NPS Form 10-900
(3-82)

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 JUL 11 1984
date entered AUG 9 1984

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

1. Name

historic Houston Street Viaduct

and/or common Dallas-Oak Cliff Viaduct

2. Location

street & number Houston St. roughly from ~~Union~~ Terminal to ~~intersection of~~ Lancaster Avenue (Arlington St.) N/A not for publication

city, town Dallas N/A vicinity of

state Texas code 048 county Dallas code 113

3. Classification

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

4. Owner of Property

name City of Dallas

street & number City Hall, 1500 Marsilla Street

city, town Dallas N/A vicinity of state Texas 75201

5. Location of Legal Description

courthouse, registry of deeds, etc. Dallas County Courthouse

street & number

city, town Dallas state Texas

6. Representation in Existing Surveys

title (1) Texas Historic Engineering Site Inventory
(2) Historic Sites Inventory
has this property been determined eligible? ___ yes X no

date (1) 1975
(2) 1984
___ federal (2) state ___ county (1) local

depository for survey records (1) History of Engineering Program, C.E. Dept., Texas Tech Univ.
(2) Texas Historical Commission

city, town (1) Lubbock
(2) Austin
state Texas

7. Description

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

Describe the present and original (if known) physical appearance

Extending across the Trinity River and connecting the Dallas Central Business District with the early suburb of Oak Cliff, the Houston Street Viaduct is one of the longest viaducts with reinforced-concrete arches ever built. The viaduct has had few alterations, and is noteworthy for the special "shoes" to accommodate ocean-going vessels which, almost 75 years after the bridge was built, have yet to materialize.

The reinforced concrete viaduct between Dallas and Oak Cliff is 6,562 feet long, 56 feet wide overall, and has a roadway of 44 feet with two 4.5-foot sidewalks. It is made of fifty-one, 79'6" arches, a steel girder 100 feet in length spanning the Trinity River, and 16 panels of concrete bents and girders next to the approaches. The crossing of Lancaster Avenue in Oak Cliff from the last pier to the abutments consists of six panels of girder design. Beyond this is an earthen approach 787 feet in length.

Laying of concrete was facilitated by a rigid tower and chute moving on a track next to the viaduct. Bents and girders were poured continuously using two shifts when necessary. Slabs and floor members were also continuously poured. Because of a drought during the construction of the viaduct, raw sewage was used in the concrete mixture.

All arch piers rest upon timber piles except for the easternmost abutment arch, which rests upon bedrock a few feet below the ground surface. Piles were driven into the ground and concrete was poured around them for a firm foundation.

Arches rest upon cross walls which are supported by three columns. Vertical supports rest upon cross walls and reinforced concrete arches. These vertical members support longitudinal girders which in turn support the floor slab.

One of the extraordinary features of the Houston Street Viaduct is the use of rocker bearings for girders. On one end, the longitudinal girders are rigidly attached to the reinforced corner brackets. On the other end, the girders rest in a socket formed by two bent copper plates extending the full width of the girders. The lower plate rests on the cross girder and the upper plate is fastened to the longitudinal girder. Both plates are connected by reinforcing bars just above each socket, but a cleavage plane is left between them to permit rotation. All girders are, therefore, discontinuous and designed as simple beams.

The cost of the project was $570,000, or $2.10 per square foot of floor. Dallas County paid all construction costs. The contractors were Corrigan, Lee, and Halpin of Kansas City, Missouri. Construction of the viaduct began in October of 1910 and was completed in late 1911.

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Despite major changes in the northern setting over the years, the viaduct remains substantially intact. A new concrete handrail was added in the early 1930s and, more recently, stairs were added to the Reunion Arena parking areas. Otherwise, the viaduct has not undergone visible modification.

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	
___ 1800–1899	___ commerce	___ exploration/settlement	___ philosophy	___ theater
X 1900–	___ communications	___ industry	___ politics/government	X transportation
		___ invention		___ other (specify)

Specific dates Built 1910-1911 **Builder/Architect** Corrigan, Lee, and Halpin, Contractors, Kansas City, Missouri.
Hedrick and Cochrane, Consulting Engineers, Kansas City, Missouri
J.F. Witt, Dallas Co. Engineer

Statement of Significance (in one paragraph)

The Houston Street Viaduct was the first of five concrete and steel viaducts built to connect the north and south sections of Dallas. One of the longest viaducts with reinforced concrete arches ever built (6,562'), the bridge was constructed entirely with Dallas County funds at a surprisingly low cost of $2.10 per square foot of floor. The bridge includes an unusual feature designed to facilitate ocean-going vessels in this inland city; a steel plate girder span over the river channel with special "shoes" that feature vertical bearing surfaces for transmitting the arch thrust through the piers to the girder span.

On May 25, 1908, the worst flood in Dallas history swept down the Trinity River causing over a million dollars worth of damage to homes and businesses located near the banks of the river. This flood washed away most of the bridges, and left the remaining one under water. The Oak Cliff community and Dallas were thus effectively cut off from each other for a week. The Houston Street Viaduct was built as a direct result of this flood.

In 1909, the County of Dallas voted a bond issue of $600,000 to construct the viaduct. After acquisition of the right-of-way, the county had $563,000 remaining for construction. In November of 1909, County Engineer J.F. Witt advertised for competitive bids. All bids had to be in on January 1, 1910, with these general specifications:

1. Any structure between Dallas and Oak Cliff has to be of reinforced concrete of either arch or trestle construction.
2. The bridge must provide a roadway for vehicular traffic and shall include two sidewalks, with provisions for a double-track electric railway in the future.
3. It must be 50 feet from handrail to handrail, or any greater width so long as that width does not cause the construction of the viaduct to exceed money available.
4. Conduit spaces must be provided longitudinally throughout the viaduct of no less than 20 square feet.
5. All designs are to consider live loads of two 100,000-pound electric cars on each track plus 100 pounds per square foot, or a 15-ton roadroller having maximum axle concentration of 10 tons. Sidewalks should be designed to support 80 pounds per square foot.
6. Complete construction plans, specifications, and design analysis are to accompany bids.

9. Major Bibliographical References

Cochrane, Victor H. The Dallas-Oak Cliff Viaduct. Engineering Record, LXIII, No. 13 (April 1, 1911), pp. 357-360.
Dallas Morning News, January 5, 1909.
Ralph Banks to Peter Flagg Maxson, interview, Austin, April 27, 1984
(see continuation sheet)

10. Geographical Data

Acreage of nominated property Approx. 8 acres
Quadrangle name Dallas, Tex **Quadrangle scale** 1:24000

UTM References

	Zone	Easting	Northing
A	14	705510	3628165
B	14	705530	3628080
C	14	704790	3626940
D			
E			
F			
G			
H			

Verbal boundary description and justification
The structure begins near the south line of Arlington Street and proceeds along the east side of Houston Street on an ascending grade of 2.8% to a point near the tracks of several railroads, a distance of 567.7 feet. From this point, (see continuation sheet)

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

state N/A	code	county	code
state	code	county	code

11. Form Prepared By

name/title	Murray R. Arrowsmith, Research Associate (with Peter Flagg Maxson, Texas Historical Commission)
organization	History of Engineering Program
date	April 1976 (April 1984)
street & number	Civil Engineering Department, Texas Tech University
telephone	(806) 742-1231
city or town	Lubbock
state	Texas

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

___ national ___ state X 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 Curtis Tunnell

title State Historic Preservation Officer date 2 July 1984

For NPS use only

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

Entered in the National Register date 8/9/84

for Keeper of the National Register

Attest: date

Chief of Registration

GPO 894-785

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All bids were considered by a board of engineers consisting of T.U. Baylor, Otto H. Lang, and N. Werenskiold. Of the 15 bids submitted, an arch design of Ira G. Hedrick, C.E., of Kansas City, Missouri, with M.R. Ash as Associate Engineer, was accepted with only two modifications. Exceptions included the adoption of pile footings instead of spread reinforced concrete footings, and widening of the roadway from 40 to 44 feet with two 45-foot-wide sidewalks. Pile footings were utilized because of soil conditions. The roadway was broadened because the bid submitted was low enough to warrant the alteration with money available.

The county awarded the contract to Corrigan, Lee and Halpin, of Kansas City, Missouri. The field work was carried out under the supervision of Hedrick and Cochrane, Consulting Engineers, of the same city, and J.F. Witt, Dallas County Engineer. Work on the viaduct began in October of 1910 and was completed late in 1911. It incorporated top-quality materials and workmanship, and utilized both proven and innovative techniques. The proposed Trinity River Canal, which would have connected Dallas to the 300-mile-distant Gulf of Mexico, demanded a 90-foot clearance under the viaduct's central span. The use of a concrete arch at this point was prohibited by the height. It was necessary either to build abutment piers on either side of the river capable of receiving the unbalanced thrust of the arches or to transmit the thrust through the river span. The latter scheme was chosen, prompting the design of the special "shoes," which have both the usual horizontal, plus vertical, bearing surfaces on the bridge seat.

Careful construction has proved a valuable investment, for the Houston Street Viaduct continues to serve as a major traffic artery for the county. Newer, nearby bridges over the Trinity are higher, but none have the solidity or visual prominence of the Houston Street Viaduct. The northern, downtown, sections of the bridge begin at Union Terminal (National Register, 1975), and continue over a network of railroad tracks, IH 30, and Reunion Arena. The context of the southern half of the bridge remains little changed, crossing the Trinity River and flood plain into an early and intact section of the Oak Cliff suburb.

Reinforced-Concrete Viaduct between Dallas and Oak Cliff, Texas. Engineering News. LXV, No. 13 (March 30, 1911), pp. 392-394.

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the viaduct swings to the right through an angle of 47 degrees 44 minutes, crosses the railway tracks overhead, and runs on a level grade in a southwesterly direction to the south banks of the Trinity River, a distance of 2,529 feet. Thence it proceeds in the same direction on a descending grade of 0.74% to the west side of Lancaster Avenue, a distance of 2,009.4 feet. The nomination includes the viaduct structure, from footings through superstructure, and ancillary facilities. The length of the structure nominated is delineated on the enclosed USGS quad map, and extends from UTM grid coordinates A through C; the width is 60 feet.

WASO Form - 177
("R" June 1984)

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

Houston Street Viaduct
Dallas County
TEXAS

Working No. JUL 11 1984
Fed. Reg. Date: 2.5.85
Date Due: 8/9/84 – 8/25/84
Action: ACCEPT 8-9-84
___ RETURN
___ REJECT
Federal Agency: _____

Entered in the National Register

☐ resubmission
☐ nomination by person or local government
☐ owner objection
☐ appeal

Substantive Review: ☐ sample ☐ request ☐ appeal ☐ NR decision

Reviewer's comments:

Recom./Criteria _____
Reviewer _____
Discipline _____
Date _____
_____ see continuation sheet

Nomination returned for: _____ technical corrections cited below
_____ substantive reasons discussed below

1. Name

2. Location

3. Classification

Category	Ownership	Status	Present Use
	Public Acquisition	Accessible	

4. Owner of Property

5. Location of Legal Description

6. Representation in Existing Surveys

Has this property been determined eligible? ☐ yes ☐ no

7. Description

Condition
☐ excellent ☐ deteriorated
☐ good ☐ ruins
☐ fair ☐ unexposed

Check one
☐ unaltered
☐ altered

Check one
☐ original site
☐ moved date _____

Describe the present and original (if known) physical appearance

☐ summary paragraph
☐ completeness
☐ clarity
☐ alterations/integrity
☐ dates
☐ boundary selection

8. Significance

Period Areas of Significance—Check and justify below

Specific dates Builder/Architect
Statement of Significance *(in one paragraph)*

☐ summary paragraph
☐ completeness
☐ clarity
☐ applicable criteria
☐ justification of areas checked
☐ relating significance to the resource
☐ context
☐ relationship of integrity to significance
☐ justification of exception
☐ other

9. Major Bibliographical References

10. Geographical Data

Acreage of nominated property _____
Quadrangle name _____
UTM References

Verbal boundary description and justification

11. Form Prepared By

12. State Historic Preservation Officer Certification
The evaluated significance of this property within the state is:

____ national ____ state ____ local

State Historic Preservation Officer signature

title date

13. Other

☐ Maps
☐ Photographs
☐ Other

Questions concerning this nomination may be directed to _____

Signed _____ Date _____ Phone: _____

Comments for any item may be continued on an attached sheet

Houston Street Viaduct
Houston Street
Dallas, Dallas County, Texas
Photograph by Peter Flagg Maxson, January 1984
Negative on file, Texas Historical Commission,
Austin
Southeast side, camera facing northwest
Photo 1 of 8


BEER
Hickory House
CURB SERVICE

Houston Street Viaduct
Houston Street
Dallas, Dallas County, Texas
Photograph by Peter Flagg Maxson, January 1984
Negative on file, Texas Historical Commission,
Austin
Northwest side, camera facing northeast
Photo 2 of 8


BEGIN
40

Houston Street Viaduct
Houston Street
Dallas, Dallas County, Texas
Photograph by Peter Flagg Maxson, January 1984
Negative on file, Texas Historical Commission,
Austin
Northwest side, camera facing southeast
Photo 3 of 8


Crown Royal

Houston Street Viaduct
Houston Street
Dallas, Dallas County, Texas
Photograph by Peter Flagg Maxson, January 1984
Negative on file, Texas Historical Commission, Austin
Railing/lamppost detail, camera facing south
Photo 4 of 8

Houston Street Viaduct
Houston Street
Dallas, Dallas County, Texas
Photograph by Peter Flagg Maxson, January 1984
Negative on file, Texas Historical Commission, Austin
Span detail over Industrial Boulevard, camera facing northwest
Photo 5 of 8


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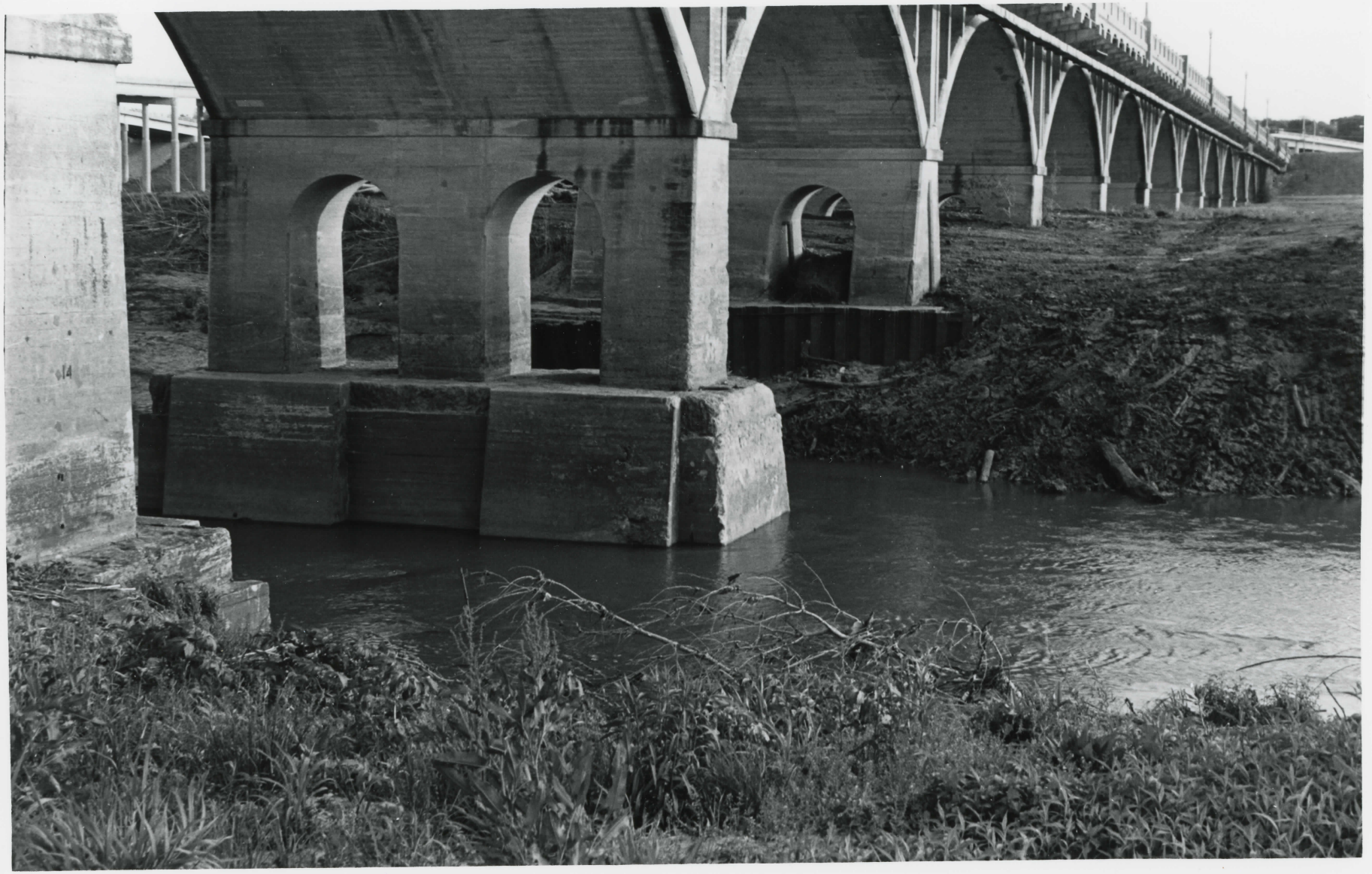
Houston Street Viaduct
Houston Street
Dallas, Dallas County, Texas
Photograph by Peter Flagg Maxson, January 1984
Negative on file, Texas Historical Commission,
Austin
Arch detail, camera facing southwest
Photo 6 of 8

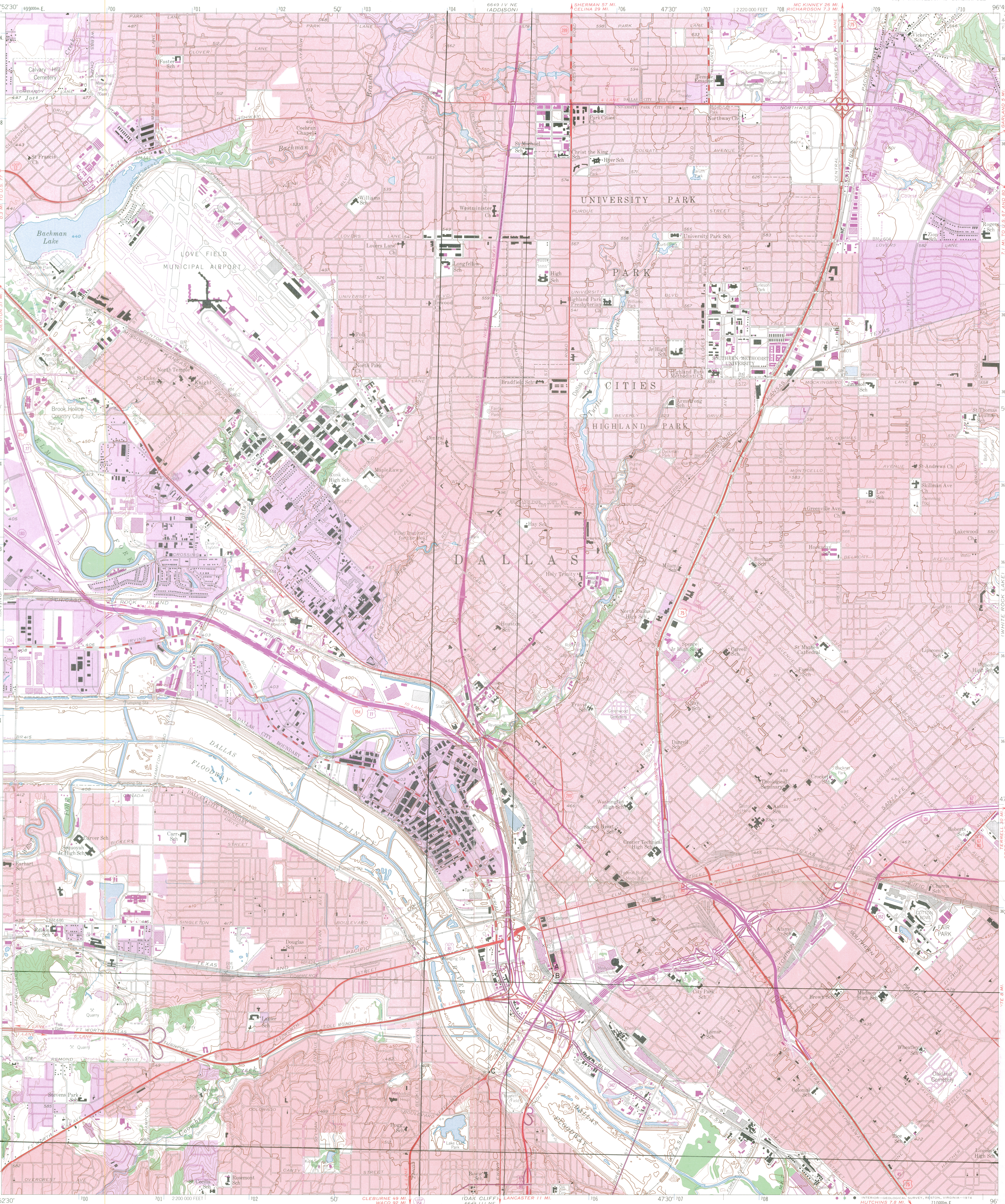


Houston Street Viaduct
Houston Street
Dallas, Dallas County, Texas
Photograph by Peter Flagg Maxson, April 1984
Negative on file, Texas Historical Commission,
Austin
Trinity River juncture, camera facing southeast
Photo 7 of 8

Houston Street Viaduct
Houston Street
Dallas, Dallas County, Texas
Photograph by Peter Flagg Maxson, April 1984
Negative on file, Texas Historical Commission,
Austin
Plate girder detail, camera facing west
Photo 8 of 8

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

DALLAS QUADRANGLE
TEXAS–DALLAS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SE/4 CARROLLTON 15' QUADRANGLE



6649 IV NW (CARROLLTON)
6649 IV NE (ADDISON)
6649 I NW (GARLAND)
96°52'30"
32°52'30"
96°45'
32°45'
SHERMAN 57 MI.
CELINA 29 MI.
MC KINNEY 26 MI.
RICHARDSON 7.3 MI.
GARLAND 5 MI.
7.1 MI. TO U.S. 67 AND 80
0.3 MI. TO U.S. 77
GAINESVILLE 63 MI.
DENTON 31 MI.
6649 IV SW (IRVING)
IRVING 4.3 MI.
FORT WORTH 25 MI.
FORT WORTH (P.O.) 27 MI.
0.4 MI. TO U.S. 80
(WHITE ROCK LAKE) 6649 I SW
TERRELL 30 MI.
GREENVILLE 46 MI.
CLEBURNE 49 MI.
WACO 92 MI.
(OAK CLIFF) 6649 III NE
LANCASTER 11 MI.
HUTCHINS 7.8 MI.
CORSICANA 49 MI.
UNIVERSITY PARK
HIGHLAND PARK
PARK CITIES
DALLAS
LOVE FIELD MUNICIPAL AIRPORT
Bachman Lake
Calvary Hill Cemetery
Brook Hollow Country Club
SOUTHERN METHODIST UNIVERSITY
DALLAS FLOODWAY
TRINITY RIVER
FAIR PARK
COTTON BOWL
Oakland Cemetery
Greenwood Cemetery
INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1974

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Culture and drainage in part compiled from aerial photographs taken 1952 and 1956. Topography from city of Dallas surveys 1954 and by planetable surveys 1958

Polyconic projection. 1927 North American datum
10,000-foot grid based on Texas coordinate system, north central zone
1000-meter Universal Transverse Mercator grid ticks, zone 14, shown in blue

Red tint indicates areas in which only landmark buildings are shown

Revisions shown in purple compiled from aerial photographs taken 1968 and 1973. This information not field checked

Purple tint indicates extension of urban areas

6649 III NW (DUNCANVILLE)

MN GN 1°11' 21 MILS 8° 142 MILS

UTM GRID AND 1973 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

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

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
Interstate Route — U. S. Route — State Route

TEXAS
QUADRANGLE LOCATION

DALLAS, TEX.
SE/4 CARROLLTON 15' QUADRANGLE
N3245—W9645/7.5

1958
PHOTOREVISED 1968 AND 1973
AMS 6649 IV SE–SERIES V882

UTM REFERENCES
A-14/705510/3628165
B-14/705530/3628080
C-14/704790/3626940

HOUSTON STREET VIADUCT
HOUSTON STREET ROUGHLY FROM UNION
STATION TO LANCASTER AVE INTERSECTION
DALLAS, DALLAS CO., TEXAS