GEOMETRIC DESIGN STANDARDS
FOR THOROUGHFARES

THE CITY OF ADDISON

TEXAS

1980

Prepared By

GINN, INC.

Consulting Engineers

Dallas, Texas

CITY OF ADDISON

GEOMETRIC DESIGN STANDARDS
FOR THOROUGHFARES

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GEOMETRIC DESIGN STANDARDS FOR THOROUGHFARES

DEFINITIONS

MAJOR ARTERIAL

A thoroughfare that serves the entire region and carries a high volume of long trips.

MINOR ARTERIAL

A thoroughfare that interconnects with the major arterial, but serves a smaller geographic area.

COLLECTOR

A thoroughfare that collects traffic within residential, commercial and industrial areas, and channels it into the arterial system.

LOCAL

A thoroughfare that primarily serves as direct access to abutting property, such as a residential street.

GEOMETRIC DESIGN STANDARDS FOR THOROUGHFARES

RIGHT-OF-WAY

A.	Major Arterial:		
	6 Lanes Divided	Minimum	100 ft.
		Desirable	120 ft.
	4 Lanes Divided	Minimum	80 ft.
		Desirable	100 ft.
B.	Minor Arterial:		
	6 Lanes Undivided	Minimum	86 ft.
		Desirable	90 ft.
	5 Lanes Undivided	Minimum	75 ft.
		Desirable	90 ft.
	4 Lanes Undivided	Minimum	60 ft.
		Desirable	70 ft.
C.	Collector:		
	2 or 4 Lanes Undivided	Minimum	60 ft.
		Desirable	60 ft.
D.	Local:		
	2 Lanes Undivided	Minimum	50 ft.
		Desirable	50 ft.

ROADWAY WIDTH

A.	Major Arterial:		
	6 Lanes Divided	Minimum	2-34 ft. b-b
		Maximum	2-37 ft. b-b
	4 Lanes Divided	Minimum	2-23 ft. b-b
		Maximum	2-25 ft. b-b
B.	Minor Arterial:		
	6 Lanes Undivided	Minimum	67 ft. b-b
		Maximum	73 ft. b-b
	5 Lanes Undivided	Minimum	56 ft. b-b
		Maximum	61 ft. b-b
	4 Lanes Undivided	Minimum	45 ft. b-b
		Maximum	49 ft. b-b
C.	Collector:		
	4 Lanes Undivided	Minimum	45 ft. b-b
		Maximum	49 ft. b-b
	2 Lanes Undivided	Minimum	37 ft. b-b
		Maximum	41 ft. b-b
D.	Local:		
	2 Lanes Undivided	Minimum	28 ft. b-b
		Maximum	31 ft. b-b

MEDIAN OPENINGS (Figure 1)

Distance Between Opening (nose-to-nose of median)

	S
Minimum	300 ft.
Desirable	500 ft.
Maximum	1,300 ft.

Width Opening:	O
Minimum	60 ft.
Maximum	120 ft.

LEFT-TURN LANE (Figure 1)

Length of Lane		T
A. Low volume driveways or local street	Minimum	60 ft.
	Maximum	100 ft.
B. High volume driveways and collector or minor arterial	Minimum	100 ft.
	Maximum	150 ft.
C. Signalized Intersection	Minimum	150 ft.
	Desirable	200 ft.
	Maximum	300 ft.

Width of Lane		N
	Minimum	10 ft.
	Maximum	13 ft.

Transition		X
	Length	99.5 ft.
	Reverse Curves	250 ft.

MEDIAN WIDTH (Figure 1) M

	Minimum	14 ft.
	Maximum	50 ft.

LANE WIDTH (Figure 1) L

Through Lanes	Minimum	11 ft.
	Maximum	12 ft.

DESIGN SPEEDS

Major Arterial	40-50 MPH
Minor Arterial	35-45 MPH
Collector	30-40 MPH
Local	30 MPH

VERTICAL GRADES

Major & Minor Arterial	Maximum 6%
Collector & Local	Maximum 10%

HORIZONTAL CURVATURE

Design Speed	Minimum Radius
30 MPH	425 ft.
40 MPH	820 ft.
50 MPH	1,390 ft.

INTERSECTION RADIUS (Figure 1) R

Major to Major	Minimum	40 ft.
Major to Minor	Minimum	30 ft.
Major to Local	Minimum	30 ft.
Minor to Minor	Minimum	25 ft.
Minor to Local	Minimum	25 ft.
Local to Local	Minimum	20 ft.

DESIGN STANDARDS
FOR COMMERCIAL DRIVEWAYS
(Figure 2)

Distance Back From Intersection

A=Minimum - Intersection radius + 10 ft. + length of inlet (if exists)

Driveway Radius

R=Minimum - 10 ft.

Approach Width

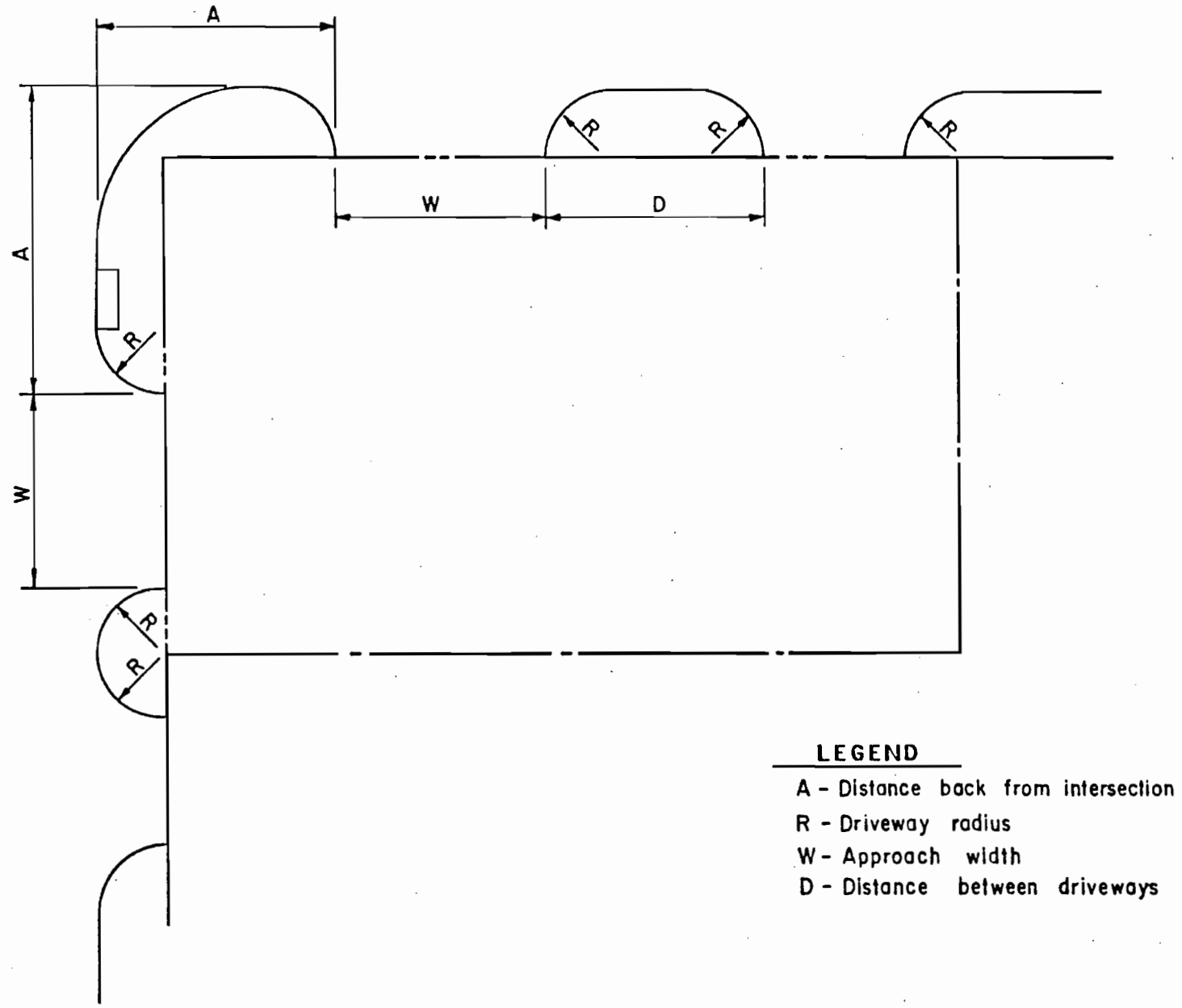
W=Minimum 25 ft.
Desirable 30 ft.
Maximum 35 ft. (45 ft. for large truck volumes)
One-way driveway - Minimum 15 ft.
Maximum 20 ft.

Distance Between Driveways at Property Lines

D=Minimum - 40 ft.

Distance from Property Corner

R=Minimum - Driveway Radius



LEGEND

A - Distance back from intersection
R - Driveway radius
W - Approach width
D - Distance between driveways

FIGURE 2 — GEOMETRIC FOR DRIVEWAY DESIGN

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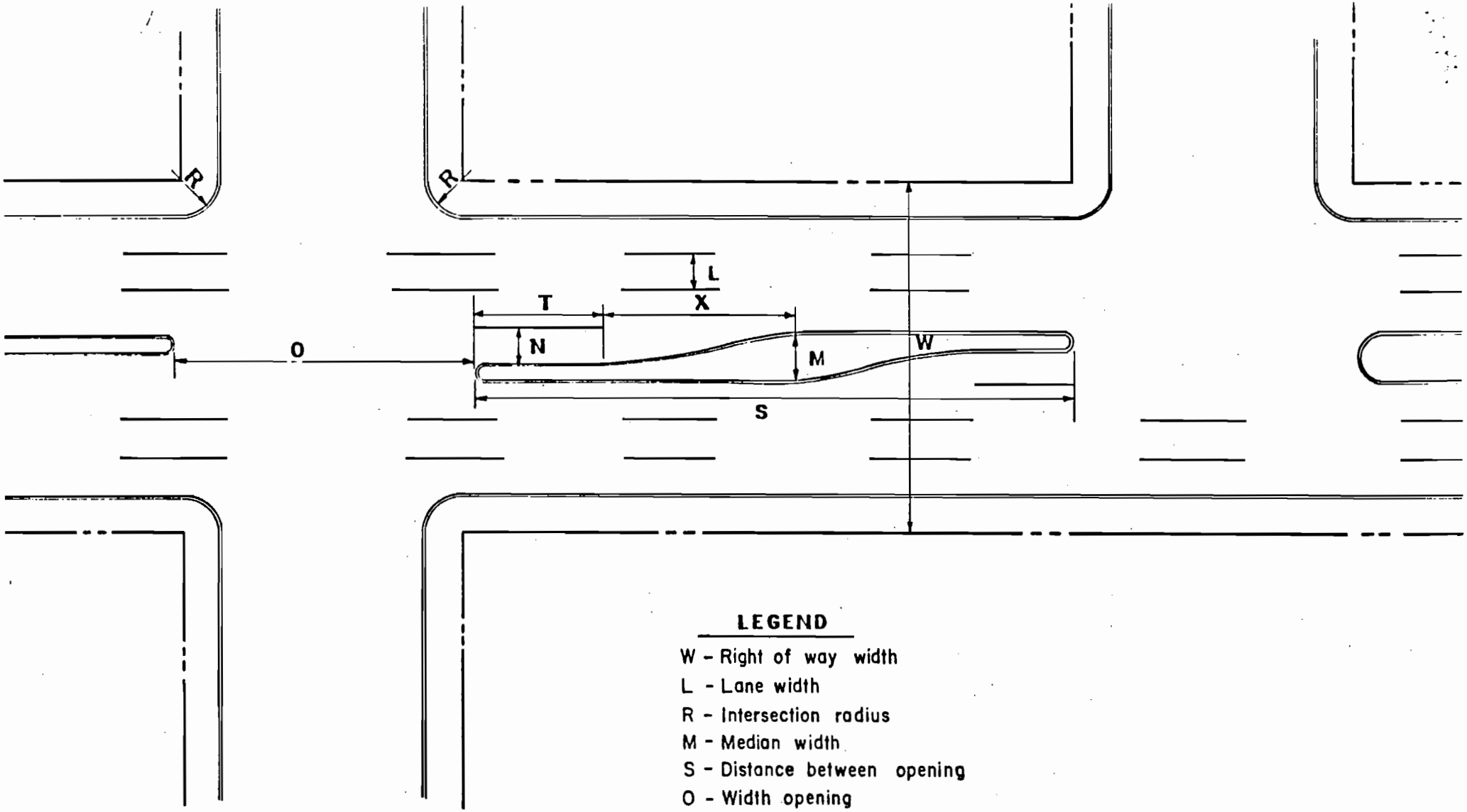

LEGEND

W - Right of way width
L - Lane width
R - Intersection radius
M - Median width
S - Distance between opening
O - Width opening
T - Length left turn lane
X - Transition
N - Width left turn lane

FIGURE I - GEOMETRIC FOR THOROUHFARE DESIGN

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CITY OF ADDISON
RECOMMENDED DESIGN CRITERIA FOR STORM SEWERS
1980

I-01. Definition. Runoff is the quantity of water passing any given point of the drainage course as a result of precipitation. Runoff may properly be referred to as storm water, flow, or discharge.

I-02. Rainfall. The U.S. Department of Commerce Weather Bureau Technical Paper No. 40 is to be utilized to determine the rainfall intensities. Texas Highway Department criteria may also be used.

I-03. The Rational Method

A. Description. For drainage areas that are not complex and have an area of less than 1,000 acres, the Rational Method of determining runoff is recommended.

B. Formula. The Rational Method is based on formula:

$$Q = CIA$$

where: Q is the rate of runoff in cubic feet per second (CFS).

C is coefficient of runoff which is the ratio of the maximum rate of runoff and the average rainfall intensity. As a ratio, C has no unit.

I is the average intensity of the rainfall in inches per hour for the duration under consideration.

A is the area in acres contributing to the runoff.

NOTE: The unit of Q as expressed by the formula is inches per hour per acre; however, this rate differs from cubic feet per second by less than one percent and the unit of cubic feet per second is commonly used.

I-04. Coefficient of Runoff

A. Description. The coefficient of runoff represents the effects of infiltration, detention, storage, and evaporation. Some of the factors which affect the coefficient of runoff are permeability of the soil, amount and type of vegetation, slope of the surface, and future land uses.

I-04. (continued)

B. Values. Table I lists various values of "C" applicable to the City of Addison. The value listed in the Design "C" column is recommended for general use.

C. Complex Areas. Many drainage areas contain land of more than one use, such as Planned Unit Developments, and therefore more than one value for "C." These areas may be measured separately and a CA value established for each sub-area. The total CA value for the drainage area is then the sum of the CA values of the sub-areas. In many instances it is considered adequate to assign a "C" value to a drainage area based on its overall use.

I-05. Time of Concentration

A. Definition. The time of concentration is the time required for all parts of the drainage area to contribute flow to the point under consideration.

B. Overland. The time of concentration for overland flow can be determined. The time thus obtained is a function at the distance of flow, the average slope of the land and the coefficient of runoff.

C. Velocity. The velocity of flow in natural or constructed channels can be determined by use of Manning's Formula. Considering the anticipated growth in the area, a velocity of less than five feet per second is not recommended.

D. Minimum Time. A minimum time of concentration of ten minutes for inlets and twenty minutes for culverts is recommended. A maximum inlet time of twenty minutes is recommended.

I-06. Design Frequency

A. Definition. The design frequency is the frequency of the design runoff or the rainfall return period. A design frequency is based on the importance of the facility under design consideration and the possible flood damage resulting from an overflow of the drainage facility.

B. Recommended Values. The recommended design frequencies are listed in Table II.

I-07. Intensity. Rainfall intensity curves for design frequencies of two years to 100 years are presented in Technical Paper No. 40, or can be obtained from the Texas Highway Department.

TABLE I

COEFFICIENTS OF RUNOFF

LAND USE	RANGE OF C	DESIGN C
Residential	0.3 - 0.6	0.5
Commercial	0.7 - 0.9	0.8
Industrial	0.6 - 0.8	0.7
Multiple Unit Dwelling	0.6 - 0.8	0.7
Parks	0.3 - 0.5	0.4
Pasture	0.3 - 0.5	0.4
Shopping Centers	0.8 - 0.9	0.9
Paved Areas	0.9	0.9

TABLE II

DESIGN FREQUENCY

TYPE OF FACILITY	RECOMMENDED DESIGN FREQUENCY (YEARS)
Storm Sewers and Inlets	25*
Culverts, Channels, Storm Sewers and Inlets at Low Points	50**
Bridges	100

* The total capacity of the storm sewer and the surface flow within the limits of the right-of-way should be compatible with a 100-year design frequency.

** If no positive overflow is provided, the storm sewer system should be designed on a 100-year design frequency.

TOWN OF ADDISON

CITY ENGINEER'S OFFICE (214) 450-2886

Post Office Box 144 Addison, Texas 75001 16801 Westgrove

May 15, 1991

Mr. David Adams
TU Electric
P. O. Box 151325
Irving, Texas 75015-1325

Dear Mr. Adams,

Attached is a list of Bench Marks in Addison. If you have any questions, please call me at 450-2886.

Sincerely,

Town of Addison

John R. Baumgartner 5-15-91

John R. Baumgartner, P.E.
City Engineer

JRB/rp

Attachment

BENCH MARK DESCRIPTIONS

AIRPORT PARKWAY

1. 60 d. nail in 10" Live Oak, 80'± west of ℄ Addison Road at entrance road to terminal restuarant.

   Elevation 644.08

2. RR spike in P.P., 150'± west of ℄ Addison Road and 75' north of enterance to airport flying school.

BENCH MARK DESCRIPTIONS

QUORUM DRIVE

1. "□" on southeast corner sidewalk at front entrance to 4805 Quorum Drive.
   Elevation: 630.66

2. "□" on southeast corner sidewalk at south entrance to 4805 Quorum Drive.
   Elevation: 630.54

3. RR Spike in telepnone pole 120'± Rt. Sta. 8+18.
   Elevation: 622.54

4. RR Spike in 8" Hackberry - 90' Lt. Sta. 26 +20.
   Elevation: 636.41

5. "□" on center of 14' inlet, 50' Lt. Sta. 30+69.
   Elevation: 634.90

6. #2-2 Keller Springs Road Survey

7. "□" on top curb center radius island @ Sta. 14+60± and right 40'.
   Elevation: 638.44'

8. "□" on northmost NW corner United Fidelity Life Insurance parking lot - Sta. 46+91.50 39.3' Rt ℄.
   Elevation: 627.58

BENCH MARK DESCRIPTIONS

MARSH LANE

1. RR spike in p.p. approximately 400 ft. South of Brookhaven Club Drive on West side of Marsh Lane.
   Elevation: 546.99

2. "□" cut on NorthWest curb return and sidewalks on East side of Marsh Lane approximately 375 ft. North of Brookhaven Club Drive.
   Elevation: 550.86

3. RR spike in p.o. on West side of Marsh Lane approximately 1,225 ft. South of Spring Valley.
   Elevation: 559.72

4. "X" cut on top of bolt on SouthWest corner base plates light standard at Greenhaven Shopping Center, West side of Marsh Lane, approximately 370 ft. South of Spring Valley Road.
   Elevation: 571.95

5. "□" cut on light base in island on West side of Marsh Lane at Pebble Beach Drive.
   Elevation: 564.14

6. "□" cut on NorthWest corner of concrete box on East side of Marsh and North side of Sidney Drive.
   Elevation: 574.98

7. RR spike in p.o. on West side of Marsh Lane approximately 1,000 ft. North of Pebble Beach Drive.
   Elevation: 580.69

8. "□" cut on nose of concrete island at South entrance to Brookhaven, North of Tanglewood Drive, West side of Marsh Lane.
   Elevation: 575.51

9. Letter "M" on Mueller Hydrant on West side of Marsh Lane and South side of Gardenbrook Drive.
   Elevation: 586.08

10. RR spike in p.p. West side of Marsh Lane, 415 ft. North of Gardenbrook Drive.
    Elevation: _____

11. RR spike in p.p. West side of Marsh Lane approximately 300 ft. South of Belt Line Road.
    Elevation: 566.87

BENCH MARK DESCRIPTIONS

MIDWAY ROAD

1. "□" on NorthWest corner of parking lot at Gulf station, SouthWest corner Belt Line Road and Midway Road.
   Elevation: 624.32

2. SouthEast corner of concrete walk at building, 15101 Midway Road.
   Elevation: 614.84

3. "□" on concrete walk at SouthEast corner of building at 15301 Midway Road.
   Elevation: 621.43

4. "□" on concrete walk at NorthEast corner of building at 15321 Midway Road.
   Elevation: 625.55

5. "□" on concrete base of lamp post at SouthWest corner of Wiley Post and Midway Road.
   Elevation: 631.34

6. "□" bottom step to loading dock at 15502 Midway Road.
   Elevation: 636.05

7. "□" on steps of building at 15508 Midway Road.
   Elevation: 638.57

8. "□" on concrete pavement at SouthEast corner of building at 15635 Midway Road.
   Elevation: 642.61

9. "□" on corner of parking lot curb (NorthWest corner) at NorthEast corner of Wright Brothers Drive and Midway Road.
   Elevation: 647.28

BENCH MARK DESCRIPTIONS

SPRING VALLEY ROAD

1. "□" on concrete walk at SouthWest corner of 7-11 building at NorthEast corner of Spring Valley and Marsh Lane.
   Elevation: 572.565

2. "□" on concrete walk at NorthWest corner of building for L&R Sporting Goods, South side of Spring Valley.
   Elevation: 585.90

3. "□" on top of curb East side of Woodway and 25 ft. North of East curb return.
   Elevation: 588.12

4. top of operating nut of fire hydrant on South side of Spring Valley at entrance drive to Springhaven Apartments office at 3820 Spring Valley.
   Elevation: 580.45

5. "□" on concrete walk at NorthEast corner of Stop-N-Go building at SouthWest corner of Spring Valley and Brookhaven Drive.
   Elevation: 583.36

6. "□" on concrete at NorthEast corner sidewalk of City of Farmers Branch Fire Station #2 at NorthEast corner of building.
   Elevation: 584.57

7. RR spike in power pole on North side of Spring Valley, approximately 900 ft. East of City of Farmers Branch Fire Station (35+83±).
   Elevation: 583.50

8. RR spike in 14" Elm on North side of Spring Valley, approximately 600 ft. West of Midway Road.
   Elevation: _____

9. "□" on concrete foundations of Greenhill School brick sign - SouthWest corner, North side of Spring Valley at Midway Road.
   Elevation: 588.18

BENCH MARK DESCRIPTIONS
BELT LINE ROAD (continued)

12. "□" on concrete walk at NorthWest corner of Minx Restaurant, East side of Beltwood Drive and South side of Belt Line Road.
    Elevation: 627.80

13. "□" on NorthEast corner of concrete vault at NorthEast corner of Belt Line Road and Addison Road.
    Elevation: 634.20

14. "□" on concrete walk at SouthEast corner of storage building at Payless Cashways, North side of Belt Line Road.
    Elevation: 638.65

15. "□" on top of North curb of Belt Line Road, 175' West of Dallas Parkway.
    Elevation: 635.53

BENCH MARK DESCRIPTIONS

BELT LINE ROAD

1. "□" on median nose, centerline Marsh Lane, 50' North of centerline of Belt Line Road.
   Elevation: 571.55

2. RR spike in 12" willow 75' North of centerline Belt Line Road, 250± from centerline of old Marsh Lane.
   Elevation: 576.32

3. "□" on top curb at curb return East side Business Ave and North side of Belt Line Road.
   Elevation: 579.86

4. "□" on top of curb at curb return East side of Commercial and North side of Belt Line Road.
   Elevation: 582.16

5. "□" on top of curb at curb return East side of Surveyor Bldv. and North side of Belt Line Road.
   Elevation: 596.16

6. "□" on top of curb at curb return East side of Runyon Road and North side of Belt Line Road.
   Elevation: 606.00

7. "□" on SouthWest corner of concrete water valve box at SouthWest corner of building @ 4055 Belt Line Road.
   Elevation: 610.74

8. "□" on top of curb at NorthWest corner of parking lot at Gulf station at SouthWest corner of Belt Line and Midway Roads.
   Elevation: 624.32

9. "□" on top of curb at curb return, West side of most western drive into Victoria Station and South side of Belt Line Road.
   Elevation: 633.05

10. "□" on top of curb at center radius North side of west drive into Fire Station, 4500 blk. Belt Line Road.
    Elevation: 629.33

11. "□" on top of curb at curb return East side of Beltway Drive and South side of Belt Line Road.
    Elevation: 629.05

BENCH MARK DESCRIPTIONS

(FACTORY/MARCY)

1. B.M. 1 "□" on corner of loading dock at Howard Green Furniture, 15289 Addison Road.

   Elevation: 629.854

2. B.M. 3 "□" on southeast corner of concrete walk at front entrance to 4805 Arapaho Road.

   Elevation: 630.66

3. "□" on southeast corner of retaining wall at southeast corner of building at Whittaker Metals, 15251 Marcy Road (Quorum)

   Elevation: 637.61

4. "□" on curb at northwest corner of walk at the northwest corner of Shakey's Pizza, Belt Line at Quorum Drive.

   Elevation: 646.07