PS Form 10-900
United States Department of the Interior
National Park Service

OMB No. 1024-0018

National Register of Historic Places Registration Form

1. Name of Property

Historic name: Carretera Núm. 6

Other names/site number: PR-123 / PR-10 / PR- 6609 / Antigua #10/ Road #6

Name of related multiple property listing: N/A

(Enter "N/A" if property is not part of a multiple property listing)

2. Location

Street & Number:

City or town: Ponce / Adjuntas / Utuado/ Arecibo State: PR County: Ponce / Adjuntas / Utuado / Arecibo

Not for publication [] Vicinity [X]

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this [X] nomination [] request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property [X] meets [] does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance: [] national [X] statewide [] local

Applicable National Register Criteria: [X] A [] B [X] C [] D

Carlos A. Rubio - Cancela State Historic Preservation Officer — August 2, 2021

Signature of certifying official/Title: — **Date**

Puerto Rico State Historic Preservation Office

State or Federal agency/bureau or Tribal Government

In my opinion, the property [] meets [] does not meet the National Register criteria.

Signature of Commenting Official — **Date**

Title — **State of Federal agency/bureau or Tribal Government**

4. National Park Service Certification

I, hereby, certify that this property is:

[X] entered in the National Register.
[ ] determined eligible for the National Register.
[ ] determined not eligible for the National Register.
[ ] removed from the National Register.
[ ] other, (explain):

James Gabbert — 9/14/2021

Signature of Keeper — **Date of Action**

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5. Classification

Ownership of Property (Check as many boxes as apply)

- [] Private
- [X] Public-local
- [X] Public-state
- [] Public-federal

Category of Property (Check only **one** box)

- [] Building(s)
- [X] District
- [] Site
- [] Structure
- [] Object

Number of Resources within Property (Do not include previously listed resources in the count.)

Contributing	Noncontributing	
2	**0**	Buildings
0	**0**	Sites
244	**2**	Structures
0	**0**	Objects
246	**2**	Total

Number of contributing resources previously listed in the National Register

6. Function or Use

Historic Functions (Enter categories from instructions.)	**Current Functions** (Enter categories from instructions.)
TRANSPORTATION/ road-related	TRANSPORTATION/ road-related

7. Description

Architectural Classification (Enter categories from instructions.)

Materials (enter categories from instructions.)

Principal exterior materials of the property: Asphalt, masonry, brick, stone, iron, concrete, steel, wood

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Description

Summary Paragraph (Briefly describe the general characteristics of the property, such as its location, type, style, method of construction, setting, size, and significant features. Indicate whether the property has historic integrity.)

Carretera Núm. 6, with its historic course built between 1880 and 1904, is a stretch of asphalted road of almost ninety kilometers in length that crosses Puerto Rico in a winding north to south direction connecting the northern city of Arecibo, to the southern city of Ponce. The second road within Spain's 19th century *Plan Carretero* to cross the island form north to south, this engineering marvel runs from the coastal plains of the Atlantic Ocean to the coastal plains of the Caribbean Sea, cutting its way throughout some of the most challenging terrain, topographically and scenery wise, in the western portion of the *Cordillera Central*, the continental divide than runs east to west along the island's center. Along its path, **Carretera Núm. 6** connects the municipalities of Ponce, Adjuntas, Utuado and Arecibo. **Carretera Núm. 6,** a linear district, is composed of several contributing resources, among these, the road itself, bridges, historic culverts, and *casillas de peones camineros*.

Depending on the source and period, **Carretera Núm. 6** has been estimated to be between seventy-four (74) to almost ninety (90) kilometers in length. Using today's road designations, as established by the *Departamento de Transportación y Obras Públicas (DTOP/*Department of Transportation and Public Works), the old **Carretera Núm. 6** route corresponds to sections identified as PR-123, PR-6609 and PR-10. Using these three designations, the length of the road is about ninety (89.5) kilometers from Ponce's town square; to Adjuntas'; to Utuado's; and ending in Arecibo's town square.[1] (**Fig. 1**)

Carretera Núm. 6's construction period is extremely significant to understand the road intrinsic composition. Less than twenty kilometers were built during the late part of the Spanish control upon the island, with almost sixty kilometers completed during the early years of the new American administration in Puerto Rico after the Spanish American War in 1898. The road shows this transition in its construction techniques and materials. Many surviving structures representative of these changes and construction approaches were documented as part of a survey conducted to support this nomination effort.

[1] The length of ninety (90) kilometers is just an estimation using the municipalities' town squares as a distinguishable reference point. In actuality, **Carretera # 6**, when built in the late 19th and early 20th century, was shorter than that. The road spliced with existing roads prior to reach to urban core of the mentioned towns.

A look at 19th century maps and drawings, different United States Geological Survey maps from the 1940s until the 1980s, and present aerial photographs, show the integrity of **Carretera Núm. 6**'s in terms of its historical course and footprint. With expected deviations due to more than one hundred and forty years of continuous use, urban developments, new available routes and road regulations, a large section of today's **Carretera Núm. 6** traverses practically the very same route of the macadam road started in 1880 and finished by 1904.

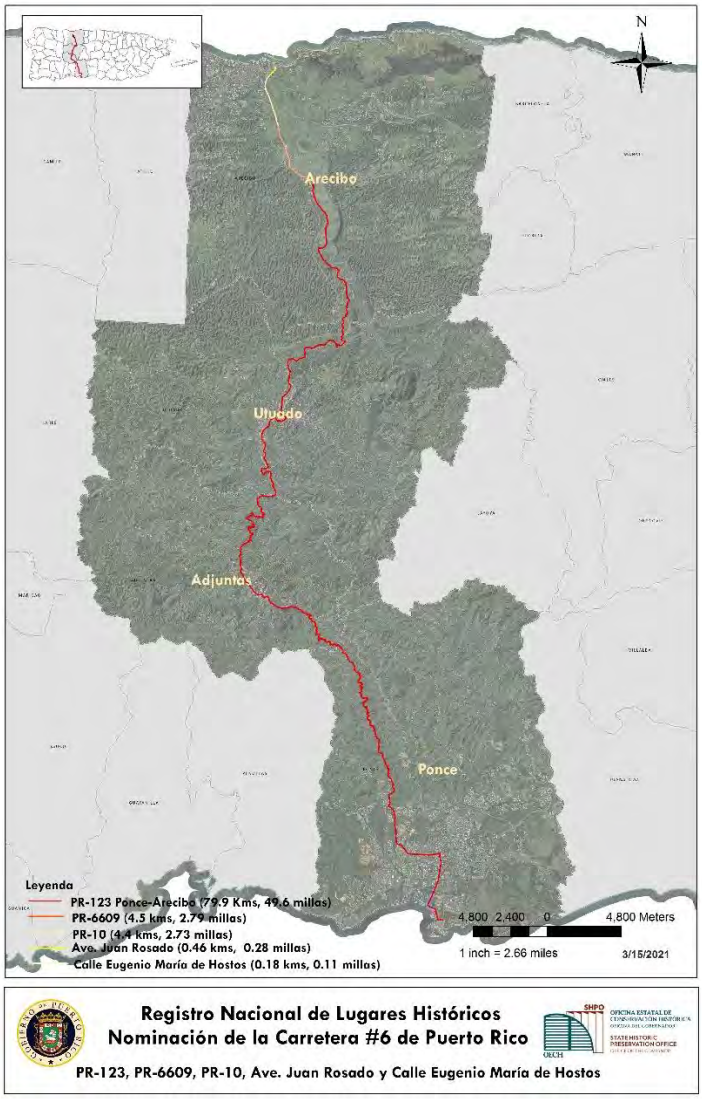

Figure 1. Map shows todays PR-123, PR-6609, PR-10 and two minor municipal roads within Arecibo's urban core. The historical route of **Carretera Núm. 6** is comprise within these roads, mostly within PR-123. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2019)

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Narrative Description (Describe the historic and current physical appearance and condition of the property. Describe contributing and noncontributing resources if applicable.**)**

The Sections

Using Playa Ponce as a starting and reference point, **Carretera Núm. 6** (under its current designation as PR-123) runs north towards Ponce's urban center, turning later westerly. At a point, the route turns northwest for thirty-five kilometers, until reaching Adjuntas's urban core. On its northwesterly direction, the road uses the Río Canas' valley in a tortuous climbing from the flat land in its southern end, towards Adjuntas, town sitting in a much higher level at the mid-point of the Cordillera Central. (**Fig. 2**) The research conducted on primary sources revealed that the first fifteen (15) kilometers of the road from Ponce to Adjuntas were completed while the island was a possession of the Spanish government. Those fifteen kilometers are comprise today within kilometers 6 to 21 in PR-123. The resources found on this section of the road as part of the survey conducted support that finding.

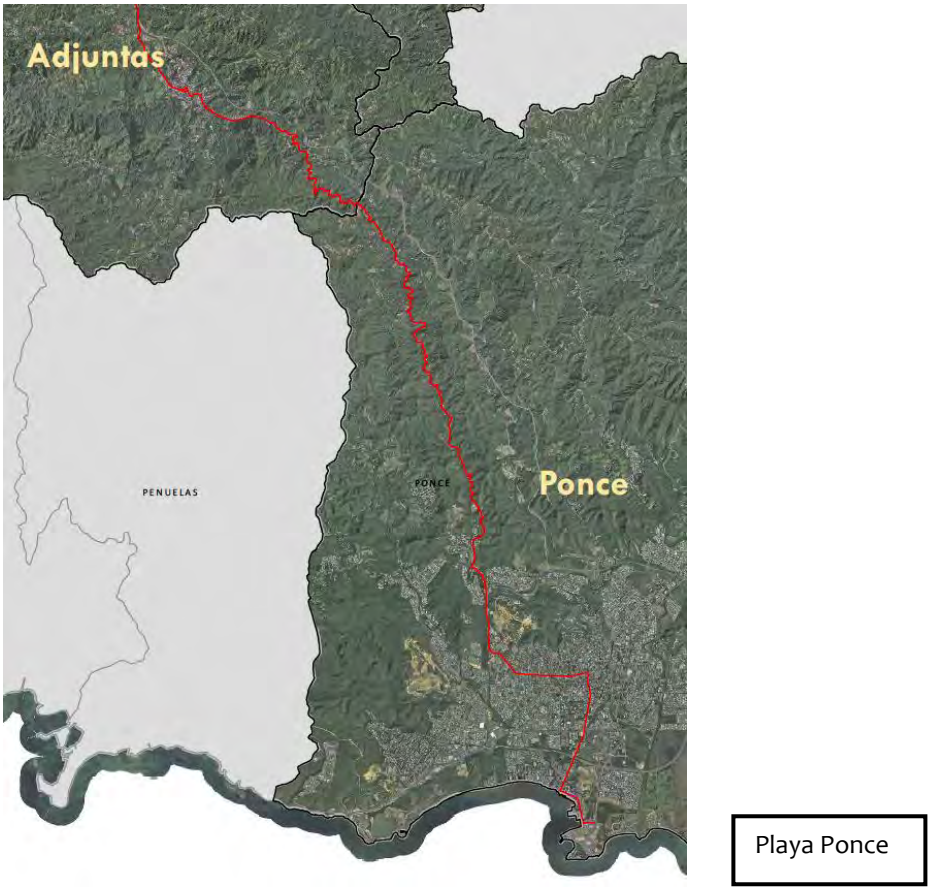

Figure 2. View of **Carretera #6** in red (PR-123), from Ponce towards Adjuntas. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

Just before reaching Adjuntas, **Carretera Núm. 6**'s (PR-123) footprint turns away from Río Canas, and approaches the Río Portugués valley on its northerly travel-way. From Adjuntas, the road travels in a northeasterly direction for twenty-one kilometers, until reaching Utuado's urban ore. The Adjuntas – Utuado section was the last segment to be build; finished during the early years of the 20th century (**Fig. 3**)

Figure 3. View of **Carretera Núm. 6** twenty-one kilometers from Adjuntas's urban center to Utuado's urban center in red (PR-123). (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

On its last stretch, **Carretera Núm. 6**, travels thirty-two kilometers from Utuado's mountainous coffee lands, through the tight and challenging karst region of Arecibo, reaching eventually the flat plateaus of Arecibo's once rich sugarcane lands and the urban core. The research of primary sources indicated that **Carretera Núm. 6** first four kilometers as it departs from Utuado towards Arecibo, were built under the Spanish government.

Approximately ten kilometers south of Arecibo's urban center, PR-123 (in red) ends. However, the historic footprint of **Carretera Núm. 6** continues on today's PR-6609 for four (4.6) kilometers; becoming later PR-10 for another four (4.4) kilometers. At the northern end of the PR-10 section, the road merges with pre-existing municipal streets that run into Arecibo's town square. **Carretera Núm. 6**'s historic travel-way it's within the footprint of PR-6609 and PR-10 (**Fig. 4**).

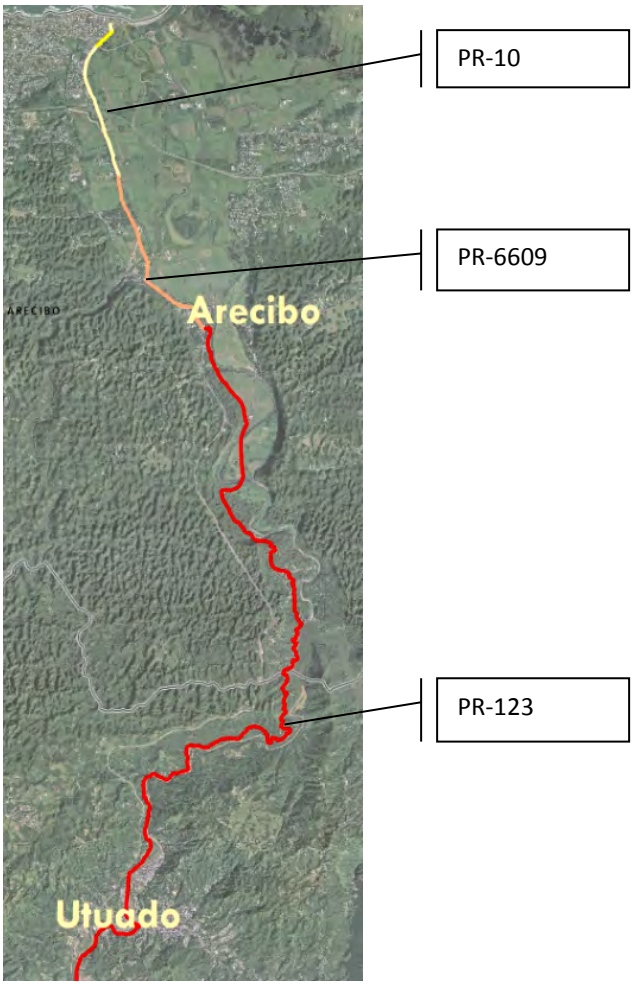

Figure 3. View of **Carretera #6** thirty-two kilometers from Utuado to Arecibo. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

There are plenty built components that contribute to the historic significance of **Carretera Núm. 6**, many of them constructed during the Spanish period, but mostly during the early years of the twentieth century. Besides the road itself (the travel-way), over two hundred structures and buildings functionally associated with **Carretera Núm. 6** were identified as essential and integral parts of the road's historic design. These structures and buildings support the road's ability to transmit its historic significance, as they contain within their fabric, the construction history of **Carretera Núm. 6**.

The bridges in **Carretera Núm. 6** are one of the most significant resources of the historic road. A total of fifty-five (55) bridges were identified along the road's historic footprint. This amount of bridges exemplify the rugged topography traversed by **Carretera Núm. 6**. Their lengths range from four-meter-wide *pontones*, to twenty meters span bridges.[2] The bridges fabric, types and model, show the complex construction diversity within **Carretera Núm. 6**. In many ways, the bridges present the road as a great example of new approaches, in between-centuries, in construction materials and construction techniques. At the same time, they speak of the practices of the Spanish engineering school of thought and the new early twentieth century American approach. In between those two, and just as relevant, the bridges, *pontones* and culverts, speak of the high quality legacy of the local engineers, contractors and workers.

Along it eighty kilometers, there are early 20th century reinforced concrete bridges with elliptic, semi-circular and reduce arches; 19th century *pontones* with stone and masonry abutments with 19th century iron beams supporting 19th century undulated metal plates. There are bridges and *pontones* with 20th century metal safety railings in substitution of the classic stone or concrete safety parapet; while at the same time there are 19th century bridges and *pontones* with 19th century elaborated bronze railings.

The bridges and *pontones* diversity is better understood when seen by sections, starting with the Ponce-Adjuntas Section. As stated, the first fifteen (15) kilometers in this section were built under the Spanish government's control upon the island. The resources within those 15 kilometers reflect that construction period, not only in bridges and *pontones*, but in the culverts as well. (**Figs. 4/5**).

[2] Strictly using 19th century Spanish's engineers terms, a *pontón* was a culvert with a four to six meters span. An overpass with a six-meter span or more was designated as a bridge. However, **Carretera #6** construction period falls in the transitional period of Spanish and American administration of the island. Early 20th century documents refer to the *pontones* as small bridges. For data collection and description purposes, *pontones* and bridges were grouped all together in this nomination form, although understanding the differences in length.

Figure 4. Example of *pontones* and bridges along Carretera Núm. 6, Ponce-Adjuntas Section.

Pontón with its 19th century brick, stone, and masonry abutments, and its original longitudinal iron beams. The parapets are an early 20th century addition. The structure is located at Km. 14.0, in the Ponce-Adjuntas Section. (Photo, Juan Llanes Santos)

Puente Juana Matos, located at Km. 14.9, in the Ponce-Adjuntas Section. Finished in the early 1890s, the Juana Matos Bridge combined brick, stone and masonry for the abutments, iron beams and metal plates for roadway support, masonry parapets with added bronze metal railings. The bridge sits today in a private property, as PR-123 was diverted and widened just fifty meters northeast of the bridge. (Photo, Juan Llanes Santos)

A *pontón*, in the Ponce-Adjuntas Section, at Km. 15.5, with its 19th century stone, brick and masonry abutments, and its 19th century longitudinal iron beams supporting the modern concrete/asphalted roadway. (Photo, Juan Llanes Santos)

Partial view of a 19th century bridge with its stone, brick and masonry abutments, built upon the natural rock foundation, with its original longitudinal iron beams, supporting the modern asphalted roadway. The structure is located at Km. 17.7 in the Ponce-Adjuntas Section. (Photo, Juan Llanes Santos)

The Ponce-Adjuntas Section also contains a small group of bridges, *pontones* and culverts with a unique addition in the upper deck: a 19th century bronze ornamental safety railing. The distinguishable component was used in a limited number of resources within the area designed and built under the Spanish engineers. This element is not found in any other section of **Carretera Núm. 6**, or has been identified on any other historic road surveyed or included for Puerto Rico in the National Register of Historic Places (**Fig. 5**).

Figure 5. Examples of the bronze railing.

The 19th century bronze railing above, connecting two classical style pedestal, along with the traditional parapets, provide safety for drivers and users. They sit atop the 19th century culvert below, at Km. 16.9, in the Ponce-Adjuntas Section. (Photos, Juan Llanes Santos)

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The ornamental safety railing above is part of the upper deck of this 19th century *pontón* located at Km. 20.5, Ponce-Adjuntas Section. (Photos, Juan Llanes Santos)

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Atop of an inaccessible culvert, this metal railing with its classic style pedestals is located within the vicinity of km. 20.6, in this lonely, but pristine bend of **Carretera #6**, in the Ponce-Adjuntas Section. (Photos, Juan Llanes Santos)

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The classic style pedestals at Km. 20.7 in the Ponce-Adjuntas Section, identify the location of the *pontón* below, however missing the bronze railing on both sides. (Photos, Juan Llanes Santos)

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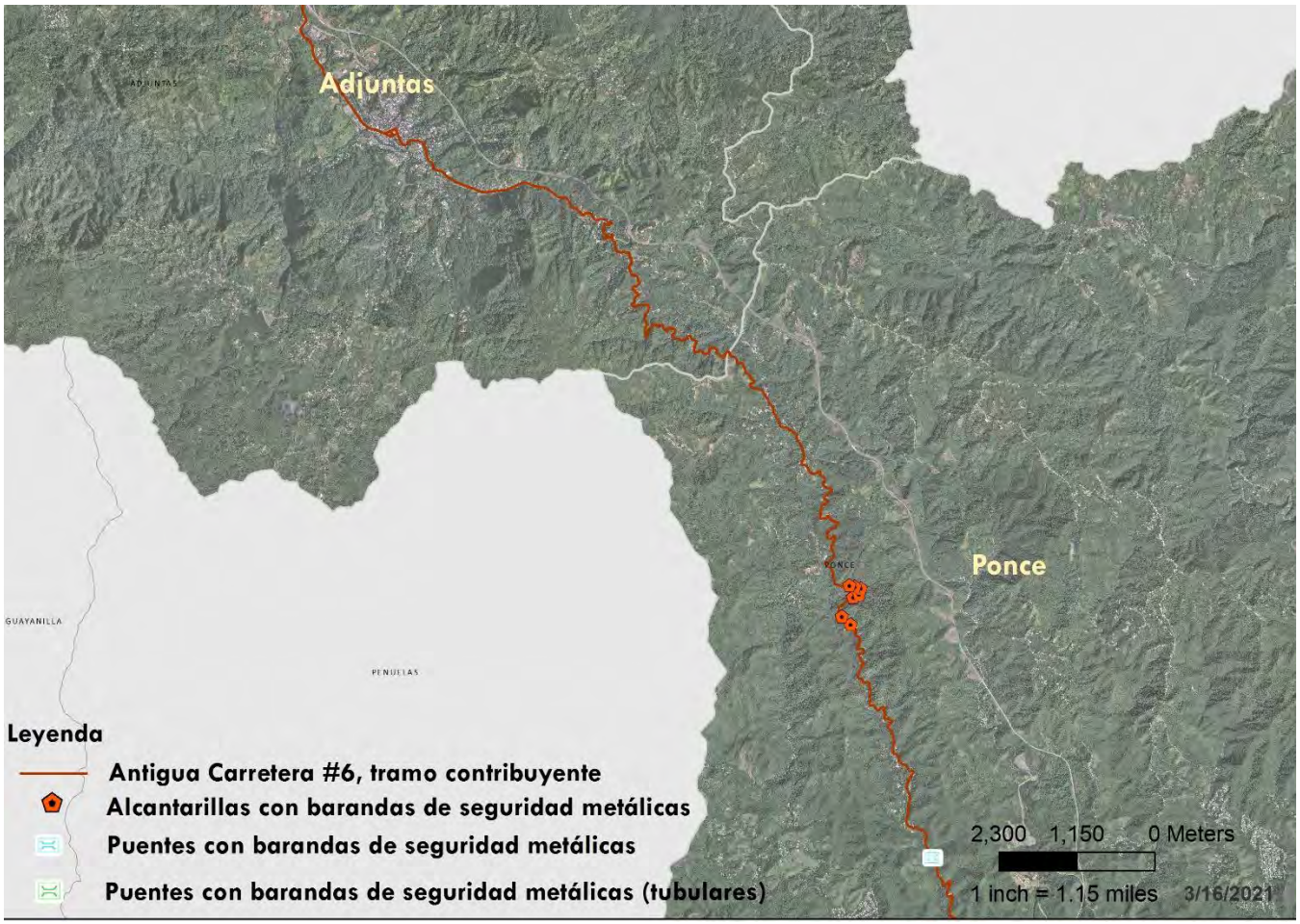
The bronze railing above, at Km. 20.8, in the Ponce-Adjuntas Section, marks the location of the hardly accessible culvert in the photo below. (Photo, Juan Llanes Santos)



Map depicting the location of culverts, bridges and *pontones* with the unique bronze safety railing, all within Ponce's jurisdiction. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

Past the first fifteen kilometers of the Ponce-Adjuntas section, built while the Island was under the Spanish government, the remaining resources of **Carretera Núm. 6** (with the exception of the first four kilometers from Utuado to Arecibo) were completed during the early years of the 20th century by the new American administration. As such, the resources reflect the early twentieth century techniques and materials brought by the American engineers, mostly associated with the military corps of engineers. However, as the contractors and the workforce was highly skillful in the Spanish construction tradition, the resources built should not be seen as a rupture with the past building legacy, but a continuation with new additions, especially in construction materials. (**Figs. 6/7**)

Figure 6. Examples of early 20th century bridges and pontones in the Ponce-Adjuntas Section.

Few kilometers short of reaching Adjuntas' urban center, this *pontón* located at km. 32, shows reinforced concrete used as the new construction material in substitution of stones, brick and masonry. However, the molding accentuating the elliptic arch resemble the traditional Spanish's methods of construction. (Photo, Juan Llanes)

Resembling the previous *pontón* in construction material and style with its concrete elliptic arch, the one located at km. 32.2, shows the original width of **Carretera Núm. 6**, with its 1930's extension.

Located at Km. 34.7, this early 20th century pontón, uses the extruded concrete mortar joint technique resembling the Cyclopean masonry method used by the Spanish engineers. It is possible that this similarity could be attributed to the contractors and labor used, more than to the American engineers in charge at the time. (Photo, Juan Llanes Santos)

Figure 7. Examples of early 20th century bridges and pontones in the Adjuntas-Utuado Section.

Just as **Carretera Núm. 6** leaves Adjuntas' urban core on its way to Utuado, this 16.8 meters, elliptic arch reinforced concrete bridge was built in 1901 above Rio Cidra. Used as a pedestrian bridge today, is located at km. 35.8. (Photo, Juan Llanes Santos)

A 1920's concrete slab bridge, located at Km. 46.7, with its exposed aggregated as a trademark of the 1920's construction period. The structure type was a quick solution to cross water obstacles widely used by the Department of the Interior. (Photo, Juan Llanes Santos)

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The reinforced concrete slab, with longitudinal concrete coated iron beams, spans ten meters over Quebrada Arenas. The bridge, located at Km. 53.5, was built in 1924. Just like the previous bridge at Km. 46.7, this model had the advantage of been a quick construction to be overcome the natural obstacle. The Department of the Interior at this time (1920's) was under direct control of a new cadre of Puerto Rican engineers. (Photo, Juan Llanes Santos)

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Located in the municipality of Utuado, almost ten kilometers south from the town's urban core, the bridge known as *Puente Blanco* is a 1924, reinforced concrete, with one singe spectacular elliptic arch, and twenty (20.5) meters in length. Designed by engineer Rafael Nevares, the front walls have smooth vertical moldings over a background of exposed aggregate. A row of white balustrades, on each side, end in a parapet. On the arch's keystone, the construction date (1924) is raised over the exposed aggregate. The structure, located at Km. 48.8, replaced a temporary wooden bridge built during the 20th century early years. *Puente Blanco* is an example of the quality work done by the Puerto Rican engineers that took over the local Department of the Interior by 1919. (Photo, Juan Llanes Santos)

Departing Utuado, **Carretera Núm. 6** travels slightly over thirty kilometers until reaching Arecibo's urban center. As previously stated, the first four kilometers from Utuado were built under the Spanish government. Just like in Ponce-Adjuntas Section's first fifteen kilometers, the resources in those four kilometers reflect that particular construction period, repeating patterns used in Ponce-Adjuntas. (**Fig. 8**)

(Figure. 8) Example of *pontones* and bridges in Carretera #6, Utuado-Arecibo Section.

The first ten photos show a group of bridges and pontones built by 1892 within the first four kilometers of **Carretera Núm. 6**, in the Utuado-Arecibo Section. All of them retain an enormous integrity with their transversal and longitudinal iron beams, supported by brick columns, with un-coursed and coursed rubble walls. The bridge located at Km. 59.6, inclusive still have the undulated metal plates, on top of which the macadam was deposited. The resources are sequentially located between kilometers 56.6 – 59.6. (Photos, Juan Llanes Santos)

Km. 56.6

Km. 57

Km. 57.2

Km. 58.7

Kilometer marker not found. (Photo, Juan Llanes Santos)

Kilometer marker not found. (Photo, Juan Llanes Santos)

Kilometer marker not found. (Photo, Juan Llanes Santos)


Sep 2, 2020 14:38:05
19Q 742365 2024453
245° SW
Antigua PR-10
Salto Abajo
Utuado

Km. 59.3


Sep 2, 2020 14:48:30
19Q 742380 2024594
191° S
Antigua PR-10
Río Abajo
Utuado

Km. 59.4

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Km. 59.6

A non-contributing, non-historic bridge (at this time) over Rio Caguanitas, built in 1976. The structure, located at km. 59.9, replaced a 19th century metallic bridge, which abutments still in place. The four kilometers build under Spain in the Utuado-Arecibo Section end at this bridge.

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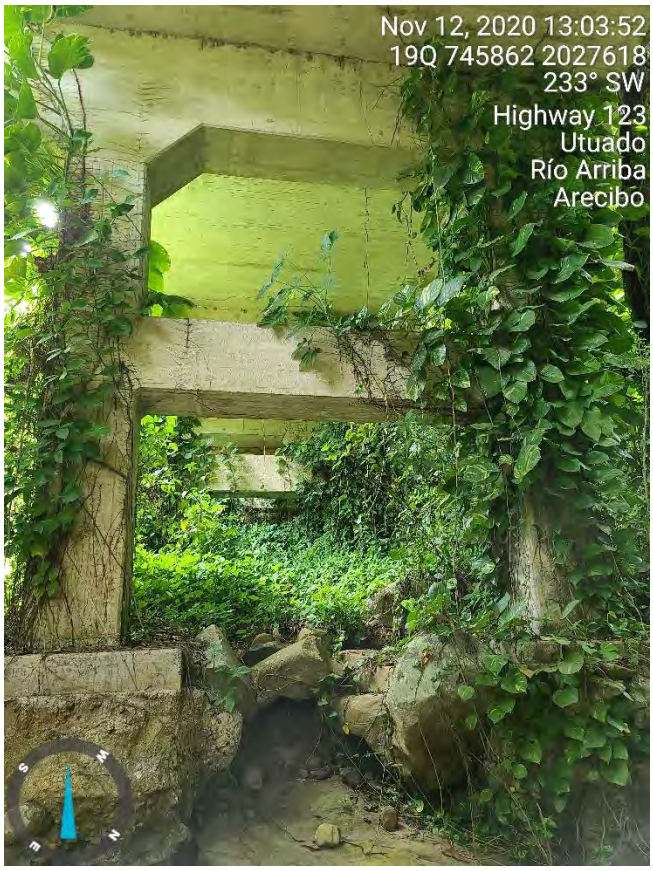


The contributing bridge above, located at Km. 67 in the municipality of Arecibo, is a mid-1940's addition to the **Carretera Núm. 6'**s historic footprint. (Photo, Juan Llanes Santos)

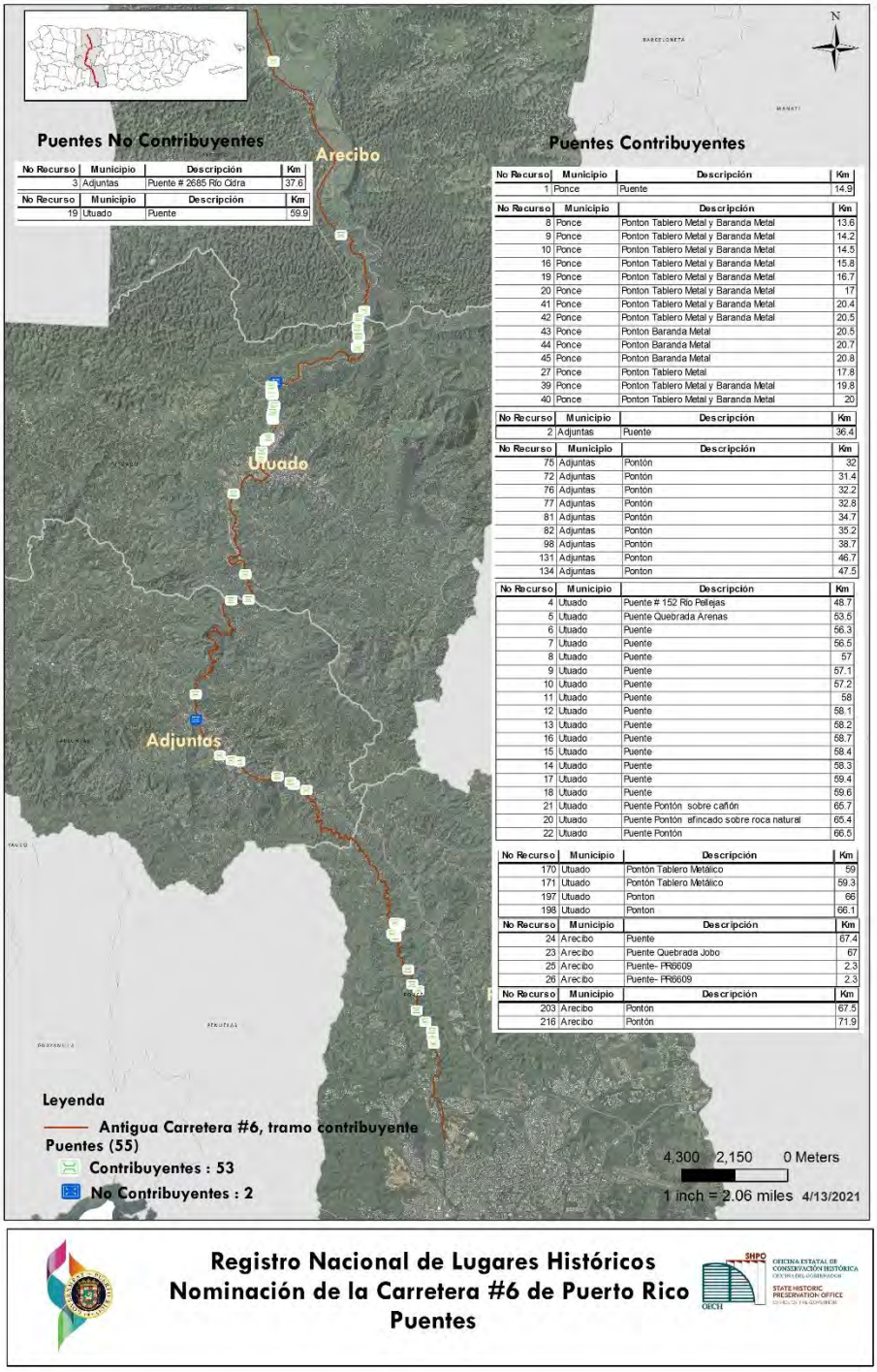
A late 1930's reinforced concrete bridge (*pontón*) at km. 67.4

The reinforced concrete structure at Km. 67.4 (above) is the last bridge/*pontón* within PR-123 corresponding to the historic course of **Carretera Núm. 6**. PR-123 ends in Arecibo approximately at kilometer 79.9. From that point on, the historic footprint of **Carretera Núm. 6** continues its northern travel upon today's PR-6609 (see **Fig. 1**). The latest runs for 4.6 kilometers. Approximately at Km. 3.0, at the point where the road reaches Rio Tanamá, two collapsed bridges are found on close proximity to each other over the river course in a desolated bend of the road (**Fig. 9**).

Figure 9. **Partial views of the two collapsed bridges on PR-6609.**

At one time these two bridges were part of **Carretera #6**, providing pass over the Tanamá River. The construction period of the concrete arched bridge precedes the reinforced concrete bridge with longitudinal iron beams. No information regarding their collapse has been obtained from Puerto Rico Departamento de Transportación y Obras Públicas (DTOP). (Photos, Juan Llanes Santos)

At kilometer 4.6, PR-6609 ends, merging with Highway 10, which initial construction date from 1974. As it merges, the footprint of **Carretera Núm. 6** is absorbed by the modern expressway, losing its historic travel-way and all its contributing resources.



Location of bridges and pontones. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

Besides bridges and *pontones*, two more resources significantly contribute to **Carretera Núm. 6**'s historic character: the *casillas de peones camineros* and the *alcantarillas* (culverts). During the 19th century, the macadam method of road construction was the most commonly used. This method required frequent maintenance, demanding a permanent, diligent and skillful labor force. The Spanish government, like many other European countries, relied upon the *peón caminero* (road mender) to perform the daily preventive maintenance checks and any required repair of the roads directly under the peninsular government's jurisdiction. Due to the distances and the difficult accessibility to some roads, most of the time the *peón caminero* was assigned to live within walking distance of the extension of the road under his care. As such, depending on the location, the coveted position of *peón caminero* came with a house built by the government within his assigned road. Immediately, these houses, *casillas de peones camineros* (road mender's houses), became a highly identifiable component of the built landscape associated with roads designated as *First Class Roads*, as only the roads which such designation had *casillas de peones camineros*. In 1892, **Carretera Núm. 6** was designated as a *First Class Road*.

Only two *casillas* were built in **Carretera Núm. 6**. They are both located in the Ponce-Adjuntas Section, under Ponce's municipality jurisdiction. The model used was almost similar as the one in the mighty *Carretera Central*.[3] Both built by 1895, each *casilla* in **Carretera Núm. 6** sheltered two *peones* with their families. The building was divided into two similar homes under one roof, separated by a central hallway, having each side a living area and two bedrooms. The roof was built of bricks over wooden beams, with hydraulic concrete for the floors on the central hallway, kitchens and latrines, and pitch pine boards for the floors on the rest of the building.

In the *Carretera Central* model, a small shack was usually added on the back of the house, to be used as latrine, stable and/or to shelter the equipment used by the *peón caminero* [4]. However, the *casillas* in **Carretera Núm. 6** had two sheds annexed at the building's rear: one was a double kitchen and the other had two latrines and a common supplies and tools room. (**Figs. 10/11)**

[3] *Carretera Central*. National Register of Historic Places. May 2, 2019: SG 100003686.

[4] Luis Pumarada O'Neill and María de los Ángeles Castro, *La Carretera Central: un viaje escénico a la historia de Puerto Rico*, Oficina Estatal de Preservación Histórica, Septiembre 1997. See, Sibanacan. Informe Final. *El inventario y estudio del valor arquitectónico, arqueológico e histórico social de las casillas de peones camineros de la isla de Puerto Rico, 1844-1954*. Oficina Estatal de Preservación Histórica, Marzo 1991. See also, Aida Belén Rivera Ruiz, *By the Side of the Road. An interpretative look at the road menders' houses*. Thesis presented to the Department of Anthropology of the College of William and Mary in Virginia for the Degree of Master of Arts, 2001.

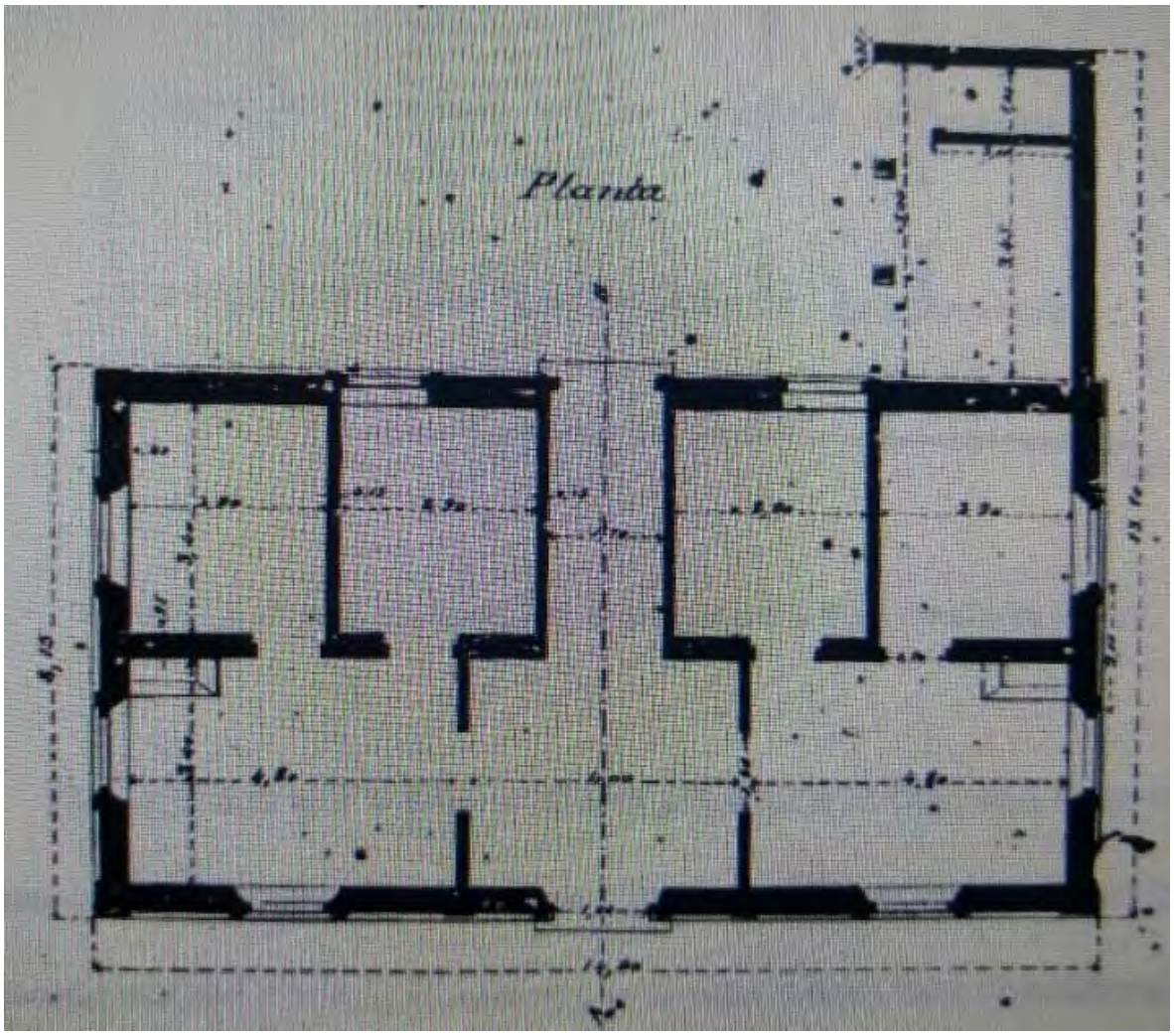


Figure 10. Lay-out of the double-dwelling 19th century *casilla de caminero*, used in the **Carretera Central**, with its central hallway dividing two identical living quarters, with a shared latrine and supplies shed on the back. With some alterations, the model used in **Carretera Núm. 6.**[5]

[5] Archivo General de Puerto Rico (AGPR). Fondo: Obras Públicas. Serie: Carreteras. Caja 210. Legajo 580.

Figure 11. Partial views of the two *casillas de peones camineros* in Carretera Núm. 6

Hidden by the dense wood-line and in a ruin but recoverable state, *Casilla* #1 sits at km. 9.1 along PR-123 **(Carretera Núm. 6)**. The property retains enough character defining features as to transmit its historic use as a *casilla de peón caminero*. (Photo, Juan Llanes Santos)

With more integrity than its previous historic partner, *Casilla* #2, located at km. 15.5 it's been used as a Head Start for the last few years. Together with *Casilla* #1, the properties are completely different from any other *casilla* surveyed until now, as the buildings' exterior walls are made of regularly coursed ashlar blocks of local limestone, not the traditional bricks, stones and masonry used in other *casillas* surveyed at this time

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Location of the two *Casillas de Peones Camineros*. For nomination purposes, Casilla #1 marks the beginning of the contributing section of **Carretera Num. 6**' southern end. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

The third structural component that need to be highlighted to properly understand **Carretera Núm. 6**'s development and its preserved integrity, are the historic culverts. Less conspicuous than the bridges or the *casillas de camineros,* but just as essential, the culverts are an engineering requirement and necessity when constructing an eighty-kilometer road with a footprint running almost entirely through a densely wooded mountain range, in a tropical zone. **Carretera Núm. 6'** planned route was intersected by many ground depressions (*quebradas*) that would fill with water running down the mountains' slopes. The culverts were designed and built to overcome terrain depressions, to allow passage over small water bodies like streams and creeks, or to allow water running down from the high grounds to pass under the road without causing damages to the 19th century macadam fabric or the eventual 20th century asphalt. Resources like the *alcantarillas*, normally go-by unrecorded and forgotten by the historic account. They are even mostly unknown even to the road's common user, as these resources are not visible from the roadway. Many have disappeared due to the expected modern improvements on the road. Many others have been covered by the layers of asphalt or concrete laid on the historic route during the early years of the 20th century. However, each one of them tells an unrecorded piece of history of the road above. Many of the *alcantarillas* combine different construction periods within a single resource, illustrating the road's development possibly better than any other resource in the upper surface. The history of the road is below its present surface.

The survey conducted to support this nomination effort recorded one hundred and seventy-seven (177) culverts of different sizes, models, and construction material along the route from Ponce to Arecibo, all identified as contributing resources to the road's historic significance.[6] Their construction period and historic development, just like with the bridges, is better understood when the road itself is divided by sections. The pictures shown below correspond, by section, to a small sample of *alcantarillas* surveyed in **Carretera Núm. 6**. (**Figs. 12/13/14**)

[6] All the structures defined as culverts are less than four meters wide. Culverts of four to six meters wide, are *pontones*. Six meters or more are bridges.

Figure 12. Culverts in the Ponce-Adjuntas Section

The first four *alcantarillas* (Km 11.3 – 18.4) correspond to culverts located within the Ponce-Adjuntas Section, built under Spain.

Located at Km. 11.3, this five- meter- high, one-meter-wide culvert shows the traditional (materials and method of construction) design used by the Spanish engineers: brick foundation, masonry walls, topped by with brick vault. (Photo, Juan Llanes Santos)

Km. 11.5 (Photo, Juan Llanes Santos)

Km. 12.3 (Photo, Juan Llanes Santos)

Km. 18.4 (Photo, Juan Llanes Santos)

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The culverts shown below, from km. 26 – 70, are samples of the type of culverts built between 1898 and the early years of the 20th century. The culvert models and types, under the new American engineers, follow a design very similar to the Spanish's models: arched vault, coursed and un-coursed walls. However, new materials (concrete) and new types (cylindrical) were added on those early years. Just like many 19th century culverts, the ones from the early 20th have also received the impact of road expansion and new safety regulations especially in the widening of the road horizontal (curves) displacement.

Km. 26.0. The culvert shows the 1940's expansion (above) on its eastern façade, while retaining its early 20th century (1899-1904) construction technique on its western entrance.

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Km. 26.7

Located at Km. 27.6, in the Ponce-Adjuntas Section (Adjuntas's jurisdiction), this impressive and inaccessible culvert shows an intense purpose of making an aesthetical statement out of a practical structure. The extruded mortar joint effect was profusely used in the culvert's headwall and in the entire retaining wall. (Photo, Juan Llanes Santos)

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Exterior and interior of an early 20th century culvert located at Km. 29.5 in the Ponce-Adjuntas Section. (Photo, Juan Llanes Santos)

Figure 13. Examples of culverts in the Adjuntas-Utuado Section

Km. 37

Km. 44.6

Km. 52.3

A fabulous culvert, located at Km. 54.7, in the Adjuntas-Utuado Section (municipality of Utuado). The structural design includes un-coursed rubble for the retaining walls, Cyclopean masonry arrangement in the culvert's headwall and interior wall, with a concrete barrel vault. The structure is supported by two coursed wall buttresses. (Photo, Juan Llanes Santos)

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Km. 63.8

Km. 70

Carretera Núm. 6 | Puerto Rico

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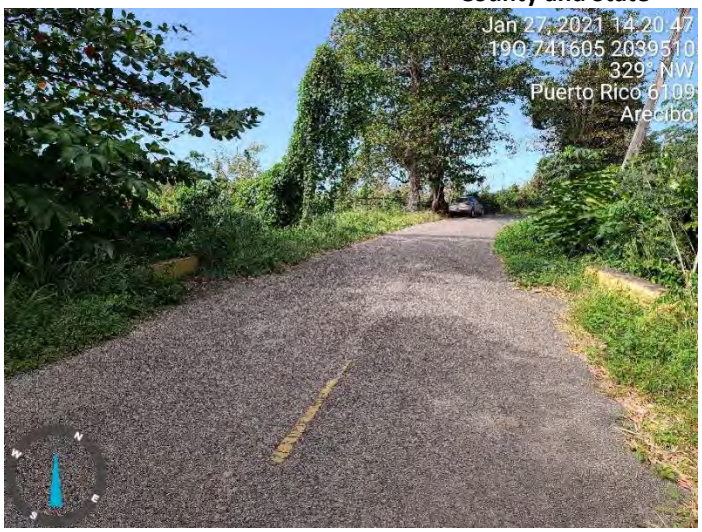

The culvert above is found six hundred meters short of the end of PR-6609, at Km. 4, still in the historic and contributing course of **Carretera Núm. 6.** The 19th century structure strongly suggests that this part of the road was built chronologically between Arecibo and Utuado before **Carretera Núm. 6** was officially started. (Photos, Juan Llanes Santos)

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Map indicating the location of the 177 culverts identified along **Carretera Núm. 6**. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

Each one of the extant components mentioned and described, the travel-way footprint, the *casillas de peones camineros*, bridges, *pontones*, and the *alcantarillas*, are character defining resources that contribute to the integrity and historic significance of **Carretera Núm. 6.**

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8. Statement of Significance

Applicable National Register Criteria
(Mark "X" in one or more boxes for the criteria qualifying the property for National Register listing.)

- X **A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- ___ **B** Property is associated with the lives of persons significant in our past.
- X **C** Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- ___ **D** Property has yielded or is likely to yield information important in prehistory or history.

Criteria Considerations
(Mark "X" in all the boxes that apply.)

Property is:

- ___ **A** Owned by a religious institution or used for religious purposes.
- ___ **B** Removed from its original location.
- ___ **C** A birthplace or a grave.
- ___ **D** A cemetery.
- ___ **E** A reconstructed building, object, or structure.
- ___ **F** A commemorative property.
- ___ **G** Less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions.)
Transportation
Engineering
Social History

Period of Significance
1880-1970

Significant Dates
1880-1904

Significant Person
(Complete if Criterion B is marked above.)

Cultural Affiliation

Architect/Builder
Larrinaga, Tulio (engineer)
Cabello, Eduardo (engineer)
US Corps of Engineers

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Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance, applicable criteria, justification for the period of significance, and any applicable criteria considerations.)

Carretera Núm. 6 is statewide significant under Criterion C in the areas of transportation and engineering. The eighty-two kilometers road was built in 1880-1904, connecting the city of Arecibo, in the northern part of the island, with the city of Ponce, the dominating economic center in the southern region during the nineteen century. Along its route, **Carretera Núm. 6** connected the municipalities of Arecibo, Utuado, Adjuntas and Ponce. By the time of its completion in 1904, **Carretera Núm. 6**, an engineering marvel, became the second road in crossing the island from north to south, in a shorted route than the one hundred and thirty-four (134) kilometers of the 1886 *Carretera Central*. As an in-between-centuries (1881-1904) road, **Carretera Núm. 6** is significant under Criterion C in engineering as a great example of the application of new materials and construction techniques. The engineering's innovations and craftsmanship applied to the **Carretera Núm. 6** still evident in many of its extant components like the bridges, road menders houses, culverts, and the road itself. The property is also significant under Criterion A in Social History as its design and planning responded to a social, political, and commercial scheme in providing and connecting the rich coffee-producing zone of the highlands with the port facilities at the northern and southern ends of the road (Arecibo and Ponce). The construction of such a long, high quality road through such difficult landscape as the *Cordillera Central* became an island wide effort, demanding a vast use of human resources. The property's period of significance directly corresponds to **Carretera Núm. 6's** initial planning and construction in 1880, until the road was displaced by Highway 10 in the 1970s.

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

By the 1800s, comments related to the poor conditions of the island's roads were extremely common. The naturalist Pierre Ledrú, that arrived in Puerto Rico in 1797, as part of a French scientific expedition, commented that the bad conditions of the roads and the absence of bridges and dinghies to get across the rivers, made the transportation of goods very difficult, doubling its costs.[7] In an 1809 report, Pedro Irizarry, mayor of San Juan, mentioned that:

> "*el abandono sin semejante con que se han visto hasta el día los puentes y caminos reales entristece y desanima al hombre más activo y laborioso en la agricultura…Son tan sumamente ásperos, pantanosos, estrechos, montuosos, y peligros, los más de los caminos y puentes de toda la isla, que son más propios para pájaros que para hombres*".[8]

In 1882, seventy-three (73) years after the mayor's comments, José Ramón Abad shouted in his work "*Puerto Rico en la Feria-Exposición de Ponce"*:

> *"Parece mentira, pero es la verdad, que un viaje de Ponce a Mayagüez, por tierra, cuesta más y absorbe tanto tiempo como una expedición de Madrid a Paris; y para ir de un extremo a otro de la isla se necesita gastar tanto como para ir de cualquier puerto de la Isla a Nueva York".*[9]

However, all these comments and requests for the improvements of the local roads were not strange on the upper echelons of the island's political structure. Strong attempts for better roads were made under the governorships of *Capitanes Generales* like Gonzalo de Aróstegui (1820-1822), Miguel de la Torre (1822-1834), Santiago Méndez Vigo and Fernando de Norzagaray (1852-1854), among others. The concern showed by these governors was parallel with the economic and demographic growth of the island. By the beginning of the 19th century, the population ranged around 155,000 inhabitants. By the end of the century, it had reached the amount of almost one million. When estimated, the numbers suggest that the population grew at a pace of 90,000 persons per decade. The

[7] Eugenio Fernández Méndez, *Crónicas de Puerto Rico. Desde la Conquista hasta nuestros días (1493-1955).* Río Piedras: Editorial de la Universidad de Puerto Rico, 1981, 343, *Relación del Viage a la Isla de Puerto Rico, en el año 1797 por el naturalista francés, Andree Pierre Ledrú*. (Fragmentos)

[8] Eugenio Fernández Méndez, Crónicas de Puerto Rico, 361-362, *Informe de Don Pedro Irizarry, alcalde ordinario de San Juan, sobre las instrucciones que debían darse a Don Ramón Power, Diputado por Puerto Rico ante las Cortes Españolas para promover el adelanto económico de la isla.* Año 1809. ("the *abandonment without comparison until present time of the bridges and royal roads sadden and discourages the most active and hardworking man in agriculture…They are so rugged, swampy, narrow, hilly, and dangerous, that most of the island's bridges and roads seen to be more suitable for birds than for men*") (Translation is ours).

[9] José Ramón Abad, *Puerto Rico en la Feria-Exposición de Ponce de 1882*, Ponce, 1885, 24. ("*It seems unbelievable, but it's true, that a trip from Ponce to Mayaguez, by land, is more expensive and it takes more time than a trip from Madrid to Paris; and to go from one end of the island to the other, costs as much as to travel from any port in the island to New York*" (translation is ours).

increase in population, the spatial geography of the production centers, combined with the dynamic of local and international commerce, demanded a better and dependable road system.

Slowly but surely, improvements were made. Under Miguel de la Torre, a network of municipal roads were initiated, including a solid macadam road from San Juan to Río Piedras, the construction of a navigational channel between the lagoons connecting Santurce, San José and Piñones; and the placements of dinghies to provide transportation in some of the most important rivers in the island.[10] On February 26, 1838, in an attempt to provide manpower for needed public works, Governor López Baños passed a royal decree making it mandatory for unemployed *jornaleros* to report to the municipal authorities to work on the local roads. In 1842, Governor Mendez Vigo established the *Junta Directiva de Caminos y Canales*, centralizing in this state designated office, the faculty to acquire funds for road construction. Under Governor Norzagaray, a plan for state roads (first and second order) was drafted by Antonio Sanchez Nuñez, Chief Engineer of *Dirección de Obras Públicas*, agency established in 1854.[11] However, it was not until the *Capitán General* Fernando Cotoner y Chacón (1857-1860), that a comprehensive road plan was developed.

Just like Miguel de la Torre had done before, Governor Cotoner traveled the island to get a personal understanding of the conditions the roads were in. Departing San Juan on March 5, 1857, going west along the coast, it took over two months for the governor to get back to La Fortaleza, completing the trip on May 10, 1857. Accompanied by a group of assistants, among them, engineer Timoteo Lubelza, a road-plan was drafted along the trip. The memoir, prepared by Lubelza, begins with a narrative describing the bad condition of the roads. Lubelza explained, that since established in 1854, the *Junta de Caminos* had barely completed eight *leguas*[12] (about 48 kilometers) of roads; six of them from San Juan to Caguas (through Río Piedras) and the other two *leguas*, from San Juan, through Bayamón, reaching *Sabana del Palmar* (Comerío). The works on the second route were held up by the Governor, as it was advised to utilize the efforts, and the money, to work on extending the completed road from San Juan to Caguas all the way to Guayama, unifying the northern and southern parts of the island. However, even this proposed route was questioned in the very same draft, as it seemed that very few

[10] AGPR. Fondo: Obras Públicas. Serie: Carreteras. Legajo 217. Caja 2317.
[11] Luis F. Pumarada O'Neill, *Los puentes históricos de Puerto Rico*. Autoridad de Carreteras y Transportación de Puerto Rico, Diciembre de 1991, 17.
[12] A *legua*, as established by 1801, was approximately 20,000 feet. Using this standard, one *legua* equals approximately six kilometers.

municipalities would benefit from it. The plan proposed the construction of three mayor roads: one running through the center of the island from east to west, while the other two would run perpendicular from north to south, sectioning the island in three areas. The municipalities in between would be responsible to build the secondary roads to connect to the three major highways, so the interior towns would have multiple outlets to the coastal cities. It was suggested in the plan also, that to speed up the construction process, the island be divided in four districts named San Juan, Mayaguez, Caguas and Ponce districts, each with a Chief Engineer in charge. By the governor's order, it was responsibility of the four Chief Engineers to join efforts in detailing the works to be done.[13]

Although sketchy and inconclusive, the plan drafted brought into consideration significant aspects. For one, the need to unify the northern and the southern sides of the island through a continuous road. Also, that the selected route should be well-thought-out, not only from the engineering perspective, but also to maximize the benefits. The proposal also brought into the plan the need for the municipalities to actively participate in the process, as the undertaking was for their benefit.

By 1858, a more detailed plan, known as the *Plan Carretero de la Isla de Puerto Rico*, was developed by the *Cuerpo de Estado Mayor*, the military component in charge of the island's defense.[14] As directed by Governor Cotoner, the new *Plan Carretero* considered the commercial and agricultural needs. An additional aspect was included into the road plan, the military defensive needs were considered as well. When carefully read, the economic elements were subordinate to the military provisions.

The plan correctly explained that the island's economy was mostly oriented towards the sugar, coffee, and tobacco exportation, which were highly coveted in the United States and the European markets. The most important port facilities were located at Ponce, Arecibo, Aguadilla, Mayaguez, Guayama and Naguabo. However, there was an absence of dependable roads connecting this coastal towns among themselves. Just as important, the absence of well-developed roads kept the interior towns in isolation, making impossible or extremely difficult, that their rich agricultural production could reach the ports. As expressed in the plan, a homogenous road system would eliminate the interiors dependence and subordination to the coastal cities. The ability to properly trade their coffee, tobacco,

[13] AGPR. Fondo: Obras Públicas. Serie: Carreteras. Legajo 608. Caja 2716.
[14] Archivo General Militar de Madrid. Fondo documental de la Sección de Ultramar del Ministerio de la Guerra. Serie: Correspondencia sobre Obras Públicas. Título: Plan general de caminos de Puerto Rico. Código de Referencia: 5632.3.

cattle, and precious woods, would bring to the towns in the interior the economic advantages already enjoyed by the cities in the coast.

The 1859-1860 *Plan Carretero de Puerto Rico* included some of the ideas already proposed in Luberza's 1857 draft, but within a much wider scope. Initially, it was determined that one central road was to run across the island from the eastern town of Humacao, traversing through Caguas and Utuado, finishing in Mayaguez or Aguadilla. A transversal road was to run north to south, from Arecibo to Ponce, crossing Utuado and Adjuntas, designated as Road # 6 and Road #7 (the future **Carretera Núm. 6**). Another road from Guayama to San Juan, crossing Caguas. The two transversal roads divided the island in three sections, which explains the creation of six brigades, two per section, to study the engineering requirements and needs of each section. Additional roads were planned to connect Ponce to Guayama, and Arecibo to San Juan, in a road along the coastline. First order roads were also projected for Caguas to Naguabo, passing Gurabo and Juncos. Another from Caguas to Utuado, running through Cidra, Aibonito and Barranquitas. A "*ramal carretero*" (a road for oxcarts) was to connect Humacao to Naguabo, as this last town was considered the best access to Vieques island. Shorter secondary branches were planned to be extended from the road designated as Road 1, which was ambitiously projected to circumvallate the entire island along the coastline (which is accomplish today by PR-2 and PR-3). Completing the network, the municipalities were expected to build multiple roads to connect their urban centers and productive zones to the state roads **(Fig. 14).**

Figure 14. An 1860 map, with the *Plan Carretero de la Isla de Puerto Rico*.[15]

The *Plan Carretero* had also a very important military role attached to it. The narrative of the plan was clear that military considerations were to supersede the commercial and agricultural ones. The Old Empire still valued Puerto Rico's strategic importance. The new form of energy used in the maritime transportation, steam, made the island easily accessible: fifteen days from Madrid and London; thirteen days from Bordeaux; seven days from New York; three to four days from Florida. The protection of the colony, now a significant contributor to Spain's treasury, was still a matter of great concern.

However, the *Plan Carretero*, more a wish list that an active project, moved at a very a slow pace for more than a decade. Mostly due to lack of funds, less than sixty kilometers were built in the entire island between 1860 and 1872. On that last year, Governor Simón de la Torre finally got 750,000 pesetas allocated from the Ministerio de Ultramar to initiate the construction. But it remained an administrative contribution until 1875, when the monies were raised to 800,000 pesetas and the actual

[15] AGPR. Fondo: Obras Públicas. Serie: Carreteras y Puentes. Caja 2652.

study, planning and construction began on the majestic road that would be known simply as **Carretera Central**, totally open and completed by 1886.

On January 21, 1868, an improved and more detailed road plan (*Plan Carretero*) was approved for Puerto Rico by the central government in Spain.[16] In this 1868 plan, five major roads were identified as *Carreteras de Primer Orden* (First Order Roads):

a) *Carretera #1*, from San Juan to Playa Ponce (later known as Carretera Central)
b) *Carretera #2*, from San Juan, to Cataño, to Arecibo, Aguadilla, ending in Mayaguez
c) *Carretera #3*, from Mayaguez to Ponce
d) Carretera #4, from Cayey, to Arroyo, through Guayama
e) *Carretera #5*, from Caguas, to Naguabo, through Humacao

The sequence is relevant. The number assigned to each road had a dual meaning. It indicated the road's significance and the construction chronological order as well. That is, *Carretera #1*, was considered the most important road and it was supposed to be the first one to be built. By 1886 the only road completely finish was the *Carretera Central*, with its one hundred and thirty-four kilometers from San Juan to Ponce. Short stretches of *Carretera #2* and *Carretera #3* were done by the early 1880s. *Carretera #2* had one complete section from Cataño to the Reyes Católicos Bridge in Bayamón. *Carretera #3* had slightly fourteen kilometers built from Mayaguez urban center to the Pezuela Bridge. However, work in both roads was suspended during the early 1880s, as the Spanish government began the arrangements with a French-owned company to build and operate the *ferrocarril de circunvalación*, a railroad system which was to encircle the entire island along the coastal plains. The government decided to put on-hold the works in *Carretera Núm. 2* and *3* as their routes were parallel with the railroad's planned route. The suspension of works in those two roads, moved-up *Carretera #4* and *Carretera #5* in the planning and construction agenda.[17] However, works on *Carretera #5* were later put on hold as well when a Royal Decree from February 19, 1885, authorized the construction of a railroad line from Caguas to Naguabo's port, passing through Gurabo, Juncos and Humacao.[18]

[16] AGPR. Fondo: Obras Públicas. Serie: Carretera y puentes. Caja 2296. Memoria descriptiva del proyecto de Carretera Primer Orden de Cayey a Arroyo, por Guayama. Enrique Gadea.
[17] *Carretera No. 4*. National Register of Historic Places. October 30, 2020. SG100005741.
[18] Op. Cit.

Carretera Núm. 6: the Spanish Period (1869-1898)

Although a proposed footprint of **Carretera Num. 6** shows up in the 1860 map (see **Fig. 14**) with two numbers assigned to it (6 and 7), the construction of the road was not contemplated in Spain's *Plan Carretero de la Isla de Puerto Rico*. The planning and eventual construction of **Carretera Num. 6** however, was included in the 1869 *Plan de Carreteras Pronvinciales*, the local road plan developed by the island's central government and administered by the *Diputación Provincial*. As such, **Carretera Num. 6** was originally a provincial, Second Class Road.[19] However, in the 1869 plan, **Carretera Num. 6** was considered the most important road among all the ones projected. The road was to traverse the island from north to south, from Arecibo to Ponce, running through Utuado and Adjuntas, two of the major coffee producers' counties in the central-western portion of the *Cordillera Central.*

Projects to build roads from Arecibo to Utuado, and from Ponce to Adjuntas preceded the 1869 *Plan de Carreteras Pronvinciales*, developed by mutual interests of the municipalities. For example, in 1864, a proposal to build a road between Ponce and Adjuntas explained the vital urgency for such a road indicating that Adjuntas needed an outlet to its significant agricultural production and a way to acquired regular daily provisions for its population, while Ponce's less fortunate inhabitants were dependents of Adjuntas's food production. At that time (1864), the towns were connected by an extremely tortuous and dangerous trail already known as "*Camino Viejo*" (Old Trail) which had over forty water crossings *(vados*). The trail was wide enough for horses and pedestrians (*camino de herraduras*), but not for oxen carts (*caminos carreteros*) and completely inaccessible for anyone during rainy season. [20] Similar projects were proposed to connect Arecibo and Utuado, for the very same reasons.

However, although there were improvements in the road network in this zone, it wouldn't be until the 1880's when the actual construction of **Carretera Núm. 6** was initiated. Neither random cause, strategic, military or specific political goals push the construction of the long desire road. The upsurge during the 1880's to build **Carretera Núm. 6** responded directly to commercial reasons. The road's planning and construction coincides with the period when coffee became the new gold from the highlands.

[19] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 229. Caja 2329.
[20] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 219. Caja 2319.

The last decades of the 19th century saw the golden age of the coffee industry in Puerto Rico. Growing in the island since its insertion in 1736, by the early 19th century, coffee was one of the main crops produced in Puerto Rico for local consumption and as an exporting crop. Alejandro O'Reilly in his 1765 report to the Spanish Crown indicated that coffee was already being exported from Puerto Rico, albeit in small quantities.

Usually associated with the mountain region, during the 18th century and early 19th century, coffee was part of the coastal landscape. The plant was frequently mentioned by Abbad y Lasierra as part of the coastal towns' crops. When describing the region between Salinas and Santa Isabel, Abbad y Lasierra mentioned that "*Cogen mucho café, de que cultivan hermosas plantaciones a lo largo de la costa*".[21] When describing the flat coastal lands of Ponce, the East African plant became again the most relevant crop:

> "*La principal cosecha es la de café: asciende algunos años a 187,932 arrobas que todo pasa a los extranjeros, igualmente que las maderas y ganados sobrantes. Toda la tierra que se extiende a lo largo de la costa está poblada de haciendas de café que fructifica pasmosamente*".[22]

However, during the years 1800-1840, sugar became the dominant crop in the coastal flatlands, displacing the coffee production and the coffee producers away from the coast and up into the mountain regions. In the highlands, the coffee plant found the ideal fertility, humidity, temperature, and shade (as coffee was planted under large, shaded trees, hardly available in the coast) for its perfect blossom. The small farmers in the mountain found in the plant the perfect companion for their others crops. While cassava, corn and plantains were growing as sustenance crops, coffee was sold in town as a cash crop, providing the small farmer the hard currency needed to buy those things that he could not produce. The coffee grown in the small farms was bought by middlemen/commercial houses with the proper contacts in the international market. Eventually, the Puerto Rican coffee became a coveted commodity highly appreciated and sought after by the gourmet consumers, especially those in the European market. By 1846, a hundredweight of Puerto Rican coffee was sold in the international market for six pesos; by 1860, it was twice that much. By 1886, the price of one hundred pounds sold for

[21] Iñigo Abbad y Lasierra, *Historia Geográfica,* 300. ("Coffee is colected in great quatities, grow in beautiful plantations along the coast"). (Translation is ours)
[22] Ibid. 327. ("Coffee is the main crop, some years ascending to 187,932 arrobas all going to the foreigners, just like the surplus of wood and cattle. All the land that extends along the coastline is full of coffee haciendas that are astonishingly fruitful"). (Translation is ours)

twenty-one pesos. While in 1894, it cost thirty-two pesos to acquire one *quintal* (100lbs.) of the best Puerto Rican coffee in the international market.[23]

Certain external factors facilitated the explosion of the local coffee industry. For one, the largest coffee producer by the end of the 18th century, the French colony *Saint Domingue*, never recover its placed in the coffee market after its destructive independence revolution into becoming Haiti. The destruction of many coffee plantations in Cuba during its Ten Years War (1868-1878) allowed Puerto Rico to replace its colonial sister in Spain's coffee market. However, the most significant external factor was the 1876 commercial agreement between the United States of America, the world largest coffee consumer, and Brazil, the world largest coffee producer. The United States practically absorbed for many years the entire Brazilian production, creating a worldwide vacuum in the coffee market, highly advantageous for other coffee producers, Puerto Rico among them. By 1896, at the top of its price, Puerto Rico exported 58,600,000 pounds of coffee, mostly to the European market. In 1899, out of a total of 396,000 cultivated *cuerdas* in the island, 197,000 were planted with coffee, with sugarcane in second with 73,000 *cuerdas*.[24] Most definitely, from 1880, until the end of the 19th century, coffee was king.

In the King Coffee's crown, Adjuntas and Utuado were among the brightest jewels. The significant increase of coffee and tobacco as international commodities added an important economical layer to the highlands. The fertile lands in the western end of the *Cordillera Central* became a new center of economic power. It did not take long to realize that the formation of new production centers in the mountain range demanded the imperative need of a dependable logical network of roads, able to transport goods, machinery, and people to and from the interior to port facilities in the coastal towns.

So it's no coincidence that in 1880, engineer Tulio Larrinaga, working for the *Diputación Provincial* , presented the first organized project to build the initial five thousand (5,000/ 5km.) meters of **Carretera Núm. 6**, from Ponce to Adjuntas. In his report, Larrinaga emphasized the importance of connecting the coffee and tobacco lands of Adjuntas to Ponce's port and commercial firms. Acknowledging the problems with the *Camino Viejo* and after conducting an intensive reconnaissance, Larrinaga discarded the possibility of building upon the existing trail. He described two possible approaches. First one, building the future road along the Portugués River' valley, or using the Rio Canas' contour line.

[23] Guillermo Baralt, *Yauco o las Minas de Oro Cafetaleras*, 1756-1898. San Juan: Model Offset Printing, 1984. 37
[24] Report of Military Governor of Porto Rico. Washington Government Printing Office, 1899, 187.

Larrinaga chose Rio Canas as it would require less clearance of hard rock, more gentle slopes, a fifteen percent reduction in distance and less masonry works. (**Fig. 15**)[25]

Figure 15. Partial view of Larrinagas's drawing of **Carretera Núm. 6** first five kilometers. The proposed road, shown in red, two thousand meters after departing a point (Km. 0.0) in the property of Narciso Garibaldi would run in a northern direction along the eastern slopes of Rio Canas (in blue). This stretch was to end at Quebrada Besosa. Eventually, in the 1890s, Casilla #1 (see Section 7) was built in the proximity of kilometer 3.

The engineer indicated in his document, that the construction of this first section should not take more than two years as a good part of the needed construction materials were accessible. There were few *tendales* (brick factories) within short distance in Ponce. There was even one brick factory in the proximity of km. 2, which existence predated the construction of the road. The wood could be acquired from the commercial warehouses at Playa Ponce. Although there were no kilns nearby, the existence of limestones (carbonates) was substantial.

Larrinaga suggested that the construction should be done by contract through public auction and bids, not by Administration. There was nothing new about this suggestion. This was the very same procedure followed in the construction of the *Carretera Central* and *Carretera # 4.* However, on those two cases, both roads ended-up been built by the *Jefatura de Obras Publicas* and their Spanish engineers. That was not the case with **Carretera Núm. 6***.* Except for specific structures or parts, the entire road was built by private contractors. The contractors were responsible for providing and

[25] AGPR. Fondo: Obras Publicas. Serie: Carreteras y puentes. Legajo 219. Caja 2319. The historic drawing above, it's an 1892 copy of Larrinaga's work. The copy was done by engineer B. Fernández as part of a *Memoria* related to the entire route from Ponce to Adjuntas.

acquiring building materials, equipment, and most definitely, the labor force. As such, no coerced but hired labor was used in **Carretera Núm. 6.**

By 1882, Larrinaga submitted to the *Diputación Provincial* his second *Memoria*, in which the engineer explained his project for *Trozo # 2*, the next five thousand five hundred and six (5,506) meters of **Carretera Núm. 6** on its way from Ponce to Adjuntas.[26] It was explained that this section was to be an expensive undertaking because the uphill, uneven, and difficult terrain was to require many and expensive masonry works, designed to overpass water and height obstacles. (**Fig. 16**)

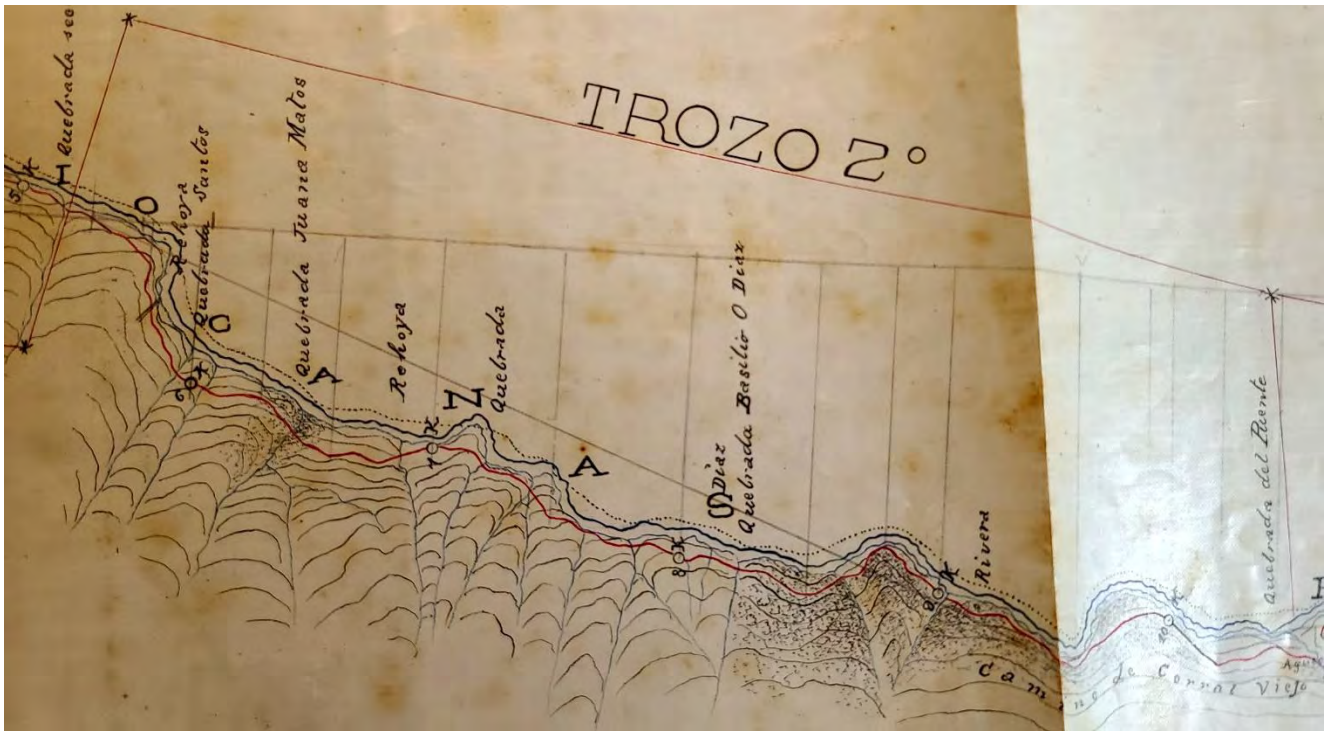


Figure 16. Starting at the end of *Trozo #1*, the 5,506 meters of the second stretch kept the road in the eastern slopes of the Canas River. Larrinaga's drawing show some of the mayor water crossings in *Trozo # 2,* including the challenging *Quebrada Juana Matos*.[27]

As the road develop farther away from Ponce's commercial houses and factories, it was estimated by Larrinaga that the transportation's cost would increase the price of most of the building materials and labor. The price of a thousand bricks raised to fifteen pesos, five more that in Ponce's lowlands; a cubic meter of Portland cement went up to fifty pesos; a cubic meter of wooden *pichipén* (pitch pine) planks was twenty-seven pesos. The labor wages went up to 62 ½ cents per day for the unskilled workers. The "high" wages were needed to compete with those paid at the coffee farms, main source

[26] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 220. Caja 2320
[27] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 219. Caja 2319

of the unskilled labor. A significant component of *Trozo #2* that made the undertaking an expensive one, were the increase of "*obras de arte*" needed to overcome the topographical obstacles, as compared to a more even *Trozo #1.* Larrinaga suggested that the construction of masonry works to overpass water crossings like *Quebrada Juana Matos*, *Quebrada Besosa* and *Quebrada Santa* was a priority, prior to consider extending the road's layout, especially the works for *Quebrada Juana Matos.* The viaduct over *Juana Matos* was needed to keep the road two hundred meters above sea level, the level at which the road was been built.

Given thought to the challenges offered by the rough topography, Larrinaga came with a solution that would have a legacy in **Carretera Núm. 6**. The engineer suggested the elimination of the traditional brick or stones barrel vault for culverts and *pontones,* regardless of their span, and using instead a straight upper deck to overcome the natural obstacle. In other words, Larrinaga suggested to made look-like-bridges out of regular culverts and *pontones*, breaking with his own designs for *Trozo #1.* The engineer explained that "*tramos metálicos*", combining iron beams and metal plates to support the macadamized road, would provide a long-lasting structural support with minimum maintenance. The structural change would also reduce production costs. As a surreptitious comment about his Spanish counterparts, the Puerto Rican engineer mentioned in his suggestions that the inclusion of this technique and materials would bring the island's construction tradition into the modern times along the industrial and scientific progress.[28] It was also Larrinaga who made the initial suggestion to use metal frames as safety railings in the upper deck of bridges and *pontones*.

However, the construction of the second stretch was seriously delayed. Larrinaga's 1882 proposals for *Trozo #2* received strong oppositions from the *Jefatura de Obras Públicas*, a higher agency than the *Diputación Provincial*, and dominated by the Spanish engineers responsible for designing the island's First-Class Roads. It took two years of arguments and explanations, finalizing with an *in-situ* walk-

[28] Tulio Larrinaga was born on January 15, 1847, in Trujillo Alto, Puerto Rico. He studied civil engineering at the Rensselaer Polytechnic Institute (RPI) in Troy, New York and, in 1871, graduated from the University of Pennsylvania in Philadelphia. Larrínaga practiced his profession in the United States for some time, returning to Puerto Rico in 1872 where he was appointed architect for the city of San Juan. In 1880, Larrínaga built the first railroad in Puerto Rico and introduced American rolling stock onto the island. For ten years he was the chief engineer of the *Diputación Provincial*. After 1898, he had an active political involvement. In 1904, he was elected as Resident Commissioner to the United States. He was reelected twice, serving from March 4, 1905, until March 3, 1911. Larrinaga also served as delegate from the United States to the Third Pan-American Conference held in Rio de Janeiro in 1906. In 1911, he served as a member of the executive council of Puerto Rico. Following his political career, Larrinaga resumed the practice of civil engineering in San Juan. He died there on April 28, 1917.

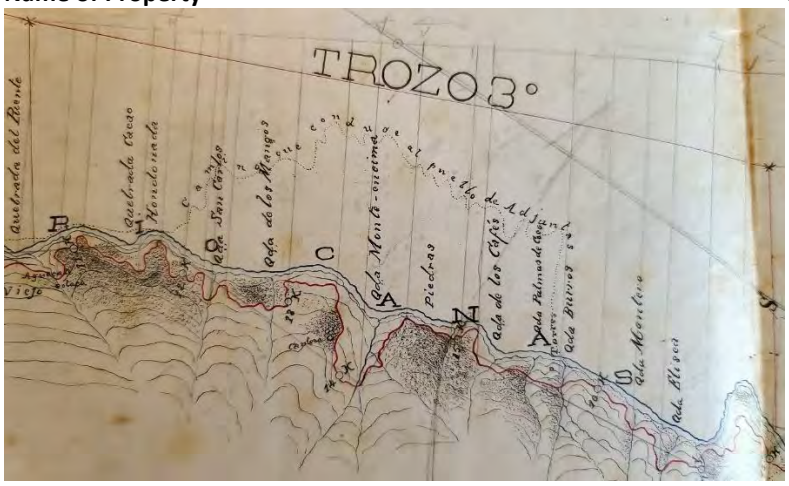
through by Larrinaga guiding a group of engineers carefully detailing the problems and his solutions. Eventually, every suggestion made by Larrinaga was accepted by the *Diputación*, the *Jefatura* and the central government in Spain.

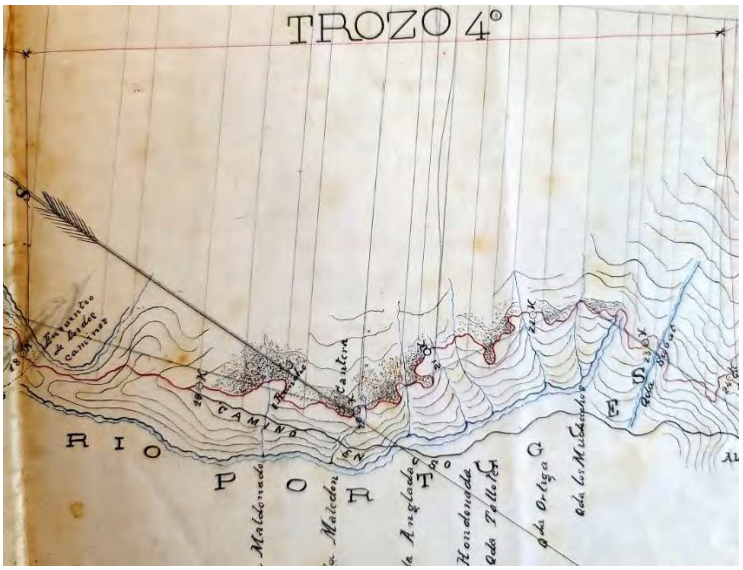
In 1884, the engineer resubmitted his project for the 5,506 meters of *Trozo # 2*.[29] In this *Memoria*, the construction of **Carretera Núm. 6** was expressed as the central piece of a larger masterplan. The road was to unify what it was called the coffee district. Coffee producer's counties from the surrounding mountain region were to build municipal roads, connecting them to **Carretera Núm. 6.** The plan was for Lares and Maricao to connect with Adjuntas; while Jayuya, Orocovis and Ciales were to build toward Utuado. Ponce and Arecibo were to be the outlets of the coveted local production to the international markets. **Carretera Núm. 6** was also presented as part of an integrated plan of transportation. By 1884, steamboats from San Juan reached Arecibo in four hours; using later **Carretera Núm. 6** to reach the southern coast. The trip could be even faster, once the completed **Carretera Núm. 6** proceeded to be connected to the *ferrocarril de circunvalación*, as planned.

As previously stated, Trozo # 2 had various challenging spots, especially the water crossings over *Juana Matos, Quebrada Besosa and Quebrada Santa*. The first one was the most important and complex work to be done in the new section.

Larrinaga was crucial in the planning and development of the twenty-nine (28,600) kilometers between Ponce and Adjuntas, directly supervising the initial construction. By 1888, the engineer had designed the entire section Ponce-Adjuntas (**Fig. 17**). By that last date, *Carretera Central*'s one hundred and thirty-four (134) kilometers had been completed. However, **Carretera Núm. 6** was a shorter route.

[29] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 220. Caja 2320. Memoria del 15 de marzo de 1884.





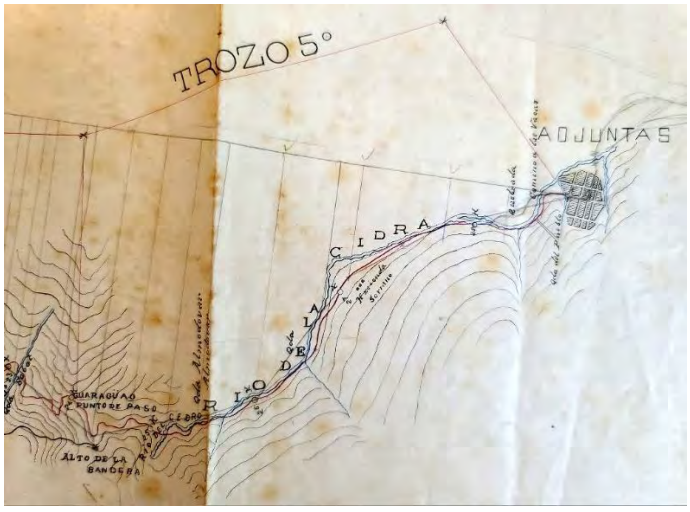


Figure 17. Larrinaga's drawing for *Trozos* # 3, 4 and 5, reproduced by Pedro F. Fernández in 1891.

Larrinaga's views on construction techniques, obviously a result of his academic training at the Rensselaer Polytechnic Institute (RPI), the oldest technological university in the English-speaking world, and the University of Pennsylvania, were also applied in the first four kilometers from Utuado towards Arecibo, especially in the use of "*tramos metálicos*" to overpass water crossings and depressions. The US trained engineer emphasized that among the countries that were actually working using iron and steel as main structural component, Belgium was the most advance, suggesting buying all needed material in the European country.

Larrinaga's 1884 construction specifications for the *tramos metálicos* in *Trozo # 2*, were approved to be applied to every culvert, *pontón* or bridge along the entire road from Ponce to Arecibo that required a straight upper deck. It was specified that for the structures with a five-meter span or less, the *tramo metálico* was to have eight (8) longitudinal beams of rolled iron supporting undulated metal planks for the macadam pavement and two longitudinal iron beams for the safety railings. Structures of six-meter span or more, would have two main longitudinal iron beams, with as many transversal ones as needed, to support the permanent weight of the structure. One hundred and thirty-seven (137) years later, the *tramos metálicos* identified as part of this nomination effort conformed to those specifications. (**Fig. 18**)

Figure 18. (Left to right) A two-meter culvert located at km. 13.6 and two five-meter *pontones*, located at km. 14.3 and 17.7 respectively, show some of the components describe by Larrinaga, according to their size.

In February 1888, the works on *Trozo #2* were permanently accepted by the *Diputación Provincial*. The 5,506 kilometers were completed and provisionally accepted in April 1887. In a letter of March 1888, Larrinaga reported that the only structures that were not finalized were the culverts, bridges and pontones that required the *tramos metálicos*. The supporting elements like the masonry abutments were all completed. However, in all cases, provisional wooden planks were placed to sustain the macadam, while waiting for the iron parts to be ordered and built.[30]

Besides de road itself with all its functional components (culverts and pontones), the most significant and complex work accomplished in *Trozo # 2* was the bridge over *Quebrada Juana Matos*. The abutments and all masonry works were done by private contractors. The bridge, designed by Tulio Larrianaga, was described by its author as thirty-five meters in length structure, combining a *tramo metálico* with extended masonry parapets. Bricks were used for the abutments' parapets, plinths, and ridges, while the bays' fabric was of ashlar. The bridge had two full-body main iron beams, thirty-four meters in length, embedded into the masonry abutments, supporting the transversal iron joists and the undulated metal planks, on top of which the macadam was deposited. The bridge was six meters wide, and it had, for a safe transit, two metal safety railings firmly screwed into the main iron beams' heads.[31] The bridge was finished and permanently accepted in December 9, 1892.[32] (**Fig. 19**)

[30] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Caja 2320.
[31] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 245-245a. Caja 2346.
[32] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 255. Caja 2354.

Figure 19. Currently abandoned and bypassed by a modern deviation of PR-123 (**Carretera Núm. 6**), the 1892, still impressive and contributing *Puente Quebrada Juana Matos* sits in a private lot. The structure retains all the components described by Larrinaga in his 1884 plan. (Photos, Juan Llanes Santos)

In January 1892, a public auction was announced for the construction and assembly of seven (7) *tramos metálicos* for *Trozo # 2*, Ponce – Adjuntas Section, including the metallic board for the Juana Matos Bridge. Out of the seven metallic boards, one was for a two-meter span culvert; three for a three-meter span; one of four-meter span; one for a six-meter span *pontón* and one for a ten-meter span *bridge*. By 1892, besides Larrinaga's proposals and designs, there were also plans done by engineer Pedro F. Fernandez. (**Fig. 20/21**).

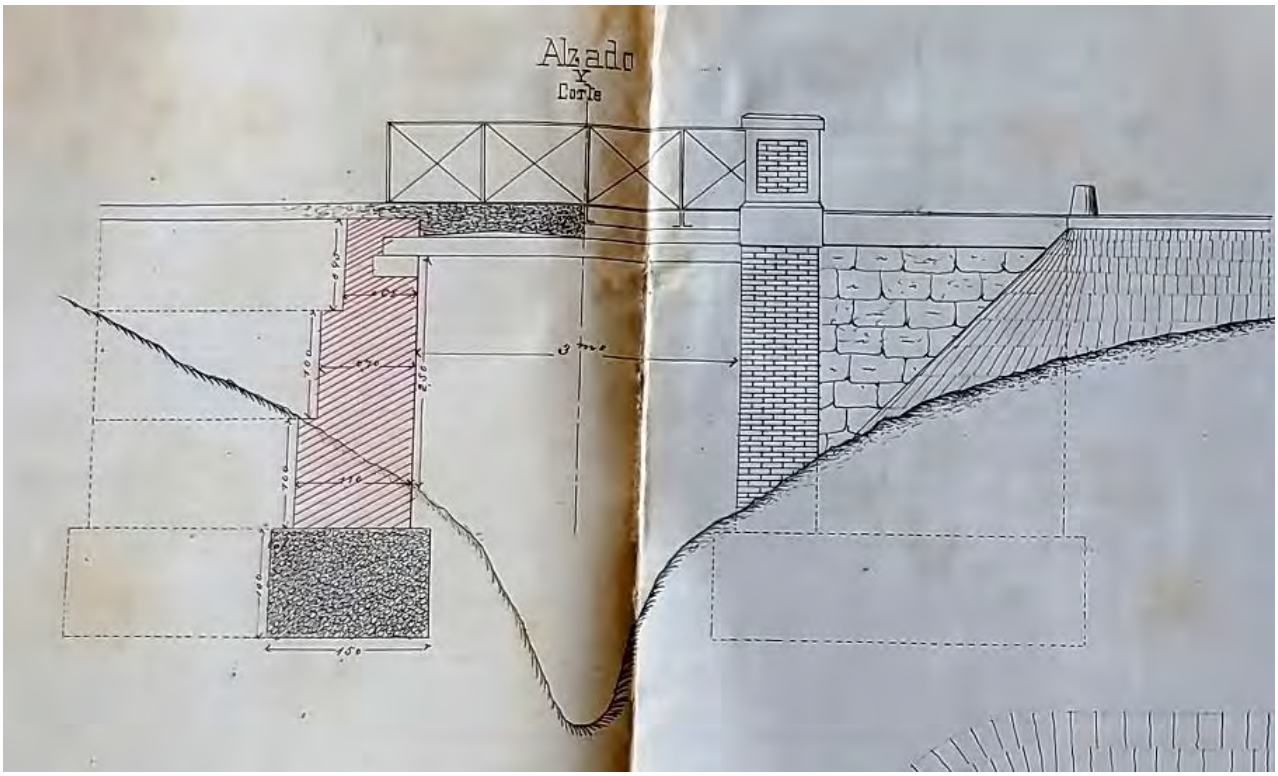


Figure 20. Above, partial view of an 1888 Larrinaga's proposal for a three-meter span culvert, with a metallic upper-deck.

Figure. 21 Above, partial view of an 1891 drawing done by engineer Pedro F. Fernandez to be used as model for a ten-meter span bridge with a *tramo metálico*.[33] Below, an 8.5 meters span bridge in the Utuado-Arecibo section, on which the major structural components from the 1880's still present: 1) masonry abutments; 2) brick columns; 3) metal railings; 4) full body (*alma llena*) longitudinal iron beams. Although not depicted in the 1891 drawing, been a ten meters span bridge required supporting transversal (not longitudinal) iron beams. The photo below shows the transversal beams for this particular structure. (Photo, Juan Llanes Santos)

[33] Ibid.

In the 1892 public auction, there was only one bid, submitted by the firm *Sres. Sobrinos de Portilla*, who received the contract on February 5, 1892. The *tramos metálicos* were built in Belgium, as suggested by Larrinaga, and arrived at Ponce's port by May 1892. The engineers from the *Diputación Provincial* themselves (not the contractors) were responsible for the download, transport, and installation *in situ* of all the metallic sections. All the *tramos metálicos* were provisionally accepted by July 1892, with a final acceptance on December 9, 1892, along with the Juana Matos Bridge. [34]

Just like in the southern region between Ponce and Adjuntas, there were early attempts to build proper roads between Utuado and Arecibo. However, once again, the organized effort to finally build a useful road within the two towns came because of the coffee production boom of the 1880s. In December 15, 1885, engineer Pedro F. Fernandez, submitted his proposal for *Trozo #1*, departing Utuado towards Arecibo.[35] It was indicated that Utuado had 373 acres producing sugar cane; 3,468 acres of plantains; 2,038 acres of fruits; and 15,193 acres dedicated to coffee production. Its average annual production of 136,737 hundredweight of the coveted commodity had an approximate value of 3,418,475 pesos.

Trozo #1 in the Utuado-Arecibo section was to begin three hundred meters at the northern end of town, traversing approximately four thousand (4,050) meters, and ending-up at the crossing of the Caguanitas River. The works, put on public auction for bids on December 21, 1887, was awarded to contractor Pedro Alonso Ruiz. The contractor divided the work in two phases. In the first track of 2, 716 meters, seven culverts of brick and masonry and eight pontones and culverts with *tramos metálicos* were built. In the second track, with an extension 1,187 meters, six regular brick and masonry were built. Additionally, five *tramos metálicos* were also built.[36] The works were initiated on March 3, 1888. They were supposed to be completed by March 1890. But due to problems like excessive rains in 1888 and 1890, difficulties in finding regular braceros, and the constant transit of horses and oxcarts, the works were finished by 1892.

As stated previously, Larrinaga's 1884 construction specifications for the *tramos metálicos* in *Trozo # 2* in the Ponce-Adjuntas section, were approved to be applied to every culvert, *pontón* or bridge along the entire road from Ponce to Arecibo that required a straight upper deck. The use of *tramos metálicos*

[34] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 255. Caja 2354
[35] AGPR. Fondo: Obras Publicas. Serie: Carreteras y puentes. Legajo 229. Caja 2329.
[36] AGPR. Fondo: Obras Publicas. Serie: Carreteras y puentes. Legajo 241a. Caja 2342

was widely repeated in the first four kilometers of **Carretera Núm. 6's** Utuado-Arecibo section (**Fig. 22**). In addition to the first fifteen kilometers in the Ponce-Adjuntas Section, *Trozo # 1* of Utuado-Arecibo was the other section build while the island was under Spain's jurisdiction. This construction period reflects upon the resources identified and documented in the area. (**Figs. 23/24/25**)

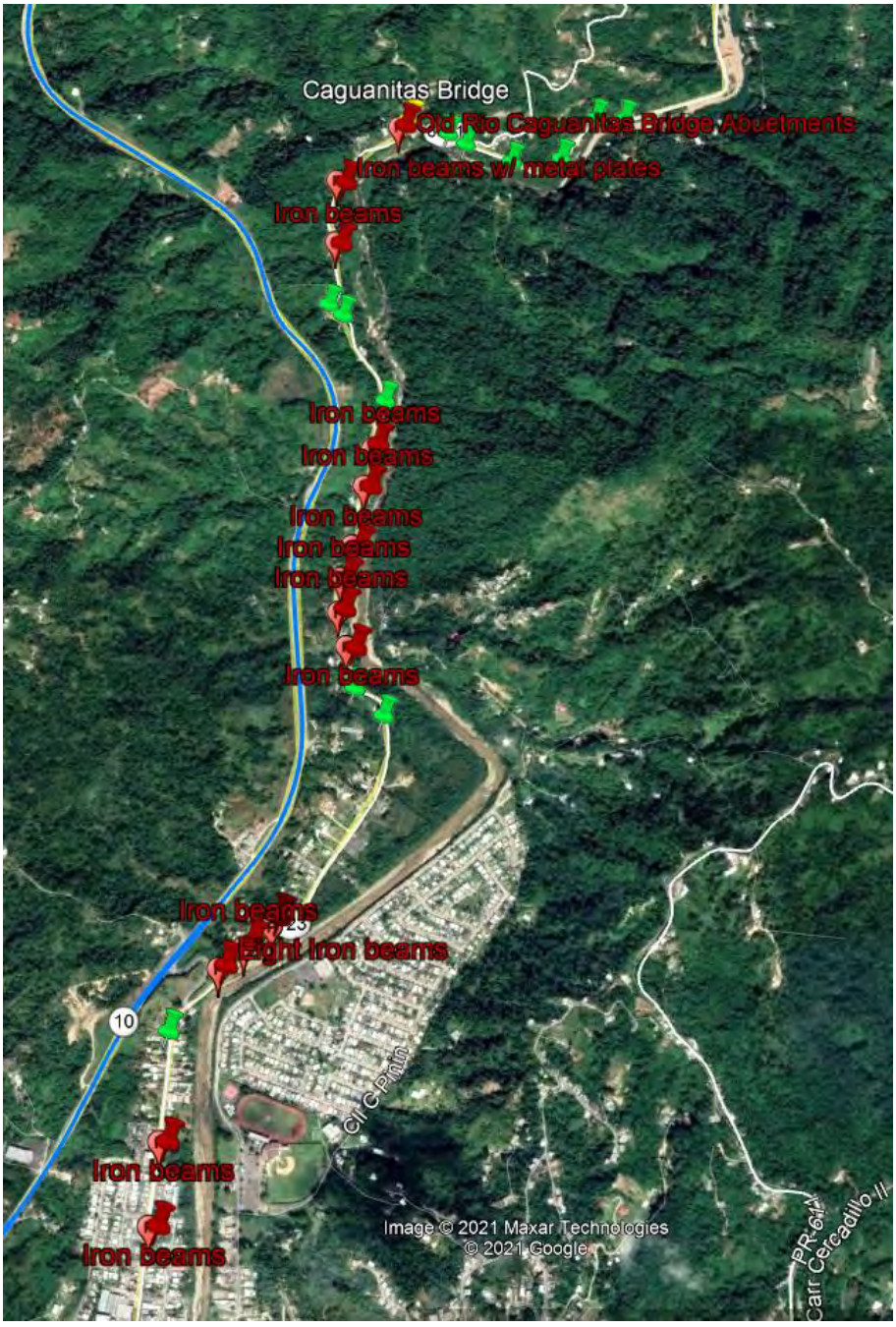


Figure 22. Location of *tramos metálicos* (red pins) surveyed as part of this nomination effort in the Utuado-Arecibo section. The structures are found within the first four kilometers from Utuado's urban center to Caguanitas Bridge, section built under Spanish government. (Map prepared by Juan Llanes Santos)

Figure 23. This five-meter span *pontón*, located at km. 57 in the Utuado-Arecibo section, retains most of the construction specifications as instructed by Tulio Larrinaga in the 1880s: its brick and masonry abutments, the eight longitudinal beams of rolled iron (painted red) embedded in the masonry interior walls supporting today concrete pavement and its two longitudinal iron beams providing support to the safety railings, parapets, and railing pedestals. (Photo, Juan Llanes Santos)

Figure 24. The six meters structure above contains the components specified by Larrinaga in the 1880s for a *pontón* of this size: brick and masonry abutments, the needed transversal rolled iron beams (5 in this case) and two embedded longitudinal iron beams. (Photo, Juan Llanes Santos)

Figure 25. This six-meter long, six meters wide *pontón*, located at Km. 59.6, in the Utuado-Arecibo section, retains practically all the structural components mentioned by Larrinaga for a structure of its size: brick and masonry abutments, transversal iron beams, two main longitudinal iron beams, and even, the undulated metal planks. (Photo, Juan Llanes Santos)

Pedro F. Fernandez's 1891 drawing, depicted in Figure 21, clearly shows that Larrinaga's suggestion a decade before of using metal safety railings to substitute the traditional parapet was still in effect. However, Larrinaga's original proposal for the metal railing was not used. The one proposed by Fernandez is closer to the actual construction. (**Fig. 26**)

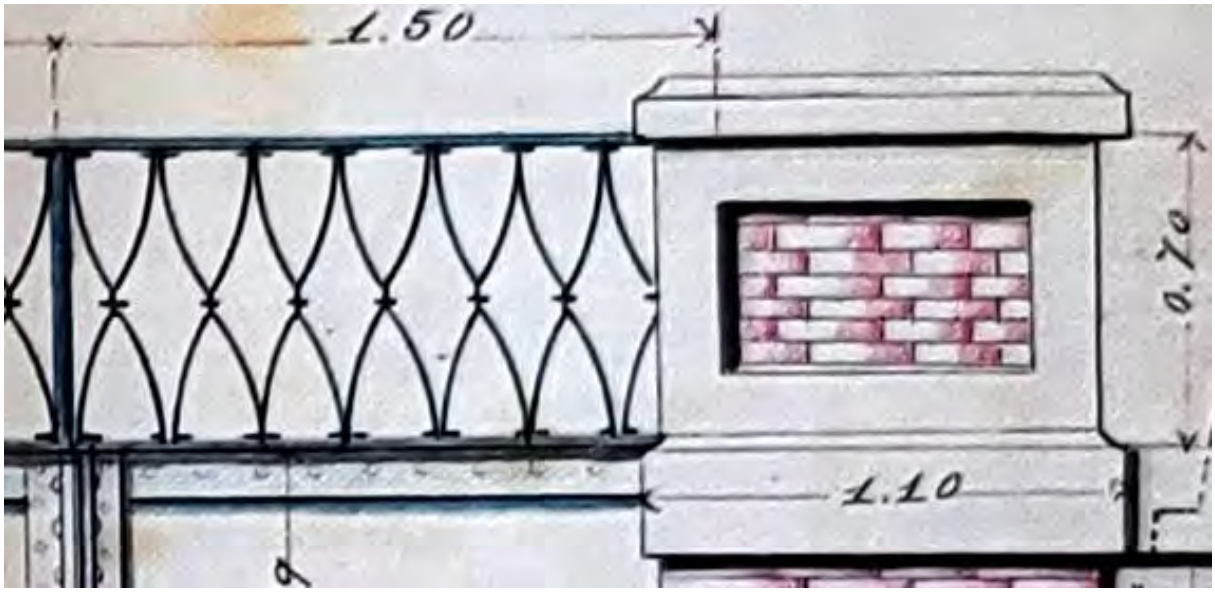
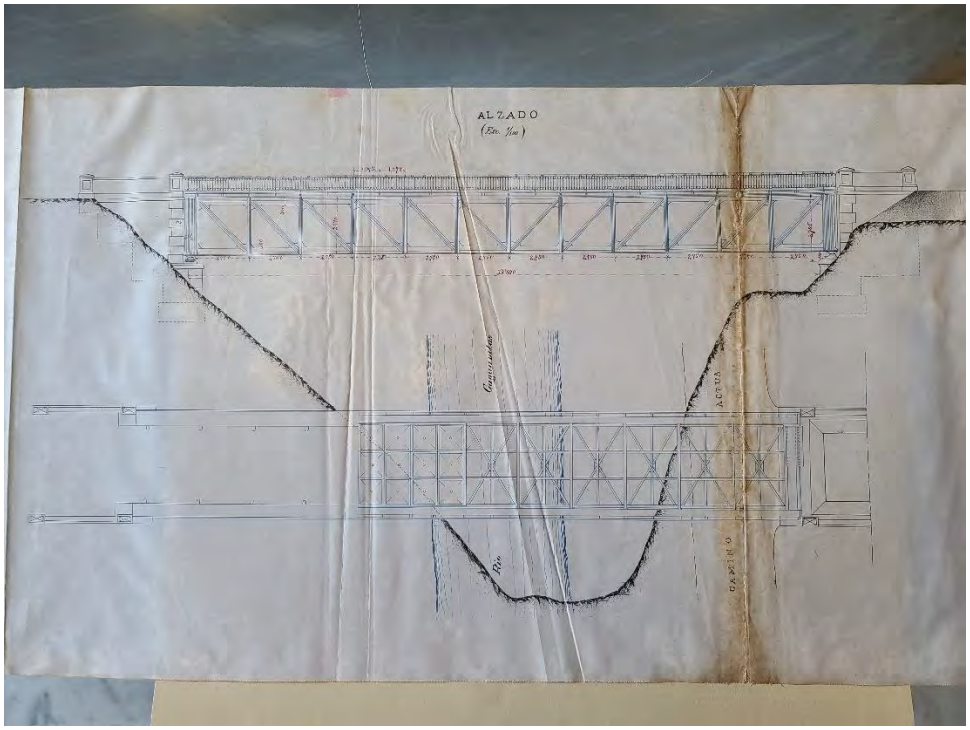


Figure 26. Above, a partial zoom of Pedro Fernandez's 1892 drawing for the metal safety railings, very similar to the final construction found in a reduced group of culverts, bridges and pontones, all in near proximity to each other in the Ponce-Adjuntas Section of **Carretera Núm. 6** (See, Section 7).

Engineer Pedro F. Fernandez, from the Diputación Provincial, was the designer of *Trozo # 1*, Utuado-Arecibo Section.[37] In his 1885 proposal, Fernandez indicated that many culverts and *pontones* were needed in this section. When the depressions and water crossings could be saved using straight stretches, Fernandez explained that the models of *tramos metálicos* already approved for the Ponce-Adjuntas Section were to be used. According to the engineer, the most challenging work of the entire section was the one at the very end of *Trozo #1*, the bridge over the Caguanitas River. Fernandez opted for a 35-meter-long, single-span metal bridge on masonry abutments. Using the old existing road between Utuado and Arecibo, the construction of the bridge was the first undertaking in *Trozo # 1*. It was clearly understood that without the construction of the bridge, the road would it be useless. Following on Larrinaga's suggestions, all masonry works were done by the contractor, while the metal parts were acquired in Belgium. By 1892, *Trozo #1* was totally completed, including the Caguanitas River metal bridge. (**Fig. 27**)



[37] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 229. Caja 2329.

Figure 27. First image, Fernandez 1885 drawing for the Caguanitas Bridge; followed by a 1906 photo depicting the then Governor Beekman Winthrop while crossing the Caguanitas Bridge. Last, today's 1976 concrete bridge, built on the west side of the demolished metal bridge. The masonry abutments of the old bridge still in place.

During the early 1890s, the classification status of **Carretera Núm. 6** was upgraded. On April 21, 1892, by Royal Decree, King Alfonso XIII included the road in the *Plan Carretero General de la Isla de Puerto Rico*.[38] A provincial road since 1869, by 1892, **Carretera Núm. 6** became a First-Class Road. The new designation brought technical and managerial changes. For once, the engineers assigned to the

[38] Ibid.

Jefatura de Obras Publicas took over the design and supervision of the road's construction. Significant characters like Tulio Larrinaga will no longer have decisional jurisdiction upon the road.

In addition, the road had to be brought-up structurally to the codes of its new and higher designation. However, after various inspections by the *Jefatura*, it was determined, to the good name of the engineers from the Diputación Provincial, that standards procedures for the construction of a First-Class Road had been followed from the beginning. The road's sections built by 1892 were six meters wide, with 4.50 meters for the central roadway, and .75 meters for the shoulders. The roadway box was twenty centimeters in depth for the macadam, and six centimeters deep at the shoulders; all parts cover by a four-centimeter-thick layer of highly compacted pulverized rocks.

As soon as **Carretera Num. 6** was included in the *Plan Carretero General*, the *Jefatura de Obras Públicas* became the agency responsible for the road's design, construction, and conservation. Their first step was to legally seize the sections of the road already completed by the *Diputación Provincial*. In 1892, that meant, the 11,325 meters from Ponce towards Adjuntas, and the 3,903 meters from Utuado towards Arecibo. It was determined by the Jefatura, that the 11.3 kilometers in the Ponce-Adjuntas section required the assignment of permanent *peones camineros* (road menders) while regular work continue to finish the entire road from Ponce to Arecibo.

By 1892, the road menders system was already in full use in the *Carretera Central*, completed by 1886. The *peón caminero* was the first line of defense on the road's conservation. A practice used all over Europe, in June 1867, copies of the regulations in effect in Spain pertaining road conservation and the organization of the road menders' service were sent from Madrid to Puerto Rico, Cuba and Philippines. These were to be revised and adjusted to the local circumstances.[39] By August 2, 1867, the local "*Reglamento de organización y servicio de los peones camineros de la isla de Puerto Rico"*, was signed and approved by Miguel Martínez de Campos, Inspector General of the *Jefatura de Obras Públicas.*[40]

However, before instructions came from Spain on how to organize a corps of *peones camineros*, a set of instructions had already been in effect in the island through the 1865's "*Reglamento de los trabajos que han de practicar los peones camineros",* which explained in detail the selection process

[39] Archivo Histórico Nacional (AHN), Ultramar, 392, Expediente 3 (Portal Archivos Españoles, PARES).
[40] Ibid., 393, Expediente 3 (PARES)

and the tasks that the *peones* were to performed.[41] According to regulations, there was supposed to be one *peón caminero* per every three or five kilometers on the First-Class roads. To qualify as a road mender the men had to be more than twenty, but less than forty years old; had to have completed military service or been a farmer; free of physical disabilities; of known good conduct; with experience in construction and had the ability to read and write.

A uniform was required, to be paid by the *peón* himself, consisting of long blue linen pant, white linen shirt, a Panama hat, and a metal badge with the number of kilometers assigned to him. The *peón caminero* was to perform the duties of a police officer enforcing the laws related to the road's conservation and safety. He was to do his rounds armed with a provided carbine (**Fig. 28**). In a small leather bag, the peon was always supposed to carry a notebook on which his supervisor would comment on his performance, as a record for future promotions or pay raise. Failing to have the notebook with him, would cost him a day's wage; losing the notebook, three days' pay, besides paying for the new one.

Figure 28. Detail of a small 1856 watercolor showing the peón caminero in his full uniform.[42]

[41] Francisco Ramos, *Apéndice al Prontuario de Disposiciones Oficiales*, Puerto Rico, Imprenta de González, 1867, 267-273.
[42] AGPR. Fondo: Obras Públicas. Serie: Personal. Legajo 14. Caja 30.

The *peón* was required to work seven days a week, from sunrise to sunset, with short rests for lunch, dinner, and a snack period in between. He was not to suspend his daily tasks because of the weather, be it extreme heat or heavy rain. In case of fire, natural or provoked, the *peón* was to do everything possible to protect the road's integrity, reporting the incident, and physically cutting down trees and bushes near the roadside that could feed the fire. In case of an earthquake or hurricane, the *peón caminero* was required to walk his entire sector, as soon as it was possible, to evaluate damages to the road, to support structures (bridges, culverts, etc.) and to identify landslides or susceptible areas for possible landslides. The peon had twenty-four hours after the natural event to submit his assessment report to his superiors.

Besides his daytime duties as a mender, night rounds were required to enforce the safety laws, on his assigned section. This was due to heavy traffic conducted during night-hours on the First-Class roads, taking advantage of cooler temperatures. The duty of the *peón caminero* as a "police" officer, had a direct impact upon his wage. According to the *Reglamento de Conservación y Policía de Carreteras*, a revised version published in the *Gaceta Oficial* on August 25, 1874, the *peón caminero* was entitled to one third of the fine imposed on those that violated the traffic laws on the state roads.[43]

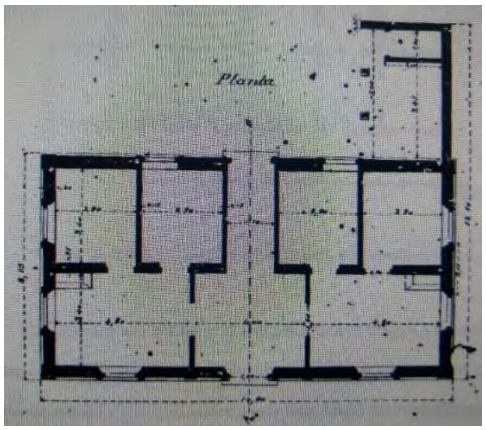
Every two days, the *peón caminero* was required to cover his entire sector, to evaluate conditions not only of the road's *afirmado* (pavement), but also bridges, culverts, roadsides, retaining walls, and even the wood-line along the road. Any problem with the *afirmado* had to be quickly repaired. If the undertaking was beyond his individual capacity, the *peón* had to promptly report the problem to his immediate supervisor, the *Peón Capataz* (foreman) or the superior *Sobrestante* (overseer), to form a *cuadrilla* (work gang) with other *peones camineros* from the nearby areas to resolve the problem expeditiously. Structural problems with the road or its components found by the supervisors, not properly reported by the *peón caminero* on his assigned section, could result on his dismissal or in having his wage suspended for an extended period to "contribute" to the needed repairs.

The *peón* had to live in or very close to his assigned road section. Depending on the location, the position came with a permanent house built by the government within his assigned road. These residences, known as *casillas de peones camineros* (road mender's houses), immediately became a symbol of the road's social status, as only the *Carreteras de Primer Orden* built by the Peninsular

[43] AGPR. Fondo: Obras Públicas. Serie: Carreteras y Puentes. Sub-serie: Asuntos Generales. Legajo 617. Expediente 779. Caja 2740.

government (not the provincial or municipal government), had *casillas de camineros* upon them. With a monthly wage of fifteen pesos (a fair salary at the time), a well-built, solid house (when most Puerto Ricans lived in hatched or wooden houses) and seen as a representative of the government in every major road, the *peón caminero* was considered a prestigious occupation and tittle during the 19th century.

As stated, First-Class roads were to have one *peón caminero* per every three kilometers responsible for the road's maintenance. In accord, in 1892, engineer Eduardo Cabello conducted the study to determine the proper site for the first two *casillas* to be used by the first four *peones camineros* assigned to the eleven (11) kilometers in Ponce, choosing kilometers three (3) and nine (9), for the locations. [44] Cabello was also responsible for the building's design (**Fig. 29**).[45]



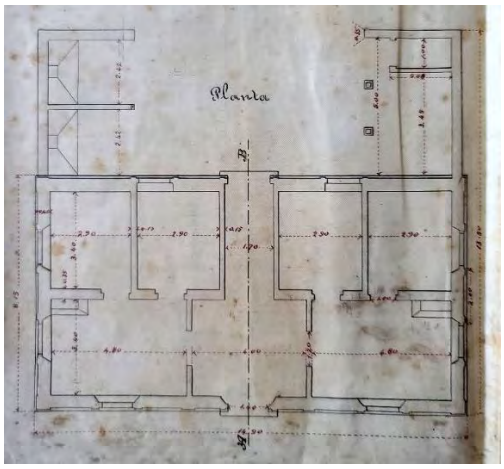


Figure 29. Above, layout of the casilla's typology used in the *Carretera Central*, sheltering two families. Below, Cabellos' design for **Carretera Núm. 6**.

[44] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 223. Caja 2322.
[45] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Sub-serie: Casillas de peones camineros. Legajo 5582-5583. Caja 2669.

The model used by Cabello was almost identical as the one used in the *Carretera Central*: a double dwelling with one single entrance, a central hallway providing access to the building's rear, dividing the property in two identical living quarters, with a shared latrine, kitchen and supplies shed on the back. Cabello's layout of the main living quarters was the same: a C-shaped, rectangular building, measuring fourteen (14.9) meters in length, eight (8.15) meters wide, with a common living area and two bedrooms, on each living quarter. The layout was formed by a longitudinal load-bearing wall running through the center of the rectangle and six transverse partitions, two in the front bay and four in the rear bay. However, instead of just one shed at the rear, Cabello designed two rectangular sheds of 5 (5.30) meter in length, three (3.85) meters wide. One shed to be used as a double kitchen (one for each family), and the other with two latrines and a shared supplies/tools room (**Fig. 30**). However, the construction materials in the casillas' walls were made of regularly coursed limestone blocks, completely different to any other *casilla* surveyed at this time.

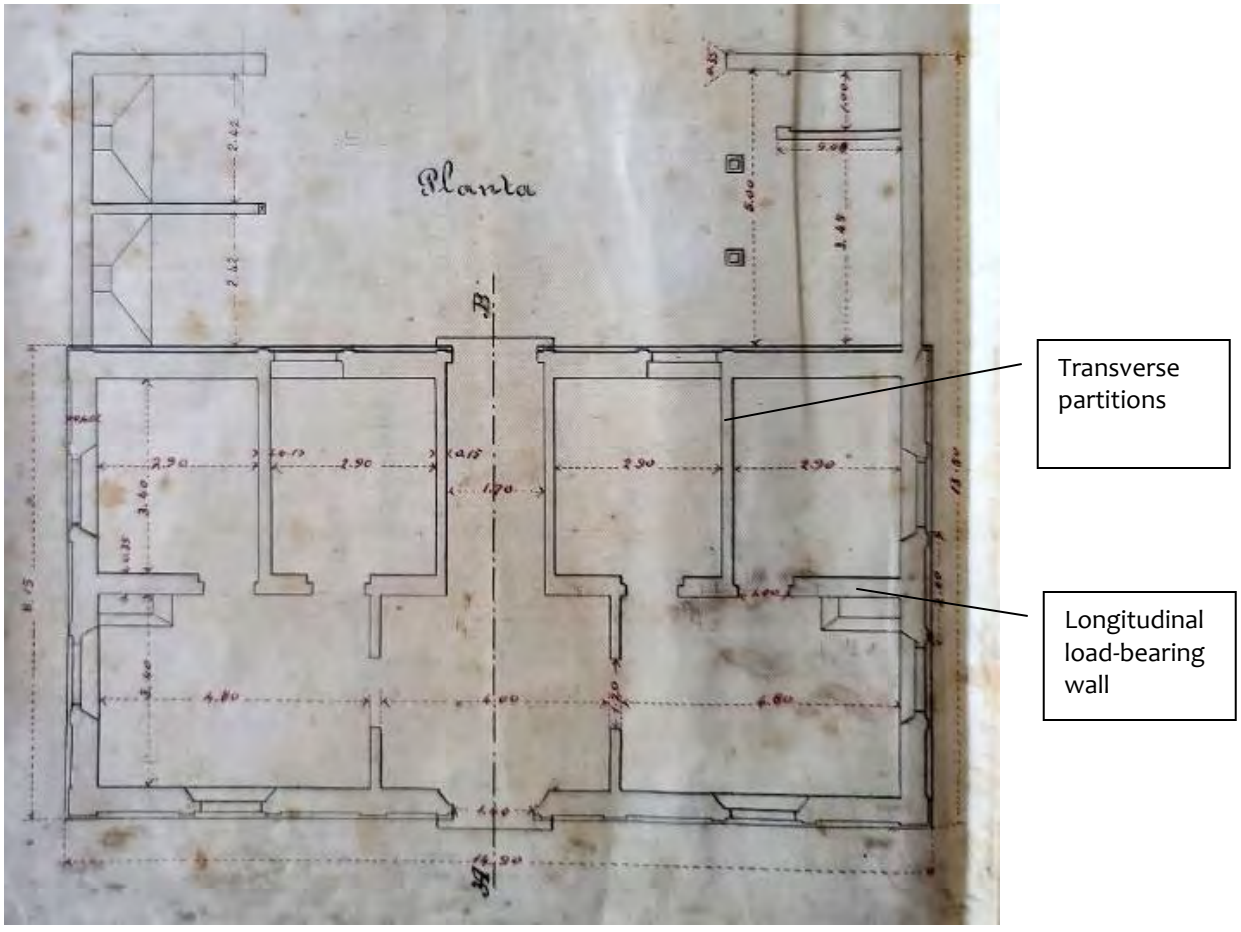


Figure 30. Cabello's 1890s drawing.

Cabello worked a budget of 4,238 pesos for the *casilla* at km. 3 and 4,352 pesos for the second one at km. 9. Budgetary plans were also made for additional *casillas* at km. 15, 21, 27 and 33.[46] After a public auction for bids was conducted, in February 1893, the contract to build both buildings was awarded to contractor Federico Heintz, who offered to do the job for 10,300 pesos, the lowest bid. On March 3, 1893, Heintz began the plot excavation at kilometer 3. On August 26, 1893, an engineer from the *Jefatura de Obras Públicas* was assigned to inspect and received both buildings, as they were satisfactorily completed.[47]

While the *casillas* were been built, the *Jefatura de Obras Públicas* continued the process of studying, surveying, and working on the many kilometers yet to be begun and finished. For example, on June 17, 1888, the construction of *Trozo # 3* in the Ponce-Adjuntas section, with a starting point in the proximity of *Hacienda Buena Vista* and ending 4,000 meters later in the highest point of the continental divide, in the *Alto de la Bandera*, was awarded precisely to the Buena Vista owner, Salvador Vives. With two years (1890) to complete his section, Vives closed-down his contract on April 17, 1893, only completing just over three kilometers.[48]

Between 1893 and 1898, the construction of **Carretera Núm. 6** became a very slow undertaking. By mid-1893, the Ponce-Adjuntas section was completed from km. 0.0 until km. 14.3; another seven hundred meters to reach Km. 15, were under construction; and a project to build an additional three kilometers (from Km. 15 to Km. 18) was approved. The last eleven kilometers to reach Adjuntas were just under study.[49] At the other end, the first 4, 050 meters from Utuado towards Arecibo was the only section completed as the 19th century ended.

Multiple factors caused the slow development in the construction process of the much-needed road. For example, many contractors complained about the serious problems in obtaining labor. During the coffee harvest period, workers preferred to be employed on the farms rather than working on the road. On the other hand, the construction of the bypass train became a competing task with the construction of the highway, attracting many workers from the region. Even the practice of using prisoners in road construction, as was done on the *Carretera Central*, left a harmful legacy. Many

[46] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 258. Caja 2357.
[47] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 241a. Caja 2342.
[48] AGPR. Fondo: Obras Públicas. Serie: Carreteras y puentes. Legajo 223. Caja 2322.
[49] Ibid.

workers, according to the complaints of many contractors, considered that working in road construction was prison labor.

The way that the working class responded to the demands from the Establishment (government, landlords, contractors, etc.) in providing their work capacity was determined precisely by the way they produced and re-produced their material life. The agricultural mode of production, the laxity of land tenure rights and its enforcement, the flexibility of exchanging work for commodities, the not-so-firm established concept of private property with its legal and mental constrictions as implemented under a full-blown capitalist society, allowed the social possibility for the working class to sustain their physical lives without binding themselves to a regular job or wage. In 1882, Manuel Maese, one of the engineers associated with the *Carretera Central* commented that:

> "*El bracero de esta isla tiene a su disposición cosas que le facilitan su menudo estilo de vida y que no promueven su interés por trabajar. Sus casas (sus pobres chozas) las construyen de yaguas, material que no les cuesta nada. Se alimentan de frutos del país que consiguen sin trabajar. Se someten a un régimen de trabajo, sólo cuando tienen una gran necesidad por devengar algún salario y una vez que obtienen la cantidad que necesitan, se ausentan de sus tareas".*[50]

By the 1890s, Maese's words were still a reality to be considered. At the time of **Carretera Núm. 6**'s construction, the workers' basic needs (shelter, food) could still be satisfied without their total immersion into the wage-earning working market.

Ironically, the upgrade of **Carretera Núm. 6** from a provincial to a First-Class Road brought with it a series of additional problems. As a First-Class Road, the funds to support the undertaking did not come from the local government, but from Spain. The granted money, however, came with centralization and restrictions. The availability of the monies did not respond to a local determination. The money was to be available when Spain allowed it. Every decision had to be approved by the authorities in Spain. Every route, bridge, *casilla de caminero*, or construction design had to be rubberstamped in the *Península* before it was implemented. If an approved route had to be changed due to problems or because a better approach was found, it needed the green light from overseas. This over management created a pervasive delay in the decision-making process that had a ripple effect upon the entire undertaking.

[50] AGPR. Fondo: Obras Públicas. Serie: Carreteras y Puentes. Legajo 23. Caja 2126.

The change of designation also brought unexpected controversies between the *Diputación Provincial* and the *Jefatura de Obras Públicas*. After the process of seizure of the sections completed by 1892, there were administrative problems in determining who was responsible for the sections begun but not finished. The *Jefatura* demanded that any construction already in progress be financed, supervised, and completed by the Provincial Council. For its part, the *Diputación* considered that all responsibility for completing the road in all its sections, whether begun or not, had fallen to the *Jefatura de Obras Públicas* as soon as the road was included in the General Road Plan by the peninsular government. The impasse between the two agencies greatly delayed the undertaking.[51]

The lack of means of transportation was also a continuous struggle as thousands of cubic feet of stones, sand, along with equipment and personnel needed to be moved or removed from and to the working sites. During the initial years, depending on the section being worked, much of the construction materials were transported from Ponce or Arecibo, based on which one was closer to the working area. However, as the work gangs went deeper into the mountain range, it became harder and more expensive to provide the construction materials from either city.

As 1898 came, forces outside the control of the *Diputación Provincial*, the *Jefatura de Obras Públicas* or the local government, were shaping the new course of the road and the whole island. In a letter dated July 5, 1898, contractor Roque Paniagua, who was selected to finish *Trozo #3* of the Ponce-Adjuntas section, indicated that he was having trouble completing his work. On the one hand, owners of the lands through which the road was to run opposed the continuation of the work. On the other hand, due to the conflict with the United States, the Spanish military demanded that he deliver all the available gunpowder. Paniagua requested a four-month extension to complete his work. Unaware of what was about to happen in less than twenty days, the extension was granted.[52]

[51] AGPR. Fondo: Obras Públicas. Serie: Carreteras y Puentes. Caja 2340.
[52] Ibid.

Carretera Núm. 6: the Early American Period (1898-1904)…and beyond

In 1898, the roads built to serve the economic, military, and political project of the Spanish government in Puerto Rico, became the main avenues of approach of the US military ground forces towards the conquering of the island as part of the Spanish American War. After San Juan's bombardment on May 12, 1898, and the city's port blockade, the attention of the US' strategists turned towards the southwest, one of the island most productive and the least militarily built section. On July 25, 1898, the landing of U.S. troops in Guánica Bay began the land occupation of the island. Two days later, three battleships departed from Guánica towards Ponce, arriving at the city's port on July 27, 1898, with ground troops setting foot ashore in Playa Ponce during the early hours of July 28. The Custom House in Playa Ponce became General Nelson Miles's headquarters. Ponce's occupation provided the invading force the southern access and control of the two major roads designed to cross Puerto Rico from north to south: the *Carretera Central* and **Carretera Núm. 6.** (**Fig. 31**).

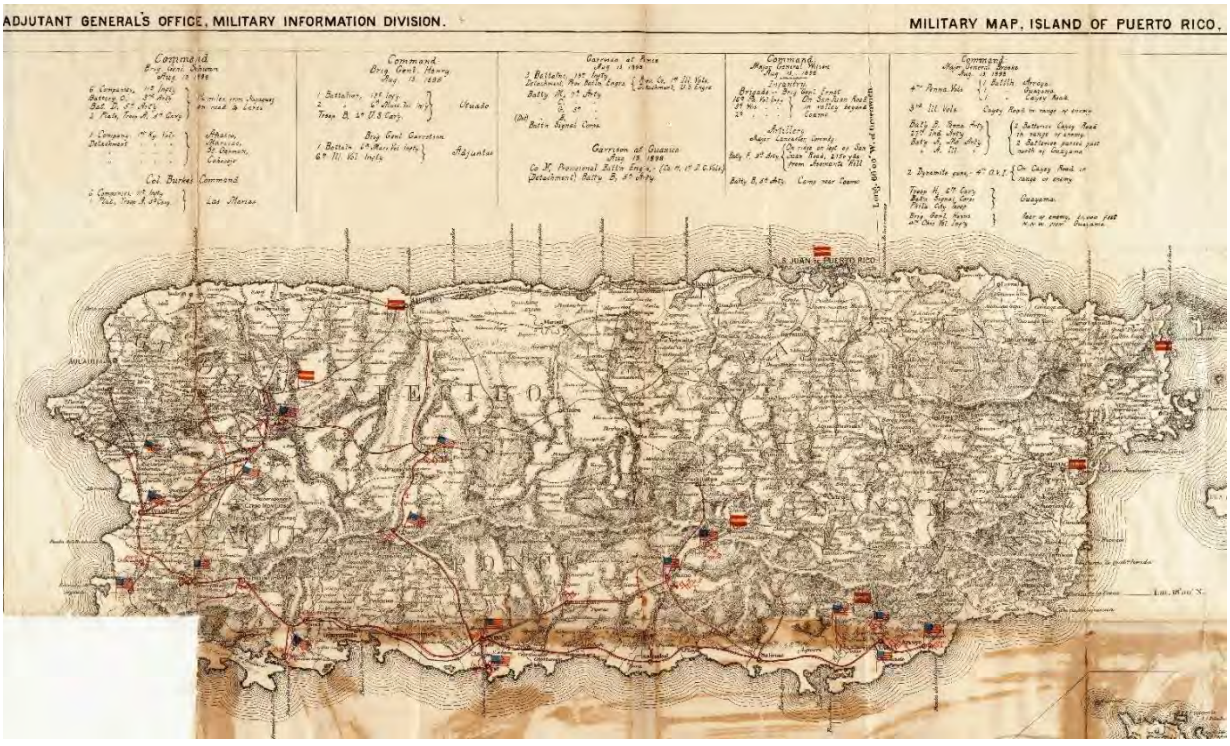


Figure 31. This 1898 map was annexed to the Report of the Major General Commanding, indicating the location of the US and Spain military forces by November 1898. The routes planned to be used by the US troops were marked in red. The *Carretera Central* is shown in red from Ponce to Coamo, with the dates August 9 and 12 (battle dates) written at the site of the military encounters. The map shows US Army posts at Adjuntas and Utuado, occupied from Ponce by the use of the unfinished **Carretera Núm. 6**.[53]

[53] Archivo Nacional Digital de Puerto Rico. Código de Referencia: 20170727_134859.

The *Splendid Little War* moved quite quickly in the island. On August 12, 1898, the US troops received orders from Washington to cease all actions, as a peace accord was being negotiated with Spain. In the morning of August 13, the Spanish commanders received similar instructions. By October 18, 1898, the Spanish resistance on the island had been defeated and the U.S. flag flew over the Fortaleza, the governor's mansion in Old San Juan. Puerto Rico was obtained from Spain under the Treaty of Paris that ended the Spanish-American War. The treaty was signed on December 10, 1898, and ratified by Congress on April 11, 1899. From October 1898 to April 1900 Puerto Rico was governed by U.S. military forces that had occupied the island after defeating the Spanish. Three consecutive military governors (Commander General John R. Brooke, Commander General Guy Henry and Brigadier General George W. Davies) administered the new colony from October 18, 1898, to May 1, 1900.

The eighteen-month military occupation destroyed any illusions that Puerto Ricans might have harbored about the promise of liberalism and democracy in the U.S. relations with the new possession. It must be admitted, however, that during the military government a genuine effort was made to improve the living conditions that the occupying forces found on the island. Access to education was expanded. Health services, communications and public service were also improved. Most definitely, clearly understanding that an adequate transportation system was essential for the development and economic exploitation of the country's resources, a special effort was put into improving and increasing the road network throughout the island.

By the time the island was transferred to the United States in 1898, the *Carretera Central* and *Carretera # 4* were the only roads fully completed as part of the 1860's *Plan Carretero de Puerto Rico*. The old *Plan* proposed a total of 880 kilometers of roads. The total of kilometers built by Spain by the time its sovereignty over Puerto Rico ended is not clear and the estimates vary depending on the sources. In 1891, the new Chief of the *Jefatura de Obras Públicas*, Eduardo Cabello, designer of the two *casillas de peones camineros* in **Carretera Núm. 6,** indicated the completion of two hundred and thirty-five (235) kilometers, with another fifty-four (54) under construction. However, in 1897, Chief Engineer Baldomero Donnet reported lower numbers with two hundred and thirty (230) kilometers completed and thirty (30) under construction.[54] The report submitted by Brigadier General George Davis in 1900, to the War Department indicated that the Americans found one hundred and fifty-eight (158.72) miles

[54] Fernando Saenz Ridruejo, Ingenieros de Caminos en Puerto Rico, 1866-1898. *Anuario de Estudios Atlánticos*, num. 55, 2009, 325-326. Cabildo de Gran Canaria. Las Palmas de Gran Canaria, España.

of completed roads in what he called "*Porto Rico*", which equals about two hundred and fifty-five (255.4) kilometers.[55] Another estimate was done in 1919, concluding that the length of roads built under Spain amounted to two hundred and sixty-seven (267.4) kilometers (**Fig. 32**).[56] Either way, the number fell far short of the projected *Plan Carretero*.

Figure 32. A 1902 map showing major roads built up to that time, indicating those built by the Spanish government. Out of the 255 kilometers built by Spain, as reported by the new US administration, 134 corresponded to the **Carretera Central** alone.

In one way or another, the economic, political, social, and administrative way of life of the island was re-arranged under the new US administrators. By General Order No. 102, dated April 30, 1900, Brigadier General George W. Davies established the Department of the Interior. Cayetano Coll y Toste was appointed acting Commissioner of the Interior and held that position until June 15, 1900. The approval of the Foraker Act on April 12, 1900, brought a civil government upon the island. Coll y Toste was replaced as Commissioner of the Interior by W. H. Elliot, appointed commissioner by the President of the US. Hunt promptly organized the department in different boards, bureaus, and divisions. The Board of Public Works, composed of three members, was given the care of public buildings, matters

[55] *Annual Report of the War Department for the Year ending June 30, 1900*. Military Government of Porto Rico from October 18, 1898, to April 30, 1900, 205.
[56] *Report of the Governor of Porto Rico to the Secretary of War*. 1919. Washington Government Printing Office, 1919, 404.

relating harbor shores and lands, railroads, streams, canals, irrigation, marsh lands, aqueducts, and of course, roads, highways, and bridges.[57]

Just as under Spain, the construction of roads became a central point in the new authorities' agenda. In his first annual report, Charles H. Allen, the first civilian governor designated under the Foraker Act, exclaimed that "*the crying need of the island is above all roads*. *It is an imperative necessity to devote every dollar which can be spared from the surplus revenue to the construction of permanent roads".*[58] The urgency for more roads was evident right from the start under the military government that lasted eighteen months in power. Nearly a million dollars was allotted to the military authorities for road construction. However, the works conducted during the military government were scattered over the island, roads were built in detached sections and scarcely a single highway was completed. Allen wanted to use the money allocated to filling up the gaps between roads already finished.

For the first decade after 1898, road construction plans were quite hasty, with emphasis given to speed over quality. The need to quickly increase the mileage of roads was understandable. The economic and social development of the island strongly depended on a reliable network of roads to connect the rural and the urban centers; to properly move the agricultural products from the mountain region to the coastal cities and vice versa; to efficiently move the construction materials to build the much needed school houses in the rural sectors, among other projects. In other words, the new authorities were highly aware that roads were required to make the island a productive addition to the US, while also providing the avenues of approach to spread the new political and cultural project. As such, quick and temporary constructions were considered more relevant than quality and permanence. By 1919, twenty years after the US' occupation, there were an additional nine hundred and twenty-two (922) kilometers of road, increasing to one thousand three hundred and thirty-four (1,334) kilometers by 1924.

Many of the roads constructed during the early years of the 20th century were built along the coast, where the island's topography made the construction relatively easy and inexpensive, without giving primary importance to the requirements of building first-class permanent roads. The aim was to extend as quickly as possible the means of communications and transportation. Under this initial policy,

[57] First Annual Report of the Governor of Porto Rico. Charles H. Allen, Governor. May 1, 1901. Washington: Government Printing Office. 1901, 314.
[58] Ibid. 73-74.

arrangements were made to facilitate traffic, and thus a considerably large number of road structures were built of wood, instead of masonry, and no bridges were provided over river crossings if they could be forded. The construction of roads during the first decade of the 20th century was therefore notable for the speed in which it was carried out, but the resulting network lacked planning and permanency.

Besides short time construction, reducing cost was also an important goal among the policy makers during the first years of the last century. Accepting as correct the figures given in the 1900' report by General Davies, the cost of the 253.6 kilometers of roads built by the Spanish government until 1898, amounted to $3,484,627.00, an amount described as excessive. A simple calculation provides the average of $13,740.00 construction's cost per kilometer. During the twenty years interval of 1898-1919, nine hundred and twenty-two (922) kilometers were built at a total expense of $5,970,956. [59] This was an equivalent to an average cost per kilometer of $6,476.00, almost 50 percent of the cost of roads per kilometer built during Spain's regime upon the island.

However, once again, the reduction in production cost was accomplished at the expense of quality. One of the steps taken to reduce expenses was the abandonment of the *peones camineros* system, eliminated from 1905 to 1914. The practice installed during those ten years was the one in vogue in the United States, allowing sections of the road to deteriorate to a certain extent and then make periodical repairs, using a work gang.

Despite the many ill-advised decisions made during the first decades of the twentieth century regarding road construction, there is no doubt that there was a genuine interest and enormous effort was made to provide the island with a comprehensive road system. The road construction program was also widely used under the military government and following administrations to promote the general welfare as an employment generating program.

As previously stated, the last two decades of the 19th century were the golden years of the coffee production, becoming the main exporting crop and a coveted commodity in the international market, displacing the sugarcane from the old throne. King Coffee lost its crown right after 1898. On August 8, 1899, the island was devastated by *San Ciriaco*, an estimated category four hurricane. Millions of dollars of damaged property were lost and over 3,000 persons were killed. It was estimated that over eighty percent of the coffee production of that year, priced at $ 5.5 to $6 million dollars was lost. Even worst,

[59] Report of the Governor of Porto Rico to the Secretary of War. 1919. Washington Government Printing Office, 1919, 403.

island-wide, over sixty percent of the coffee plants were destroyed.[60] It takes the coffee tree, once planted, a period of five to six years to ripe and produce the expected aromatic seeds. With such a high percent of the plants destroyed and with such a long waiting period for harvest, thousands of small farmers found themselves without their income producing crop, losing their lands, and forcibly joining the large mass of dispossessed workers.

Adding to the natural disaster caused by San Ciriaco, the new economic policies of the US administration had longer lasting destructive effects upon the coffee industry. Before the Spanish American war, most of the island's coffee went to the European market, with less than one percent been sold in the United States.[61] Since the 1870's, the United States, the largest coffee consumer in the world, was absorbing the entire production of Brazil, the largest coffee producer in the world. The Brazilian coffee was cheap in price and quality. As Puerto Rico became a US territory after 1898, the local coffee producers lost the European markets as their outlet and found themselves trying to impossibly penetrate the US market, competing against the long established and cheaper Brazilian's producers. After the war, the US capital that rapidly invested in the island's agriculture was mostly directed toward sugarcane, which product was sent to the US refineries under protective tax provisions. The new investing capital had no interest in coffee and there were no economic policies to protect the local coffee in the US market. It took the coffee industry some years to recover from *San Ciriaco*; it took even longer to adjust to the destructive winds coming from the US economic policies and trends.

The natural disasters and the collapse of the agricultural production created a vast supply of unemployed-labor force. Lack of workers was no longer an excuse for delaying roads construction projects. Even before the destructive hurricane of 1899, during the initial months of the military government, there was a clear intention in promoting employment among those the war had left destitute, especially among the agricultural working force. The road construction program became an effective job-creating tool. By 1899, as many as 20,000 men were simultaneously working upon fifty-seven roads island wide.[62]

[60] James L. Dietz, *Historia económica de Puerto Rico*. San Juan: Ediciones Huracán, 1989, 116-117.
[61] Ibid.
[62] *Annual Report of the War Department for the Year ending June 30, 1900*. Military Government of Porto Rico from October 18, 1898 to April 30, 1900, 376.

The effort to successfully complete **Carretera Núm. 6** is an example of this. As mentioned, by 1900, still under the military government, a Board of Public Works was organized. The board was sub-divided into five sections: roads, public buildings, lighthouses, harbors, and accounts. The principal section, that of roads, was further sub-divided into survey and field data, design of bridges and construction and maintenance. Each of these subdivisions was placed under a well-equipped engineer.

Among the new Public Works agenda, **Carretera Núm. 6** was marked as a priority. In General Davies' last report, it was indicated that:

> *"This road crosses Porto Rico from north to south, traversing the rich coffee region of the west-central portion of the island, via Utuado and Adjuntas. This region was destitute of roads, although the Spanish authorities had projected one along the route we are following. The Arecibo-Ponce route will be a favorite one for tourists, as the scenery in places is grand in extreme. Via rail to Arecibo and thence via the new road will be the quickest and cheapest land route between San Juan and Ponce.* ***This is our main undertaking****."*[63]

In September 1899, it was estimated that it would take $212,000 to complete the road from Arecibo to Utuado; $160,000, for the section from Utuado to Adjuntas and another $161,000 to connect Adjuntas to the end of the first fifteen kilometers built under Spain coming from Ponce.[64] Every dollar that could be spared or redirected from other secondary roads, was to be used to finalize **Carretera Núm. 6**.

Quick and effective actions were taken to complete the undertaking. Advertisements were published in the local newspapers and in the Continent for a period of two months to attract American capital and to interest US firms in acquiring experience in road building in the tropics and at the same time, in introducing American methods in road work in Puerto Rico. Seven bids were received from the US, and a contract was awarded to a New York firm, *Central Contracting Company*.

Local contractors were essential as well. When the American troops landed in 1898, work on the road was progressing under thirteen contracts, from sections ranging from ¾ of a mile, to seven miles in lengths. However, there were problems during the transition period. There were instances in which the contractors suspended their work as American troop seized their outfits. Other suspended the works as to wait for the outcome of the war. There were even cases in which populace despoiled the work sites, taking advantage of the unstable situation created by the war.

[63] Ibid. 401 (highlight is ours)
[64] AGPR. Fondo: Obras Públicas. Serie: Carreteras y Puentes. Legajo 241. Caja 2340.

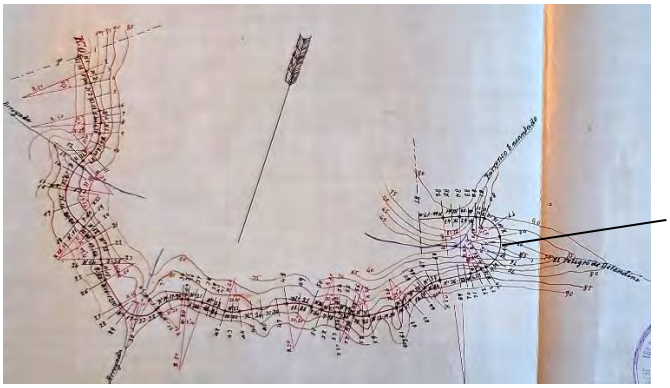
On April 4, 1899, with the island's political and social condition temporarily stabilized, the *Jefatura de Obras Públicas* (about to be replaced by the Department of the Interior's Office of Public Works) made a call to all contractors to resume their work. Showing genuine interest and a sense of emergency, the new Public Works accepted the validity of the contracts signed under the Spanish government, resuming the work where it had been suspended.

As part of the new planning, Capt. W. V. Judson, from the Corp of Engineers, suggested that the portions first to be built should connect Utuado with Arecibo, and Adjuntas with Ponce, as in general, Utuado and the surrounding coffee regions could ship via Arecibo, and Adjuntas and its coffee producers' neighbors could sell their precious cargo through Ponce.[65] The section between Adjuntas and Utuado was to be last.

A variety of approaches were made to accelerate **Carretera Núm. 6**'s construction process, like the awarding of multiple contracts for simultaneous work on different parts of the road. Sometimes the contracts were to accomplish a very specific task. For example, Carlos de Ereño re-signed a contract to build just one thousand three hundred (1.3 kms.) meters, in the Ponce-Adjuntas section. This short but difficult track had a series of culverts that included one to overpass a deep ravine known as "*el peligro de Defendini*" (Defendini's danger). It was mentioned, that without completing the specific five hundred meters that comprised this most challenging part of this track, the Ponce-Adjuntas section was useless. Initially started under Spain in 1897, delayed by the events of 1898, Ereño went back to work in this section on February 15, 1899. The construction was based in the old surveyed done in 1897, with a design for the new culvert done by an engineer from the new Public Works Office, on which traditional methods and new construction materials were combined. On September 5, 1900, Ereño received his payment for the completion of the Defendini area.[66] The final result was a complex layout of **Carretera Núm. 6** that included an impressive horseshoe bend in the road cutting through steep hillsides and a dense vegetation. Right in the center of the bend, over the water crossing Ereño built one of the most attractive culverts in the entire road, designed by engineer Ramón Gandía Cordova in 1900. After one hundred and twenty years of use, the hardly accessible *Pontón Defendini* has an enduring integrity in materials and design, including its historic six-meter width, as no modern expansions have been added (**Figs. 33/34**).

[65] Ibid.
[66] AGPR. Fondo: Obras Públicas. Serie: Carreteras y Puentes. Legajo 257. Caja 2356.

Carretera Núm. 6 | Puerto Rico
Name of Property | **County and State**



The bend and crossing over Defendini's ravine.

Figure 33. Above, partial view of the 1897 Defendini's road plan with it surveys measurements, including the propose road bend. Below, a 1910 and 2021 photo of the same area. (Photo 1910, Source: Archivo Digital de la Universidad de Puerto Rico) (Photo 2021, Juan Llanes Santos)

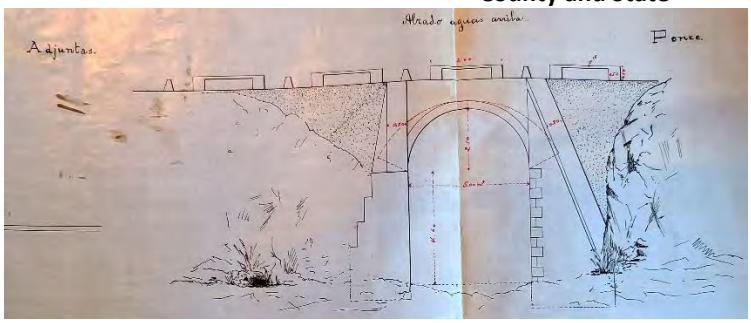


Figure 34. Above, Gandía Cordova's 1900 drawing for the Defendini's culvert. Located at Km. 28.4, the culvert was built at the center of the dense vegetation of the horseshoe bend of **Carretera Núm. 6**. Hardly accessible and unseen from the roadway, the *pontón* received a beautiful treatment using the Cyclopean masonry arrangement in the culvert's headwall, wing-walls, and interior walls, topped with a concrete barrel vault with exposed aggregated. (Photos, Juan Llanes Santos)

On October 10, 1899, Ereño also received a contract to build 4,357 meters (4.3 kilometers) in the Utuado-Arecibo section, to be completed by June 10, 1901. On April 13, 1900, the Central Contracting Company was awarded fourteen (14) kilometers in the Utuado-Arecibo section, to be completed by September 1907.[67] On December 16, 1899, contractor Marix and Denton began the construction of fourteen kilometers between Utuado and Adjuntas, finishing by April 2, 1900. On January 2, 1899, Roque Paniagua was contracted for 14,020 meters of road between Adjuntas and Utuado, completing the job on May 1, 1900. Paniagua also had 6.6 kilometers assigned in the Ponce-Adjuntas section. This last contractor was the one responsible for the construction of the reinforced concrete, fifty-five clear spans with elliptical intrados, and arch bridge in the northern end of Adjuntas' urban center as the road traverse towards Utuado. The bridge was finished by 1901, at a cost of 6,736 dollars. [68] **(Fig. 35**)

[67] *Annual Report of the War Department for the Year ending June 30, 1900*. Military Government of Porto Rico from October 18, 1898, to April 30, 1900, 373.
[68] AGPR. Fondo: Obras Públicas. Serie: Carreteras y Puentes. Legajo 219. Caja 2319.

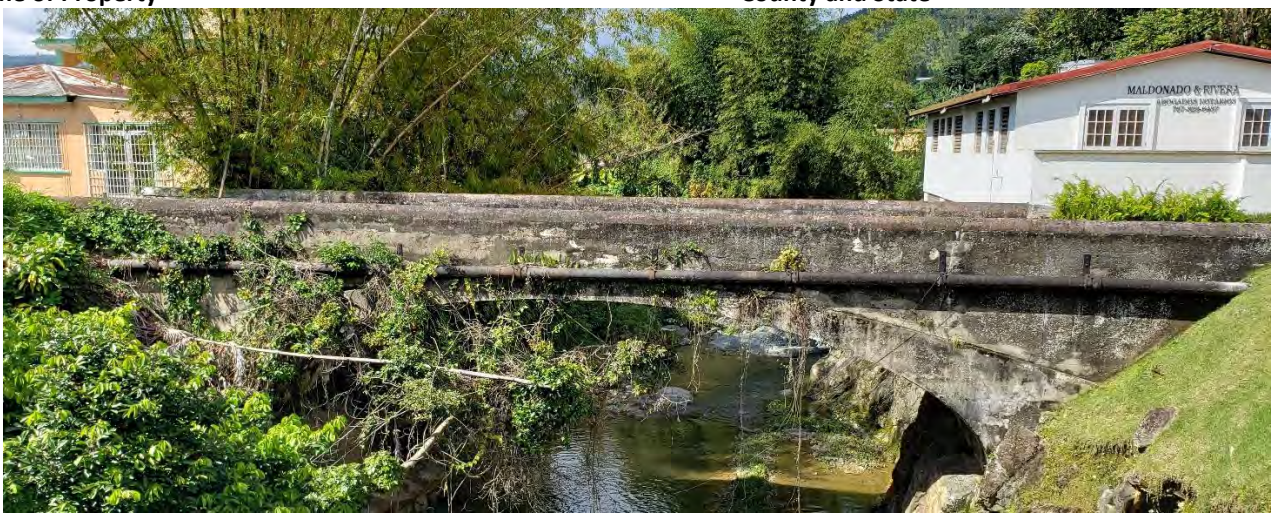


Figure 35. Above. The just finished 1901 concrete bridge (known as Puente Chavier), located in Adjuntas, over Río Cidra. Below, the bridge today is used as a pedestrian crossing, located at km. 35.8 in PR-123 (**Carretera Núm. 6**).

Along with multiple contracts to speed-up the construction process, new construction techniques and improved construction equipment were brought in by the new US administrators. From its very start in 1880, **Carretera Núm. 6** was a macadam-finished-road way into the twentieth century. Developed by the Scottish inventor John Loudon McAdam in the 18th century, this method of construction recommended that roads should be raised above the adjacent ground for good drainage and covered with a pavement made of two layers of crushed rocks, first with large rocks, and then with smaller stones. Before the rocks were placed, the existing ground was excavated one foot deep, removed and replaced with good clay to prevent the possible subsidence of the stone layers. The layers of rocks were bounded with fine gravel or slag. After the layers of rock were properly placed and bounded, the entire mass was rolled-flat and tampered down to a smooth surface, using rolling carts normally pull by oxen. This situation was true for every First-Class Road built in Puerto Rico during the 19th century.

However, after 1898, the new administrators of the island, those in charge of road construction (like the US Corps of Engineer), had greater economic resources at their disposal. Nearly a million dollars was allotted to the military authorities for the building of roads throughout the island. Even more money came after the initiation of the civilian government after the 1900 Foraker Act. [69] The allocation of a permanent budget for road construction translated into the availability of better equipment and

[69] First Annual Report of the Governor of Porto Rico covering the period from May 1, 1900, to May 1, 1901. Washington: Government Printing Office. 1901, 73.

materials. Larger and fully mechanized stone crushers were acquired to massively produce the needed macadam, considerably reducing the back-breaking work of the hated "*machaqueo*", the manual crushing of the hard rocks. By 1901, the first steam roller was introduced in the island, making the macadam tampering process more efficient. Increased availability of powder and dynamite accelerated the ability to cut through the harsh karst region between Utuado and Arecibo, while improved safety devices (such as better detonators) reduced the levels of fatalities and injuries (**Fig. 36**).

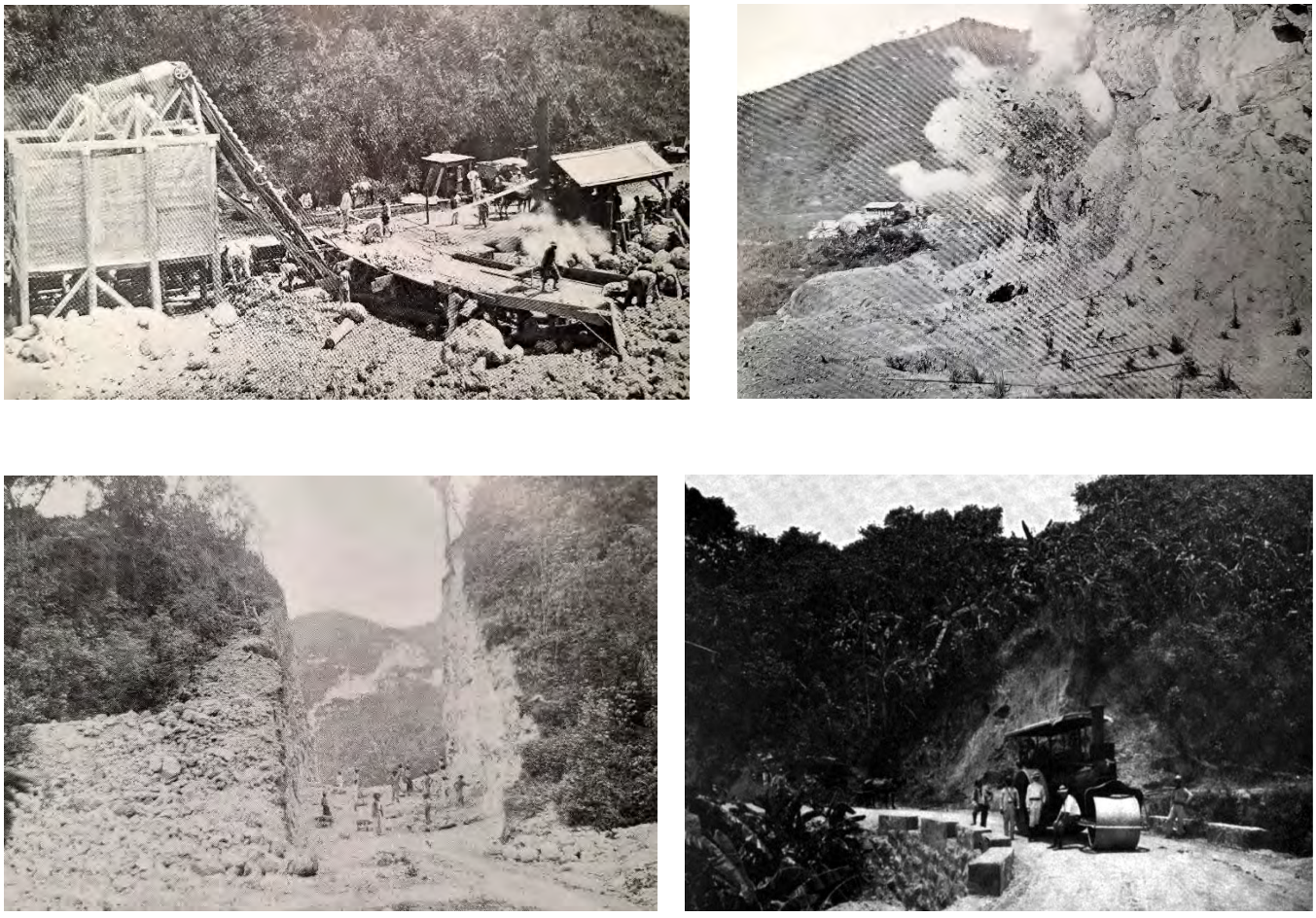


Figure 36. Images above were all taken during the actual construction of the Arecibo – Ponce Road, **Carretera Núm. 6**. (Source of the first three photos, left to right: Report of the Military Governor of Porto Rico on Civil Affairs, 1900). At the moment of the photo, the steam roller shown above has been used in Tallones, Adjuntas, the last section of **Carretera Núm. 6**, finished by 1904. (Source: Report of the Commissioner of the Interior, 1901).

The increased availability of concrete also served to accelerate the process of construction of the **Carretera Núm. 6**. Used in Puerto Rico since the 1850s, the innovative material showed great durability and ease of mixing. The material was imported in 376-pound waterproof barrels and required no preparation prior to use. In 1901, imports of Portland cement to the island from Europe amounted to 8,807,585 pounds, equivalent to 23,425 barrels of concrete, in addition to 7,500 barrels from the United States.[70]

The flexibility and malleability of concrete allowed it to be used more frequently in the construction of large arches for bridges, as well as in the vaulted ceilings of culverts (**Fig. 37**). Poured into wooden moldings, the concrete was also shaped into cylindrical tubes. The use of cylindrical concrete pipes replaced in many instances the traditional stone and masonry walled culvert in **Carretera Núm. 6**. The fact that these concrete cylinders could be connected in series facilitated the work of drilling into the ground without disturbing excessive amounts of soil (**Fig. 38**).

Figure 37. Two early 20th century culverts with rough facing stones in the headwalls and wing-walls, with concrete vaulted ceilings. Both culverts are located within the Ponce - Adjuntas section built under the new American engineers. (Photos, Juan Llanes Santos)

[70] Beatriz del Cueto, Historia en Concreto: el desarrollo de los morteros hidráulicos y el uso del cemento en Puerto Rico, in *Entorno*, Año 8 / Vol. 1/ 2013, 12 – 16.

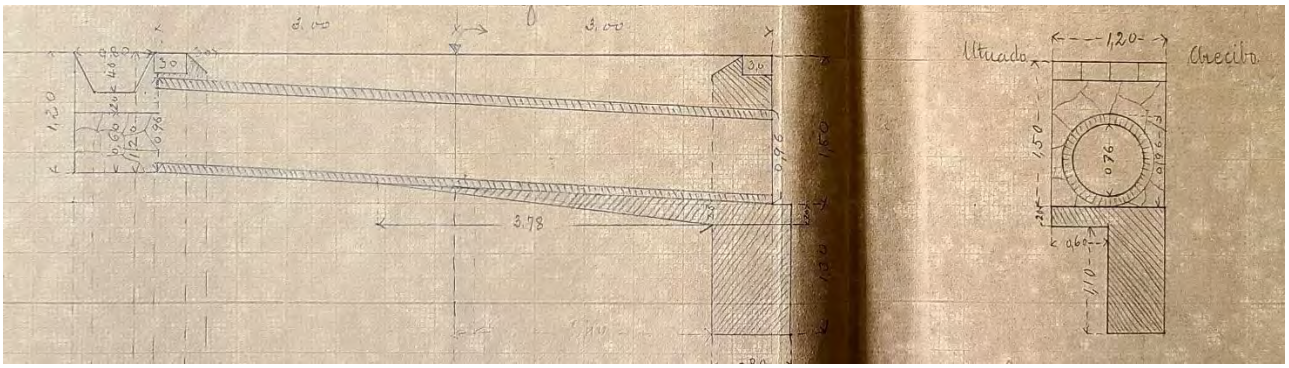


Figure 38. Above, a 1901 drawing of a concrete pipe culvert to be used somewhere in **Carretera Num. 6**, between Utuado and Arecibo.[71] Below (left), shows a concrete pipes construction site.[72] Below (right) an example of the many extant cylindrical concrete pipe culverts, introduced in **Carretera Num. 6**, during the early stage of the road construction after 1898 by the American engineers. The concrete cylinders were about one meter in length, with widths ranging from sixty to almost eighty centimeters. Mortar jointed, they extended the road's width, usually in a decline angle on which logically the pipe inlet was placed higher than the pipe outlet. In the culvert's 2020 photo, located at Km. 37, the collecting box, the headwall, the wing-walls, and the parapet are decorated with the extruded mortar joint technique with an added Grapevine design, similar to the design depicted in the 1901 drawing. (Photo, Juan Llanes Santos)

[71] AGPR. Fondo: Obras Públicas. Serie: Carreteras y Puentes. Legajo 224. Caja 2323.
[72] Report of the Military Governor of Porto Rico on Civil Affairs, 1900. Washington. Government Printing Office, 1900.

A more substantial budget, combined with a more efficient bureaucratic process (less red tape), the ability to make decisions locally more effectively and quickly, the availability of new construction materials and better machinery, allowed the new authorities to accomplish the completion of **Carretera Núm. 6** in the very early years of the 20th century. However, none of these factors would have been relevant without the presence of an abundant, available and cheap labor force. The construction of **Carretera Núm. 6**, like every other component of the social wealth, rested on the shoulders of the working class (**Fig. 39**)

Figure 39. Above, workers grading a section between Utuado and Adjuntas. Below, all hands on deck filling, grading, and shaping the box for the eventual macadam, also in **Carretera Núm. 6**. [73]

[73] Second Annual Report of the Governor of Porto Rico. Washington: Government Printing Office, 1902.

On July 27, 1903, a contract was awarded to Raoul Marix to build the last 4.6 kilometers in the area known as Tallones, in the Adjuntas – Utuado section. In a letter dated July 18, 1904, it was reported that the works at Tallones were finished. On August 2, 1904, in a submitted report, the Bureau of Public Works indicated that all works at Tallones were completed and after the mandatory waiting period, finally accepted.[74] (**Fig. 40**). **Carretera Núm. 6** was finally and officially done.

Figure 40. Partial view of **Carretera Num. 6** at Tallones, the last part of the road between Adjuntas and Utuado, finished by 1904.[75]

In his 1904 report, the Commissioner of the Interior proudly mentioned the accomplishment:

> *"The completion of the road from Arecibo to Ponce, 85 kilometers in length, is worthy of special mention. Construction was begun by the Spanish authorities many years ago. At the date of American occupation, they had built about 20. 5 kilometers. The military authorities promptly took up the work, and the insular government has vigorously pursued it. On July 1, the last section was finished, and the highway is open to traffic. This road shortens the travel time between San Juan and Ponce at least three hours. It is of first-class construction throughout, and presents a panorama of the most magnificent scenery, rivaling the views of any of the famed roads in Europe. As its attractions become known it will undoubtedly grow in favor with tourists, who will find it more attractive and beautiful than the popular so-called military road"*.[76]

[74] AGPR. Fondo: Obras Públicas. Serie: Carreteras y Puentes. Caja 2325.
[75] Report of the Commissioner of the Interior for Porto Rico to the Secretary of the Interior, USA. 1903. Washington: Government Printing Office. 1903
[76] Report of the Commissioner of the Interior for Porto Rico to the Secretary of the Interior, USA. 1904. Washington: Government Printing Office. 1904, 11.

It took the local and Spanish engineers eighteen years (1880 – 1898) to complete twenty kilometers. In six years (1898 – 1904), the new US administrators completed the remaining sixty-five kilometers. **Carretera Núm. 6** was their "*main undertaking*". The instructive schematic map made by the Bureau of Public Works in 1903, provides an excellent overview of the chronological development of the road, indicating the agency responsible for the sections and the estimated cost. Considering that Section 7 numbers are not provided, the construction of **Carretera Núm. 6** was approximately $1,008,480, in 1903 US currency value. Under the eighteen months of military government, thirty (30) kilometers were built, while the insular government established after 1900, organized the construction of the last thirty-five (35) kilometers. (**Fig.41**)

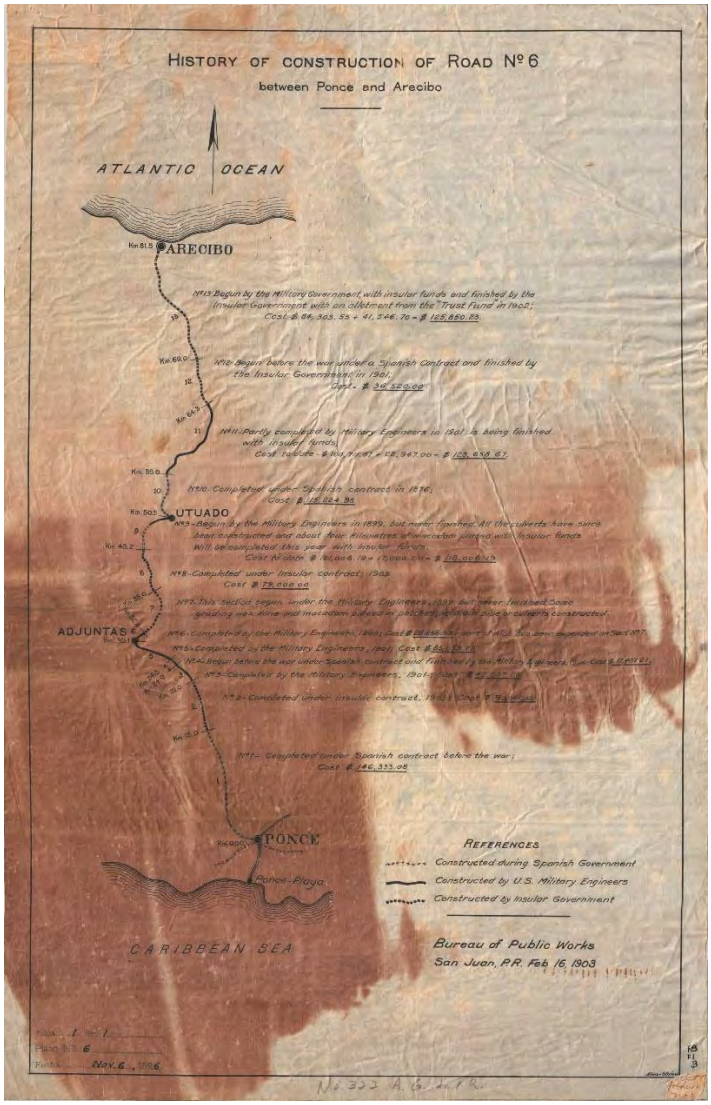


Figure 41. The 1903 schematic showing the construction development of **Carretera Num. 6**.[77]

[77] Archivo Digital Nacional de Puerto Rico. Código de Referencia: ADNPR_20170822_134131.

It should be considered, however, that during those first few years under the new US administration, the principal aim was to extend as quickly as possible the means of transportation and communication. As it was stated on future reports, "*Under this policy temporary arrangements were made to facilitate traffic, and thus a considerably large number of road structures were built of wood, instead of masonry or concrete, and no bridges were provided over river crossings wherever the latter could be forded"*.[78] The construction of roads during the first decade of the 20th century, including **Carretera Núm. 6's** construction period, was therefore notable for the speed in which it was carried out, but the system of roads, although justified by the needs of the time, was incomplete. The resulting road network mostly lacked planning and permanency.

Besides reducing the construction time frame, reducing costs was also an important goal among the policy makers during the **Carretera Núm. 6's** construction period. The statistics left by the Spanish authorities suggested that their high-quality roads were also very expensive. For example, the Military Road (*Carretera Central*) had an approximate cost of $1,879,340.00 American dollars for an average of $22,790.00 per mile. *Carretera #4* was even more expensive. The construction of Road No. 4's twenty-six kilometers (15.74 miles) took $615,600.00, averaging $39,110.00 per mile.[79] As previously stated, even before its official completion, the construction's cost for **Carretera Num. 6** had already been estimated over a million dollars.

Among the structures needed in **Carretera Núm 6** to really complete the works, was the construction of additional *casillas de peones camineros*, to provide housing for the road's permanent workers. However, the following year after the road's completion, the system of *peones camineros* became one of the many programs suspended as the Administration implanted budget cuts. The system was suspended from 1905 to 1914. The practice installed during those ten years was the one in vogue in the United States, which was, allowing sections of the road to deteriorate to a certain extent and then make periodical repairs, using a work gang. During those ten years, the so-called work gangs were mostly made of convicts. The supervisory structure remained like the "old system". The construction and maintenance were managed by engineers, overseers (*sobreestantes*) and foremen (*capataces)*, but the actual work, especially the important part of providing the needed maintenance to

[78] Report of the Governor of Porto Rico to the Secretary of War. 1919. Washington: Government Printing Office. 1919, 398.
[79] First Annual Report of the Governor of Porto Rico. Charles H. Allen, Governor. May 1, 1901. Washington: Government Printing Office. 1901, 324.

the roads, was left on the hands of a coerced workforce, instead of a highly skill worker like the *peon caminero*.

During the ten years that the road menders' program was inactive, the casillas in **Carretera Núm. 6** lost their historic functionality**.** By 1906, Casilla #1 (today located at kilometer 9.1 on PR-123) was turned over to Department of Public Instruction and became a two-classroom schoolhouse. Casilla #2 (Km. 15.5) had various uses. Eventually, the suspension of the *peones camineros* was understood as a serious mistake. By 1910, the authorities in the Department of the Interior were questioned their previous decisions explaining that "*the problem of paramount importance concerning this department is that of maintaining the highways after they are constructed. If such roads are not kept in good conditions, it would be better not to build them.*"[80] In the 1919 Report of the Governor, the 1905-1914 suspension of the *peones camineros* was described as "*evidently disastrous to many sections of roads which rapidly deteriorated. Experience demonstrated the convenience and necessity of reestablishing the Old Spanish system*".[81] With the system of employing a gang of men to make repairs every now and then, the small defects passed unnoticed until they grew to such proportions that extensive repairs had to be made. The work needed would be more expensive, and the method unsuitable for traffic, since the roads could never be continuously maintained in good conditions.

Realizing this, the *peones camineros* system was re-installed in 1915. Each peon was placed in charge of about three kilometers of road, under the supervision of a foreman (*peón capataz*) who cared for eighteen to twenty-four kilometers. Both foremen and road menders were under the supervision of an overseer (sobreestante), who oversaw approximately one hundred kilometers of road. Besides taking care of all the details to properly preserve the road, the *peones* were again assigned the role of exercising police powers to enforce the proper observance of the laws, rules and regulations governing the public use of insular roads.

After 1915, Casilla #2 came back into service the road assigned as an alternate residence of foremen and overseers. Casilla #1, however, remained in use as a schoolhouse for many years. Curiously, even after reinstating the *peones camineros* system, no other *casillas de peones* were built in **Carretera of Núm. 6**. By means of oral history, while conducting the physical reconnaissance of the nominated

[80] Report of the Governor of Porto Rico to the Secretary of War, 1910. Washington Government Printing Office, 1910, 120.
[81] Report of the Governor of Porto Rico to the Secretary of War. 1919. Washington Government Printing Office, 1919, 420.

property, the researchers met locals that informed of having parents and grandparents that worked for many years as *peones camineros*. It seems, that local males already residing at the road were employed as *peones camineros* with the same tasks, duties, and responsibilities, but residing at their own dwellings. During the archival research, documents were found on which *peones camineros* assigned to **Carretera Núm 6** claimed additional monthly compensations for housing expenses. Living in government quarters or in their own simple dwellings, these workers took care of **Carretera Núm 6** and other state roads, way into the late 1950s, when they were replaced by new technology and new ways of organizing the workforce under the *Departamento de Obras Públicas*.[82] During the 1950s, Puerto Rico Department of Transportation and Public Works made an inventory of their *casillas de peones camineros*, as part of the program's dismantling process (**Fig. 42**).

[82] El Mundo. Ante Mecanización. Desaparecerá el caminero de carreteras de la Isla, 20 de septiembre de 1957, 19. By 1957, there were 1,100 designated peones camineros, 519 fully active. As they were replaced, the government made sure that the peones were given priority into been employed as regular workers in the new roads' work gangs. Those occupying the position of Peón Capataz were also given the opportunity to fully acquire the ownership of the *casillas de camineros*.

Figure 42. The 1950s photos show both *casillas* in Ponce's jurisdiction still in use. As both *casillas* had the same color during the 1950's, it's assumable that both resources were been used by the same custodian, the Puerto Rico Department of Education, as two classrooms schoolhouses. Their inclusion in the 1950s survey, however, strongly suggest that ownership was retain by the *Departamento de Transportación y Obras Públicas*.

By the early 1920s, some depressions and river crossings on **Carretera Num 6** were still overpassed by wooden constructions or just by fording the natural obstacle. The Department of the Interior, with a strong presence of Puerto Rican engineers at that time, affirmed its intentions of completely finishing the busy road. Some of the obstacles were overcome with simple engineering solutions like the use of small bridges with very sober concrete abutments, straight decks supported by exposed or concrete encased iron and steel beams (**Fig. 43**). However, the traditional elliptic arc didn't disappear from the

engineers' arsenal solution of the 1920's to resolve narrow water crossings or more complex natural obstacles (**Fig. 44**).

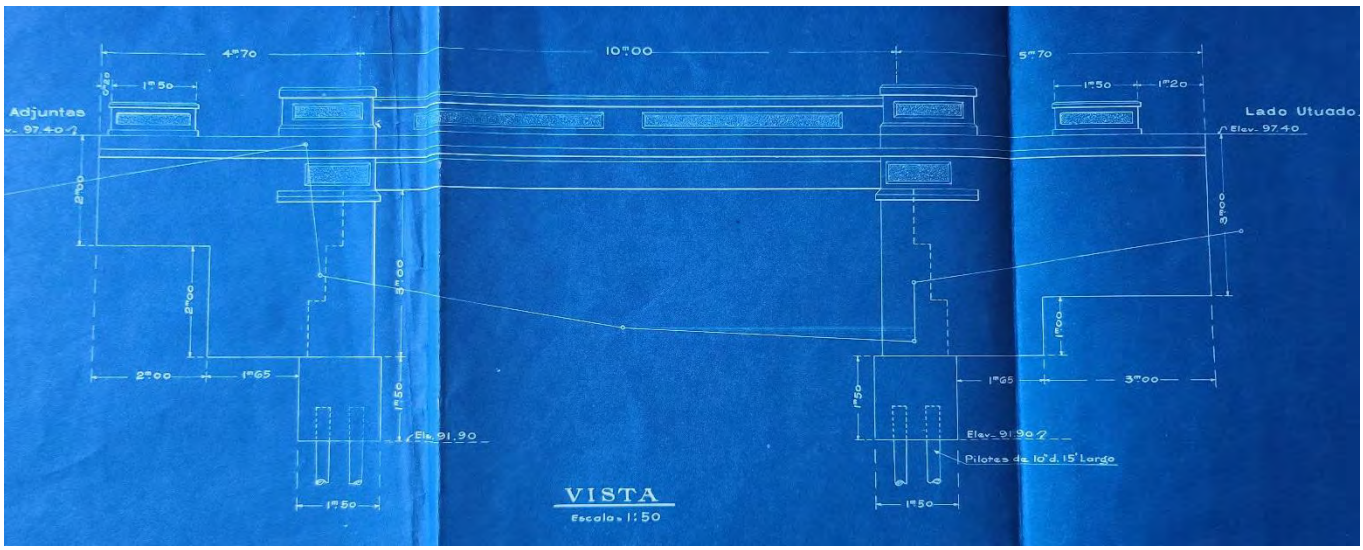


Figure 43. The 1924 concrete bridge above represents the model used for a quick solution to overpass water crossing or short natural obstacles. Its simplicity, however, does not diminishes its significant and historical integrity, as it shows when compared to the bridge's original drawing below.

Figure 44. The two bridges above, both from 1924 also, show a more complex solution adopted by the newcomers in the Department of the Interior to overcome depressions and water obstacles. The works functionality didn't overshadowed the aesthetical perspective.

Despite its engineering qualities and its essential services in transportation and communications, **Carretera Núm. 6**, as expected, had to adapt to the new requirements in road construction, added functionalities and new regulation and procedures.

Looking at the value of the imports and exports, an idea can be formed of the great increase of traffic over the insular roads that took place in the first twenty years of the twentieth century. By 1901, that value was of $17,502,103.00; $68,595,074 by 1910; and $143,383,314.00 by 1918. The numbers reflect an increase in the internal commerce exclusively transported over land, providing an indirect assessment of the pressure placed upon the island's road.

The increase in over-land commerce, brought the equally increasing use of motor trucks and automobiles, with their natural destructive effect upon macadam roads. In the year 1906, there were 99 motor vehicles in Puerto Rico; 309 by 1910; in 1918, there were 4,529; and 4,769 by the following year.

The damaging effects upon the major roads carrying increasing loads and destructive motor vehicles required different approaches to their maintenance and repair. Some of the new trends were to increase the thickness of the macadam, make an expensive selection of the material employed and improve the method of construction. It was also necessary to resort to more frequents resurfacing of the macadam in the old roads. In 1910, experiments were conducted in the road between San Juan and Rio Piedras (Carretera Central) to study the life expectancy of the macadam. Findings indicated that it was about four years. The trials were made by leveling observations, which determined the wear of the macadam as an average of three centimeters yearly under the new motor vehicles. With an average thickness of macadam roads been twelve centimeters, in four years usage the macadam would it have to be totally replenished.[83]

The heavy traffic, combined with the destructive effects of the motor vehicles and the rain waters of the mountain region, induced the administrators to undertake the use of asphalt and bituminous materials to pave the sections of heaviest traffic. The first tests with such pavement were made in 1909, with a machine brought from England the previous year at a cost of $4,500.00. With a capacity of 1,000 gallons of asphalt, the new pavement was tested in the *Carretera Central'* stretch of road from San Juan to the Martin Peña Bridge in 1910-1911.

[83] Report of the Governor of Porto Rico to the Secretary of War, 1910. Washington Government Printing Office, 1910, 118.

By 1925, a total of four hundred and nineteen (419) kilometers of roads were asphalted in the island. Out of this amount, one hundred and thirty-four kilometers corresponded to the *Carretera Central*, totally re-done with its new fabric. The rest were divided among the other First-Class road. [84] However, **Carretera Núm. 6** asphalted process was delayed up into the 1930s. It was indicated, that the road, even with the increase in motor vehicle traffic, was in such good condition, that its maintenance consisted mainly in replacing the macadam when needed. However, by 1926, a group of merchants, industrialist and owners of trucking companies signed a petition requesting that the road be included in an announced list of roads to be asphalted.[85]

The road was eventually reached by modernity. On July 1, 1937, the Federal Highway Act, in effect in the US since 1917, was extended to Puerto Rico. Its extension brought additional and a steady amount of funds for road construction and maintenance. Right away, $750,000.00 were allocated for the improvement of the local roads. Additional funds were provided that same year through a special tax imposed upon gasoline and automobile licenses. An extensive amount of the monies collected was used for paving and grading. [86]

This trend in road improvements and changes continued intensively throughout the following years. By 1942, a total of 32,195 motor vehicles were registered in Puerto Rico. To provide the required safety measures for the increased number of travelers (commercial, personal and leisure type) the macadam material practically disappeared from the construction materials list. Undertakings involving paving, grading, road widening, and curve elimination projects were carried out heavily throughout all major roads with the participation of the Works Progress Administration. [87] It is precisely during these years that **Carretera Núm. 6** was completely asphalted, graded, and have many of its curves widened **(Fig. 45).**

[84] Twenty-fifth Annual Report of the Governor of Porto Rico, 1925. Washington Government Printing Office, 1926, 220.
[85] AGPR. Fondo: Obras Publicas. Serie: Carreteras y puentes. Legajo 244. Caja 2345.
[86] Thirty-seven Annual Report of the Governor of Puerto Rico, 1937. San Juan Bureau of Supplies, Printing and Transportation, 1937, 26-27.
[87] Forty-second Annual Report of the Governor of Puerto Rico, 1942. San Juan, Puerto Rico. Bureau of Supplies, Printing and Transportation, 1943, 43.

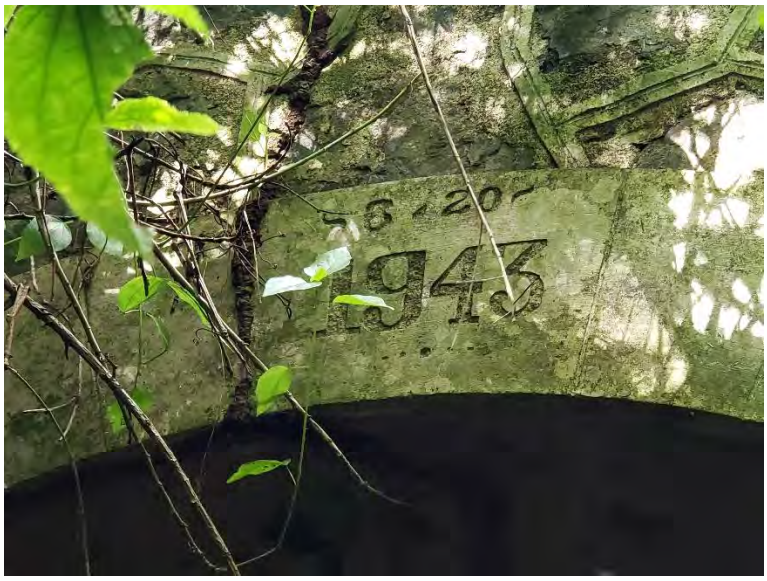


Figure 45. The culvert above is a solid document of the works done by the Works Progress Administration in **Carretera Núm. 6** during the early years of the 1940's. The precise completion date for the culvert's expanded section, June 20, 1943, was proudly and beautifully engraved in the arch of the new facade. This is the only culvert properly dated found within the hundreds of *alcantarillas* documented in *Carrereta Central*, *Carretera #4* (both included in the National Register of Historic Places) and the current nominated road. The resource, located in Adjuntas, at Km. 36.8 in a rough, hardly accessible depression, was almost missed by the reconnaissance team because of the difficulties in reaching the resource. (Photo, Juan Llanes Santos)

However, the restrictive topography did not allow for much widening and even less, for the straightening of the road's horizontal displacement. A look at the resources surveyed as part of this nomination effort, clearly showed that the undertakings were sensibly performed, keeping most of the original 19th and early 20th century structures in the road's travel-way, roadside and setting.

During the 1940s, **Carretera Núm. 6** received a new designation as well. Since the beginning of the construction of highways in Puerto Rico, they have been numbered in chronological order of construction. As the years went by, there were 103 roads with assigned numbers distributed in no order over the entire area of the island. In addition, there were a growing number of municipal highways that were known by their names. In 1944, a new stage in the history of the island's road development began with the creation of a road research division. The nature of the studies to be carried out required that each number represent a continuous logical route, the geographic location and the type or class of road.

Neither the numbering established until then, nor the method used to identify municipal roads by their names, complied with these requirements. A careful study was therefore carried out, adjusting as far as possible to the three requirements mentioned above. After determining the roads that constituted continuous routes between their origin and their termination, the research division proceeded to give them numbers. In general terms, the rule was to number them in sequence from west to east and from south to north. For the first class roads the numbers from 1 to 99 were reserved; for the second class roads the numbers from 100 to 299 were reserved; and for the municipal roads, the numbers from 300 to 999. On July 1, 1945, the *Departamento de Obras Públicas*, made the new numbers official. Within the new order **Carretera Núm. 6** was officially designated as *Carretera Núm. 10.*[88] Is this last number the one that remains associated to the old road in the collective memory.

[88] Estado Libre Asociado de Puerto Rico. Departamento de Obras Públicas. Negociado de Carreteras. *Numeración de las Carreteras.* San Juan, Puerto Rico. Enero – 1956.

A more pervasive effect upon **Carretera Núm. 6** than changing its designation or widening its curves, came with the modern Highway 10. As traffic in the historic road increased in the 1950s and 1960s, **Carretera Núm. 6** (Carretera #10 since 1945**)** started to show its limits. In 1974, to ameliorate the situation, the Puerto Rico Department of Transportation and Public Works started the construction of the new *Carretera 10* to connect the cities of Ponce and Arecibo. The new road runs mostly parallel to **Carretera Núm. 6. (Fig. 46)**

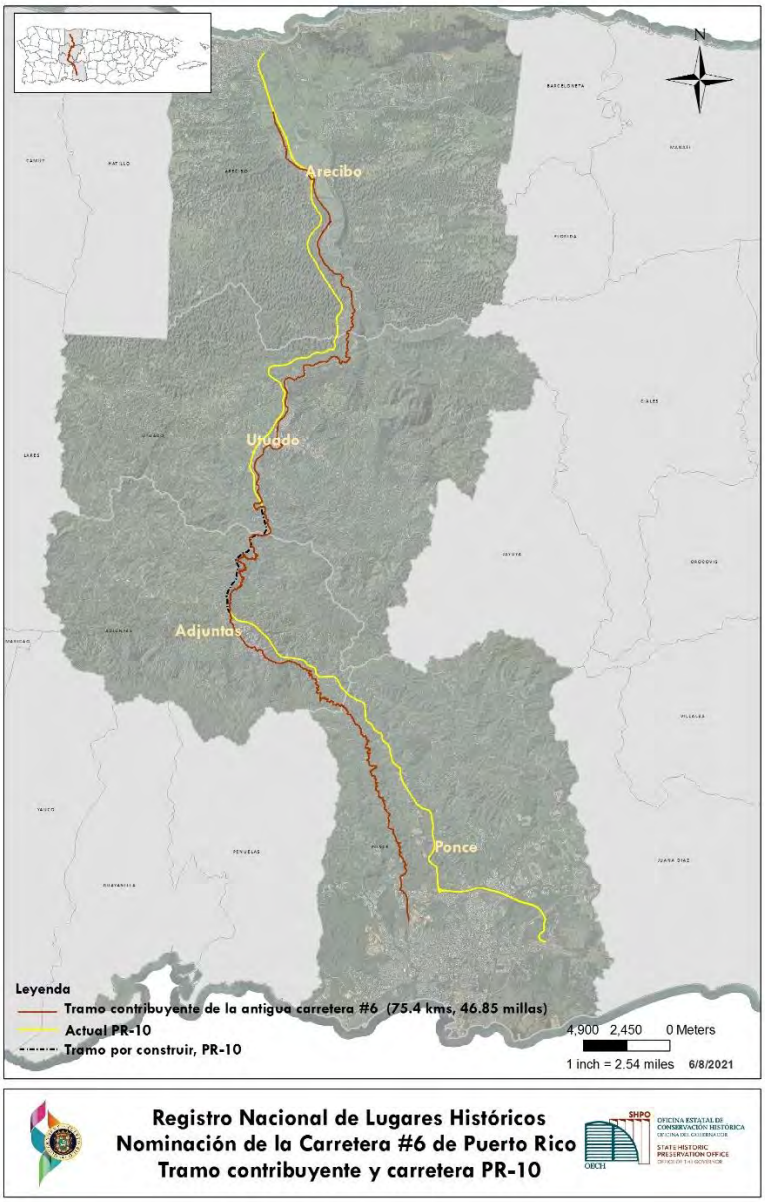


Figure 46. Map shows **Carretera Núm. 6** historic course and the new PR-10 that has displaced the old road. The black dotted line is the PR-10 unfinished section. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

The first segment of the new PR-10, the road from Utuado to Arecibo was built at a cost of $120 million; the second segment, from Ponce to Adjuntas, was built at a cost of $ 80 million. Up to present time (2021), the remaining segment, from Adjuntas to Utuado, is just partly completed. Curiously, it has taken longer to build the new PR-10 (1974 – Present), than it took the original **Carretera Núm. 6**. The old Ponce – Arecibo road was resigned as PR-123, as the construction of the new PR-10 started in the mid-1970s.

As PR-10 advances in sections, from Utuado to Arecibo, and from Ponce to Adjuntas, with its two and four lanes, straight stretches, it's reduce transportation time and comfort, the new highway has been displacing the old road as the main avenue between the two coastal towns. The old road has become a secondary road, mostly used by the residents that lived in the vicinity of the still challenging and impressively historic **Carretera Núm. 6**.

Carretera Núm. 6: the contributing components

According to the document "*The Preservation Office Guide to Historic Roads*", every road is comprised of three parts: the road, the roadside and the setting.[89] Understanding the main distinctive elements that form the basic components of these three sections and how they complement each other, is the best way to articulate the character defining features that collectively define a historic road.

Carretera Núm. 6's travel-way, that is, the area of the road historically designed and dedicated to the movement of vehicles, people and goods, 19th or 20th century, it's a contributing resource. By the time of its completion in 1904, the pavement in the **Carretera Núm. 6**, the durable or semi-durable surface of the travel-way, was done in macadam. However, during the 1930s and 1940s the road began to be asphalted, in some instances with the macadam been removed or simply just covered, becoming part of the subsurface providing a stable base support on which to lay the new surface. The possibility of layers of different construction materials mixed in the **Carretera Núm. 6** composition, especially on the sections less affected by modern interventions, makes the subsurface of the road a potential archeological resource, adding weight to the significance of its travel-way.

[89] Paul Daniel Mariot, *The Preservation Office Guide to Historic Roads. Clarifying Preservation Goals for State Historic Preservation Offices, Establishing Preservation Expectations for State Transportation Departments*. June 2010.

Besides the travel-way's fabric, when evaluating the significance and integrity of any road, the alignment of the resource is most definitely an important aspect to be considered. Horizontal alignment refers to the road's movement to the left or right, in other words, its curves. While the vertical alignment refers to the road's movement up and down. Even with expected changes on its course due to road improvements and interventions on its grading for mandatory safety reasons within the last one hundred and twenty years of continuous use, **Carretera Núm 6'**s vertical and horizontal alignment remains extremely close to its original design and eventual course, reflecting a high level of integrity upon the road's historic character. (**Fig. 47/48**)

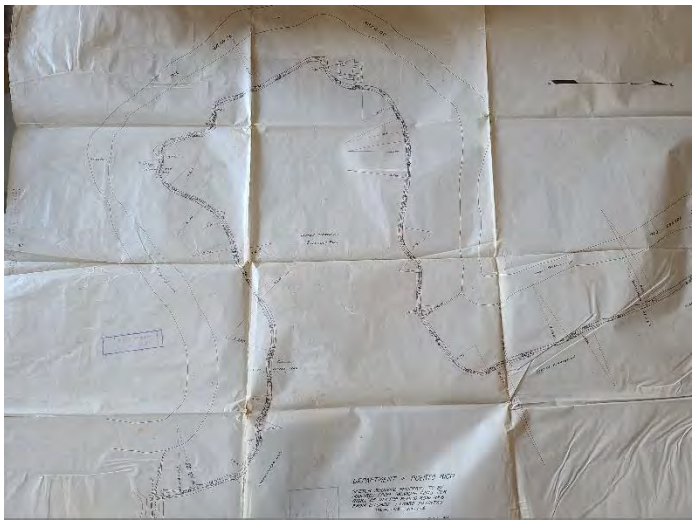


Figure 47. Above, a 1900 drawing showing a proposed route in red for **Carretera Núm. 6** as the road was to border a private coffee plantation in the Utuado – Arecibo section.[90] The right of way had to be acquired from the owner. Below, a Google image shows, in yellow, **Carretera Núm. 6** today's route, exactly as proposed one hundred and twenty-one years ago.

[90] AGPR. Fondo: Obras Publicas. Serie: Carreteras y puentes. Legajo 226. Caja 2326a

Carretera Núm. 6 | Puerto Rico

Name of Property | **County and State**

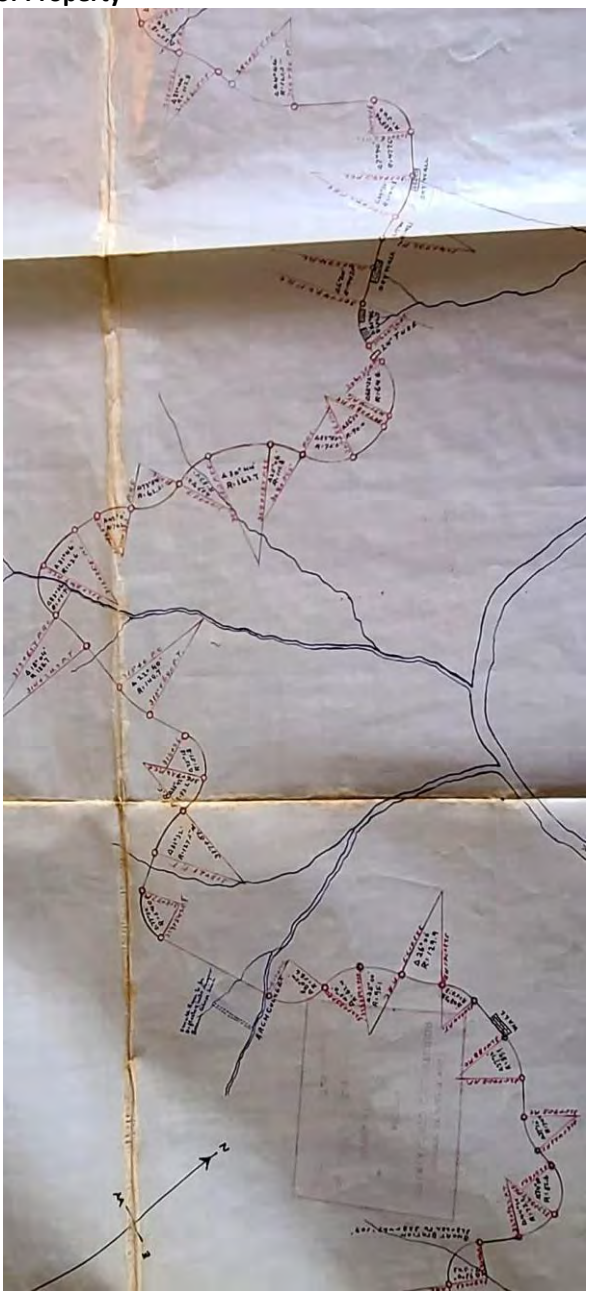


Figure 48. Left, partial view of an 1899 drawing showing a propose route for **Carretera Núm. 6** in Adjuntas, in the vicinity of Barrio Portugués sector. Right, a Google image shows, in yellow, **Carretera Núm. 6** today's route, running almost identical to the plan proposed over a century ago.

A change to **Carretera Núm. 6**'s historic footprint needs to be addresses. Sometime after the late 1980s, a section of the old road was "straightened" in the municipality of Arecibo. The new route had a double crossing over the *Río Grande de Arecibo*, forcing the construction of two bridges. During the reconnaissance and survey carried out to support this nomination, the SHPO team identified, traveled and documented the abandoned section.[91] This section, approximately eight hundred (800) meters in length, located in the ridge line bordering the river's west bank, is in a state of abandonment, but recoverable and identifiable as part of the historic route of **Carretera Núm. 6**. For nomination purposes, it is the abandoned section the one identified and included as contributing to the historic route of the old road, not the new track. (**Fig. 49**)

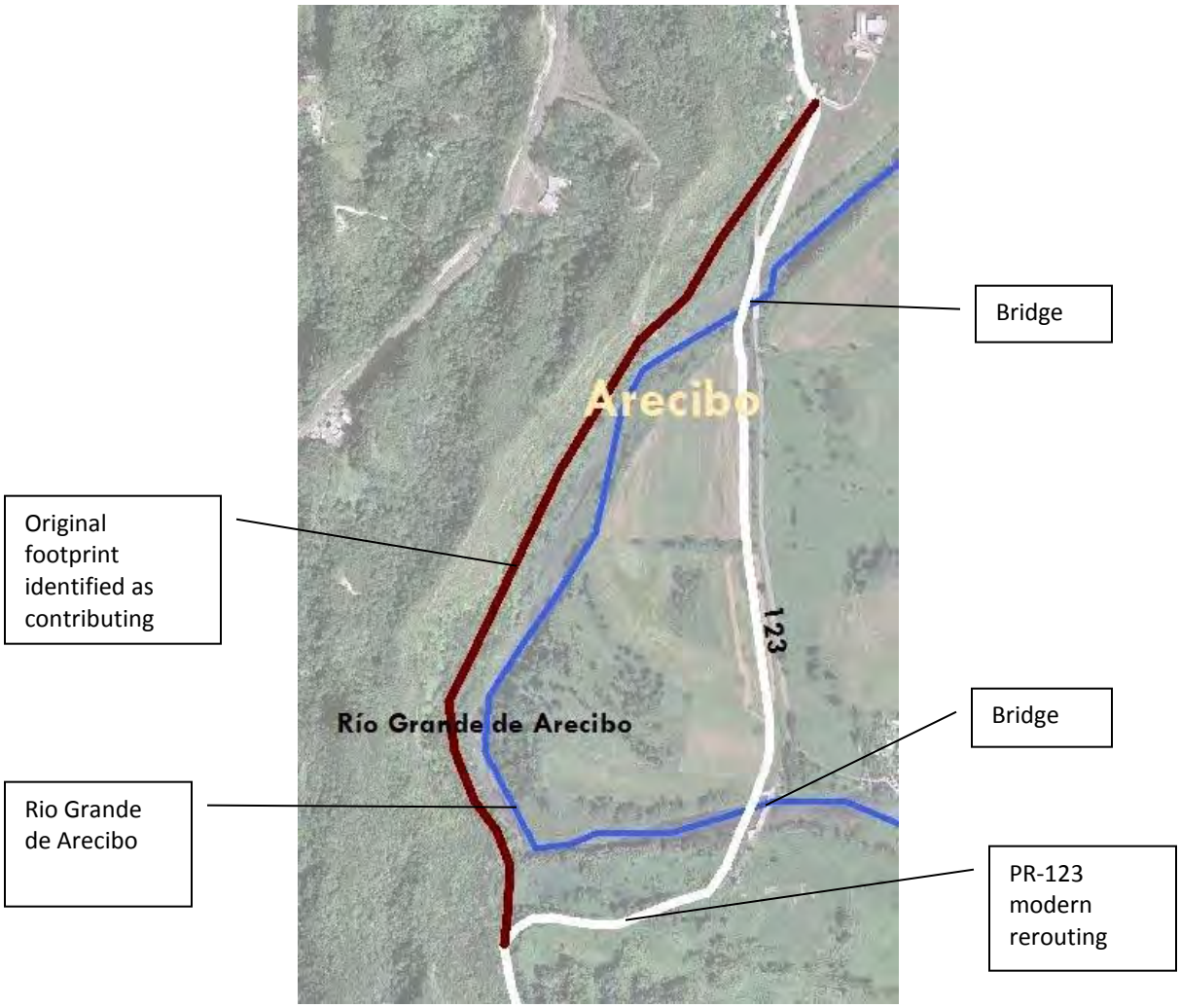


Figure 49. Map showing **Carretera Núm. 6**'s route change. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

[91] In the 1986 United States Geological Survey (USGS) map, the abandon track was still in use.

The ability of the road's structures in transmitting their significance and their association with the road itself is also an important aspect when determining the historical character of a road. Essential structures that are integral to the road's design and function include bridges, culverts, retaining walls and others.[92] As previously shown in Section 7 and in the historic recount in Section 8, **Carretera Núm. 6** retains many of the original structures purposely designed and built during the 19th century and/or very early 20th century to sustain the road's engineering mission. The road's structures integrity is such that allows an easy recognition of components built over one hundred and twenty years ago without great effort, while at the same time, it shows the very same components still performing their engineering function. (**Figs. 50 / 51**)

Figure 50. Above, photo of a retaining wall included in the 1900 *Report of the Military Governor of Porto Rico* at an unidentified location in **Carretera Núm. 6**. Below, the very same retaining wall easily identifiable at present moment, located at Km. 30.8. A partial view of the road, in both photos, allows to perceive the integrity of the road's horizontal alignment. (Photo, Juan Llanes Santos)

[92] Ibid. 12.

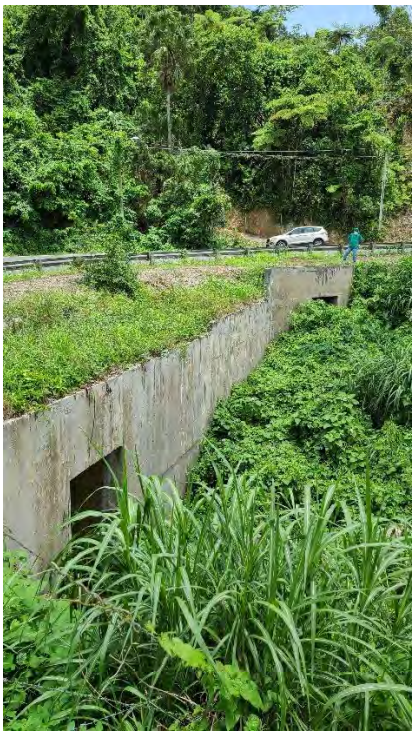


Figure 51. Above, photo of a pair of culverts included in the *Report of the Military Governor of Porto Rico,* published in 1900. Below, a photo of the very same resources. The concrete façade responds to a modern expansion of the road, hiding and extending the historic culvert. However, if approach from the hillside on the background, both 1900's façades come to perfect view, allowing, even with the sediment, the entrance into the historic culverts. From the inside, the 1900 construction and the modern concrete expansion are easily identifiable and distinguishable. (Photo, Juan Llanes Santos)

The roadside is the second area that needs to be considered in determining any road's historical significance. The roadside is composed of the elements and structures that are immediately adjacent to the road and enhance its function, use or safety. Elements associated with the roadside include: the right of way, swales, barriers and signs, among others. **Carretera Núm. 6**'s roadside has all these mentioned elements easily identifiable. Some of them, like the bronze safety railings previously described, are even unique, responding to very early construction projects and periods.

In addition, in its roadside, **Carretera Núm. 6** has among its associated resources one that is very significant: the *casillas de peones camineros*. The two *casillas* within Ponce's jurisdiction are unique, not so much for their spatial distribution, but rather for their method of construction. As the road menders system was not employed within the continental United States, *casillas de peones camineros* are not part of the US' road construction context or tradition. This make the *casillas de camineros* in **Carretera Núm. 6** (or on any other road) a very significant and unique property in Puerto Rico's and the United States' construction legacy.

The setting is the third aspect that needs to be considered in assessing a road's significance and integrity. The setting refers to the area beyond the right-of-way, with elements like landscape features (parklands, natural areas, plantings), character (rural, suburban or urban in nature), and the view-shed (encompassing everything that can be seen from the road at a close or far distance).[93] From the very start, **Carretera Núm. 6's** setting was made of an urban and rural landscape. Connecting with roads that started in the urban center of Arecibo, **Carretera Núm. 6**, crossed the urban center of Utuado, Adjuntas, and ended up connecting with the old *Calle Villa*, an avenue that still runs directly into Ponce's urban core, making the urban component a significant element of the road's setting. On the other hand, as **Carretera Núm. 6** makes its way across the Northern Karst region between Arecibo and Utuado, as it crosses the western end of the *Cordillera Central* where Utuado and Adjuntas are located, and traverses the highland area in the northern part of Ponce, the rural landscape and the rural view-shed were a dominating aspect. The view of the farmlands with their coffee or tobacco crops (in the highlands) or the never-ending sugarcane crops visible within Arecibo and Ponce's coastal plains, became part of the collective memory and experiences deeply associated with **Carretera Núm. 6.** Even though the road traveled throughout dense populated areas, the rural character of the route with the greenish

[93] Op. Cit., 17.

landscape, the isolated deep valleys and the magnificent views from the high grounds became extremely associated with the expected landscape of the road from its very early start. That landscape still present today along the road's route, especially on its nominated portion, supporting its historic atmosphere and setting, as can be observe in the following eight images. (**Fig. 52**)

Carretera Núm. 6 | Puerto Rico
Name of Property | **County and State**

Carretera Núm. 6 | Puerto Rico

Name of Property | **County and State**

Carretera Núm. 6 | Puerto Rico

Name of Property | **County and State**

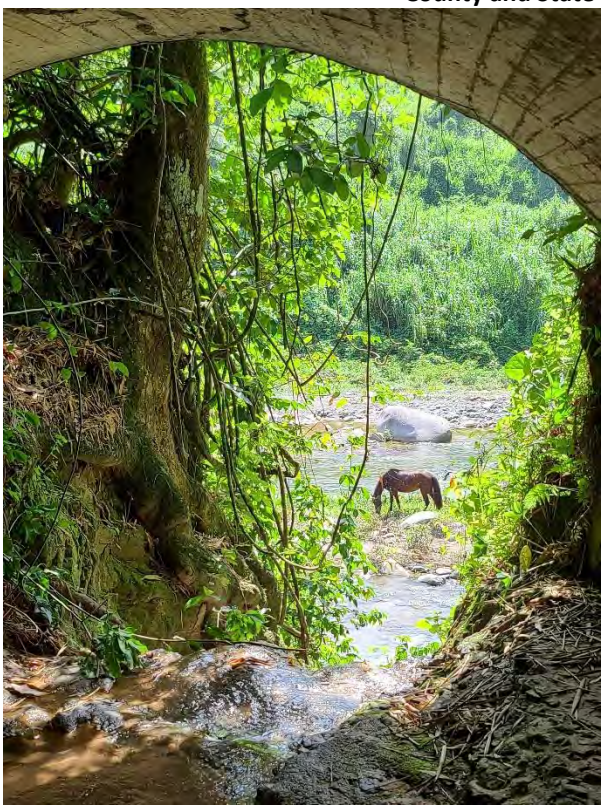


Figure 52. **Carretera Núm. 6**'s examples of landscapes features in and beyond the right of way.

The relationship of these multiple areas provides the analytical base to properly determine the integrity of a road and its ability to convey its historic significance. That is, the extant built resources that conform the travel-way, the roadside and the setting, were combined with the understanding of the road's historic context to identify and determine **Carretera Núm. 6**'s section that better represent the historic significance of the property.

Few historic roads, if any, exist unchanged and unaltered since first conceived and constructed. Because of their pragmatic nature, roads have a history of evolution and changes that present the modern observer and researcher with an array of layers, alignments, materials, alterations, accommodations, and even loses over the years. As expected, the resource evolved through time under new pavement material, realignments, safety and speed regulations, traffic volume, and new types of motor vehicles, among many other structural, commercial and social requirements placed upon it.

Regardless of the difficulty of finding the unchanged and unaltered old road, the past is still the departure point to analyze the historic, engineering, and social significance of today's **Carretera Núm. 6**. Only with an understanding of the road's history and its current status can a proper evaluation of the resource's integrity be accomplished. That was precisely the guiding objective of the developed previous historic context.

Summary of contributing resources

Based on the research of primary and secondary sources, along with a survey and documentation of the eighty-two (82) kilometers that comprise **Carretera Núm. 6,** it was concluded that seventy five kilometers, with four hectometers (75.4) retain a substantial amount of resources in its travel-way, right-of-way and setting, allowing this stretch to be able to transmit its historical significance and convey its association with the old **Carretera Núm. 6**. The contributing section is a continuous linear district of which 17.3 kilometers fall under Ponce's jurisdiction; 22 kilometers under Adjuntas; 19.4 kilometers under Utuado; and 16.7 kilometers under Arecibo.

Altogether, the length of the linear district, 75.4 kilometers, represents ninety-two (92%) percent of the entire length of 82 kilometers of the old road. (**Fig. 53**)

Figure 53. Map showing the 75.4 kilometers designated as the contributing section that best represent and support the historic significance of **Carretera Núm. 6.** The southern point starts at *Casilla* #1 in Ponce. The northern point corresponds to the last culvert documented in PR-6609, UTM (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2021)

The linear district includes the road itself and all its structural components on its travel-way, right-of-way (roadside) and setting that are directly associated with the road's functionality. Among these components are bridges, *pontones*, *casillas de camineros, culverts, historic stone/concrete or metal s*afety rails or posts and retaining walls. There are fifty-three (53) bridges/*pontones* identified as contributing resources and two (2) identified as non-contributing. (**Fig. 54**)

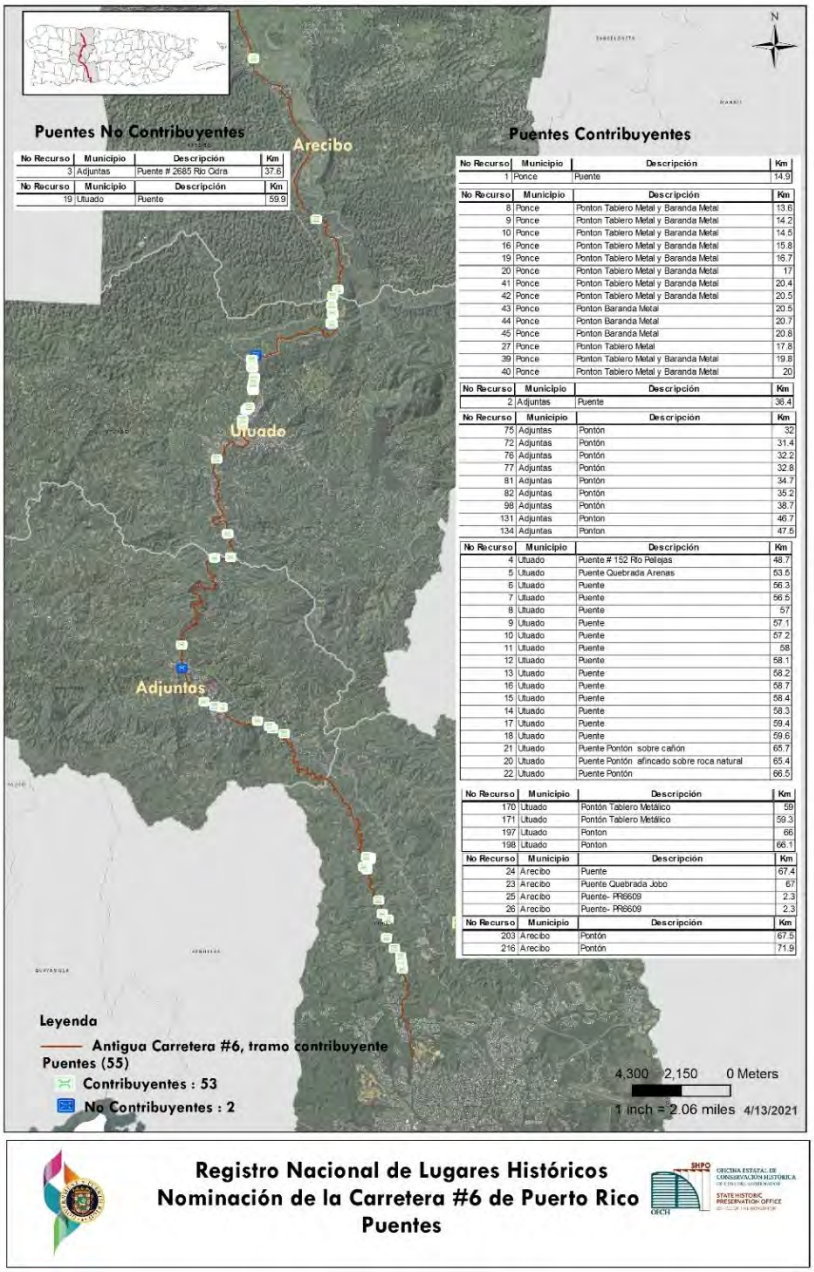


Figure 54. Map showing the fifty-five bridges and pontones identified in Carretera Num. 6. (Map prepared by Eduardo Cancio González, Information System Specialist, PRSHPO, 2019)

Two (2) *casillas de peones camineros* located in the right-of-way of the Ponce – Adjuntas section, both under Ponce's municipal jurisdiction, are also included as contributing resources: *Casilla* #1, located at Km. 9.1; and *Casilla* #2, located at Km. 15.5. (**Fig. 55**)

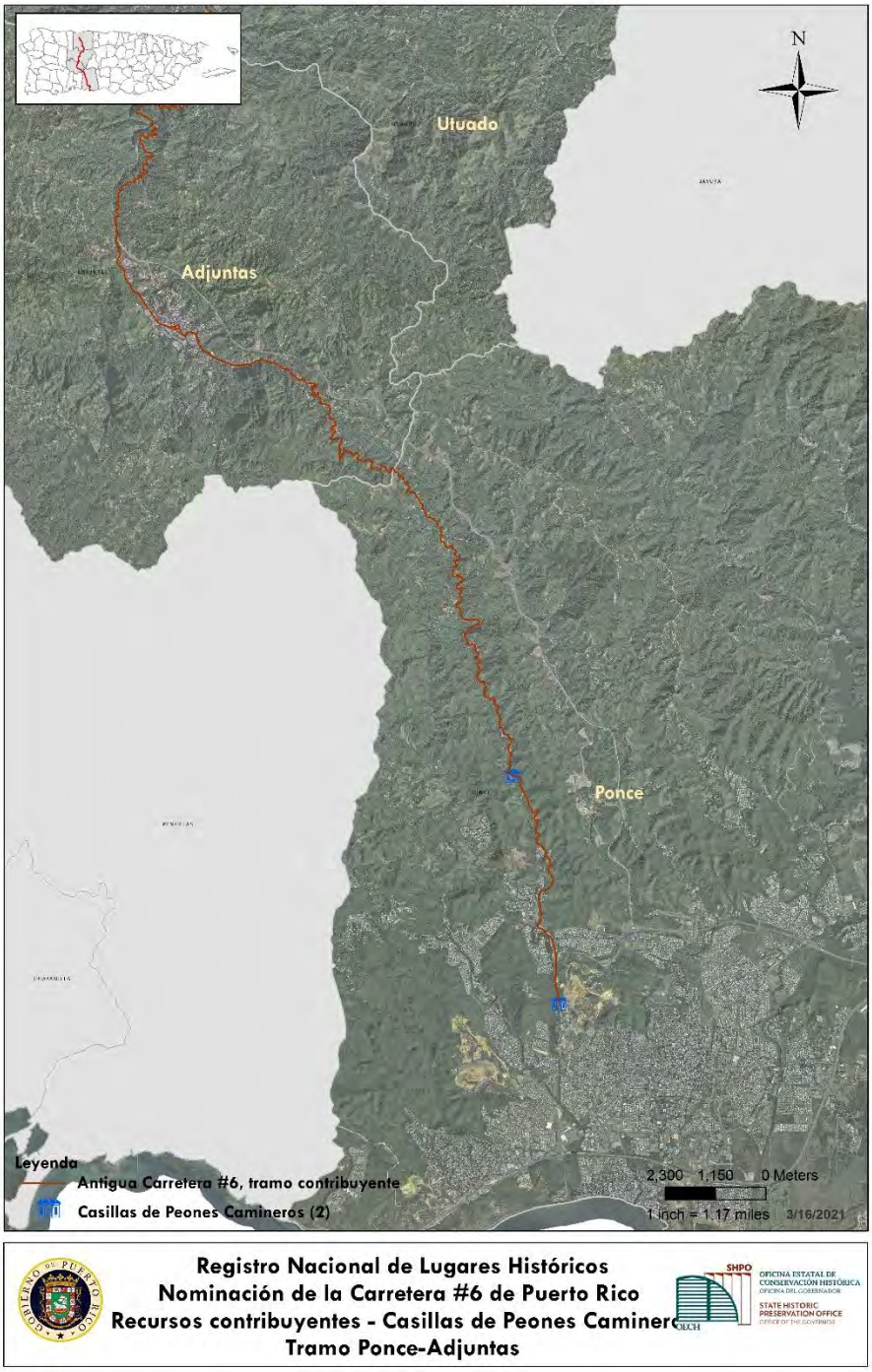


Figure 55. Map showing the location of the two (2) contributing *casillas de camineros*.

Included as well are all the 19th century culverts; the culverts built during the early years of the 20th century as the road was finished; and all culverts identified as been built prior to 1970 that were used to extend and widen the existing culverts. In total, one hundred and seventy-seven (177) culverts were identified and documented as contributing resources (**Fig. 56**). Additionally, fourteen (14) historic retaining walls were documented and identified as contributing resources.

Figure 56. Location of identified historic culverts.

In total, two hundred and forty-eight (248) resources were documented, with two hundred and forty-six resources (246) identified as contributing along the 75.4 kilometers of **Carretera Núm. 6** (**Fig. 57**).

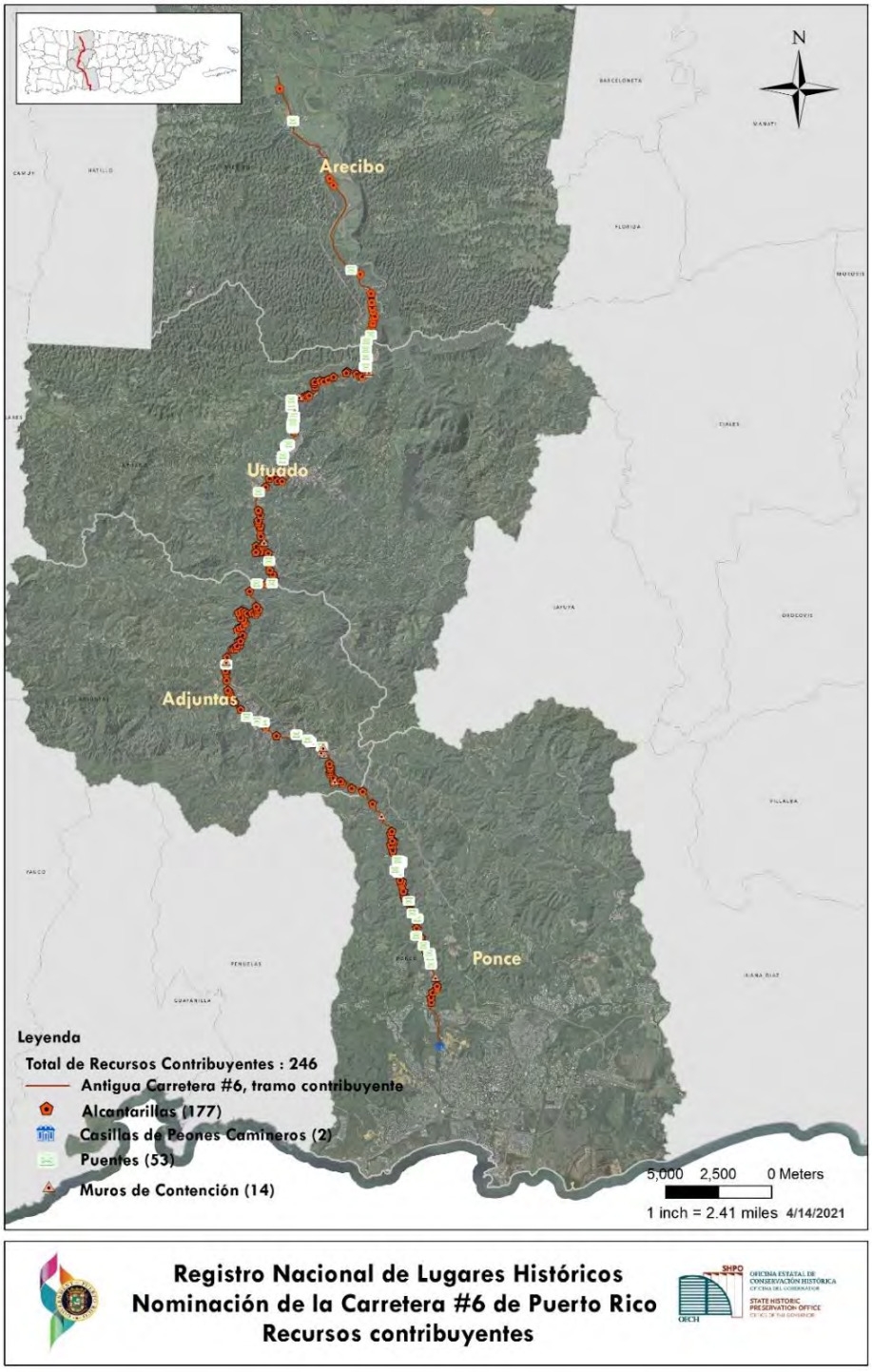


Figure 57. All the contributing resources.

Across the island, just like in the United States, historic roads are being lost through demolition, neglect and poor management. Sometimes this lost is due to policy, sometimes external pressures and many times, simply ignorance. These losses can be swift and devastating or slow and incremental, hardly noticed until it is too late.

The nominated 75.4 kilometers of the old **Carretera Núm. 6** represent a marvelous example of what was once a First-Class Road and one of the most significant extant resources within the 19th century road plan for the island. Began in 1880 and finished in 1904, it was the second road to traverse the island from north to south, across the *Cordillera Central*. Its construction period (1880 – 1904) makes **Carretera Núm. 6** a transition road in many ways. A physical and no so silent witness to the island new political and social reality after the Spanish American War. A road that, just like the *Carretera Central*, demanded an enormous human effort in its construction, and as such, is a monument to all those involved. A road in which new construction methods were experimented, without breaking with traditional techniques. A road in which new construction materials were used in an innovative way, but in harmony with traditional materials. **Carretera Núm. 6** served as a meeting point for two different schools of engineering thought, the European and the American. This meeting brought the road into modern times, without losing it engineering ancestry. A travel through its route allows to experience the island's transportation, engineering, social, and even, political history.

Carretera Núm. 6 was a road designed for the efficient movement of people, goods and services. Every bridge, *pontón*, *casilla de caminero*, *alcantarilla*, retaining wall, among other components, were purposely created with a pragmatic function. However, almost immediately after its final construction, the road developed an additional ability in providing a meaningful experience to the traveler through the road's careful, aesthetic and brilliant design, construction materials and construction techniques. **Carretera Núm. 6** is, simultaneously, an engineering and an artistic feast. The nominated 75.4 kilometers represent the best of such significant property.

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Name of Property | **County and State**

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Previous documentation on file (NPS):

___ preliminary determination of individual listing (36 CFR 67 has been requested)
___ previously listed in the National Register
___ previously determined eligible by the National Register

Primary location of additional data:

___ State Historic Preservation Office
___ Other State agency
___ Federal agency

Carretera Núm. 6	Puerto Rico
Name of Property	**County and State**

___ designated a National Historic Landmark
___ recorded by Historic American Buildings Survey #
___ recorded by Historic American Engineering Record #
___ recorded by Historic American Landscape Survey #

___ Local government
___ University
___ Other (Name of repository)
_____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of property 223.5 USGS Quadrangle _____

(Use either the UTM system or latitude/longitude coordinates. Delete the other.)

Datum if other than WGS84: _____

1. Latitude _____ _____
2. Latitude _____ _____
3. Latitude _____ _____
4. Latitude _____ _____

OR

UTM References

Datum (indicated on USGS map): _____

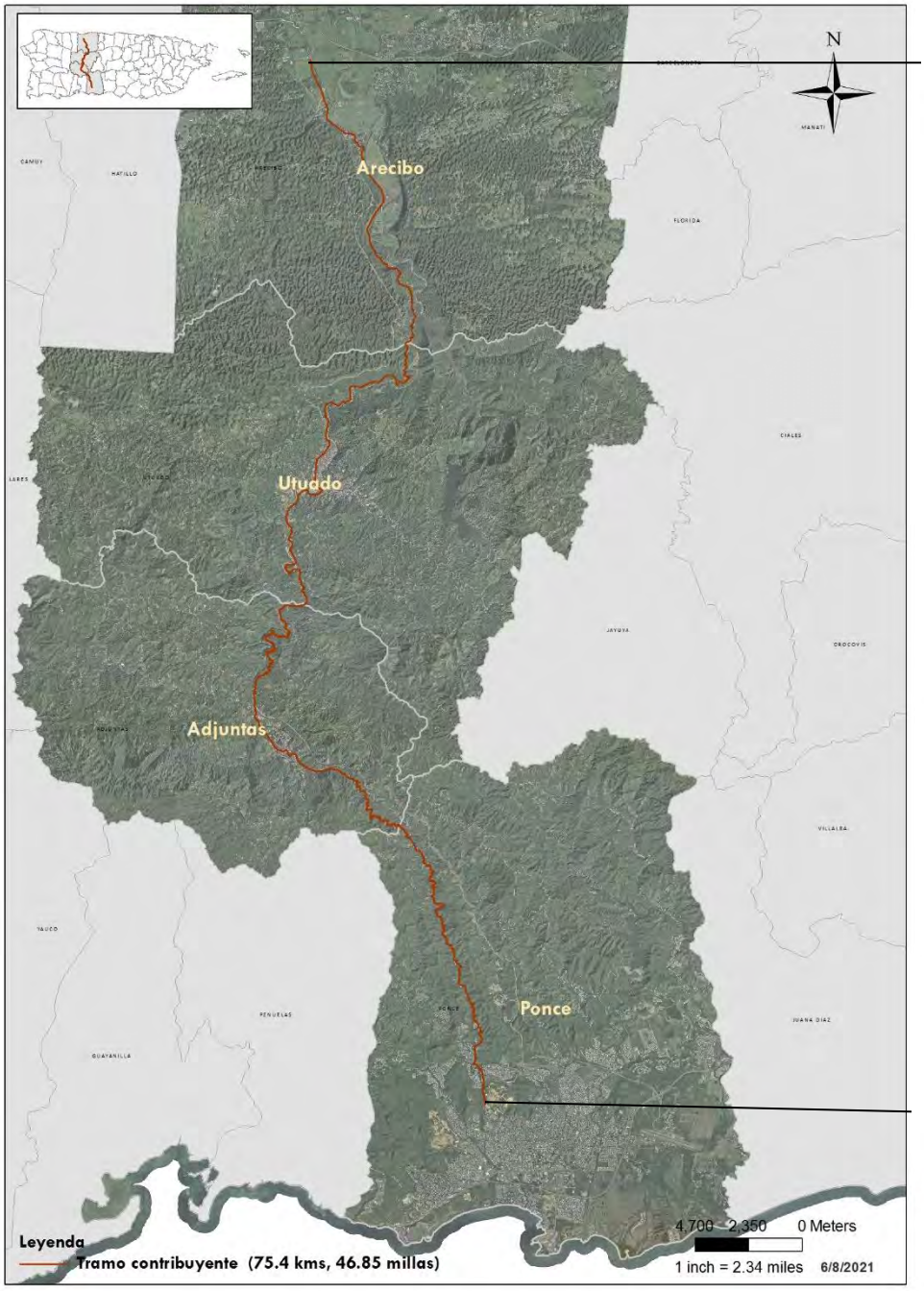
___ NAD 1927 or X NAD 1983

1.	Zone 19Q	Easting 741531	Northing 2040066
2.	Zone 19Q	Easting 749811	Northing 1994413
3.	Zone	Easting	Northing
4.	Zone	Easting	Northing

Due to the length of the nominated property, the difficult topography that traverses and the numerous vertical and horizontal displacements, only two UTMs references are provided. UTM #1, corresponds to the northern point in PR-6609 Km. 4.6, in the municipality of Arecibo. UTM #2, corresponds to the southern point in PR-123, Km. 9.1, in the municipality of Ponce. (See map below).

Carretera Núm. 6 | Puerto Rico

Name of Property | **County and State**



UTM
E- 741531
N-2040066

UTM
E- 749811
N- 1994413

Registro Nacional de Lugares Históricos
Nominación de la Carretera #6 de Puerto Rico
Tramo Contribuyente

OFICINA ESTATAL DE CONSERVACIÓN HISTÓRICA
STATE HISTORIC PRESERVATION OFFICE

Verbal Boundary Description (Describe the boundaries of the property.)

Carretera Núm. 6	Puerto Rico
Name of Property	**County and State**

Carretera Núm. 6 is a continuous linear district of seventy-five kilometers, with four hectometers (75.4 kms.) in length that span along two state roads: PR-123 and PR-6609, traversing four municipalities: Arecibo, Utuado, Adjuntas and Ponce. In PR-123 the contributing section starts at kilometer 9.1 in Ponce, ending at Km. 79.9 in Arecibo. **Carretera Núm. 6**'s historic footprint continues in PR-6609, in Arecibo, starting in Km. 0.0., and ending in Km. 4.6. To its linear length of 75.4 kilometers, a twelve meters wide right-of way is added as a buffer zone, along the property's entire length, resulting in a total area of 904.8 kilometers. This last quantity (904.8 kilometers) equals to 223.5 acres.

Boundary Justification (Explain why the boundaries were selected.)
The mentioned boundary was selected as the identified 75.4 kilometers contain the largest number of resources associated with the old road and the highest level of integrity. As such, this section it's best able to transmit the historic significance of the old **Carretera Núm. 6**.

11. Form Prepared By

name/title Juan Llanes Santos, Historian
organization PRSHPO date
street & number PO Box 9023935 telephone 787-721-3737
city or town San Juan state PR zip code 00902-3935
email jllanes@prshpo.pr.gov

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** or equivalent (7.5 or 15 minute series) indicating the property's location.
- **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to map.
- **Additional items:** (Check with the SHPO for any additional items.)

Carretera Núm. 6 | Puerto Rico

Name of Property | **County and State**

Photographs

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels (minimum), 3000x2000 preferred, at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map. Each photograph must be numbered and that number must correspond to the photograph number on the photo log. For simplicity, the name of the photographer, photo date, etc. may be listed once on the photograph log and doesn't need to be labeled on every photograph.

Photo Log

Name of Property **Carretera Núm. 6**

City or Vicinity Ponce/ Adjuntas/Utuado/Arecibo County Ponce/Adjuntas/Utuado/Arecibo State Puerto Rico

Photographer Juan Llanes Santos Date Photographed

Description of Photograph(s) and number, include description of view indicating direction of camera.