NATIONAL REGISTER NOMINATION SUMMARY SHEET

Property: Southern Pacific Locomotive Number 1673

Location: Himmel Park, Tucson, Pima County, Arizona

Ownership: Public-Local

Nomination Prepared By: David Devine

Description: The Southern Pacific Locomotive #1673, which currently stands in Himmel Park in downtown Tucson, was built in 1900 by the Schenectady Locomotive Works of Schenectady, New York. It was one of 105 engines of this type built by the firm, and is one of only two that remain, the only one in Arizona. The locomotive retains good structural integrity from its original design.

Significance: The Southern Pacific Locomotive #1673 is eligible for the National Register under Criterion "A" as being representative of early railroad expansion into Tucson and the rest of Arizona. Just twenty years after the arrival of the first trains which entered the state at Yuma, mogol-type 2-6-0 locomotives, like the SP #1673, were in operation. These locomotives ran the tracks for more than fifty years hauling cattle, foodstuffs and mining supplies throughout the southern portion of Arizona.

Suggested Level of Significance: Local, because of its close ties with the city of Tucson.

NPS Form 10-900-a
(8-86)

OMB Approval No. 1024-0018 12-23-91
1st Partial Upper Decker 1-3-92

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Section number _____ Page _____

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 91001918 Date Listed: 1/9/92

Southern Pacific Railroad Locomotive No. 1673
Property Name

Pima AZ
County **State**

N/A
Multiple Name

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.

Antoinette J Lee for
Signature of the Keeper **Date of Action** 1/13/92

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Amended Items in Nomination:

Function or Use: Under Current Functions, "Transportation/rail-related" should be removed.

Statement of Significance: Criteria consideration B should be removed.

This information was confirmed with Jay Ziemann of the Arizona State historic preservation office.

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

NPS Form 10-900
(Rev. 8-86)

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

FINAL

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name Southern Pacific Railroad Locomotive Number 1673

other names/site number

2. Location

street & number Himmel Park [N/A] not for publication

city, town Tucson [N/A] vicinity

state Arizona code AZ county Pima code 019 zip code 85716

3. Classification

Ownership of Property	Category of Property	Number of Resources within Property	
		Contributing	Noncontributing
[ ] private	[ ] building(s)		buildings
[X] public-local	[ ] district		sites
[ ] public-State	[ ] site		structures
[ ] public-Federal	[ ] structure	1	objects
	[X] object	1	0 Total

Name of related multiple property listing: N/A

Number of contributing resources previously listed in the National Register -0-

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, 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. [ ] See continuation sheet.

Sheree Kenner — 11/26/91

Signature of certifying official — Date

State Historic Preservation Officer

State or Federal agency and bureau

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

Signature of commenting or other official — Date

State or Federal agency and bureau

5. National Park Service Certification

I, hereby, certify that this property is:

FINAL
JUNE 2011
FROM SHPO

[ ] entered in the National Register.
[ ] See continuation sheet.

[ ] determined eligible for the National Register. [ ] See continuation sheet.

[ ] determined not eligible for the National Register.

[ ] removed from the National Register.

[ ] other, (explain:) _____

Signature of the Keeper — Date of Action

6. Function or Use

Historic Functions (enter categories from instructions)	Current Functions (enter categories from instructions)
TRANSPORTATION/rail-relat	TRANSPORTA ail-related
COMMERCE/business	RECREATION AND CULTURE/monument
INDUSTRY/communications facility	

7. Description

Architectural Classification (enter categories from instructions)

Other: Mogul 2-6-0

Materials (enter categories from instructions)

foundation
walls
roof
other Metal: Steel

Describe present and historic physical appearance.

Summary

Southern Pacific Railroad locomotive number 1673 (serial #5683) is a mogul 2-6-0 wheel type engine built by Schenectady Locomotive Works in November, 1900. It is one of only two of the 105 locomotives of this type that Schenectady and Cooke Locomotive and Machine Company built at the turn of the century for Southern Pacific which is still in existence. After being used by the company for over 50 years, the locomotive was donated to the city of Tucson. It was first moved to the Arizona Historical Society and later relocated to Himmel Park, a municipal recreation facility. The locomotive retains good structural integrity and its physical condition is fair and in need of some renovation.

Locomotive #1673 was one of 105 engines of this type built for Southern Pacific between February, 1899 and January of 1901 by Schenectady Locomotive Works of Schenectady, New York and Cooke Locomotive and Machine Company of Paterson, New Jersey. Only two of these locomotives still exist with the other being located in Saugus, California after being purchased from Southern Pacific by Gene Autry in 1957. In addition, only seven of the 355 engines of this type ever built in the United States still exist.

Number 1673's wheel arrangement, 2-6-0, indicates that it has two leading truck wheels, six drive wheels and no trailing truck wheels. This arrangement, possibly first used in Russia in the 1840s, made the locomotive well suited for hauling heavy freight loads. Of the total moguls built in this country, most were used by Pacific line railroad companies where the high traction to weight ratio of the locomotives would come in especially helpful.

The locomotive's loaded weight, without its tender, is 146,000 pounds. In 1905, the engine was converted from coal to oil. While the availability of coal in the west made it an attractive fuel, it was extremely dirty. The lack of dust, soot and cinders made oil the obvious choice for locomotives and by the early 1900s most Southern Pacific engines were being converted. In 1922, superheater equipment was installed on the locomotive at Sacramento, California. This was done to add heat to the steam thus greatly increasing the efficency of the engine's cylinders.

Other technical specifications of the locomotive are:

Class M-4
Cylinder bore and stroke 20"x28"
Working steam pressure 190 lbs. psi
Driver diameter 63"
Driving wheel base 15'2"
Length 36'1" (pilot to rear of cab excluding roof overhang)

[X] See continuation sheet

Width 9'6" over roof eaves
Tractive effort 28,710 pounds

The tender for the locomotive was built at Baldwin Locomotive Works and is numbered 7255. It is a class 70R-1 tender and is 27 feet 10¼ inches in length, 12 feet ½ inches in height, and 10 feet, 8½ inches wide. It has a wheel base of 19 feet.

Southern Pacific locomotive 1673 was used as a freight hauler and logged over one million miles of service for the company. For a few months in 1946 it was leased to Southern Pacific of Mexico. In 1954 the locomotive was used in the filming of the movie "Oklahoma". The locomotive was retired from service in December, 1954 and donated to the city of Tucson in June of the following year. At first it was on display at the Arizona Historical Society but in June, 1962, due to construction at the Society, the locomotive was moved to Himmel Park, a city owned recreation facility, where it has remained on display.

Integrity

The locomotive was converted from coal to oil in 1905. In 1922, superheater equipment, which greatly increased the efficiency of the engine's cylinders, was installed at Sacramento. Neither of these changes impacted the exterior appearance of the locomotive and few other alterations have been made to it since that time. It still has its original bell and light and many of the original fixtures are still in place. In general the integrity of the locomotive is good.

The physical condition of the locomotive is fair. Rehabilitation will be needed since exposure to the elements has caused some deterioration.

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:
☐ nationally ☐ statewide ☒ local

Applicable National Register Criteria ☒ A ☐ B ☐ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☒ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)
Transportation
Commerce
Industry

Period of Significance
1900-1941

Significant Dates
1900

Cultural Affiliation

Significant Person

Architect/Builder
Schenectady Locomotive Works

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

Summary

Locomotive #1673 represents the era when the Arizona territory was opened up to regular communication with the outside world. It also represents a style of design which is long since past and is one of only a few such type of locomotives which still exist. The mogul style of locomotive and other engines from this era were instrumental in opening Arizona to modernization by providing access to the goods and services needed to develop first the territory and then the state of Arizona. In addition, train service was essential for delivering the products of the state to the rest of the country. Rail service was essential for the development of the mining and agricultural industries in the state. It also played a large role in the transformation of architectural building styles and materials from Sonoran adobe to Victorian wood frame construction.

Prior to the railroad entering the state at Yuma in 1877, communication with other parts of the United States had been extremely difficult. Stage coaches, wagon trains and other basic forms of transportation were used to supply the territory with goods and to export raw materials and livestock. Many people saw it as a necessity to link the state with the rest of the nation by rail. One account of the railroads importance to Arizona is given by David Myrick in his book, Railroads of Arizona volume 1 the southern roads.

> Mayor J.B. 'Pie' Allen (of Tucson) convened the council at his house on the evening of January 10, 1877 where the council ...heard the general (General Phineas T. Banning) tell of SP's plans and, after some discussion, the council voted to transfer about 200 acres within the town limits on the condition that the railroad would be completed to Tucson and in good running order within five years.

By 1880 Southern Pacific tracks stretched from Yuma on the west to San Simon on the eastern edge of the state. Tucson and other communities in southern Arizona which were along the line were open to reliable interstate commerce for the first time when the line was complete. The modern world could, for the first time, come to Tucson conveniently and reliably.

☒ See continuation sheet

The change in lifestyle which thearrival of the railroad brought to southern Arizona can not be underestimated. As C.L. Sonnichsen wrote in Tucson, the life and times of an American city,

> Now that the railroad was a reality, not one Tucsonan doubted that wealth and prosperity were inevitable and it was true that life thenceforward was, for many people, simpler, easier-and cheaper. Orders to the West Coast, and later to Kansas City or Saint Louis or New York, could be transmitted in minutes by telegraph and received in days by train. Prices on practically everything were revised rapidly downward. Ordinary people rejoiced in the new dispensation, but signs were ominous for the merchant princes of yesterday.

The railroad brought not only supplies and material, it also brought soldiers. It was soon after the arrival of the railroad that the Indian uprisings in the state were finally put down.

But with the arrival of the railroad, those businesspeople who had prospered and made fortunes on the old ways of doing business either had to change or face hard times. Because many of them did not adapt to the new realities, they were left financially broken. Thus, the prosperity of the many was achieved at the expense of the few.

Within twenty years of the completion of the track line across southern Arizona, mogul type 2-6-0 locomotives were in operation in the state. They were engines which were built for heavy freight hauling. According to George Abdill in his book, A Locomotive Engineer's Album, The Saga of STEAM ENGINES in America, "The type probably received its name from the mogols of India, since both personified power".

Shortly after the turn of the century there were 33 moguls in operation in southern Arizona. They were hauling such items as copper, citrus and cotton. Cattle being taken to market was also an important commodity. Only two of these locomotives, and only seven of the 355 2-6-0 moguls ever built, are still in existence. The others were scrapped in the 30s, 40s and 50s.

Locomotive 1673 was sent to southern Arizona directly from Schenectady Locomotive Works. Its history from then until the late 1940s is unknown but engines similar to it were working out of the Tucson rail yard throughout this period.

A flavor of these times was given by Connie Weinzapfel, a Southern Pacific locomotive engineer for 50 years until he retired in 1987. He remembers running #1673 for three months in the late 1940s leaving Benson, Arizona every day of the week except Sunday. The train would haul items such as cattle, food stuffs including meat in refrigerated cars, dynamite from a plant at Curtis, Arizona, and feed for the calvary horses then located at Fort Huachuca, Arizona. Three days a week the train would make the 16 hour round trip to Patagonia via Elgin. On the other days, the train would go to and return from Fort Huachuca via Tombstone.

He recalls that an S.P. operator named Rosie would often ride with him in the engine from Benson after she got off working her 11:30 p.m. to 7:30 a.m. shift. He taught her how to fire and run the locomotive as they made their way south. She would sleep in the train and return to work when they had completed the round trip from Benson.

While hauling freight was the primary function of #1673, a job in which it logged over 1,000,000 miles for the Southern Pacific company, it did play some other roles. In 1954 it was used in the making of the movie "Oklahoma". The next year it played an important part in the 75th anniversary celebration of the railroads arrival in Tucson. After this celebration, the locomotive was donated to the city of Tucson.

After being given to the city, the locomotive was displayed at the Arizona Historical Society. It was moved to its present location in Himmel Park, a city owned recreation facility, in 1962 due to construction at the Historical Society.

In 1984 a group of local business people spent approximately $20,000 to perform boiler inspection on the locomotive. They were considering putting the engine back into service between Tucson and Nogales, Arizona but the project was not pursued.

Locomotive #1673 represents both the opening of Arizona to the rest of the country and the transformation of the Arizona territory from a rural, isolated outpost to a growing state. The development of Tucson is, in large part, reflected in the history of the railroad and #1673 is a symbol of that past.

9. Major Bibliographical References

Abdill, George B. A Locomotive Engineer's Album the Saga of STEAM ENGINES in America. (Seattle, Washington:Superior Publishing Company, 1965).

Diebert, Timothy S. and Strapac, Joseph A. Southern Pacific Company Steam Locomotive Compendium. (Huntington Beach, California:Shade Tree Books, 1987).

Dunscomb, Guy L. A Century of Southern Pacific Steam Locomotives. (Modesto, California: Printing Company, 2nd Printing, 1967).

Duke, Donald. Southern Pacific Steam Locomotives. (San Marino, California: Pacific Railway Journal, 1962).

Hofsommer, Don L. The Southern Pacific 1901-1985. (College Station, Texas: Texas A&M University Press, 1986).

Myrick, David F. Railroads of Arizona volume 1 the southern roads. (Berkeley, California: Howell-North Books, 1975).

☒ See continuation sheet

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 # _____

Primary location of additional data:

- ☐ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☒ Other

Specify repository: Arizona Historical Society

10. Geographical Data

Acreage of property Less than one acre

UTM References

	Zone	Easting	Northing
A	12	510,622,2,0	3,516,611,1,0
B			
C			
D			

☐ See continuation sheet

Verbal Boundary Description

Locomotive #1673 is located in Himmel Park which is bounded by First Street, Treat Avenue, Tucson Boulevard and the extension of Hawthorne Street. The engine and tender are located in the west central portion of the park near a parking lot.

☐ See continuation sheet

Boundary Justification

The boundaries are those delineated by the chain link fence which surrounds the locomotive.

☐ See continuation sheet

11. Form Prepared By

name/title David Devine

organization City of Tucson-Ward 6 date November 20, 1991

street & number P.O. Box 27210 telephone (602) 791-4601

city or town Tucson state AZ zip code 85726-7210

Peplow, Edward H. History of Arizona. (New York:Lewis Historical Publishing Company, Inc., 1958).

Price, Paul. Steam Trains. (Secaucus, New Jersey: Chartwell Books, Inc., 1978).

Sheaffer, Jack. Jack Sheaffer's Tucson 1945-1965. (Tucson, Arizona: Arizona Daily Star, 1985).

Sonnichsen C.L. Tucson, the life and times of an American city. (Norman, Oklahoma: University of Oklahoma Press, 1982).

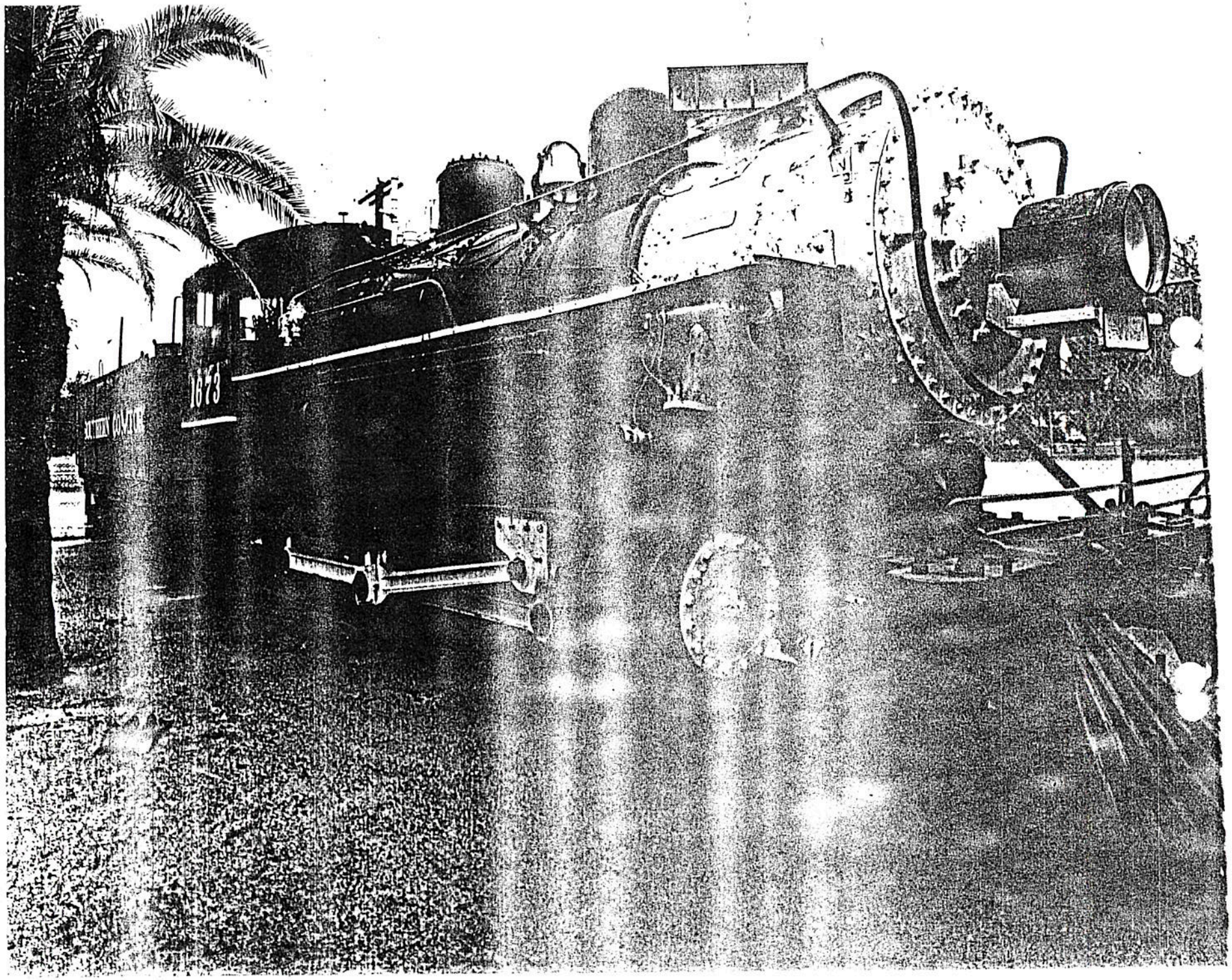
Strapac, Joseph A. Southern Pacific Review 1952-82. (Huntington Beach, California: Shade Tree Books, 1983).

"Catch 22 holds Engine 1673 on tracks at Himmel Park." Tucson Citizen, 6 September 1979, by Laura Diamond.

"Train buffs plan future for 1673." Arizona Daily Star, 5 September 1989, by Joe Burchell.

"Tucson's Biggest Toy Turns 60 Next Month." Arizona Daily Star, 25 November 1960, by Pete Cowgill.

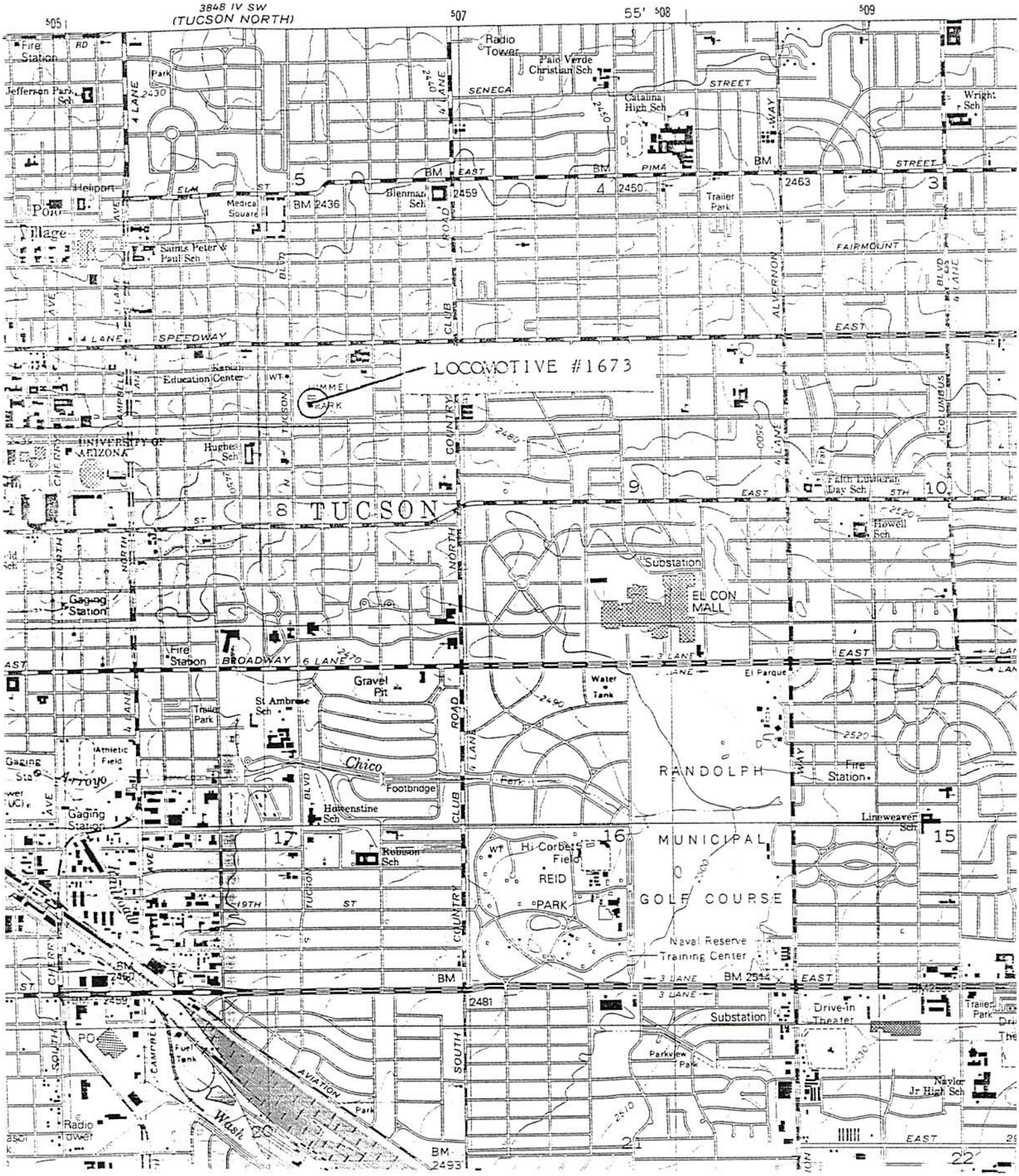
Oral history interview with Connie Weinzapfel on March 29, 1991.


1673

Southern Pacific Locomotive Number 1673

E - Zone 12 - 506220

N - Zone 12 - 3566110



Form No. 10-300 REV. (9/77)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

1024. P1 06869 56

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DATE ENTERED

RECEIVED
AUG 20 1990
ARIZONA STATE PARKS BOARD

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC
~~#223~~ Grant ~~Narrow Gauge~~ Steam Locomotive, ~~D&RG~~ Class ~~60N~~, ~~2-8-0~~ I.C. 223

AND/OR COMMON

2 LOCATION

STREET & NUMBER ~~Approximately~~ 6th South & 13th East
Liberty Park - ~~Refer to~~ #10 ___ NOT FOR PUBLICATION

CITY, TOWN Salt Lake City ___ VICINITY OF CONGRESSIONAL DISTRICT

STATE Utah CODE COUNTY Salt Lake CODE

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
___DISTRICT	X PUBLIC	___OCCUPIED	___AGRICULTURE	___MUSEUM
___BUILDING(S)	___PRIVATE	X UNOCCUPIED	___COMMERCIAL	___PARK
___STRUCTURE	___BOTH	___WORK IN PROGRESS	___EDUCATIONAL	___PRIVATE RESIDENCE
___SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	___ENTERTAINMENT	___RELIGIOUS
X OBJECT	___IN PROCESS	X YES: RESTRICTED	___GOVERNMENT	___SCIENTIFIC
	___BEING CONSIDERED	___YES: UNRESTRICTED	___INDUSTRIAL	___TRANSPORTATION
	X Public owned	___NO	___MILITARY	___OTHER:

4 OWNER OF PROPERTY

NAME Salt Lake City Corporation

STREET & NUMBER City and County Building

CITY, TOWN Salt Lake City ___ VICINITY OF STATE Utah

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC. County Recorder's Office

STREET & NUMBER City and County Building

CITY, TOWN Salt Lake City STATE Utah

6 REPRESENTATION IN EXISTING SURVEYS

TITLE None

DATE ___FEDERAL ___STATE ___COUNTY ___LOCAL

DEPOSITORY FOR SURVEY RECORDS

CITY, TOWN STATE

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
_EXCELLENT	_DETERIORATED	XUNALTERED	_ORIGINAL SITE
_GOOD	_RUINS	_ALTERED	XMOVED DATE July 1941
XFAIR	_UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

Description of Locomotive:

The #223 Grant steam locomotive, a consolidation type 2-8-0, class C-16-60 engine originally had the following dimensions and specifications: cylinder size 15" x 20", 36" drive wheel diameter, engine weight 60,000 lbs., tractive effort 16,540 lbs. and Grant construction number of #1436-1881.

This coal-fired steam locomotive was built as number 223 in a series of engines beginning with #200 and ending with #227. It was a class 60-N locomotive and was classed by the Denver & Rio Grande Railroad as a C-16-60 N. The N catagory indicates that the locomotive had an extended smoke box and a larger tender than the 60 series.

The consolidation series of 2-8-0 locomotives saw their first heavy usage as freight haulers in the Pennsylvania coal fields. These were identical to the Baldwin and Grant class 60 series engines later brought to Utah and Colorado to serve the D&RG Railroad. The D&RG purchased the vast majority of its locomotives from the Baldwin Locomotive Works. It is speculated that Baldwin was unable to supply enough of the 2-8-0 locomotives to the D&RG which resulted in the Grant Locomotive Works receiving a contract to produce near identical engines from the Baldwin plans. Grant was awarded a contract in 1881 to build locomotives #200 to #227. The last engines produced under this order were #222, and #224-227. This series of twenty-seven locomotives were the only non-Baldwin locomotives to see service on the D&RG Road. The Grant Locomotive Works ceased operation in 1890.

The #223 Grant locomotive has seen numerous modifications ~~from the period extending~~ from the period extending ~~from~~ 1914 to 1941 when it was retired from service.

Equipment Modifications:

The front pilot (cow catcher) was originally wood extending out from its mounts 4'8-3/8". It was replaced with a steel pilot which was approximately 3'0" long in order to accomodate the new automatic coupler first introduced in 1903. The valve gear, cylinders, pilot wheels and drive wheels remain as original with no visible changes. The original smokestack had been connected to a diamond-shaped spark arrester. The diamond-shaped spark arrester was replaced just after the turn of the century due to poor exhaust characteristics. It was replaced with a longer vertical stack with a drum-shaped spark arrester on top. This stack remains inside the current diamond stack which is on the engine now. This diamond stack is purely decorative, probably installed on the engine in 1941 and bears no resemblance to the original.

The headlight is Kerosene-fired in the original style and shape. It is doubtful that it is the original, since the engine carried a smaller electric head lamp which replaced the original one after the turn of the century. Flanking the headlight and attached to the smoke box sides were two classification lamps, which originally identified the disposition of the train. Green lenses signified that the engine pulled a freight, while white or clear lenses indicated a special. The engine number was displayed on either side of the main headlight with numbers illuminated by the head lamp.

The boiler is believed to have been replaced at some unknown date. The letter N in the 60N classification indicates that the locomotive came from the factory with an

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extended front smoke box. The smoke box is a round cylinder which forms the front nose of the engine. The box resembles part of the boiler, but attaches just ahead of it. The smoke travels from the fire box through the boiler tubes, into the smoke box and up and out of the smoke stack which attaches on top of the smoke box. The purpose of the extended smoke box was to improve the flow of gases, through and out of the engine and also served to collect ashes, cinders and further arrest sparks. The smoke box is currently painted silver. Originally, the smoke box had a silvery polished finish resembling stove black.

The boiler appears to be the same overall shape and size as the original, and shows no signs of having its outer metal jacket rusted out. Originally, the engines came from the factory with air pumps mounted on the engineer's side of the boiler, just ahead of the cab. These pumps compressed air to power the air brakes on the train. These pumps have been relocated on the fireman's side. Looking forward from the cab of the engine, the engineer operates the engine on the right side of the boiler, with the fireman on the left. The engine cab is intact and in relatively good repair considering its exposure to the weather since 1941. The cab is roughly square with an arched roof. Some Baldwin engines of the same design had pitched roofs with a ridge line down the center extending from front to rear. The cab appears to be oak. All of the windows and window locations on the front and sides of the cab are original. The sides of the cab have been sheathed in sheet metal which, when removed, should expose the original locations of lettering and numbering, as well as the exact colors used on the engine and cab. The lettering is known to have originally been yellow or gold with pin striping.

All of the original pressure gauges and equipment appear to be intact within the engine cab. The all-weather curtains which could be drawn around the rear open portion of the cab are missing.

The tender is in original condition with all equipment intact except for a missing air tank which extended in traverse fashion across the rear of the frame. The tender is supported by two large wood beams running the full length of the tender, forming the frame. This wood frame shows serious deterioration at the rear, but is suitable to serve as a pattern.

The overall condition of the engine and tender is good, considering the length of time it has set unattended. The only items which have been stolen from the engine during its stay in the park are the front classification lamps. The engine still retains its original brass bell and steam whistle.

In keeping with National Register requirements for nominations of stationary steam engines, the following data has been included in this description:

Form No. 10-300a
(Rev. 10-74)

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Cylinder bore and stroke - 15 x 20".
Horsepower - not applicable, same as tractive effort.
R.P.M. - not applicable.
Pounds per square inch - 160 pounds.
Type of valves and gears - Stephenson valve gear.
Type of crosshead guides - Alligator crossheads.
Type of connecting rod ends - main rod connects crosshead to drive pins.
Type of crank - Stephenson valve gear.
Method of drive - direct power to wheels via crank.
Flywheel diameter and face - not applicable.
Type of condenser - none.
Uses of exhaust system - exhaust steam is exhausted out of the stack.
Boiler history - originally wrought iron. Between 1910 and 1914 D&RG changed all iron boilers to steel due to explosions on wrought iron boilers.
Earlier power sources on site - not applicable.

Description of Location:

At the present time, locomotive #223 is located in a city-owned park. The engine has been in the park for the past 36 years, between a children's aviary and the site of an old mill. In spite of the chain link fence which surrounds it, it has been vandalized (lights and builders plate have been removed). This is obviously not a location suitable for a locomotive on the National Register. The Utah State Historical Society proposes that the engine shall be placed in a more suitable location to meet the criteria of the National Register. The Society plans to move the locomotive by trailer to the Denver and Rio Grande Depot in Salt Lake City, where it can be protected, restored and displayed. The State Historical Society is in the process of restoring the D&RG Depot to serve as a multi-functional center housing a state museum, meeting areas, Historical Society offices, library and other functions. The Historical Society feels that the D&RG Depot would be a highly appropriate setting for the D&RG locomotive. This setting would allow for better protection of #223 while enabling a greater number of visitors to see the engine. The State Historical Society will notify the National Register Office when the move is completed.

Form No. 10-300a
(Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
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CONTINUATION SHEET ITEM NUMBER 7 PAGE 4

Plans are to move Locomotive 223 to the Denver and Rio Grande Depot sometime in 1980. The Locomotive has been given to the Utah State Historical Society. The Denver and Rio Grande Depot will become a permanent home for the Utah State Historical Society in early 1980. Locomotive 223 will be restored and become a permanent museum object at the Depot. The present setting in Liberty Park is greatly out of character with the history of the Locomotive. The new setting, on tracks just west of the Denver and Rio Grande Depot where Locomotive 223 ran during its days of activity, will greatly enhance the historical integrity of the Locomotive.

The verbal boundary description for the new location is best described as immediately west and adjacent to the Denver and Rio Grande Depot, which has been listed in the National Register of Historic Places. UTM references for the new location are 12/423665/4512620.

8 SIGNIFICANCE

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
__PREHISTORIC	__ARCHEOLOGY-PREHISTORIC	__COMMUNITY PLANNING	__LANDSCAPE ARCHITECTURE	__RELIGION	
__1400-1499	__ARCHEOLOGY-HISTORIC	__CONSERVATION	__LAW	__SCIENCE	
__1500-1599	__AGRICULTURE	__ECONOMICS	__LITERATURE	__SCULPTURE	
__1600-1699	__ARCHITECTURE	__EDUCATION	__MILITARY	__SOCIAL/HUMANITARIAN	
__1700-1799	__ART	X ENGINEERING	__MUSIC	__THEATER	
X 1800-1899	X COMMERCE	__EXPLORATION/SETTLEMENT	__PHILOSOPHY	X TRANSPORTATION	
__1900-	__COMMUNICATIONS	X INDUSTRY	__POLITICS/GOVERNMENT	__OTHER (SPECIFY)	
		X INVENTION			

Grant Locomotive Works

SPECIFIC DATES 1881 BUILDER/ARCHITECT Grant Locomotive Works

STATEMENT OF SIGNIFICANCE

Locomotive engine #223 played a significant role in the development of the steam locomotive in the intermountain west. This engine was built in 1881 for the Denver and Rio Grande Railroad. It is the last of the narrow gauge type engines to be built by the Grant Locomotive Works for the Denver & Rio Grande Railroad. After 1882, production of all narrow gauge locomotives for the D&RG was halted. Engine #223 was part of a series of engines which were unique. They were the only locomotives not built by the Baldwin Locomotive Works to be in service on the D&RG rails up until the end of the 19th Century. Number 223 is the only Grant-built narrow gauge locomotive of this type in existence today. It is particularly significant that this engine is in Utah, since it is the only remaining narrow gauge of its type which saw freight service in Utah. Because of this fact, we feel that Engine #223 should be properly recognized as the only survivor of a species which has been extinct for almost 100 years.

History

Engine #223 has a colorful history which spans two centuries. It was in operation over 60 years and saw service in both Utah and Colorado. From 1881 to 1890 it was used for freight service in Utah. It was then moved to Colorado and continued in freight service until 1941. On July 24, 1941, the Denver & Rio Grande Railroad leased the engine to Salt Lake City for display purposes in city-owned Liberty Park. In 1952, the engine was formally given to Salt Lake City by the railroad. It has stood in Liberty Park for the past 37 years and is now in a state of disrepair.

When the Denver & Rio Grande Railroad was incorporated on October 27, 1870, General William J. Palmer was its president. General Palmer, of Colorado Springs, was determined to break out of the mold adhered to by the great majority of railroads. He decided not to follow their pattern of connecting similar regions in different stages of development, depending on westbound manufactured goods and eastbound raw materials and foodstuffs for business. Instead, Palmer designed the Denver & Rio Grande to connect points varying in climate, products and needs. The major portion of his traffic was to be local.

General Palmer realized that building a railway south from Denver would not be a simple task. Palmer had been an engineer for the Kansas Pacific Railroad and had studied mining in England. At first his railroad was to run through the gentle grades and meadows which boarded on the great plains. It was only when Palmer contemplated the Rocky Mountains and decided to conquer them that his railroad grew in stature.

Form No. 10-300a
(Rev 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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DATE ENTERED DEC

Palmer decided that a narrow gauge line, of a 3 foot width instead of the conventional 4 foot 8-1/2 inch track would best suite the terrain. The narrow gauge rails and locomotives were light, to accomodate steeper grades and sharper turns, while carrying a heavy load. Construction of the narrow gauge was also cheaper because trestles and rails were lighter. In addition to these economic and geographic considerations, Palmer may have decided on the three foot gauge for moral reasons. Palmer was a gentleman whose tastes ran along the lines of polo and croquet. He found the general practice of selling two, and not one sleeping space in lower berths distasteful. This practice meant that passengers who were strangers would be forced to sleep in the same berth. It also meant that gentlemen would be sleeping in close proximity of persons of a lower social class. Palmer's narrow gauge cars solved this dilemma since they could not accomodate more than one person in each berth.

Between 1871 and 1873, the D&RG bought 12 locomotives from the Baldwin Locomotive Works. By 1877 the D&RG had begun to operate through Colorado's mountains with 4% grades and 30° curves. A light, more powerful locomotive was needed. Baldwin then produced what was to become the prototype of the narrow gauge for decades to come. The "Alamosa", the first 2-8-0 weighed 34 tons (twice the weight of the original narrow gauge) but was still able to negotiate the D&RG's fragile track. Engine #223 was built in 1881 by the Grant Locomotive Works. It was identical to the previous class 60 locomotives. The Grant locomotives were almost the only non-Baldwin locomotives on the railroad up until the end of the century. It is probably that Baldwin could not produce enough of this class for the D&RG so the identical plans were used by Grant for this engine.

While this expansion was taking place, the railroad "wars" of the late 1870's and early 1880's had left the D&RG short of its southern goal of Santa Fe. The Atchinson, Topeka and Santa Fe Railroad was at war with the D&RG over the southern routes. The D&RG eventually agreed not to build south of Trinidad, Colorado, or Española, New Mexico, while the AT&SF agreed not to build into Denver or Leadville. Palmer then turned his southbound ambitions westward and on August 1, 1882, the Denver & Rio Grande Western Railway which was building a line across Utah was leased to the D&RG. In March 1883, the through line to Salt Lake City was completed by the D&RGW Railroad. That same year Palmer resigned as President of the D&RG, however, he remained as President of the D&RGW.

The days of the narrow gauge were then numbered. In 1882 the last of the class 60 locomotives were built, most of these being the overflow of the 1881 order. The 1882 engines were the last Grant locomotives ever built for the D&RG. Beginning in 1882, the narrow gauge rails were phased out in favor of the 4'8-1/2" standard gauge. By 1890, the conversion to standard gauge was completed, on the major routes, and engine #223 was transferred from Utah to Colorado. Number 223 ran a freight route in Colorado from 1890 until 1941.

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The D&RG Railroad was the first railroad in North America to carry people and freight on narrow-gauge tracks. It became the largest such carrier with 1,300 miles of track from Denver and Pueblo, Colorado, to Salt Lake City and Ogden, Utah. At the height of its narrow gauge career, it had over 300 locomotives in its service. General Palmer had hoped that his 3 foot gauge would become standard, but the economics of handling freight to and from 4'8-1/2" connections became an obvious handicap, and conversion to standard gauge became a necessity. As the narrow gauge locomotives disappeared from the rails, very few remained in operating condition. Most were dismantled or left to wither away. Engine #223 is the only Grant locomotive of its kind left intact. Two other Baldwin locomotives of its type are on display in Colorado. Salt Lake City is fortunate to possess this locomotive whose history is so much a part of the development of the national railway system and part of the history of the state of Utah.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

Beebe, Lucius and Clegg, Charles Narrow Gauge in the Rockies.

Colorado Railroad Museum, Golgon, Colorado, Steam in the Rockies.

Le Massena, Robert A., Rio Grande to the Pacific.

Le Massena, Robert A., Colorado's Mountain Railroads, Vol. II

10 GEOGRAPHICAL DATA

NEW LOCATION Quad. Salt Lake City North, Utah

ACREAGE OF NOMINATED PROPERTY less than one 12/432665/4512620 (new UTM Ref.)

QUADRANGLE NAME Sugarhouse, Utah (current location) QUADRANGLE SCALE 1:24000

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	12	426210	4510450 (4523 current)
B			
C			
D			
E			
F			
G			
H			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE
Larry Jones, Architectural Consultant, Lois Harris, Historian

ORGANIZATION
Utah State Historical Society

DATE

STREET & NUMBER
307 West 200 South, Suite 1000

TELEPHONE
801-533-6017

CITY OR TOWN
Salt Lake City

STATE
Utah 84101

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL X STATE ____ LOCAL ____

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE Executive Director and State HIstoric Preservation Officer DATE Sept. 8, 1978

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE 5-23-79

KEEPER OF THE NATIONAL REGISTER

ATTEST: Bill Lebenkohl DATE May 21, 1979

CHIEF OF REGISTRATION

GPO 921-803

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

Deseret News, January 9, 1907, p. 3

Form No 10-300a
(Rev 10-74)

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NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED OCT 24 1978
DEC 22 1978
DATE ENTERED

Anderson, George L., General William J. Palmer.

Colorado Railroad Museum, Golden, Colorado, Colorado Rail Annual 1970.

Beebe, Lucius and Clegg, Charles, Rio Grande.

Harvey, Fred, "King of the Narrow Gauge," *True West* (February, 1960) p. 24.

Adams, Ramon F. The Language of the Railroader.

Zimmerman, Karl R. "Hear That Whistle Blow Again," *Historical Preservation* (April/June 1978) p. 5.

Telephone Interview, September 5, 1978, with Bob Richardson, Director Colorado Railroad Museum, Golden, Colorado.

Utah State Historical Society, Clipping File "Railroads, Denver and Rio Grande Railroad."

NPS Form 10-900
(3-82)

OMB No. 1024-0018
Expires 10-31-87

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

For NPS use only
received AUG 6 1986
date entered

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name

historic I. and E. Greenwald Steam Engine #1058

and/or common N/A

2. Location

street & number 3898 Shipping Avenue N/A not for publication

city, town Miami N/A vicinity of

state Florida code 012 county Dade code 025

3. Classification

Category	Ownership	Status	Present Use	
___ district	___ public	___ occupied	___ agriculture	___ museum
___ building(s)	X private	___ unoccupied	___ commercial	___ park
___ structure	___ both	X work in progress	___ educational	___ private residence
___ site	**Public Acquisition**	**Accessible**	___ entertainment	___ religious
X object	___ in process	X yes: restricted	___ government	___ scientific
	___ being considered	___ yes: unrestricted	___ industrial	___ transportation
	N/A	___ no	___ military	X other: Private Coll.

4. Owner of Property

name Finlay B. Matheson

street & number 240 San Lorenzo

city, town Coral Gables ___ vicinity of state Florida

5. Location of Legal Description

courthouse, registry of deeds, etc. N/A

street & number N/A

city, town N/A state N/A

6. Representation in Existing Surveys

title N/A has this property been determined eligible? ___ yes X no

date N/A ___ federal ___ state ___ county ___ local

depository for survey records N/A

city, town N/A state N/A

7. Description

Condition		Check one	Check one
X excellent	___ deteriorated	X unaltered	___ original site
___ good	___ ruins	___ altered	X moved date 1926, 1984
___ fair	___ unexposed		

Describe the present and original (if known) physical appearance

SUMMARY

The I. & E. Greenwald steam engine, serial No. 1058, was built in Cincinnati, Ohio in 1906.[1] The horizontal cross-compound engine weighs 124,500 pounds and has overall dimensions of 23' 6" in length, 14' 1" in width and 13' in height. Its two cylinders are arranged horizontally astride a 16' diameter flywheel, the lower portion of which revolves in a pit near the center of the engine. The cylinders, one high pressure and one low pressure, have dimensions of 20" x 42" and 36" x 42" respectively. The engine is constructed primarily of cast iron but has components of steel and alloy materials. It is painted harvester red and butterscotch, period tones specially formulated by Robert I. Johnson[2] who has done extensive restoration work for museums including the Ford Museum at the Edison Institute and the Smithsonian Institution. The engine rests on a concrete foundation bed raising the base of its cylinders 11" and 21" above the floor, as was standard practice for such engines. The engine has automatic cut-off slide valves which are activated by external 2" diameter polished steel shafts running parallel to the cylinders which are in turn geared directly to the main shaft. The shafts in turn operate a series of cams which open and close the four valves for each cylinder. The governor system is a 72" high polished steel shaft employing the "Watt" type of spherical controls.

An integral part of the engine is its American style or continuous rope drive power transmission system. The engine is perhaps the only surviving example of this type of power transmission system, which was manufactured by the Dodge Engineering Company of Misawaska, Indiana. The system is comprised of an idler pulley, a take-up pulley and a tensioner carriage linked by 1,200 feet of continuous, four strand, 1-1/2" manila transmission rope. The rope is laid in 18, 1-1/2" deep machined and polished grooves on the flywheel and corresponding grooves on the take-up pulley. The system's tensioner carriage rides on two, 14-foot parallel steel rails suspended from the ceiling of the engine room by eight steel stanchions, measuring 3" x 32". The configuration of the pulleys and tensioner carriage conforms directly to original rope manufacturers diagrams.[3] The rope drive is fully functional and powers pulleys on line shafting suspended from the ceiling of the engine room.

RELOCATION AND RESTORATION INFORMATION

Extensive attention was taken to photo document the engine and its related components prior to their relocation from Beaumont, Texas to Miami, Florida in 1984. Subsequent to photo documentation of the engine prior to disassembly, a complete system of tagging individual pieces was accomplished. An additional safeguard measure was accomplished by photo documentation of the piece labeling system. Following these procedures, the engine was disassembled over a two week period. Disassembly required the full time (seven days a week) efforts of a two man team, augmented periodically by numerous laborers for particular labor intensive tasks. Removal of the 16-ton flywheel and the 4-1/2-ton crankshaft required demolition of part of the mill roof in order to allow the components to be lifted out by an 80-ton crane.

Once transported to its present site at Miami, Florida, the task of cleaning and restoration began. Procedures used in this process included cleaning of all greases and oils by 180 degree caustic soda baths, followed by steam cleaning to remove all traces of the caustic soda. Cast iron parts were then carefully sand-blasted, all machined surfaces securely covered during the process. The engine castings were then primed and sealed with two coats of Dupont Corlor (824S or 825S) and areas that needed filling were treated to gain a smooth surface texture. This was all done following procedures recommended by Robert I. Johnson.[4] The surfaces were then sanded and primed again for the third coat of Dupont primer/sealer. After this coat, two coats of Dupont Dulux alkyd enamel paint were applied in colors typical of those used at the turn of the century (the original color scheme is not known). Corresponding to the work on the cast and painted surfaces, the machined surfaces were to be polished and coated with "Magnus FF-11," a clear coating formulated by the Magnus Chemical Company.

Following this procedure, a detailed physical inspection of the engine was undertaken. The purpose of the inspection was not only to locate any damage such as cracks, repairs, etc., but also to determine if there were any extraneous bolt holes indicating evidence of some missing or altered parts. No such evidence was detected. Secondly, the existing parts were correlated directly to line drawings of similar heavy duty frame type engines in an original Greenwald factory catalog.[5]

After this phase, the actual reassembly of the engine began. The engine was first placed on raised concrete foundations which were laid utilizing a transit for leveling the surfaces. Once the cylinder assemblies were set on the foundation and aligned, the careful placement and alignment of the 4-1/2-ton crankshaft was initiated. Taking several days and requiring the repeated blueing, turning and removal of the crankshaft, the babbit surfaces of the main bearings were meticulously hand scraped. The alignment of the crankshaft and cylinders required days of careful effort utilizing piano wire, calipers and a transit to obtain the exact alignment.

As a result of these efforts, the engine appears today as it would have when first assembled, unaltered by the addition of any unauthorized parts or the removal of any of the original equipment. It remains the only known Greenwald engine and one of the very few large cross-compound engines in the United States.[6]

NOTES

[1] A foundation plan provided by the Beaumont Rice Mill for this engine indicated that the date of manufacture was 1906. The serial number stamped on many of the engine's parts agrees with information provided by the Beaumont Rice Mill, confirming that the serial number of the engine is 1058.

[2] Robert Wernick, "The Singular Vision of a Reincarnated Victorian Millwright," The Smithsonian Magazine, Vol. 16, No. 7. (October, 1985), p. 193.

3 Hunt, C. W. Manila Rope Transmission and Hoisting. New York: C. W. Hunt and Company, 1872, p. 34.

4 Robert Wernick, The Smithsonian Magazine.

5 Greenwald Automatic Cut-Off Engine Catalog #5, pp. 27-30, 46.

6 Vogel, Robert M., Curator, Division of Engineering and Industry, National Museum of American History, Smithsonian Institution. Correspondence to Finlay B. Matheson, December 3, 1985, and interview by Lamar Noriega, May 16, 1985.

ANALYSIS OF INTEGRITY

LOCATION: The engine and rope drive assembly described above was used to power a rice mill in Beaumont, Texas until its replacement by a more modern and cost effective system in 1984. Its preservation in situ or at an alternate on the mill site was not possible. Therefore, its relocation was an essential prerequisite to prevent its loss through demolition for scrap. However, the resulting compromise of its locational integrity by removal to its present site does not materially detract from its primary historic significance as the only known surviving example of a major technological innovation in the development of stationary steam power machinery for industrial application. Such stationary engine and drive assemblies were installed and used in a wide variety of applications configured to meet individual needs and circumstances in locations throughout the country.

DESIGN: The integrity of design is in no way compromised. The engine and rope drive assembly, including its innovative valve system, appears today as it would have when first erected, unaltered by either the addition of non-engine parts or the removal of any original equipment. It has been completely and authentically restored to operating condition as originally designed.

SETTING: The present setting approximately reflects the environment in which such power and drive assemblies were typically installed. The assembly is housed beneath a steel frame and corrugated metal sheet attached to an industrial warehouse located in an industrial section of Miami. The setting is thus appropriate to the industrial and utilitarian character of the engine.

MATERIALS: The integrity of materials remains totally intact, and has been enhanced by the restoration and preservation treatment carried out since the relocation of the assemble. All work involved in the disassembly, shipment, and reassembly of the engine and power drive was performed under competent supervision and carried out to museum quality standards.

FEELING: The assembly continues to impart an impressive feeling of its historic character through its massive size, functional design, and mechanical complexity. This feeling is particularly impressive when the engine is set in motion and reflects the predominance of steam driven, mechanically transmitted power systems in nineteenth and early twentieth century industrial development.

ASSOCIATION: Although the direct association of this particular engine and rope drive assembly with its historic use in the Beaumont Rice Mill has been lost, its integrity of design, materials, and workmanship, together with its authentic restoration in an appropriate evocative setting, provide a sense of the typical purpose and use of stationary power lant installations in American industry.

IN SUMMARY: The I & E Greenwald engine and rope drive assembly is the only remaining example of a significant technological development in the design and construction of industrial power machinery. It retains the physical and aesthetic integrity of its original design, materials, and workmanship to a remarkably high degree. Its meticulous restoration in an appropriately prepared setting effectively mitigates the effects of its relocation.

8. Significance

Period	Areas of Significance—Check and justify below			
___ prehistoric	___ archeology-prehistoric	___ community planning	___ landscape architecture	___ religion
___ 1400–1499	___ archeology-historic	___ conservation	___ law	___ science
___ 1500–1599	___ agriculture	___ economics	___ literature	___ sculpture
___ 1600–1699	___ architecture	___ education	___ military	___ social/ humanitarian
___ 1700–1799	___ art	___ engineering	___ music	___ theater
___ 1800–1899	___ commerce	___ exploration/settlement	___ philosophy	___ transportation
X 1900–	___ communications	X industry	___ politics/government	X other (specify) Technology
		X invention		

Specific dates 1906 **Builder/Architect** I. and E. Greenwald Company

Statement of Significance (in one paragraph)

SUMMARY

The I. and E. Greenwald steam engine is significant for reasons both industrial and technological in nature. The industrial significance of the engine is derived primarily through its association with the East Texas rice industry. Prior to 1926, for an undetermined amount of time, the engine was used for irrigation purposes. Subsequently, the owner of the Beaumont Irrigation Company and Beaumont Rice Mill, Joe Broussard, Sr., finding a need for more power for his rice mill, had the engine moved to Beaumont where it powered his rice mill for over half a century. Demonstrating ingenuity and efficiency, the rice mill recycled spent rice hulls by forcing them into the boiler by steam injection, thereby running the engine on the product it helped produce. The engine is also significant technologically because of its unusual valve system and its power transmission system. The engine has a plane plate (gridiron type) sliding valve system actuated by a cam shaft which has a co-incident rotary motion with the main crank shaft.[1] This is believed to be the only example of this specific Greenwald type valve system. Technological significance is also demonstrated through the engine's rope drive power transmission system. Rope drive as a form of power transmission was introduced in America in the 1840's but did not come into prominence until the late 1880's.[2] There are no known examples of an American rope drive engine such as this on display or in any museum. The engine was moved from Beaumont, Texas, to Miami, Florida, in 1984 in an effort to secure its preservation and restoration. Although the industrial significance of the engine is not directly associated with its present Florida location, the technological significance of the engine has not been compromised by its relocation. Further, the subsequent restoration of the engine has served to only further enhance its technological importance.

THE I. AND E. GREENWALD COMPANY

American manufacturing and industrial empires were in many cases created by immigrants bent on pursuing the American dream free of old world constraints on their labor and inventiveness. Isaac and Ezra Greenwald pursued their dreams and forged them through just such hard work and inventiveness. By 1846 Isaac had established himself with a partner in the carpentry business. Within the next five years they had expanded their skills and were now iron founders and millwrights. By 1858 Isaac had joined his brother Ezra, combining one's technical expertise with the other's business acumen. In 1863 they were involved in the manufacture of steam engines and by 1885 they had branched out into other products, including mill gearing, for which they were credited as having the "largest variety of patterns in the country."3

As with many burgeoning dynasties, sons followed their fathers in work. Members of both brothers' families went into the industry in various capacities. Isaac's son Thomas Lambert Greenwald worked his way up through the hierachy of the plant from bench laborer to Vice President of the company by 1895. But by 1888 the fortunes of the company and the family were failing. In 1888 Isaac was killed in an industrial accident at the shop and by 1895 his brother Ezra was also dead. Financial reverses followed and pressures mounted from other family members for liquidation rather than investment of more capital for improvements. In 1913 nature delivered the fatal blow in the form of a devastating flood which inflicted such damage to the Greenwald plant that it was forced into receivership. The demise of the I. and E. Greenwald Company was the end to a long chapter in the history of American industry and to the history of Cincinnati as well.

INDUSTRIAL AND TECHNOLOGICAL SIGNIFICANCE

The I. and E. Greenwald engine #1058 has a documented history of powering the Beaumont Rice Mill for over 56 years of continuous service. It was retired not due to mechanical inefficiency or failure but rather because the mill was unable to obtain a 24 hour engineering staff to monitor the engine's operation. Prior to its installation in the rice mill, the engine was used on the San Jacinto River for an unspecified amount of time by the Beaumont Irrigation Company. Prior to its use in the irrigation of Texas rice fields, it may have been employed in any one or a number of mills, mines or factories which would have required the use of its tremendous motive force. It is inherent in the character of this type of engine that it would never have been expected to remain in one place for its entire working life.[4] In this way it can be argued that the technological significance of the engine is not dependent upon its location and accordingly that the relocation of the engine from Texas to Florida has not compromised this area of its significance.

The engine's second technologically significant component is its valve system. The I. & E. Greenwald valve system is unique although other engine manufacturers had their own versions of an efficient valving system. The engine makes use of an efficient automatic cut-off valve system using traditional slide valves such as was a hallmark of the I. & E. Greenwald Company. This system permitted the long-term operation of the engine with no erratic wear on the valve surfaces which otherwise might have been cause for frequent interruption of service for repair. The reliability of this system is evident in the almost constant operation of the engine for over 50 years with no significant repair down time.[5] The Greenwald automatic slide valve system was recognized as a leader in the field of engine manufacturing. "Plane sliding valves are so well known, their great durability and other good qualities so unquestionable an established fact, that mechanics and engineers justly regard them as the highest standard in use,"[6] noted the Greenwald catalog. While this type of valve gear not only increased the efficiency of the system from a maintenance point of view, it also increased the smooth flow of power

in the engine due to the quick action of the gridiron type slide valves activated by trip latches and aided by dash pots. The only known examples of a similar valve system, although different, are three engines in the Henry Ford Museum, Dearborn, Michigan, each making use of C. H. Brown valves.

NOTES

1 I. & E. Greenwald Catalog #5, Cincinnati: I. and E. Greenwald Company, undated pp. 19 and 21.

2 Flather, John J., Rope Driving, 1st Edition. New York: John Wiley and Sons, 1897, pp. 1 and 3.

3 Roe, George Mortimer, "Cincinnati: Queen City of the West," Cincinnati: Cincinnati Times Star Co., 1895, p. 116.

4 Vogel, Robert M., Curator, Division of Engineering and Industry, National Museum of American History, Smithonian Institution. Correspondence to Finlay B. Matheson, December 3, 1985.

5 Thallman, Robert, engineer for the Beaumont Rice Mill, interview by Finlay B. Matheson, February, 1984.

6 I. & E. Greenwald Catalog #5, p. 19.

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"Beaumont: The Twentieth Century City" Beaumont, Texas: Beaumont Chamber of Commerce, 1912.

Cist, Charles. Sketches and Statistics of Cincinnati in 1859.

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"A Little Blue Book on Rope Transmission". 3rd Edition. New York: The American Manufacturing Company, 1902.

"Mesta Rope Drives". Pittsburgh: Mesta Machine Company, 1923.

Roe, George Mortimer. "Cincinnati: Queen of the West". Cincinnati: Cincinnati Times-Star Company, 1895.

UNPUBLISHED SOURCES

Broussard, Joseph II. Interview by Finlay B. Matheson, February 1984, Beaumont, Texas. Mr. Broussard is the present owner of the Beaumont Rice Mill and his family has owned it since its inception.

Greenwald, Mabel. Interview by Brien Doran, May 1985, Cincinnati, Ohio. Mabel Greenwald is the granddaughter of Isaac Greenwald, one of the founders of the I. & E. Greenwald Company.

Hartford Steam Boiler Inspection and Insurance Company. Correspondence dated 1923 between Walter Gerner, Chief Inspector, and H. B. Vandereb, Superintendent, Engineering Department. Original correspondence in the Smithsonian Institution's files.

Thallman, Elmer. Interview with Finlay B. Matheson, February 1984, Beaumont, Texas. Mr. Thallman worked for the Beaumont Rice Mill for 63 years and was present when the I. & E. Greenwald engine was installed in 1926.

Vogel, Robert M., Curator, Division of Engineering and Industry, National Museum of American History, Smithsonian Institution. Interview by Lamar Nariega, May 16, 1985, Washington, D.C.

Vogel, Robert M., Curator, Division of Engineering and Industry, National Museum of American History Smithsonian Institution. Correspondence to Finlay B. Matheson, December 3, 1985.

9. Major Bibliographical References

See Continuation Sheet

10. Geographical Data

Acreage of nominated property ___

Quadrangle name South Miami

Quadrangle scale 1:24,000

UTM References

	Zone	Easting	Northing
A	17	574180	2846100
B			
C			
D			
E			
F			
G			
H			

Verbal boundary description and justification The engine is contained within a 24.00' x 100.25' shed located on the western portion of Lots 1 through 9 inclusive, Block 13 of Realty Securities Subdivision of Coconut Grove. Reference attached survey plat.

List all states and counties for properties overlapping state or county boundaries

state	N/A	code N/A	county	N/A	code N/A
state	N/A	code N/A	county	N/A	code N/A

11. Form Prepared By

name/title Brien Doran, Michael Zimny/Historic Sites Specialist

organization Bureau of Historic Preservation date July 1986

street & number The Capitol telephone (904) 487-2333

city or town Tallahassee state Florida

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

X national ___ state ___ local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature George W. Percy

title State Historic Preservation Officer date 7/29/86

For NPS use only

I hereby certify that this property is included in the National Register

Keeper of the National Register date

Attest:

Chief of Registration date

GPO 911-399

NPS Form 10-900
(3-82)

RECEIVED
AUG 20 1990
ARIZONA STATE PARKS BOARD

OMB No. 1024-0018
Exp. 10-31-84

United States Department of the Interior
National Park Service

National Register of Historic Places Inventory—Nomination Form

For NPS use only
received JAN 24 1995
date entered FEB 21

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name

historic FLORIDA EAST COAST RAILWAY LOCOMOTIVE #153

and/or common ENGINE #153

2. Location

street & number 12400 Southwest 152nd Street N/A not for publication

city, town MIAMI N/A vicinity of

state FLORIDA code 12 county DADE code 025

3. Classification

Category	Ownership	Status	Present Use	
___ district	___ public	___ occupied	___ agriculture	_x_ museum
___ building(s)	_x_ private	_x_ unoccupied	___ commercial	___ park
___ structure	___ both	___ work in progress	_x_ educational	___ private residence
___ site	**Public Acquisition**	**Accessible**	___ entertainment	___ religious
_x_ object	___ in process	_x_ yes: restricted	___ government	___ scientific
	___ being considered	___ yes: unrestricted	___ industrial	_x_ transportation
	N/A	___ no	___ military	___ other:

4. Owner of Property

name GOLD COAST RAILROAD MUSEUM

street & number 12400 Soutwest 152nd Street

city, town MIAMI N/A vicinity of state FLORIDA

5. Location of Legal Description

courthouse, registry of deeds, etc. N/A

street & number N/A

city, town N/A state N/A

6. Representation in Existing Surveys

title N/A has this property been determined eligible? ___ yes _x_ no

date N/A ___ federal ___ state ___ county ___ local

depository for survey records N/A

city, town N/A state N/A

7. Description

Condition		Check one	Check one
x excellent	___ deteriorated	x unaltered	___ original site
___ good	___ ruins	___ altered	___ moved date N/A
___ fair	___ unexposed		

Describe the present and original (if known) physical appearance

Outshopped by the American Locomotive Company's Schenectady Works as locomotive #63262 in May of 1922, Engine #153 is a Pacific-type 4-6-2 oil-burning steam locomotive initially intended for fast passenger train operations. The 203,500 pound locomotive is equipped with type "E" superheater, Walscheart valve gear, and 68 inch driving wheels. The locomotive generates 1,500 horsepower and 29,000 pounds of tractive effort; it runs on steam pressure of 180 pounds per square inch, and has 22 inch by 26 inch cylinders. The locomotive's tender has a capacity of 7,300 gallons of water and 3,500 gallons of fuel oil. Engine #153 was retired from service by the Florida East Coast Railway in 1937, and was sold to the United States Sugar Corporation for $8,000.00 on 29 December 1939.[1] It was used by USSC on their industrial railway at the Clewiston Sugar House, keeping the same number (USSC #153). On 12 April 1957 Engine #153 was donated by USSC to the University of Miami.[2] The Miami Railroad Historical Society, predecessor of the Gold Coast Railroad, was organized for "perpetual maintenance, upkeep and running of the engine."[3]

FOOTNOTES

[1] District Court of the United States, Southern District of Florida. Florida East Coast Railway Bankrupt Documents #910 and #911 filed at Jacksonville, Florida 28 December 1939 and 29 December 1939 respectively. Bound volumes in possession of Seth Bramson, Miami Shores, Florida.

[2] "Old 153 will get its welcome today", Miami Herald, 12 April 1957, p. 28C.

[3] "End of line for old 153 is South Campus at University", Miami Herald, 7 April 1957, p.10A.

8. Significance

Period	Areas of Significance—Check and justify below				
___ prehistoric	___ archeology-prehistoric	___ community planning	___ landscape architecture	___ religion	
___ 1400–1499	___ archeology-historic	___ conservation	___ law	___ science	
___ 1500–1599	___ agriculture	___ economics	___ literature	___ sculpture	
___ 1600–1699	___ architecture	___ education	___ military	___ social/ humanitarian	
___ 1700–1799	___ art	___ engineering	___ music	___ theater	
___ 1800–1899	_x_ commerce	___ exploration/settlement	___ philosophy	___ transportation	
_x_ 1900–	_x_ communications	___ industry	___ politics/government	___ other (specify)	
		___ invention			

Specific dates 1922 **Builder/Architect** AMERICAN LOCOMOTIVE COMPANY

Statement of Significance (in one paragraph)

Originally constructed for the Flagler System's Florida East Coast Railway, Engine #153 is significant in the areas of commerce, communications and transportation at the level of state significance. Through its association with FEC Railway and the United States Sugar Corporation, the locomotive is intimately connected with the history and development of the east coast of Florida. As Engine #153, the locomotive functioned to haul both passenger and freight trains over the FEC system in Florida between 1922 and 1937. Later, through its ownership by the United States Sugar Corporation, it was used to haul sugar cane trains to the company's mill in Clewiston. The locomotive is kept in operating condition today by the Gold Coast Railroad Museum. It provides an important reminder of the railroad's contribution to the economic and social development of South Florida

Engine #153 was built for the Florida East Coast Railway, a unit of the Flagler System. In addition to the railway, the Flagler System included the Florida East Coast Hotel Company which operated 10 resort hotels (8 along Florida's east coast--and served by the FEC Railway--and 2 in Nassau, Bahamas--served by the P & O Steamship Line), the Model Land Company, several smaller land companies, a number of local utility companies, Jacksonville's Florida Times-Union (the largest daily newspaper in the state) and almost all of the daily newspapers along the east coast, and controlling interest in the Peninsular & Occidental Steamship Company (which provided service to the Nassau hotels, Key West and Havana). Flagler's "system" founded the towns of West Palm Beach and Homestead, and was instrumental in the development of Miami.[1]

Engine #153 has never left the state of Florida since it was delivered to the Florida East Coast Railway at Jacksonville in 1922. Engine #153 was assigned to engineer Gilbert Totten and while the locomotive operated primarily between Fort Pierce and Key West, it had occassion to run over the entire FEC system. The locomotive handled special pineapple and banana trains between Key West and Miami, in addition to regularly scheduled passenger train on the FEC's "Oversea Extension"--the railroad that went to sea.[2] Engine #153 had the distinction of hauling President Calvin Coolidge's special train to Key West in January 1928.[3] President Coolidge and his party made a trip to Havana, Cuba to address the Sixth Pan American Conference.[4] Engine #153 remained in service through three hurricanes. Legend says that it powered the last train to leave Key West before the great Labor Day hurricane of 2 September 1935 struck the Florida Keys, wrecking the "Oversea Extension" of the FEC and severing Key West's rail link to the mainland forever. Because the FEC was in bankruptcy, reconstruction of the "Oversea Extension" was financially impossible. The right-of-way later formed the foundation for the "Oversea Highway", but reminders of the railroad (rail bridges, a mile post, etc.) remain to this day.[5] After the storm abated Engine #153 pushed the survey train as far south on the "Oversea Extension" as possible so that railway officials and construction engineers could assess storm damage to the right-of-way (see photo #8).[6]

In 1937 Engine #153 was retired from service, and in 1939 it was sold to the United States Sugar Corporation (USSC) for $8,000.00.[7] During this phase of Engine #153's service, it hauled sugar can trains to the USSC mill in Clewiston, Florida. A photograph of USSC's locomotive fleet shows Engine #153 as the second steam engine from the right (see photo #7).8

On 12 April 1957 USSC donated Engine #153 to the University of Miami. The Miami Railroad Historical Society, the predecessor of the Gold Coast Railroad, was organized to operate the locomotive. Engine #153 was operated at the old South Campus of the University of Miami, formerly Richmond Naval Air Stateion, in Sunday afternoon excursion passenger train service.[9] Because of the buildup of defense facilities during the Cuban missile crisis in 1962, the Gold Coast Railroad moved from this site in southern Dade County to a site adjacent to the Fort Lauderdale-Hollywood International Airport in southern Broward County. Here Engine #153 operated in Sunday afternoon excursion service until 1984 when construction plans for Interstate 595 forced the relocation of the Gold Coast Railroad Museum back to its original site in southern Dade County, at the old Richmond Naval Air Station site, adjacent to Dade County's new Metrozoo. Here Engine #153 will continue to power excursion trains between the museum/zoo area and downtown Homestead (a town founded by the Flagler System), a twenty-two mile round-trip over the tracks of the Seaboard System Railroad.

FOOTNOTES

[1]Akin, Edward Nelson. Southern Reflection of the Gilded Age: Henry M. Flagler's System, 1885-1913. University of Florida Ph.D. dissertation, 1975.

[2]Parks, Pat. The Railroad That Died At Sea. (Brattleboro, VT: Stephen Green Press, 1968), pp. 43-44.

[3]Letter from Florida East Coast Railway Company, John W. Martine, Trustee to Gold Coast Railroad, 30 April 1957. On file at Gold Coast Railroad Musuem, Miami.

[4]"En Route Through Miami and Key West", New York Times, 15 January 1928, p. 2, col. 5.

[5]I call this a "legend" because I have been unable to verify it in a primary source. The statement appears in numerous later printed articles. At the time of the Florida East Coast Railway strike, many important business records of the FEC were discarded or destroyed. Some which escaped destruction are in the private collection of Seth Bramson of Miami Shores.

[6]Official Florida East Coast Railway photograph. Negative owned by Seth Bramson and used with permission.

[7]District Court of the United States, Southern District of Florida. Florida East Coast Railway Bankruptcy Documents #910 and #911 filed at Jacksonville 28 December 1939 and 29 December 1939 respectively. Bound volumes in possession of Seth Bramson.

[8]Official United States Sugar Corporation photograph courtesy of John B. Boy, USSC president.

[9]"Old #153 Will Get Its Welcome Today", Miami Herald, 12 April 1957, p. 28C, "End Of Line For Old #153 is South Campus at University", Miami Herald, 7 April 1957, p. 10A.

9. Major Bibliographical References

See continuation sheet #2.

10. Geographical Data

Acreage of nominated property Less than one acre

Quadrangle name Goulds Quadrangle scale 1:24,000

UTM References

	Zone	Easting	Northing
A	17	559640	2833680
B			
C			
D			
E			
F			
G			
H			

Verbal boundary description and justification

Florida East Coast Railway Locomotive #153

List all states and counties for properties overlapping state or county boundaries

state	N/A	code	N/A	county	N/A	code	N/A
state	N/A	code	N/A	county	N/A	code	N/A

11. Form Prepared By

name/title Samuel J. Boldrick/Michael Zimny, Historic Site Specialist

organization DAHRM date 12-10-84

street & number The Capitol telephone (904) 487-2333

city or town Tallahassee state Florida

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

___ national X state ___ local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature George W. Jones

title SHPO date 1/4/85

For NPS use only

I hereby certify that this property is included in the National Register

Patrick Andrus date 2/21/85

for Keeper of the National Register

Attest: date

Chief of Registration

Books Akin, Edward Nelson. Southern Reflection of the Gilded Age: Henry M. Flagler's System, 1885-1913. University of Florida Ph.D. dissertation, 1975.

Parks, Pat. The Railroad That Died At Sea. Brattleboro, Vt.: Stephen Greene Press, 1968.

Court Documents District Court of the United States. Southern District of Florida. Florida East Coast Railway Bankruptcy Documents.

Newspapers "En Route Through Miami and Key West." New York Times, 15 January 1928, p. 2. col. 5.

"End of Line For Old #153 is South Campus at University." Miami Herald, 7 April 1957, p. 10A.

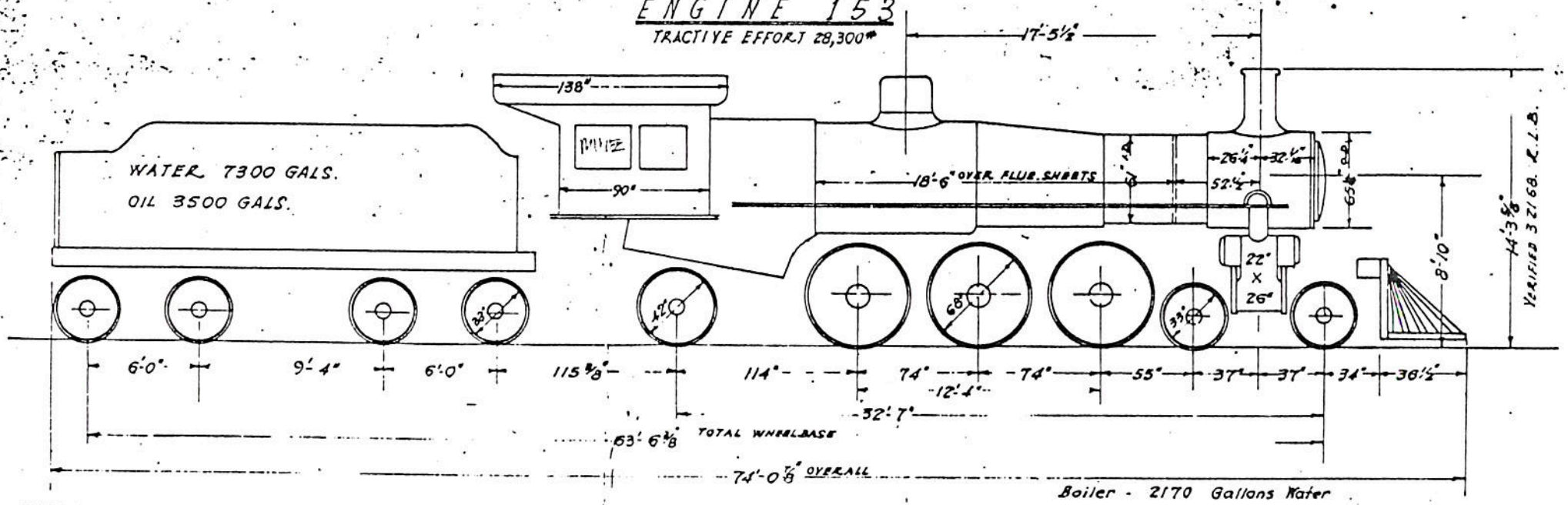
"Old #153 Will Get Its Welcome Today." Miami Herald, 12 April 1957, p. 28C.

Scrapbook Gold Coast Railroad Museum History.

GOLD COAST RAILROAD INC.

EX-FLORIDA EAST COAST RAILWAY CO.

ENGINE 153



WIDTH OF CAB	121"
CENTER TO CENTER - FRAMES	43"
" " " CYLINDERS	86"
VALVES 11" PISTON	
BOILER PRESSURE	180#
NO. TUBES 146-2" 21-5⅜"	
HEATING SURFACE - TOTAL	2111 SQ. FT.
" " TUBES	1951 " "
" " FIREBOX	160 " "
SUPERHEAT "	440 " "
WIDTH OF FIREBOX - BOTTOM	70¼"

WIDTH OF FIREBOX TOP	58"
HEIGHT OF FIREBOX FRONT	71½"
HEIGHT OF FIREBOX BACK	56½"
GRATE SURFACE	47.1 SQ FT.
RATIO GRATE TO HEATING SURFACE	1: 48.5
DRIVING JOURNALS MAIN	9½" X 12"
" " OTHERS	8½" X 12"
ENGINE TRUCK JOURNALS	5½" X 10"
TRAILING " "	8" X 14"
BUILDER	AMERICAN LOCOMOTIVE CO.
DATE BUILT - 1922	BUILDERS NO 63262

WEIGHT ON DRIVERS	129,000 LBS.
" ON LEAD TRUCK	37,000 "
" ON TRAILING TRUCK	37,500 "
TOTAL WEIGHT OF ENGINE	203,500 "
" " " TENDER - LOADED	168,000 "
" " " " LIGHT	80,260 "
" " " ENGINE "	185,400 "

TOTAL ENGINE & TENDER IN WORKING ORDER 371,500# = 185¼ TONS

SCALE: ⅛" = 1'2"
W.H. TOUSEY
4-25-1957

Copied 4-8-68 E. Blaker 6812-698

Form No. 10-300 (Rev. 10-74)

PH0691941

DATA SHEET

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED FEB 5 1976
DATE ENTERED MAR 25 1977

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC
Texas & Pacific Steam Locomotive #610

AND/OR COMMON

RECEIVED
AUG 20 1990
ARIZONA STATE PARKS BOARD

2 LOCATION

STREET & NUMBER
400 E. Exchange Avenue

__NOT FOR PUBLICATION

CITY, TOWN
Fort Worth

__ VICINITY OF

CONGRESSIONAL DISTRICT
12

STATE
Texas

CODE
048

COUNTY
Tarrant

CODE
439

3 CLASSIFICATION

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	__PUBLIC	__OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	√PRIVATE	__UNOCCUPIED	__COMMERCIAL	__PARK
__STRUCTURE	__BOTH	√WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
__SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
√OBJECT	__IN PROCESS	√YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	__YES: UNRESTRICTED	__INDUSTRIAL	√TRANSPORTATION
		__NO	__MILITARY	__OTHER:

4 OWNER OF PROPERTY

NAME
610 Historical Foundation

STREET & NUMBER
3500 Hulen Street

CITY, TOWN
Fort Worth

__ VICINITY OF

STATE
Texas

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.
Texas & Pacific Railway Company

STREET & NUMBER
Main and Lancaster Streets

CITY, TOWN
Fort Worth

STATE
Texas

6 REPRESENTATION IN EXISTING SURVEYS

TITLE
Tarrant County Historic Sites Inventory

DATE
1975

__FEDERAL √STATE __COUNTY __LOCAL

DEPOSITORY FOR SURVEY RECORDS
Texas Historical Commission

CITY, TOWN
Austin

STATE
Texas

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
✓EXCELLENT	_DETERIORATED	✓UNALTERED	✓ORIGINAL SITE
_GOOD	_RUINS	_ALTERED	✓MOVED DATE 1969
_FAIR	_UNEXPOSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

Texas and Pacific steam locomotive #610 was built by the Lima Locomotive Works in 1927 and was delivered to the T&P in June of that year. The mammoth locomotive was designed expressly for the T&P to handle the heavy freight hauls between Texarkana and El Paso. The 2-10-4 wheel arrangement was the first of its kind to be used on an American railroad. The four-wheel trailing truck was devised to accomodate a larger firebox for greater boiler pressure.

The cylinders of the locomotive measure 29x32 inches with nickel silver cylinder heads, a T&P trademark. The 63-inch driving wheels support the 725,200-pound locomotive. The original Walschaerts driving rod assembly was replaced in 1938 with a light-weight burnished rod assembly, thereby increasing the maximum speed from 45 to 60 miles per hour. The engine with the tender measures 99 feet-1 inch in length, and 15 feet-5 3/4 inches in height. The boiler pressure of 255 pounds-per-square-inch developed a tractive effort of 97,900 pounds. The cost of the locomotive when built was $106,656. When retired in 1950, the value had depreciated to $2,718.

Other idiosyncracies of the 2-10-4 or Texas Type locomotives of the T&P were the Elesco feed-water heaters. Cylindrical in shape and three-feet in diameter, the unit is located directly over the smokebox door on the front of the boiler. This special device pre-heated the water as it circulated through the flues in the boiler. Another unusual feature of the locomotives are the square sand domes as opposed to the cylindrical-shaped domes used by most railroads. The square shape allowed for greater sand storage volume as required to prevent driver slippage on the many grades encountered on the T&P system. Still another distinctive trademark of the Texas & Pacific locomotives is the flared bell of the exhaust stack. Both the bell of the stack and the smokebox door were silver in color. Three additional colors used in painting the T&P mainline engines were: black for the front side sections of the boiler, pilot, pump shields, sides of the cab, and the tender; light gray for the rear sections of the boiler and firebox; dark red for the roof of the cab.

A Sunbeam headlight with a visor graced the center of the boiler door. The number 610 was illuminated on either side of the headlight, and the T&P diamond-shaped railroad herald was located on both pump shields, and in the center of the feed-water heater on the front of the boiler.

8 SIGNIFICANCE

PERIOD

—PREHISTORIC
—1400-1499
—1500-1599
—1600-1699
—1700-1799
—1800-1899
✓1900-

AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW

—ARCHEOLOGY-PREHISTORIC
—ARCHEOLOGY-HISTORIC
—AGRICULTURE
—ARCHITECTURE
—ART
—COMMERCE
—COMMUNICATIONS
—COMMUNITY PLANNING
—CONSERVATION
—ECONOMICS
—EDUCATION
✓ENGINEERING
—EXPLORATION/SETTLEMENT
—INDUSTRY
✓INVENTION
—LANDSCAPE ARCHITECTURE
—LAW
—LITERATURE
—MILITARY
—MUSIC
—PHILOSOPHY
—POLITICS/GOVERNMENT
—RELIGION
—SCIENCE
—SCULPTURE
—SOCIAL/HUMANITARIAN
—THEATER
✓TRANSPORTATION
—OTHER (SPECIFY)

SPECIFIC DATES 1927

BUILDER/ARCHITECT Lima Locomotive Works

STATEMENT OF SIGNIFICANCE

Texas and Pacific steam locomotive 610 is the only remaining example of the railroad's fleet of seventy engines of the 2-10-4 wheel arrange ment. Not only is the locomotive the last example of the 2-10-4 wheel arrangement, it is also one of only two remaining steam locomotives of the Texas and Pacific's roster of hundreds of steam engines. After the restoration currently underway is completed, the engine will be the largest operating steam locomotive in the world. The locomotive will also pull the American Freedom Train throughout Texas during February, 1976.

Engine 610 was built by the Lima Locomotive Works of Lima, Ohio during 1927, and was delivered to the Texas and Pacific in June of that year. The locomotive was the first of the second group of now famous "Texas Type" engines, so named because of their inception and first service on the Texas and Pacific Railway. The first group of ten locomotives, numbered 600-609 and classed I-1, were delivered in 1925. The following four classes, I2-I5 and numbered 610-624, 625-639,640-654,655-669, were built and delivered during 1927-1929. Of these seventy engines, only the 610 is extant.

The T&P's 600 series engines were designed to accomodate the heavy freight traffic between Texarkana and El Paso, which reached its zenith during the late 1920's and early 1930's. The smaller freight engines of the 2-8-2 or Mikado wheel arrangement which preceded the 2-10-4's were incapable of handling the increased freight traffic. So successful was the first class of new engines that four more classes were ordered during the next four years.

Modifications were made to the T&P's 600 series engines in August, 1938, by application of light weight driving rods and improved counterbanalces so that the maximum speed was increased from 45 to 60 miles per hour. This modification was made to make the engines suitable for both freight and passenger service. During the motive power shortage brought about by World War II, many of the troop trains were pulled by 2-10-4's.

Form No. 10-300a
(Rev. 10-74)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

FOR NPS USE ONLY
RECEIVED FEB 5 1976
DATE ENTERED MAR 25 1977

During the twenty-three years of active service on the T&P Railway from June, 1927, through February, 1950, the locomotive pulled trains over 1,152,872 miles of T&P tracks. All seventy of the 600 series locomotives were retired from the active motive power roster in 1950. Engine 638 was preserved along with 610, and the locomotives were presented to the City of Dallas and Amon Carter, Sr., of Fort Worth, respectively. Locomotive 638 was displayed at the State Fair of Texas in Dallas in October, 1950, but vandalism soon ravaged the engine. So heavily damaged was the locomotive that the city officials decided to sell it for scrap value. After the engine had been dismantled, a group of citizens demanded a replacement engine. All of the other T&P locomotives had since been scrapped, so the railroad purchased a retired 4-8-2 or Mohawk locomotive from the New York Central Railroad in 1956. This engine was shipped to the T&P erecting shops in Marshall, Texas, where it was modified to resemble the famous 900 series of Texas and Pacific passenger locomotives. Engine 900 is currently displayed along with several other steam locomotives in the "Age of Steam" railroad exhibit at Fair Park in Dallas.

W. G. Vollmer, president of the T&P, presented engine 610 to Amon G. Carter, Sr., prominent Fort Worth businessman and civic leader, in a formal ceremony at the Will Rogers Coliseum on January 27, 1951. The ceremony was attended by hundreds of Fort Worth citizens, railroad officials, and businessmen. The locomotive was named "Will Rogers" in honor of the noted humorist who had made many appearances at the Southwestern Exposition and Fat Stock Show. After having been on display for many years in an open area of Will Rogers Park, the engine had deteriorated from exposure to the weather. The 610 Historical Foundation was chartered in 1969 for the purpose of preserving the locomotive and restoring it to operating condition. The engine was moved in July, 1969, from the park to the Fort Worth Army Depot for storage purposes. It remained at this location until February, 1975, when it was moved to its present location at the Fort Worth Stockyards. A contract between the American Freedom Train Foundation and the 610 Historical Foundation was signed on July 18, 1974, to insure that the locomotive would be restored in order to pull the Freedom Train throughout the Southwest. Private contributions toward the restoration amounted to more than $100,000.

GPO 892 455

9 MAJOR BIBLIOGRAPHICAL REFERENCES

Beebe, Lucius. Highball - A Pageant of Trains, New York: Bonanza Books, 1945, p. 113.

Westcott, Linn, editor. Steam Locomotives, Model Railroader Cyclopedia, Milwaukee: Kalmbach Publishing Company, Vol. I, 1960, pp.92

Roberts, Dick. "Old 610 Steams Again," Texas Highways, Vol. 23, No. 1976. pp. 18-20.

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY one

UTM REFERENCES

	ZONE	EASTING	NORTHING
A	14	655060	3628920
B			
C			
D			

VERBAL BOUNDARY DESCRIPTION

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

Joe R. Williams, Project Director; Stephen Smith, Research Associate

ORGANIZATION

Texas Historical Commission

DATE

January 14, 1976

STREET & NUMBER

1511 Colorado

TELEPHONE

512-475-3094

CITY OR TOWN

Austin

STATE

Texas

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL ✓ STATE ___ LOCAL ___

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

STATE HISTORIC PRESERVATION OFFICER SIGNATURE Jewell Galloway

TITLE Texas State Historic Preservation Officer DATE Jan. 20, 1976

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

CHIEF DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION DATE 3/28/77

ATTEST: KEEPER OF THE NATIONAL REGISTER DATE 3/22/77

GPO 892-453