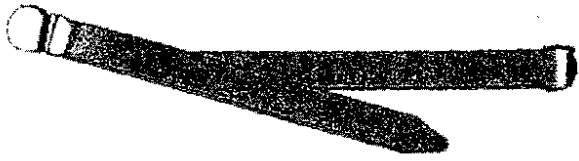


A1 2000-3 Arapaho Road
Strength & Depth tests

17H



Depth Test Results

Arapaho Rd

Right Tools...
Right Price...
Right Place...
RIGHT NOW!



ADDISON - Arapaho Rd.

1-25-2000

1-10	19-10 1/4	39-10 1/4
2-11 1/2	20-10 1/4	40-11
3-10 1/2	21-10 1/4	41-11
4-10 1/2	22-10 1/4	42-10 3/4
5-10 1/2	23-11 1/4	43-10 1/2
6-10 1/4	24-10 1/4	44-11
7-10 1/4	25-10 1/4	45-10 1/4
8-10 1/2	26-10 1/4	46-10 1/2
9-10 1/2	27-10 3/4	47-10 1/2
10-10	28-10 1/4	48-10 3/4
11-10	29-10 1/2	49-10
12-11 1/4	30-11 1/2	50-11
13-10	31-26-2000	51-10 1/4
14-10 1/4	32-10 1/4	
15-11	33-10 1/4	
16-10 1/4	34-10 1/2	
17-10 1/2	35-10 1/4	
18-10	36-11	
	37-10 1/2	
	38-11 1/4	

Your LOCALLY OWNED equipment rental SUB-CONTRACTOR

Dallas 972-864-8640	D/FW Mid-Cities 972-647-4140	Fort Worth 817-847-8880
Longview 903-758-6175	Waco 254-662-4911	Wichita Falls 940-767-4384
		Oklahoma City 405-947-6771
		Tulsa 918-627-4500

ED BELL CONSTRUCTION COMPANY
P.O. BOX 540787
DALLAS, TX 75354-0787

FACSIMILE TRANSMITTAL SHEET

TO: JIM PIERCE	FROM: Robert D. Weber
COMPANY: Town of Addison	DATE: 24 Jan 00
FAX NUMBER: (972) 450-2834	TOTAL NO. OF PAGES INCLUDING COVER: 4
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
RE:	YOUR REFERENCE NUMBER:

- URGENT FOR REVIEW PLEASE COMMENT PLEASE REPLY PLEASE RECYCLE

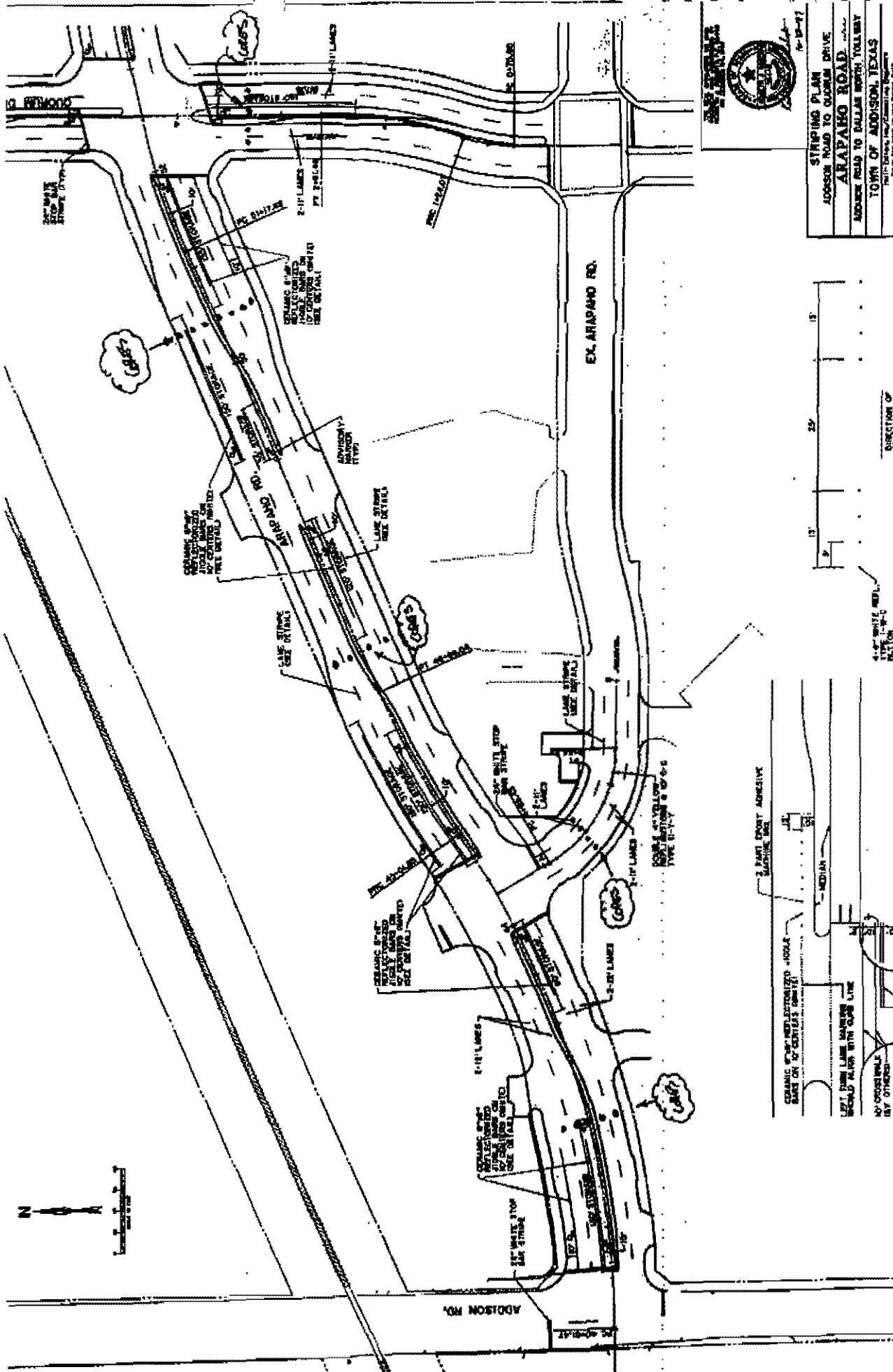
NOTES/COMMENTS:

Jim,

Here is our plan for depth coring. I think this meets your original intent. Let me know if you want additional cores.

Rob

*Received 2/1/00
 2:38 (4:35) 2/1/00*



STRIPING PLAN
 ADDRESS ROAD TO QUONIA DRIVE
ARAPAHO ROAD
 ADDRESS ROAD TO DALLAS NORTH TOLLWAY
 TOWN OF ADDISON, TEXAS



3-SIDE POINT ADHERIVE

CERAMIC WHITE PRED-ELECTRIFIED - 400LB
 MARK ON CENTER'S CENTER

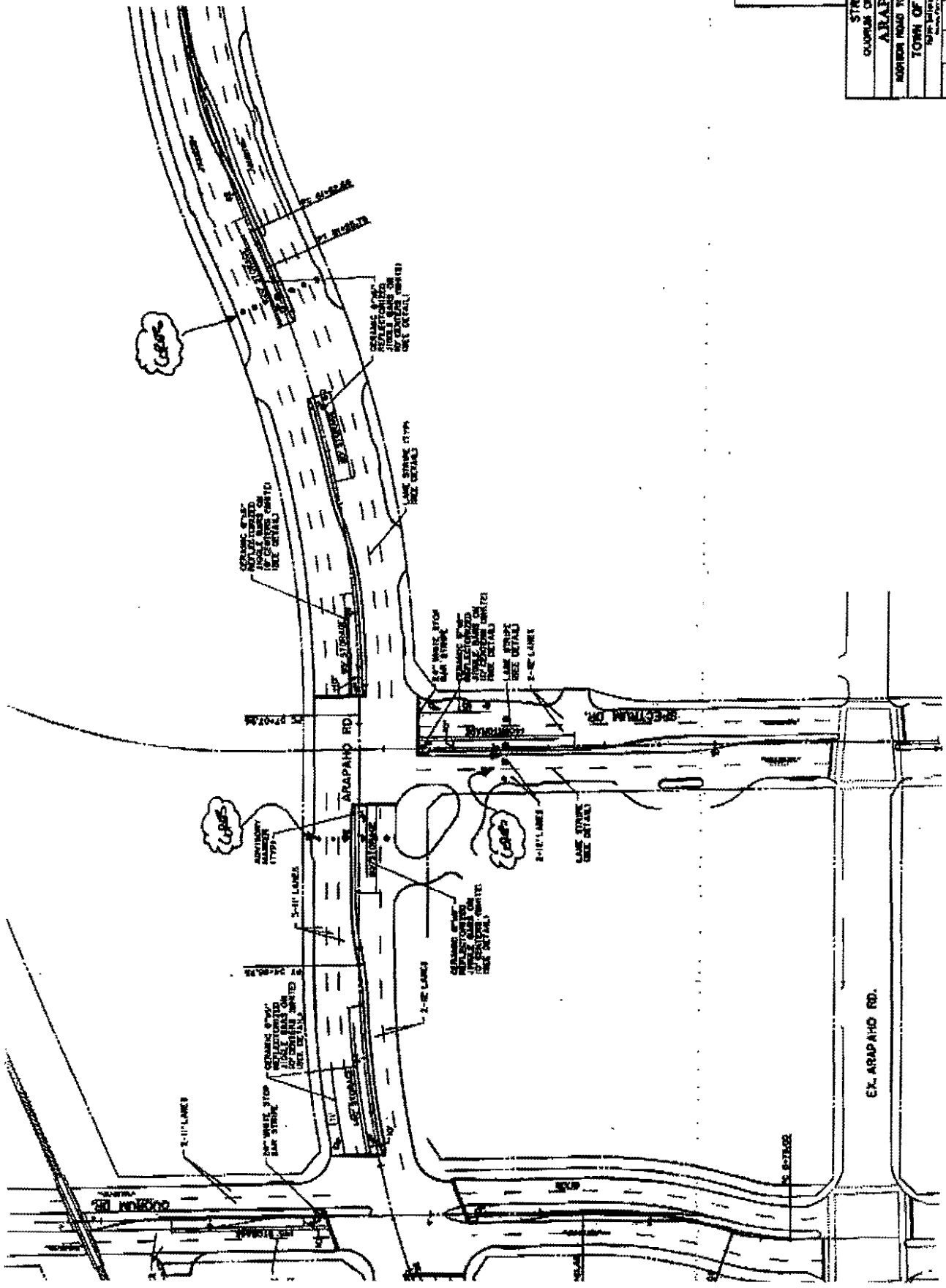
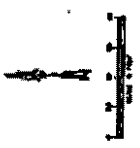
LEFT FROM LANE MARKING
 SHOULD BE WITH QUOTE LINE

NO PROVISIONS
 BY OTHERS

ADHERIVE

ADHERIVE

4-4" WHITE MARK
 LINE MARK
 BOTTOM

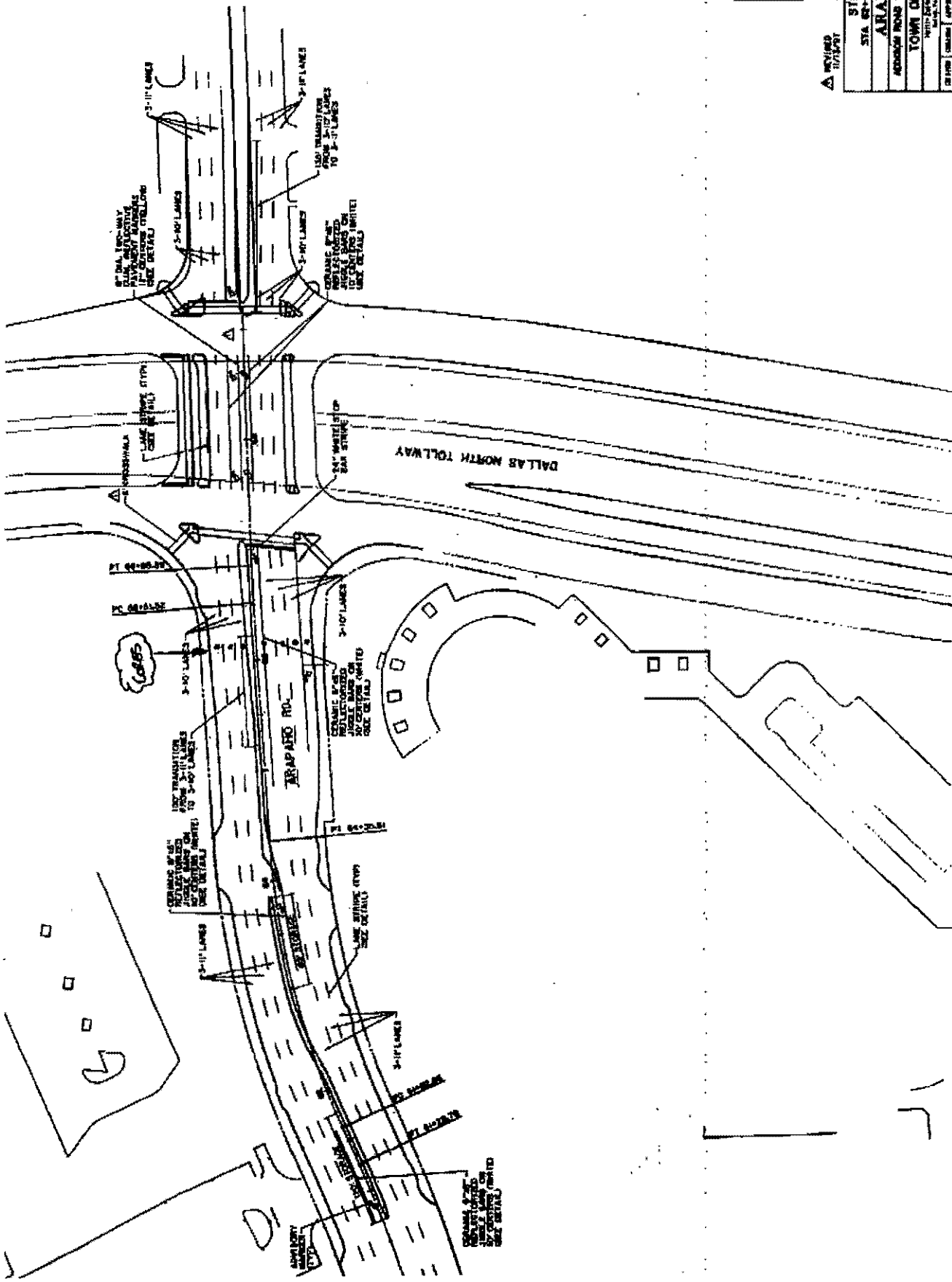


STRIPING PLAN
 COLUMB DRIVE TO STA. 61+00
ARAPAHO ROAD
 HIGHWAY ROAD TO DALLAS NORTH ROLLWAY
 TOWN OF ADDISON, TEXAS

DATE: 1/19/97

BY: [Signature]

SCALE: 1" = 40'



STRIPING PLAN
STA 88+00 TO 96+00
ARAPAHO ROAD
ADDISON ROAD TO DALLAS NORTH TOLLWAY
TOWN OF ADDISON, TEXAS

NO.	DATE	BY	CHK'D	APP'D	SCALE	SHEET NO.	TOTAL SHEETS
1	1/24/00	EBCC	EBCC	EBCC		4	8

1-8-97

P-18

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
DALLAS FORT WORTH HOUSTON LONGVIEW LUBBOCK AUSTIN

11050 Ables Lane, Dallas, Texas 75229 Phone: 972-488-8800

cb

CONCRETE INSPECTION AND FLEXURAL STRENGTH TEST REPORT
(THIRD POINT LOADING)

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 7/23/99
TMI REPORT #: DC98-050-131

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitt-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

SPECIFICATIONS

Strength (psi): 650
 Slump (in.): 5
 Air Content (%): _____
 Concrete Temp (°F): 90

PROJECT DATA

Placement Date: 6/23/99
 Sampled By: R. Shaheed
 Weather: Partly Cloudy
 Supplier/Mix: Lattimore-650 Flex

FIELD DATA SET #1

Ticket #: 73110 Time Batched: 9:02 Time Sampled: 10:40
 Slump (in.): 4 Air Content: 3.2 Unit Weight (pcf): _____
 Conc. Temp. (°F): 90 Ambient Temp. (°F): 83 Yardage (c.y.): 9 yds
 Sample Location: East bound turning lane @ tollway/Arapaho; west of toll 50ft. West
 Remarks: Paving

FIELD DATA SET #2

Ticket #: 73141 Time Batched: 12:32 Time Sampled: 1:47
 Slump (in.): 4.5 Air Content: 2.3 Unit Weight (pcf): _____
 Conc. Temp. (°F): 93 Ambient Temp. (°F): 89 Yardage (c.y.): 9 yds
 Sample Location: East bound turning lane @ tollway/Arapaho; west of toll 150ft West
 Remarks: Paving

CONCRETE COMPRESSION TEST RESULTS

BEAMS MOLDED AND CURED PER ASTM C31, TESTED PER ASTM C78

Set #	Beam #	Test Date	Age (Days)	Max. Load (lbs)	Average Depth, D	Average Width, B	Modulus of Rupture (psi)	Notes
1	AR062301	6/30/99	7	7140	6.00	6.10	595	*Does not meet specifications.
2	AR062301	6/30/99	7	7560	6.00	6.10	630	*Does not meet specifications

- (1) SPAN LENGTH OF 18 INCHES, UNLESS NOTED ABOVE.
- (2) SPECIMENS GROUND PRIOR TO TESTING, LEATHER SHIMS USED DURING TESTING.
- (3) TEST RESULTS COMPLY WITH PROJECT SPECIFICATIONS UNLESS INDICATED IN NOTES.
- (4) FIELD TESTS ARE PER APPLICABLE ASTM STANDARDS: C138, C143, C172, C231

Note: This report is for the exclusive use of the Client addressed. This report may not be reproduced except in its entirety, without the written consent of TMI. Results apply only to above tests.

George L. Fox, P.E.
 TERRA-MAR, INC.

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
 DALLAS FORT WORTH HOUSTON LONGVIEW LUBBOCK AUSTIN

11050 Ables Lane, Dallas, Texas 75229 Phone: 972-488-8800

CONCRETE INSPECTION AND FLEXURAL STRENGTH TEST REPORT
(THIRD POINT LOADING)

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 04/28/99
TMI REPORT #: DC98-050-121

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitt-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

SPECIFICATIONS	PROJECT DATA
Strength (psi): <u>650</u>	Placement Date: <u>04/21/99</u>
Slump (in.): _____	Sampled By: <u>EE</u>
Air Content (%): <u>3-5</u>	Weather: <u>P. Cloudy/Windy</u>
Concrete Temp (°F): _____	Supplier/Mix: <u>Ed Bell</u>

FIELD DATA SET #1

Ticket #: <u>7068521</u>	Time Batched: <u>7:45</u>	Time Sampled: <u>8:33</u>
Slump (in.): <u>2</u>	Air Content: <u>4.0</u>	Unit Weight (pcf): <u>na</u>
Conc. Temp. (°F): <u>78</u>	Ambient Temp. (°F): <u>71</u>	Yardage (c.y.): <u>9</u>
Placement Location: <u>Median of Arapaho Road</u>		

FIELD DATA SET #2

Ticket #: <u>6094472</u>	Time Batched: <u>12:51</u>	Time Sampled: <u>2:00</u>
Slump (in.): <u>1 1/2</u>	Air Content: <u>4.0</u>	Unit Weight (pcf): _____
Conc. Temp. (°F): <u>76</u>	Ambient Temp. (°F): <u>88</u>	Yardage (c.y.): <u>100-200</u>
Placement Location: <u>Median of Arapaho Road</u>		
Remarks: _____		

CONCRETE COMPRESSION TEST RESULTS
 BEAMS MOLDED AND CURED PER ASTM C31, TESTED PER ASTM C78

Set #	Beam #	Test Date	Age (Days)	Max. Load (lbs)	Average Depth, D	Average Width, B	Modulus of Rupture (psi)	Notes
1	AR040501	04/28/99	7	7260	6.05	6.20	605	Does not meet specification
	AR040502	05/19/99	28	7740	5.95	6.05	645	
2	AR040503	04/28/99	7	7200	5.95	6.30	600	
	AR040504	05/19/99	28	8640	6.00	6.35	720	

- (1) SPAN LENGTH OF 18 INCHES, UNLESS NOTED ABOVE.
- (2) SPECIMENS GROUND PRIOR TO TESTING, LEATHER SHIMS USED DURING TESTING.
- (3) TEST RESULTS COMPLY WITH PROJECT SPECIFICATIONS UNLESS INDICATED IN NOTES.
- (4) FIELD TESTS ARE PER APPLICABLE ASTM STANDARDS: C138, C143, C172, C231

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Serry L. Fox
 TERRA-MAR, INC.

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
 DALLAS FORT WORTH HOUSTON LONGVIEW LUBBOCK AUSTIN

11050 Ables Lane, Dallas, Texas 75229 Phone: 972-488-8800

CONCRETE INSPECTION AND FLEXURAL STRENGTH TEST REPORT
(THIRD POINT LOADING)

*Revised Copy - Specifications

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 02/01/99
TMI REPORT #: DC98-050-93

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitt-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

SPECIFICATIONS

Strength (psi): 650*
 Slump (in.): 4
 Air Content (%): 5
 Concrete Temp (°F): _____

PROJECT DATA

Placement Date: 12/31/98
 Sampled By: J. Perez
 Weather: Sunny
 Supplier/Mix: TXI

FIELD DATA SET #1

Ticket #: <u>na</u>	Time Batched: <u>8:14</u>	Time Sampled: <u>9:00</u>
Slump (in.): <u>5.00</u>	Air Content: <u>5.0</u>	Unit Weight (pcf): <u>na</u>
Conc. Temp. (°F): <u>50</u>	Ambient Temp. (°F): <u>40</u>	Yardage (c.y.): <u>50</u>

Placement Location: Quorum and Arapaho Road - northwest

FIELD DATA SET #2

Ticket #: _____	Time Batched: <u>9:03</u>	Time Sampled: <u>9:55</u>
Slump (in.): <u>5.00</u>	Air Content: <u>5.0</u>	Unit Weight (pcf): <u>na</u>
Conc. Temp. (°F): <u>50</u>	Ambient Temp. (°F): <u>40</u>	Yardage (c.y.): <u>50</u>

Placement Location: Quorum and Arapaho Road - south center

Remarks: _____

CONCRETE COMPRESSION TEST RESULTS

BEAMS MOLDED AND CURED PER ASTM C31, TESTED PER ASTM C78

Set #	Beam #	Test Date	Age (Days)	Max. Load (lbs)	Average Depth, D	Average Width, B	Modulus of Rupture (psi)	Notes
1	APR123101	01/07/99	7	6300	5.90	6.10	525	* * Does not meet specification <i>6% deficient, 90% of contract Price allowed</i>
	APR123102	01/28/99	28	7320	5.90	6.10	610	
2	APR123103	01/07/99	7	6060	5.90	6.10	505	* * Does not meet specification <i>7% defecient, 90% of contract allowed</i>
	APR123104	01/28/99	28	7260	5.90	6.00	605	

- (1) SPAN LENGTH OF 18 INCHES, UNLESS NOTED ABOVE.
- (2) SPECIMENS GROUND PRIOR TO TESTING, LEATHER SHIMS USED DURING TESTING.
- (3) TEST RESULTS COMPLY WITH PROJECT SPECIFICATIONS UNLESS INDICATED IN NOTES.
- (4) FIELD TESTS ARE PER APPLICABLE ASTM STANDARDS: C138, C143, C172, C231

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Russ L. Furr
 TERRA-MAR, INC.

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
 DALLAS FORT WORTH HOUSTON LONGVIEW LUBBOCK AUSTIN

11050 Ables Lane, Dallas, Texas 75229 Phone: 972-488-8800

CONCRETE INSPECTION AND FLEXURAL STRENGTH TEST REPORT
(THIRD POINT LOADING)

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 04/28/99
TMI REPORT #: DC98-050-121

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitt-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

SPECIFICATIONS	PROJECT DATA
Strength (psi): <u>650</u>	Placement Date: <u>04/21/99</u>
Slump (in.): _____	Sampled By: <u>EE</u>
Air Content (%): <u>3-5</u>	Weather: <u>P. Cloudy/Windy</u>
Concrete Temp (°F): _____	Supplier/Mix: <u>Ed Bell</u>

FIELD DATA SET #1

Ticket #: <u>7068521</u>	Time Batched: <u>7:45</u>	Time Sampled: <u>8:33</u>
Slump (in.): <u>2</u>	Air Content: <u>4.0</u>	Unit Weight (pcf): <u>na</u>
Conc. Temp. (°F): <u>78</u>	Ambient Temp. (°F): <u>71</u>	Yardage (c.y.): <u>9</u>
Placement Location: <u>Median of Arapaho Road</u>		

FIELD DATA SET #2

Ticket #: <u>6094472</u>	Time Batched: <u>12:51</u>	Time Sampled: <u>2:00</u>
Slump (in.): <u>1 1/2</u>	Air Content: <u>4.0</u>	Unit Weight (pcf): _____
Conc. Temp. (°F): <u>76</u>	Ambient Temp. (°F): <u>88</u>	Yardage (c.y.): <u>100-200</u>
Placement Location: <u>Median of Arapaho Road</u>		
Remarks: _____		

CONCRETE COMPRESSION TEST RESULTS								
<small>BEAMS MOLDED AND CURED PER ASTM C31, TESTED PER ASTM C78</small>								
Set #	Beam #	Test Date	Age (Days)	Max. Load (lbs)	Average Depth, D	Average Width, B	Modulus of Rupture (psi)	Notes
1	AR040501	04/28/99	7	7260	6.05	6.20	605	* Does not meet specification
	AR040502	05/19/99	28	7740	5.95	6.05	645	
2	AR040503	04/28/99	7	7200	5.95	6.30	600	
	AR040504	05/19/99	28	8640	6.00	6.35	720	

- (1) SPAN LENGTH OF 18 INCHES, UNLESS NOTED ABOVE.
- (2) SPECIMENS GROUND PRIOR TO TESTING, LEATHER SHIMS USED DURING TESTING.
- (3) TEST RESULTS COMPLY WITH PROJECT SPECIFICATIONS UNLESS INDICATED IN NOTES.
- (4) FIELD TESTS ARE PER APPLICABLE ASTM STANDARDS: C138, C143, C172, C231

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Serry L. Fox
 TERRA-MAR, INC.

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
 DALLAS FORT WORTH HOUSTON LONGVIEW LUBBOCK AUSTIN

11050 Ables Lane, Dallas, Texas 75229 Phone: 972-488-8800

CONCRETE INSPECTION AND FLEXURAL STRENGTH TEST REPORT
(THIRD POINT LOADING)

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 02/11/99
TMI REPORT #: DC98-050-94

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitt-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

SPECIFICATIONS

Strength (psi): 650
 Slump (in.): _____
 Air Content (%): _____
 Concrete Temp (°F): _____

PROJECT DATA

Placement Date: 01/27/99
 Sampled By: MK
 Weather: Clear
 Supplier/Mix: TXI

FIELD DATA SET #1

Ticket #: 126896 Time Batched: 12:25 Time Sampled: 1:40
 Slump (in.): 5 1/2 Air Content: na Unit Weight (pcf): _____
 Conc. Temp. (°F): 70 Ambient Temp. (°F): 68 Yardage (c.y.): 4.5/4.5
 Placement Location: Light pole footing @ intersection of Arapaho Rd & Quarum Rd.

FIELD DATA SET #2

Ticket #: _____ Time Batched: _____ Time Sampled: _____
 Slump (in.): _____ Air Content: _____ Unit Weight (pcf): _____
 Conc. Temp. (°F): _____ Ambient Temp. (°F): _____ Yardage (c.y.): _____
 Placement Location: _____
 Remarks: _____

CONCRETE COMPRESSION TEST RESULTS

BEAMS MOLDED AND CURED PER ASTM C31, TESTED PER ASTM C78

Set #	Beam #	Test Date	Age (Days)	Max. Load (lbs)	Average Depth, D	Average Width, B	Modulus of Rupture (psi)	Notes
1	APR012701	02/03/99	7	6960	6.00	6.40	580	* * Does not meet specification
	APR012702	02/24/99	28	7740	6.10	6.20	645	
			<i>0.7% deficient</i>		<i>95% of contract price allowed</i>			

- (1) SPAN LENGTH OF 18 INCHES, UNLESS NOTED ABOVE.
- (2) SPECIMENS GROUND PRIOR TO TESTING, LEATHER SHIMS USED DURING TESTING.
- (3) TEST RESULTS COMPLY WITH PROJECT SPECIFICATIONS UNLESS INDICATED IN NOTES.
- (4) FIELD TESTS ARE PER APPLICABLE ASTM STANDARDS: C138, C143, C172, C231

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Sunny L. Fox, P.E.
 TERRA-MAR, INC.

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
 DALLAS FORT WORTH HOUSTON LONGVIEW LUBBOCK AUSTIN

11050 Ables Lane, Dallas, Texas 75229 Phone: 972-488-8800

CONCRETE INSPECTION AND FLEXURAL STRENGTH TEST REPORT
(THIRD POINT LOADING)

*Revised Copy - Specifications

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 02/01/99
TMI REPORT #: DC98-050-93

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitt-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

SPECIFICATIONS

FIELD DATA SET #3

PROJECT DATA

Ticket #: <u>na</u>	Time Batched: <u>na</u>	Time Sampled: <u>na</u>
Slump (in.): <u>5.00</u>	Air Content: <u>5.0</u>	Unit Weight (pcf): <u>na</u>
Conc. Temp. (°F): <u>50</u>	Ambient Temp. (°F): <u>40</u>	Yardage (c.y.): <u>160</u>
Placement Location: _____		
Remarks: <u>Quorum and Arapaho Road - southeast</u>		

FIELD DATA SET #4

Ticket #: _____	Time Batched: _____	Time Sampled: _____
Slump (in.): _____	Air Content: _____	Unit Weight (pcf): _____
Conc. Temp. (°F): _____	Ambient Temp. (°F): _____	Yardage (c.y.): _____
Placement Location: _____		
Remarks: _____		

CONCRETE COMPRESSION TEST RESULTS

BEAMS MOLDED AND CURED PER ASTM C31, TESTED PER ASTM C78

Set #	Beam #	Test Date	Age (Days)	Max. Load (lbs)	Average Depth, D	Average Width, B	Modulus of Rupture (psi)	Notes
3	APR123105	01/07/99	7	6300	5.90	6.10	525	
	APR123106	01/28/99	28	7320	6.00	6.10	610	* * Does not meet specification
<i>6% deficient 90% of Contract Price Allowed.</i>								

- (1) SPAN LENGTH OF 18 INCHES, UNLESS NOTED ABOVE.
- (2) SPECIMENS GROUND PRIOR TO TESTING, LEATHER SHIMS USED DURING TESTING.
- (3) TEST RESULTS COMPLY WITH PROJECT SPECIFICATIONS UNLESS INDICATED IN NOTES.
- (4) FIELD TESTS ARE PER APPLICABLE ASTM STANDARDS: C138, C143, C172, C231

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 TERRA-MAR, INC.

be required to complete the pavement in accordance with the plans and specifications.

5.8.4. ALLEY PAVING: Alley paving shall be constructed in accordance with the specifications for street paving hereinbefore described in accordance with the details shown on the plans; and with the following additional provisions:

Alley paving shall be constructed to one of the typical cross sections shown on the plans.

Transverse expansion joints of the type shown on the plans shall be constructed at the property line on each end of the alley with a maximum spacing of 600 feet (180M). Transverse contraction and dummy joints shall be placed at the spacing shown on the plans. Contraction and dummy joints shall be formed in such a manner that the required joints shall be produced to the satisfaction of the OWNER. All joints shall be filled with top seal in accordance with the requirements of Item 5.8.2.(e)., "Joints."

5.8.5. PAVEMENT LEAVEOUTS: Pavement leaveouts as necessary to maintain and provide for local traffic shall be provided at location indicated on the plans or as directed by the OWNER. The extent and location of each leaveout required and a suitable crossover connection to provide for traffic movements shall be determined in the field by the OWNER. Left or right-turn lanes and median openings shall not be considered as pavement leaveouts.

5.8.6. PAVEMENT TESTING:

(a) Testing of Materials. Samples of all materials for test shall be made at the expense of the OWNER, unless otherwise specified in the special provisions or in the plans. In the event the initial sampling and testing does not comply with the specifications, all subsequent testing of the material in order to determine if the material is acceptable shall be at the CONTRACTOR's expense at the same rate charged by the commercial laboratories.

(b) Pavement Thickness Test. Upon completion of the work and before final acceptance and final payment shall be made, pavement thickness test shall be made by the OWNER or his authorized representative. The number of tests and location shall be at the discretion of the OWNER, unless otherwise specified in the special provisions or on the plans. The cost for the initial pavement thickness test shall be at the expense of the OWNER. In the event a deficiency in the thickness of pavement is revealed during normal testing operations, subsequent tests necessary to isolate the deficiency shall be at the CONTRACTOR's expense. The cost for the additional coring test shall be at the same rate charged by commercial laboratories.

Where the average thickness of pavement in the area found to be deficient in thickness by more than 0.2 inch (5 mm), but not more than 0.50 inch (12.5mm), payment shall be made at an adjusted price as specified in the following table:

CONCRETE PAVEMENT DEFICIENCY

Deficiency in Thickness Determined by Cores		Proportional Part of Contract Price Allowed
Inches	(mm)	
0.00 to 0.20	(0.0—5.0)	100 percent
0.21 to 0.30	(5.3—7.5)	80 percent
0.31 to 0.40	(7.8—10.0)	70 percent
0.41 to 0.50	(10.3—12.5)	60 percent

Any area of pavement found deficient in thickness by more than 0.5" of an inch (12.5mm) but not more than .75" (19mm) or 1/10 of the plan thickness, whichever is greater, shall be evaluated by the OWNER. If, in the judgment of the OWNER, the area of such deficiency should not be removed and replaced, there shall be no payment for the area retained. If, in the judgment of the OWNER, the area of such deficiency warrants removal, the area shall be removed and replaced, at the CONTRACTOR's entire expense, with concrete of the thickness shown on the plans. Any area of pavement found deficient in thickness by more than .75" inch (19 mm) or more than 1/10 of the plan thickness, whichever is greater, shall be removed and replaced, at the CONTRACTOR's entire expense, with concrete of the thickness shown on the plans.

No additional payment over the contract unit price shall be made for any pavement of a thickness exceeding that required by plans.

(c) Pavement Strength Test. During the progress of the work, the CONTRACTOR shall cast test cylinders to maintain a check on the compressive strengths of the concrete being placed.

Four test cylinders shall be taken from a representative portion of the concrete being placed for every 150 cubic yards of concrete pavement placed, but in no case shall less than two sets of cylinders be taken from any one day's placement.

After the cylinders have been cast, they shall remain on the job site undisturbed for 24 hours and then transported, moist cured, and tested by the OWNER.

Two of the cylinders in each set shall be tested in seven days; and then, if, in the opinion of the OWNER, the seven-day test results are low enough, the other two cylinders in each set may be tested in 28 days.

If the 28-day test results indicate deficient strength, the CONTRACTOR may, at his option and expense, core the pavement in question and have the cores tested by an approved laboratory to override the results of the cylinder tests.

Pavement not meeting the minimum specified strength shall be subject to the money penalties or removal and replacement at the CONTRACTOR's expense as shown in the following table:

<u>Percent Deficient</u>	<u>Percent of Contract Price Allowed</u>
Greater Than 0% — Not More Than 5%	95 percent
Greater Than 5% — Not More Than 10%	90 percent
Greater Than 10% — Not More Than 15%	80 percent
Greater Than 15%	60 percent or removed and replaced at the entire cost and expense of CONTRACTOR as directed by OWNER.

The amount of penalty shall be deducted from payment due to CONTRACTOR; such penalty deducted is to defray the cost of extra maintenance.

These requirements are in addition to the requirements of Item 5.8.7.(2).

The strength requirements for structures and other concrete work are not altered by this special provision.

No additional payment over the contract unit price shall be made for any pavement of strength exceeding that required by plans and/or specifications.

5.8.7. MEASUREMENT AND PAYMENT: "Concrete Pavement" shall be measured by the square yard (M^2) of completed and accepted pavement. The price bid per square yard (M^2) for concrete reinforced pavement, as shown on the proposal, shall be full payment for furnishing and laying the reinforced concrete pavement, including the foundation course, and for all labor, equipment, materials, tools, and incidentals necessary to complete the work. Measurement for reinforced concrete pavement shall be by the square (M^2) measured in its final position.

The work performed and material furnished as prescribed by this item and measured as provided in this item shall be paid for at the unit price bid per square yard (M^2) for concrete pavement, or the adjusted unit price for pavement of deficient thickness or deficient strength as provided under Pavement Thickness Test and Pavement Strength Test, which price shall be full compensation for shaping and fine grading the roadbed, including furnishing and applying all water required; for furnishing, loading and unloading, storing, hauling and handling all concrete ingredients, including all freight and royalty involved; for mixing, placing, finishing and curing all concrete; for furnishing and installing all reinforcing steel; for furnishing all materials and placing longitudinal, warping, expansion, and contraction joints, including all steel dowels, dowel caps and load transmission units required, wire and devices for placing, holding and supporting the steel bar, load transmission units, and joint filler material in the proper position; for coating steel bars where required by the plans; for all manipulations, labor, equipment, appliances, tools, traffic provisions and incidentals necessary to complete the work.

MODULUS OF RUPTURE

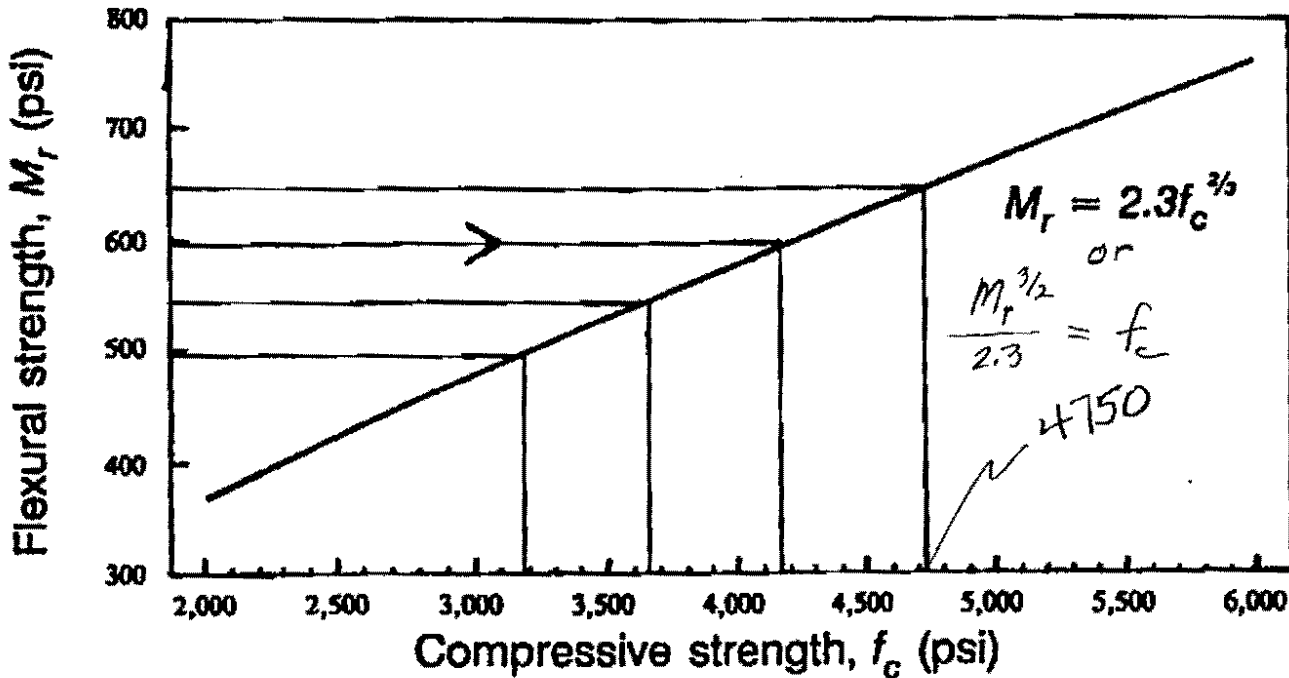


Fig. 2.5—Flexural to compressive strength relationship

2.6—Thickness design

2.6.1 Basis for design—Thickness designs for concrete pavements are based upon studies, road tests, and surveys of pavement performance. The most commonly used methods are the AASHTO Design Equation, which was developed from data obtained at the AASHTO Road Test, and the Portland Cement Association's Design Procedure, which is based on the pavement's resistance to fatigue and deflection. Other methods have been used, e.g., the Brokaw Method,⁴ which is based on surveys of the performance of plain concrete pavements in use throughout the country. While these design methods were developed for analyzing and designing pavements for streets and highways, the research behind them has included thin pavements, and they can be used for parking lot design. The different design procedures give very similar thicknesses. More complete explanations of these design procedures can be found in Appendix A.

Concrete pavements are usually classified as plain or reinforced, depending on whether or not the concrete contains distributed steel reinforcement. Plain pavements may be divided into those with or without load transfer devices at the joints. Those with devices are usually referred to as plain-doweled pavements. The design methods cited above can be used for plain or reinforced pavements since the presence or lack of distributed steel reinforcement has no significant effect on the load-carrying capacity or thickness. The presence or absence of distributed steel reinforcement does affect joint design. Load transfer devices have a significant effect on pavement thickness, but they are costly and not

normally used in light duty pavements. The differences between these types of pavements are discussed in Sections 2.7 and 2.8.

Tables 2.6(a) and 2.6(b) have been prepared to facilitate the selection of an appropriate pavement thickness for the types of traffic and soil conditions most frequently encountered in parking lots. Table 2.6(a) lists five different traffic categories ranging from entirely passenger cars and light trucks, to heavy trucks. Table 2.6(b) gives recommended concrete pavement thicknesses for large and small numbers of trucks per day in five different traffic categories and six different categories of subgrade support, ranging from very high to low. The very high values can apply to treated subbases or existing flexible pavement. The levels of subgrade support can be related back to Table 2.4, which lists the estimated support values for the most commonly occurring subgrade soil types. The thicknesses shown are based on moduli of rupture ranging from 500 to 650 psi, which can be correlated to 28-day compressive strengths using Eq. (2-1). Approximate cost comparisons may show that the lower strength concrete can be justified in areas where freeze-thaw resistance is not important. It should be noted however that changes in modulus of rupture do change the required concrete thickness or the capacity. A designer should determine whether it is more cost effective to increase strength or thickness, taking into account the other benefits of high strength. Table 2.6(b) can be used to assist the designer in this determination.

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
 DALLAS FORT WORTH HOUSTON LONGVIEW LUBBOCK AUSTIN

11050 Ables Lane, Dallas, Texas 75229 Phone: 972-488-8800

CONCRETE INSPECTION AND FLEXURAL STRENGTH TEST REPORT
(THIRD POINT LOADING)

cc to put ✓

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 12/03/98
TMI REPORT #: DC98-050-88

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitt-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

SPECIFICATIONS

Strength (psi): 650
 Slump (in.): 4
 Air Content (%): 4-6
 Concrete Temp (°F): 95

PROJECT DATA

Placement Date: 11/25/98
 Sampled By: Ed Emanuel
 Weather: Clear
 Supplier/Mix: Lattimore

Ticket #: 62653
 Slump (in.): 3.5
 Conc. Temp. (°F):
 Placement Location:
 Remarks:

Take core (5)

T #1

Time Sampled: 2:18
 Unit Weight (pcf):
 Yardage (c.y.): 20

Ticket #:
 Slump (in.):
 Conc. Temp. (°F):
 Placement Location:
 Remarks:

Time Sampled:
 Unit Weight (pcf):
 Yardage (c.y.):

TEST RESULTS

ASTM C31, TESTED PER ASTM C78

Set #	Beam #	Test Date	Span (in.)	Modulus of Rupture (psi)	Average Depth, D	Average Width, B	Modulus of Rupture (psi)	Notes
1	ARI112501	12/02/98	7	6540	6.10	6.15	545	
	ARI112502	12/02/98	7	6180	6.05	6.10	515	
	ARI112503	12/23/98	28	6900	6.10	6.15	575	* * Does not meet specification
	ARI112504	12/23/98	28	6660	6.10	6.15	555	* * Does not meet specification
					<i>avg = 565 psi 87% of that specified</i>			

- (1) SPAN LENGTH OF 18 INCHES, UNLESS NOTED ABOVE.
- (2) SPECIMENS GROUND PRIOR TO TESTING, LEATHER SHIMS USED DURING TESTING.
- (3) TEST RESULTS COMPLY WITH PROJECT SPECIFICATIONS UNLESS INDICATED IN NOTES.
- (4) FIELD TESTS ARE PER APPLICABLE ASTM STANDARDS: C138, C143, C172, C231

Note: This report is for the exclusive use of the Client addressed. This report may not be reproduced except in its entirety, without the written consent of TMI. Results apply only to above tests.

Larry L. Fox, P.E.
 TERRA-MAR, INC.

TOWN OF
ADDISON

Faxed

PUBLIC WORKS

To: Robert Weber

From: James C. Pierce, Jr., P.E., DEE
Assistant City Engineer
Phone: 972/450-2879
FAX: 972/450-2837

Company: Ed Bell Const.

FAX #: 214-352-3201

Date: 11-17-98

16801 Westgrove
P.O. Box 9010
Addison, TX 75001-9010

of pages (including cover): 3

Re: Arapaho Rd Strength Testing

- Original in mail Per your request FYI Call me

Comments: The Terra Mar Core compression Test data (attached) has been summarized in a spreadsheet (attached). The concrete panel from which core #1 was taken needs to be removed & replaced. Core #2 was deficient in strength such that reduced payment can be made. However, the extent of the reduced strength must be determined. I suggest cores be taken 15' either side of core #2 for this purpose. If you have another idea please let me know. The cores should be numbered 2A, 2B etc. Let Dave Wilde know when the cores are to be taken.

Jim

cc Dave Wilde

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
DALLAS FORT WORTH HOUSTON AUSTIN LONGVIEW LUBBOCK

11050 Ables Lane, Dallas, Texas 75229 Phone: 972-488-8800

CONCRETE CORE COMPRESSION TEST REPORT

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 11/04/98
TMI REPORT #: DC98-050-83

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitt-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

PROJECT DATA

Placement Date: na **Drilled By:** Mike Young/John Sullivan
Date Drilled: 10/29/98 **Moisture Condition at Time of Test:** Dry
Date Tested: 11/02/98 **Nominal Max. Size of Aggregate:**
Age at Test: na
Design Strength (psi):

CONCRETE COMPRESSION TEST RESULTS

CONCRETE CORED IN ACCORDANCE WITH ASTM C42, CURED (IF APPLICABLE) PER ASTM C31,
 TESTED PER ASTM C39, CAPPED PER ASTM C617

CORE I.D.	CORE LENGTH (in.)	CAPPED LENGTH, L (in.)	DIAMETER 1 (in.)	DIAMETER 2 (in.)	AVERAGE DIAMETER, D (in.)	AREA (in ²)	MAXIMUM LOAD (lbs.)	L/D	CORRECTION FACTOR	CORRECTED STRENGTH (psi)
1	11.0	7.80	3.89	3.90	3.90	11.92	44020	2.00	1.00	3680
2	9.8	7.70	3.90	3.90	3.90	11.95	51180	1.97	1.00	4280
3	9.5	7.80	3.90	3.90	3.90	11.95	61160	2.00	1.00	5030
4	9.8	7.80	3.90	3.90	3.90	11.95	56380	2.00	1.00	4720

LOCATION OF DRILLED CORES

CORE I.D.	LOCATION
1	East end of Arapaho, station 55+50 (core contains rebar)
2	West end of Arapaho, station 46+25
3	West end of Arapaho, station 45+45
4	West end of Arapaho, station 44+50

Note: This report is for the exclusive use of the Client addressed. This report may not be reproduced except in its entirety, without the written consent of TMI. Results apply only to above tests.

TERRA-MAR, INC. *Henry L. Fox*

ARAPAHO ROAD CORE TEST RESULTS							
Pavement Thickness = 10.0 inches. Pavement Compressive Strength = 4,750 psi.							
R&R = Remove and Replace							
							Combined
			Percent			Percent	Percent
	Core		Contract	Core		Contract	Contract
	Length	Deficiency	Price	Strength	Percent	Price	Price
Core ID	(inches)	(inches)	Allowed	(psi)	Deficient	Allowed	Allowed
1	11	0	100	3680	22.5%	R&R	R&R
2	9.8	0.2	100	4280	9.9%	90	90
3	9.5	0.5	60	5030	-5.9%	100	60
4	9.8	0.2	100	4720	0.6%	100	100

MODE = TRANSMISSION

START=11-17 03:53PM

END=11-17 03:54PM

NO.	COM	SPEED NO	STATION NAME/ TELEPHONE NO.	PAGES
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001	OK	5	92143523201	003
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-Addison Svc Ctr -Upstairs-

TOWN OF
ADDISON

PUBLIC WORKS

To: Robert Weber

From: James C. Pierce, Jr., P.E., DEE
Assistant City Engineer
Phone: 972/450-2879
FAX: 972/450-2837

Company: Ed Bell Const.

FAX #: 214-352-3201

Date: 11-10-98

16801 Westgrove
P.O. Box 9010
Addison, TX 75001-9010

of pages (including cover): _____

Re: Arapaho Road - Pavement Thickness Testing

Original in mail Per your request FYI Call me

Comments: For the purposes of thickness testing
I have divided the job into 6 "units"
as follows:

Unit #	Begin Station	End Station
①	40+35	45+72
②	45+72	51+09
③	51+09	56+46
④	56+46	61+83
⑤	61+83	67+20

⑥ Edwin Lewis Drive, Quorum Drive N&S, Spectrum Dr.

One thickness test shall be taken, per lane,
including turn lanes, in each unit. The location
shall be selected at random by Dave Wilde.

The remainder of the procedure shall be as
per COG Spec 5.8.6. Cores shall be the
minimum diameter possible for a proper test.

Testing shall proceed whenever a lane has been completed within a unit.

Dave Wilde will keep a set of plans specifically for the purpose of locating test cores.

Please call if you have any questions.

Jim Pucci

cc Dave Wilde

MODE = TRANSMISSION

START=11-10 03:29PM

END=11-10 03:33PM

NO.	COM	SPEED	NO	STATION NAME/ TELEPHONE NO.	PAGES
001	OK	2		92143523201	002

-Addison Svc Ctr -Upstairs-

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
DALLAS FORT WORTH HOUSTON AUSTIN LONGVIEW LUBBOCK

11050 Ables Lane, Dallas, Texas 75229 Phone: 972-488-8800

CONCRETE CORE COMPRESSION TEST REPORT

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 11/04/98
TMI REPORT #: DC98-050-83

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitz-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

PROJECT DATA

Placement Date: na **Drilled By:** Mike Young/John Sullivan
Date Drilled: 10/29/98 **Moisture Condition at Time of Test:** Dry
Date Tested: 11/02/98 **Nominal Max. Size of Aggregate:**
Age at Test: na
Design Strength (psi):

CONCRETE COMPRESSION TEST RESULTS

CONCRETE CORED IN ACCORDANCE WITH ASTM C42, CURED (IF APPLICABLE) PER ASTM C31,
 TESTED PER ASTM C39, CAPPED PER ASTM C617

CORE I.D.	CORE LENGTH (in.)	CAPPED LENGTH, L (in.)	DIAMETER 1 (in.)	DIAMETER 2 (in.)	AVERAGE DIAMETER, D (in.)	AREA (in ²)	MAXIMUM LOAD (lbs.)	L/D	CORRECTION FACTOR	CORRECTED STRENGTH (psi)
1	11.0	7.80	3.89	3.90	3.90	11.92	44020	2.00	1.00	3680
2	9.8	7.70	3.90	3.90	3.90	11.95	51180	1.97	1.00	4280
3	9.5	7.80	3.90	3.90	3.90	11.95	61160	2.00	1.00	5030
4	9.8	7.80	3.90	3.90	3.90	11.95	56380	2.00	1.00	4720

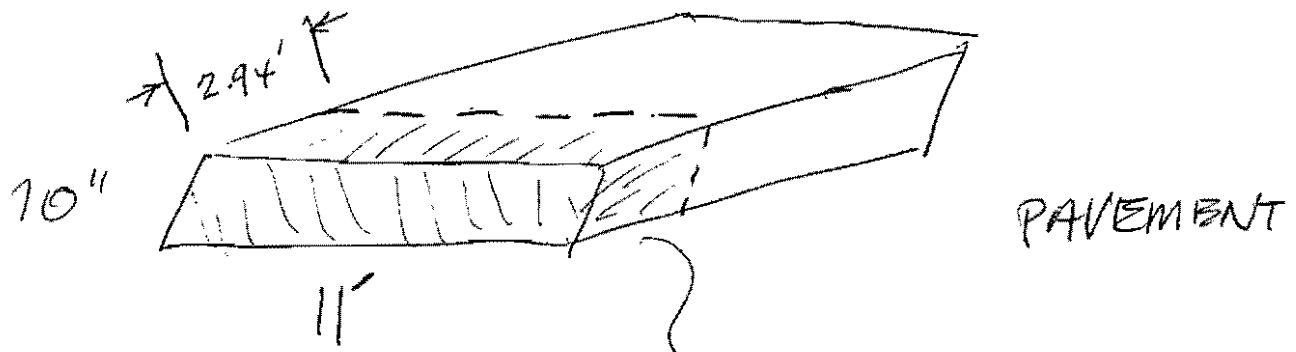
LOCATION OF DRILLED CORES

CORE I.D.	LOCATION
1	East end of Arapaho, station 55+50 (core contains rebar)
2	West end of Arapaho, station 46+25
3	West end of Arapaho, station 45+45
4	West end of Arapaho, station 44+50

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TERRA-MAR, INC. *Serry I. For. 19*

ARAPAHO ROAD CORE TEST RESULTS							
Pavement Thickness = 10.0 inches. Pavement Compressive Strength = 4,750 psi.							
R&R = Remove and Replace							
							Combined
			Percent			Percent	Percent
	Core		Contract	Core		Contract	Contract
	Length	Deficiency	Price	Strength	Percent	Price	Price
Core ID	(inches)	(Inches)	Allowed	(psi)	Deficient	Allowed	Allowed
1	11	0	100	3680	22.5%	R&R	R&R
2	9.8	0.2	100	4280	9.9%	90	90
3	9.5	0.5	60	5030	-5.9%	100	60
4	9.8	0.2	100	4720	0.6%	100	100



$$\frac{10}{12} \times 11 = 9.167 \text{ ft}^2$$

1 cubic
yard of
concrete

$$\frac{27 \text{ ft}^3}{9.167 \text{ yd}^3} = 2.94 \text{ linear feet} / \text{yd}^3$$

$$\frac{9 \text{ yd}^3 \times 2.94'}{\text{yd}^3} = 26.5$$

is poured per 9 yd³ linear feet
truck of concrete

ARAPAHO ROAD CORE TEST RESULTS							
Pavement Thickness = 10.0 inches. Pavement Compressive Strength = 4,750 psi.							
R&R = Remove and Replace							
							Combined
			Percent			Percent	Percent
	Core		Contract	Core		Contract	Contract
	Length	Deficiency	Price	Strength	Percent	Price	Price
Core ID	(inches)	(inches)	Allowed	(psi)	Deficient	Allowed	Allowed
1	11	0	100	3680	22.5%	R&R	R&R
2	9.8	0.2	100	4280	9.9%	90	90
3	9.5	0.5	60	5030	-5.9%	100	60
4	9.8	0.2	100	4720	0.6%	100	100

add cores for strength

15' within side of # 2 @ 46+25

46+10

46+40

in same lane —

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
 DALLAS FORT WORTH HOUSTON LONGVIEW LUBBOCK AUSTIN

11050 Ables Lane, Dallas, Texas 75229 Phone:972-488-8800

CONCRETE INSPECTION AND FLEXURAL STRENGTH TEST REPORT
(THIRD POINT LOADING)

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 10/05/98
TMI REPORT #: DC98-050-70

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huitt-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

SPECIFICATIONS

Strength (psi): 650
 Slump (in.): 3 +/-1
 Air Content (%): 5 - 8
 Concrete Temp (°F): na

PROJECT DATA

Placement Date: 09/04/98
 Sampled By: Ed Emanuel
 Weather: Sunny
 Supplier/Mix: Ed Bell Construction

FIELD DATA SET #1

Ticket #: 14318 Time Batched: 09:45 Time Sampled: 9:55
 Slump (in.): 2.00 Air Content: 3.8 Unit Weight (pcf): na
 Conc. Temp. (°F): 91 Ambient Temp. (°F): 97 Yardage (c.y.): 126
 Placement Location: Paving at Arapaho Road, station 46+25
 Remarks: _____

FIELD DATA SET #2

Ticket #: 14323 Time Batched: 11:00 Time Sampled: 11:22
 Slump (in.): _____ Air Content: 3.8 Unit Weight (pcf): na
 Conc. Temp. (°F): 98 Ambient Temp. (°F): 98 Yardage (c.y.): 171
 Placement Location: Paving at Arapaho Road, station 45+45
 Remarks: _____

CONCRETE COMPRESSION TEST RESULTS

BEAMS MOLDED AND CURED PER ASTM C31, TESTED PER ASTM C78

Set #	Beam #	Test Date	Age (Days)	Max. Load (lbs)	Average Depth, D	Average Width, B	Modulus of Rupture (psi)	Notes
1	ARI090401	09/11/98	7	6120	6.00	6.00	510	
	ARI090402	09/11/98	7	5820	6.00	6.00	485	
	ARI090403	10/02/98	28	7560	6.00	6.00	630	* * Does not meet specification
	ARI090404	10/02/98	28	7440	6.00	6.00	620	* * Does not meet specification
2	ARI090405	09/11/98	7	4680	6.00	6.00	390	
	ARI090406	09/11/98	7	5640	6.00	6.00	470	
	ARI090407	10/02/98	28	7020	6.00	6.00	585	* * Does not meet specification
	ARI090408	10/02/98	28	6780	6.00	6.00	565	* * Does not meet specification

- (1) SPAN LENGTH OF 18 INCHES, UNLESS NOTED ABOVE.
- (2) SPECIMENS GROUND PRIOR TO TESTING, LEATHER SHIMS USED DURING TESTING.
- (3) TEST RESULTS COMPLY WITH PROJECT SPECIFICATIONS UNLESS INDICATED IN NOTES.
- (4) FIELD TESTS ARE PER APPLICABLE ASTM STANDARDS: C138, C143, C172, C231

Note: This report is for the exclusive use of the Client addressed. This report may not be reproduced except in its entirety, without the written consent of TMI. Results apply only to above tests.

Benny L. Ford
 TERRA-MAR, INC.

TERRA-MAR, INC.
GEOTECHNICAL ENVIRONMENTAL AND MATERIALS ENGINEERS
 DALLAS FORT WORTH HOUSTON LONGVIEW LUBBOCK AUSTIN

11050 Ables Lane, Dallas, Texas 75229 Phone:972-488-8800

CONCRETE INSPECTION AND FLEXURAL STRENGTH TEST REPORT
(THIRD POINT LOADING)

CLIENT: Ed Bell Construction
PROJECT: Arapaho Road Improvements
REPORT DATE: 10/05/98
TMI REPORT #: DC98-050-70

REPORT DISTRIBUTION:
 Ed Bell Construction - Doug Teter
 Huit-Zollars, Inc. - Kenneth Roberts, P.E.
 Town of Addison - James Pierce, P.E.
 Town of Addison - Dave Wilde

SPECIFICATIONS	FIELD DATA SET #3	PROJECT DATA
Ticket #: 14333	Time Batched: 13:40	Time Sampled: 14:08
Slump (in.): 3.50	Air Content: 4.0	Unit Weight (pcf): na
Conc. Temp. (°F): 94	Ambient Temp. (°F): 103	Yardage (c.y.): 261
Placement Location: Paving at Arapaho Road, station 44+50		
Remarks:		

FIELD DATA SET #4		
Ticket #: _____	Time Batched: _____	Time Sampled: _____
Slump (in.): _____	Air Content: _____	Unit Weight (pcf): _____
Conc. Temp. (°F): _____	Ambient Temp. (°F): _____	Yardage (c.y.): _____
Placement Location: _____		
Remarks: _____		

CONCRETE COMPRESSION TEST RESULTS								
BEAMS MOLDED AND CURED PER ASTM C31, TESTED PER ASTM C78								
Set #	Beam #	Test Date	Age (Days)	Max. Load (lbs)	Average Depth, D	Average Width, B	Modulus of Rupture (psi)	Notes
3	ARI090409	09/11/98	7	6540	6.00	6.00	545	
	ARI090410	09/11/98	7	5100	6.00	6.00	425	
	ARI090411	10/02/98	28	7380	6.00	6.00	615	** Does not meet specification
	ARI090412	10/02/98	28	6960	6.00	6.00	580	** Does not meet specification
4								

- (1) SPAN LENGTH OF 18 INCHES, UNLESS NOTED ABOVE.
- (2) SPECIMENS GROUND PRIOR TO TESTING, LEATHER SHIMS USED DURING TESTING.
- (3) TEST RESULTS COMPLY WITH PROJECT SPECIFICATIONS UNLESS INDICATED IN NOTES.
- (4) FIELD TESTS ARE PER APPLICABLE ASTM STANDARDS: C138, C143, C172, C231

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Ernest L. Furr, P.E.
 TERRA-MAR, INC.