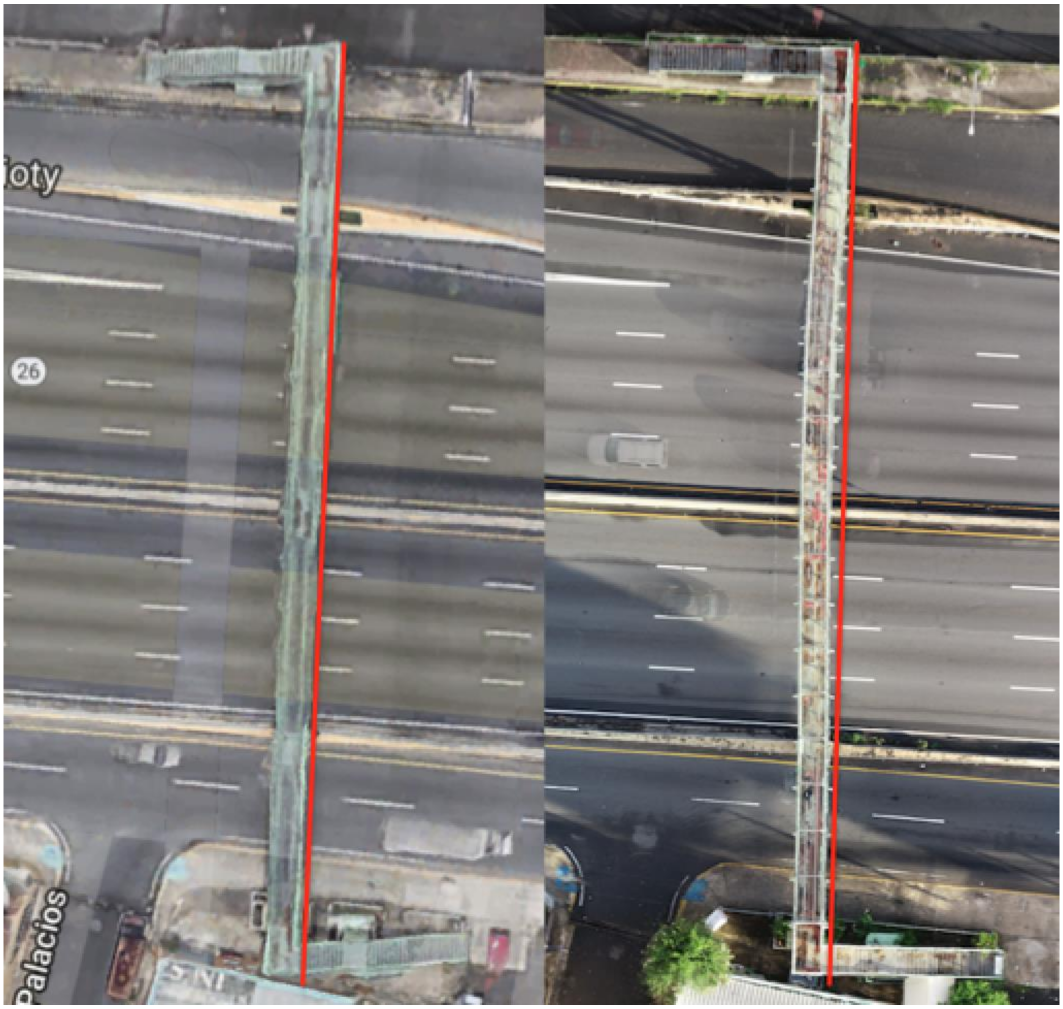


Figure 6.3: 2016 (Google Earth) and 2018 (Drone Survey) Bridge Geometry Comparison

Using Google Earth, the dimension of the bridge was verified, as illustrated in Figure 6.4. The length obtained from Google Earth was 202 ft. Considering that the bridge has a length equivalent to 20 truss panels, and every truss panel measures approximately 10 ft, the distance obtained from Google Earth is considered accurate. The distance of 10 feet of the truss panel was verified in the field, and it is also the same length indicated in an old manual for the Bailey Bridge (U.S. War Department, 1943). With the surveyed image imported to AutoCAD, it was scaled to measure the same distance measured using Google Earth. As illustrated in Figure 6.5, the length of the pedestrian bridge was scaled to measure 2,424 inches (202 feet).

Figure 6.4: Google Earth Dimension Verification

Figure 6.5: Bridge Dimension

In addition to the bridge length, the deflection was also measured. For this, two colored lines were drawn in AutoCAD and the distance between them was measured (as presented in Figure 6.5 and Figure 6.6). The first line drawn was the red line, which runs straight from north to south of the bridge. The second line drawn was the blue line, which follows the contour of the bridge. Then an offset was given to the red line so that it touched the tangent of the blue line. In the intersection of the tangent point, the distance between the original red line and the blue line measured 25 inches, as illustrated in Figure 6.6. With this dimension, it is understood that the bridge had an approximate lateral deflection of 25 inches in its most critical point. In addition, looking closely, it can be appreciated that this point corresponds to the location of the second to last structural beam that supported the signs.

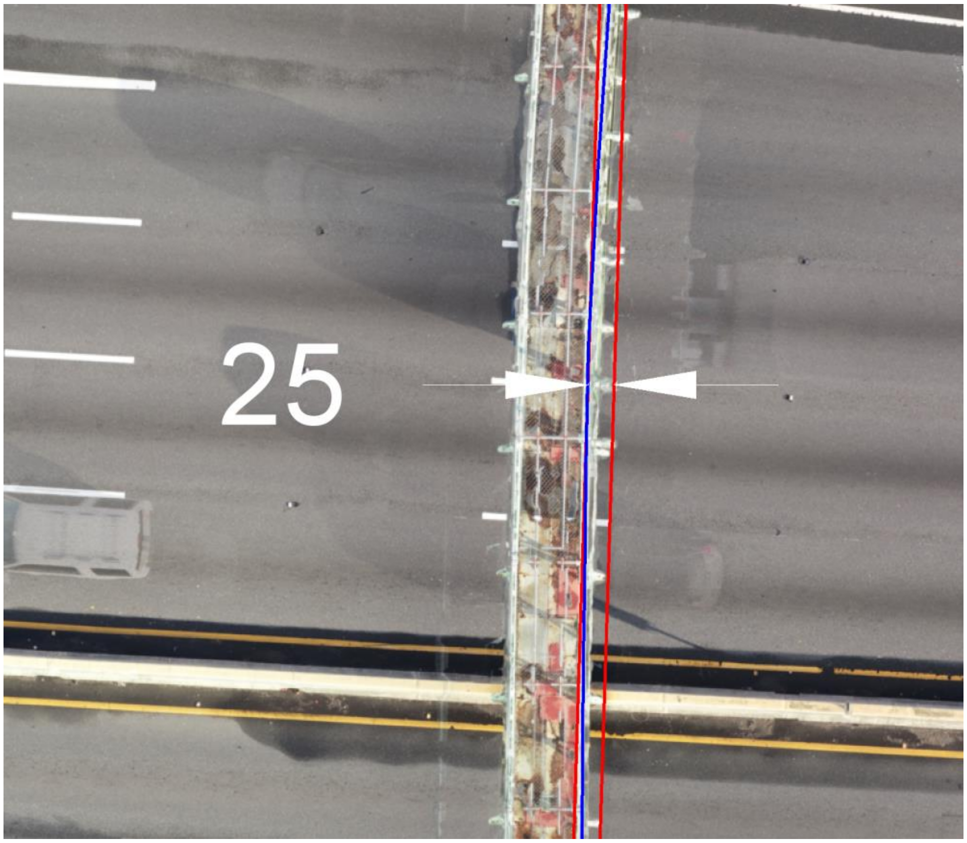


Figure 6.6: Bridge Maximum Plastic Deflection (in inches)

7 Laboratory Testing of Bridge Fragments

Due to its condition, the pedestrian bridge was demolished. This permitted the collection of fragments of the bridge to be tested for determining material strength. This chapter presents information on how the bridge was demolished, how the fragments were recovered and tested, and what were the results of the tests.

7.1 Bridge Demolition and Sample Procurement

The bridge was constructed to cross over the expressway Roman Baldorioty de Castro, one of the main roads of the San Juan Metropolitan Area. This meant that, for the bridge demolition, the expressway had to be closed and traffic redirected. The Puerto Rico Department of Transportation granted permission for the demolition, and it was scheduled to start on March 10, 2019, at midnight, and to last 12 hours.

The demolition started as scheduled. For the demolition, the bridge was moored with two cranes. Figure 7.1 illustrates the rigging of the bridge. The bridge consisted of three spans from which the middle span was the first section to be moored. After the middle span was secured with the cranes, using a man lift that section was cut out with oxyacetylene. After the middle section was completely cut out (as shown in Figure 7.2), it was lowered to the street. Once it was laying in the street it was cut into smaller sections and loaded to a flatbed for final transportation to its disposal facility, as shown in Figure 7.3. This procedure was repeated with the other sections.

After the bridge had been removed and transported to a yard (see Figure 7.4), the company in charge of the demolition was contacted. A formal letter from the Polytechnic University of Puerto Rico (see Appendix C) was submitted to the demolition contractor requesting bridge fragments to be tested to determine mechanical properties of the bridge elements. After several months of negotiations, on April 26, 2019, the contractor handed the fragments presented in Figure 7.5.

Figure 7.1: Bridge Rigging

Figure 7.2: Bridge Being Removed

Figure 7.3: Transportation of Demolished Bridge

Figure 7.4: Demolished Bridge at Junkyard (April 26, 2019)

Figure 7.5: Bridge Fragments Recovered

7.2 Applicable ASTM Standard

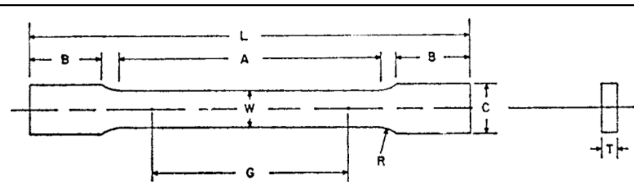
The standard applied to the testing of the recovered bridge fragments was ASTM E8 – *Standard Test Methods for Tension Testing of Metallic Materials* (2016). The purpose of following this ASTM is to perform tension tests to determine the yield strength of the fragments of the bridge that were recovered.

When conducting the tension test, it is important the specimen is held in a position where the load is transmitted axially through the whole cross-sectional area. For this, special care must be taken during the gripping of the specimen in the testing machine. Once the specimen is ready to start the load test, special attention also must be made for the speed of testing. The speed shall not be greater than that at which the lectures can be accurately recorded. When determining yield properties, the speed of testing shall be between 10,000 and 100,000 psi/min.

The specimens used in the tension tests must have the appropriate dimensions. For this project, the specimens were prepared following the ASTM requirements for a Rectangular Tension Test Specimen, as presented in Figure 7.6. The dimensions established from the figure are the following:

- Gauge Length (G): 2.000 ± 0.005 in
- Width (W): 1½ + 1/8 in
- Thickness (T): Thickness of material
- Radius of fillet, min (R): ½ in
- Overall length, min (L): 8 in
- Reduced section (A); 2¼ in
- Length of Grip Section (B): 2 in
- Width of Grip Section (C): 2 in

Once the specimen has been cut, gauge marks have to be placed on it to determine the elongation. This marks may be painted, scribed, or drawn.



Dimensions			
	Standard Specimens		Subsize Specimen
	Plate-Type, 40 mm [1.500 in.] Wide	Sheet-Type, 12.5 mm [0.500 in.] Wide	6 mm [0.250 in.] Wide
	mm [in.]	mm [in.]	mm [in.]
G—Gauge length (Note 1 and Note 2)	200.0 ± 0.2 [8.00 ± 0.01]	50.0 ± 0.1 [2.000 ± 0.005]	25.0 ± 0.1 [1.000 ± 0.003]
W—Width (Note 3 and Note 4)	40.0 ± 2.0 [1.500 ± 0.125, -0.250]	12.5 ± 0.2 [0.500 ± 0.010]	6.0 ± 0.1 [0.250 ± 0.005]
T—Thickness (Note 5)		thickness of material	
R—Radius of fillet, min (Note 6)	25 [1]	12.5 [0.500]	6 [0.250]
L—Overall length, min (Note 2, Note 7, and Note 8)	450 [18]	200 [8]	100 [4]
A—Length of reduced section, min	225 [9]	57 [2.25]	32 [1.25]
B—Length of grip section, min (Note 9)	75 [3]	50 [2]	30 [1.25]
C—Width of grip section, approximate (Note 4 and Note 9)	50 [2]	20 [0.750]	10 [0.375]

Figure 7.6: Dimensions of Rectangular Tension Test Specimens (ASTM E8, 2016)

7.3 Specimen Preparation and Test Procedure

The recovered fragments of the pedestrian bridge were taken to a metal workshop where a water-jet cutter (shown in Figure 7.7) was used to cut out the specimens to be tested. The specimens were specifically cut out from a C3x5 section used as a diagonal. The water-jet cutter was used so that the properties of the material were not altered by heat. Since deformations and heating by welding, or cutting may affect the properties of the material, special attention was taken to avoid areas of the channel that could have been affected during the demolition of the bridge.

Figure 7.7: Water-jet Cutter

Figure 7.8 illustrates four specimens that were ready to be tested. Prior to testing, the specimens were measured to assure that they had the dimensions required by the ASTM standard, as shown in Figure 7.9 and Figure 7.10.

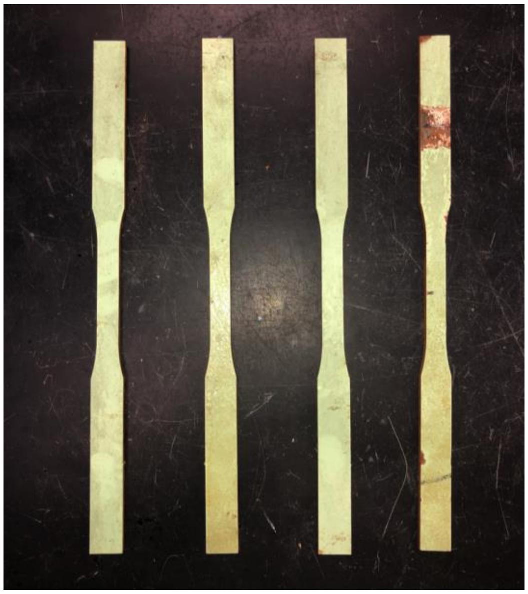


Figure 7.8: Testing Specimens

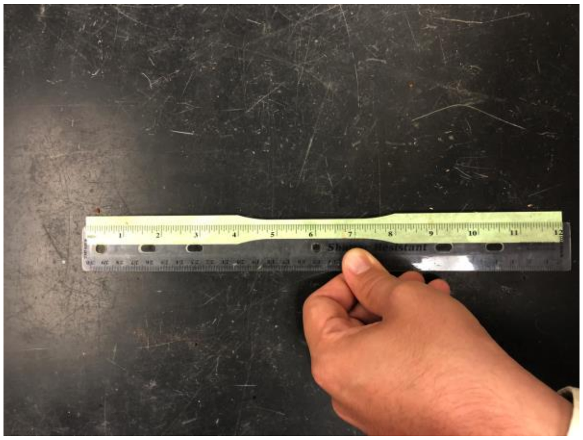


Figure 7.9: Specimen Cut Verification (1 of 2)

Figure 7.10: Specimen Cut Verification (2 of 2)

To determine the cross-sectional area in which the load for the tensile stress would be applied a Mitutoyo Digital Caliper was used. Using the caliper, three different measurements were taken for the thickness and the width of the specimen as illustrated in Figure 7.11 and Figure 7.12. Then the average of these measurements was calculated and used to compute the cross-sectional area of the specimen.

Figure 7.11: Measurement of Specimen Thickness

Figure 7.12: Measurement of Specimen Width

The tensile tests on the specimens were conducted at Construction Materials Laboratory of the Polytechnic University of Puerto Rico, San Juan Campus. The apparatus that was used to conduct the tests was an Instron 300DX shown in Figure 7.13. A total of six specimens were tested and the results will be discussed in the following section.

Figure 7.13: Tensile Testing Apparatus

7.4 Results

Initially, only two specimens were tested for equipment verification, procedures verification, grip adjustment, and calibration purposes. After these two run tests, the other four specimens were tested, and the results were within expected ranges for the material strength. Table 7-1 illustrates the measurements that were obtained from those four specimens with respect to their width and thickness. With their width and thickness their corresponding area was determined, and this information was used with the tensile testing apparatus.

Table 7-1: Measurements of Specimens

Sample	Width	Average Width	Thickness	Average Thickness	Area
1	0.4690	0.4690	0.1740	0.1743	0.0818
	0.4690		0.1745		
	0.4690		0.1745		
2	0.5020	0.5033	0.1665	0.1670	0.0841
	0.5030		0.1670		
	0.5050		0.1675		
3	0.5055	0.5057	0.1695	0.1690	0.0855
	0.5045		0.1680		
	0.5070		0.1695		
4	0.5040	0.5030	0.1740	0.1728	0.0869
	0.5020		0.1750		
	0.503		0.1695		

Figure 7.14 presents the stress vs. strain diagrams that were obtained from the tension tests. Table 7-2 illustrates the results obtained from each curve. From these results, an average yield strength of 56.58 ksi, was obtained, as presented in Table 7-3. Given the results of the testing tests, it is suspected that the steel used for the construction of the bridge was A572. Still, the average yield stress of 56.6 ksi was used when modeling the bridge to evaluate the impact of wind loads.

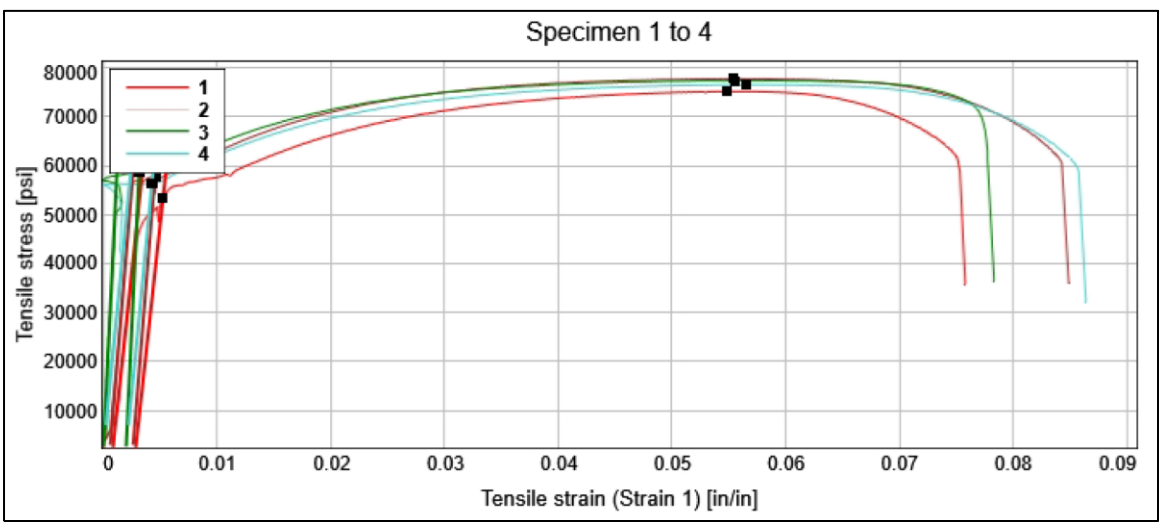


Figure 7.14: Stress vs. Strain Diagrams

Table 7-2: Tensile Tests Results

	UTS [ksi]	Peak Load [lbf]	YTS [ksi]	Elongation after fracture [%]
1	75.22	6149	53.46	26.25
2	77.83	6537	57.85	26.02
3	77.47	6621	58.70	20.42
4	76.62	6660	56.30	24.12

Table 7-3: Yield Strength Average

Curve	Yield Strength (ksi)	Average (ksi)
1	53.46	**56.58**
2	57.85	
3	58.70	
4	56.30	

8 Bridge Analytical Model and Results

A model was developed to analyze the expected performance of pedestrian bridge PB-1137 when subjected to wind loads similar to those of Hurricane Maria. This chapter presents a description of the analytical model generated and the steps followed to that end. Afterwards, it presents the results obtained when the model was analyzed considering two cases: the bridge with no signs attached to it and the bridge with the signs it had attached when it underwent Hurricane Maria.

8.1 Analytical Model

Using the Bailey Bridge Drawings and the field inspection results, an element list table was created in Excel. With the element list table and the drawings, the total quantities of elements in the bridge were determined. A partial view of the table is presented in Table 8-1.

Table 8-1: Elements List Table

Group	ID	Element	Qty	Sections	Total Qty	From Drawing	
						Nominal Size	Length [in]
Panel	LC1	Longitudinal Channel	1	21	21	4" x 2" x 1/4"	116
	LC2	Longitudinal Channel	1	21	21	4" x 2" x 1/4"	116
	LC3	Longitudinal Channel	1	21	21	4" x 2" x 1/4"	116
	LC4	Longitudinal Channel	1	21	21	4" x 2" x 1/4"	116
	VC1	Vertical Channel	3	21	63	3" x 1" x 1/8"	57
	DCP1	Diagonal Channel Parralel	2	21	42	3" x 1-1/2" x 1/8"	41
	DCP2	Diagonal Channel Parralel	2	21	42	3" x 1-1/2" x 1/8"	41
	DCP3	Diagonal Channel Parralel	2	21	42	3" x 1-1/2" x 1/8"	41
	DCP4	Diagonal Channel Parralel	2	21	42	3" x 1-1/2" x 1/8"	41
	RP1	Reinforcing Plate	1	21	21	9" x 9"	9
	RP2	Reinforcing Plate	2	21	42	9" X 4-1/2"	4.5
Floor	TB1	Transverse Beam	1	21	21	10" x 5" x 5/16"	108
	DCP5	Diagonal Channel Perpendicular	1	21	21	3" x 1-1/2" x 1/8"	51.5
	TBC	Transverse Bracing Channel	2	21	42	4" x 2" x 1/4"	75
	DBC1	Diagonal Bracing Channel	1	21	21	3" x 1-1/2" x 1/8"	89.2
	DBC2	Diagonal Bracing Channel	1	21	21	3" x 1-1/2" x 1/8"	89.2

Using the element list table created with the drawings, another excel table was developed, identifying the location of every member using XYZ coordinates. A partial view of this table in presented in Table 8-2. The locations identified in the table were used to develop a grid mesh in SAP2000 v21, the program adopted for the analysis.

Table 8-2: Elements Location Table

X			
meters	inches	Description	ID
0	0	Truss Start	a
0.05	2	1st Vertical Bar	b
0.177	7	Transverse Beam	c
0.7375	29	1st Bracing Center	d
1.019	40	1st Horizontal Frame Connection	e
1.475	58	2nd Vertical Bar	f
2.2125	87	2nd Bracing Center	g
2.543	100	2nd Horizontal Frame Connection	h
2.9	114	3rd Vertical Bar	i
2.95	116	Truss Finnish	j

Y			
meters	inches	Description	ID
0	0	Column Start	1
0.71	28	1st Bracing	2
2.41	95	2nd Bracing	3
4.11	162	3rd Bracing	4
4.41	174	Column Finnish	5
4.82	190	Truss Start	6
4.87	192	1st Channel	7
4.97	196	2nd Channel	8
5.147	203	Transverse Beam	9
5.6925	224	Center of Truss	10
6.365	251	Transverse Beam Bracing	11
6.415	253	3rd Channel	12
6.465	255	4th Channel	13

Z			
meters	inches	Description	ID
0	0	Transverse Beam Start	k
0.45	18	1st Column	l
0.55	22	1st Horizontal Bracing	m
1.4119	56	Half of Pedestrian Bridge	n
2.2238	88	2nd Horizontal Bracing	o
2.3738	93	2nd Column	p
2.8238	111	Transverse Beam Finnish	q

To build the model, a grid mesh system was created, as presented in Figure 8.1. For this, the dimensions known of the bridge either by site inspection or obtained from drawings or from the War Department Technical Manual 5-277, were taken into consideration. The supports of the bridge extreme towers were modeled as pin supports (as per the detail shown in Figure 8.2 and Figure 8.3).

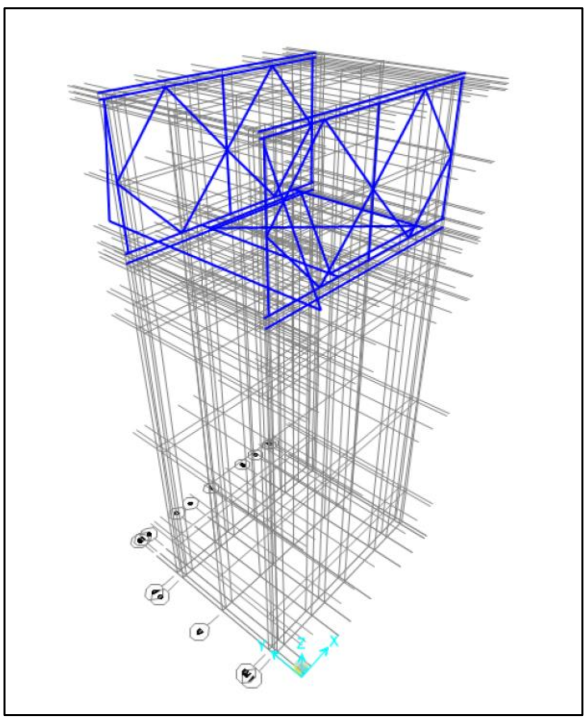


Figure 8.1: Grid Mesh Used to Develop the Analytical Model

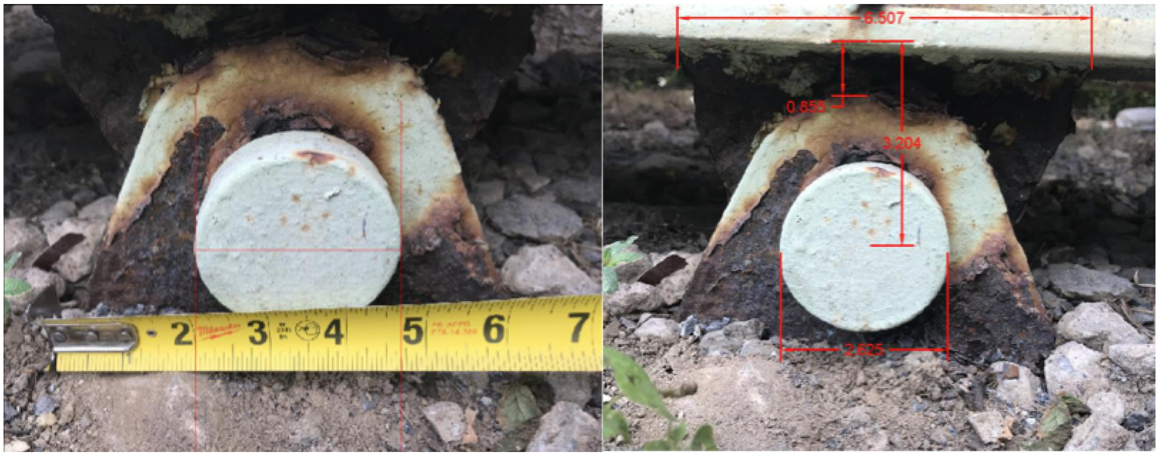


Figure 8.2: Frame Connection of Pedestrian Bridge with Column (1 of 2)

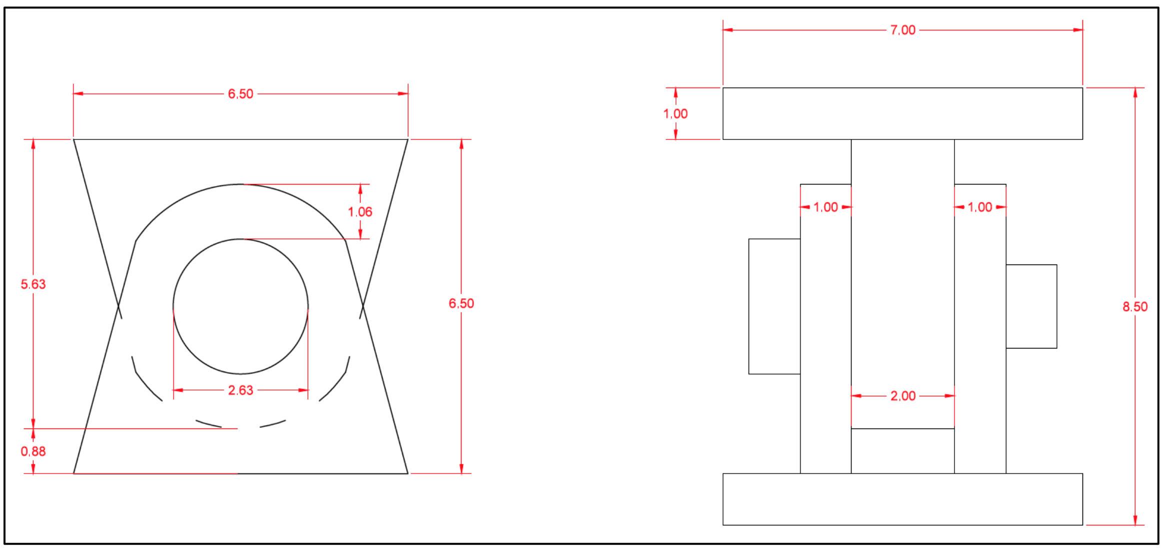


Figure 8.3: Frame Connection of Pedestrian Bridge with Column (2 of 2)

Figure 8.4 presents the simplified finite element model developed. The structural model adopted was a simplified bar element assembly, allowing 3D behavior. The model did not consider eccentricities, the effect of the bars used to support the security netting on top of the bridge, or the decking as a rigid diaphragm. All the bar elements have the shape obtained from the inspection and construction drawings. The main idea of the analysis was to propose a simple model and apply wind loads according to AASHTO specifications considering that the signs are not present, and then apply wind loads considering the presence of the signs. By comparing analysis results, it could be determined if the presence of the signs produced a significant increase on members strength demand on the elements located in the area that experienced plastic lateral deflections, by comparing interaction equation results in both cases (without and with signs).

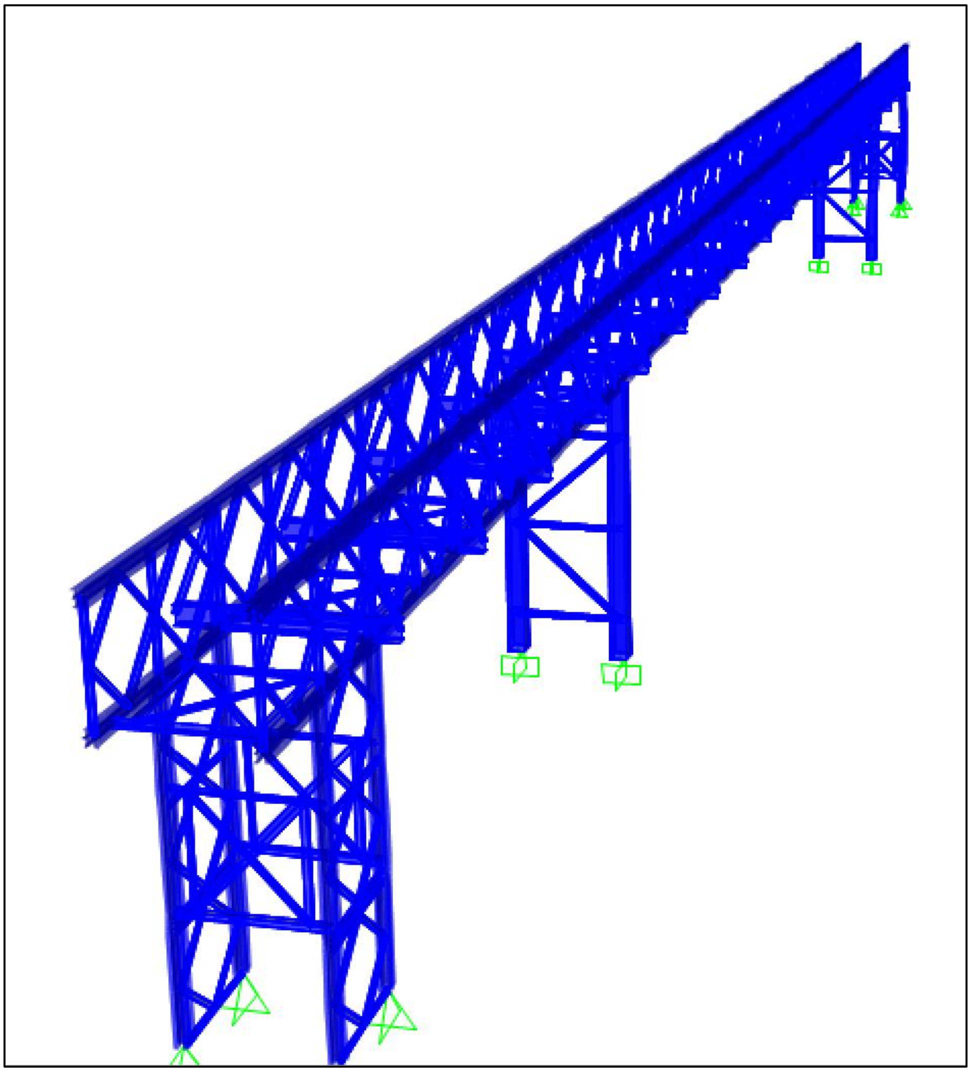


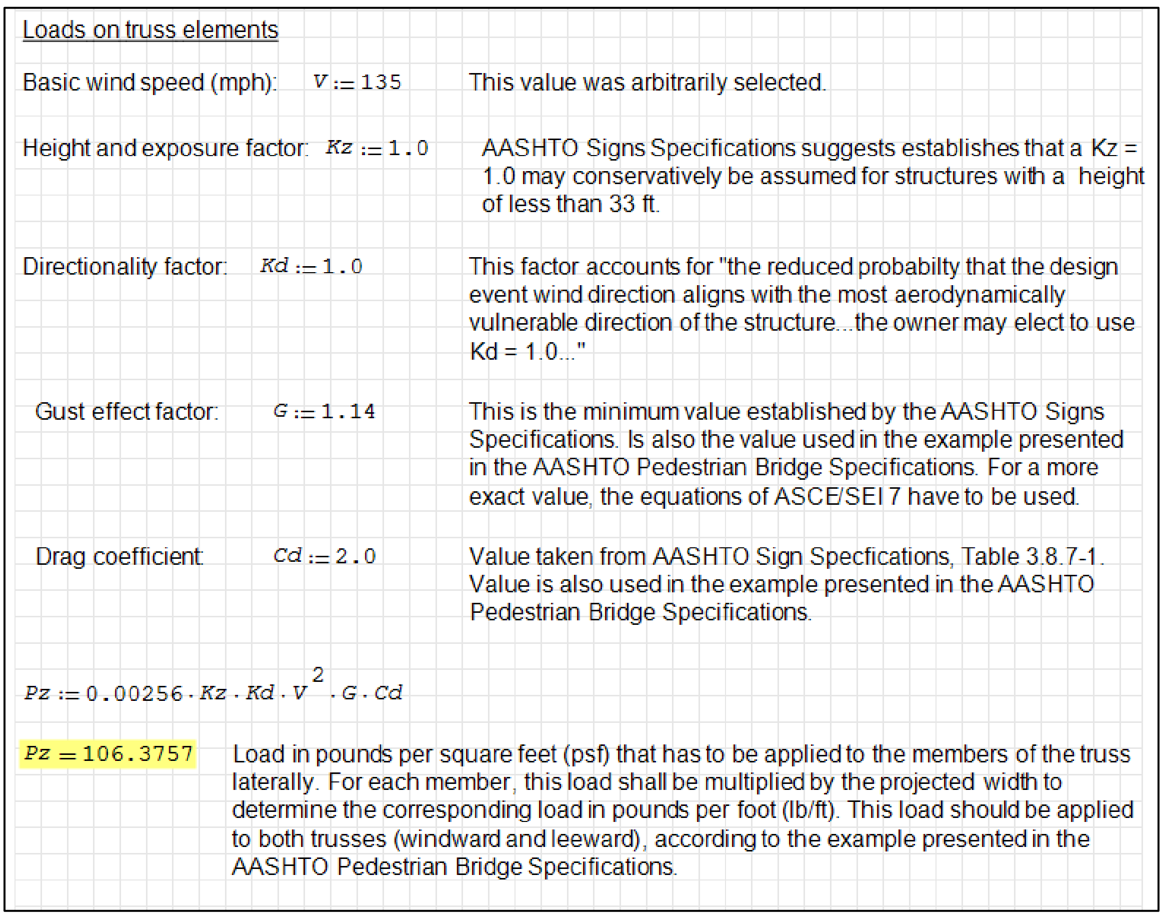
Figure 8.4: Simplified Finite Element Model

8.2 Analysis Without Signage

The first model analyzed was assuming no signage was installed in the pedestrian bridge, to determine the behavior of the bridge in its neutral state (previous to the installation of traffic signs).

Regarding wind loads, the *LRFD Guide Specification for the Design of Pedestrian Bridges* (AASHTO, 2009) refers to the AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals* for the calculation of wind loads. Therefore, wind loads were calculated according to the *LRFD Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals*, 1st edition (2015), with interim revisions of 2017 to 2020.

Considering a wind gust speed of 135 mph, the computations presented in Figure 8.5 summarize the computations to obtain the pressure over truss elements, which resulted in 106.4 psf.



Loads on truss elements

Basic wind speed (mph): $V := 135$ This value was arbitrarily selected.

Height and exposure factor: $Kz := 1.0$ AASHTO Signs Specifications suggests establishes that a Kz = 1.0 may conservatively be assumed for structures with a height of less than 33 ft.

Directionality factor: $Kd := 1.0$ This factor accounts for "the reduced probabilty that the design event wind direction aligns with the most aerodynamically vulnerable direction of the structure...the owner may elect to use Kd = 1.0..."

Gust effect factor: $G := 1.14$ This is the minimum value established by the AASHTO Signs Specifications. Is also the value used in the example presented in the AASHTO Pedestrian Bridge Specifications. For a more exact value, the equations of ASCE/SEI 7 have to be used.

Drag coefficient: $Cd := 2.0$ Value taken from AASHTO Sign Specfications, Table 3.8.7-1. Value is also used in the example presented in the AASHTO Pedestrian Bridge Specifications.

$$Pz := 0.00256 \cdot Kz \cdot Kd \cdot V^2 \cdot G \cdot Cd$$

$Pz = 106.3757$ Load in pounds per square feet (psf) that has to be applied to the members of the truss laterally. For each member, this load shall be multiplied by the projected width to determine the corresponding load in pounds per foot (lb/ft). This load should be applied to both trusses (windward and leeward), according to the example presented in the AASHTO Pedestrian Bridge Specifications.

Figure 8.5: Summary of Computations for Wind Pressure over Truss Elements

Figure 8.6 presents an image of the resulting lateral deflections due to wind action, while Figure 8.7 presents the results of the design check, showing that the interaction equation results in most of the elements in the plastic deflected area working at low stress demand.

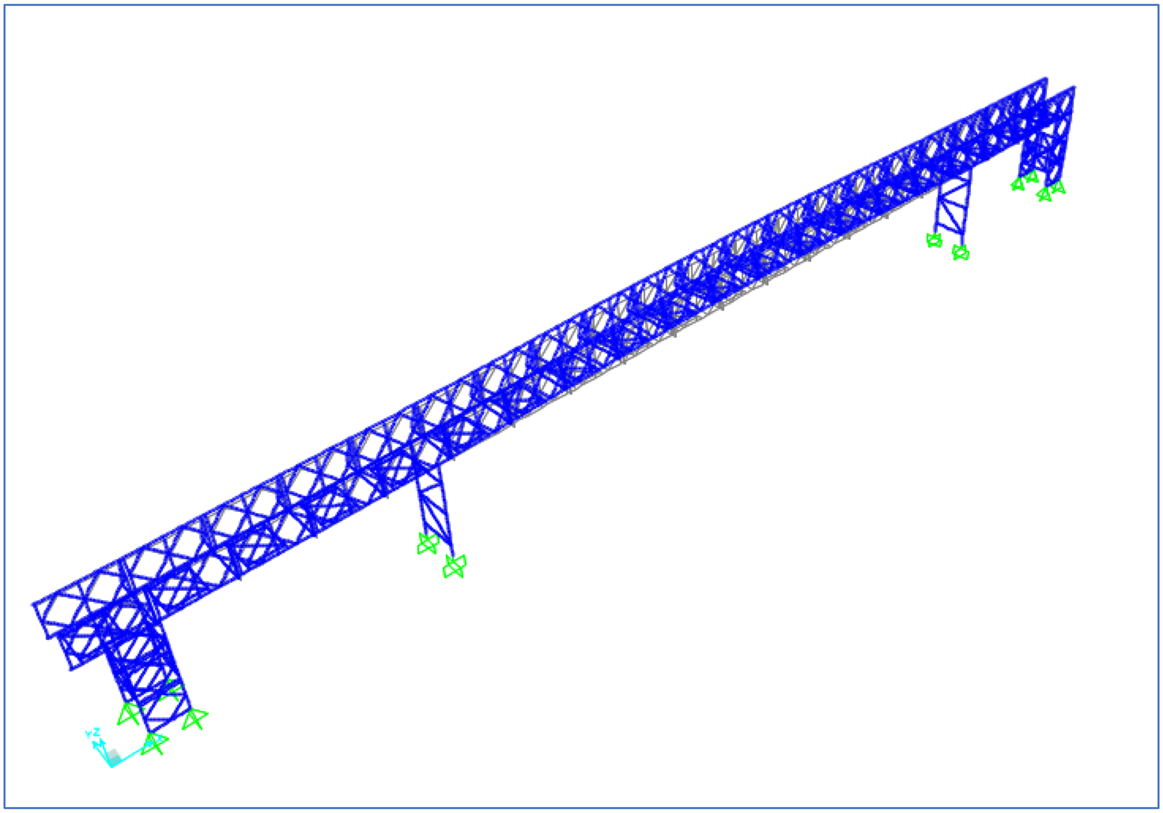


Figure 8.6: Lateral Deflections due to Wind - Without Signs

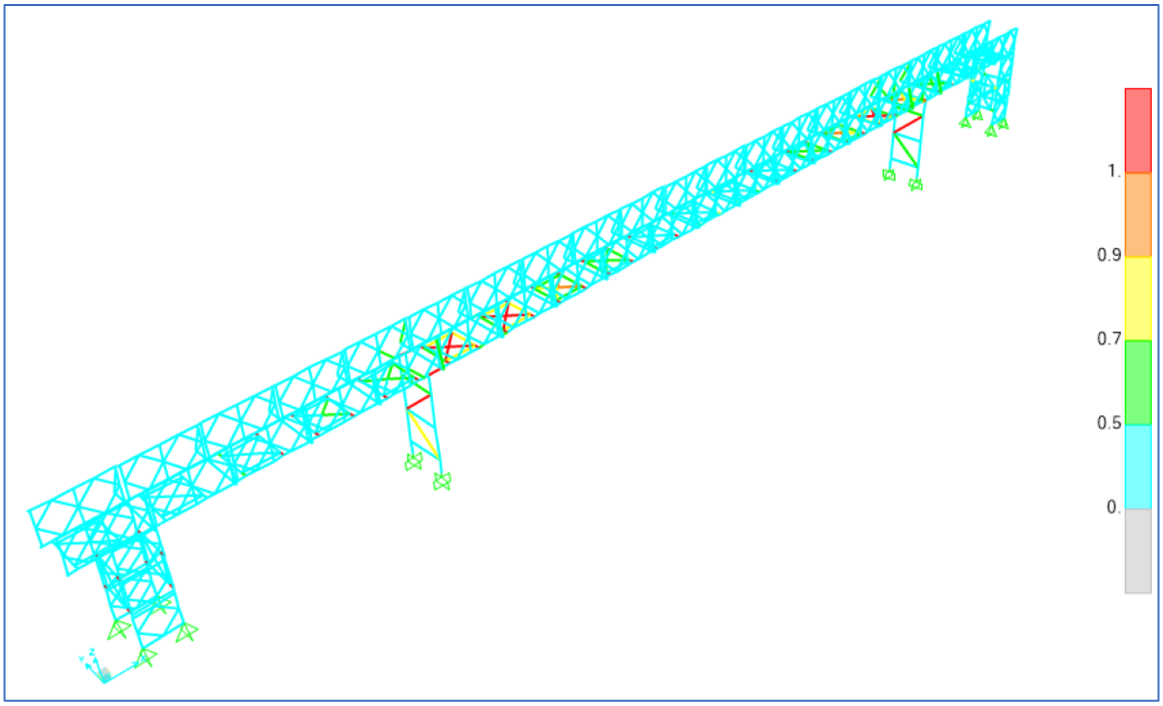


Figure 8.7: Interaction Equation (Strength Demand) Results - Without Signs

8.3 Analysis with Signage

The second model that was created was of the pedestrian bridge with the signage installed. With this model, the bridge can be analyzed to understand the implications that the signage brought to the bridge. Figure 8.8 illustrates the signage that was installed on the bridge at the time Hurricane Maria made landfall in Puerto Rico. Figure 8.9 through Figure 8.11 illustrate the structure that held the signage in place. From Figure 8.11 it was determined that the structure that held the signage in place had 5 vertical beams, and from Figure 8.10 it is evident that the beams were attached to the truss vertical channels with U-bolts in two points.

Figure 8.8: Signage Installed at the Pedestrian Bridge

Figure 8.9: Signage Support Structure (1 of 3)

Figure 8.10: Signage Support Structure (2 of 3)

Figure 8.11: Signage Support Structure (3 of 3)

Since the transportation signs had been removed previous to the moment of inspection, the dimensions of the signs were estimated from previous photos as 35-ft wide ad 10-ft in height. It was assumed that the distribution of loads to the supporting beams was by tributary areas, and that each beam, in turn, distributed half the load to each support. To evaluate an overall response, instead of a local response, these support loads were applied directly to the top and bottom chord in the connection of the vertical elements to the chord.

Figure 8.12 presents an image of the resulting lateral deflections due to wind action. It can be appreciated that the general behavior observed on the bridge, with the plastic deformation, is captured.

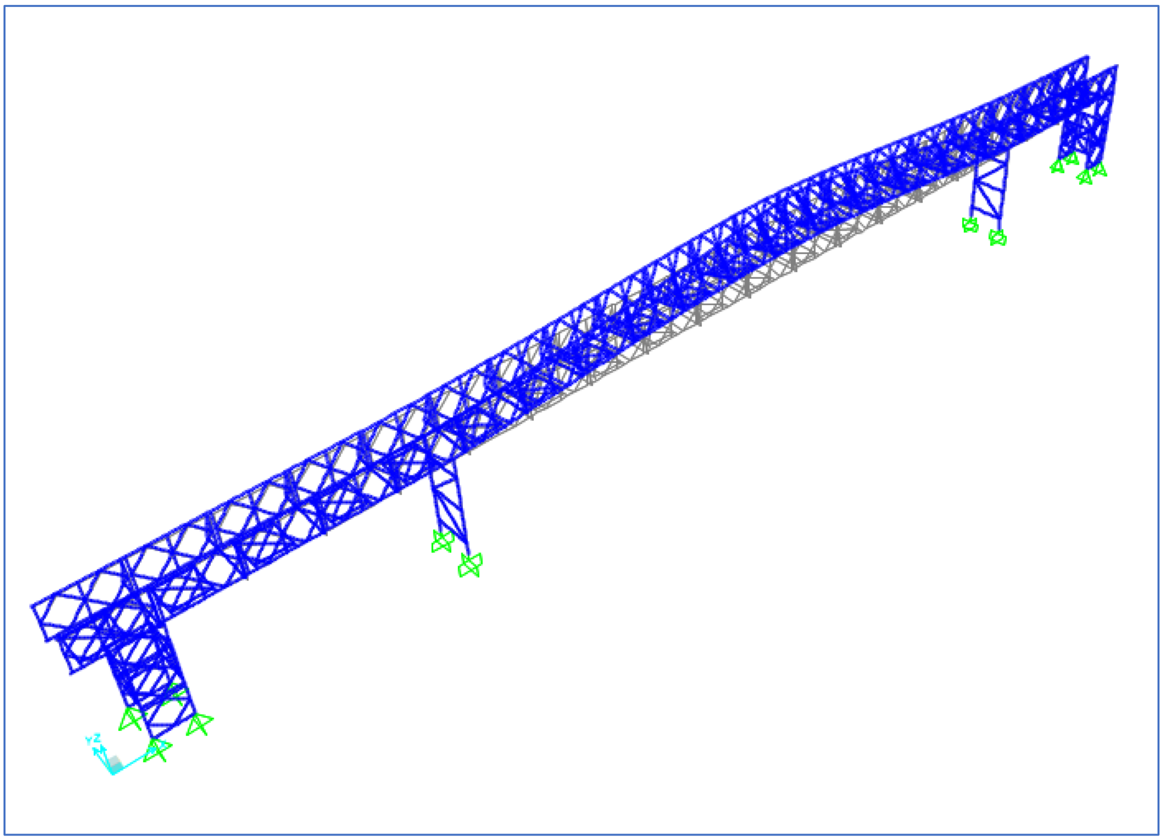


Figure 8.12: Lateral Deflections due to Wind - With Signs Included

Figure 8.13 displays the results of the design check, showing that the interaction equation results in most of the elements in the plastic deflected area working with a much higher stress demand that the previous analysis. This leads to the conclusion that the installation of the signs had an important role in the lateral inelastic deformations.

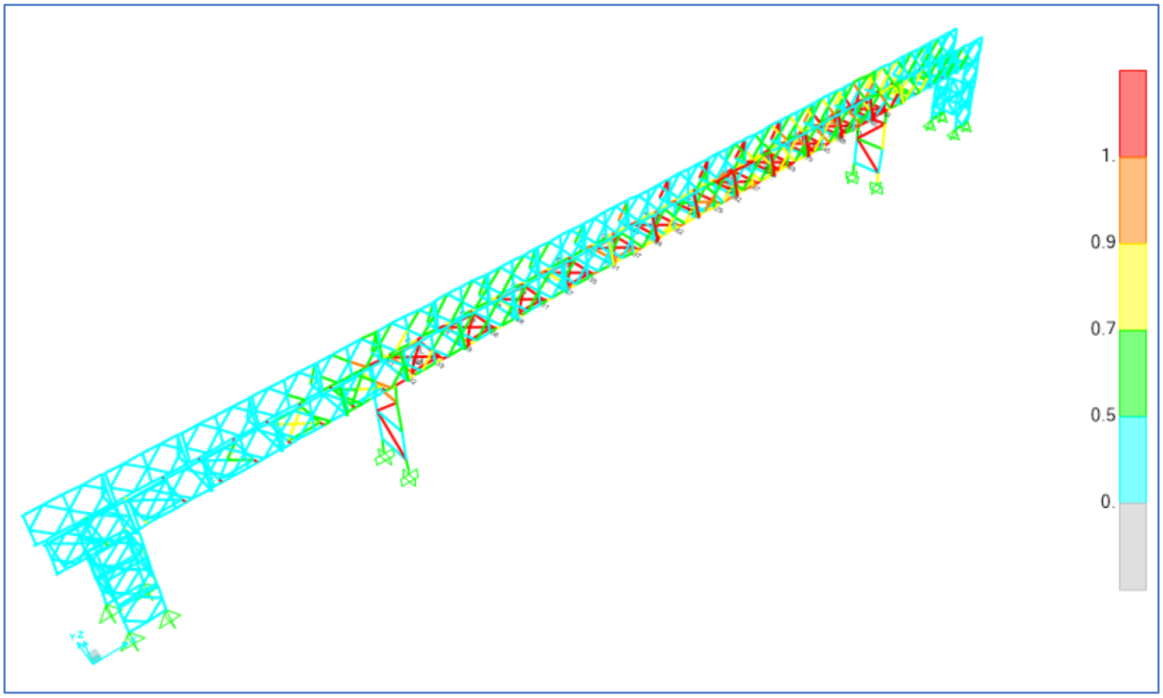


Figure 8.13: Interaction Equation (Strength Demand) Results - With Signs Included

8.4 Results analysis

The simplified FE analysis proposed demonstrated that large signs may impose significant overstress in bridge elements, and that the signs should have played a major role in the inelastic lateral deflections that the bridge experienced due to Hurricane Maria.

In addition to the presence of the signs, the resulting inelastic lateral deflections that actually occurred in the bridge may have been aggravated by: (a) the presence of many corroded elements and connections, (b) the detail of hinge support (explained below), and (c) the detail of sign connection to the truss (also explained below).

Figure 8.14 displays that the hinge support plate appeared to have experienced lateral deflection, resulting in twisting of the upper beam. This situation may be probably due to eccentricity between the lateral load applied by chords on top of the beam and the hinge location. Figure 8.15 presents other view of this situation. This condition requires further study to assess a proper design and may be an extension of current project.

Figure 8.14: Eccentricity of Pin-Plate and Lateral Load

Figure 8.15: Twisted Pin-Plate and Supporting Beam

Due to their layout (see Figure 8.16), sign supports applied significant load to the top chord (with lateral bracing trough transverse beams and diagonals) that may be responsible of the resulting twisting of the truss panel displayed in Figure 8.17.

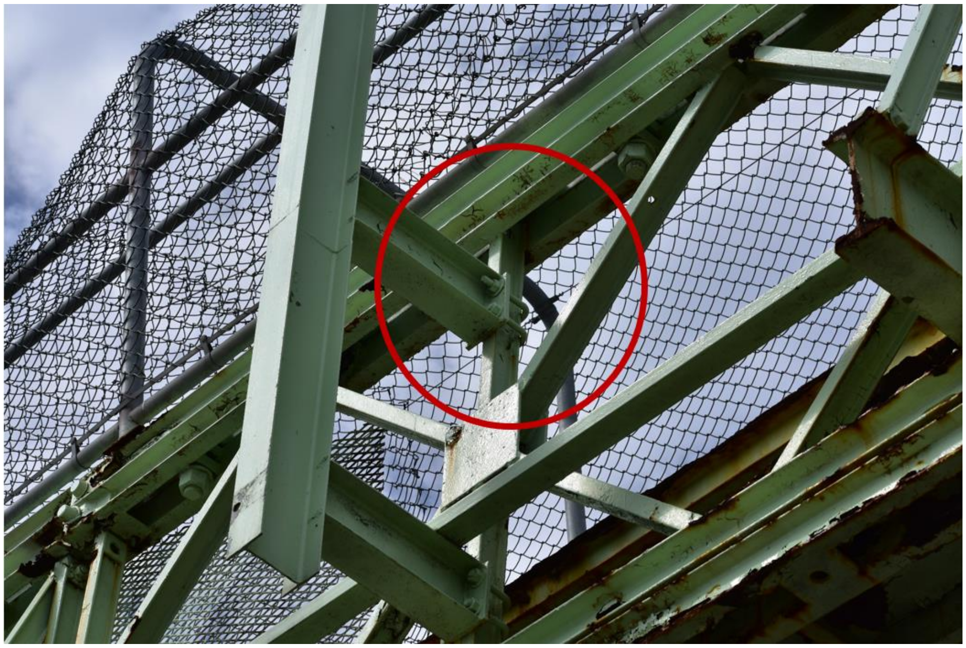


Figure 8.16: Location of the Signs Support

Figure 8.17: Twist of the Truss Panel

9 Conclusions and Recommendation

The main conclusions and recommendations of the project are the following:

- The visual inspection revealed advanced corrosion in almost all components of the bridge, that presented loss of section, loose connections, and some missing elements.
- The condition assessment based on the visual inspection resulted in a severe condition for all the components evaluated.
    - The bridge would have been probably dismantled despite the inelastic lateral deflections.
    - It was also a significantly old bridge (1968), 49 years old at the time of Hurricane Maria, probably near its expected service live.
- The simplified FE analysis performed demonstrated that large signs may impose significant overstress in bridge elements. This leads to the conclusion that the installation of the signs had an important role in the lateral inelastic deformations experienced by the bridge during Hurricane Maria.
- In addition to the presence of the transportation signs, the resulting inelastic lateral deflections that actually occurred in the bridge may have been aggravated by:
    - The presence of corroded elements and connections.
    - The details of truss hinge support.
    - The details of sign connection to the bridge elements.
- Placing signs on existing bridges should be avoided without the proper:
    - Analysis to determine if reinforcement of the structure is required.

- Design (and maintenance) of the sign support.

The analysis and design should be performed according to current codes (treated as a retrofit), to assure resilience under current design loads and state of the practice.

References

AASHTO. (2009). *LRFD Guide Specifications for the Design of Pedestrian Bridges.* Washington, DC: American Association of State Highway and Transportation Officials.

AASHTO. (2013). *Manual for Bridge Element Inspection.* Washington, DC: American Association of State Highway and Transportation Officials.

AASHTO. (2015). *LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals* (6th ed.). Washington, DC: American Association of State Highway and Transportation Officials.

AASHTO. (2020). *LRFD Bridge Design Specifications* (9th ed.). Washington, DC: American Association of State Highway and Transportation Officials.

ASTM E8. (2016). *Standard Test Methods for Tension Testing of Metallic Materials.* West Conshohocken, PA: ASTM International.

Chen, W.-F., & El-Metwally, S. E.-D. (2011). *Understanding Structural Engineering.* CRC Press.

Gere, J. M., & Goodno, B. J. (2008). *Mechanics of Materials* (7th ed.). Toronto, ON, Canada: Cengage Learning.

Mabey Bridge. (2019). *Bridging the World: Connecting People and Places.* Retrieved 05 10, 2020, from Mabey Bridge: https://www.mabeybridge.com/__data/assets/pdf_file/0019/8263/Mabey-Bridge-Bridging-the-World.pdf

Pasch, R. J., Penny, A. B., & Berg, R. (2019). *National Hurrciane Center Tropical Cyclone Report: Hurricane Maria (AL 152017) 16-30 September 2017.* National Oceanic and Atmospheric Administration (NOAA). Retrieved June 1, 2021, from https://www.nhc.noaa.gov/data/tcr/AL152017_Maria.pdf

Roberge, P. R. (1999). *Handbook of Corrosion Engineering.* New York: McGraw-Hill.

U.S. War Department. (1943). *Fixed Steel Panel Bridge Bailey Type (War Department Technical Manual TM 5-277).* Washington, DC: United States Government Printing Office.

Appendix A – Bridge Drawings 2001

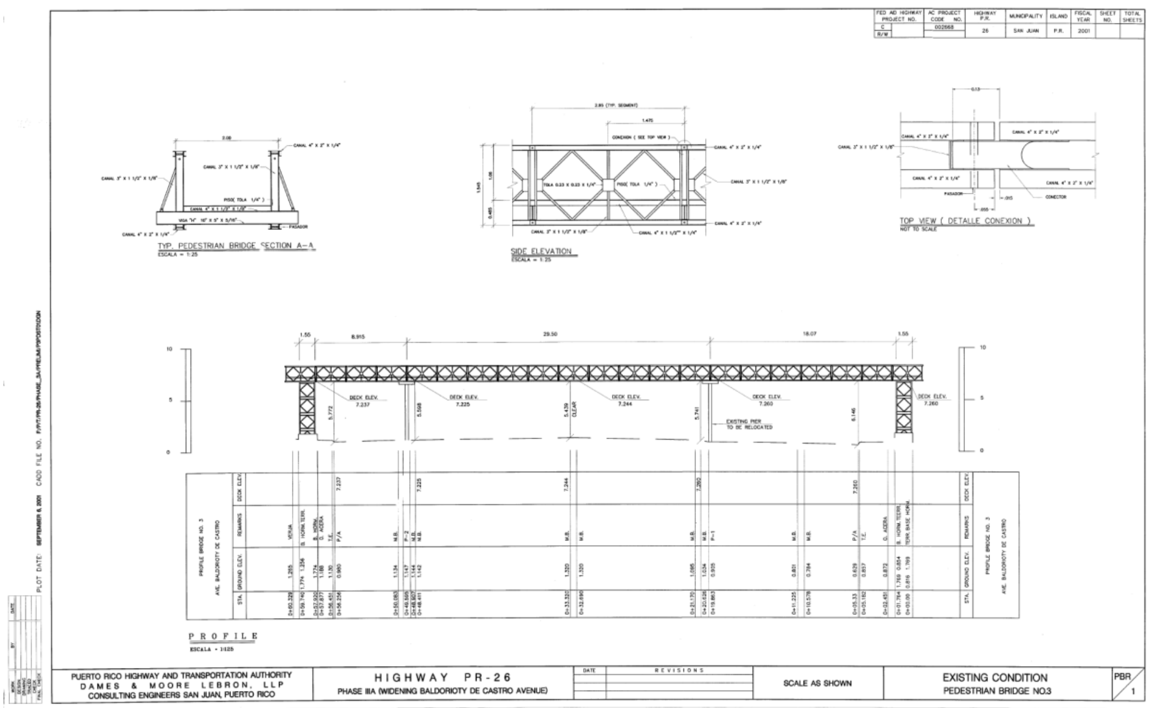


Figure A - 1: Bridge Drawings 2001 – Sheet 1

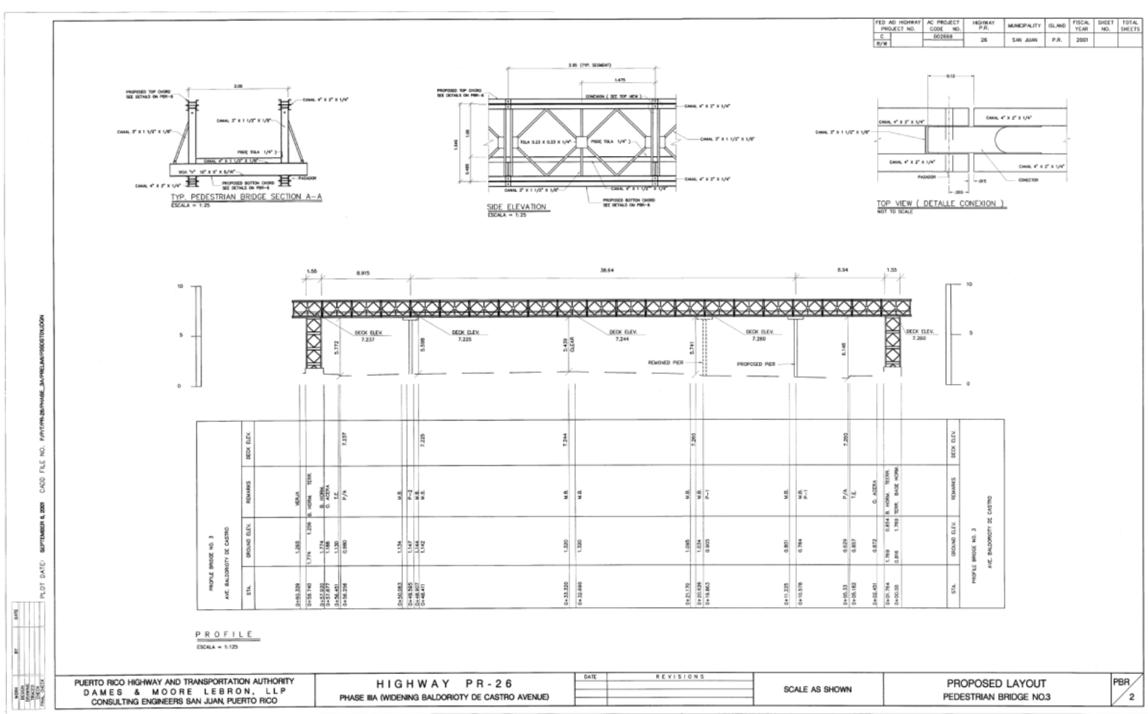


Figure A - 2: Bridge Drawings 2001 – Sheet 2

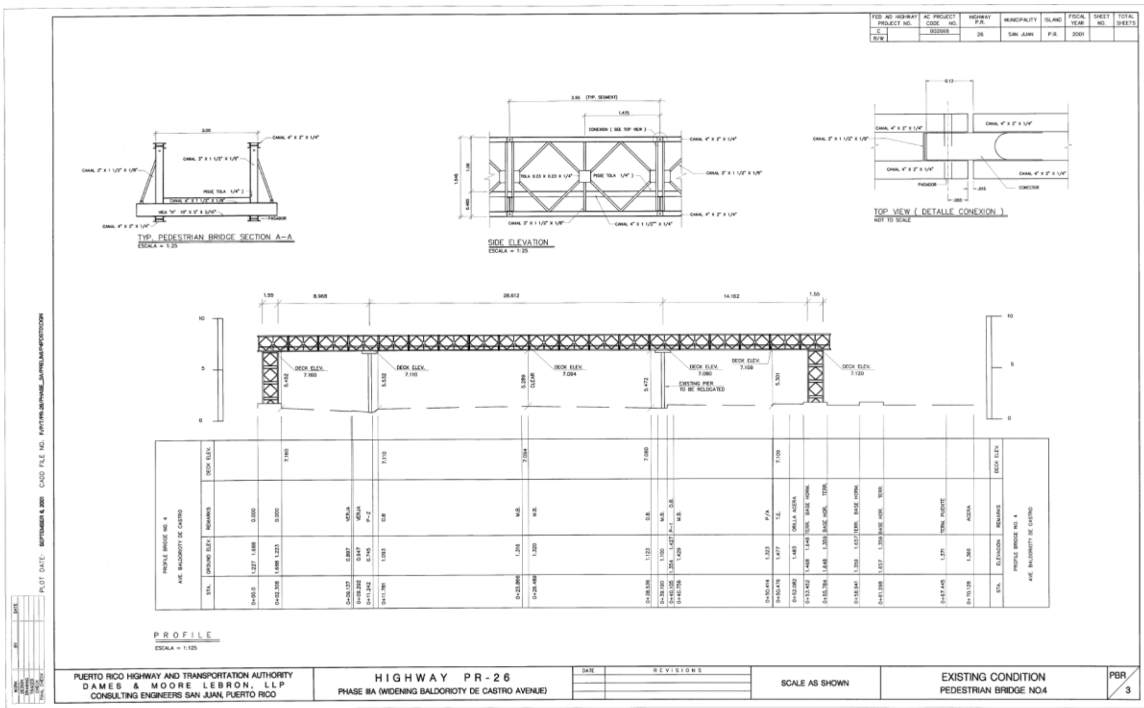


Figure A - 3: Bridge Drawings 2001 – Sheet 3

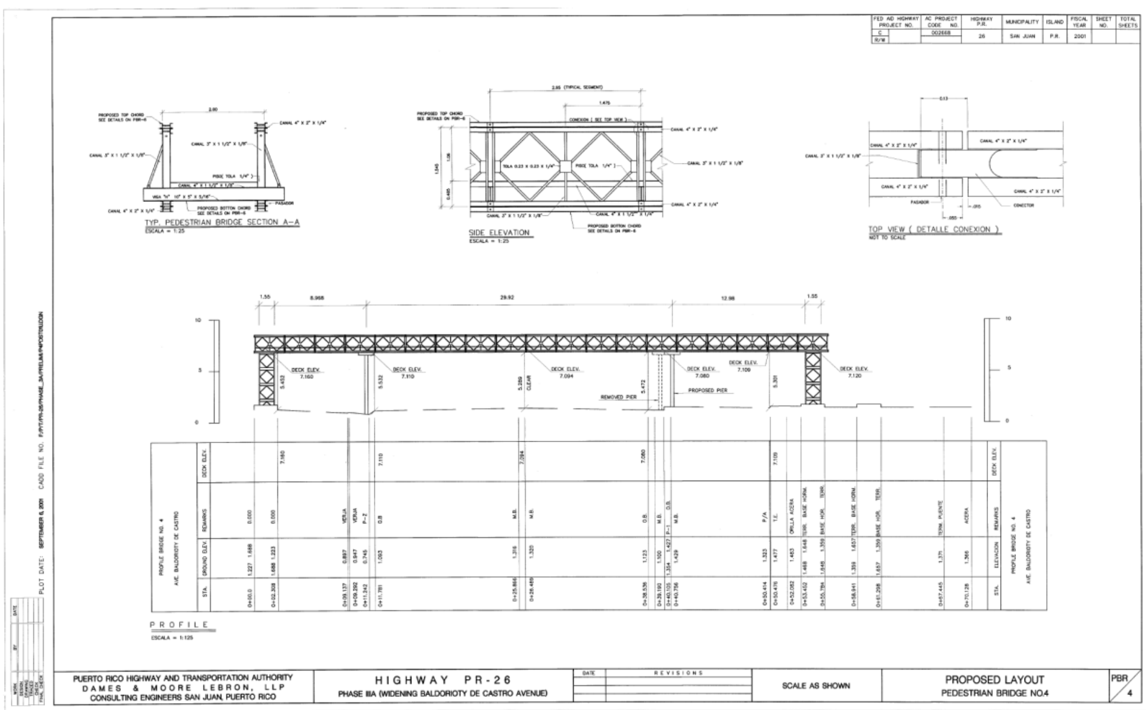


Figure A - 4: Bridge Drawings 2001 – Sheet 4

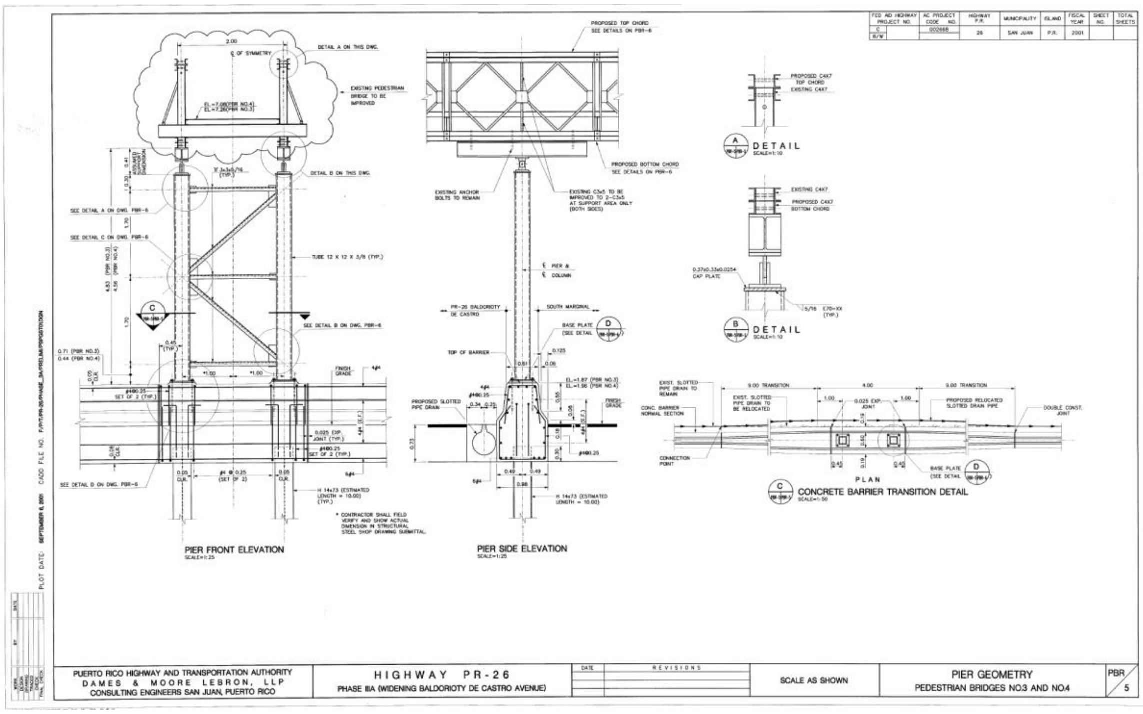


Figure A - 5: Bridge Drawings 2001 – Sheet 5

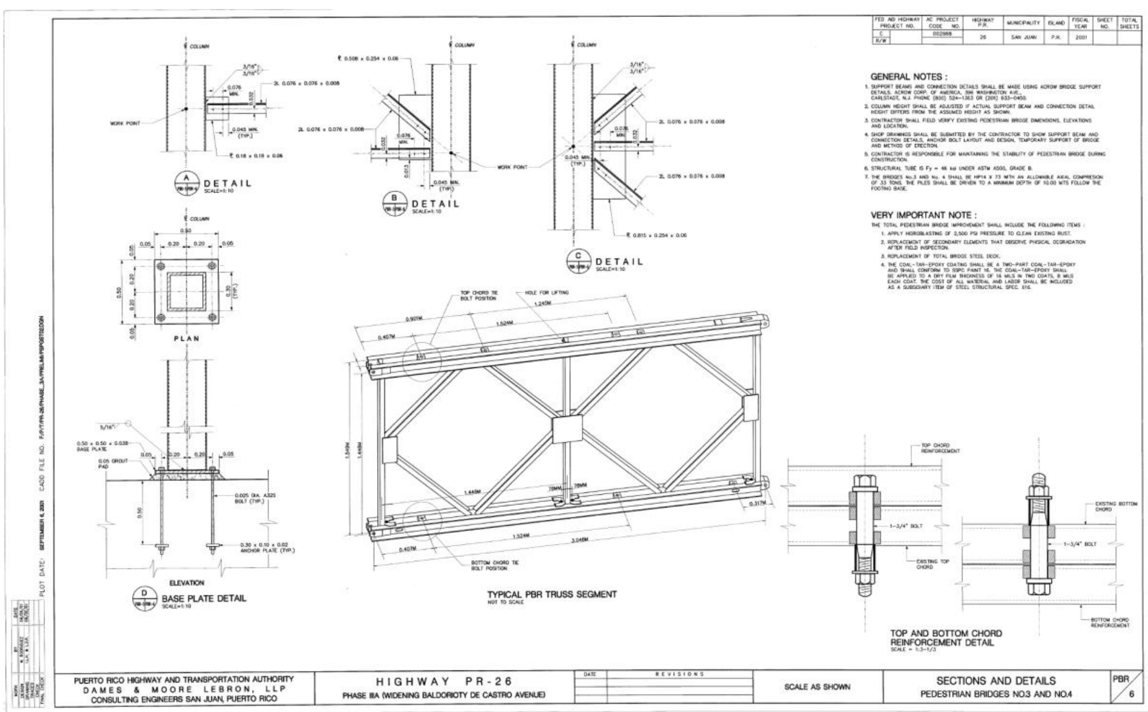


Figure A - 6: Bridge Drawings 2001 – Sheet 6

Appendix B - Collection of images of the bridge

Figure B - 1: East side panels from right to left 1, 2 & 3

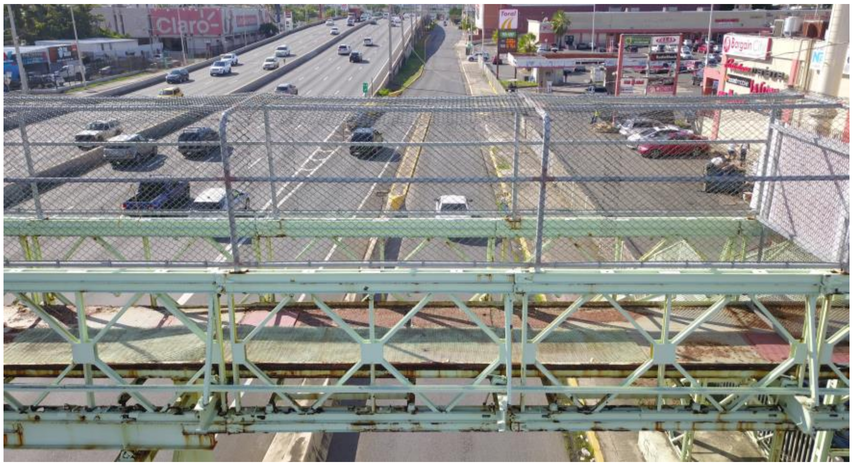


Figure B - 2: East side panels from right to left 2, 3 & 4

Figure B - 3: East side panels from right to left 3, 4 & 5

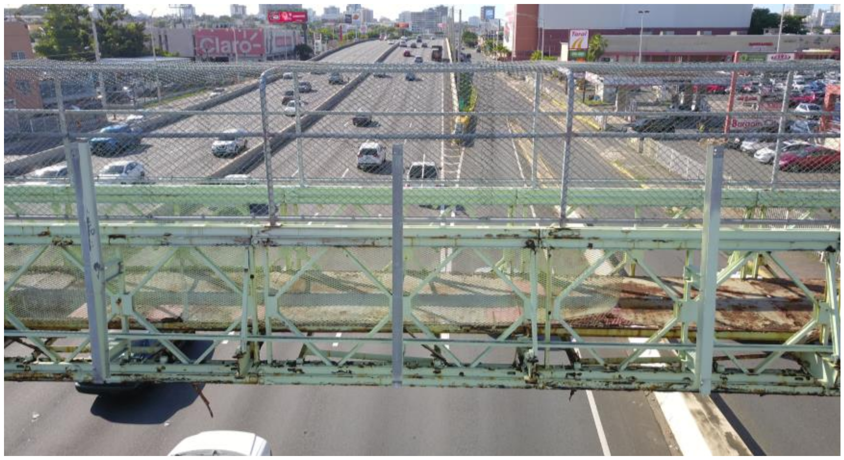


Figure B - 4: East side panels from right to left 3, 4 & 5

Figure B - 5: East side panels from right to left 6, 7 & 8

Figure B - 6: East side panels from right to left 8, 9 & 10

Figure B - 7: East side panels from right to left 9, 10 & 11

Figure B - 8: East side panels from right to left 10, 11 & 12

Figure B - 9: East side panels from right to left 10, 11, 12 & 13

Figure B - 10: East side panels from right to left 11, 12, 13 & 14

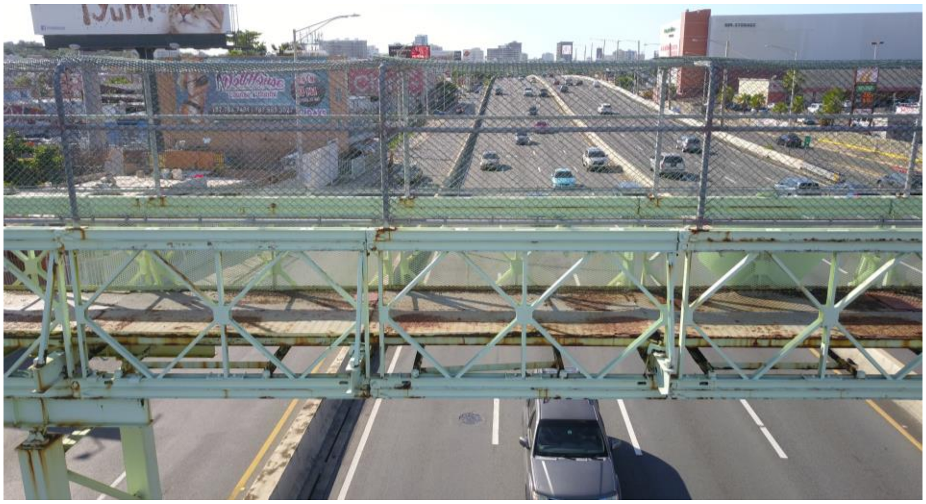


Figure B - 11: East side panels from right to left 13, 14 & 15

Figure B - 12: East side panels from right to left 16, 17, 18 & 19

Figure B - 13: East side panels from right to left 17, 18, 19 & 20

Figure B - 14: West side panels from left to right 1, 2, 3 & 4


Figure B - 15: West side panels from left to right 2, 3, 4 & 5

Figure B - 16: West side panels from left to right 4, 5, 6 & 7

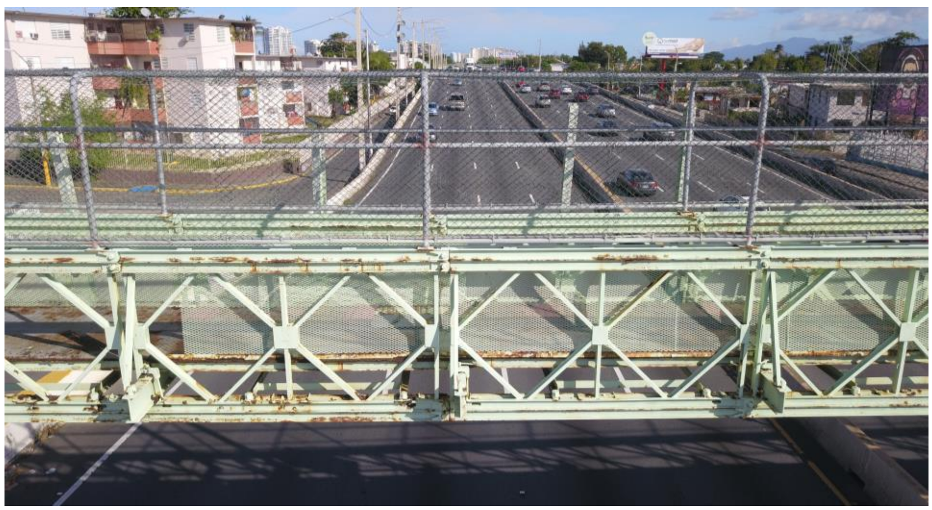


Figure B - 17: West side panels from left to right 6, 7, 8 & 9

Figure B - 18: West side panels from left to right 8, 9, 10 & 11

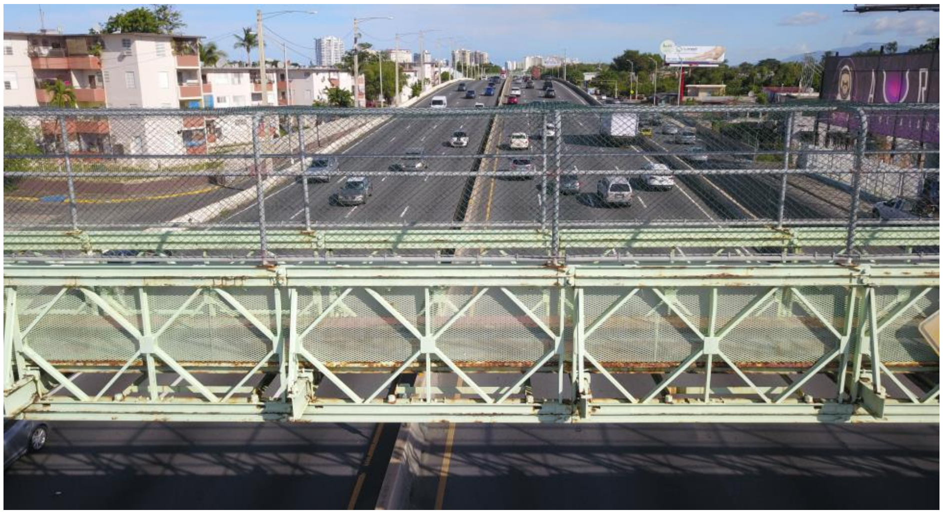


Figure B - 19: West side panels from left to right 10, 11, 12 & 13

Figure B - 20: West side panels from left to right 11, 12, 13 & 14

Figure B - 21: West side panels from left to right 13, 14, 15 & 16

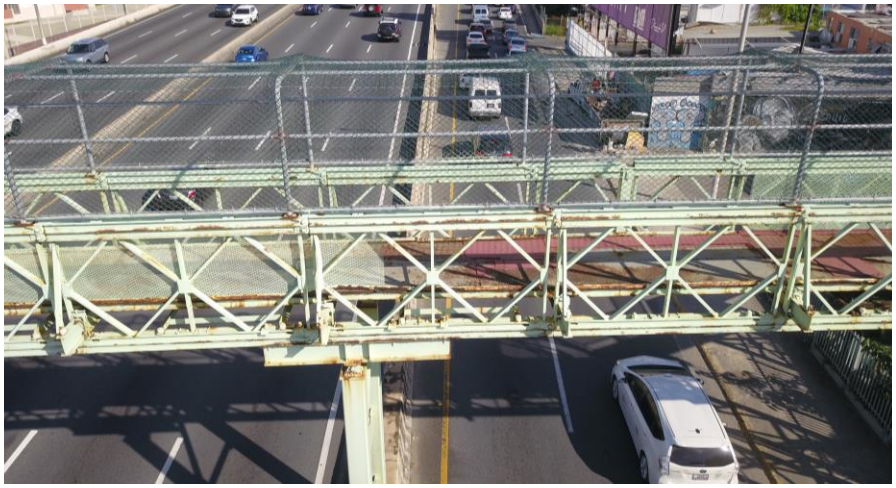


Figure B - 22: West side panels from left to right 14, 15, 16, 17 & 18

Figure B - 23: West side panels from left to right 17, 18, 19 & 20

Figure B - 24: West side panels from left to right 17, 18, 19 & 20

Appendix C – Letter Requesting Bridge Samples

UNIVERSIDAD POLITÉCNICA
SAN JUAN • ORLANDO • MIAMI

Escuela de Ingeniería, Agrimensura y Ciencias Geoespaciales

377 Ponce de León Ave.
Hato Rey, PR 00918
(787) 622-8000
www.pupr.edu

22 de abril de 2019

A quien pueda interesar:

La Universidad Politécnica de Puerto Rico recinto de San Juan se encuentra realizando un proyecto de investigación sobre el efecto del huracán María en la infraestructura de trasportación. Se tomó como caso de estudio con el puente peatonal que se encontraba en el Km 4.1 del Expreso Román Baldorioty de Castro, San Juan, Puerto Rico. El mismo fue removido recientemente ya que representaba un peligro para los peatones y el expreso Román Baldorioty de Castro.

El caso de estudio surge luego del huracán María ya que se observó que el puente había sufrido deflexiones laterales permanentes. Se entiende que la deflexión es resultado de los fuertes vientos producidos por el huracán sobre un rotulo que se encuentra en el puente. El propósito general del caso de estudio es obtener los datos sobre la geometría y materiales del puente, para luego desarrollar modelos avanzados del mismo y poder obtener las velocidades del viento del Huracán María que provocaron las deflexiones, y corroborar si la presencia de los letreros fue determinante en la respuesta o no.

Como parte del caso del estudio nos interesa obtener piezas del puente para poder determinar, mediante pruebas de laboratorio, las propiedades mecánicas del material que se utilizó para construir el puente en la década del 60. Por este medio le solicitamos si es posible pasar por las facilidades de donde se encuentra el puente para remover algunas piezas las cuales nos ayudarán con el caso de estudio. Muchas gracias de ante mano por su colaboración; la misma será muy valiosa para PR y el entendimiento de los efectos del huracán María en la isla.

Cordialmente,

Gustavo E. Pacheco-Crosetti, PhD, PE
Director, Transportation Infrastructure Research Center - TIRC
Full Professor, Department of Civil Engineering, Environmental Engineering and Land Surveying
Polytechnic University of Puerto Rico

SAN JUAN • ORLANDO • MIAMI
PO Box 192017 • San Juan, PR 00919-2017 • 787.622.8000 • www.pupr.edu