4854

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form*. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

Historic name: Acueducto Alfonso XII

Other names/site number:

Name of related multiple property listing: Going With the Flow: Water Works in Puerto Rico, 1840 – 1898.
(Enter "N/A" if property is not part of a multiple property listing)

2. Location

Street & Number: Calle del Acueducto

City or town: Ponce State: PR County: Ponce

Not for publication [] Vicinity [X]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 SHPO/Director — November 7, 2019

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):

Signature of Keeper 12.30.2019 **Date of Action**

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 100004854 Date Listed: 12/30/2019

Property Name: Acueducto Alfonso XII (Going With the Flow: Waterworks in Puerto Rico, 1840-1898 MPS)

County: Ponce State: PR

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

Signature of the Keeper

12.30.2019
Date of Action

Section 10: UTM coordinates

The property is located in UTM Zone 19Q.

The Puerto Rico State Historic Preservation Office was notified of this amendment.

DISTRIBUTION: National Register property file; Nominating Authority (without nomination attachment)

Acueducto Alfonso XII | Ponce, PR
Name of Property | **County and State**

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.)

The **Acueducto Alfonso XII** was the structural system built in 1878 to provide potable water to the urban center of Ponce. The system had several main components: the river dam, the water intake, the water distribution channel or conduit, filtering stations, the deposits or reservoir and the water piping distribution system. It also had supporting structures like manholes that allowed to clean the canal and metal shafts placed above the conduit channel used to oxygenate the water below. With the exception of the cast iron pipes that moved the water underneath the urban center and the metal shafts along the conduit, all the other components were a mix of bricks, stones, masonry and hydraulic concrete. The original components of the aqueduct spanned over four kilometers. The extant resources, however, are located within a four hundred meters lineal area, north of Ponce's urban core, arranged within the *Calle del Agua* and *Calle del Acueducto* roads, in the urban wards of Cantera and Portugués Urbano. The extant resources are character defining components still able to convey the historic significance of the entire complex.

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

The system, as explained in Section 8, was designed to supply fresh, clean water for public baths, ornamental fountains, public water faucets, industrial uses, and human and animal consumption. Water was moved through gravity alone, along a slight overall downward gradient through a conduit of stone, bricks and hydraulic concrete from the water intake all the way to the water reservoir. The water taken at a certain point in the Portugués River, was carried by a conduit channel, sometimes above or underground, following the terrain's contours, extending for almost four kilometers. Throughout the length of the channel, *registros* (access points or manholes) were placed at regular intervals to clean and provide proper maintenance to the conduit. When the channel reached the depression known as *Quebrada de la Cantera*, the ground level canal became a three arched bridgework or aqueduct bridge (*murallón*). About three hundred meters south from the bridgework,

the water reached the distribution basin or deposits. From the deposits, a network of iron pipes distributed the water throughout Ponce's urban center.

The extant components of the old **Acueducto Alfonso XII** identified as part of this nomination effort are a section of the underground conduit canal, five manholes, the *Murallón de la Cantera* and the deposit. All these resources, components of the very same structure, are still aligned and properly connected to each other, allowing the property's ability to convey its construction period, materials, location and engineering techniques (**Fig. 1**). From manhole #5 to the deposit, there are four hundred and one (401.4) linear meters to the reservoir, while the deposit's area comprises eight hundred and two (802.77) square meters.

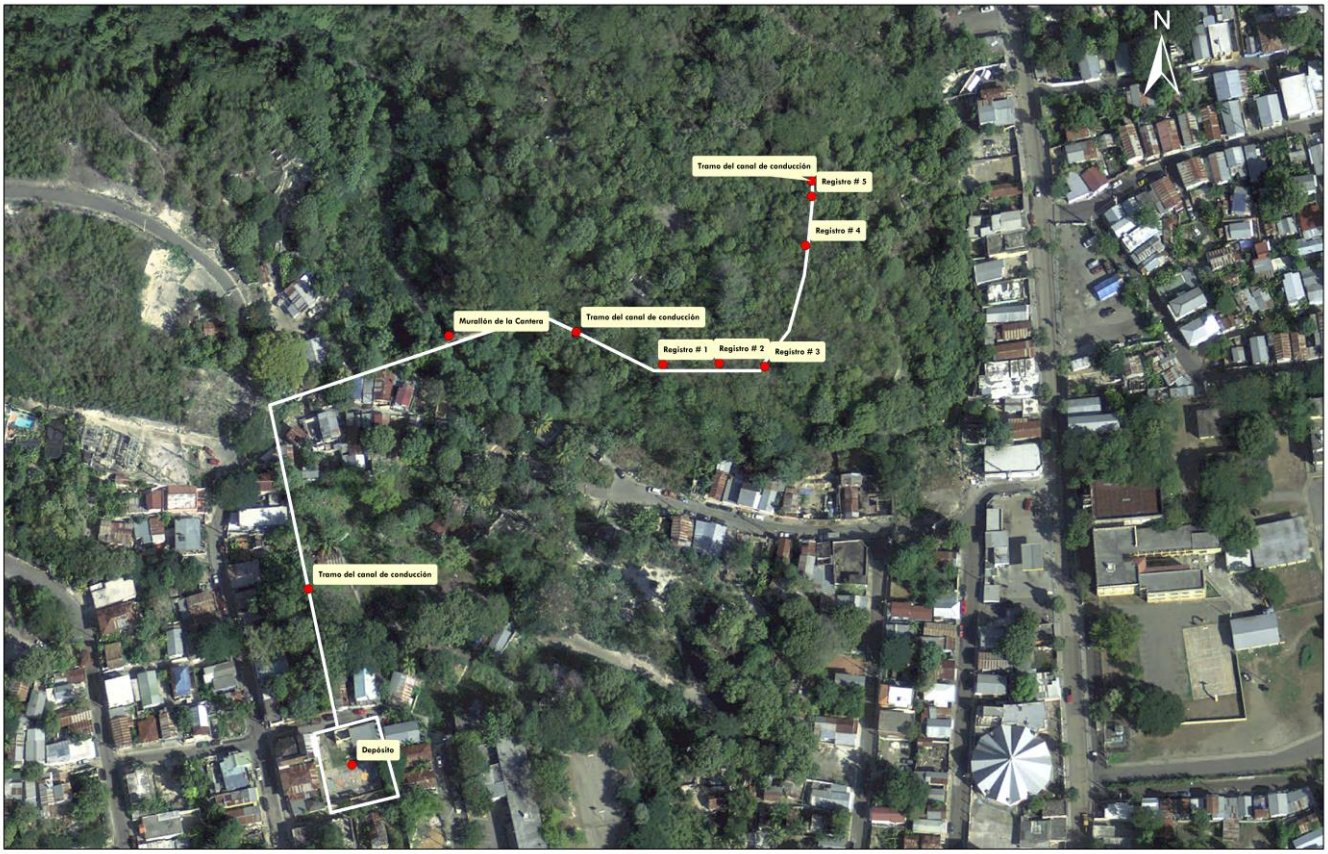


Figure 1. Alfonso XII's extant components. The conduit channel runs through private backyards today. At some points, the top portion of its vaulted shape surfaces above ground, allowing to determine its traverse course from the western end of the Murallón de la Cantera to the deposit's entrance. The points within the tree line (conduit channel and manholes) were found by PRSHPO personnel. (Map prepared by Eduardo Cancio, PRSHPO, 2019).

The deposit, built completely underground, is a two-thousand five hundred (2,500) cubic meters capacity rectangle tank, twenty-five meters long and twenty-four meters wide. The brick and masonry structure, coated with hydraulic concrete, is divided by a two meters wide brick and masonry wall in two equal chambers. Each chamber has a barrel vaulted ceiling, supported by a central arcade (**Fig. 2**).

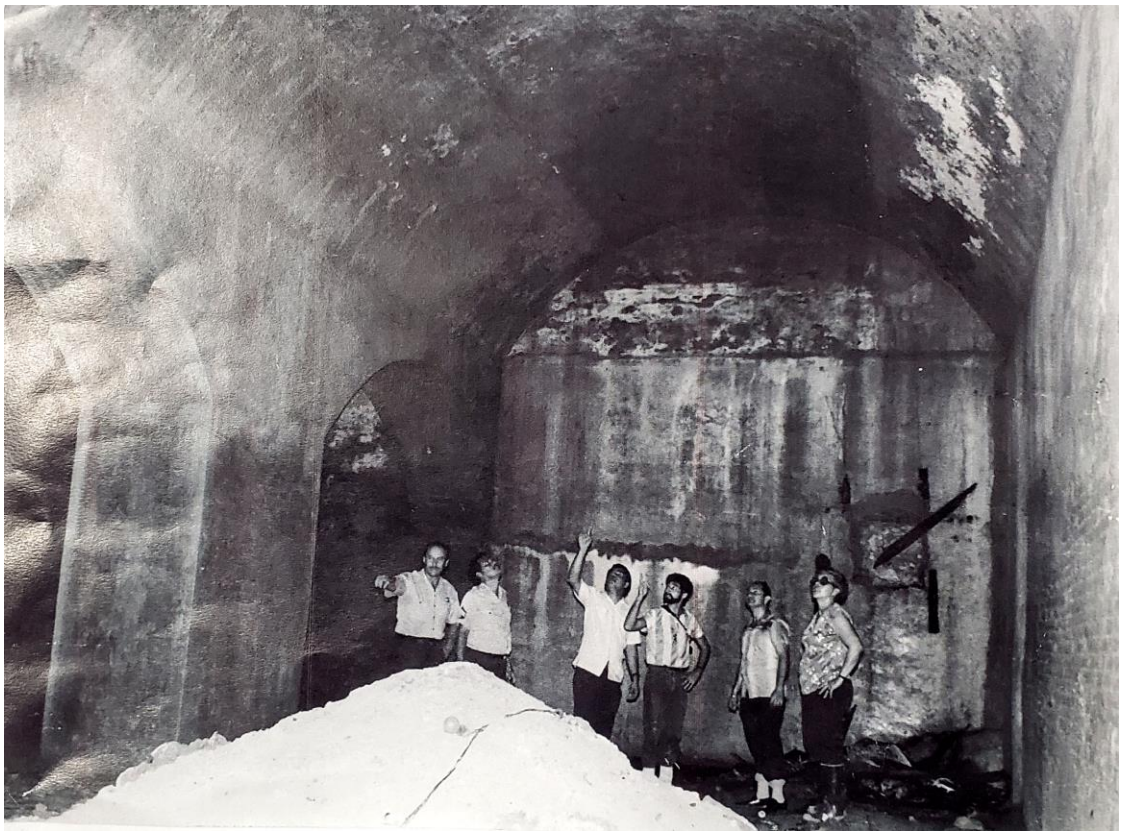


Figure 2. A 1984 photo of one of the two chambers. Today, access to the deposits is restricted by *Obras Públicas Municipales* (Municipal Public Works). As such, the author of this nomination document, was unable to acquire current photos. The entrance to the property has been sealed-off since the 1980's. The only opening found to access the deposit it's considered unsafe and unhealthy. (Source: *Inventario Recursos Arquitectónicos de Puerto Rico*. *Oficina Estatal de Preservación Histórica*, 1984.)

In the 1970's, during Luis Morales Crespo's period as Ponce's mayor (1972-1976), a basketball court was built atop the deposit' site as a recreational facility for the low-income, working class neighbors in La Cantera ward. Currently in a state of abandonment, the court still retains above ground 19th century components associated with the deposit complex. For example, a large section of the concrete-blocks wall that encompasses the court, was built atop a visible brick and masonry wall's

foundation that surrounded the deposit's area. Sections of this brick and masonry foundation still exposed (**Fig. 3**). A hole on the southern side of the exposed brick and masonry wall, allows to peak into a section of the underground deposit, but extremely unsafe for a possible entrance into the structure.

Figure 3. The photo sequence shows the basketball court that sits atop the deposit; the exposed brick and masonry foundation on the southern side of the court's wall; the undefined hole on the brick wall and a partial view of the deposit's structural system below the basketball court. (Juan Llanes, 2019)

Today, the deposit' site access is through a gated northwest entrance from *Calle del Agua*. At the entrance, there is a small roofless brick and masonry building, a 19th century extant component. This particular building contained the above ground manhole (*registro*) to the deposit, currently sealed-off and covered with an iron plank. (**Fig. 4**).

Figure 4. The roofless building that contains the sealed-off entrance to the deposit. (Juan Llanes, 2019)

All the components directly associated with the deposit sit on an area of eight hundred and two (802.7) square meters (**Fig. 5**).

Figure 5. Aerial view of the deposit's area: the basketball court, the brick and masonry roofless building with sealed-off access to the deposit and the brick and masonry wall that surrounds most of the area.

Another significant component of the **Acueducto Alfonso XII** identified as part of this nomination effort is a continuous section of the conduit channel of four hundred and one (401.4) meters in length. Under the trees in the southeast woodland area of *Cerro Vigía*, above ground sections of the canal were uncovered among the dense growth of shrubs and other plants, allowing to follow its alignment. Five *registros* (manholes) were also identified as part of the conduit channel (**Fig. 6**).

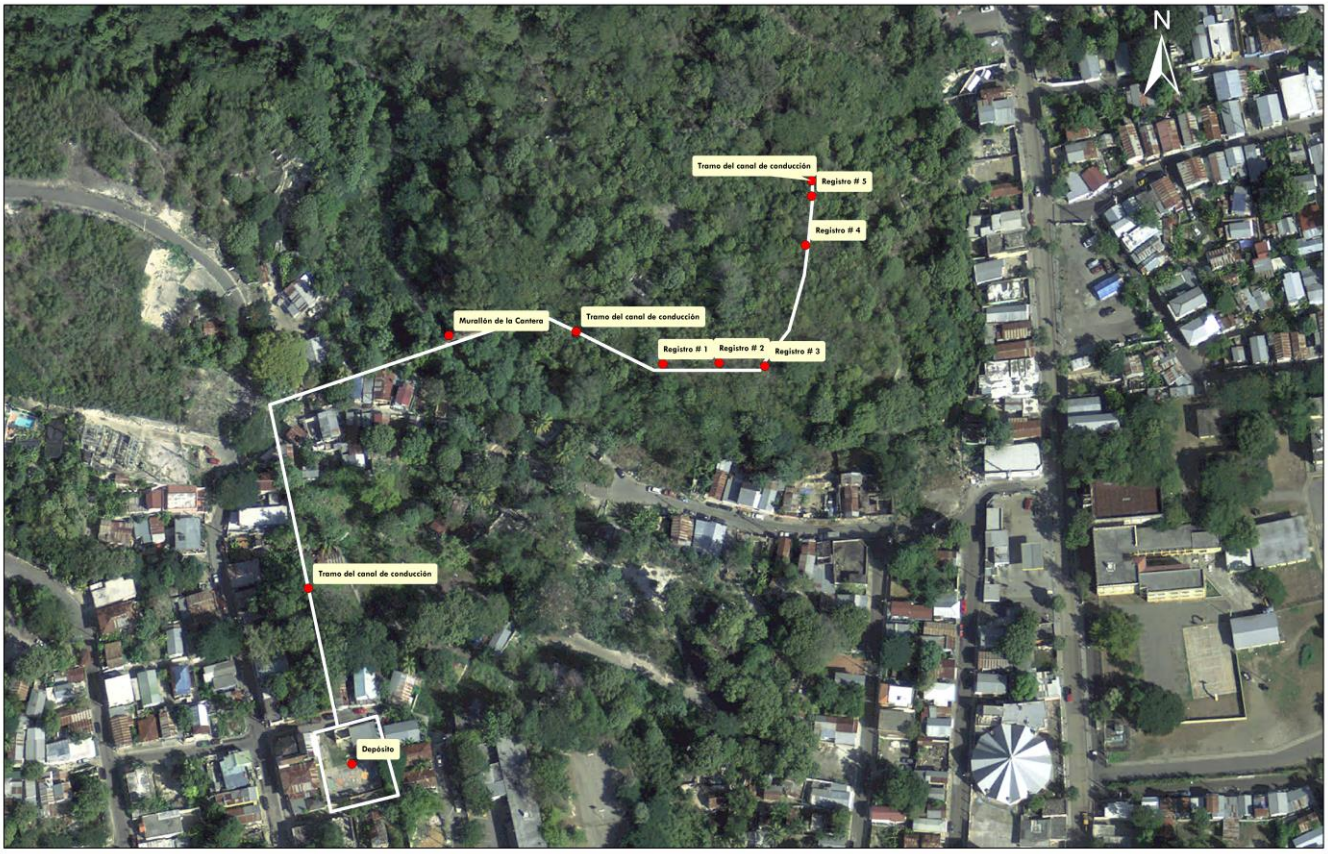


Figure 6. Alignment of the conduit channel found, along with the five manholes: Registro #1 (UTM, E 752676 /N 1994170); Registro #2 (UTM, E 752694 / N 1994168); Registro #3 (UTM, E 752711 / N 1994166); Registro#4 (UTM, E 752727 / N 1994218); Registro #5 (UTM, E 752728 / N 1994233). (Map prepared by Eduardo Cancio, PRSHPO, 2019).

According to the 19th century plan, the manholes were to be located every two hundred meters along the conduit channel to allow for the canal's maintenance and cleaning. However, the five *registros* found are spaced-out about twenty meters apart. The *registros* #1, #2 and #4, seem to be a late 19th or early 20th century construction with their above ground boxes made of concrete while the

registros #3 and #5 are 19th century structures, entirely made of bricks with hydraulic concrete as mortar (**Fig. 7 and Fig. 8)**).

Figure 7. Photos show sections of the conduit channel showing construction material: brick, stone and hydraulic concrete for the outer shell, with the interior vault made of brick with a hydraulic cement grout. The conduit channel in the pictures below still retains parts of its outer fabric horseshoe vaulted component. (Juan Llanes, 2019)


Above: manhole #1


Left, manhole #2. Right, manhole #3.


Left, manhole #4. Right, manhole #5

Figure 8. R*egistro #1*, covered with earth and undergrowth, is a rectangular box-like concrete structure placed atop the conduit, with a circular entrance, most likely covered with a missing iron cap. It has a sixty (60) centimeters wide opening and its ninety (90) centimeters in height from the conduit bottom to the top. *Registros* 2 and 3 have approximate the same measures in depth and height, but are square-shaped in form and entrance. *Registros* 4 and 5 have same dimensions as the previous. Manhole 3 and 5 retain the brick fabric. (Juan Llanes, 2019)

Out of all the extant resources, the most visible and impressive, is the property historically known as *Murallón de la Cantera*. In the collective memory, when the locals refer to the **Acueducto Alfonso XII**, what they actually have in mind is this particular resource (**Fig. 7**).

Figure 7. An aerial and ground view of the Murallón de la Cantera, with PRSHPO personnel to provide scale. (Juan Llanes, 2019)

Included by Timoteo Lubelza in the 1876 plan for the **Acueducto Alfonso XII**, the *Murallón* was intended to overpass the ground depression at this location, keeping the canal's grading to maintain the water running just through gravity. The Roman-like bridgework is a marvelous structure of bricks, stone, masonry and hydraulic cement. The highly symmetrical resource is sixty-five (65) meters long (213 feet) and fifteen (15.2) meters high (50 feet). The span of each one of the three arches is precisely six and a half (6.5) meters (21.3 feet). Each of the middle columns are four (4) square meters in area. (**Fig. 8**).

Figure. 8. Views of the Murallón's length, arches and supporting columns.

Out of the sixty-five meters in length of the *Murallón de la Cantera*, twenty-three meters correspond to the area covered by the arched element. The length of the remaining forty (41.5) meters are the massive brick and stone abutments (**Fig. 9**).

Figure 9. On the left, the abutment at the eastern end of the *Murallón*, looking southeast. On the right, the abutment on the western end, looking southwest. (Juan Llanes, 2019)

When in used, the *Murallón* was not an open, but a vaulted canal. Sometime during the 1930s, as the entire **Acueducto Alfonso XII** was abandoned, the water bridge lost its vaulted component and became an improvised "pedestrian bridge" as the nearby high grounds were occupied by squatters. Eventually, for safety reasons, the local authorities ratified its new imposed use, building a railing with evenly spaced concrete columns connected with long, hollow tubes (**Fig. 10**).

Figure 10. Three views of the Murallón upper level. Until the late 1920's, this was a vaulted canal, transporting water towards the deposit.

Through the years, as people moved out of the surrounding high grounds due to the terrain instability, especially after *La Tragedia de Mameyes* in 1985, the *Murallón* became an abandoned structure among the growing vegetation.[1]

The resources identified as part of this nomination effort retain a high level of integrity in their location, design, setting, materials, workmanship, feeling and association. The eight hundred square meters of the deposit area, together with the structures (conduit canal, manholes and the *Murallón de la Cantera*) identified along a four hundred and one linear meters area, shape a discernible district, with all the mentioned resources still aligned and connected (**Fig. 11**). The combined resources have great ability of conveying the historic significance of the entire system of the **Acueducto Alfonso XII**.

Figure 11. Acueducto Alfonso XII District (Map prepared by Eduardo Cancio, PRSHPO, 2019)

[1] An *onda tropical* entered the Caribbean Sea on October 5, 1985, bringing record breaking rainfall over Puerto Rico. On October 7, 1985, around three o'clock in the morning, the saturated soils around the hillside community of Mameyes, nearby the northern sector of the Murallón area, caused a massive mudslide. A large slab of sandstone detached, moving about 250,000 cubic yards of material down the hill. The landslide destroyed about ninety houses, leaving a death toll of more than three hundred people. The Mameyes' tragedy is considered the deadliest single landslide on record in North America.

Acueducto Alfonso XII | Ponce, PR
Name of Property | **County and State**

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.)
Engineering
Architecture
Social History

Period of Significance
1875-1928

Significant Dates
1875
1876
1878

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

Cultural Affiliation

Architect/Builder
Lubelza, Timoteo (engineer)
Bertoly Calderoni, Juan (architect)

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.)

The **Acueducto Alfonso XII** is statewide significant under Criterion C in the category of Engineering as an exemplary representation of 19th century practical application of scientific principles in design and construction of structures to serve human needs. The property is also statewide significant under Criterion C in the category of Architecture as the resource superbly exemplifies its period, type and method of construction, conveying 19th century architectural art in the design and construction of structures which purpose was to improve human living conditions. The **Acueducto Alfonso XII** is statewide significant under Criterion A in the category of Social History as the property is a great example of the efforts of 19th century local and central government authorities in promoting the welfare of Ponce's urban inhabitants living condition and as a model to be followed by other towns island-wide. It's also a great example in representing the lifeways of the social groups in their commitment of improving their status, health and hygiene through a more adequate mean of providing potable water to the population in general.

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

The **Acueducto Alfonso XII** is associated with and represents Ponce's nineteenth century urban development. By the late eighteen century the town was just a humble settlement consisting of one hundred and fifteen (115) houses and 5,038 souls scattered around a small plaza with a little deteriorated church at the center.[2] By 1876, precisely at the time the **Acueducto Alfonso XII** was planned, the municipality of Ponce consisted of five urban sectors, numerically named as sectors 1,2,3,4 and 5; the urban wards of La Playa and Cantera and twenty one rural wards. Within the urban core, excluding public buildings and huts, there were nine hundred and seventy-three residences: fifty-three two-story brick and masonry houses; one hundred and one houses of just one level of the same material; thirty-three two-story houses of mixed construction (masonry at the lower level with a wooden upper floor); thirty-seven two-story wooden houses and seven hundred and forty one-story

[2] Iñigo Abbad y Lasierra, *Historia geográfica, civil y natural de la isla de San Juan Bautista de Puerto Rico*. Anotada en la parte histórica y continuada en la estadística y económica por Jose Julián Acosta y Calbo. Ediciones Doce Calles, 2002, 326.

wooden houses.[3] Two years later, just at the time the **Acueducto** was inaugurated in 1878, Ponce's urban center was a striving city with four squares, an urban grid with thirty-four major streets, one thousand and eighty-four houses (1084), two hundred and sixty (260) huts and two thousand two hundred and four (2204) families co-existing within the urban core. [4]

The boom in Ponce's urban development was tied to the city's agricultural and commercial activity. During the first decades of the 19th century, Puerto Rico's agricultural production became more important than its military strategic location within the Caribbean. As foreign trade became significant, so did cities with port facilities. Ponce took great advantage of its location in the southern portion of the island and its most adequate port facilities, officially opened at La Playa by 1804. The city was able to capitalized on its distant location from San Juan, channelizing not only its own local production, but also absorbing the production of adjacent municipalities and becoming the main center in the island's international market, replacing San Juan as head of the exporting commerce. In 1890, Ponce was responsible for the exportation of 33.2 percent of the island's production, while San Juan accounted for 21.2 percent.[5]

Ponce's economic strength was also the result of the city becoming the home base of a very influential immigration. Events like the Haitian Revolution (1789-1804), the Latin America Wars of Independence (1810-1824)[6], and the Spanish government immigrants policies (like the 1815 *Real Cédula de Gracia*) promoted the arrival of numerous well-to-do foreign citizens that made out of Ponce's fertile flatlands their new production centers (specially sugarcane) and turned Ponce's urban center into their new homes.[7]

[3] Ramón Marín. *La Villa de Ponce considerada en tres distintas épocas. Estudio histórico, descriptivo y estadístico, hasta finales del año 1876*. Ponce, Puerto Rico, Establecimiento tipográfico "El Vapor", 1877, 346. Obras Completas.

[4] Manuel Ubeda y Delgado. *Isla de Puerto Rico. Estudio histórico, geográfico y estadístico de la misma*. Puerto Rico. Establecimiento tip. del Boletín, 1878, 219-222.

[5] Archivo General de Puerto Rico (AGPR). Gobierno de Puerto Rico. Estadística general del comercio exterior y balances mercantiles. 1895.

[6] A very dramatic example of this human transplant took place on October 15, 1821, when as result on the Venezuelan's independence from Spain, a Spanish soldier's garrison of 4 generals, 666 soldiers and 599 civilians loyal to Spain, arrived in Ponce. Most of them took permanent residence in the city. See, Pedro Tomas de Córdova, *Memorias geográficas, económicas y estadísticas de la Isla de Puerto Rico*. Tomo III. Año de 1831. Instituto de Cultura Puertorriqueña. San Juan, Puerto Rico, 1968, 437.

[7] Guillermo A. Baralt, *Buena Vista. Life and Work on a Puerto Rican Hacienda, 1833-1904*. The University of Carolina Press, 1999, 7.

The slave commerce, the sugar, coffee and other crops produced within the southern region and mostly exported through Ponce, promoted the formation of a strong commercial sector, even more powerful than the landlord class. United through commercial relationships, social interaction and marriage arrangements, these upper groups conformed an urban bourgeoisie that shaped Ponce's urban landscape.

The words used by historian Frank Moya Pons to describe the new urban centers in the Dominican Republic could be properly applied to Ponce's development by mid-nineteenth century: "*new buildings were erected, light system were installed, the streets were paved and provided with sewage and aqueducts, social clubs and literary societies were founded and theaters and plazas were built*".[8] As architect Jorge Rigau indicates, "*The vigorous commercial activity…introduced an urban lifestyle previously unknown*."[9] The striving commercial activity in the city attracted into the urban core businessmen, landlords, speculators; but also attracted carpenters, artisans, brick layers, contractors, architects, engineers, artists, and many others, from which the city's built landscape grew and benefited.

Through the intensive use of agriculture and its equally intensive port commerce, Ponce became the richest municipality in the island. By 1890, with seventy municipalities already formed, Ponce was the town that most contributed in taxes to the state treasury.[10] During the second half of the nineteenth century, the city's well-to-do citizens shaped the urban center through many ways, being its architecture, one of the most enduring means. This urban bourgeoisie competed for social status and public recognition, using architecture to express their personal achievement and social aspirations. Their residences became social statements that ultimately differentiated Ponce from any other urban center. The social discourse of Ponce's urban center facades created an urban element based, contrary to Old San Juan, not on homogeneity but on its diversity. As sociologist Angel Quintero Rivera suggest, the elaboration of Ponce's residential urban center facades manifested a cultural character associated

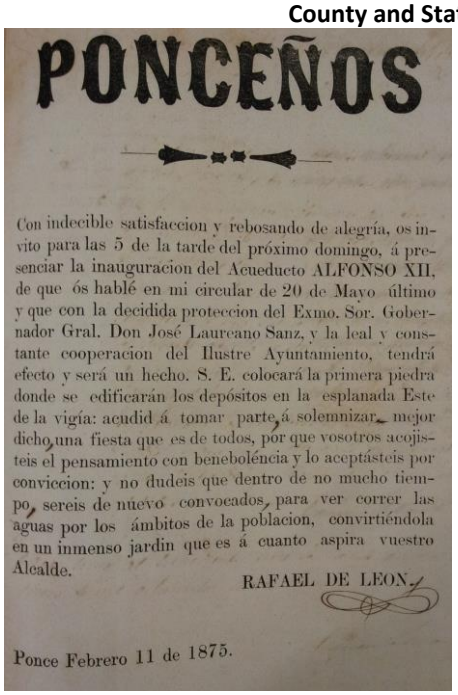
[8] Frank Moya Pons, *Manual de historia dominicana*. Santiago, D.R.: Universidad Católica Madre y Maestra, 1984, 480.
[9] Jorge Rigau, *Puerto Rico, 1900. Turn-of-the-Century Architecture in the Hispanic Caribbean, 1890-1930*. New York: Rizzoli, 1992, 124.
[10] Ángel G. Quintero Rivera. *Patricios y plebeyos: burgueses, hacendados, artesanos y obreros. Las relaciones de clase en el Puerto Rico de cambio de siglo*. San Juan: Ediciones Huracán, 1988, 42-43.

to a Manorial worldview, where the patrician families, upon their "generosity", perceived their residence as a gift to the public and a way to embellish and dignify their city.[11]

In such an embellished city, a system to provide potable water for its dignified dwellers became not only a welfare requirement, but a social statement of the city's progress, advance and modern views. Fortunately, the money to initiate the project was provided by the good deed of Valentín Tricoche. When the Spanish landlord Tricoche died in August 1863, he left to the city an endowment in his will of 82,970 pesos to build a charitable shelter for the poor and an aqueduct. The *Albergue Caritativo Tricoche* was finished in 1875. By that time, 53,717 pesos were left for the aqueduct project.[12] Tricoche saw the aqueduct as an investment and his plan was that the money obtained from the sale of water to city residents and local business and industry could be used to support the hospital. In 1878, when Ubeda y Delgado reported about Ponce, he mentioned that the project had already started, but it wasn't finished. The final cost was estimated as to be 128,000 pesos and it was to include ornamental water fountains, fire hydrants, public sprouts, and connections to private residences.

On February 14, 1875, after been proudly announced by several means by the city officials and inviting all the *Ponceños* to participate in the ceremony, Governor José Laureano Sanz, symbolically placed the first cornerstone of the future water deposit at the foot of the mountain historically known as *El Vigía*, northwest of the urban center (**Fig. 12**).

[11] Ibid. 55.
[12] Manuel Ubeda y Delgado, *Isla de Puerto Rico. Estudio histórico,* 217



PONCEÑOS

Con indecible satisfaccion y rebosando de alegría, os invito para las 5 de la tarde del próximo domingo, á presenciar la inauguracion del Acueducto ALFONSO XII, de que ós hablé en mi circular de 20 de Mayo último y que con la decidida proteccion del Exmo. Sor. Gobernador Gral. Don José Laureano Sanz, y la leal y constante cooperacion del Ilustre Ayuntamiento, tendrá efecto y será un hecho. S. E. colocará la primera piedra donde se edificarán los depósitos en la esplanada Este de la vigía: acudid á tomar parte, á solemnizar, mejor dicho, una fiesta que es de todos, por que vosotros acojisteis el pensamiento con benebolencia y lo aceptásteis por conviccion: y no dudeis que dentro de no mucho tiempo, sereis de nuevo convocados, para ver correr las aguas por los ámbitos de la poblacion, convirtiéndola en un inmenso jardin que es á cuanto aspira vuestro Alcalde.

RAFAEL DE LEON.

Ponce Febrero 11 de 1875.

Figure 12. City Hall announcement for the Alfonso XII Aqueduct ceremony.

However, the actual work didn't start until 1876. In between the official ceremony and the beginning of the actual construction, the required studies, the logistic and the planning was organized. The first plan for the future aqueduct was done by engineer Felix Vidal D'Ors. But the accepted proposal for the project was prepared by Timoteo Lubelza in 1875, main planner of the Mayaguez's aqueduct. On March 31, 1876, the public auction for the project's bids was conducted, with the contract awarded to architect Juan Bertoly Calderoni, who initiated the actual construction by mid-August that very same year. Lubelza, coming onboard the actual construction late 1877, was in charge of the design and placement of all fire hydrants, public water faucets and the entire system of iron pipes in the city' streets. [13]

On May 18, 1878, after almost two years, the gate at the Portugués dam was lifted to allow the water into the distribution canal. It took forty-five minutes for the water to reach the city. On November 1878, the city officials properly accepted the entire water work from contractors. The aqueduct system provided twelve public sprouts conveniently located for free public use. A large number of fire hydrants (*bocas de riego*) were also strategically placed around the city. Two washing places were built, one in the high grounds in the urban ward of Cantera, and another in Calle Isabel.

[13] Lidio Cruz Monclova. Historia de Puerto Rico, II, 2, 871-872.

The washing places had a capacity for one hundred laundress each. One drinking trough for the city's animals was built nearby the washing place in Calle Isabel. Additionally, the new aqueduct provided the water for two ornamental fountains placed at the city's *Plaza Principal* (north across city hall) and one for *Plaza de las Delicias*, the second mayor town square. Potable water was made available directly to the dwelling and commercial houses for those individuals and business willing to pay the annual fee for their private services. Modernity arrived in Ponce through three thousand meters of brick and stone canals and many thousands of meters of cast iron pipes that distributed clean water to the urban population.

The Alfonso XII Aqueduct[14]

Ponce's aqueduct was designed to bring the precious liquid from an outside source (Portugués River) into town to provide potable water to the urban dwellers. Showing remarkable foresight, Lubelza attempted to design and build a long lasting system that could accomplish its purpose for many years after completion. Among the things considered was to determine the volume of water needed for proper consumption; to verify the quality of the water; to determine the daily rate of water consumption; to choose the best location to extract the waters from the river and transport them to the city by pure means of gravity; the best location to build the water deposits and to organize the water distribution system within the city.

In his writings, Lubelza explained that in Europe and in the US, the standard amount of water estimated to sustain an urban population averaged twenty gallons (ninety litters) per person, per day. Showing that he was well informed, the engineer reported also that almost the very same amount of water was provided by the aqueduct systems in London, East London, Chelsen, Brussels, Segovia, Madrid and Havana.

Using the public census, Lubelza estimated that Ponce's urban population in 1876 (adding Ponce Playa) was around 11,722 inhabitants. Rounding it up to 12,000, and with a water right concession of twenty three litters per second from the Portugués, the engineer calculated that his

[14] Archivo Histórico Municipal de Ponce (AHMP). Fondo: Ayuntamiento. Sección: Secretaria. Subsección: Obras Públicas. Serie: Acueductos y Alcantarillados. Cajas S-369/ S-370. This archival reference contains the primary documents used for the Alfonso XII Aqueduct's narrative in the section that follows, including proposed plans, drawings, and some construction memorials.

aqueduct was to provide one hundred and sixty-six litters of water per day, per person, way above the averaged in other cities.

Even with a rate of population increase of three hundred and ten persons per year (Ponce's grow rate in the previous fifteen years), which would had placed Ponce's population around 21,300 people in a thirty years period, the aqueduct was to be able to provide ninety-three litters of water per dweller every day, taking the very same twenty three litters per second from the Portugués. Accordingly, the **Acueducto Alfonso XII** was to have a life expectancy of perfect functionality for thirty years without changes, additions or improvements.

As any other aqueduct of its time, the system had several main components: the river dam, the water intake, the water distribution channel or conduit, filtering stations, the deposits or reservoir and the water piping distribution system. It also had supporting structures like manholes and/or metal shafts used to oxygenate the water below.

The dam and the water intake was located one kilometer above the Río Portugués and Río Chiquito junction. The dam was one meter high, seventy centimeters wide at the top and one meter, seventy centimeters at the bottom. The water intake was placed on the right (western) riverbank, with its hydraulic concrete screed, eighty-five centimeters higher than the riverbed. The dam's layout was shaped in a circular arc inclined towards the river's flow (**Fig. 13**).

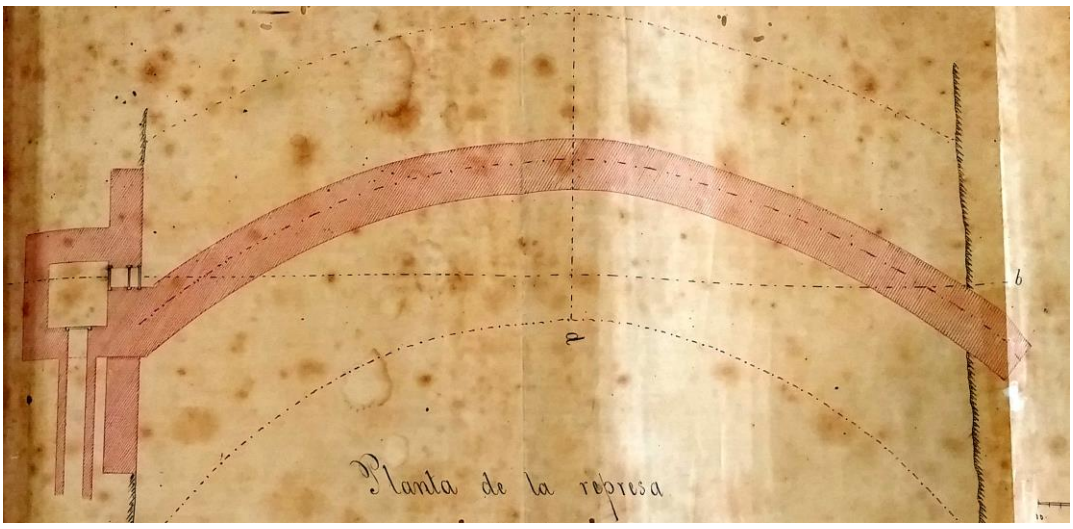


Figure 13. Drawing for the Acueducto Alfonso XII.

At the entrance of the conduit, an iron sluice stopped all debris from entering the channel. Not far from the intake, a vaulted canal transported the collected water into a filtering station. The filtering process consisted of running the water through three layers of rock materials: one of loose sand, then one layer of thin gravel and the last one made of grinded stones. The filter was a rectangular, enclosed pool-like masonry structure twenty-five (25) meters long, twenty-one (21) meters wide and three (3) meters high, with a galvanized metal roof. The filtering material occupied half of the height (1.5 meters). The rectangular pool was divided in two equal size sections divided by a masonry wall one and a half (1.5) meters wide (**Fig. 14**). Six lines of perforated clay tubes collected the filtered water and deposited it onto the conduit channel that end up at the deposits.

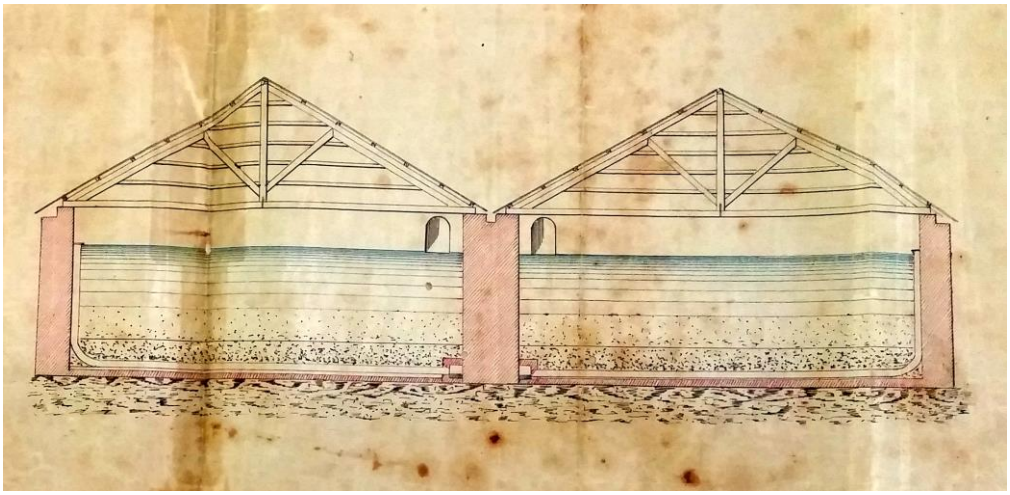


Figure 14. The filtering station chambers.

The conduit canal was completely vaulted, sometimes running through a wooded area at surface level sometimes, sometimes underground, for three thousand, seven hundred and thirty (3,730) meters from the water intake to the water deposit (**Fig. 15**). Its flooring was a ten (10) centimeters thick layer of hydraulic concrete, with bricks atop symmetrically distributed, bonded by a grout of Portland cement. The canal's interior wall and vault were made of bricks. In the exterior, the entire canal was to be covered by a plaster of mixed hydraulic concrete and brick dust. Every two hundred and fifty meters along the underground canal, a *registro* (manhole) was built to allow for its proper cleaning and monitoring.

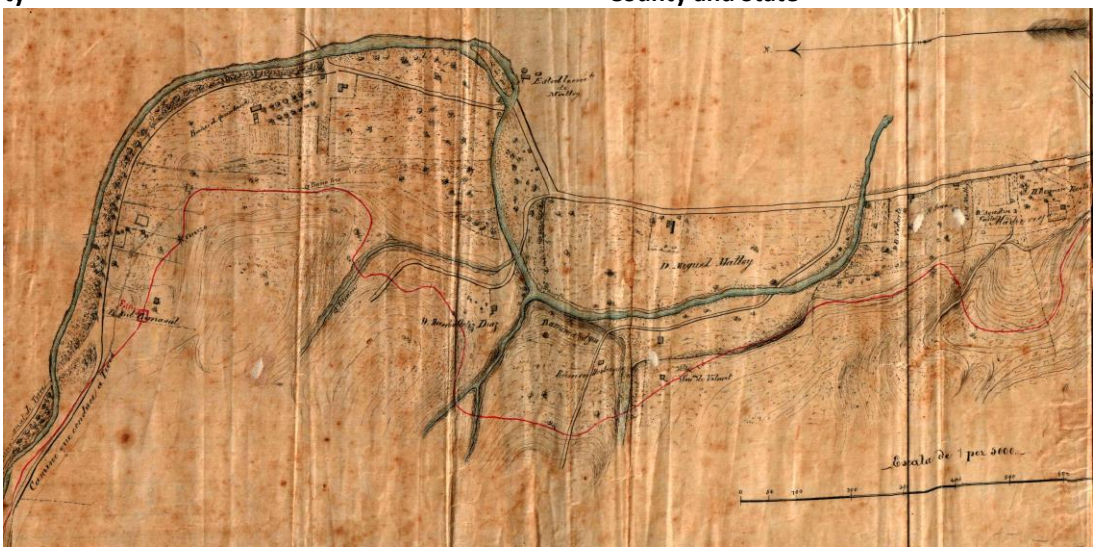


Figure 15. Lubelza's 1875 map, depicting in red the proposed route for the conduit canal.

Lubelza estimated that because of the canal's route, at some instances it would have to salvage drop-offs, ground depressions and other natural or man-made obstacles, becoming a visible bridge-like structure. This was particularly true in the section where the canal crossed "*la quebrada de la Cantera*". As planned by Lubelza, at these topographical obstacles, brick and masonry *murallones* were to be used to overpass them. All the proposed *murallones* would have two arcs, to allow for the proper flow of the downpour waters underneath the structure. However, as mentioned in Lubelza's plan, the *murallón* over "*la quebrada de la Cantera*", had to have three arcs to allow not only the rainwater flow, but also to avoid interrupting the neighbor's local road already in use at the location (**Fig. 16**).[15]

[15] By the time the Alfonso XII was completed, the local road that guided into the *Murallón de la Cantera* became known as *Calle del Acueducto*.

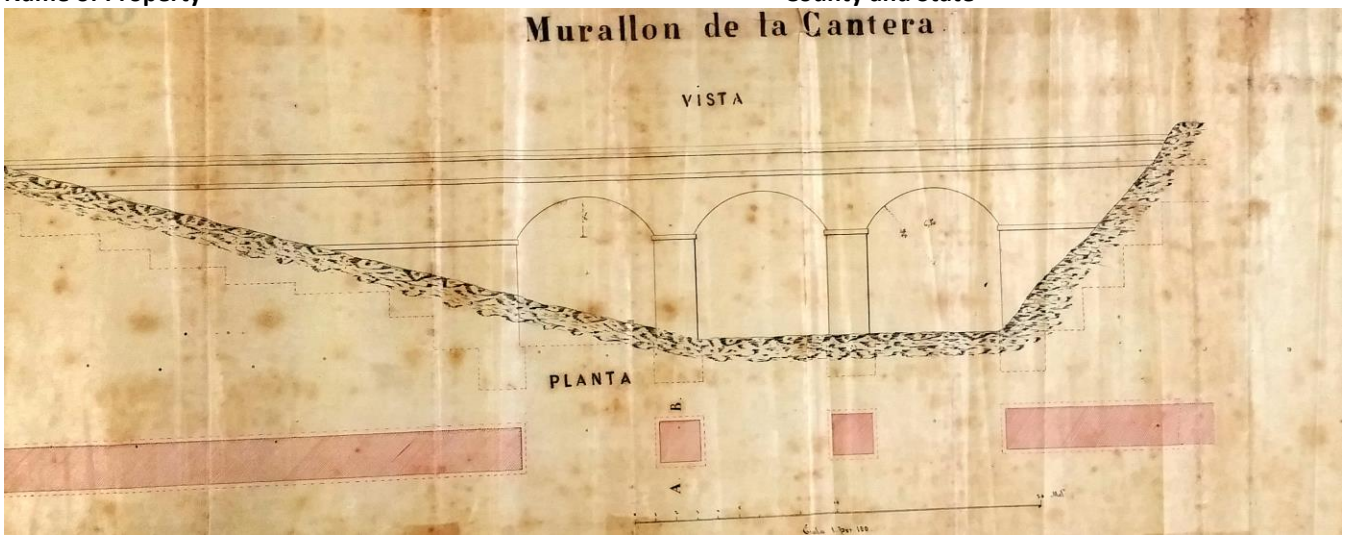
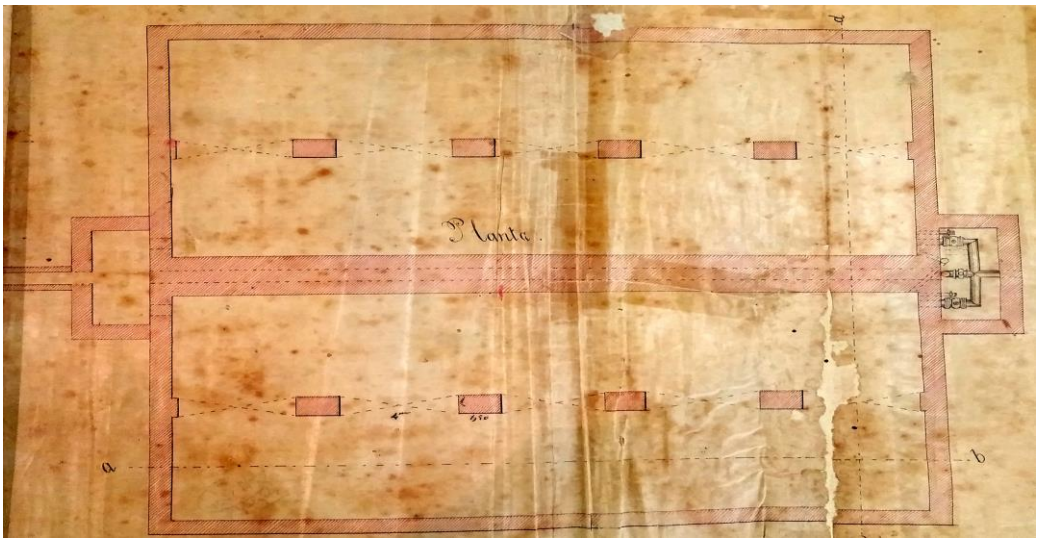


Figure 16. The 1875 plan for the *Murallón de la Cantera*.

With a 0.0005 meters-gradient, the water moved through the entire canal by simple gravity, finally reaching the water deposit located at the southeast slope of the *Cerro del Vigía*, north end of Calle Atocha, in the town outskirt. The deposits' bottom sat twenty-two meters above the town's main square. The deposit, built completely underground, was a brick and masonry, two thousand cubic meters capacity rectangle tank, twenty-five meters long and twenty-four meters wide, divided by a two meters wide brick and masonry wall in two equal chambers. Each chamber had a barrel vault ceiling, supported by a central arcade. The vaulted ceiling was four meters above the ground-bottom, being four meters precisely the height of the water level at both chambers in the deposit (**Fig. 17**).



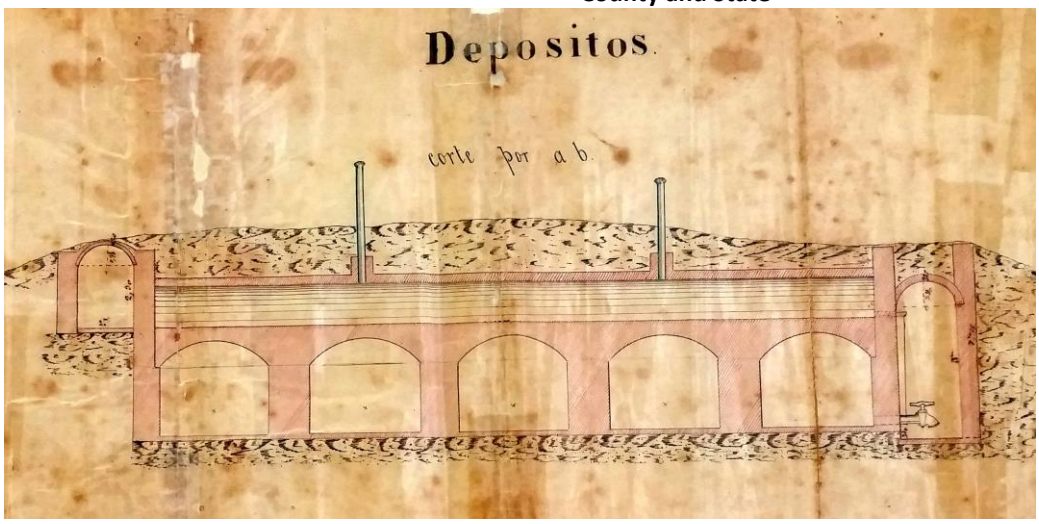


Figure 17. Lubelzas' 1875 plan for the deposits.

From the deposit, the water was distributed throughout the city by a network of cast iron pipes. The main pipe, 0.35 meters in diameter, ran from the deposit straight down (South) Calle Atocha, the town main artery, towards Calle Cristina, at the southern end of the city. From the main pipe, transversal pipes ranging from 0.15 to 0.25 meters in diameter, distributed the water along the urban center (**Fig. 18**).

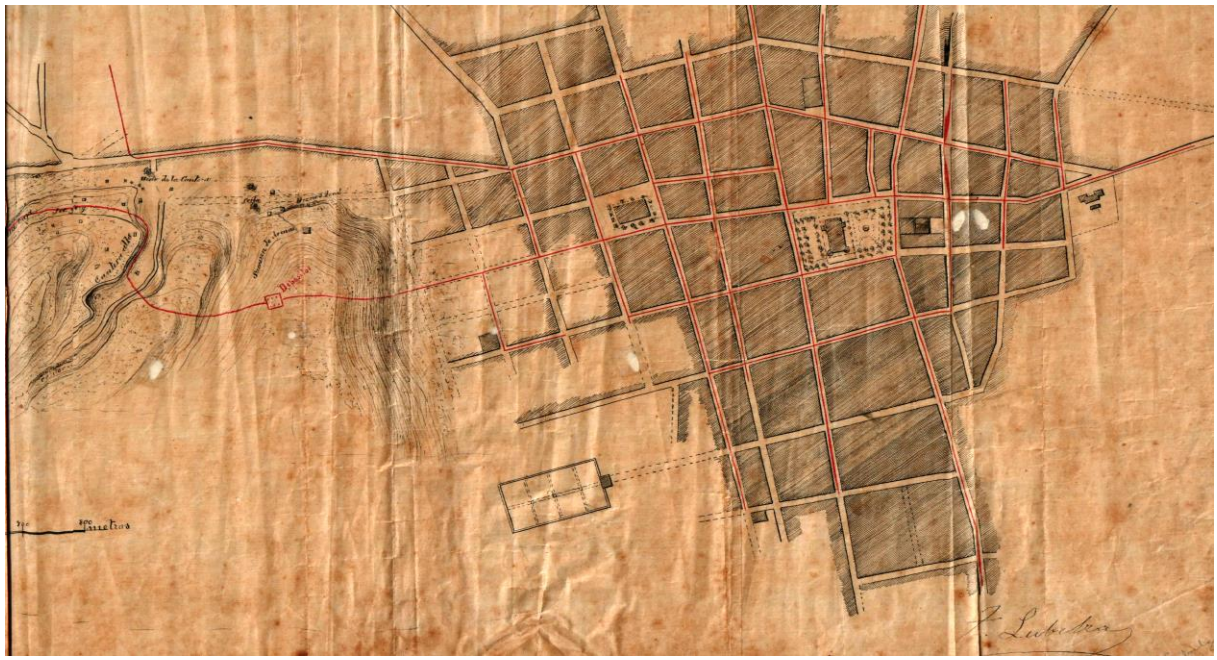


Figure 18. The image above depicts in red the aqueduct's cast iron pipe network from the deposit throughout the city.

In 1875, Timoteo Lubelza estimated that the **Acueducto Alfonso XII**, if built as planned, could properly operate without changes or improvements for at least thirty years. His numbers were very accurate. In 1915, thirty-seven years afetr the aqueduct's construction, it was reported that the increase in Ponce's population, 38,200 at the time, and the settlement of many urban dwellers in the high-grounds around the city's northern outskirt, had placed new challenges upon the city's ability to provide potable water.[16] The report mentioned that since its construction, no alterations or improvements of importance had been made on the **Acueducto Alfonso XII**.

However, the report strongly indicated the need, not just to improve the existing waterworks, but to build a new system. Transporting the water by means of simple gravity was no longer useful. The aqueduct didn't provide enough pressure to supply water to those dwelling in high-grounds and more pressure was also needed for the fire hydrants. It was also mentioned, that although no major improvements had been done, many repairs had been necessary on the Alfonso XII, especially in the conduit channel. Made of masonry with a vault in a horseshoe shape, and extending for over 3,000 meters from the dam to the deposit, the conduit followed the surface of the ground, frequently damaged from washouts, landslides and roots from the surrounding trees and shrubs.

[16] Report of the Governor of Porto Rico to the Secretary of War, 1915. Washington Government Printing Office, 1915. 78-80.

In 1928, Ponce built a new aqueduct system, replacing the old **Acueducto Alfonso XII**. Two of the aqueduct's most visible components, the deposit and the *Murallón de la Cantera*, were photographed at the time, as part of the government's campaign promoting the new system (**Fig. 19 and Fig. 20**).

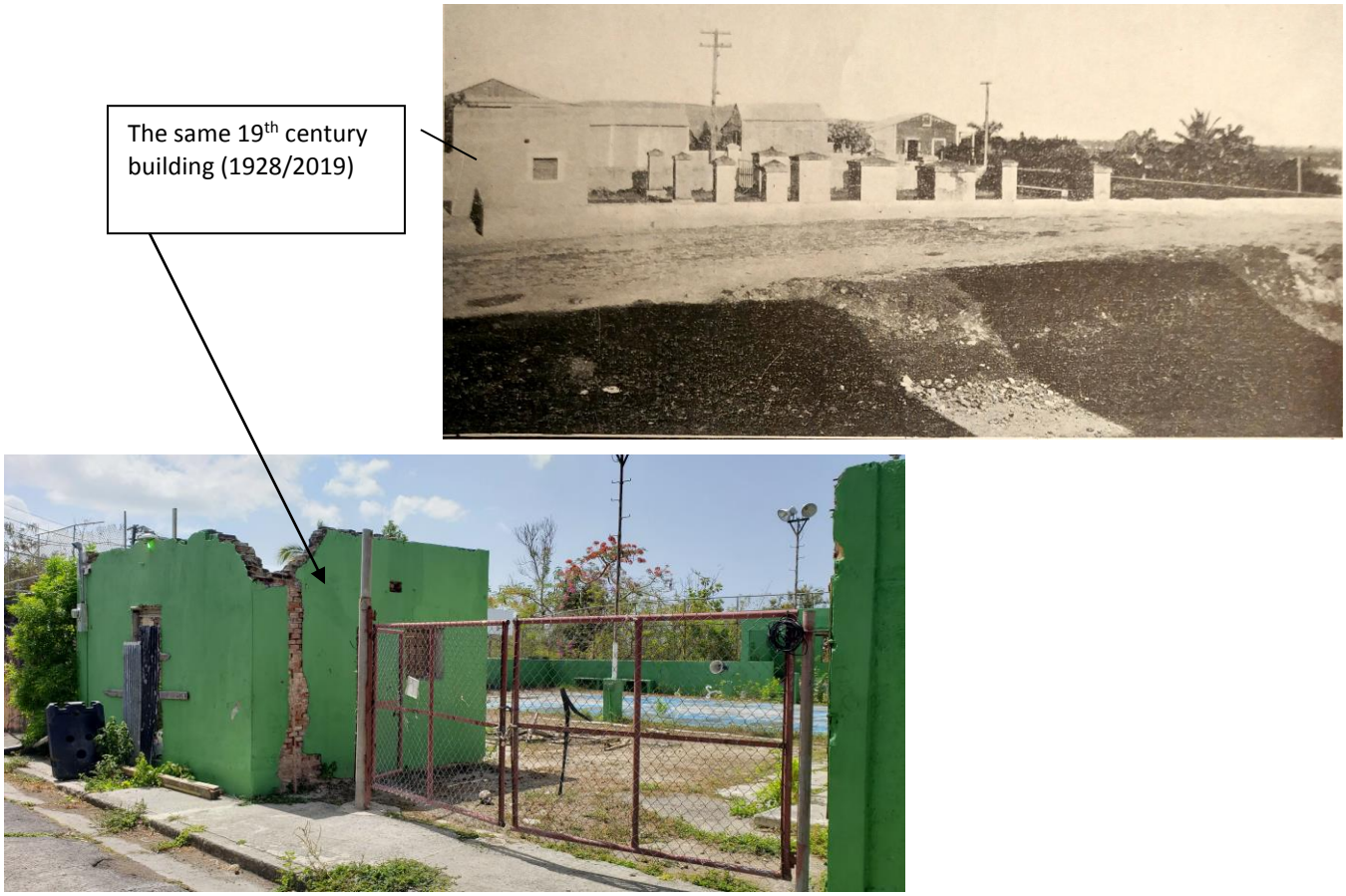


Figure 19. Above, the deposit site in the 1928 photo. Below, a 2019 partial view of the same site. Marked building housed the manhole to access the deposit's chamber.

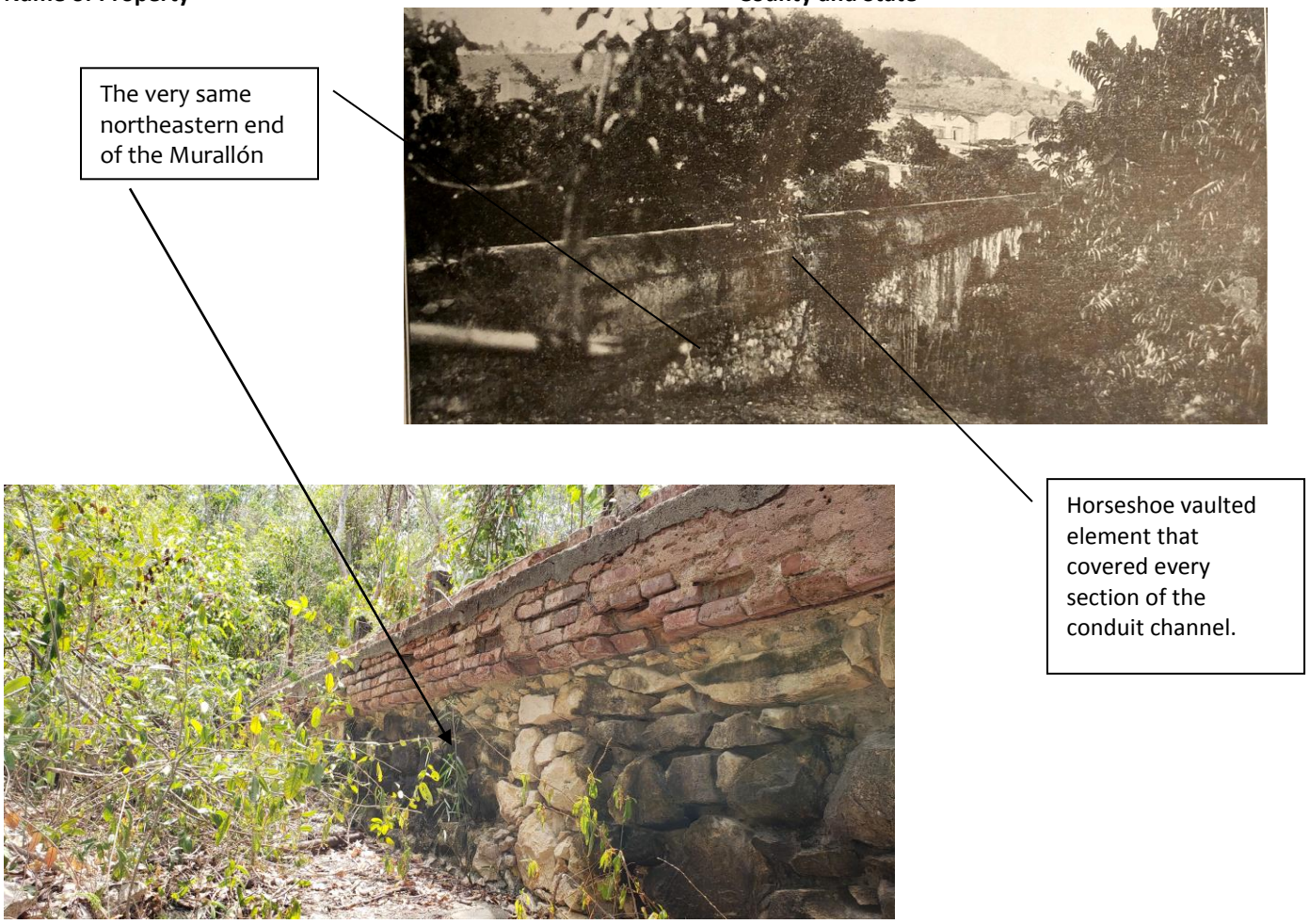


Figure 20. Above, the 1928 photo of the *Murallón de la Cantera*, when it still had the horseshoe vaulted component. Below, a 2019 partial view of the *Murallón* upper part, lacking the vaulted component. (Source of the 1928's photos: *Puerto Rico Department of the Interior. Álbum de Obras Municipales. Puerto Rico, 1919 – 1928*, 177-178.)

After fifty years of operation (1878 – 1928), surpassing Lubelza's productive life estimate, the **Acueducto Alfonso XII** became a thing of the past. During the 1920s and 1930s, the surrounding terrain around the deposit, the Murallón, and the conduit channel were occupied by hundreds of dispossessed families looking for a place to call their own. The new residents built their shanty dwellings in very close proximity to the resources, definitely having an effect upon the property's integrity (**Fig. 21**)

Figure 21. A 1936 aerial view shows the unplanned urban sprawl around some of the most visible components of the Acueducto Alfonso XII.

The unrestricted and unorganized occupation of the area, especially of the hilly sector around the *Cerro Vigía*, came to a halt after the terrible tragedy of Mameyes in 1985. As the settlers left, the undergrowth took over again, especially in the vicinity of the *Murallón de la Cantera*. The broken sections of the conduit channel shows also the effects of abandonment and mistreatment. The ground above the deposit became a basketball court during the 1970s. However, even in their current state of abandonment, the components identified as part of this nomination effort retain their ability to transmit their historic significance.

In terms of extension and number of components, the nominated resource is a small part of the entire **Acueducto Alfonso XII.** As previously stated, the aqueduct had a river dam, a water intake, a filtering station, a water conduit channel over three thousand meters in length, the *Murallón de la Cantera* and the deposit or reservoir. Additionally, it had supporting structures like manholes that allowed to clean the canal and metal shafts placed above the conduit channel to oxygenate the water. From the dam to the deposit, the system was almost four thousand meters in length.

Considered linearly, the nominated resource extends for four hundred and one (401.4) meters, from *Registro* #5 to the deposit, representing about twelve percent of the entire system. The deposit's rectangular area adds an additional eight hundred and two (802.8) square meters to the linear boundary (**Fig. 22**).

Figure 22. The **Acueducto Alfonso XII**'s Historic District.

However, all the components identified as part of this nomination effort are character defining features extremely significant to understand the complexity of the system. Each one of them represents a singular important resource within the system: the conduit channel, the five manholes, the *Murallón de la Cantera* and the deposit's site with its extant elements above and underground. The components still properly aligned and physically connected, conforming an identifiable structure, in which each component serves to convey the property's period of construction, its construction materials and techniques, and most definitely, its historic significance.

As stated in the thematic *Going with the Flow, Water Works in Puerto Rico, 1840 – 1898,* due to the urban development, mistreatment and abandonment, the finding of a 19th century water work (irrigation, water power or potable water system) is highly unlikely.[17] As such, individual components could and should be evaluated for inclusion in the National Register of Historic Places as long as they retain enough integrity in location, design, materials and setting. They should also be considered for inclusion as long as their engineering design is prominent and discernible. These resources should also be able to convey their association to historic events as representations of efforts to promote the welfare of society and the lifeways of its social groups. The identified extant resources of the **Acueducto Alfonso XII** meet all these requirements.

[17] National Register of Historic Places Multiple Properties Cover Document. *Going with the Flow. Water Works in Puerto Rico, 1840 – 1898*. December, 2016.

9. Major Bibliographic References

Bibliography (Insert bibliography here – cite the books, articles and other sources used in preparing this form.)

Abbad y Lasierra, Iñigo, *Historia geográfica, civil y natural de la isla de San Juan Bautista de Puerto Rico*. Anotada en la parte histórica y continuada en la estadística y económica por Jose Julián Acosta y Calbo. Ediciones Doce Calles, 2002.

Archivo General de Puerto Rico (AGPR). Gobierno de Puerto Rico. Estadística general del comercio exterior y balances mercantiles. 1895.

Archivo Histórico Municipal de Ponce (AHMP). Fondo: Ayuntamiento. Sección: Secretaria. Subsección: Obras Públicas. Serie: Acueductos y Alcantarillados. Cajas S-369/ S-370.

Baralt, Guillermo A. *Buena Vista. Life and Work on a Puerto Rican Hacienda, 1833-1904*. The University of Carolina Press, 1999.

Cruz Monclova, Lidio. *Historia de Puerto Rico*, Tomo II. Segunda parte. (1875- 1885). Editorial Universitaria. 1957.

Marín, Ramón. *La Villa de Ponce considerada en tres distintas épocas. Estudio histórico, descriptivo y estadístico, hasta finales del año 1876*. Ponce, Puerto Rico, Establecimiento tipográfico "El Vapor", 1877, 346. Obras Completas.

Moya Pons, Frank. *Manual de historia dominicana*. Santiago, D.R.: Universidad Católica Madre y Maestra, 1984.

National Register of Historic Places Multiple Properties Cover Document. *Going with the Flow. Waterworks in Puerto Rico, 1840 – 1898*. December, 2016.

Puerto Rico Department of the Interior*. Álbum de Obras Municipales. Puerto Rico, 1919 – 1928*.

Quintero Rivera, Ángel G. *Patricios y plebeyos: burgueses, hacendados, artesanos y obreros. Las relaciones de clase en el Puerto Rico de cambio de siglo*. San Juan: Ediciones Huracán, 1988.

Report of the Governor of Porto Rico to the Secretary of War, 1915. Washington Government Printing Office, 1915.

Rigau, Jorge. *Puerto Rico, 1900. Turn-of-the-Century Architecture in the Hispanic Caribbean, 1890-1930*. New York: Rizzoli, 1992.

Tomas de Córdova, Pedro. *Memorias geográficas, económicas y estadísticas de la Isla de Puerto Rico*. Tomo III. Año de 1831. Instituto de Cultura Puertorriqueña. San Juan, Puerto Rico, 1968.

Acueducto Alfonso XII | Ponce, PR
Name of Property | **County and State**

Ubeda y Delgado, Manuel. *Isla de Puerto Rico. Estudio histórico, geográfico y estadístico de la misma*. Puerto Rico. Establecimiento tip. del Boletín, 1878.

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

Primary location of additional data:

___ State Historic Preservation Office
___ Other State agency
___ Federal agency
___ Local government
___ University
___ Other (Name of repository)
_____

Historic Resources Survey Number (if assigned): _____

10. Geographical Data

Acreage of property Less than an acre (0.49 acres) USGS Quadrangle _____

The nominated property has a linear component that extends for 401.4 meters, with a three meters wide right-of-way, and a rectangular section that is 802.8 square meters. The linear meters equal 1,204.2 square meters, for a total of 2,007 square meters for the entire property. This make the acreage of the property about 0.49 acres.

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

UTM References

Components:

1. Deposit 752555 E 1994031 N
2. Murallón de la Cantera 752581 E 1994180 N
3. Registro #1 752676 E 1994170 N
4. Registro #2 752694 E 1994168 N
5. Registro #3 752711 E 1994166 N
6. Registro #4 752727 E 1994218 N
7. Registro #5 752728 E 1994364 N

Datum (indicated on USGS map): _____

___ NAD 1927 or X NAD 1983

1.	Zone _____	Easting _____	Northing _____
2.	Zone _____	Easting _____	Northing _____
3.	Zone _____	Easting _____	Northing _____
4.	Zone _____	Easting _____	Northing _____

Acueducto Alfonso XII | Ponce, PR

Name of Property | **County and State**

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

Boundaries are indicated on the accompanying base map.

The nominated property has a linear component that extends for 401.4 meters, with a three meters wide right-of-way, and a rectangular section that is 802.8 square meters. The linear meters equal 1,204.2 square meters, for a total of 2,007 square meters for the entire property. This make the acreage of the property about 0.49 acres.

Boundary Justification (Explain why the boundaries were selected.)

The boundary includes the historically aligned extant resources including *Registro* #1,2,3 4and 5, the length of the conduit channel, and the *Murallón de la Cantera*. A three-meter right-of-way was given to the linear conduit canal (including the Murallón de la Cantera). The boundary also comprises the *Depósito*'s rectangular area.

Acueducto Alfonso XII | Ponce, PR
Name of Property | **County and State**

11. Form Prepared By

name/title Juan Llanes Santos, Historian
organization Puerto Rico State Historic Preservation date November 7, 2019
street & number PO Box 90223935 telephone 787-721-3737
city or town San Juan state PR zip code 009092-3935
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.)

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 **Acueducto Alfonso XII**

City or Vicinity Ponce County Ponce State PR

Photographer Juan Llanes Santos Date Photographed June-July 2019

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

1. Basketball court above deposit; looking west; 0001.
2. 19th Century roofless building at the basketball court entrance that provided access to deposit. Manhole is currently sealed with concrete and covered with an iron plank; looking northwest; 0002.
3. Partial view of the deposit' structural components under basketball court; looking north; 0003.
4. Partial view of broken section of conduit channel; looking south; 0004.
5. Partial view of exposed section of conduit channel; looking north; 0005.
6. Partial view of 19th century Registro; looking northwest; 0006.
7. Murallón de la Cantera; looking west; 0007.
8. Murallón de la Cantera; looking northeast; 0008.
9. Murallón de la Cantera with PRSHPO personnel for scale; looking northeast; 0009.

Acueducto Alfonso XII	Ponce, PR
Name of Property	**County and State**