1241

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. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

1. Name of Property

historic name Plaza Tower

other names/site number

2. Location

street & number 1001 Howard Avenue — NA not for publication

city or town New Orleans — NA vicinity

state Louisiana code LA county Orleans Parish code 071 zip code 70113

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 ___ statewide X local

Pam Breaux, State Historic Preservation Officer 12-11-2012
Signature of certifying official/Title Date

Louisiana Department of Culture, Recreation and Tourism
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 or Federal agency/bureau or Tribal Government

4. National Park Service Certification

I hereby certify that this property is:

✓ 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:)

1-30-2012
Signature of the Keeper Date of Action

Plaza Tower
Name of Property

Orleans Parish, LA
County and State

5. Classification

Ownership of Property
(Check as many boxes as apply.)

- [x] private
- [ ] public - Local
- [ ] public - State
- [ ] public - Federal

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

- [x] building(s)
- [ ] district
- [ ] site
- [ ] structure
- [ ] object

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

Contributing	Noncontributing	
1	1	buildings
		district
		site
		structure
		object
1	1	**Total**

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

N/A

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions
(Enter categories from instructions.)

COMMERCE/TRADE- business

Current Functions
(Enter categories from instructions.)

VACANT/NOT IN USE

7. Description

Architectural Classification
(Enter categories from instructions.)

Mixed

Materials
(Enter categories from instructions.)

foundation: Concrete

walls: Metal- aluminum, steel

Stone- marble, glass

roof: Concrete, Synthetics- elastomeric acrylic

other:

Narrative Description

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

Constructed between 1964 and 1969, the Plaza Tower is a 45 story skyscraper standing on an irregularly-shaped city block on the western edge of the New Orleans (Orleans Parish) Central Business District. The character of the surrounding area is largely commercial and the building is located near the Superdome and New Orleans Arena, city Government complexes, and has easy access to incoming and outgoing traffic arteries. The exterior is clad in white Cherokee marble and Duranodic aluminum with Solar Bronze windows set in aluminum frames also with a Duranodic finish. The style of the visually complex building is a mixture of elements from every significant architectural movement of the twentieth century, including elements of constructivism, futurism, expressionism, modernism and the work of Frank Lloyd Wright, according to Architectural Historian Karen Kingsley. Thus, the term mixed is being used as the style designation for the purposes of this nomination. Although the interior has been gutted, the building has undergone few exterior changes, and retains a high degree of exterior integrity. The building's exceptional significance under Criteria Consideration G is explained in the appropriate section of this document.

Narrative Description

General Background

Although the property is less than 50 years old, and is not located in a National Register District, the Louisiana National Register Coordinator has allowed the owner to seek an independent National Register listing, with exceptional significance, based on the property's design significance (Criterion C: in the area of Engineering and Criteria Consideration G: Exceptional Significance, see part 8). The National Register listing is being sought because the property owner seeks rehabilitation through the federal and state historic tax credit programs.

Based on the original plans (located in the Louisiana Collection of the New Orleans Public Library) from the office of Leonard R. Spangenberg and Associates, the Plaza Tower is an example of an early modern high-rise building. When built, it was intended to anchor the city's business district. However, later office towers located on Poydras Street instead, leaving the Plaza Tower set apart from the rest of the city's skyline. The building was designed by architects Gordon I. Kuhne and Raymond C. Bergeron of the New Orleans architectural firm, Leonard Reese Spangenberg & Associates Architects in 1964. Spangenberg was a student of Frank Lloyd Wright's and a member of the Taliesin Fellowship. An interesting insight into the early design appeared in the discussion thread of a skyscraper enthusiast site, the discussion thread having the title "Vintage New Orleans." Gordon Kuhne's daughter, Randi, in response to a post about Plaza Tower said,

> My dad, Gordon I. Kuhne, designed it, while working for Leonard Spangenberg. I have an early sketch of his original conception of it, a simple tower without the parking garage addition he was forced to include (which my parents derogatorily called the "watermelon slice.")

The building was constructed by George A. Fuller Co., of Dallas, TX, general contractor in a joint venture with H and H Construction of New Orleans, between 1964 and 1969. Stephen K. Whitty, Inc. of New Orleans was the pile subcontractor. New Orleans consulting engineer William J. Mouton designed the wall system of deep spandrel trusses as well as the foundation design. The foundation design incorporated the patented sectional piles invented by T.C. Bruns, a New Orleans bridge builder who held the patent on the splice detail that enabled the driving of pre-cast sectional concrete piles that supported the foundation. These pre-stressed concrete piles were designed to bear values of 180 tons, the greatest pile load ever approved in the city.

Description

The Plaza Tower is composed of three parts:

1. a 510 foot tall, forty-five story, rectangular tower surmounted by a three story "hat" with a flat top designed to accommodate a helicopter landing pad,
2. an eighteen story lower curved section that partially wraps around that tower and accommodates parking on 11 of its levels,
3. a five story Annex building that is roughly triangular in shape.

The entire resource occupies approximately one (1) acre of land in an irregularly-shaped city block bounded by Howard and Loyola avenues and Julia and South Rampart streets. With the exception of the Loyola Avenue façade, the outer façade elevations are nearly flush with the edges of the street. The Loyola Avenue façade features some green space as well as asphalt paved spaces creating more separation from the street. The complex relationship of these components and their relationship to the building's unusually shaped site are depicted on the attached sketch and boundary map. Photographs of the Julia Street façade also show the complex interaction of the tower, base and annex.

The foundation includes 315, 150 ton Design Load Heavy Duty piles. The two sizes of piles used are 12 ¾" and 14" in diameter and octagonal in shape. They are composed of pre-stressed concrete made of 6000 P.S.I. Hard Rock concrete and are driven 168 feet deep into the Pleistocene layer. A unique concrete grillage links each of the 315 pilings. The structure is steel-vertical latticed steel trusses coated with fireproof material consisting of asbestos that had to be removed in later remediation. William J. Mouton, consulting engineer, designed a wall system of deep spandrel trusses to resist wind pressure of 50 psf on the tower.

As mentioned above, the exterior is clad in white Cherokee marble set between vertical steel columns finished with bronze-colored Duranodic aluminum. The lower parking levels are wrapped in anodized aluminum screen. The windows are of Solar Bronze glass and are lock hinged and in-swinging. The frames are aluminum with a Duranodic finish. The alternating of the bronze-colored aluminum with the white marble creates contrast in color and material.

Due to the complexity of the resource as described above, the exteriors of its three components will be described separately.

The Tower

The Howard Avenue entrance closely abuts the street and meets the sidewalk. This is the only side of the tower that lines up with a bounding street, thereby making this the primary public face of the building. A large red metal cantilevered canopy covers the stairs leading to the double bronze entrance doors; one set of doors is currently boarded over. The original plans called for marble basin fountains on either side of the stairs atop the marble planters. The marble planters are still intact, but are not landscaped, and the basin fountains appear to have been removed.

An aluminum screen extends across the lower portion of the tower's façade. The screen's panels are interspersed with the structural columns. Five flat boxed columns alternate with four aluminum "fins" that return to flat columns at the top of the eighteenth story where the screen ends. The rhythm produced by this arrangement is as follows: fin column, screen panel, flat column, screen panel, fin column, etc. The remaining floors of the tower feature a "checkerboard effect" of pre-cast white marble panels alternating with rows of Solar Bronze and aluminum windows, broken vertically by aluminum-clad boxed columns. From the 36th to the 42nd stories, the four alternating "fins" commence until reaching the "hat" at the 42nd floor.

The "hat" at the top of the tower is comprised of floors 42-44 where the floor area is larger than the remainder of the tower floors below. Here the exterior walls are also clad with marble-faced pre-cast panels, although stucco spandrels were indicated on the original plans. Marble fascia was indicated on the original plans at the roof of the 44th floor, but now appears to be dark metal. Aluminum screen and fascia clad the 45th helistop level. At present the roof features many aerials and satellite dishes.

The tower's Loyola Avenue façade features a deeper setback from the street than the other facades. A sidewalk leads to a metal cantilevered canopy-covered entrance featuring marble fascia. Marble-clad planters adjoin the terrazzo tile-clad steps and porch. It is difficult to ascertain the current form of the entrance canopy, as it is obscured by scaffolding and black mesh fabric screening. Rusting structural members are visible. Two sets of outward-swinging brass doors lead into the lobby. To the left of the pedestrian entrance is a concrete driveway for cars, leading into a terrazzo tiled valet area. A canopy over the entrance also protrudes from the base of the tower and, at present, is devoid of any high-style decoration. To the right (Howard Avenue side) of the entrance, there are some large glass shop windows; some are boarded over.

On this elevation the tower features one course of marble panels, and then continues the pattern of anodized aluminum cladding to approximately eight stories above the entrance. Some aluminum cladding is missing in places. Above the solid aluminum cladding the walls commence with the alternating window/marble/column pattern through the rest of the floors of the tower until reaching the final three stories of the "hat." The arrangement of materials is the same as the Howard Avenue tower façade except that there are six boxed columns alternating with five "fins."

The Tower's Julia and South Rampart facades also match those found on Howard and Loyola avenues. It is interesting that, when viewing the Julia Street elevation, the tower appears askew on the site, with both the Loyola Avenue and Julia Street sides visible.

The Base

On the Howard Avenue elevation the base attaches to the tower's façade, making them appear as one component from this view. For the purposes of this description the base will be described solely as the lower-rise component extending out from the tower. The base is actually seventeen stories, but is listed as eighteen due to the omission of a thirteenth floor.

Two courses of precast marble panels, with an open space in between, clad the façade of the ground floor entrance level and second floor. There is an auto entrance from Howard Avenue. A canopy devoid of decoration and surrounded by scaffolding and black mesh material covers the opening into the ground floor parking area.

Duranodic aluminum panels cover the next seven floors and are installed consistently all the way across. These floors are primarily reserved for parking. Above the aluminum panels, through to the eighteenth floor (actual seventeenth) floor, the remaining uppermost eight floors of the base consist of alternating rows of Solar Bronze ribbon windows and pre-cast marble panels with no protruding columns, the surface is flat. From the edge of the windows on the South Rampart Street side there are solid panels of marble, four panels wide, terminating at the "corner" in a Solar Bronze glass and Duranodic aluminum triangular glass point enclosing a staircase. This triangular "corner" is taller on the very corner at the rooftop of the base.

There are three projecting soffits also clad in pre-cast marble panels. The first soffit is located at the first floor/mezzanine level. The second soffit creates a distinctive marker between the end of the Duranodic aluminum screening and the beginning of the floors of ribbon windows. The third soffit protrudes from the top floor of the base atop the final row of ribbon windows.

The base's Loyola Avenue façade attaches to the tower's façade at the latter's north (Julia Street) side, also making them appear as one component from this view. Above the aluminum screen, the treatment is five floors of the same smooth alternating horizontal rows of white marble and Solar Bronze glass as seen in the eight stories of the Howard Avenue façade. The next three stories have aluminum screen visibly covering the windows and then what appears to be a concrete wall with no openings and no marble. Two stories above that is an open space with two horizontal steel structural members attaching to a solid parapet-type wall on the Julia Street side that hides mechanical equipment.

The eighteen story base at the Julia Street elevation consists of a flat marble wall with a couple of precast panels missing. This wall culminates in the parapet mentioned in the previous paragraph.

On the final elevation, the base bows out along the curve of South Rampart Street. The sweeping convex curve of the base is fully visible from across South Rampart Street. Architectural Historian Karen Kingsley said that this curved wall was intended to echo the curve of the Mississippi River. The description is the same as mentioned on the Howard Avenue elevation: marble cladding on the first three floors, with openings for light and air; aluminum screening covering the parking floors, and marble panels alternating with rows of aluminum-framed Solar Bronze windows through the eighteenth floor. There are three projecting marble soffits, in the same locations as mentioned above in the Howard Avenue description. The windows stop four courses of marble short of the glass corner of the Howard Avenue elevation. Viewed from the corner of South Rampart and Howard Avenue, the corner of the base, with the aforementioned "prowlike" glass corner, according to Kingsley, "lends the feeling of a ship about to sail into the future."

The Annex

Although the five-story Annex is shaped much like a triangle, a small rectangle-shaped projection on the Julia Street side gives it four rather than three elevations. Some of its exterior walls parallel nearby streets, while others are set at distinct angles.

The Howard Avenue façade features a terrazzo tile porch with a marble fascia canopy covering one set of outward-swinging double doors. The second through fifth floors feature marble-clad balconies extending approximately halfway across the façade. Where the balconies end the façade is solidly clad with marble-faced pre-cast panels. Behind the balconies are windows of fixed Solar Bronze plate glass divided vertically at intervals by aluminum-covered columns complementing the columns on the tower. A marble-clad room containing elevator equipment sits atop the roof.

The Loyola Avenue façade of the Annex building is the most "public" face of the Annex. The ground floor features a double entrance door with terrazzo tile steps. The second through fifth floors feature marble-clad balconies extending the length of the façade continued from the Howard Avenue façade and wrapping to the Julia Street façade. The openings behind the balconies are windows of fixed Solar Bronze plate glass divided vertically at intervals by aluminum-covered columns complementing the columns on the tower. A single pedestrian door provides egress at each end of this façade, at the Julia Street and Howard Avenue ends on each floor. Several of the doors are boarded over, as well as a few windows.

Near the adjacent intersection of Loyola Avenue and Julia Street, the balconies of the Loyola Street façade wrap around the Julia Street corner of the Annex, giving each floor's corner balcony the appearance of a ship's prow. However the balconies do not cross the entire Julia Street façade. Instead, eleven courses of marble panels rise in this façade's mid-section to form a solid wall. To the left of this wall is another set of four balconies, one atop the other.

The rear elevation of the Annex (facing South Rampart Street) is virtually solid. It consists of a smooth wall of marble panels at a flat angle following the line of South Rampart Street. However, it is broken in one area by a large vertical black vent. More prow-like corner balconies, one above the other, are located at its left corner, where the Annex joins the eighteen story base.

The Interior

Prior to the demolition necessary for asbestos and mold remediation, the interior consisted of 1) plastered gypsum walls with sand finish, 2) partition walls of drywall over aluminum studs, 3) drop-type acoustic tile ceilings, and 4) fire-rated marble window-sills. Still extant are the lobby floor of Roman Travertine marble and the walls and security desk, both made of Colorado Travertine marble. The lobby area is 6000 square feet. Finishes are of brass and bronze and are visible in the elevators, door handles and frames, and mailboxes.

The office building has approximately 485,000 square feet of rentable space. Floors 2-8 contain a 120,000 square foot valet parking garage with space for approximately 330 cars. The adjoining five-story Annex is 30,000 square feet and was originally designed with outside gardens and a restaurant. Floors 9-18 have 140,000 square feet (17,000 square feet per floor) of office space. Floors 19-35 have approximately 120,000 square feet of office space or 7000 square feet per floor. Floors 36-41 have 37,000 square feet of office suites, also 7000 square feet per floor, and floors 42-44 have a total of 30,000 square feet of office space, or 10,000 square feet per floor. This increase in per floor square footage from floors 19-41 to 42-44 accounts for the signature "hat" that sits atop the tower.

All floors contain washroom facilities. The building has thirteen "silent" high-speed elevators that service the high and low-rise portions of the building. At one time the interior lobby and exterior plazas were attractively landscaped to create a park-like setting at the ground level. As the building has been vacant since 2002, this is no longer the case. The building also had a branch post office and a sundry shop. Floors 36-41 were originally designed as apartments, although the residential intentions for the building never materialized. A swimming pool and sun deck are still extant on the fifth floor of the Annex building as an attractive feature for the intended residential tenants.

Although Plaza Tower has experienced regrettable but needed gutting of its interior, as well as ten years of neglect since it was last occupied, it clearly retains integrity of location, association, feeling, setting, materials, workmanship, exterior design, and engineering design. Almost all of the original early modern eclectic features, primarily on the exterior, are intact as designed in 1964 by the architects from Leonard Spangenberg and Associates. The building would be instantly recognizable by any former tenant of the building or resident of New Orleans in 1969. However, what makes the building historic and significant is not visible above ground. The Brunspile sectional piles and connectors have supported the forty-five story Plaza Tower for forty-three years. One need only look to the Poydras Street skyline to see further skyscrapers built after Plaza Tower, using the same technology in their foundations.

Non-Contributing Element

On the Loyola Avenue side of the Annex building there is a non-contributing mobile office building (visible in photo 4). It was placed on the site for a past proposed development, and was never removed. It will not be a permanent part of the site, and will be removed when the Plaza Tower is again placed in service.

Figure 1

May 9, 1961 **T. C. BRUNS** **2,983,104**

SECTIONAL PILES

Filed Oct. 14, 1958 **2 Sheets-Sheet 1**

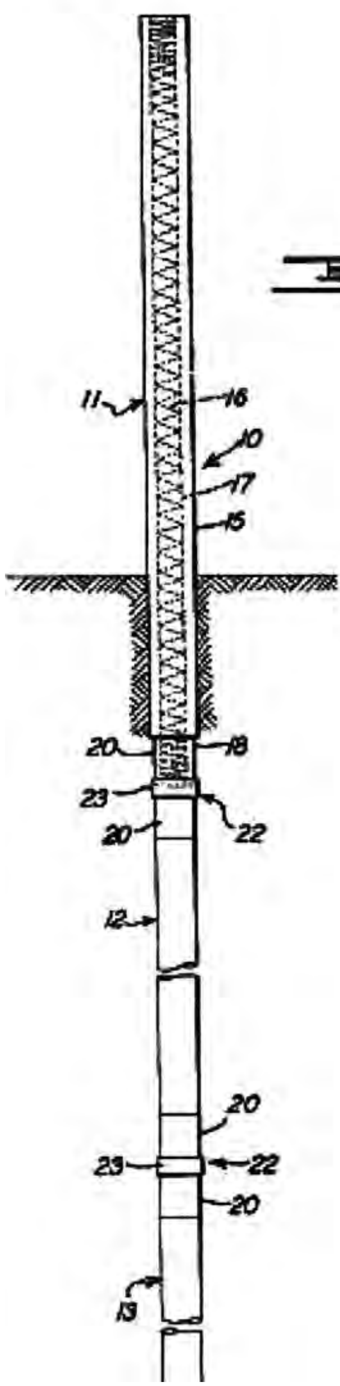


FIG. 1

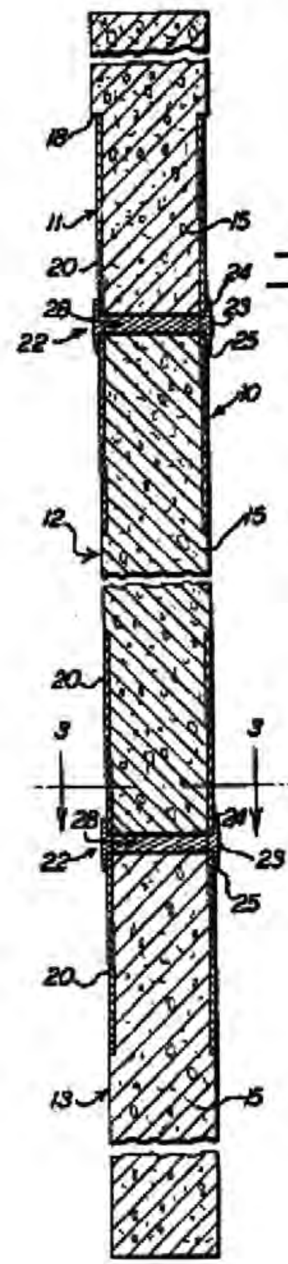


FIG. 2.

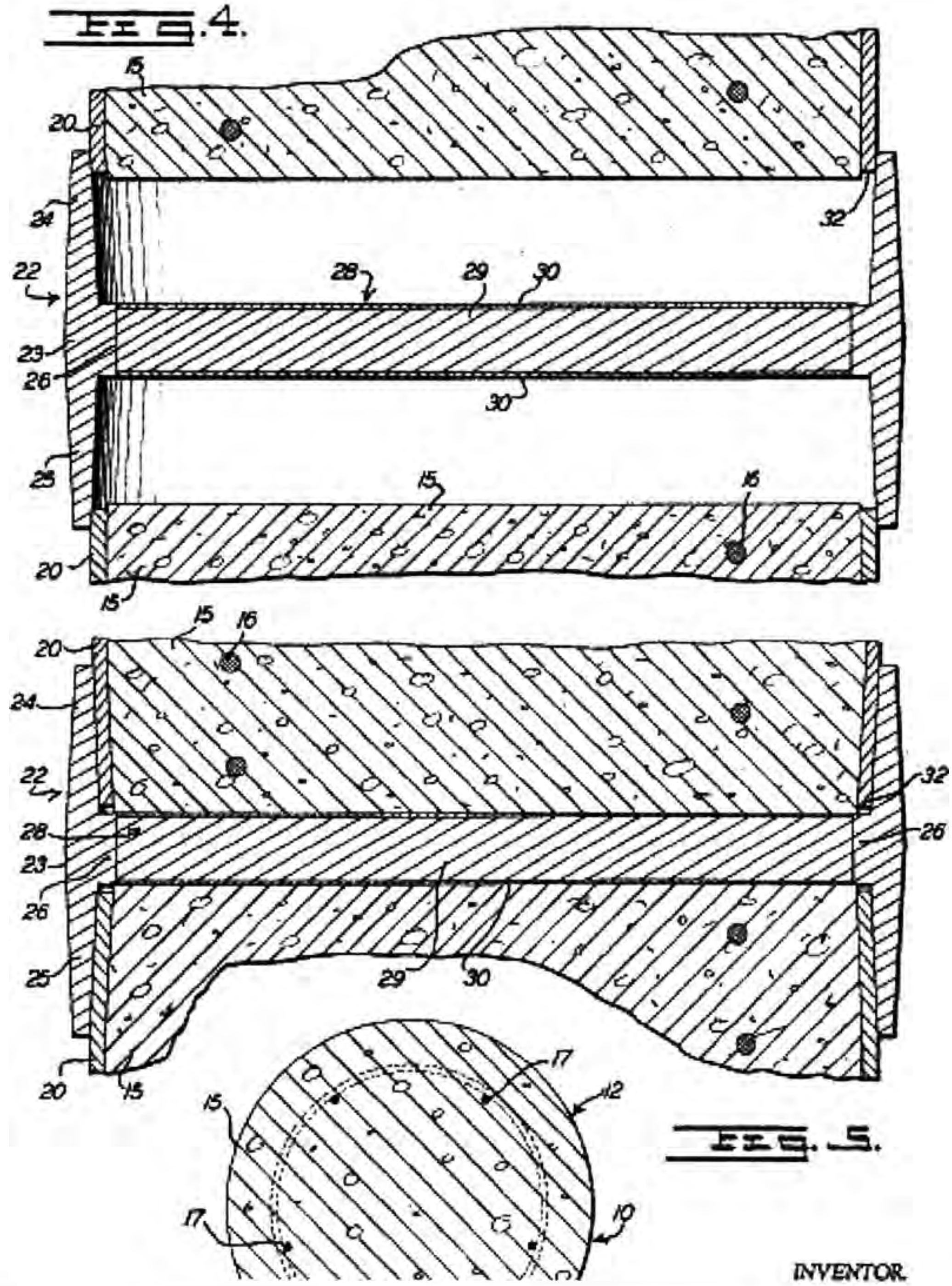
INVENTOR

Figure 2

May 9, 1961 **T. C. BRUNS** **2,983,104**

SECTIONAL PILES

Filed Oct. 14, 1958 **2 Sheets-Sheet 2**



INVENTOR

Brunspile Patent Labels

Figure 1 includes drawings labeled as Figure 1 and Figure 2
Figure 1 is a side elevation of a complete pile unit of the preferred type, shown partially driven into the ground
Figure 2 an enlarged fragmentary axial sectional view through three of the pile sections, parts being broken away
Figure 2 includes drawings labeled as Figures 3, 4, and 5
Figure 3 (bottom drawing) is an enlarged transverse section on line 3_3 of figure 2
Figure 4 (top drawing on page) is a substantially enlarged fragmentary axial sectional view showing the relation of two adjacent pile sections with the connecting means upon initial assembly
Figure 5 (middle drawing) is a similar view with the parts driven completely together in driving relationship and in the relationship which the parts will retain throughout the driving operation.

Numeral 10 refers to the pile unit as a whole
Numeral 11 refers to the upper pile section
Numeral 12 refers to the intermediate pile section
Numeral 13 refers to the lower pile section
*Note- the drawing shows an instance of the unit being comprised of three sections, however the invention is applicable for use with two sections, or more than three sections, as well.

Each pile section is composed of :
Numeral 15 a concrete body of the usual cement mixture which contains
Numeral 16 spiraled reinforcing the turns of which are fixed with respect to each other by
Numeral 17 longitudinally extending reinforcing rods
*Note- The reinforcing elements (16) are more closely spiraled towards the end of each pile section to increase the
ability of each section to absorb driving shocks, and are not part of the connector invention.

The upper portion of the upper body (15) may be of a greater diameter than the lower end of such section. At
Numeral 18 the lower end of the larger portion of the section is being shouldered.
Numeral 20 the adjacent ends of the pile sections are provided with steel jackets which are in position in the molds when the bodies (15) are cast
Numeral 22 refers to the patented connecting unit arranged between the adjacent ends of each adjacent pair of pile sections
Numeral 23 refers to the annular member/body/driving unit, having
Numeral 24 and Numeral 25 integral upwardly and downwardly extending annular flanges into which the adjacent ends of the pile sections are adapted to be initially inserted as shown in figure 4.
Numeral 26 refers to an internal annular flange, the diameter of which is approximately equal to the internal diameter of the adjacent sleeves (20)
Numeral 28 refers to an impact plate which may be integral and formed of
Numeral 29 an interior relatively thick body and which may be formed of steel plates
Numeral 30 a veneer layer which may be formed of sheet lead or felt
Numeral 32 the spa

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.)

[ ] 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.

[■] Not applicable

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 grave.

[ ] D a cemetery.

[ ] E a reconstructed building, object, or structure.

[ ] F a commemorative property.

[x] G less than 50 years old or achieving significance within the past 50 years.

[ ] Not applicable

Areas of Significance
(Enter categories from instructions.)

Engineering

Period of Significance

1964-1969

Significant Dates

1964 (foundation)

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

N/A

Cultural Affiliation

N/A

Architect/Builder

Leonard R. Spangenberg and Associates, Architects, George Fuller, contractor, William J. Mouton, structural engineer

Period of Significance (justification)
The period of significance begins in 1964 when the building was begun and ends in 1969 when the building was completed.

Criteria Considerations (explanation, if necessary)

When Plaza Tower was built, it was the tallest building in New Orleans. Due to New Orleans' soft soil substrate, it previously had not been possible to drive foundation piles deep enough to support a building taller than 33 stories. A new Civil engineering technology, the patented Brunspile sectional pile and wedge connector, allowed pre-cast concrete pilings to be cast in smaller sections and connected, thereby creating a longer pile. This engineering allowed the piles for Plaza Tower's foundation to be driven to further depths and bear heavier loads than previous buildings. Plaza Tower was the first time this technology was used for a high-rise building at this height in New Orleans. The building proved the new Brunspile connector worked in New Orleans' soils and thus, impacted the construction of future high-rise buildings in the city. Further high-rise buildings constructed in the 1970s and 1980s populate the skyline of New Orleans, and many of these buildings were made possible by the same foundation engineering proven successful by Plaza Tower. Therefore, Plaza Tower was a "first" that led to a pattern of high rise buildings taller than 33 stories. For this reason, the building is eligible for listing at the local level under Criteria Consideration G: exceptional significance.

Statement of Significance Summary Paragraph (Provide a summary paragraph that includes level of significance and applicable criteria.)

Although not yet fifty years of age, the Plaza Tower qualifies for the National Register under Criteria Consideration G, and is locally significant in the area of engineering under Criterion C: Design in the area of Engineering, because it was the first high rise building in New Orleans to utilize a new method of engineering relating to driven pile foundations that allowed a greater height and pile load than ever attempted before in the city. In its engineering, the Plaza Tower set the standard by which New Orleans' high-rise skyline would continue forward. Other notable skyscrapers, including the city and state's current tallest building, One Shell Square, were able to be built based upon precedents set in the design and completion of Plaza Tower. The period of significance for this eligibility argument, 1964-1969, is explained above.

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

Note: Technical terms are defined in a glossary at the end of the significance statement.

Plaza Tower is of local significance under Criterion C: Design, in the area of Engineering, as a significant building constructed using new engineering and construction methods. The successful execution of these methods led to future buildings enabled by the same technology.

<u>Development of New Orleans Skyline</u>

(The following history was drawn heavily from an article in *The Louisiana Civil Engineer*, titled, "History of driven piles in New Orleans," by Lloyd A. Held, Jr., PE)

The construction of skyscrapers in New Orleans was delayed for many years due to soil conditions that could not support heavy, tall buildings.

Because New Orleans is located adjacent to the Mississippi River, the river has had a major impact on the riverine soil deposits seen in the region. Soils near the surface in the New Orleans area are recent deposits generally characterized as weak, compressible material. This characterization is somewhat correct in that inland swamps generally exist throughout Kenner and New Orleans East. On the other hand, riverine soil deposits immediately adjacent to the river provided a natural levee of a much more competent, meaning stronger and less compressible, material.

Although not uniform, soil conditions in the New Orleans area can be described in a general manner. Near surface soils are typically characterized as recent geologic deposits consisting of weak, compressible material (inland swamp). Adjacent to the Mississippi River, riverine deposits have formed a natural levee formation of much more competent, stronger and less compressible, material. Other natural ridges have formed as near surface deposits consisting of point bar deposits, abandoned river and tributary courses, and beach ridge deposits which are stronger and less compressible as well. These deposits occur sporadically across the greater New Orleans area. The most competent and consistent geological formation encountered is the Pleistocene formation. This formation has been subdivided into at least three or four horizons in the greater New Orleans area. For the purposes of this nomination the first and second horizons are the only two of consequence. The first horizon was last mapped in 1958 and is generally encountered between el (elevation) -40 and -100, and typically consists of approximately five to ten feet of relatively thin layers of precompressed (over-consolidated) clays underlain by normally consolidated clays. The second horizon, last mapped in 1975, is generally encountered between el (elevation) -120 and el -160. It consists of approximately forty to fifty feet of over-consolidated clays near the top and generally slightly over-consolidated to normally consolidated clays near the bottom.

Geologically, the Pleistocene formation developed during the glacial age. These horizons represent portions of this formation that have experienced past loading during its formation from glacial migration, resulting in an over-consolidated, or precompressed, condition. Consolidation is a process of gradual reduction of volume of a soil mass resulting from the expulsion of water from the soil mass due to an increase in compressive stresses or natural drainage conditions. Drainage due to consolidation will progressively strengthen highly stressed soils. Cycles of loading have created "crusts" of stronger soils within the Pleistocene formation.

Before pile foundations, New Orleans' buildings were supported on shallow foundations such as the bearing wall foundation used in the Pontalba Building circa 1849. The first recorded pile foundation in the city was built in 1897 to support the Central Power Station. This foundation consisted of 1,900 untreated timber piles driven to a tip embedment 64-73 feet below the existing ground surface. In 1920 the massive Domino Building constructed for the American Sugar Refinery used more than 5500 untreated timber piles driven to 62 feet below the existing ground surface. The first recorded pile load test was performed for this foundation.

During this same time period the first settlement measurements were taken for the pile foundation of the 20-story Hibernia Bank building, constructed on untreated timber piles to 67 feet below the ground surface. A settlement of 2.5" occurred after construction was complete and there was no further settlement. The 1920s construction boom associated with the "roaring 20's" transformed the Central Business District with new large buildings such as the Cotton Exchange, the Pere Marquette building and the Whitney Bank Building Annex. All of these buildings were masterpieces in their time, but were limited by the wooden pilings supporting the foundations in the soft soil. The first treated timber piles were used in New Orleans in 1922 for the foundation of Dinwiddie Hall at Tulane University.

In 1937, the Louisiana WPA studied the experience gained from more than 80 driven pile foundations. It was learned that soil borings did not give satisfactory information and geological formations can change not only within city blocks, but also under a single building. The study concluded that if piles were spaced two to three feet on center and driven to a fairly firm resistance (this depth varied based on the composition of the geological strata at the site) and loaded to 12-15 tons per pile, there would not be any settlement of the superstructure. Charity Hospital in 1938 challenged that conclusion. The Charity foundation used more than 9,700 untreated timber piles driven to a tip embedment of 42 feet below the ground surface. By January of 1939 the settlement of the 21-story portion of the building was at 9", and 5" at the lower wings. It was determined that the actions of the structural engineer were sound, and the pile settlement was unexpected. Charity's settlement showed, and geotechnical engineers agreed, that heavily loaded foundations required special attention to minimize settlement. (Geotechnical engineering deals with earth materials, including soil, rock and groundwater. Among other things, geotechnical engineers design foundations for structures.) If the timber pile was going to continue as the mainstay of foundation support in the New Orleans area, the design load would have to be increased and the piles driven to deeper embedments.

The *New Orleans Building Code* increased the design load to 25 tons per pile for treated timber piles and 30 tons per pile for composite timber piles. The composite pile had a segment 20 to 23 feet long composed of a light gage corrugated cylindrical metal shell added to the top end of the driven pile that acted as a form to be filled with cast in place concrete. Composite piles extended pile embedment to 90 feet below the ground surface, thereby allowing piles to be seated in the very dense sand or the precompressed clay of the Pleistocene formation. By enabling the dead loads of the structure to be transferred into this deeper, less compressible material, the result was a marked improvement in the capability of timber pile foundations to support major foundation loads with acceptable limits on settlement.

Today all the buildings built during the 1920s in the Central Business District are dwarfed by the skyscrapers of the 1960's and 1970's, primarily along Poydras Street. Their sheer size changed the economic picture of Downtown New Orleans. Higher capacity piles with design load capacities of 50 to 100 tons were being used in a limited number of structures where normal timber pile foundations were expected to have more than an acceptable amount of settlement over time. These higher capacities were achieved in part by the use of precast, prestressed, concrete piles. Unfortunately, however, the precast, prestressed concrete pile was initially limited by its length.

Brunspile

(The following section relies heavily on the patent explanation for the Bruns Sectional Pile)

New Orleans structural engineer and bridge builder Thomas C. Bruns (1902-1966) invented the Brunspile, a pre-cast, pre-stressed concrete piling built in sections that could be attached end to end using the Bruns connector, patented in 1961. (Although composite timber pile foundations had been used to support structures as early as 1920, their use was more for the reduction in construction costs and project schedule than settlement.) When driven to depths of more than 160 feet, the Brunspile could support previously unheard-of loads of 460 tons per piling and greater. The connector allowed the joining of two or three pile sections during driving operations to extend embedment to more than 200 feet and well into the Pleistocene. Before the development of Brunspile, New Orleans could only envy the skylines of other cities, but after the Brunspile, it could also expand skyward.

Bruns' invention more specifically relates to a novel type of sectional, preferably reinforced concrete piles, and the connector used to join them. As explained by the inventor, and as discussed above, in some parts of the country it is necessary to drive piles of a length of up to 100 feet, and the common practice at the time was to cast such piles in single units. This practice created several disadvantages: the length of such piles was so great that it was very impractical to cast the piles at the site; on the other hand, transporting the piles, if made away from the site, was extremely difficult and expensive. Even more difficult, driving piles of this length required a special and very expensive pile driving apparatus.

The invention had several objectives: 1) such a novel sectional pile could be cast at the site with a higher degree of practicality than possible for single long piles; 2) the piles' shorter lengths would facilitate loading them on trucks when the sections were made at a casting yard away from the building site; 3) these piles would be hauled on conventional-type trucks, eliminating the need for special and expensive trucks required for transporting longer piles; and finally,4) to eliminate the very heavy and expensive reinforcing rods required for piles of intermediate lengths such as 50 feet. Such reinforcing rods had to be very large and numerous to prevent the pile from breaking when being handled in a horizontal position before being up-ended into a vertical position for driving the piles.

Further objectives of this new sectional pile invention related to the connecting method of such sectional piles. For example, if a 100 foot pile were desired, it could be cast in two or three sections and connected end-to-end at the driving site by means of a novel connecting element between the pile sections. Additionally, the connecting member between the two pile sections would be relatively cheap to make by widely-used manufacturing practices. It would be made in such a way that the driving forces would be transmitted from the upper to the lower pile section via the connector. The connecting member would be formed entirely separate from the pile sections and would perform its function efficiently without being welded or otherwise connected via hardware, to the adjacent pile sections. The connecting member would also be associated with a novel impact plate between adjacent ends of the pile and through this most of the driving forces would be transmitted and the body of the connecting member would gain a tight fit with the adjacent pile sections. This tight fit would help transmit the driving forces throughout and relieve the impact plate from some of the forces to minimize the danger of cracking the concrete bodies of the piles.

The invention is applicable for use with two sections or more than three sections, if desired. If three sections were chosen, the pile unit as a whole is comprised of an upper, intermediate and lower pile section. Each pile section includes an octagonal concrete body made of the usual cement mixture, rounded at the ends to fit into the Bruns connector, in the same manner as a take-down fishing rod, allowing the piles to fit end to end. The piles can be manufactured in a number of lengths and in a variety of diameters.

Each pile contains on its interior, spiral reinforcing, held together at the edges of the curves or turns of the spiral by six or seven longitudinally extending reinforcing cables or rods. The steel spiral is similar to a heavy-gauge Slinky toy wrapped around and attached to the longitudinal reinforcing cables. The spirals are closer together, more tightly wound and bunched together, towards the ends of each pile section in order to increase the ability of each section to absorb driving shocks of the pile driver. The reinforcing cables are also pre-stressed, literally stretched lengthwise. This pre-tension feature helps negate the rebound effect which would separate the piles underground as they are being driven from above. Pre-stressing the longitudinal reinforcing cables keeps the piles connected end to end. Each adjacent end of the pile sections is also made with a steel jacket or sleeve that is in position in the mold when the body of the pile section is cast.

The connecting unit is comprised of a cast-steel, cylindrical wedge connector into which fits the ends of the pile unit. The pile units are separated via a steel impact plate within the connector. Engineer Donald Makofsky, PE, President of Morphy-Makofsky, Inc. in New Orleans explained that

> There is a piece of steel cast onto the ends of the piles during the precast process. These steel sleeves or jackets are the same diameter as the connector. The connector is round and has a flange and impact plate. The flange goes all the way around the circumference and the impact plate is in the middle.

To drive the pile, a standard pile-driving rig is used. For a long pile unit, the individual sections may be up to 33 feet long, the length which can be accommodated beneath the hammer of a standard driving rig. To begin, the lower section of the pile is placed in position. Then, the pile driver repeatedly hits the top of the section until it is driven directly into the ground. The process temporarily stops when the pile's upper end is only slightly above the surface. One of the connectors is then placed in position at the upper end of the lower pile section, making sure to engage the lower part of the flange of the connecting unit around the upper extremity of the sleeve of the lower pile section. At this point, the next pile section is hoisted into position above the previously placed connecting unit and lowered into position. The lower extremity of the sleeve of the upper pile section will enter slightly within the upper flange of the connecting unit.

The pile driving rig then drives the pile downward. The driving of the second pile section causes the lower end of that second pile section to be driven into the upper flange of the connecting unit of the lower (first) pile section, while the lower flange of the connecting unit will be driven downwardly over the sleeve of that lower pile section. According to Walter Zehner, PE (a practicing structural engineer in New Orleans who is qualified and accepted in state and federal court as an expert in structural engineering) it is simply friction that connects the piles together with the Bruns connector. The lower (first) and intermediate (second) pile sections then become a unit to be driven downwardly until the upper end of the second section projects only slightly above the surface of the ground. This process is continued until the pile is of the desired length. It should be noted that the connecting units are formed wholly separate from the pile sections and are never positively connected by welding or any other means, thus manufacturing tolerances are not important and this is beneficial to the economics of manufacturing.

Once the piles are driven together via the connector, the impact forces are delivered through the impact plate, located in the middle of the connecting unit, to the next lower pile sections. The deformability or malleability of the plates permits them to be deformed to accommodate irregularities in the ends of the pile sections and secure a uniform distribution of forces from each upper pile section through to the next lower pile section, minimizing the chances of cracking the concrete of the pile sections. Additionally, the driving together of the pile sections causes the sleeves of adjacent (end-to-end) pile sections to become tightly wedged in the flanges and thus very effectively confining the adjacent ends of the pile sections to further minimize cracking. Most of the forces will be directly transmitted through the impact plates.

The end result is a pile unit just as effective as a single unit and the cost of making and driving the pile sections and associated parts is very much reduced from what is involved in the making and driving of single long pile units. Bruns' invention, called the Brunspile, solved all the problems of driving connected piles end to end, deep into the ground. The pilings created a platform that could support the weight of high-rise buildings.

Plaza Tower

Again referring to the aforementioned article by Lloyd Held, PE, the skyline of New Orleans underwent significant changes in the 1960's. The first high-rise structure to be constructed was Plaza Tower beginning in 1964. According to an article in the *Times Picayune*, April 21, 1964, Plaza Tower was developed by Sam Recile, President of Plaza Towers, Inc., the ownership corporation for the building. Recile created a stir on April 20, 1964 when he announced the construction of a $10 million office-apartment tower that was to herald a new wave of "high-rise thinking" in New Orleans. The planned 40-story (later expanded to 45) Plaza Tower was to be the tallest building in the state, surpassing the state capital in Baton

Rouge. The group was making arrangements to permit construction on a three-shift 24-hour a day basis in order to meet the first occupancy deadline by early 1965.

The new, state-of-the-art construction methods that would be part of the project were a focus of publicity for Plaza Tower from the beginning. For example, under the heading "Construction Methods," the above-mentioned article went on to say,

> "Many of the newest developments in construction will be used to erect the Plaza Tower, a slender building of great height, according to William J. Mouton, structural engineer. "A new foundation pile, designed and manufactured locally, permits a design load of 150 tons per piling compared with 50 tons which was formerly considered maximum." Mouton said.

However, before such a tall tower could rise, a zoning variance had to be approved. Plaza Tower was to be located in a J-light industrial zone with a 175 foot height limit. In presenting their case to the Board of Zoning Adjustments (BZA), principal architect Leonard Spangenberg asserted that the great height planned was made necessary due to the irregular shape of the land site and that it would be "difficult to get a building of uniform dimensions on the tower floor." Louis C. Bisso, planning consultant, echoed the sentiments of Spangenberg, when he justified the zoning variation due to the city's development of the "new" South Rampart Street right-of-way that had cut through the square city block (chosen for Plaza Tower's location) in such a way as to leave, "a trapezoidal shape of ground." Structural engineer Mouton asserted to the BZA that, "New methods of construction made possible by the development of precast concrete pile and the use of lightweight structural steel will make possible the construction of 'tall slender buildings' in New Orleans in the future."

Upon the Board's approval of the application, Mayor Victor H. Schiro hailed the announcement of the 40-story tower as "a giant stride" towards revitalization of the central business district. He said,

> "This project will be a great asset to our community as a new landmark on our skyline, and as a symbol of our confidence and unbounded enthusiasm for the future of New Orleans. I need hardly mention the fact of its being conceived, financed, and built by New Orleans people adds immeasurably to our pride in it. This is a shining example of what can be done when people quit talking about our future growth and get into action."

An advertisement in the *Times-Picayune* on April 26, 1964 touted,

> To New Orleans, a city renowned for its unique and varied aspects, comes PLAZA TOWER, a totally new and unprecedented experience...rising upward 40 stories to a height never achieved in this City's two-and-a half centuries of vibrant history, PLAZA TOWER surmounts the skyline. In the realization of its bold, precedent-shattering concept, New Orleans, the Nation and the World perceive a portent of unbounded optimism for the future of this venerable and again, vigorous city. PLAZA TOWER serves as a beckoning beacon, attracting others to challenge if they will, to surpass if they can, its shining example.

By June of 1964 the $8.5 million contract for construction had been awarded to George A. Fuller, Co. in a co-venture with H and H Construction Co., of New Orleans. The contract called for construction to begin on or before July 5, 1964 and the foundation to be completed within four months. The building was to be topped out by February of 1965 and completed by December 31, 1965.

The Foundation Challenge

The building's designers recognized that, once construction began, the 45-story building would create considerable (heavy) loading conditions. For this reason, deeper pile embedment to the second Pleistocene horizon would be required and pile lengths exceeding 100 feet would be necessary to minimize settlement and develop the desired load capacity of perhaps as much as 200 tons per single pile. As mentioned above, the second Pleistocene horizon is encountered at a depth of 140 to 160 feet below the existing ground surface in most areas of downtown New Orleans.

The pile chosen for the project was a three-section, prestressed, concrete Brunspile manufactured by Belden Concrete Products, Inc. According to structural engineer William J. Mouton, this new foundation pile, "designed and manufactured locally, permits a design load of 150 tons per piling compared with 50 tons which was formerly considered maximum." The lower section of the pile consisted of a 12 ¾ inch octagonal cross-section and the two upper sections were 14 inch octagonal in cross section. It was not uncommon to have a smaller diameter pile on the bottom. Since the top (closest to the ground surface) piles carry more load, the lower pile can be smaller or less thick. Donald Makofsky, PE, explained that on a frictional pile the soil around the pile is like glue. The ability of the pile to adhere to the soil is increased the larger the diameter or circumference of the pile. During the driving operation, the sections were connected butt-to-tip using the Brunspile connector described above. The pile was driven to a tip embedment of 177 feet below the existing ground surface and was able to sustain a load of 450 tons under load tests although the project limited the load capacity to 200 tons per pile. The tower of the building is supported on 315 driven piles. According to Lloyd Held, Jr., a professional engineer and former chairman of the board of Eustis Engineering Company, "this was the first application of a major driven multi-section prestressed concrete pile in New Orleans."

Pile breakage was a concern during the initial driving of the permanent piles, and as a result, greater quality control measures were employed in the manufacturing phase of the piles. Additionally, modified pile driving techniques were developed to install the piles based on the soil conditions found at the site. The modifications in the manufacturing of piles and the modifications to pile driving techniques developed during the course of the project were successful and successfully used on future projects.

Publicity/Plaza Tower in the News

After announcement of the project, local as well as national periodicals followed its progress and the implementation of the new pile construction method. An article in the *Times-Picayune* dated May 16, 1964 titled, "Building Piling Tests Success," reported that a successful 400-ton load test piling for the new Plaza Tower office-apartment building was hailed as the start of a new era in New Orleans construction. The test load, according to structural engineer William J. Mouton, was about 25 percent greater than comparable pilings had been subjected to before. Sam J. Recile, president of the owner corporation, acknowledged that the favorable tests would result in the possible addition of five more stories to the proposed 40-story building, to be the tallest in the state, even at its originally-planned height. Mouton said the pilings tested were of a new design, developed and manufactured in New Orleans. The pilings, prestressed octagonal concrete, afford twice the circumference and three times the gripping surface of a poured-in-place piling.

In the *Times-Picayune* dated June 14, 1964 it was explained that,

> The building will be supported by 315 pre-cast, pre-stressed concrete pilings driven in three sections to a depth of 168 feet. At this depth they will rest in the Pleistocene strata of extremely hard clay. A test piling on the site withstood 400 tons of load for 48 hours without slippage, establishing a "design load" of 200 tons per piling- approximately 25 percent greater than originally required in the building's design.

As reported in the *Times-Picayune* July, 12, 1964, on the previous day, Saturday, July 11, a helicopter gave people at the dedication ceremony for Plaza Tower an idea of how high the building would soar, by hovering 510 feet, 45 stories in the air. At this height the completed building was to be the tallest in the state. U.S. Secretary of Commerce Luther H. Hodges spoke at the ceremony and praised the builders for their foresight and ability to do the job with local talent and capital, with no federal money. Hodges said, "more than just a record-sized building, the tower would be a symbol of the progressive spirit of New Orleans helping the nation to move ahead." After the helicopter hovered at the proposed height, the mayor, two members of the U.S. House of Representatives and developer Sam Recile threw the switch to set the pile driver in motion to begin the ceremonial pile.

On the same day in the *Times-Picayune* a full-page "Progress Report" was published, touting the beginning of construction on Plaza Tower, a "widely acclaimed project." A caption for a photograph showing the results of the Plaza Tower test pile said the results of the test were "marking the start of a new era of high rise construction for New Orleans."

It also mentioned the "record-breaking depth" to which the pile was driven, as well as the load tested being "greater than has ever been attempted." The most convincing statement was at the end of the caption: "For New Orleans the test proves conclusively that a solid footing can be achieved through this method and that buildings of even greater height than the 45 story Plaza Tower are both physically and economically possible here."

The Plaza Tower was gaining notoriety in publications beyond the *Times-Picayune*. In August of 1964, the *Engineering News-Record* featured an article about the building. The article said that the 45 story skyscraper under construction in downtown New Orleans would set "structural records" and be the "tallest building in the Old South." As an engineering journal, the article further detailed aspects of the piles and patented connector detail, mentioning Thomas Bruns as the Brunspile designer.

By September of 1964, the story of the Plaza Tower was being reported in the *New York Times*. Under the headline "Piles 168 Feet Deep to Support Tallest Building in Louisiana" with the subheading, "New Construction Methods Allow Tower to Rise on Sandy Subsoil," the article detailed the soil conditions in New Orleans that made high-rise construction impractical, the development of the "specially-designed piling developed for the job," and how the special connector and sectional technique permitted the use of conventional driving equipment. This article was the first to mention that the demand for office space was so great that it prompted the owners to add plans for the extra, ground-level, five-story annex facing Loyola Avenue, (not to be confused with the tower's additional floors), before the foundation work had even begun. The smaller annex building was designed to contain the service facilities originally planned for the tower, such as the cafeteria, rooftop pool and specialty shops, thereby freeing up office space in the tower.

A photo on the front page of the July 25, 1965 *Times-Picayune* showed the floors of the Plaza Tower numbered as it was built, for the convenience of sidewalk superintendents. The floors were numbered in five floor intervals. The article, continued on subsequent pages of the paper, bore the headline, "Plaza Tower Framework to Reach 34- Story Level This Week: Orleans Workmen Making History in Construction," and the sub-headline read "Record for Height Will be Set This Week." The opening paragraph stated,

> Wednesday workmen will make construction history for New Orleans when they inch the skeleton of the Plaza Tower farther skyward to make it the tallest structure in the city. New steel frames will carry the building upward to 371 feet at the 34th floor level to top the height record held briefly by the International Trade Mart Building.

The *New York Times* picked up the story a month later, In August of 1965, the article, "Skyscraper Rises in New Orleans" reported that, "the steel skeleton of a new skyscraper reached its 34th story recently and became the tallest structure in New Orleans."

By September of 1965 the top floor of the Plaza Tower structure was in place. The *Times-Picayune* on September 5th reported that,

> The building that popped the central core of the business lid off the construction ceiling in New Orleans is to be "topped out" on Friday at the 45th level, 510 feet high. Since last February when the first rods of prefabricated steel peeked from the ground, Plaza Tower has "zoomed skyward" on schedule...the slender mass has already made a distinctive mark on the city's landscape. Besides breaking construction records for height (officially the tallest structure in Louisiana), the building claims another first: it will be the tallest structure of marble in the world.

Despite such a promising and highly-publicized beginning, construction on the Plaza Tower faced multiple challenges. Hurricane Betsy in 1965 hit the city while the building was still only at the steel-frame stage. The next year (1966), construction stopped due to financial difficulties. By 1968 the building had to be sold at auction. As a result, the hoped-for revitalization of the Howard and Loyola avenues area was not realized, and development clustered around the Canal and Poydras Street corridors instead. This is the reason Plaza Tower stands apart from the main cluster of downtown buildings today. The tower was completed in 1969, almost four years after its projected completion date. Although some of the upper story apartments were never occupied, the building remained in use until 2002.

Criteria Consideration G

In trying to reach someone who could attest personally to the impact of the Plaza Tower on future construction in the City of New Orleans, the author of this nomination made numerous efforts to contact professional architects, engineers and other contractors who were in practice at the time Plaza Tower was built. Unfortunately, all of the original designers associated with the project are deceased. However, two structural engineers, Donald Makofsky and Lloyd Held, architect Stewart Farnet, and pile contractor Bill Fleming were available to be interviewed by phone or in person.

Lloyd Held, Jr., who wrote the article about the history of driven piles for *The Louisiana Civil Engineer* mentioned above, was contacted by phone. In the brief biography given as author of the article, Mr. Held's qualifications are shown to be many. In February 2004 at the time the article was written, Mr. Held was Chairman of the Board of Eustis Engineering Company, Inc., (a geotechnical engineering firm) and was with the firm 38 years. He was a registered professional engineer in Louisiana and Mississippi and his professional experience included all phases of geotechnical engineering practice including supervision of soil mechanics laboratory tests, engineering analyses, and engineering report preparation. He has served as either the staff engineer or principal for more than 75 percent of the high rise structures in the New Orleans area. Thus, for the purposes of this nomination, his commentary will be considered expert.

During the phone interview, Mr. Held confirmed that the usage of the sectional pre-stressed concrete piles and the Bruns patented connector were important in major high-rise buildings erected after the Plaza Tower in New Orleans. Mr. Held said that absolutely, without this connector, 100-120 feet was as far as piles could be driven, and that without this technology, the heights of buildings would have been limited. Importantly, it was the construction of the Plaza Tower that proved the Brunspiles and connectors worked in the New Orleans soil.

The only building mentioned specifically by Mr. Held that is also a skyscraper, is One Shell Square (a different building from the city's 1952 Shell Building, which was listed on the Register in 2002.). He said that One Shell Square, completed in 1972 and currently the tallest building in New Orleans definitely used all sectional pre-cast piles with the connector because the pile load had to be within the 150-230 ton range, which required deeper piles to support that load. Based on the results of the load test, the prestressed concrete pile was selected. The test pile sustained a load of 720 tons, indicating a design load capacity of 360 tons; however the structural limits of the pile limited the design load capacity to 280 tons per pile. One Shell Square is 51 stories tall at a height of 697 feet. The tower is supported on an 8-foot thick concrete mat over 500 octagonal 18 inch piles driven 210 feet into the ground.

In an attempt to ascertain the impact of the precast sectional piles using the Bruns connector in further skyscraper development in downtown New Orleans, the author of this nomination investigated the foundations of all skyscrapers taller than the World Trade Center, the tallest building before Plaza Tower, that were built after the Plaza Tower. There were found to be eight skyscrapers fitting the criteria. Of these eight buildings, five used the precast, sectional concrete piles with the Bruns connector. One building, the 53 story Place St. Charles, completed in 1984, used a combination of open-end steel pipe piles for the interior core foundation, as well as 14 inch square prestressed sectional concrete piles of Bruns' design driven to 170 feet below the existing ground surface piles for the columns on the outside of the tower section.

One Shell Square and Place St. Charles are the only two buildings taller than the Plaza Tower. These three buildings are both the tallest in New Orleans, as well as the tallest in the state of Louisiana. The other three buildings using the same foundation piles are the Energy Center (1984), the Sheraton Hotel (1985) and the New Orleans Marriott Hotel (1972).

New Orleans native and architect Stewart Farnet designed the Sheraton Hotel, which utilized the same foundation piles as Plaza Tower. Farnet graduated with a degree in architecture from Tulane University in 1955 and began practicing in the city in 1957 and started his own practice in 1967. When asked via phone of his recollections of the Plaza Tower, Farnet citied knowing structural engineer Bill Mouton. Of the Plaza Tower, Farnet said that "Mouton certainly spread the "orthodoxy" of the Plaza Tower," that it was, "innovative and barrier-breaking with regards to new standards for deep foundations….Plaza Tower was revolutionary and ground-breaking in its theories, and was the first to have piles driven into the Pleistocene layer," echoing the statements of Lloyd Held.

Donald Makofsky, PE is the President of Morphy-Makofsky, Inc. in New Orleans, specializing in civil, structural and foundation engineering since 1975. His firm worked on three of the skyscrapers using the same foundation as the Plaza Tower. Mr. Makofsky agreed that the Plaza Tower was the first time the sectional piles with the Bruns connector were used. Makofsky directed the author to contact Bill Fleming for further insight.

Bill Fleming is a retired civil engineer who was working for S.K. Whitty, the pile contractor for Plaza Tower, at the time it was built. When interviewed by phone, and asked about the importance of Plaza Tower, Mr. Fleming's sentiments echoed closely those expressed by the other interviewed professionals in their field, mentioned above. Fleming said that

> It (Plaza Tower) was certainly important; it was the one that led to a lot of projects that followed behind that one. There's no question that all the high rises that followed used a sectional pile to go deep to (be able to) go up high. There's no question that Plaza Tower at that time was the tallest structure in New Orleans. It was certainly a great advancement in the use of the sectional pile which allowed other high rises to follow.

Conclusion

Based on the historic context of the invention of the sectional concrete pile and the connecting mechanism, and its impact on future high-rise building in New Orleans, it is clear that before the engineering methods developed that enabled taller, larger, heavier-load buildings to be built given the soft alluvial soil conditions in New Orleans, the city was one of lower-rise buildings. It is evident from the many news articles, as well as journal articles, and the first-hand expertise of a professional in the engineering field, that there was, and is, widespread recognition of the value and exceptional importance of the Brunspile and Brunspile connector in the initiation of New Orleans' high-rise skyline, beginning with the Plaza Tower and continuing on to the skyline of today. In conclusion, the candidate is eligible for National Register listing as the first high-rise building in New Orleans built utilizing the Brunspile and Brunspile connector, a then new engineering technology.

Historical Note

In 2002 the building's tenants, mainly state and New Orleans District Attorney Employees packed up and left the building in a mass exodus. The workers complained of exposure to mold and asbestos-related health complications. The vacated Plaza Tower was purchased by a Baltimore developer who planned on reinventing the building with a new skin as the Crescent City Residences. This name is seen on the Howard Avenue entrance today. The planned development fell through, however, and the building was sold again, this time to a Connecticut Firm, Plainfield Direct, who spent $10 million on a massive environmental cleanup to rid the building of the aforementioned mold and asbestos issues. When the building failed to sell this time, it was put up for auction. The building has been purchased and is now in a suddenly vibrant area of the Central Business District, where the streetcar is being extended along Loyola Avenue.

Glossary

Annular member- shaped like or forming a ring

Flange – a projecting collar, edge, rib, rim or ring on a pipe, shaft or the like

Geotechnical Engineering-The branch of Civil Engineering concerned with the behavior of earth materials

Horizon- (1) a surface separating two beds in sedimentary rock. (2) a layer within a soil showing unique pedogenic (soil forming) characteristics. Four major horizons are normally found in a soil profile; A, B, C and O. (3) a distinct layer of soil encountered in vertical section (4) a layer of soil, approximately horizontal, which differs in structure and composition from the adjacent layers.

Developmental history/additional historic context information (if appropriate)

See above

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The New York Times, "A New Face for 'Old' New Orleans." February 18, 1968.

The Times-Picayune, "40 Story Tower to Rise at Howard, S. Rampart." April 21, 1964.

The Times-Picayune, "Advertisement for Plaza Tower." April 26, 1964.

The Times-Picayune, "Building Piling Tests Success." May 16, 1964.

The Times-Picayune, "Fuller is Given Plaza Contract: $8.5 Million Building to Have 45 Stories." June 14, 1964.

The Times-Picayune, "Advertisement for Plaza Tower." July 12, 1964.

The Times-Picayune, "Plaza Tower Started Here" July 12, 1964.

The Times-Picayune, "Plaza Tower Framework to Reach 34- Story Level This Week: Orleans Workmen Making History in Construction." July 25, 1965.

The Times-Picayune, "Plaza Tower 'Tops Out'." September 5, 1965.

The Times-Picayune, "William J. Mouton, 70, architect and engineer." July, 2, 2001.

The Times-Picayune, "Developer Buys Plaza Tower to Build Condos." March 11, 2006.

The Times-Picayune, "Remediation Begins at Plaza Tower." January 28, 2009.

The Times-Picayune, "Investors to Rehab Plaza Tower." December 19, 2009.

The Times-Picayune, "Plaza Tower in New Orleans Sold for $650,000." December 2, 2011.

"Vintage New Orleans," accessed May-June 2012, http://forum.dallasmetropolis.com/showthread.php/7170-Vintage-New-Orleans

Previous documentation on file (NPS):

_x_ 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 #___xxx___
___ recorded by Historic American Engineering Record #___xxx___
___ recorded by Historic American Landscape Survey #___xxx___
___ Not Applicable

Primary location of additional data:

_x_ State Historic Preservation Office
___ Other State agency
___ Federal agency
___ Local government
___ University
___ Other
Name of repository: Louisiana State Archives

Historic Resources Survey Number (if assigned): NA

10. Geographical Data

Acreage of Property .97337 acres (less than an acre
(Do not include previously listed resource acreage.)

UTM References
(Place additional UTM references on a continuation sheet.)

	Zone	Easting	Northing
1	15	782200	3316220
2			
3			
4			

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

Boundary is shown on the attached sketch/photo/boundary map, which uses the property's plat map as its base.

Boundary Justification (Explain why the boundaries were selected.)
Boundaries follow historic property lines as set forth by the March 1, 2006 BFM Corporation, LLC survey used as the sketch map for this nomination.

11. Form Prepared By

name/title Mary Lane Carleton, consultant
organization Williams Architects date October 17, 2012
street & number 824 Baronne Street telephone 504-566-0888
city or town New Orleans state LA zip code 70113
e-mail mlcarleton@williamsarchitects.com

Additional Documentation

Submit the following items with the completed form:

- **Maps:** A **USGS map** (7.5 or 15 minute series) indicating the property's location.

  A **Sketch map** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

- **Continuation Sheets**

- **Additional items:** (Check with the SHPO or FPO for any additional items.)

Photographs:

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

Name of Property: Plaza Tower

City or Vicinity: New Orleans

County: Orleans Parish State: LA

Photographer: Mary Lane Carleton

Date Photographed: June 2012

Description of Photograph(s) and number: Total of 21 photographs

Photo 0001
Exterior- Annex and Lower Tower, Loyola Avenue Elevation- Camera Facing E

Photo 0002
Exterior- Loyola Avenue Elevation, "Hat" of Tower- Camera Facing E

Photo 0003
Exterior- Loyola Avenue Elevation, part of Annex and Tower- Camera Facing E

Photo 0004
Exterior- Annex, Loyola and Howard Avenue Elevations- Camera Facing E

Photo 0005
Exterior – Loyola Avenue Entrance Planter Detail – camera facing NE

Photo 0006
Exterior- Julia Street Elevation showing Base, Tower and Annex - Camera Facing S

Photo 0007
Exterior- Julia Street Elevation, Base and Annex, Camera Facing S

Photo 0008
Exterior- South Rampart Street Elevation, Tower and Base; Annex behind tree - Camera Facing NW

Plaza Tower
Name of Property

Orleans Parish, LA
County and State

Photo 0009
Exterior- South Rampart Street Elevation, Annex- Camera Facing W

Photo 0010
Exterior- Howard Avenue Elevation, Tower and Base- Camera facing NW

Photo 0011
Exterior- Howard Avenue and South Rampart Street Elevations, Base and Tower- Camera Facing SW

Photo 0012
Exterior- Howard Avenue Elevation, Entrance Detail- Camera Facing NE

Photo 0013
Exterior - Howard Avenue Elevation, lower portion Tower and Base - Camera Facing NE

Photo 0014
Exterior- Annex and lower Tower, Howard Avenue Elevation- Camera Facing NE

Photo 0015
Interior- Lobby, Phone Bank Detail- Camera Facing SW

Photo 0016
Interior- Lobby, Elevator Bank Detail- Camera Facing SW

Photo 0017
Interior- Lobby, Elevator Door Detail- Camera Facing SE

Photo 0018
Interior- Howard Avenue Entrance Detail- Camera Facing SW

Photo 0019
Interior- Gutted, Steel Structure Detail- Camera Facing NW

Photo 0020
Interior- Loyola Avenue Valet Entrance- Camera Facing SE

Photo 0021
Interior- Parking Ramp Detail- Camera Facing SW

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Plaza Tower

MULTIPLE NAME:

STATE & COUNTY: LOUISIANA, Orleans

DATE RECEIVED:	12/14/12	DATE OF PENDING LIST:	1/14/13
DATE OF 16TH DAY:	1/29/13	DATE OF 45TH DAY:	1/30/13
DATE OF WEEKLY LIST:			

REFERENCE NUMBER: 12001241

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	N	LESS THAN 50 YEARS:	Y
OTHER:	N	PDIL:	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	Y	SAMPLE:	N	SLR DRAFT:	N	NATIONAL:	N

COMMENT WAIVER: N

✓ ACCEPT ___RETURN ___REJECT 1-30-2013 DATE

ABSTRACT/SUMMARY COMMENTS:

Interesting nomination - The primary reason for the building's significance is hidden - it is the engineering aspect of the deep pile foundation. The construction of this building utilized new technologies that overcame the soil conditions that previously limited building size. The construction of this bldg proved the system's worth and spurred growth in tall bldg construction in New Orleans. Meets exceptional importance consideration at local level

RECOM./CRITERIA Accept C

REVIEWER J. Gabbert DISCIPLINE

TELEPHONE DATE

DOCUMENTATION see attached comments Y/N see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the NPS.

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 13, 2012

LA SHPO Digital Archives
Camera Facing E
Photo No.: 1

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 13, 2012

LA SHPO Digital Archives
Camera Facing E
Photo No.: 2

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 13, 2012

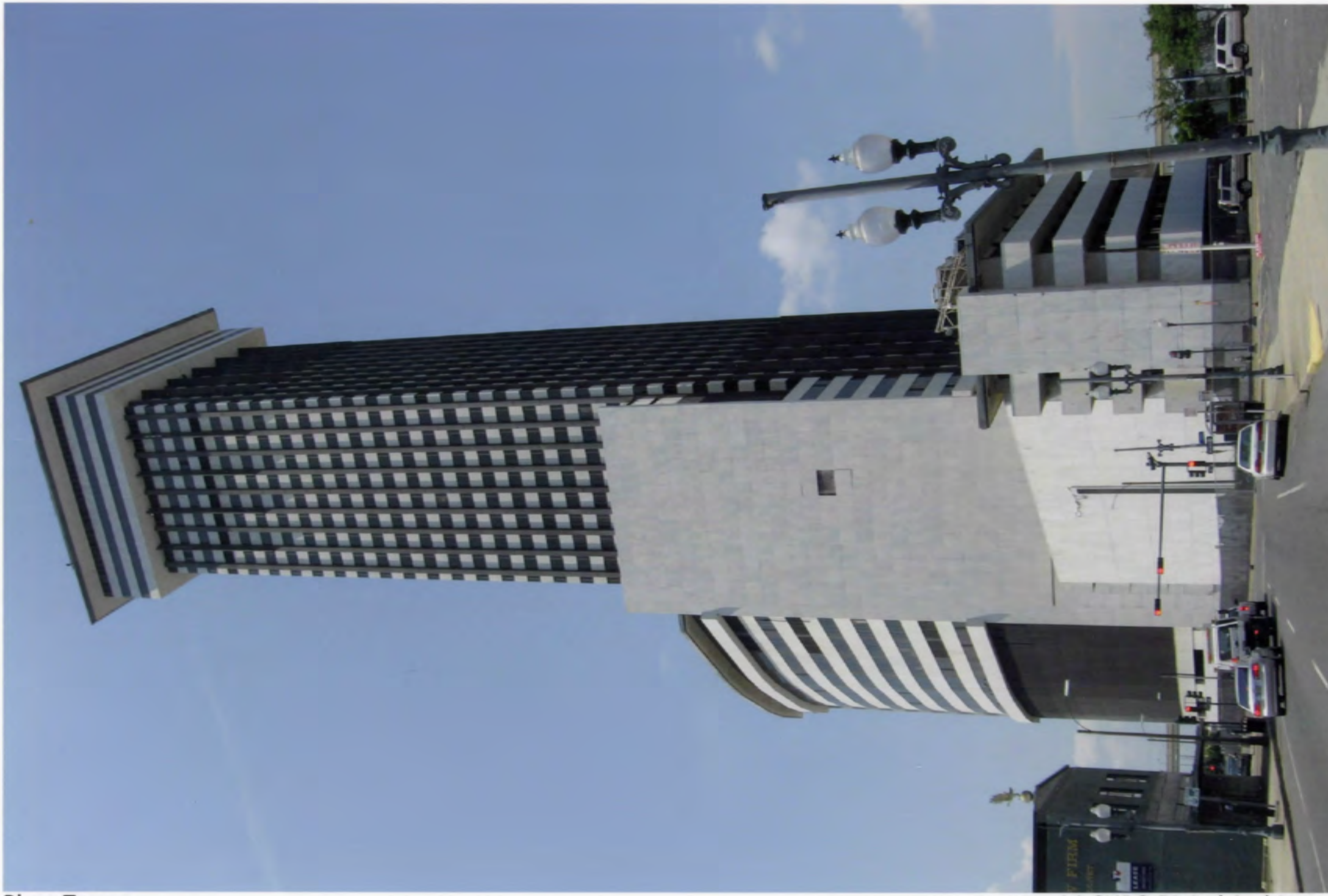
LA SHPO Digital Archives
Camera Facing E
Photo No.: 3

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 13, 2012

LA SHPO Digital Archives
Camera Facing E
Photo No.: 4

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing NE
Photo No.: 5



Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing S
Photo No.: 6

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 13, 2012

LA SHPO Digital Archives
Camera Facing S
Photo No.: 7

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing SW
Photo No.: 8

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing W
Photo No.: 9

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing NW
Photo No.: 10

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing NW
Photo No.: 11

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 13, 2012

LA SHPO Digital Archives
Camera Facing NE
Photo No.: 12

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 13, 2012

LA SHPO Digital Archives
Camera Facing NE
Photo No.: 13

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 13, 2012

LA SHPO Digital Archives
Camera Facing NE
Photo No.: 14

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing SW, Interior
Photo No.: 15

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing SW, Interior
Photo No.: 16

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing SE, Interior
Photo No.: 17

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing SW, Interior
Photo No.: 18

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing NW, Interior
Photo No.: 19

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

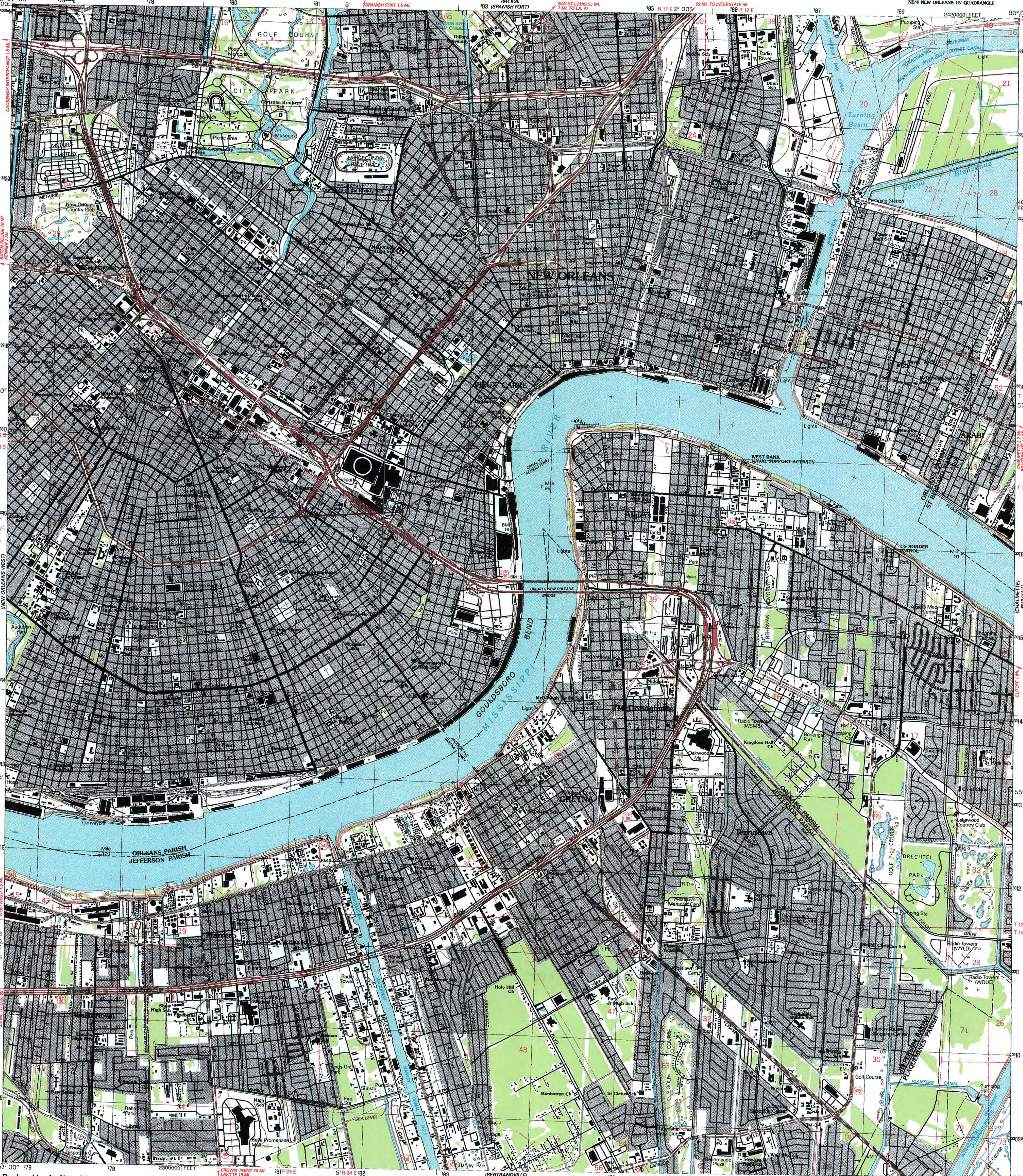
LA SHPO Digital Archives
Camera Facing SE, Interior
Photo No.: 20

Plaza Tower
New Orleans, Orleans Parish, LA
Mary Lane Carleton
June 14, 2012

LA SHPO Digital Archives
Camera Facing SW, Interior
Photo No.: 21

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

NEW ORLEANS EAST QUADRANGLE
LOUISIANA
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE/4 NEW ORLEANS 15' QUADRANGLE



Produced by the United States Geological Survey in cooperation with State of Louisiana agencies

Control by USGS and NOS/NOAA

Topography by photogrammetric methods from aerial photographs taken 1964 and planetable surveys 1965-66. Revised from aerial photographs taken 1989. Field checked 1991. Map edited 1992

Projection and 10,000-foot grid ticks: Louisiana coordinate system, south zone (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid, zone 15
1927 North American Datum

The difference between 1927 North American Datum and North American Datum of 1983 (NAD 83) for 7.5-minute intersections is given in USGS Bulletin 1875. The NAD 83 is shown by dashed corner ticks

There may be private inholdings within the boundaries of the National or State reservations shown on this map

Gray tint indicates areas in which only landmark buildings are shown

All or part of this quadrangle lies within a subsidence area

City of New Orleans and Orleans Parish are coextensive

UTM GRID AND 1992 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

1°28' 26 MILS — 2° 36 MILS

SCALE 1:24 000

KILOMETERS · METERS · MILES · FEET

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT, BATON ROUGE, LOUISIANA 70804
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

LOUISIANA
QUADRANGLE LOCATION

ROAD CLASSIFICATION

Primary highway, hard surface
Light-duty road, hard or improved surface
Secondary highway, hard surface
Unimproved road
Interstate Route
U. S. Route
State Route

NEW ORLEANS EAST, LA.
NE/4 NEW ORLEANS 15' QUADRANGLE
29090-H1-TF-024

1992

DMA 7943 I NE–SERIES V885

ISBN 0-607-22852-0

Plaza Tower New Orleans, LA Orleans Parish 15/782020 3316220

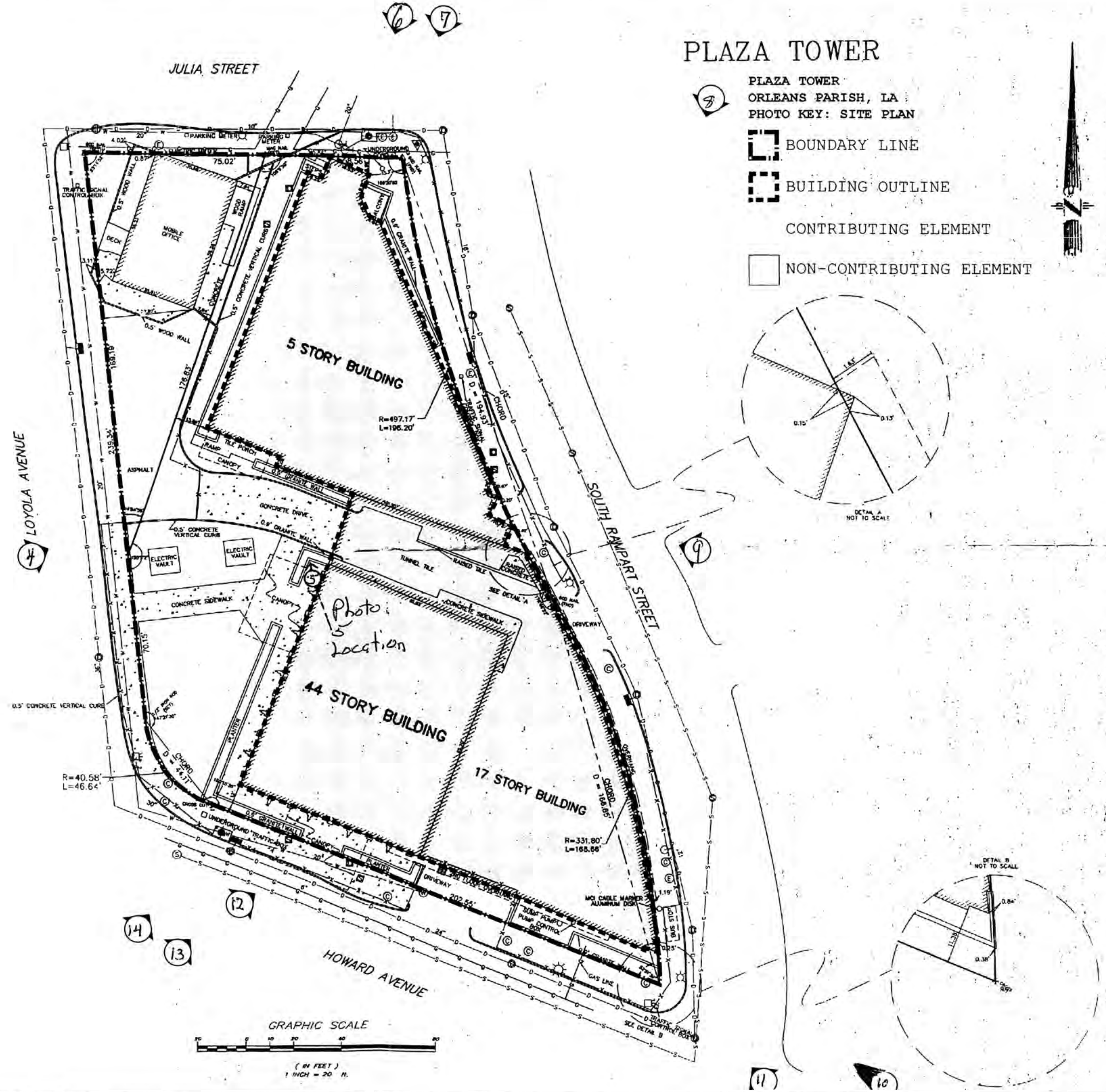
PLAZA TOWER

PLAZA TOWER
ORLEANS PARISH, LA
PHOTO KEY: SITE PLAN

- BOUNDARY LINE
- BUILDING OUTLINE
- CONTRIBUTING ELEMENT
- NON-CONTRIBUTING ELEMENT

LEGEND

- BUILDING
- BASELINE
- EXISTING RIGHT OF WAY
- CATCH BASIN
- CULVERT
- DROP INLET, DRAIN LINE
- DROP INLET, DRAIN LINE
- COMMUNICATIONS MANHOLE, COMM. LINE
- DRAIN MANHOLE, DRAIN LINE
- ELECTRICAL MANHOLE, ELEC. LINE
- GAS MANHOLE, GAS LINE
- SEWER MANHOLE, SEWER LINE
- TELEPHONE MANHOLE, TELE LINE
- TRAFFIC MANHOLE, TRAFFIC LINE
- WATER MANHOLE, WATER LINE
- UTILITY POLE / OVERHEAD LINES ELECTRIC, TELEPHONE, CABLE TV
- ELEC TOWER / OVERHEAD LINES
- FENCE
- UTILITY BOX (See Side data For Type)
- UTILITY CLEANOUT (See Side data For Type)
- UTILITY INTERFACE (See Side data For Type)
- UTILITY METER (See Side data For Type)
- UTILITY PEDESTAL (See Side data For Type)
- UTILITY VALVE (See Side data For Type)
- FIRE HYDRANT
- LIGHT STANDARD
- TRAFFIC LIGHT
- ANCHOR
- SIGN
- MISCELLANEOUS (See Side data)
- MISCELLANEOUS (See Side data)
- RESIDENTIAL MAILBOX
- TREE
- IRON ROD FOUND
- IRON ROD SET
- PP DEADMAN
- TRAFFIC SIGNAL SUPPORT POLE
- DRAIN CLEANOUT



SURVEY REFERENCE

SURVEY OF PLAZA TOWERS, SQUARE 275, FIRST DISTRICT, NEW ORLEANS, ORLEANS PARISH, LOUISIANA BY KREBS, LASALLE, LEMIEUX CONSULTANTS, DATED MAY 16, 1996

GENERAL NOTES

THE LOCATIONS OF UNDERGROUND AND OTHER NONVISIBLE UTILITIES SHOWN HEREON HAVE BEEN DETERMINED FROM DATA EITHER FURNISHED BY THE AGENCIES CONTROLLING SUCH DATA AND/OR EXTRACTED FROM RECORDS MADE AVAILABLE TO US BY THE AGENCIES CONTROLLING SUCH RECORDS. WHERE FOUND, THE SURFACE FEATURES OF LOCATIONS ARE SHOWN. THE ACTUAL NONVISIBLE LOCATIONS MAY VARY FROM THOSE SHOWN HEREON. EACH AGENCY SHOULD BE CONTACTED RELATIVE TO THE PRECISE LOCATION OF ITS UNDERGROUND INSTALLATION PRIOR TO ANY RELIANCE UPON THE ACCURACY OF SUCH LOCATIONS SHOWN HEREON, INCLUDING PRIOR TO EXCAVATION AND DIGGING.

BOUNDARY AND TOPOGRAPHIC SURVEY OF A PORTION OF SQUARE 275 FIRST DISTRICT NEW ORLEANS, LOUISIANA

BFM CORPORATION, L.L.C.

SCALE: 1" = 20'
DATE: 3/1/2006
DRAWN BY: RAH
CHECKED BY: KJ
DRAWING NO.: F-5683-2006

JAY DARDENNE
LIEUTENANT GOVERNOR

State of Louisiana

PAM BREAUX
ASSISTANT SECRETARY

OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF CULTURAL DEVELOPMENT
DIVISION OF HISTORIC PRESERVATION

December 12, 2012

TO: Mr. James Gabbert
National Park Service 2280, 8th Floor; National Register of Historic Places
1201 "I" Street, NW; Washington, DC 20005

FROM: Patricia Duncan, Architectural Historian, National Register Coordinator
Louisiana Division of Historic Preservation *Patricia Duncan*

RE: Plaza Tower, Orleans Parish, LA

Enclosed please find a nomination form with supporting materials for the above referenced property or historic district. Should you have any questions, please contact me at 225-219-4595.

PD/pld
Enclosures:

___1___ Original National Register of Historic Places nomination form

___NA___ Multiple Property Nomination form

___1___ CD with electronic images

___21___ Photograph(s)

___1___ Original USGS/NOAA map(s)

___1___ Sketch map(s)/figure(s)/exhibit(s) in archival folder

___0___ Piece(s) of correspondence

___0___ Other_

COMMENTS:

______ Please ensure that this nomination receives substantive review
______ This property has been certified under 36 CFR 67
______ The enclosed owner objection(s) do______ do not______ constitute a majority of property owners. [3 letters from original (same) owner; 1 letter from new owner]
___X___ Other: If listed, this building might become a Federal tax credit project in the future
___X___ Other: Requesting listing under Criteria Consideration G: Exceptional Significance