U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

People Saving People
http://www.nhtsa.dot.gov

DOT HS 808 500

June 1995

Final Report

Run-Off-Road Collision Avoidance Countermeasures Using IVHS Countermeasures

TASK 2

Volume 2: Support Data

Contracting Officer's Technical Representative's Precis

This report provides a basis for disseminating the preliminary contract results on a timely basis resulting in the information being available before the contract final reports are produced. Research performed during the remainder of the contract may support and/or modify the results, therefore, the material contained in this report should not be consider to be final. The current schedule calls for the completion of this research project by the third quarter of 1999.

Technical Report Documentation Page

1 Report No	2 Government Accession No	3 Recipients's Catalog No
DOT HS 808 500		

4 Title and Subtitle	5 Report Date
Run-Off-Road Collision Avoidance Countermeasures Using IVHS Countermeasures Task 2 Final Interim Report Volume 2: Support Data	June 7, 1995
	6 Performing Organization Code
7 Author(s) J.A. Pierowicz, D.A. Pomerleau, D.L. Hendricks, E.S. Bollman, N.J. Schmitt	8 Performing Organization Report No
9 Performing Organization Name and Address Robotics Institute Carnegie Mellon University 5000 Forbes Avenue Pittsburgh, PA 15213	10 Work Unit No (TRAIS)n code
	11 Contract of Grant No DTNH22-93-C-07023
12 Sponsoring Agency Name and Address National Highway Traffic Safety Administration 400 Seventh Street, S.W. Washington, DC 20590	13 Type of Report and Period Covered Final Report 11-94 to 6-95
	14 Sponsoring Agency Code

15 Supplementary Notes

16 Abstract

The Run-Off-Road Collision Avoidance Using IVHS Countermeasures program is to address the single vehicle crash problem through application of technology to prevent and/or reduce the severity of these crashes.

This volume contains a summary of the data used to develop the run-off-road collision taxonomy and functional goals for run-off-road collision countermeasures. A summary sheet is provided for each case, containing basic information about the case, as well as data on the time it took for the vehicle to depart the roadway. The methods used to calculate these departure times is also provided.

An accident collision diagram is included for each case with a superimposed timeline. The timeline depicts interpolated times for each known vehicle position during the run-off-road crash sequence.

Also included in this volume are descriptions of countermeasure functional goals applied to the causal factor groupings of these cases.

17 Key Words	18 Distribution Statement
Run-Off-Road Collision Avoidance Single Vehicle Roadway Departure Collision Taxonomy Functional Goals	Document is available to the public through the National Technical Information Service, Springfield, VA 22161

19 Security Classif (of this report)	20 Security Classif (of this page)	21 No of Pages	22 Price
Unclassified	Unclassified	209	$169,531

Form DOT F1700.7 (8-72) Reproduction of completed page authorized

INTRODUCTION

This volume contains a summary of the data utilized in Task 2 of the Run-Off-Road Collision Avoidance program. The data are presented in a case-by-case format. The cases are a subset of the clinical sample from Task 1. Of the original 207 cases, 102 were used in the analysis.

A *Summary Sheet* is provided for each case. The Summary Sheet contains basic information about the case (i.e., Driver/Occupant data, Vehicle data, and Roadway data). In addition, the summaries present data on each vehicle's departure time. Departure time is the amount of time from when the vehicle first deviated from its pre-crash travel path to when the vehicle departed the roadway edge or shoulder edge. The methods used and the assumptions made to determine the vehicle's departure time is provided.

An Accident Collision Diagram is included for each case with a superimposed timeline. The timeline depicts interpolated times for each known vehicle position (stations) during the run-off-road crash sequence. The timelines reflect each vehicle's roadway edge departure time.

Also included in this volume are *Descriptions of the Countermeasure Functional Goals* applied to the causal factor groupings of these cases.

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-2-93	***Weather:***	Clear
Time:	0130	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	17
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1981
Vehicle Make:	Ford
Vehicle Model:	Escort/EXP

Roadway Information

Trafficway Type *(Median):*	Unknown	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	56 km/h

Departure Times

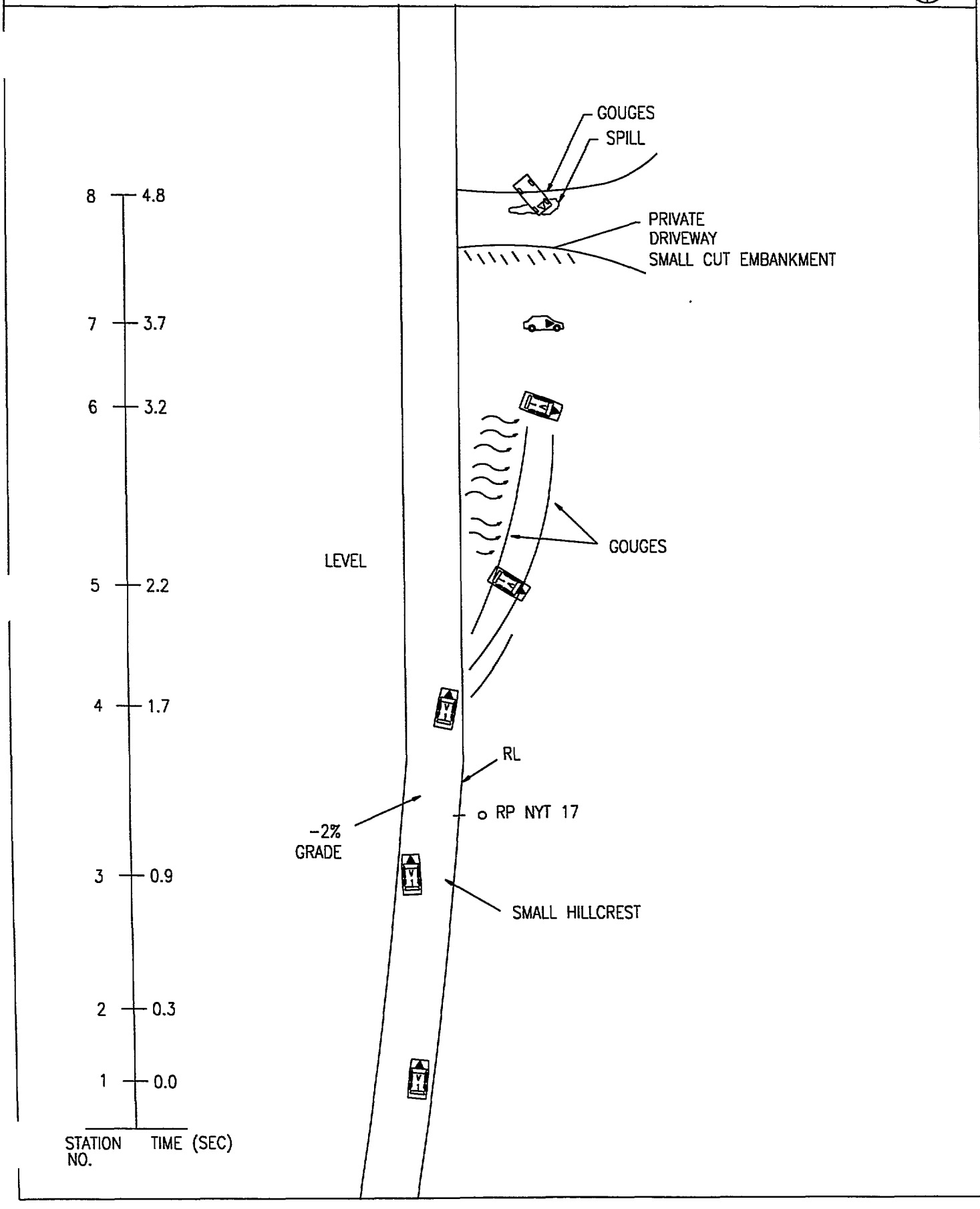
Roadway Edge:	0.93 sec	***Method***	Straight Line Projection
Shoulder Edge:	1.06 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 and 4 (+3 m).
- Departure time for the shoulder edge was calculated between Stations 3 and 4 (+6 m).
- Initial velocity of the vehicle was 80 km/h.
- Velocity of 80 km/h was assumed since excessive speed was indicated as a causal factor.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 02 Case Number – Stratum 095D Indicate North



Scale:1/500

CAUSAL FACTOR: *Evasive Maneuver - Vehicle Encroaching into Lane - SameTravel Direction*

ROADSIDE DEPARTURE: *Left*

General Accident information

Date:	7-6-93	***Weather:***	Clear
Time:	1330	***Surface Condition:***	Dry
Accident Type:	Avoid Collision	***Lighting:***	Daylight
Accident Severity:	1 (C)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	33
Driver Sex:	Male
Impairmen t:	None

Vehicle Information

Year:	1992
Vehicle Make:	Toyota
***Vehicle* Model:**	Camry

Roadway Information

Trafficway Type (Median):	Physical barrier	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

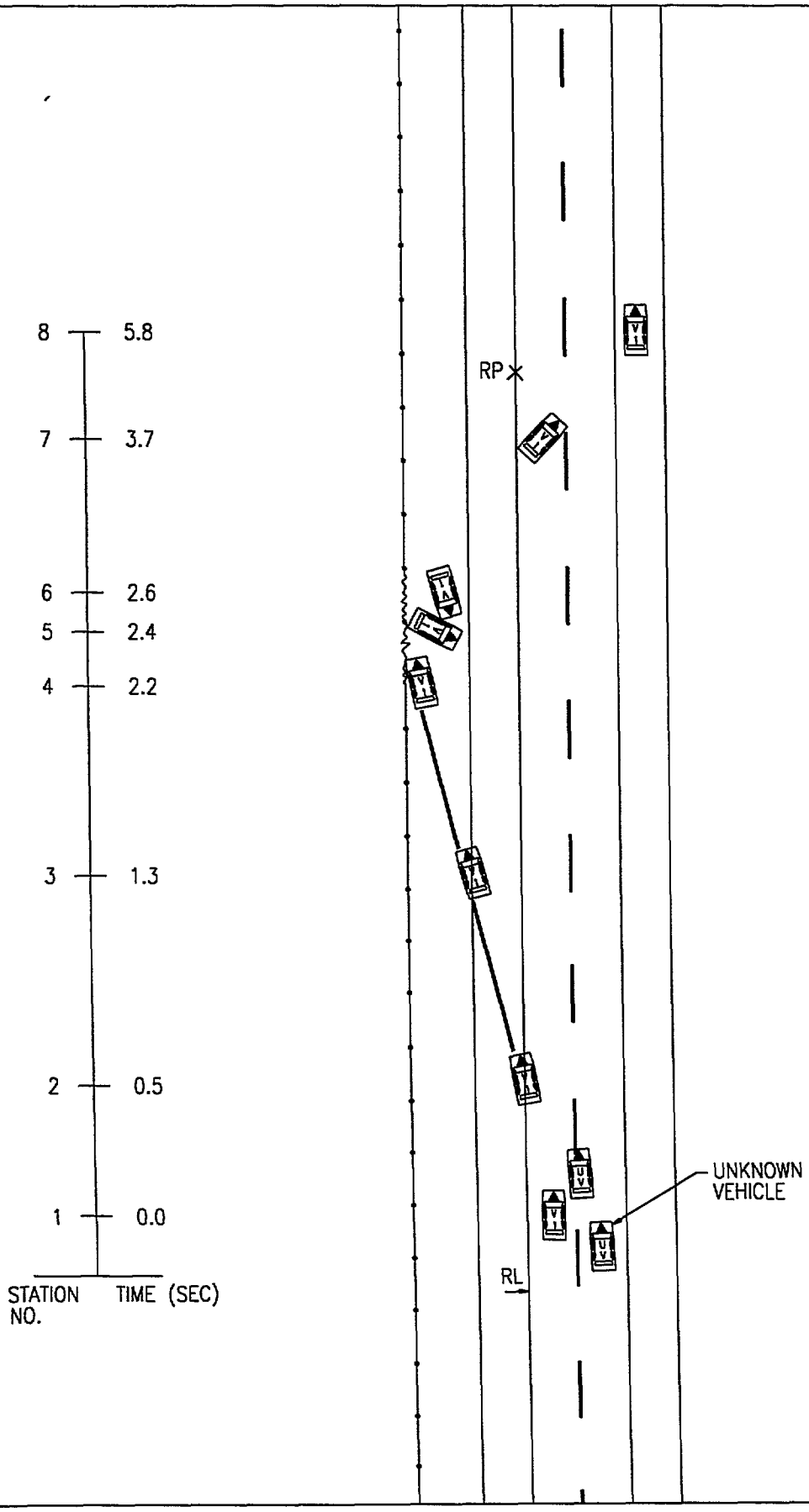
Roadway Edge:	0.32 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.04 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 2 (- 4 m).
- Departure time for the shoulder edge was calculated between Stations 1 and 3 (-3 m).
- Initial velocity of the vehicle was 89 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 02 Case Number – Stratum 096E Indicate North



Scale:1/500

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-2-93	***Weather:***	Clear
Time:	0045	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	2 (B)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	67
Driver Sex:	Male
Impairment:	Fell Asleep

Vehicle Information

Year:	1986
Vehicle Make:	Oldsmobile
Vehicle Model:	Cutlass

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Curve Right
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

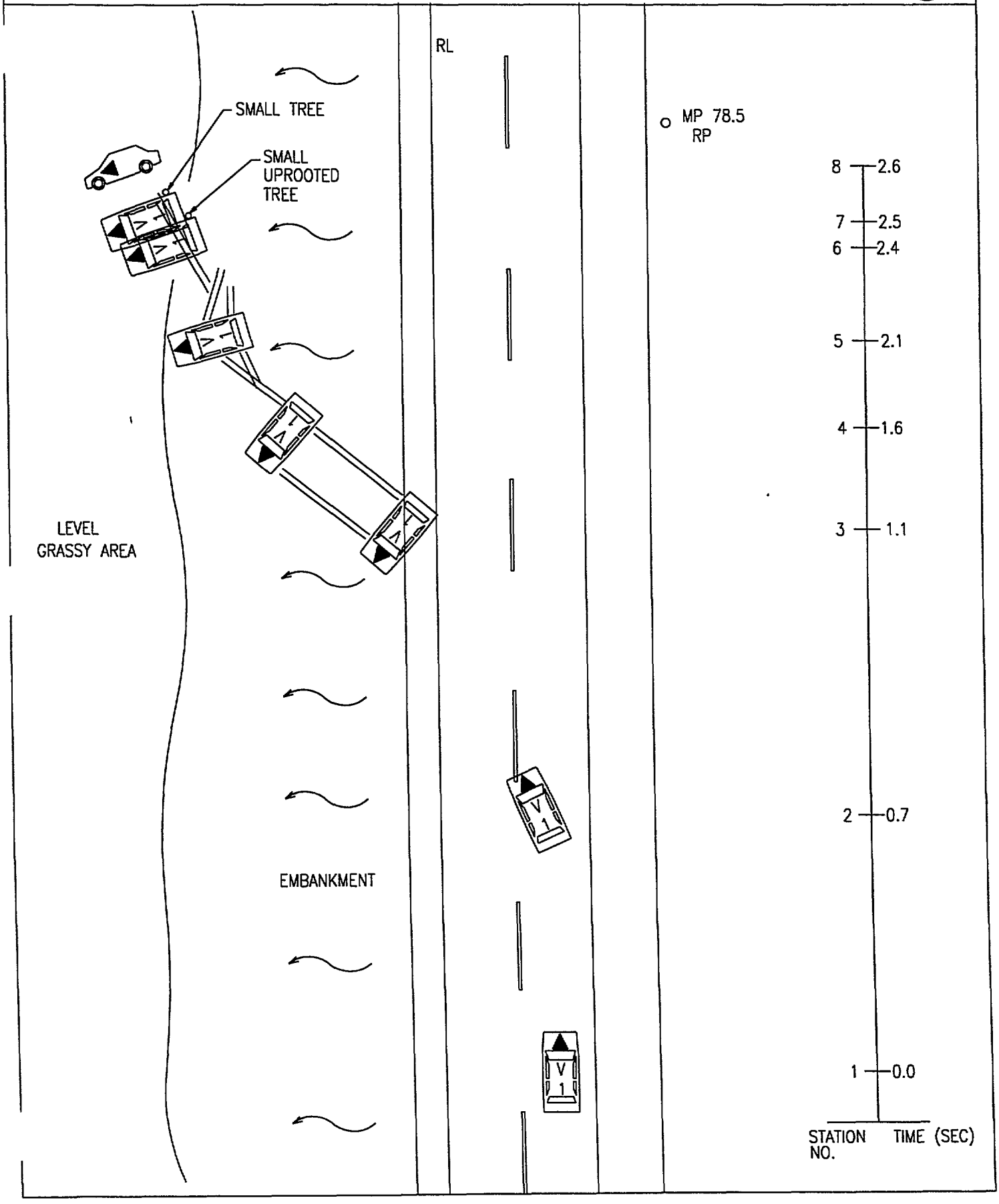
Roadway Edge:	0.93 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.96 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 3 (-3 m).
- Departure time for the shoulder edge was calculated between Stations 1 and 3 (-2 m).
- Initial velocity of the vehicle was 100 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 02 Case Number – Stratum 097F Indicate North



Scale:1/250

CAUSAL FACTOR: *Vehicle Speed - Attempted to Initiate a 90 Degree Turn*

ROADSIDE DEPARTURE: *Left*

General Accident information

Date:	7-2-93	**Weather:**	Clear
Time:	1240	**Surface Condition:**	Wet
Accident Type:	Control/Traction Loss	**Lighting:**	Daylight
Accident Severity:	2 (B)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	47
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1983
Vehicle Make:	Cadillac
Vehicle Model:	DeVille/ Fleetwood

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Right
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	56 km/h

Departure Times

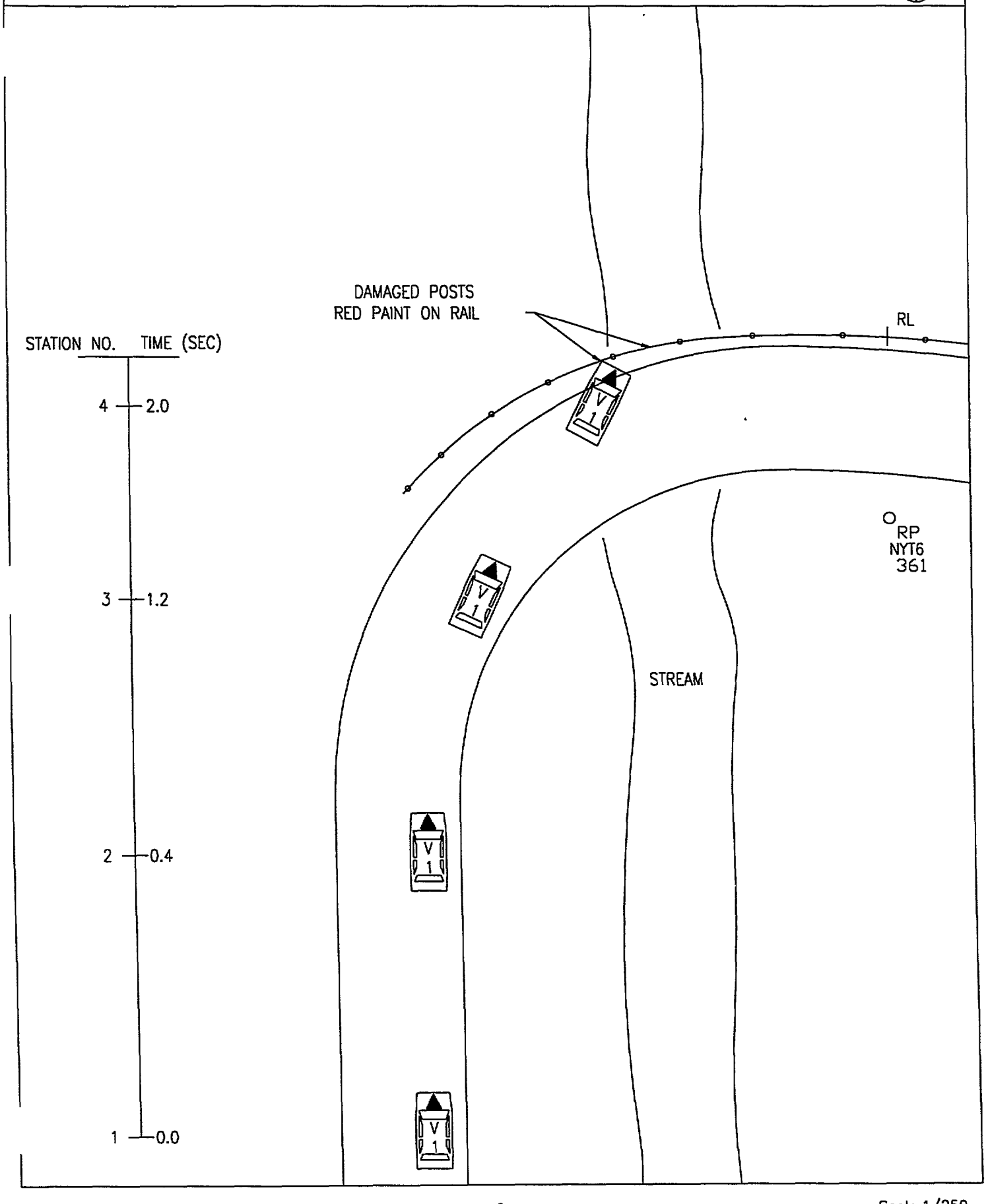
Roadway Edge:	1.62 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.62 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 and 4.
- Departure time for the shoulder edge was calculated between Stations 2 and 4.
- Initial velocity of the vehicle was 56 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 02 Case Number – Stratum 100F Indicate North



Scale:1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	8-l-93	***Weather:***	Fog
Time:	0625	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	1 (C)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	27
Driver Sex:	Male
Impairmen t:	Fell Asleep

Vehicle Information

Year:	1992
Vehicle Make:	Mazda
Vehicle Model:	GLC/323/ Protege

Roadway Information

Trafficway Type (Median):	Physical barrier	***Alignment:***	Curve Right
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

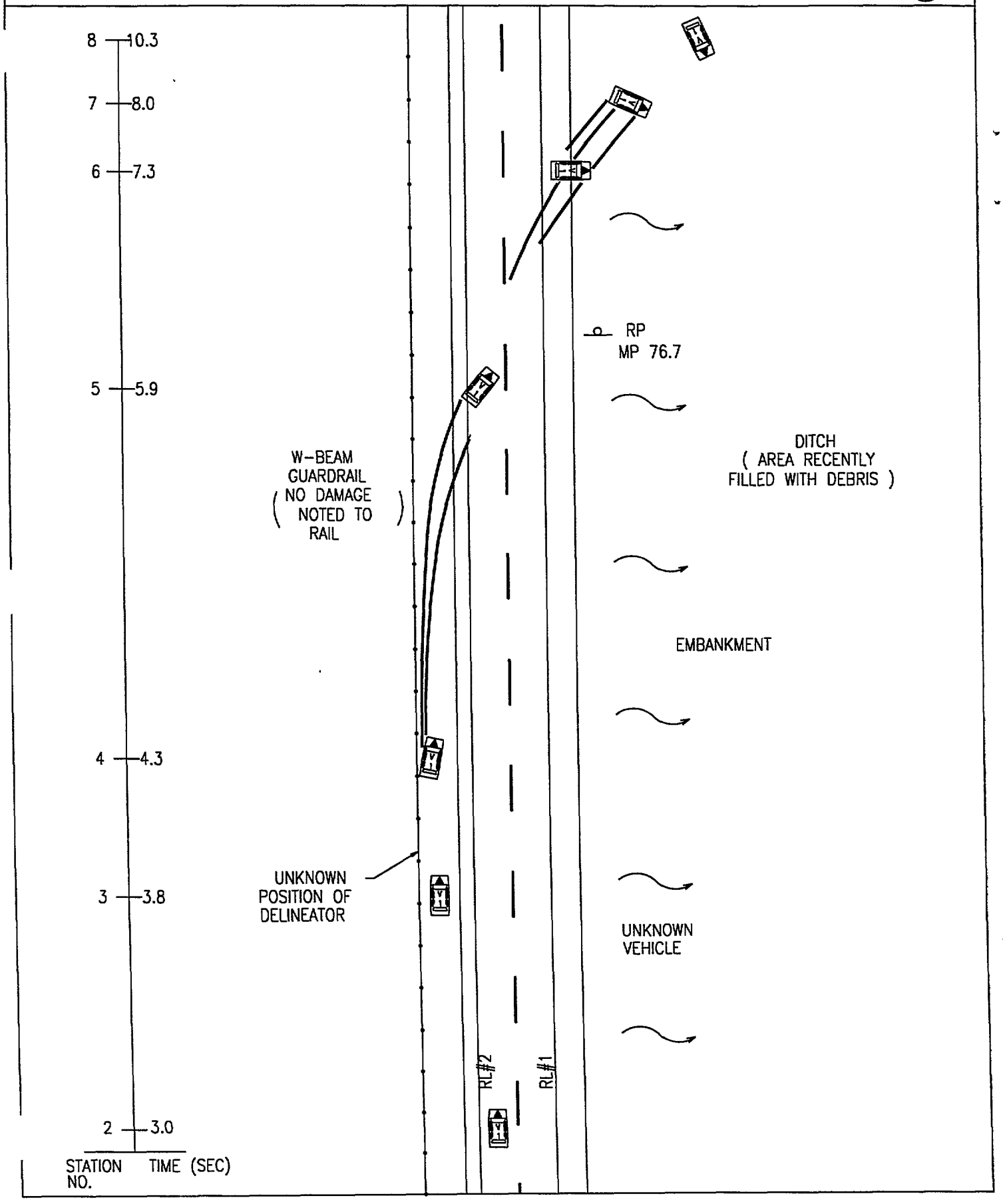
Roadway Edge:	3.32 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	5.36 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-88 m) and 2 (+lO m).
- Departure time for the shoulder edge was calculated between Stations 2 (-133 m) and 2 (+24 m).
- Initial velocity of the vehicle was 105 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 02 Case Number – Stratum 119E Indicate North



Scale:1/500

CAUSAL FACTOR: *Evasive Maneuver - Avoid Animal or Pedestrian*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	l-6-93	***Weather:***	Clear
Time:	7003	***Surface Condition:***	Wet
Accident Type:	Avoid Collision	***Lighting:***	Daylight
Accident Severity:	2 (B)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	56
Driver Sex:	Female
Impairment:	None

Vehicle information

Year:	1990
Vehicle Make:	Acura
Vehicle Model:	Integra

Roadway Information

Traficway Type (Median):	Flush or curb	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	3	***Speed Limit:***	80 km/h

Departure Times

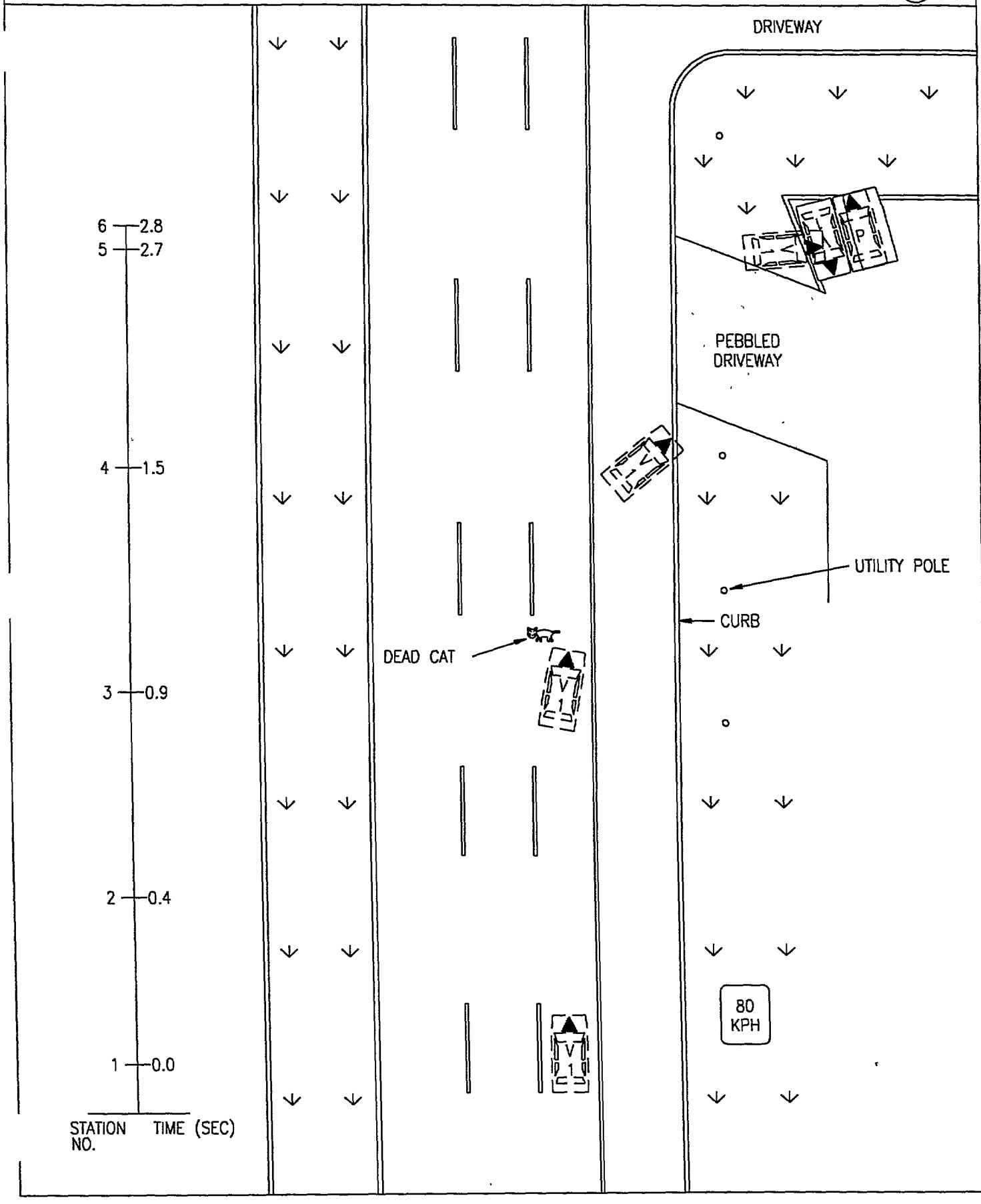
Roadway Edge:	0.45 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.95 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+lO m) and 3 (+l m).
- Departure time for the shoulder edge was calculated between Stations 1 (+lO m) and 4.
- Initial velocity of the vehicle was 80 km/h.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 04 Case Number - Stratum 005E Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	l-l-93	**Weather:**	Clear
Time:	1629	**Surface Condition:**	Dry
Accident Type:	Control/Traction Loss	**Lighting:**	Daylight
Accident Severity:	0 (0)	**Land Use:**	Urban

Driver/Occupant Information

Driver Age:	44
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1991
Vehicle Make:	Chevrolet
Vehicle Model:	Cavalier

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Level
No. of Lanes:	6	**Speed Limit:**	40 km/h

Departure Times

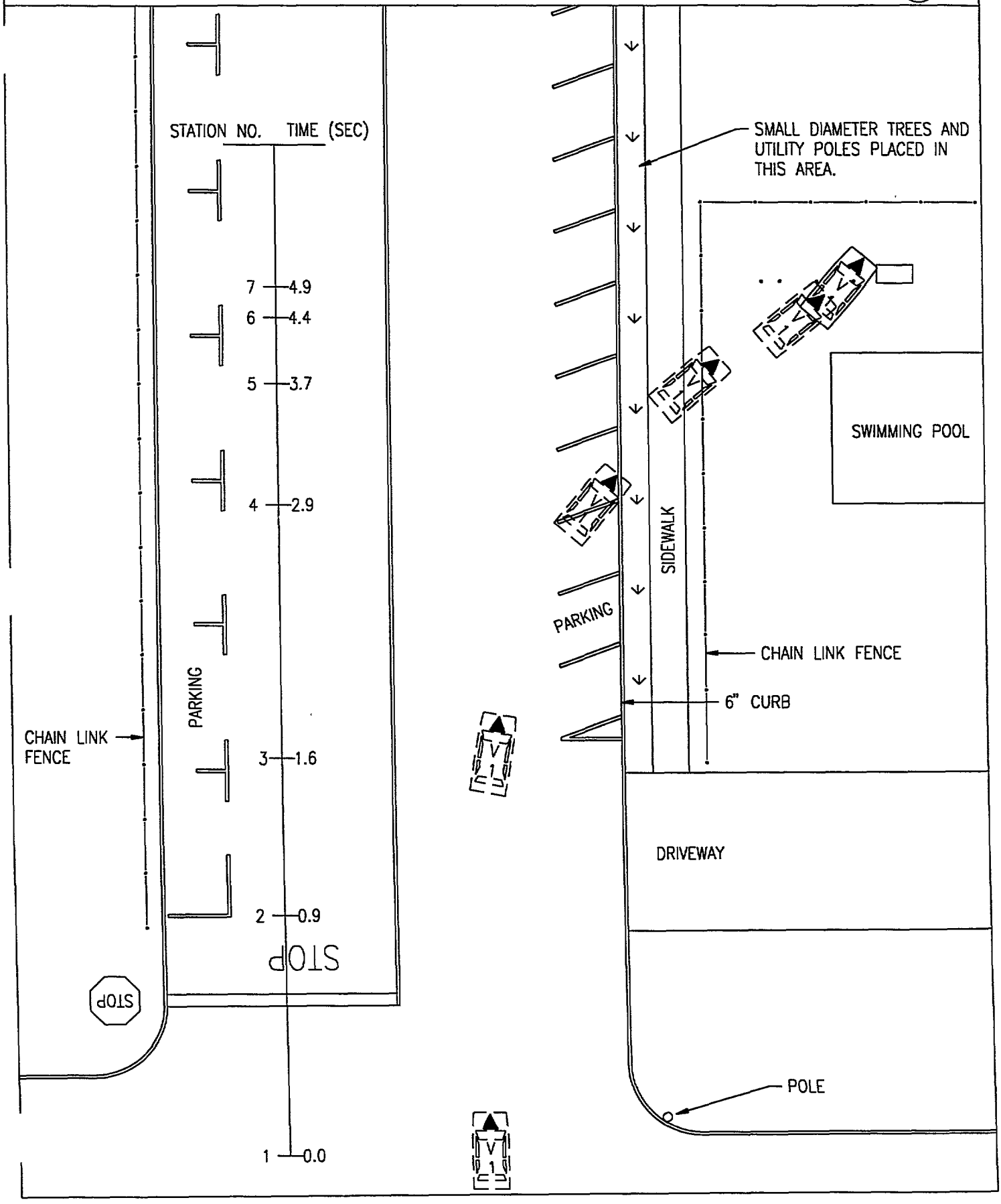
Roadway Edge:	1.80 sec	**Method**	Arc Formula Derived
Shoulder Edge:	1.80 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 (-6 m) and 4.
- Departure time for the shoulder edge was calculated between Stations 3 (-6 m) and 4.
- Initial velocity of the vehicle was 40 km/h.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 04 Case Number – Stratum 009G Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Excessive*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	l-5-93	***Weather:***	Clear
Time:	unknown	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	0 (0)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	27
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1989
Vehicle Make:	Mazda
Vehicle Model:	626

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Curve Right
		Slope:	Level
No. of Lanes:	3	***Speed Limit:***	80 km/h

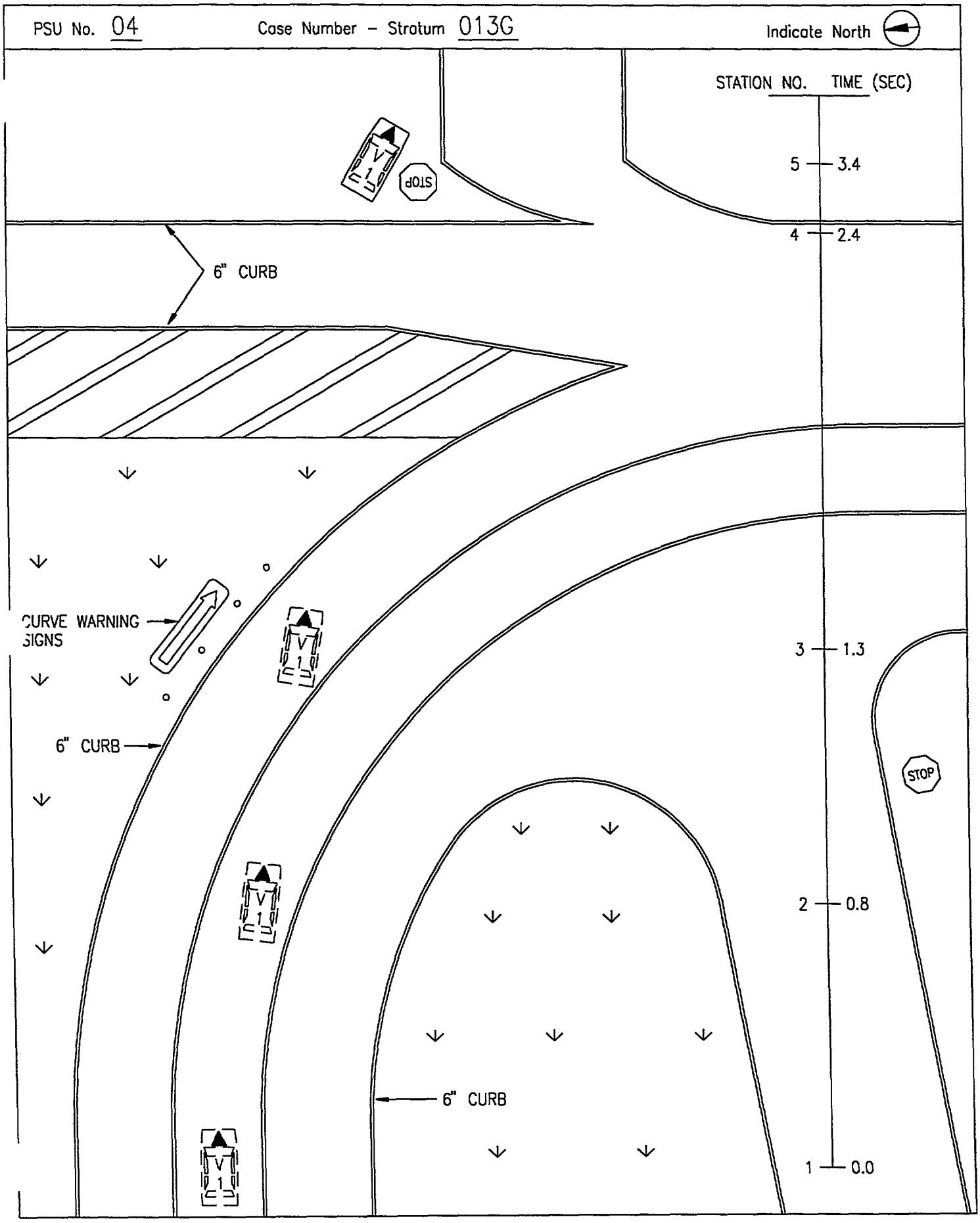
Departure Times

Roadway Edge:	1.40 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.40 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 3 (+3 m).
- Departure time for the shoulder edge was calculated between Stations 1 and 3 (+3 m).
- Initial velocity of the vehicle was 80 km/h.
- Station 4 was added.

ACCIDENT COLLISION DIAGRAM



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Sfeering Control - Physical (seizure/passed out)*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-2-93	***Weather:***	Clear
Time:	1625	***Surface Condition:***	Dry
Accicient Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	2 (B)	***Land Use:***	Rural

Driver/Occupant information

Driver Age:	39
Driver Sex:	Male
Impairment:	Physical (seizure/passed out)

Vehicle Information

Year:	1980
Vehicle Make:	Pontiac
Vehicle Model:	Sunbird

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	56 km/h

Departure Times

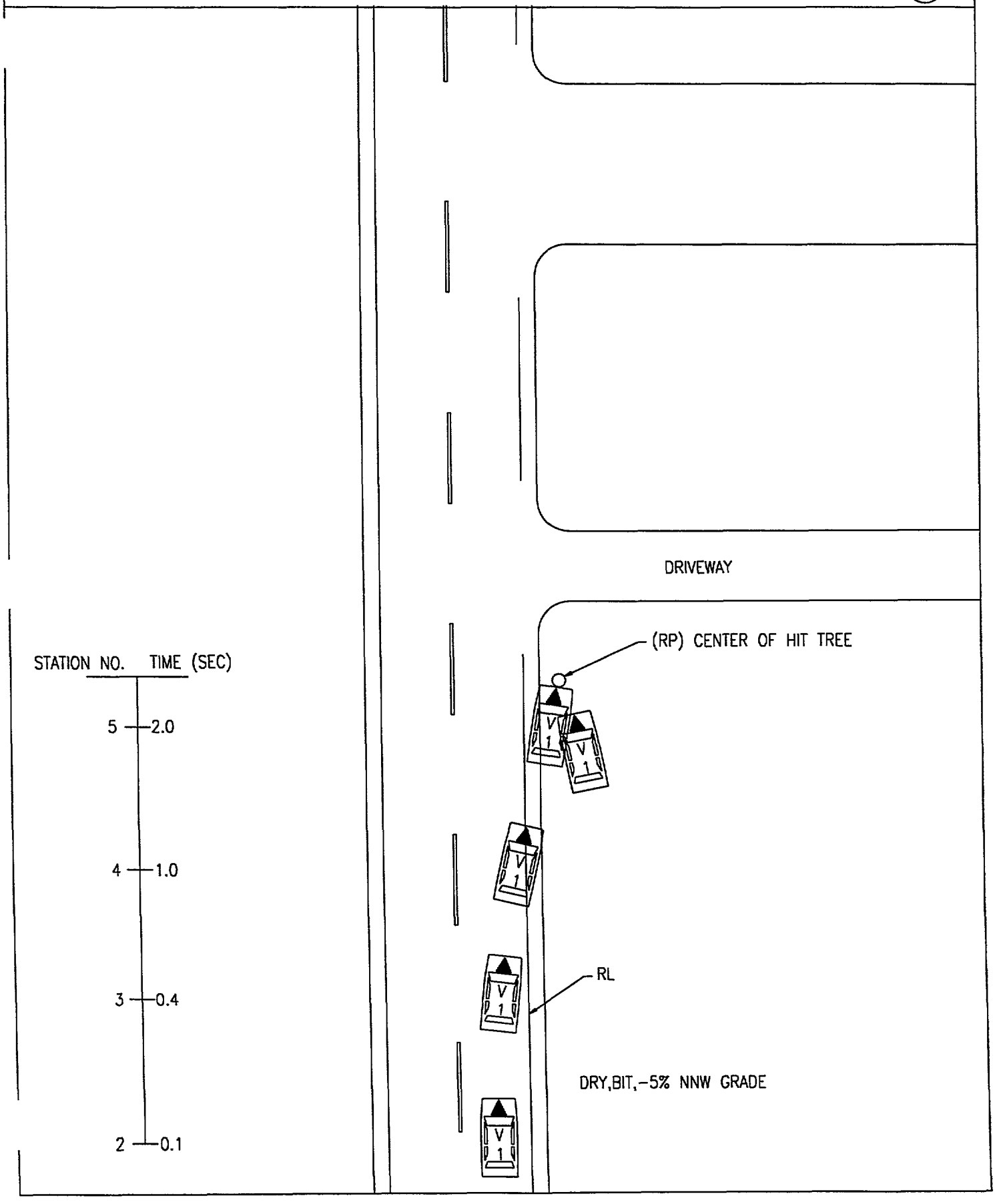
Roadway Edge:	0.71 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.01 sec		

Assumptions:

- Departure tune for the roadway edge was calculated between Stations 2 (- 1 m) and 4 (-4 m).
- Departure tune for the shoulder edge was calculated between Stations 2 (-1 m) and 4 (+l m).
- Initial velocity of the vehicle was 56 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 04 Case Number – Stratum 102F Indicate North



Scale:1/250

CAUSAL FACTOR: *Vehicle Failure*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	8-6-93	***Weather:***	Rain
Time:	1341	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	0 (0)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	17
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1987
Vehicle Make:	Ford
Vehicle Model:	Escort/EXP

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Curve Right
		Slope:	Grade
No. of Lanes:	4	***Speed Limit:***	32km/h

Departure Times

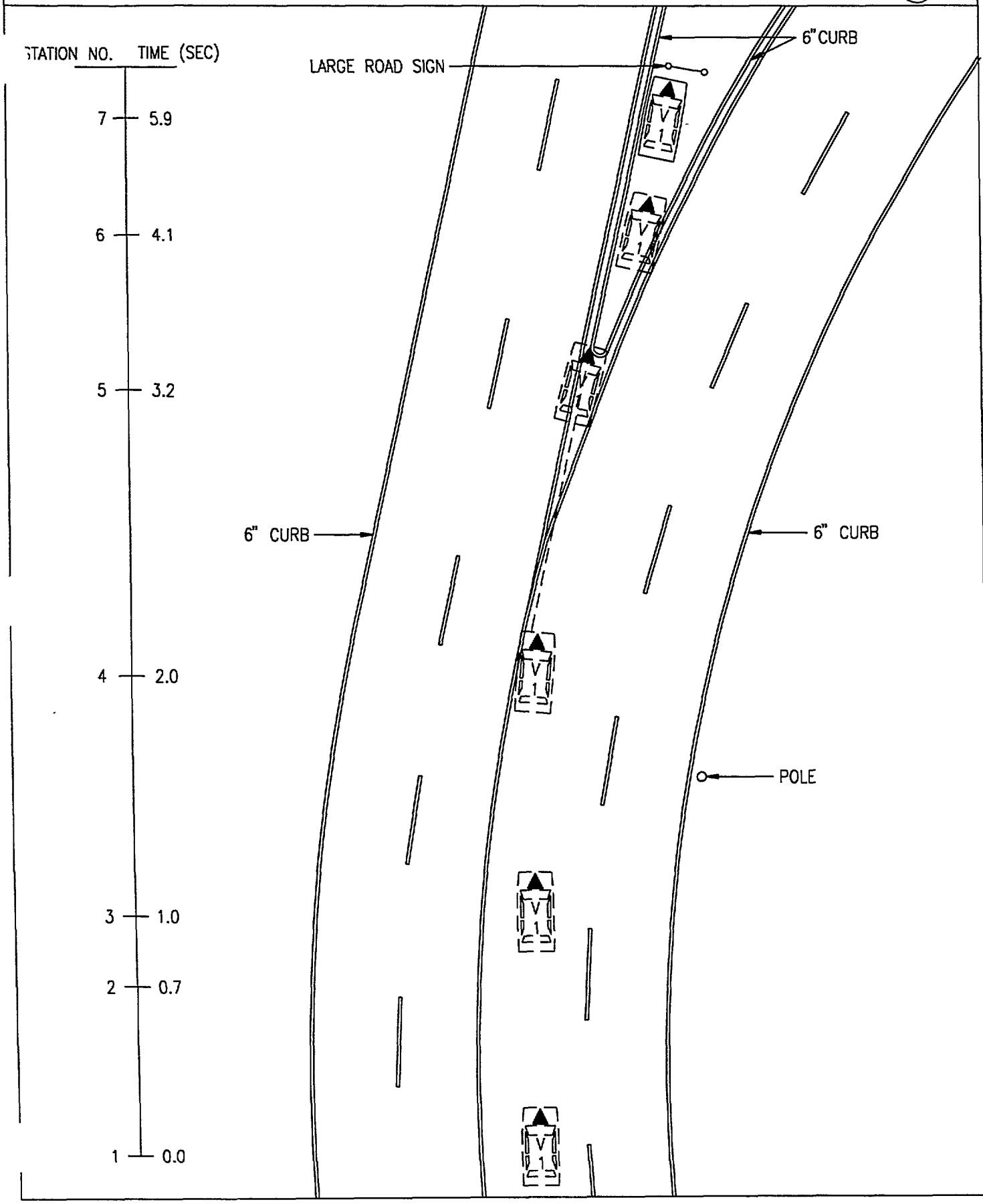
Roadway Edge:	1.02 sec	***Method:***	Straight Line Projection
Shoulder Edge:	2.21 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 and 4.
- Departure time for the shoulder edge was calculated between Stations 3 and 5.
- Initial velocity of the vehicle was 45 km/h.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 04 Case Number – Stratum 116H Indicate North



Scale: 1/250

CAUSAL FACTOR: *Evasive Maneuver - Avoid Animal or Pedestrian*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	8-2-93	**Weather:**	Clear
Time:	2341	**Surface Condition:**	Dry
Accident Type:	Avoid Collision	**Lighting:**	Yes
Accident Severity:	2 (B)	**Land Use:**	Urban

Driver/Occupant Information

Driver Age:	27
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1988
Vehicle Make:	Pontiac
Vehicle Model:	Firebird/ Trans Am

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Level
No. of Lanes:	2	**Speed Limit:**	64 km/h

Departure Times

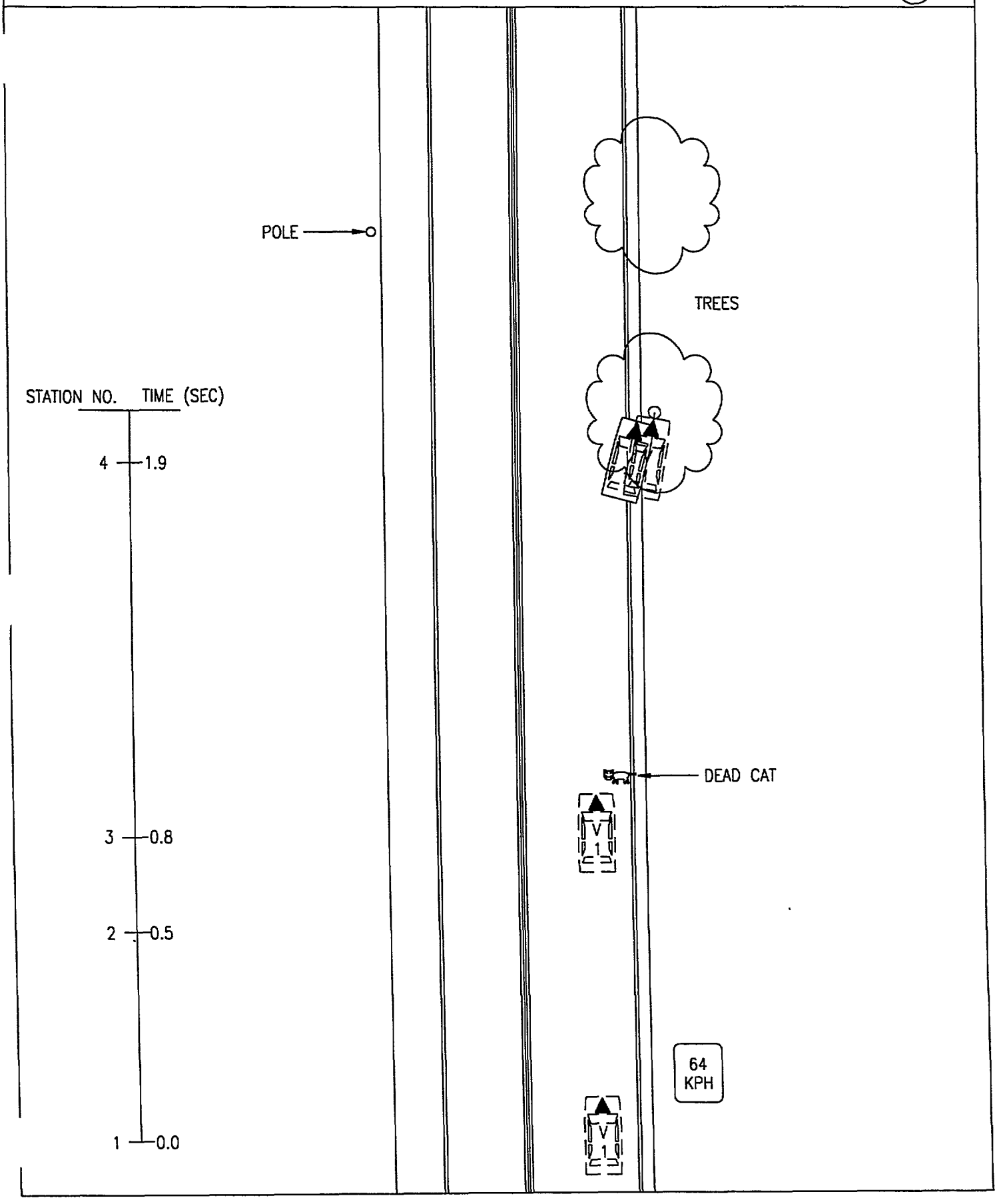
Roadway Edge:	0.65 sec	**Method:**	Straight Line Projection
Shoulder Edge:	0.93 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 and 4 (-8 m).
- Departure time for the shoulder edge was calculated between Stations 3 and 4 (-3 m).
- Initial velocity of the vehicle was 64 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 04 Case Number – Stratum 127F Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Excessive*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	3-5-93	**Weather;**	Clear
Time:	2058	**Surface Condition:**	Dry
Accident Type:	Control/Traction Loss	**Lighting:**	No
Accidenf Severity:	1(C)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	19
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1990
Vehicle Make:	Ford
Vehicle Model:	Taurus

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Right
		Slope:	Level
No. of Lanes:	2	**Speed Limit:**	64 km/h

Departure Times

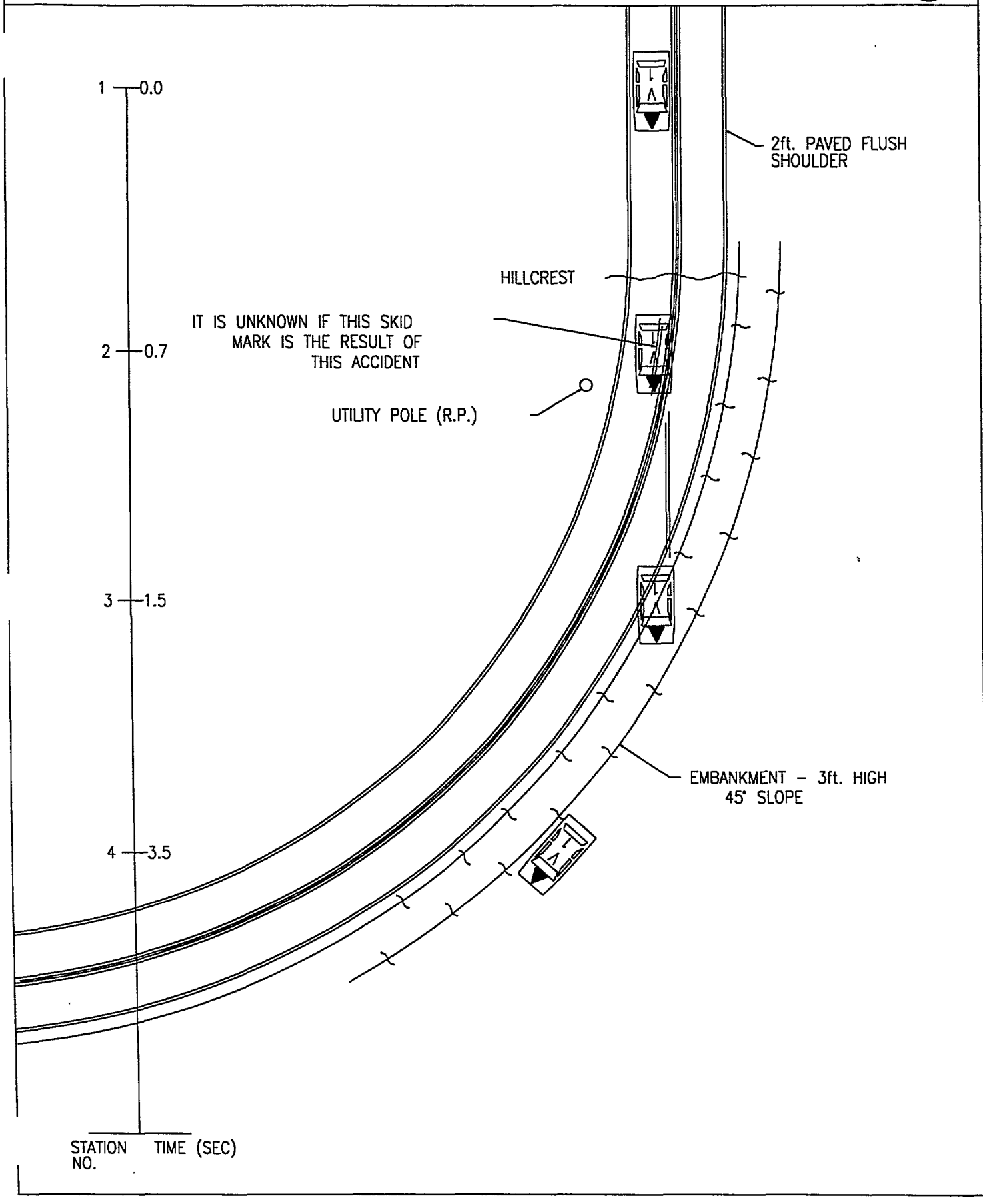
Roadway Edge:	0.84 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.01 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+6 m) and 3 (-5 m).
- Departure time for the shoulder edge was calculated between Stations 1 (+6 m) and 3 (-2 m).
- Initial velocity of the vehicle was 64 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 05 Case Number – Stratum 035E Indicate North



Scale: 1/250

CAUSAL FACTOR: *Lost Directional Control*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	l-5-93	***Wea ther:***	Snow (sleet/hail)
Time:	0937	***Surface Condition:***	Snow (slush/ice)
Accident Type:	Control/Traction Loss	**Lighting:**	Daylight
Accident Severity:	0 (0)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	22
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1989
Vehicle Make:	Ford
Vehicle Model:	Explorer

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	72 km/h

Departure Times

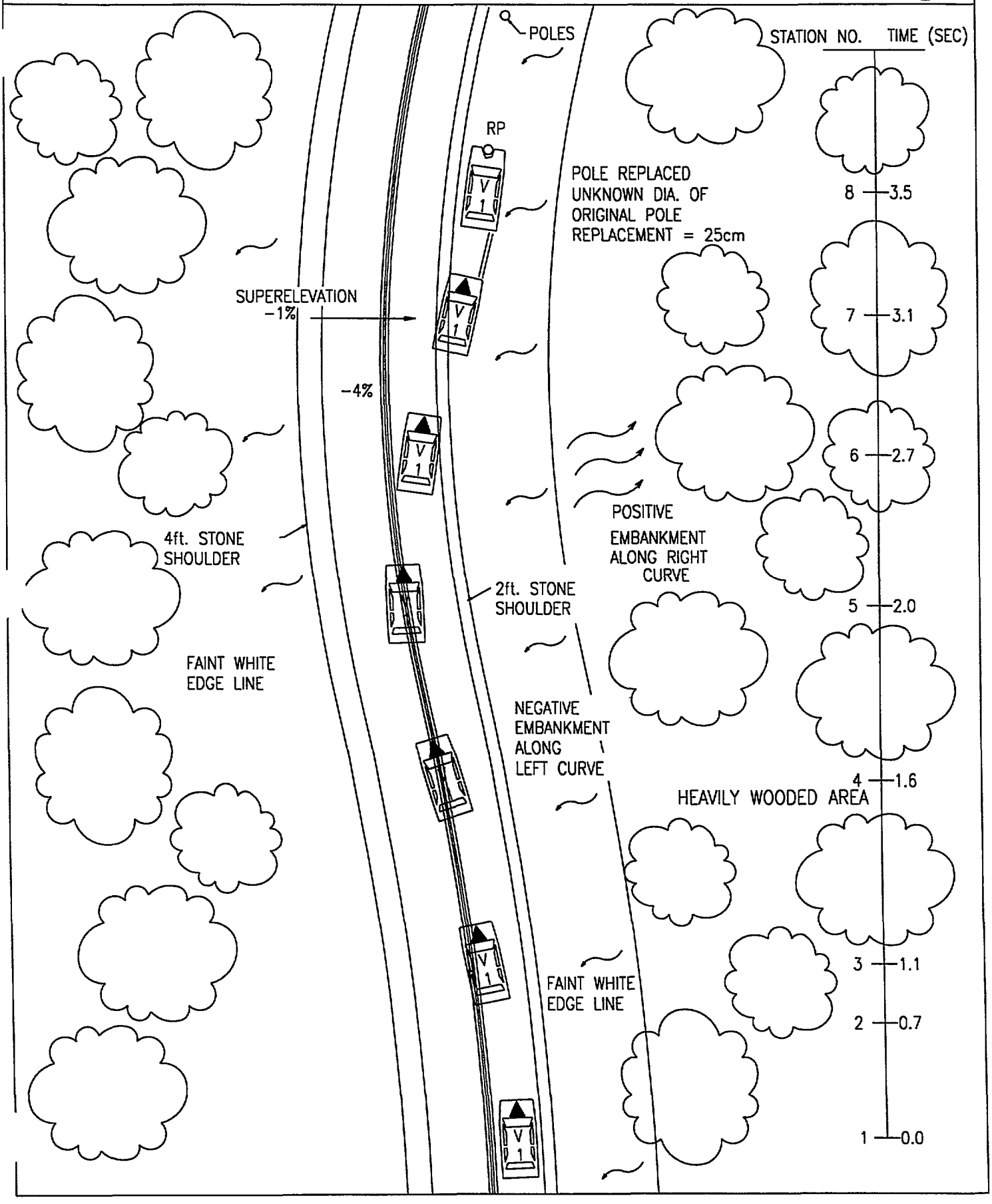
Roadway Edge:	0.72 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.99 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 5 and 6.
- Departure time for the shoulder edge was calculated between Stations 5 and 6 (+3 m).
- Initial velocity of the vehicle was 40 km/h.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 08 Case Number – Stratum 016G Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Physical (seizure/passed out)*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	2-3-93	***Weather:***	Snow (sleet/hail)
Time:	1322	***Surface Condition:***	Wet
Accident Type:	Controlffraction Loss	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	80
Driver Sex:	Male
Impairment:	Physical (seizure/ passed out)

Vehicle Information

Year:	1989
Vehicle Make:	Oldsmobile
Vehicle Model:	Ninety-Eight

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	4	***Speed Limit:***	56 km/h

Departure Times

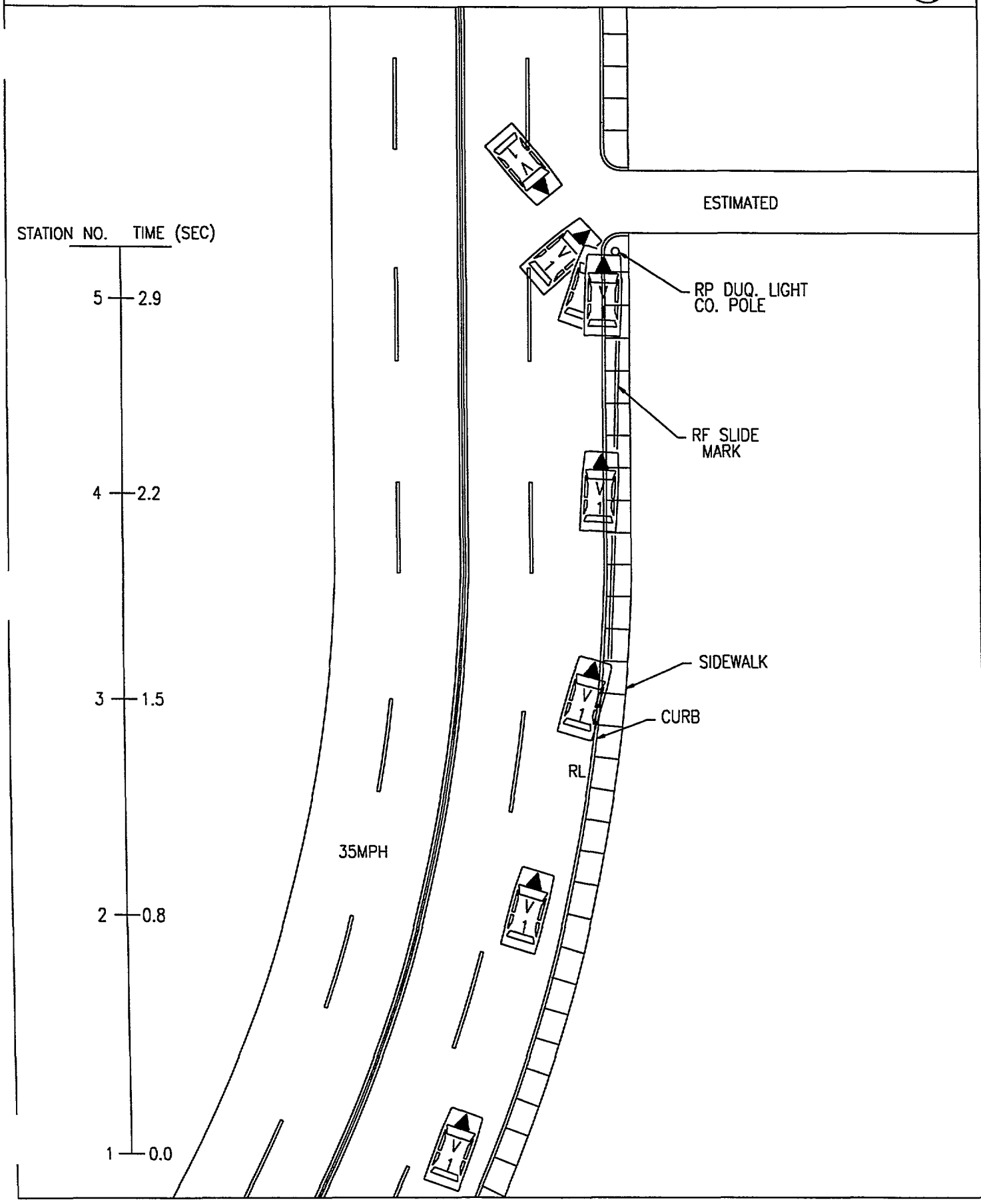
Roadway Edge:	1.51 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.51 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 3.
- Departure tune for the shoulder edge was calculated between Stations 1 and 3.
- lnitial velocity of the vehicle was 56 km/h.
- Only the first five stations were used. The last three were ommitted.

ACCIDENT COLLISION DIAGRAM

PSU No. 08 Case Number – Stratum 025J Indicate North



Scale:1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-7-93	***Weather:***	Clear
Time:	0150	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	0 (0)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	28
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1984
Vehicle Make:	Audi
Vehicle Model:	5000

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Curve Right
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

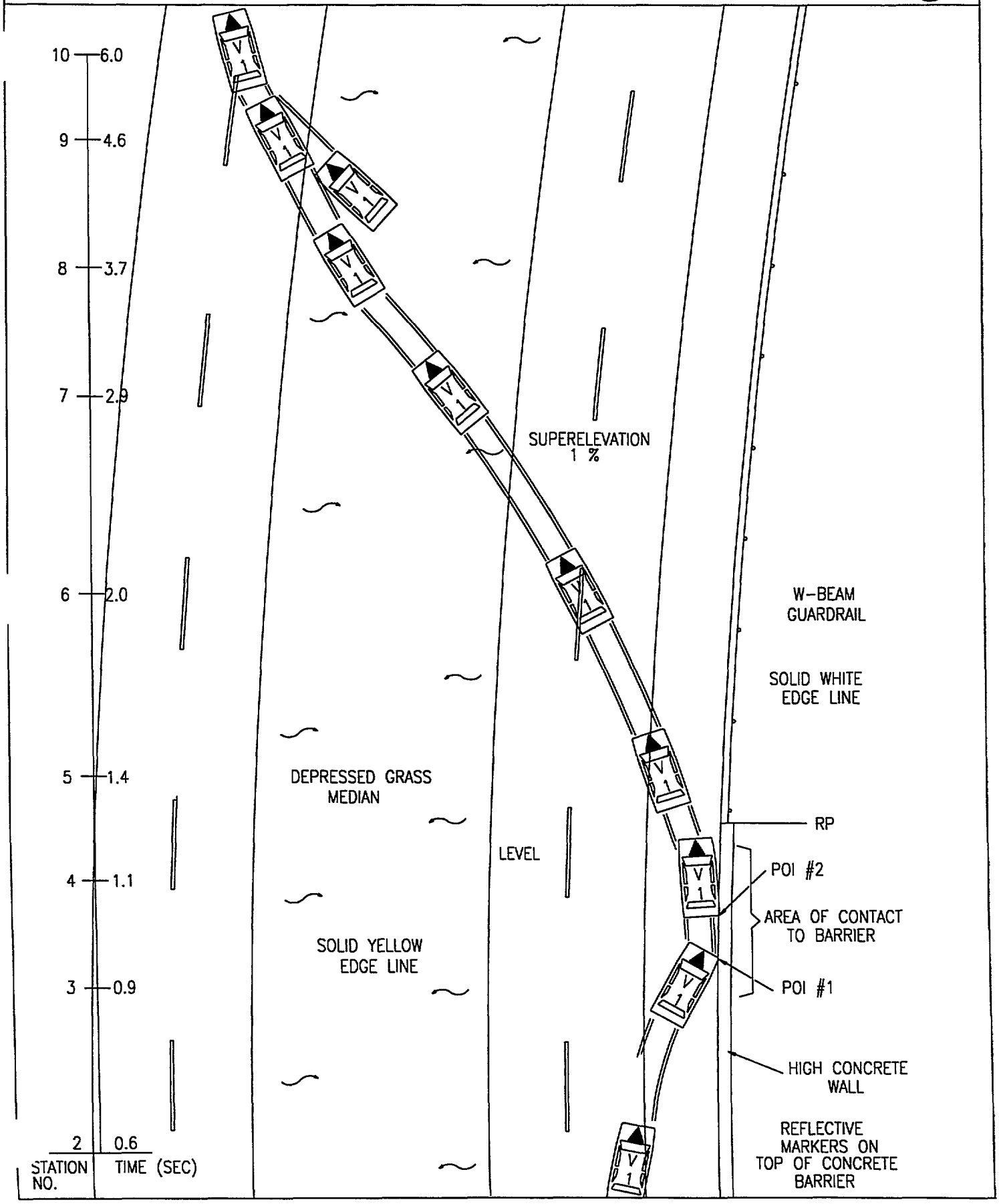
Roadway Edge:	0.61 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.23 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-16 m) and 2 (-1 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-2 1 m) and 3.
- Initial velocity of the vehicle was 89 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 08 Case Number – Stratum 126H Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-3-93	***Weather:***	Clear
Time:	2204	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Yes
Accident Severity:	0 (0)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	37
Driver Sex:	Male
Impairmen t:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1989
Vehicle Make:	Chevrolet
Vehicle Model:	Cavalier

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	3	***Speed Limit:***	56 km/h

Departure Times

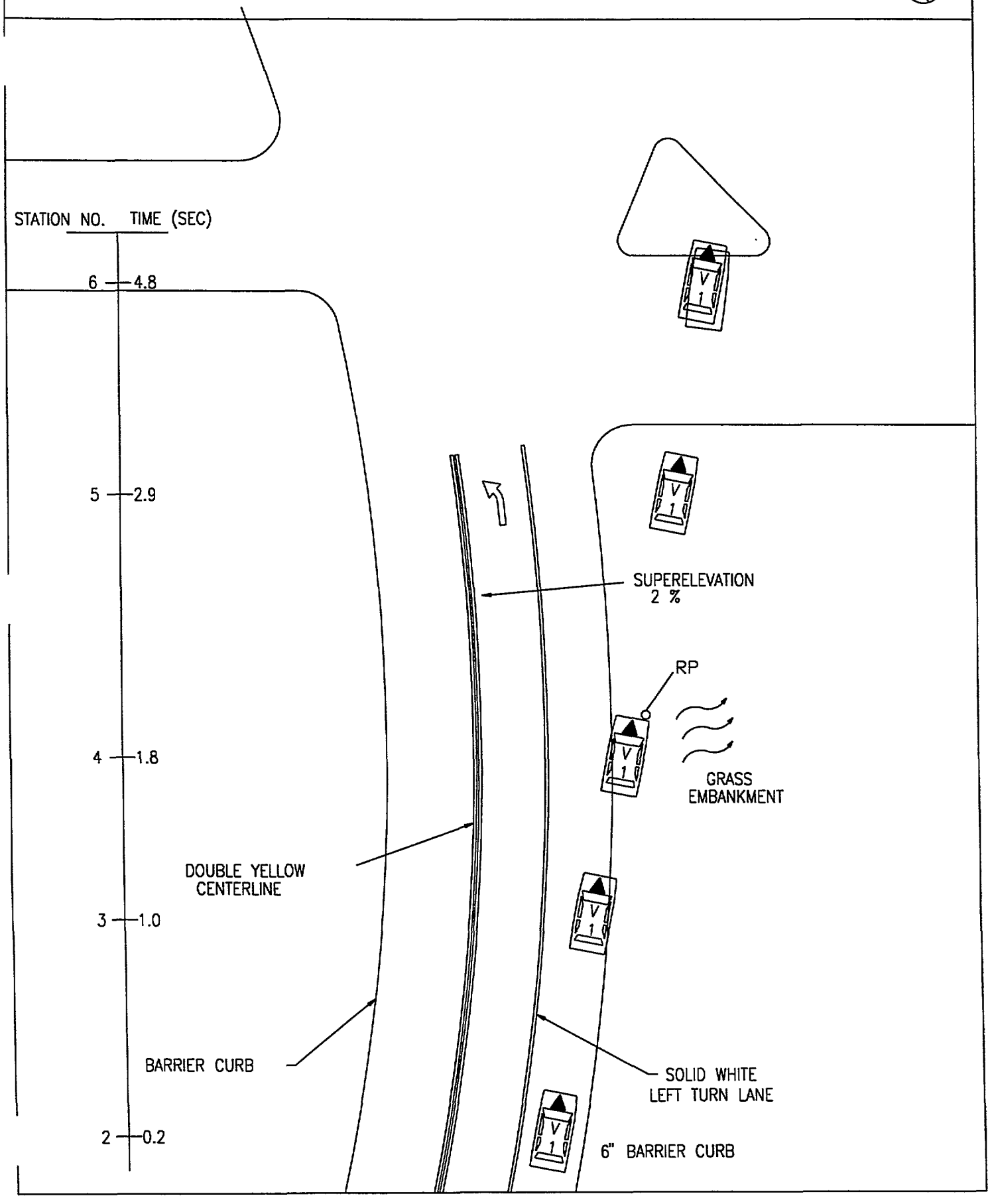
Roadway *Edge:*	0.87 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	0.87 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-3 m) and 3 (- 1 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-3 m) and 3 (-1 m).
- Initial velocity of the vehicle was 56 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 08 Case Number – Stratum 130G Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	l-l-93	**Weather:**	Clear
Time:	0220	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	3 (A)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	19
Driver Sex:	Female
Impairment:	Fell Asleep

Vehicle Information

Year:	1984
Vehicle Make:	Ford
Vehicle Model:	Tempo

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	80 km/h

Departure Times

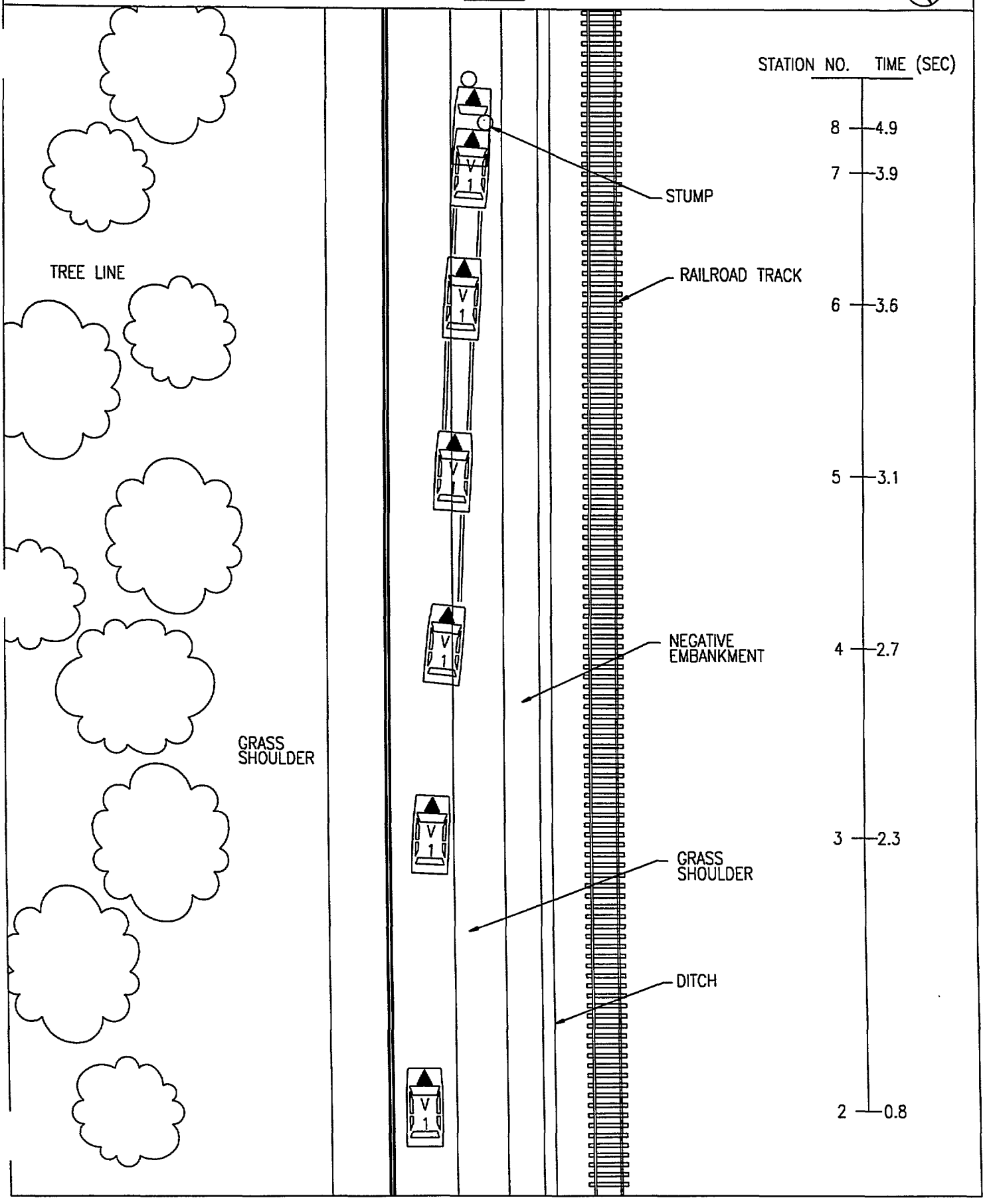
Roadway Edge:	1.71 sec	**Method:**	Arc Formula Derived
Shoulder Edge:	1.71 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-18 m) and 4 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-18 m) and 4 (-4 m).
- Initial velocity of the vehicle was 80 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 09 Case Number – Stratum 006K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	2-l-93	***Weather:***	Clear
Time:	0720	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	31
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1982
Vehicle Make:	Plymouth
Vehicle Model:	Gran Fury

Roadway Information

Trafficway Type (Median):	Physical barrier	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	4	***Speed Limit:***	64 km/h

Departure Times

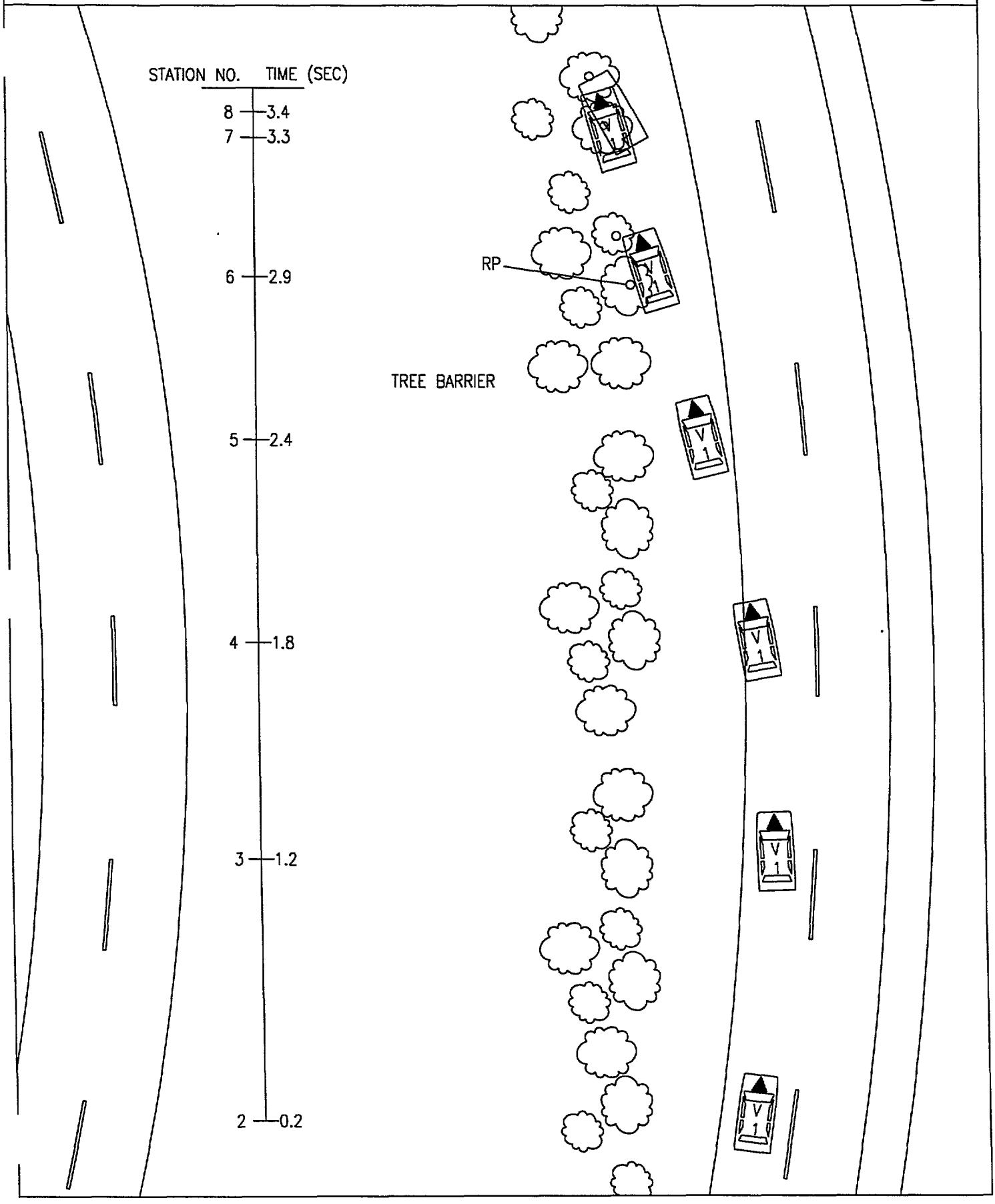
Roadway Edge:	1.47 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.47 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-4 m) and 4 (-2 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-4 m) and 4 (-2 m).
- Initial velocity of the vehicle was 64 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 09 Case Number – Stratum 020D Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver* Inattention

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	2-6-93	***Weather:***	Clear
Time:	1446	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	17
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1975
Vehicle Make:	Nissan/Datsun
Vehicle Model:	Z-car, ZX

Roadway Information

Traflicway Type (Median):	Physical barrier	***Alignment:***	Straight
		Slope:	Level
No. *of* Lanes:	4	***Speed Limit:***	89 km/h

Departure Times

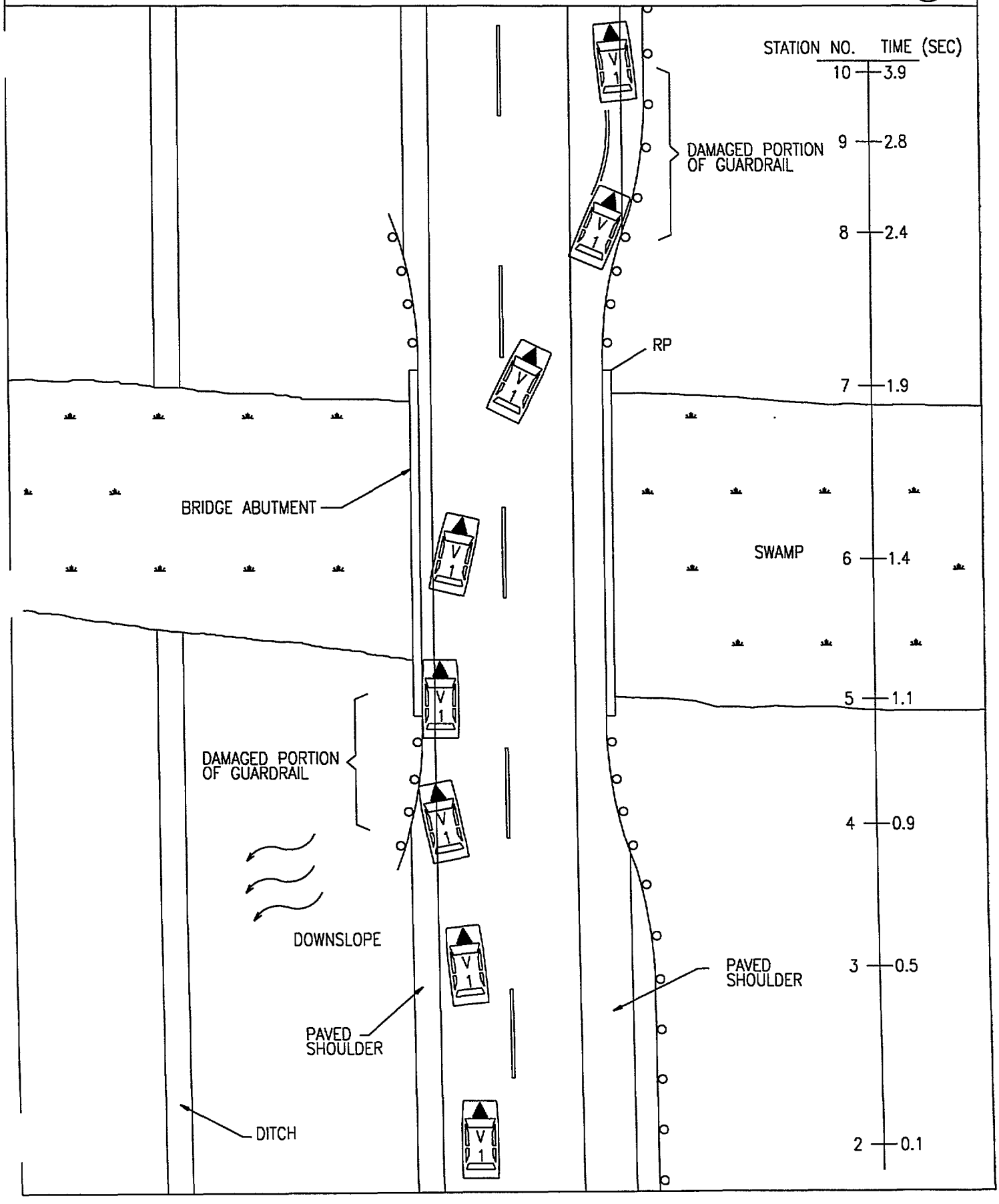
Roadway Edge:	0.70 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.08 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-3 m) and 4 (-2 m).
- Departure time for the shoulder edge was calculated between Stations 2 (- 11 m) and 4.
- Initial velocity of the vehicle was 89 km/h.
- Station 1 extends beyond scope of page.
- Station 9 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 09 Case Number – Stratum 022K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed* and *Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	l-7-93	***Weather:***	Clear
Time:	1845	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	3 (A)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	47
Driver Sex:	MaIe
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1978
Vehicle Make:	Buick
Vehicle Model:	LeSabre

Roadway Information

Trafficway Type (Median):	Physical barrier	***Alignment:***	Curve Left
		Slope:	Level
No. of Lanes:	4	***Speed Limit:***	89 km/h

Departure Times

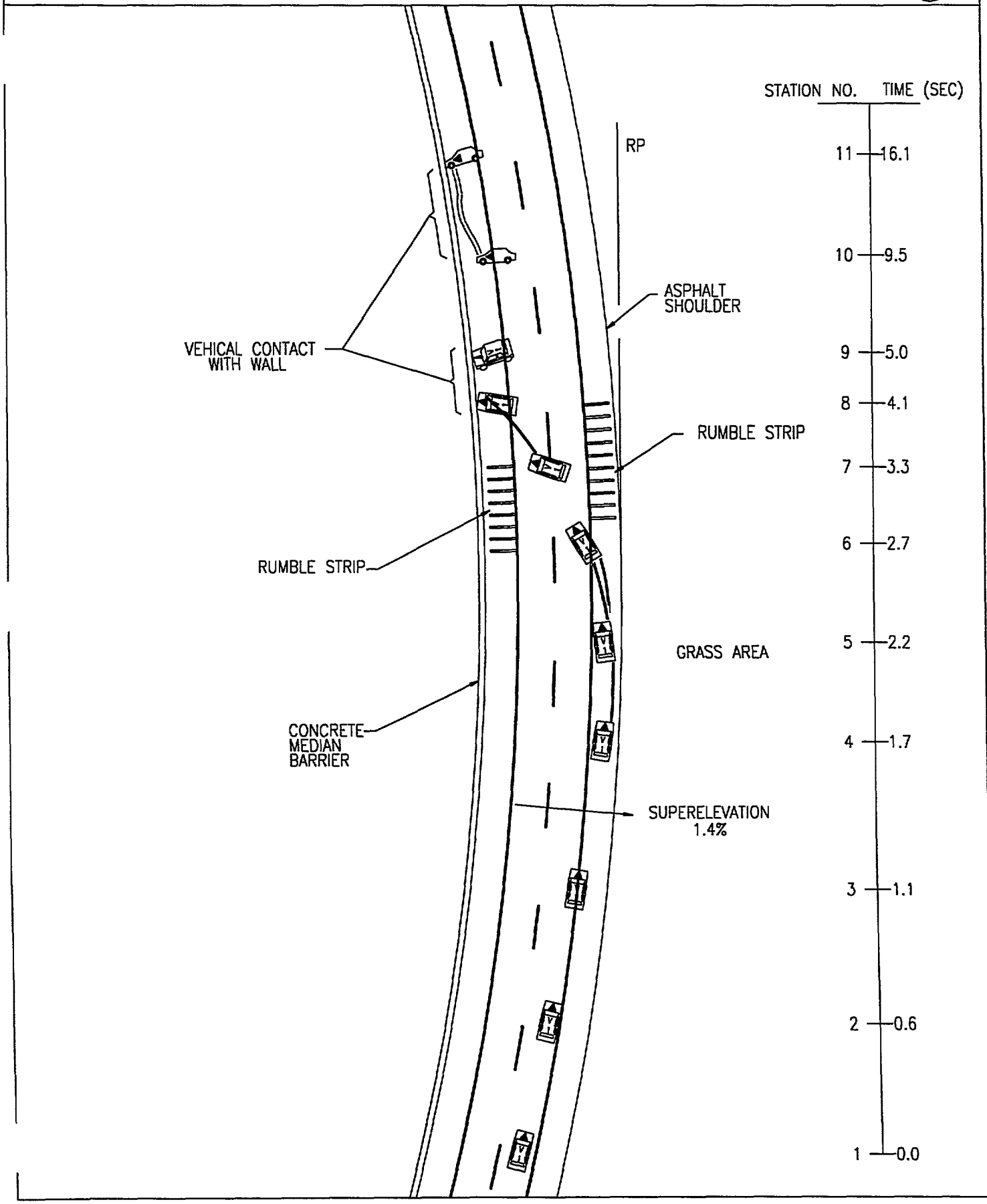
Roadway Edge:	0.97 sec	***Method***	Straight Line Projection
Shoulder Edge:	1.75 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 3 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 1 and 4.
- Initial velocity of the vehicle was 89 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 002K Indicate North



Scale: 1/500

CAUSAL FACTOR: *Vehicle Speed - Excessive*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	2-7-93	***Weather:***	Clear
Time:	0313	***Surface Condition:***	Snow (slush/ice)
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	3(A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	20
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1986
Vehicle Make:	Ford
Vehicle Model:	Escort/EXP

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	40 km/h

Departure Times

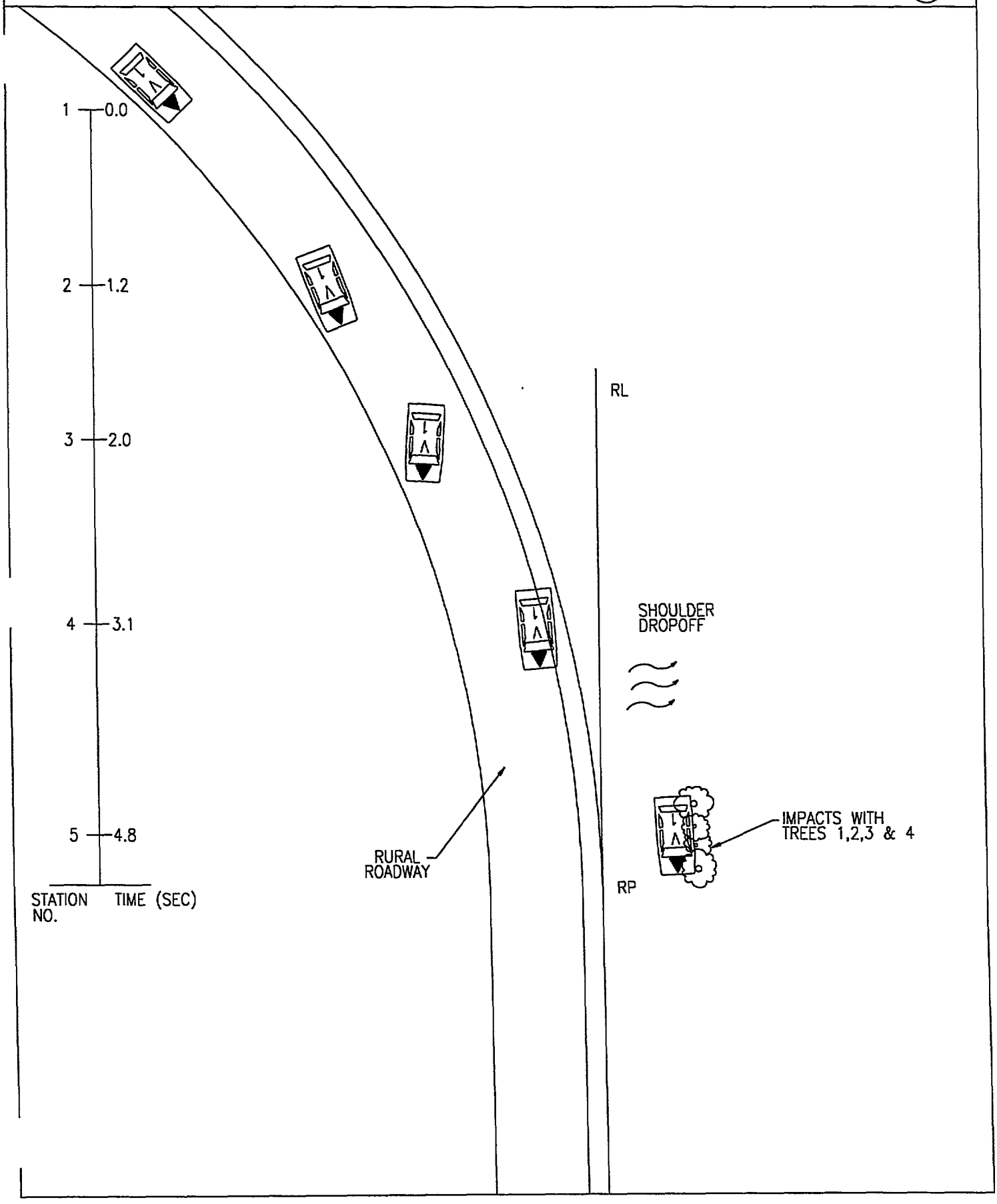
Roadway Edge:	1.87 sec	***Method:***	Straight Line Projection
Shoulder Edge:	2.50 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-5 m) and 4 (-5 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-5 m) and 4 (+2 m).
- Initial velocity of the vehicle was 40 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 048K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-6-93	***Weather:***	Clear
Time:	1650	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	4 (K)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	47
Driver Sex:	Female
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1984
Vehicle Make:	Lincoln
Vehicle Mode/:	Continental/ Town Car

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	80 km/h

Departure Times

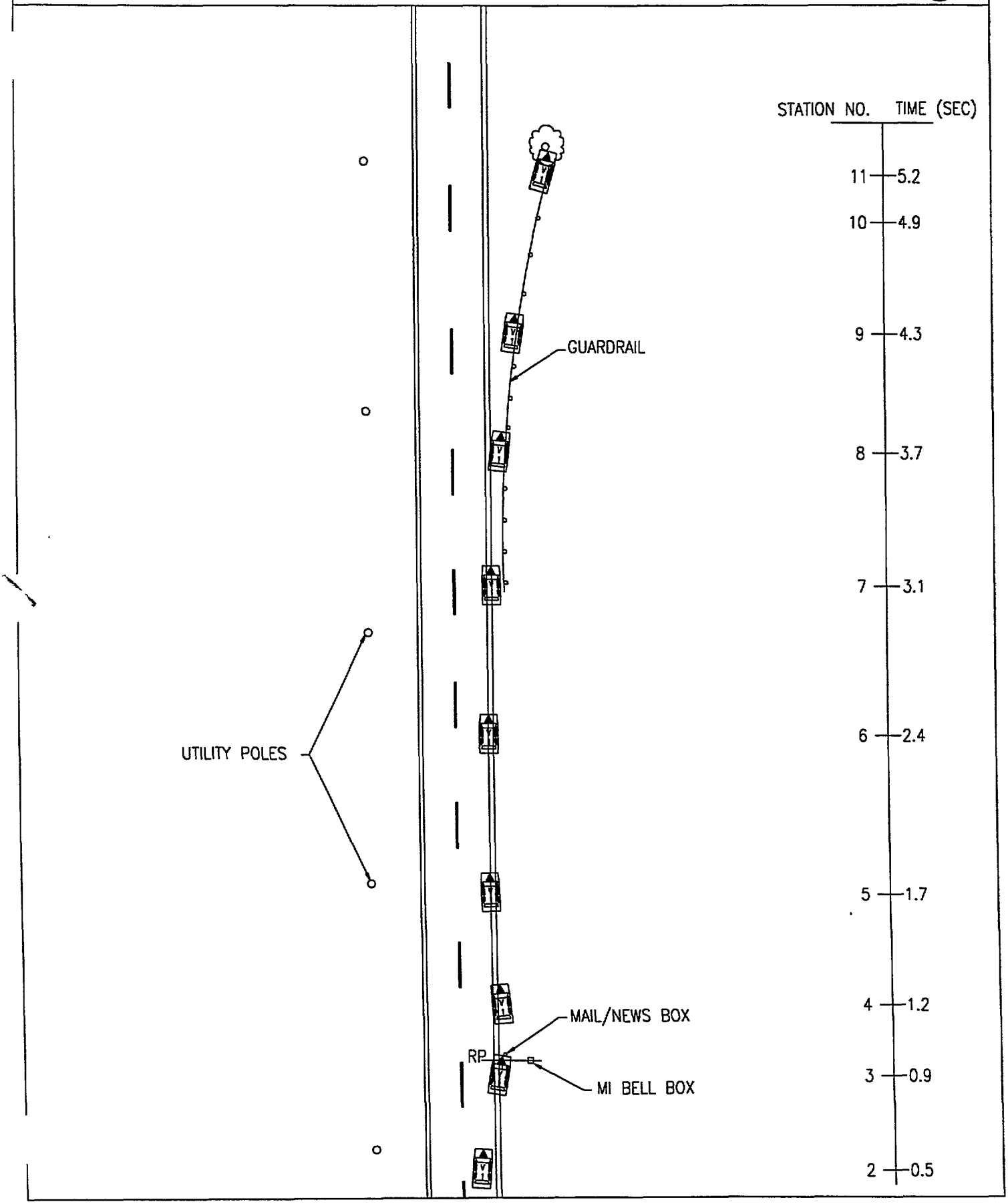
Roadway Edge:	0.60 sec	***Method***	Straight Line Projection
Shoulder Edge:	0.74 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-10 m) and 3 (-7 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-10 m) and 3 (-4 m).
- Initial velocity of the vehicle was 80 km/h.
- Station l is 10 m behind Station 2.
- Station 10 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 116B Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-5-93	**Weather:**	Rain
Time:	1550	**Surface Condition:**	Wet
Accident Type:	Drive Off Road	**Lighting:**	Daylight
Accident Severity:	3 (A)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	62
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1989
Vehicle Make:	Chevrolet
Vehicle Model:	Baretta/Corsica

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Level
No. of Lanes:	2	**Speed Limit:**	89 km/h

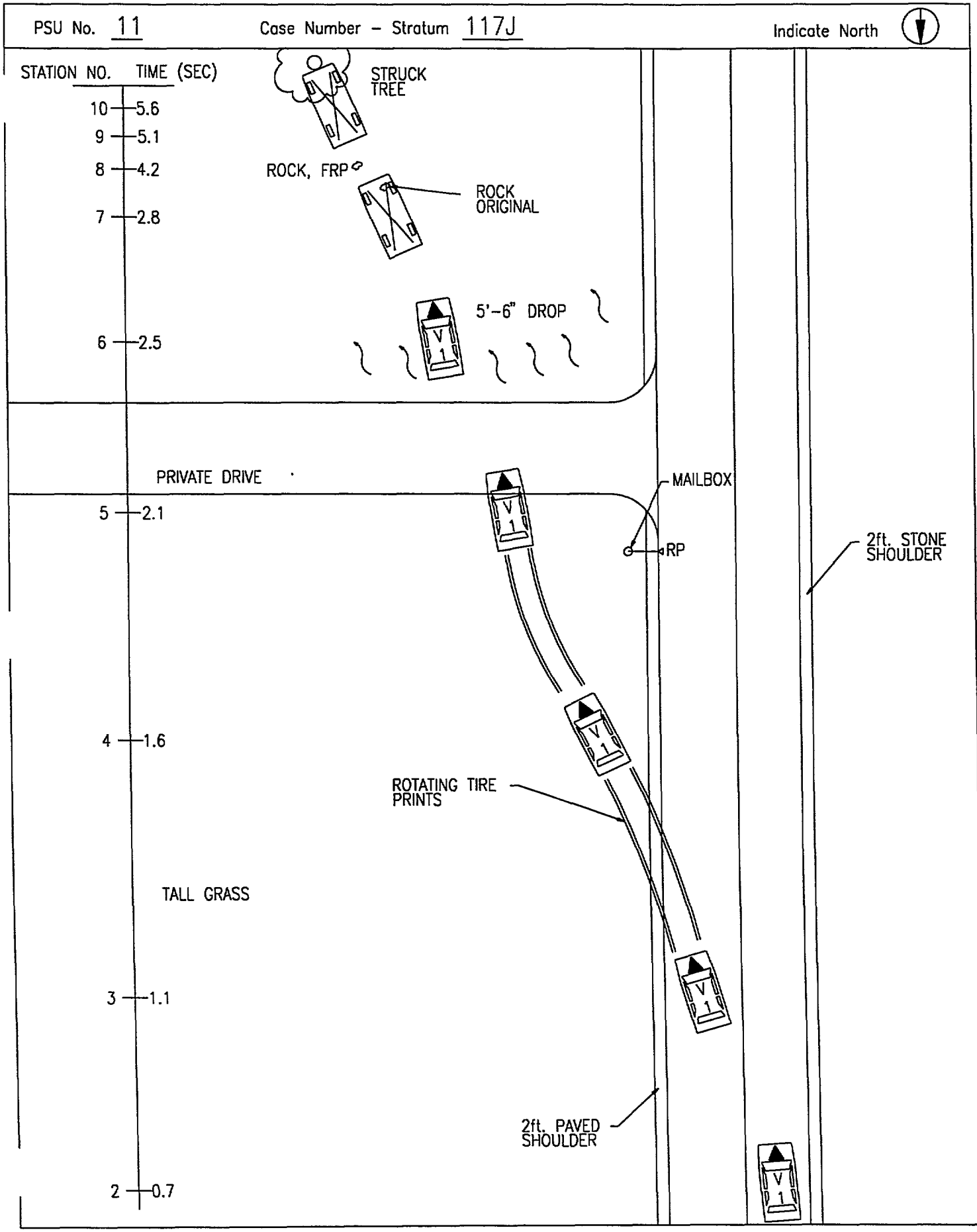
Departure Times

Roadway Edge:	1.18 sec	**Method**	Arc Formula Derived
Shoulder Edge:	1.27 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-18 m) and 3 (+2 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-15 m) and 3 (+5 m).
- Initial velocity of the vehicle was 89 km/h.
- Station 1 extends beyond scope of page.
- Stations 8 and 9 were added.

ACCIDENT COLLISION DIAGRAM



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident information

Date:	7-7-93	***Weather:***	Clear
Time:	0017	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	20
Driver Sex:	Male
Impairment:	Unknown

Vehicle Information

Year:	1988
Vehicle Make:	Toyota
Vehicle Model:	Pickup

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

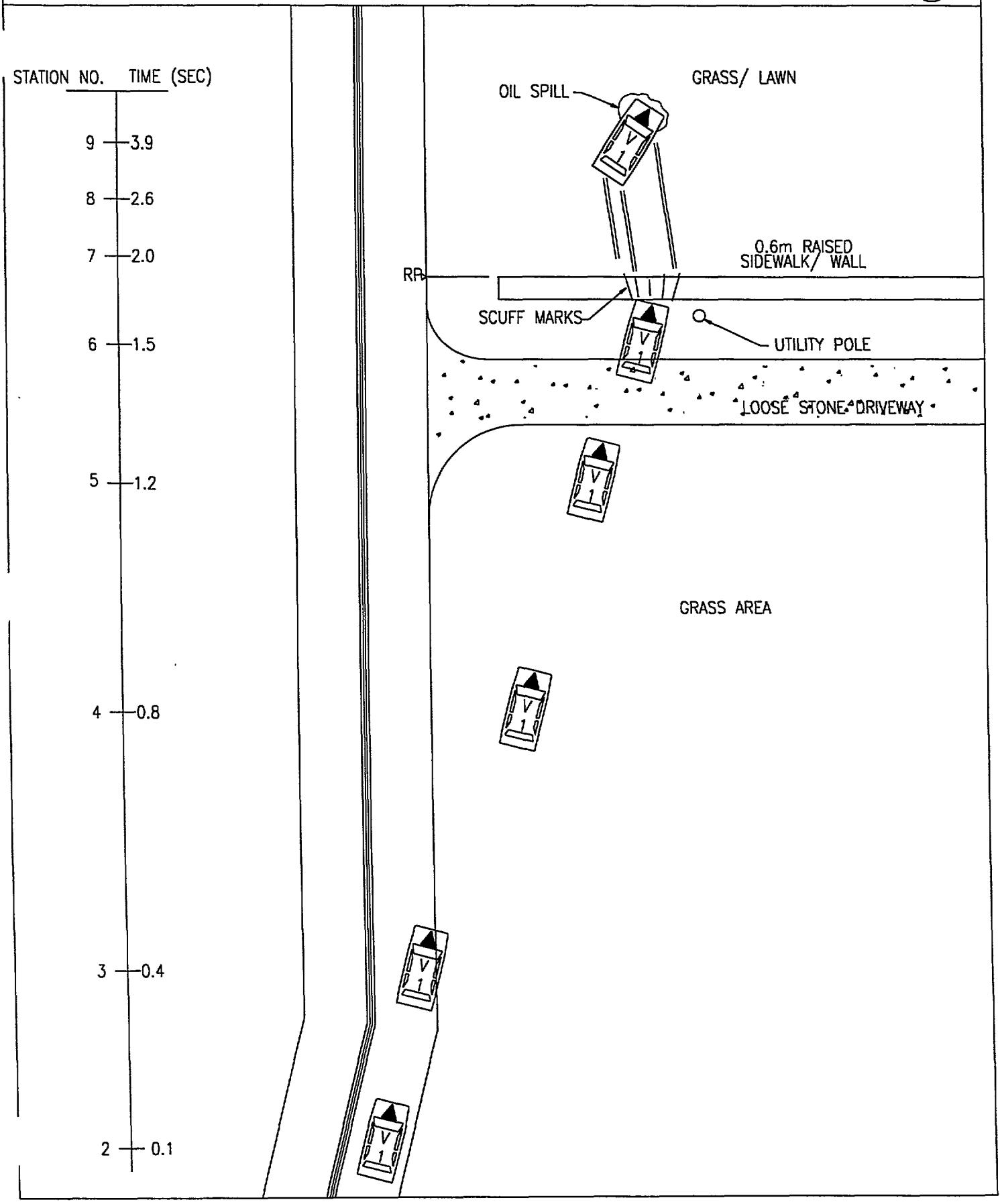
Roadway Edge:	0.29 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.29 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-2 m) and 3 (-2 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-2 m) and 3 (-2 m).
- Initial velocity of the vehicle was 113 km/h.
- Station 1 is 2 m behind Station 2.
- Stations 7 and 8 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 118K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-2-93	***Weather:***	Clear
Time:	0920	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	33
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1988
Vehicle Make:	Mazda
Vehicle Model:	MX-6

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. *of* Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

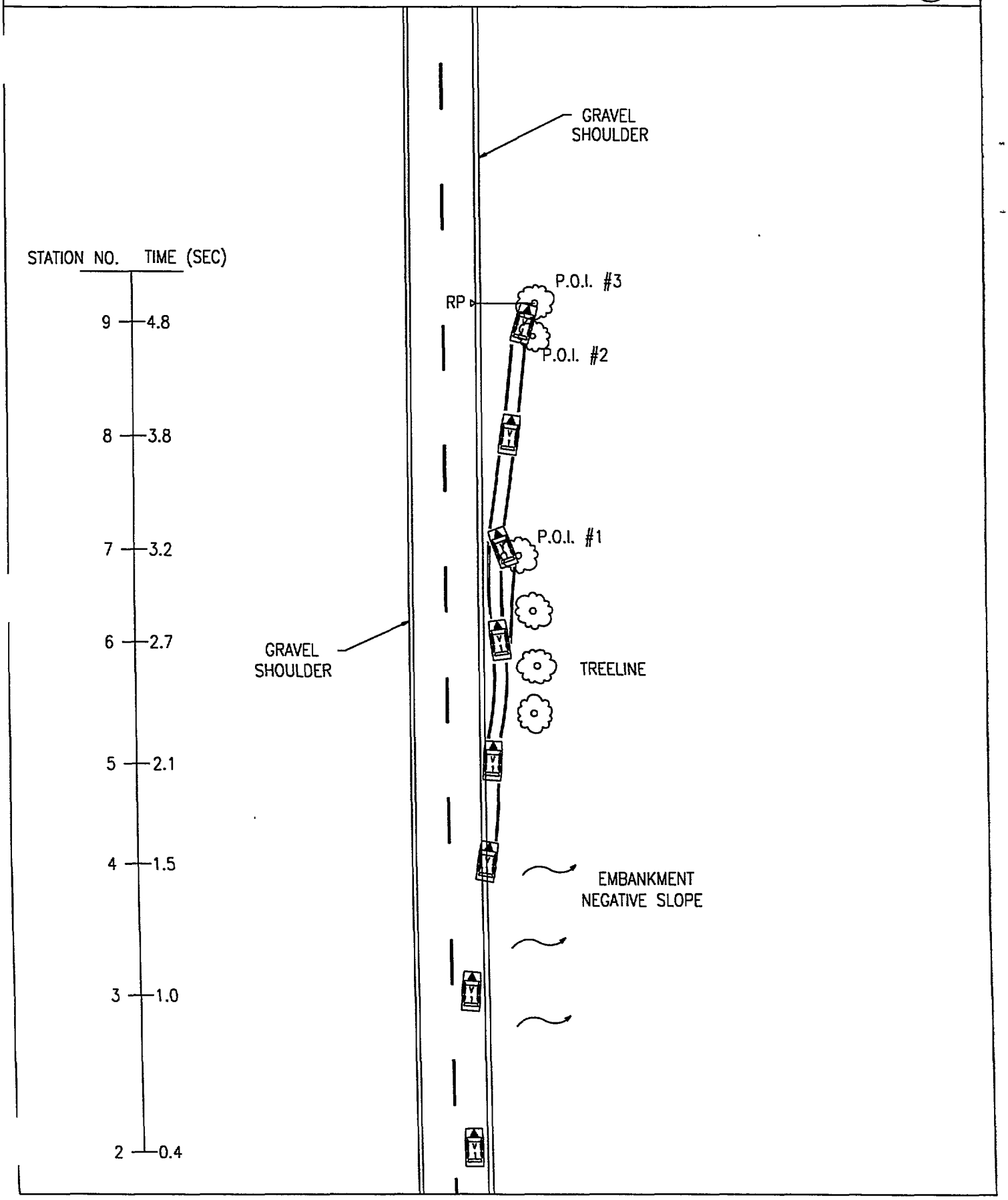
Roadway Edge:	1.23 sec	***Method***	Arc Formula Derived
Shoulder Edge:	2.13 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-10 m) and 3 (+5 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-27 m) and 3 (+lO m).
- Initial velocity of the vehicle was 89 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 125K Indicate North



Scale: 1/500

CAUSAL FACTOR: *Evasive Maneuver - Avoid Animal or Pedestrian*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-4-93	***Wea ther:***	Clear
Time:	0252	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	2 (B)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	38
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1992
Vehicle Make:	Chevrolet
Vehicle Model:	C, K, R, V-series

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	72 km/h

Departure Times

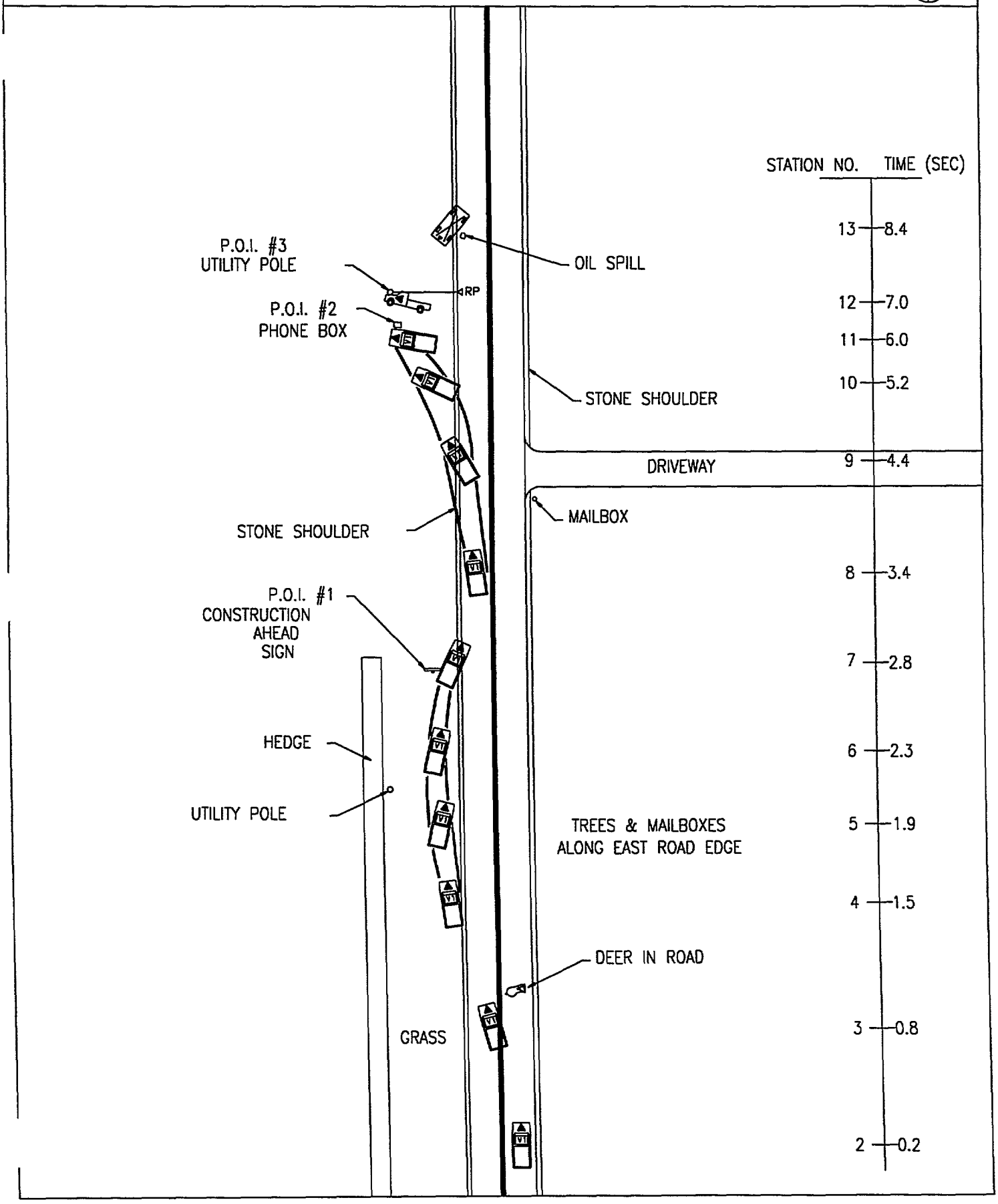
Roadway Edge:	1.28 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.33 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-4 m) and 4 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-4 m) and 4 (-3 m).
- Initial velocity of the vehicle was 72 km/h.
- Station 1 is 4 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 126E Indicate North



Scale: 1/500

CAUSAL FACTOR: *Vehicle Speed - Unsafe Driving Act*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-2-93	**Weather:**	Clear
Time:	0415	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	4 (K)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	21
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1993
Vehicle Make:	Ford
Vehicle Model:	Mustang/ Mustang II

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Left
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	89 km/h

Departure Times

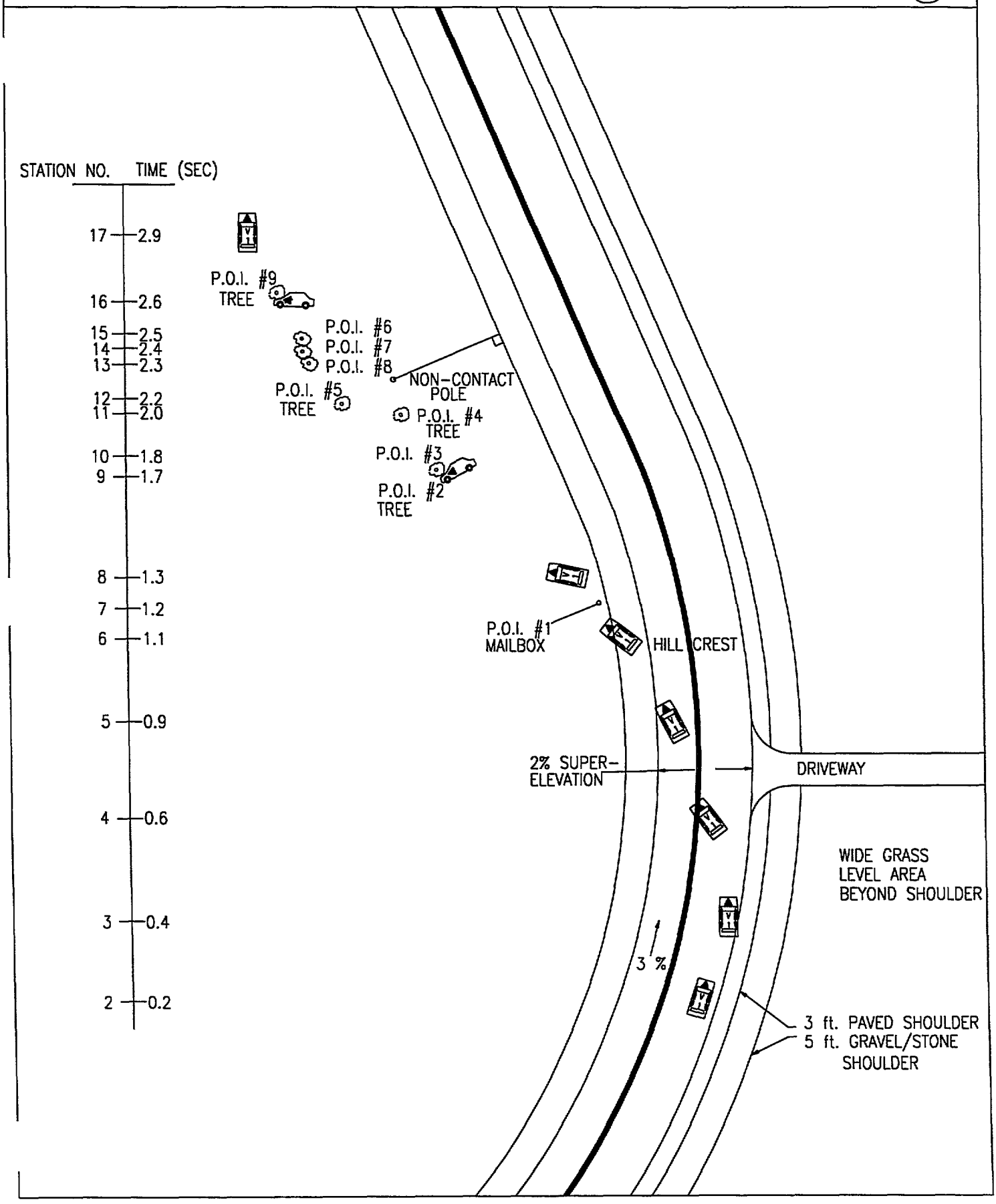
Roadway Edge:	0.38 sec	**Method**	Straight Line Projection
Shoulder Edge:	1.02 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-8 m) and 3.
- Departure time for the shoulder edge was calculated between Stations 2 (-8 m) and 6.
- Initial velocity of the vehicle was 161 km/h.
- Station 1 is 8 m behind Station 2.
- Stations 7, and 10 through 15 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 132A Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-3-93	**Weather:**	Clear
Time:	1510	***Surface Coudition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	0 (0)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	38
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1988
Vehicle Make:	Dodge
Vehicle Model:	Caravan

Roadway information

Trafficway Type **(Median):**	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	64 km/h

Departure Times

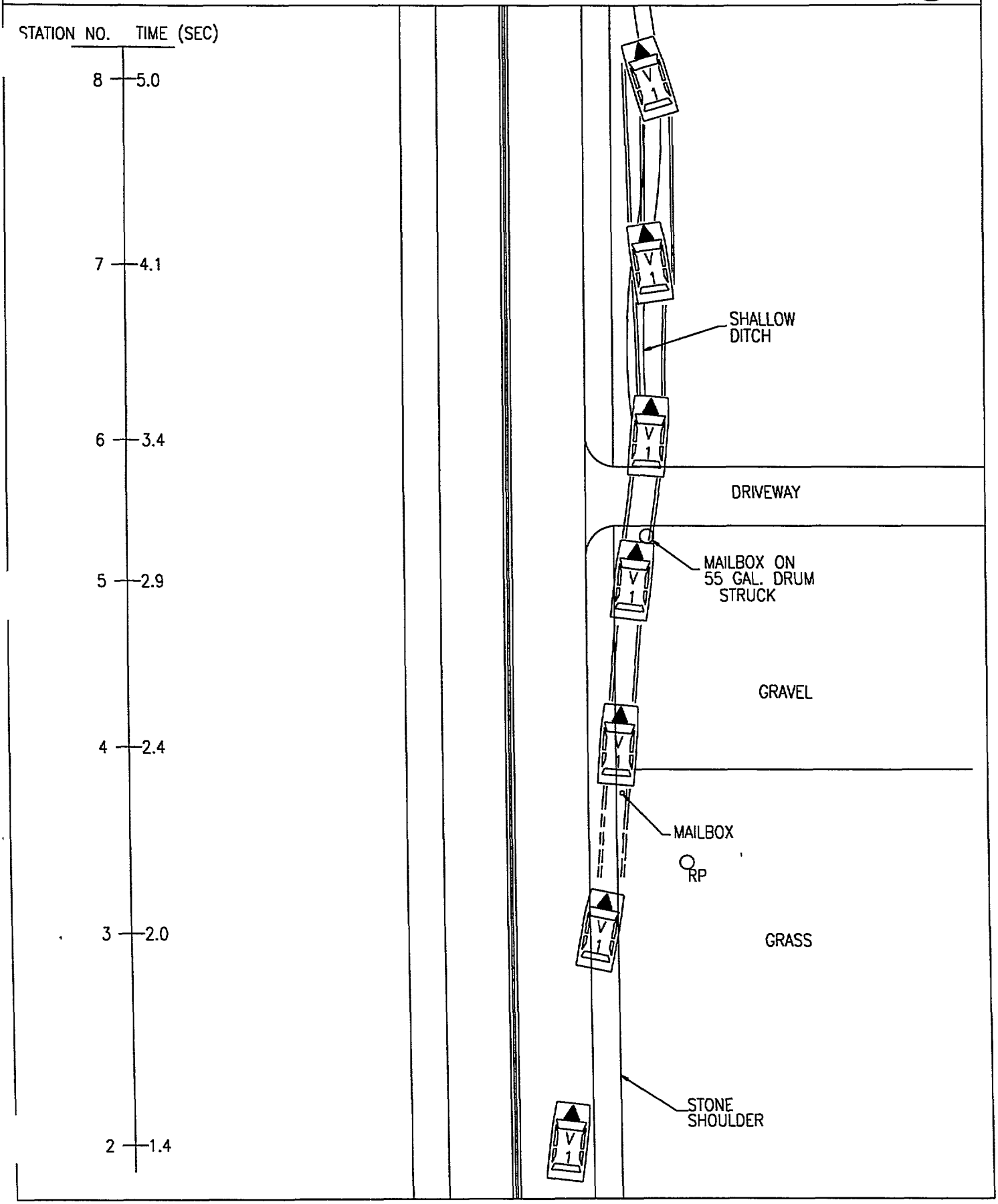
Roadway Edge:	1.75 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	2.71 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-25 m) and 3 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-38 m) and 3.
- Initial velocity of the vehicle was 64 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 135G Indicate North



Scale: 1/250

CAUSAL FACTOR: Evasive Maneuver - Vehicle Encroaching into Lane - *Other*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-3-93	***Weather:***	Clear
Time:	0740	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	25
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1993
Vehicle Make:	Ford
Vehicle Model:	Escort/EXP

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

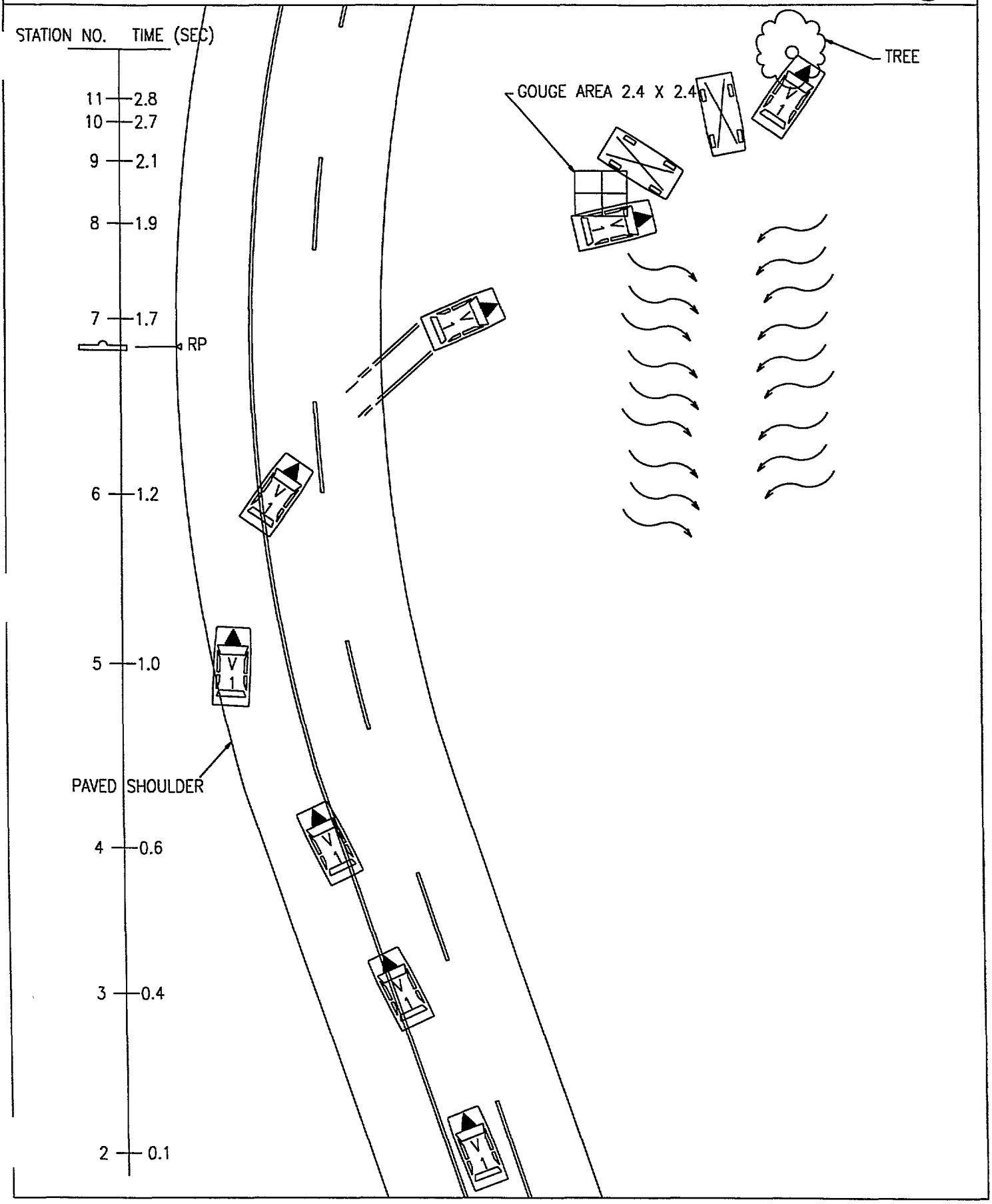
Roadway Edge:	0.29 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.01 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-4 m) and 3 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-4 m) and 5.
- Initial velocity of the vehicle was 113 km/h.
- Station 1 is 4 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 136C Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	8-3-93	***Weather:***	Clear
Time:	0200	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	2 (B)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	22
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1988
Vehicle Make:	Saab
Vehicle Model:	99/99E/900

Roadway Information

Trafficway Type (Median):	Physical barrier	***Alignment:***	Curve Left
		Slope:	Level
No. of Lanes:	3	***Speed Limit:***	89 km/h

Departure Times

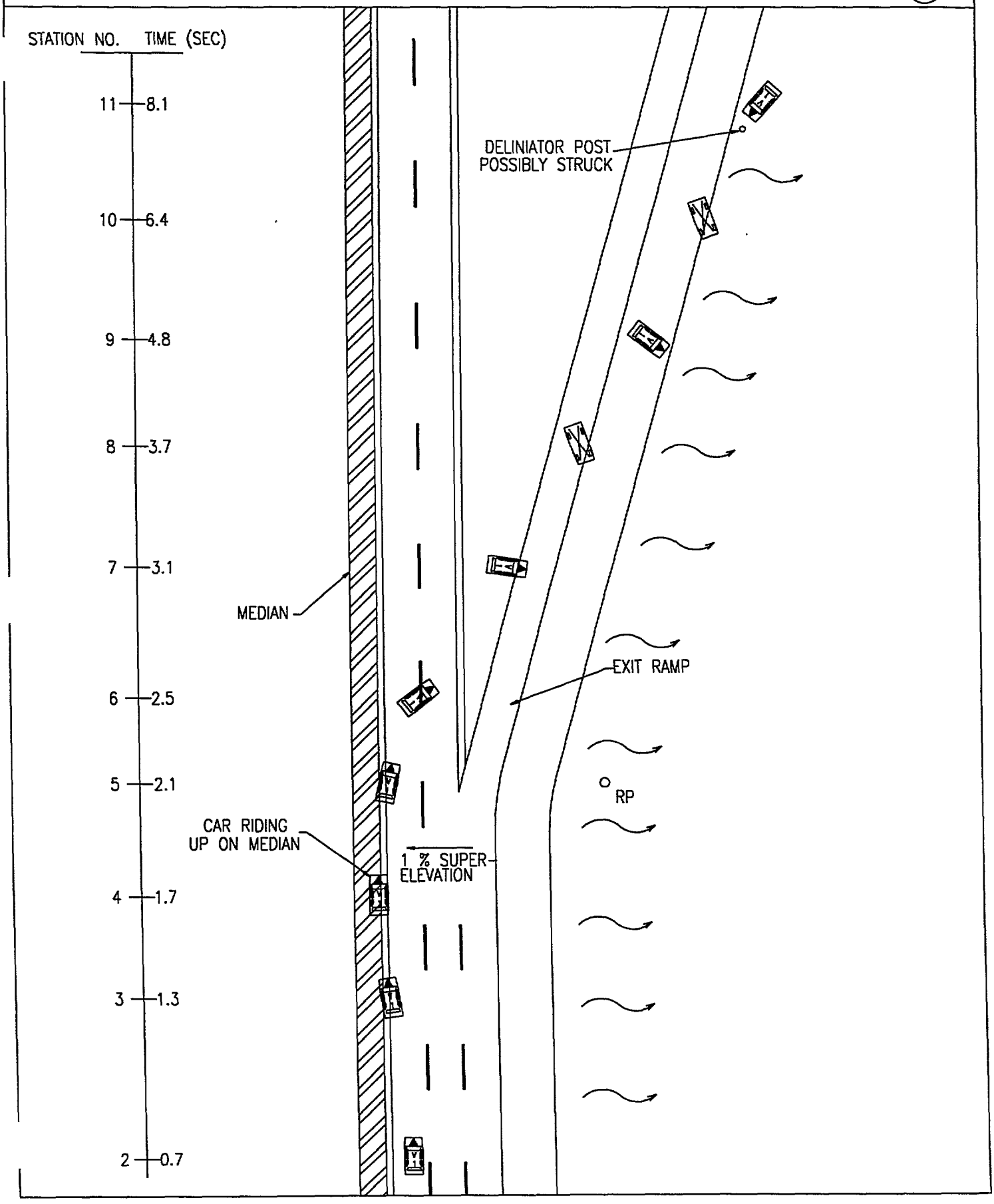
Roadway Edge:	1.01 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.30 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-17 m) and 3 (-8 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-16 m) and 3.
- Initial velocity of the vehicle was 89 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 11 Case Number – Stratum 137F Indicate North



Scale: 1/500

CAUSAL FACTOR; *Driver Relinquishes Steering Control - Other*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-2-93	***Weather:***	Clear
Time:	0125	***Surface Condition:***	Dry
Accident Type:	End Departure	***Lighting:***	No
Accident Severity:	2 (B)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	30
Driver Sex:	Female
Impairment:	Unknown

Vehicle Information

Year:	1989
Vehicle Make:	GMC
Vehicle Model:	Jimmy

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	40 km/h

Departure Times

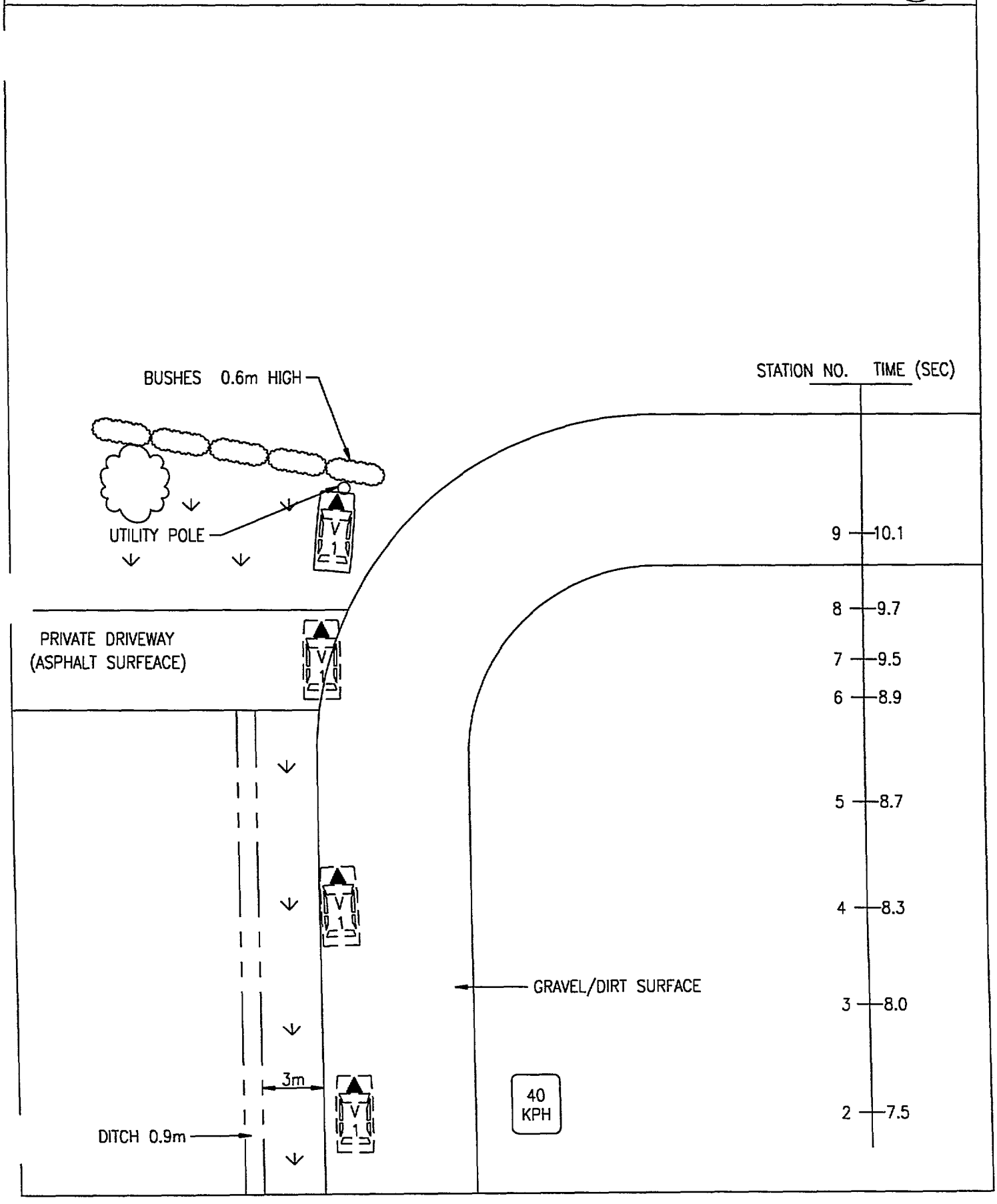
Roadway Edge:	8.98 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	8.98 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-83 m) and 7 (-6 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-83 m) and 7 (-6 m).
- Initial velocity of the vehicle was 40 km/h.
- Station 1 extends beyond scope of page.
- Stations 3, 5, 6 and 8 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 12 Case Number – Stratum 119E Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	l-4-93	***Weather:***	Clear
Time:	0753	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	21
Driver Sex:	Female
Impairment:	Fell Asleep

Vehicle Information

Year:	1991
Vehicle Make:	Chevrolet
Vehicle Model:	S-10, T-10

Roadway Information

Trafficway Type (Median):	Physical barrier	***Alignment:***	Curve Left
		Slope:	Level
No. of Lanes:	4	***Speed Limit:***	105 km/h

Departure Times

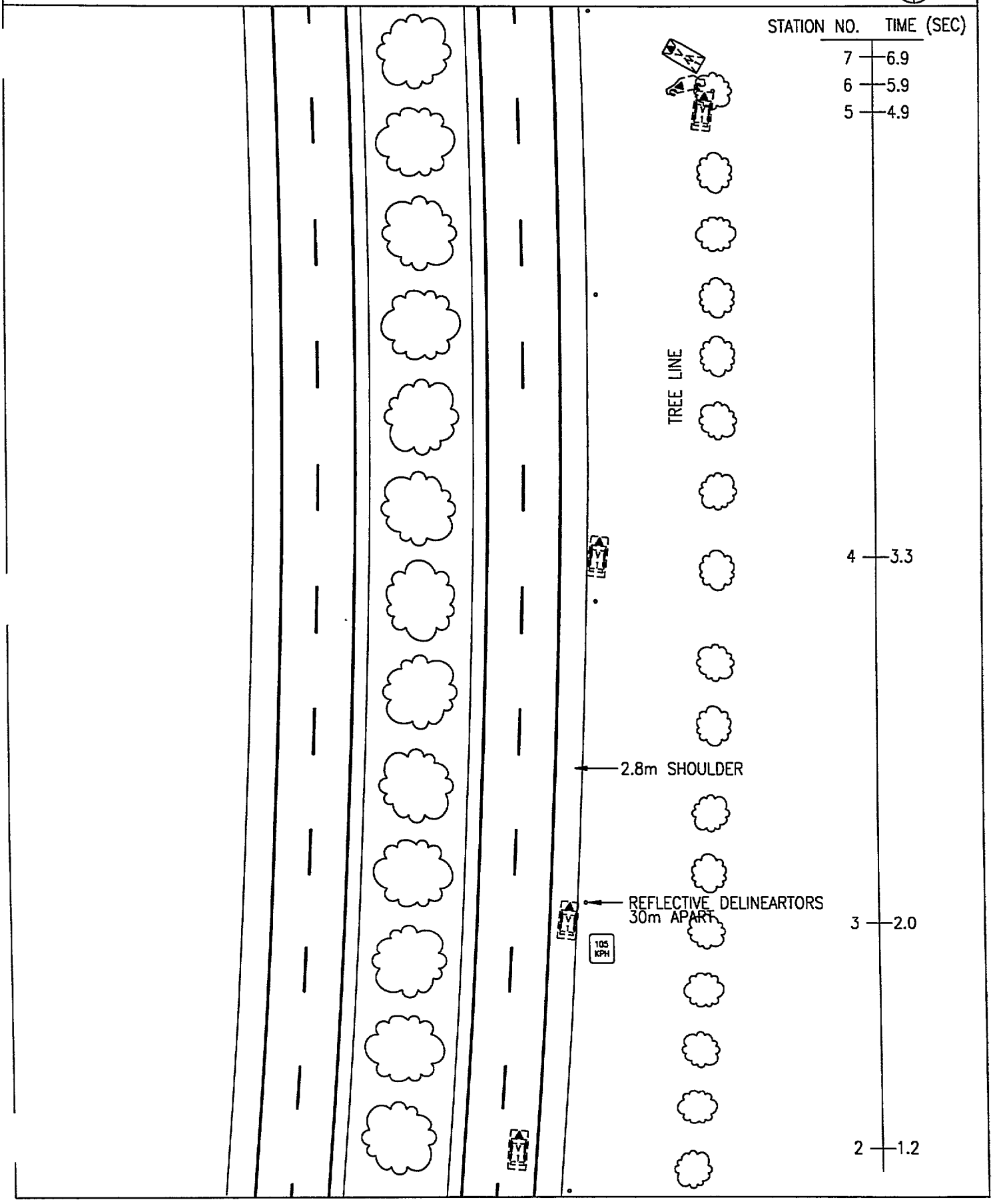
Roadway Edge:	1.40 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	2.56 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-34 m) and 2 (+7 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-5 1 m) and 3.
- Initial velocity of the vehicle was 105 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number – Stratum 017J Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-l-93	***Weather:***	Clear
Time:	1057	**Surface *Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	40
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1993
Vehicle Make:	Chevrolet
Vehicle Model:	Astro Van

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	105 km/h

Departure Times

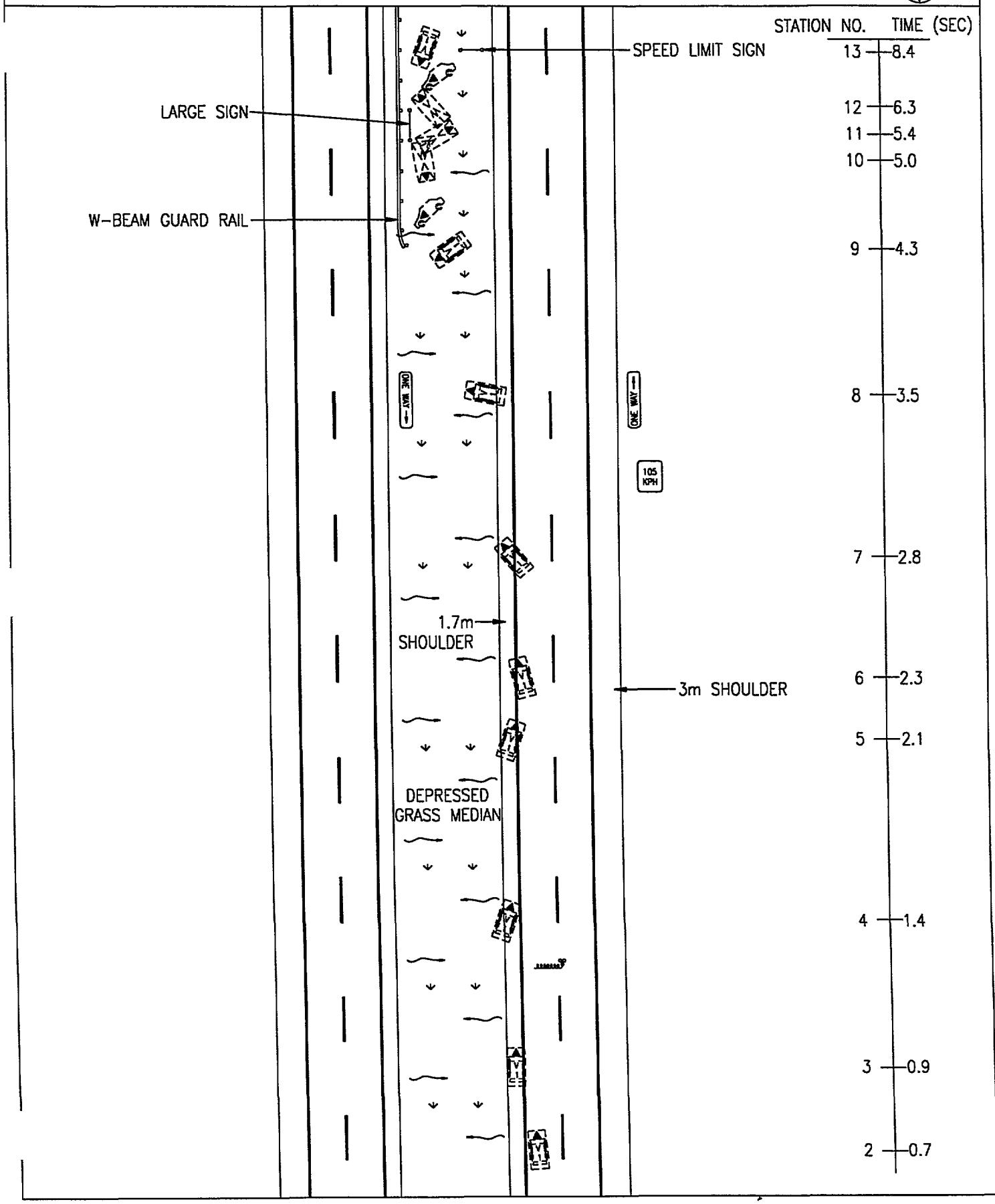
Roadway Edge:	0.73 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.29 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-19 m) and 2 (+2 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-30 m) and 3.
- Initial velocity of the vehicle was 105 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number – Stratum 149J Indicate North



Scale: 1/500

CAUSAL FACTOR: *Lost Directional Control*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-5-93	***Weather:***	Rain
Time:	2135	***Surface Condition:***	Wet
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	0 (0)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	27
Driver Sex:	Female
Impairmen t:	None

Vehicle Information

Year:	1989
Vehicle Make:	Chevrolet
***Vehicle* Model:**	Cavalier

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Grade
No. of Lanes:	1	***Speed Limit:***	89 km/h

Departure Times

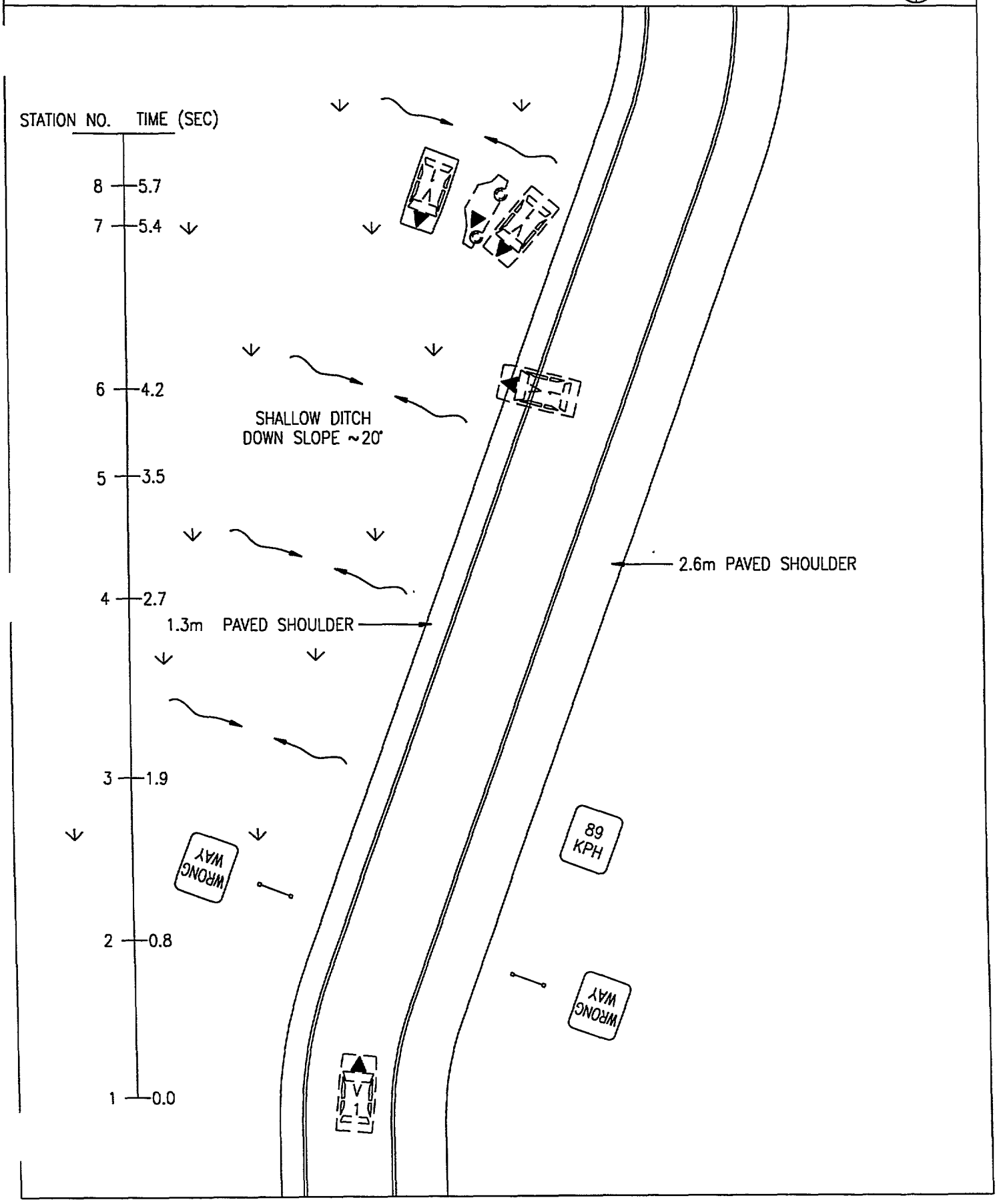
Roadway Edge:	2.09 sec	**Method:**	Straight Line Projection
Shoulder Edger	2.31 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+17 m) and 6 (-2 m).
- Departure time for the shoulder edge was calculated between Stations 1 (+17 m) and 6.
- Initial velocity of the vehicle was 32 km/h.
- Stations 2,3,4 and 5 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number – Stratum 152G Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-7-93	**Weather:**	Clear
Time:	0224	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	Yes
Accident Severity:	4 (K)	**Land Use:**	Urban

Driver/Occupant Information

Driver Age:	36
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1978
Vehicle Make:	Chevrolet
Vehicle Mode/:	Fullsize Blazer

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Left
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	40 km/h

Departure Times

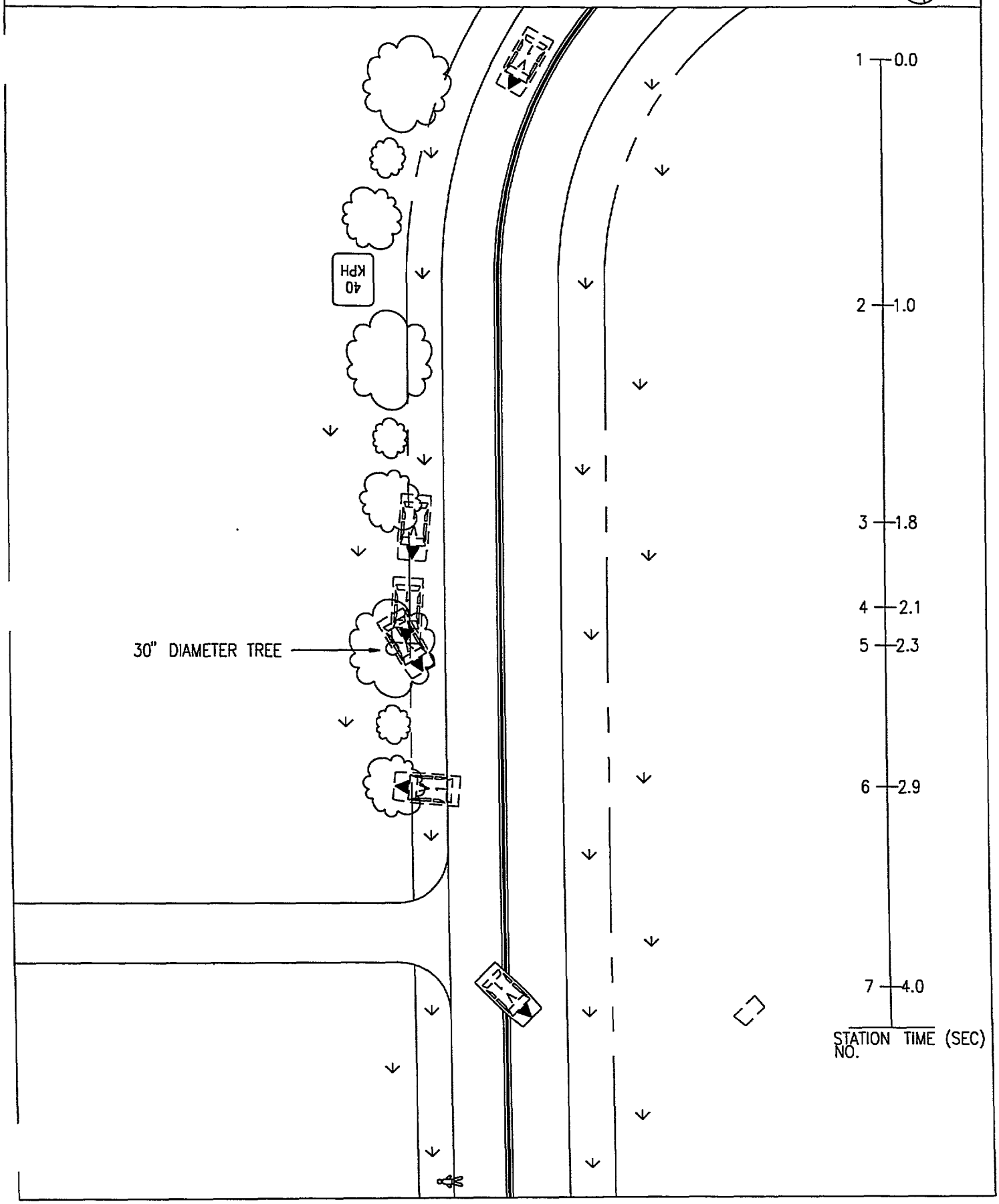
Roadway Edge:	0.99 sec	**Method**	Straight Line Projection
Shoulder Edge:	0.99 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 3 (-14 m).
- Departure time for the shoulder edge was calculated between Stations 1 and 3 (-14 m).
- Initial velocity of the vehicle was 60 km/h.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number – Stratum 153B Indicate North



Scale: 1/300

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-7-93	**Weather:**	Clear
Time:	0113	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	0 (0)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	31
Driver Sex:	Male
Impairment:	Intoxicated (alcohol other illicit drugs)

Vehicle Information

Year:	1979
Vehicle Make:	Ford
Vehicle Model:	F-series pickup

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Level
No. of Lanes:	2	**Speed Limits**	89 km/h

Departure Times

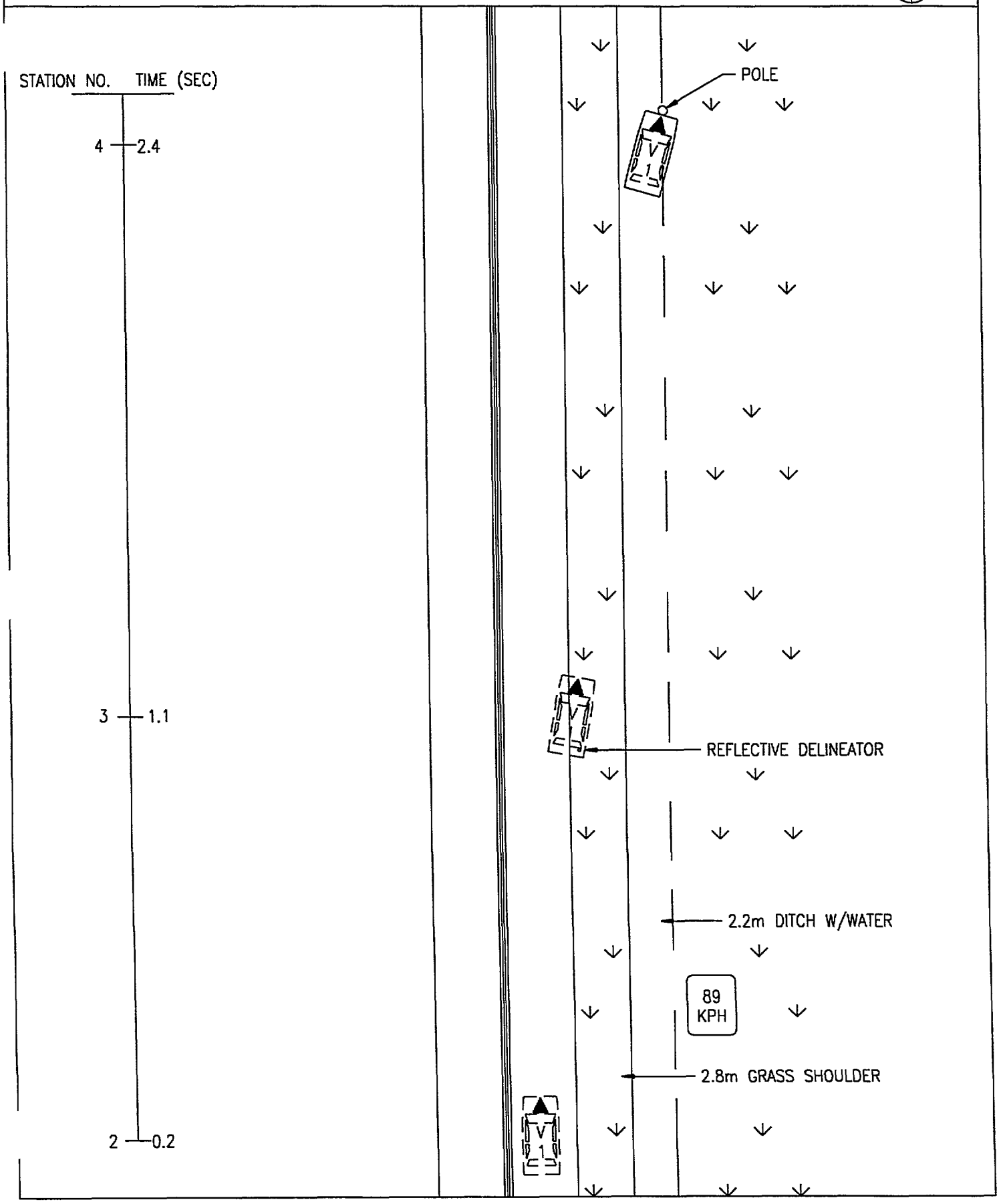
Roadway Edge:	0.88 sec	**Method:**	Arc Formula Derived
Shoulder Edge:	0.88 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-5 m) and 3 (-5 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-5 m) and 3 (-5 m).
- Initial velocity of the vehicle was 89 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number – Stratum 156H Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Excessive*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-l-93	***Weather:***	Clear
Time:	1738	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	0 (0)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	Unknown
Driver Sex:	Unknown
Impairment:	Unknown

Vehicle Information

Year:	1984
Vehicle Make:	Chevrolet
Vehicle Model:	Celebrity

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	40 km/h

Departure Times

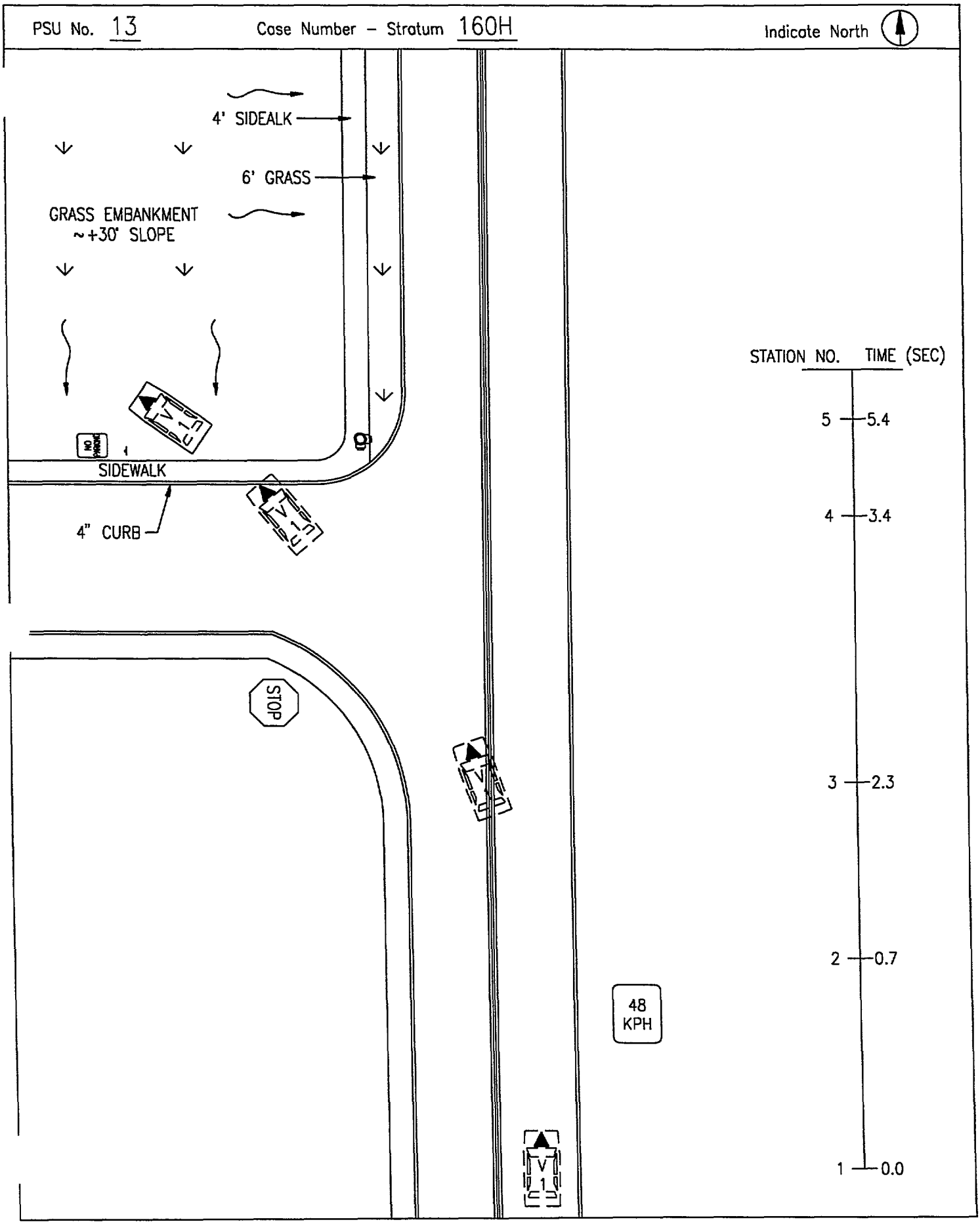
Roadway Edge:	2.59 sec	***Method***	Straight Line Projection
Shoulder Edge:	2.59 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+9 m) and 4.
- Departure time for the shoulder edge was calculated between Stations 1 (+9 m) and 4.
- Initial velocity of the vehicle was 40 kmih.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number – Stratum 160H Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-6-93	***Weather:***	Clear
Time:	0545	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	0 (0)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	17
Driver Sex:	Female
Impairmen t:	Fell Asleep

Vehicle Information

Year:	1978
Vehicle Make:	Chevrolet
Vehicle Model:	G-series van

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

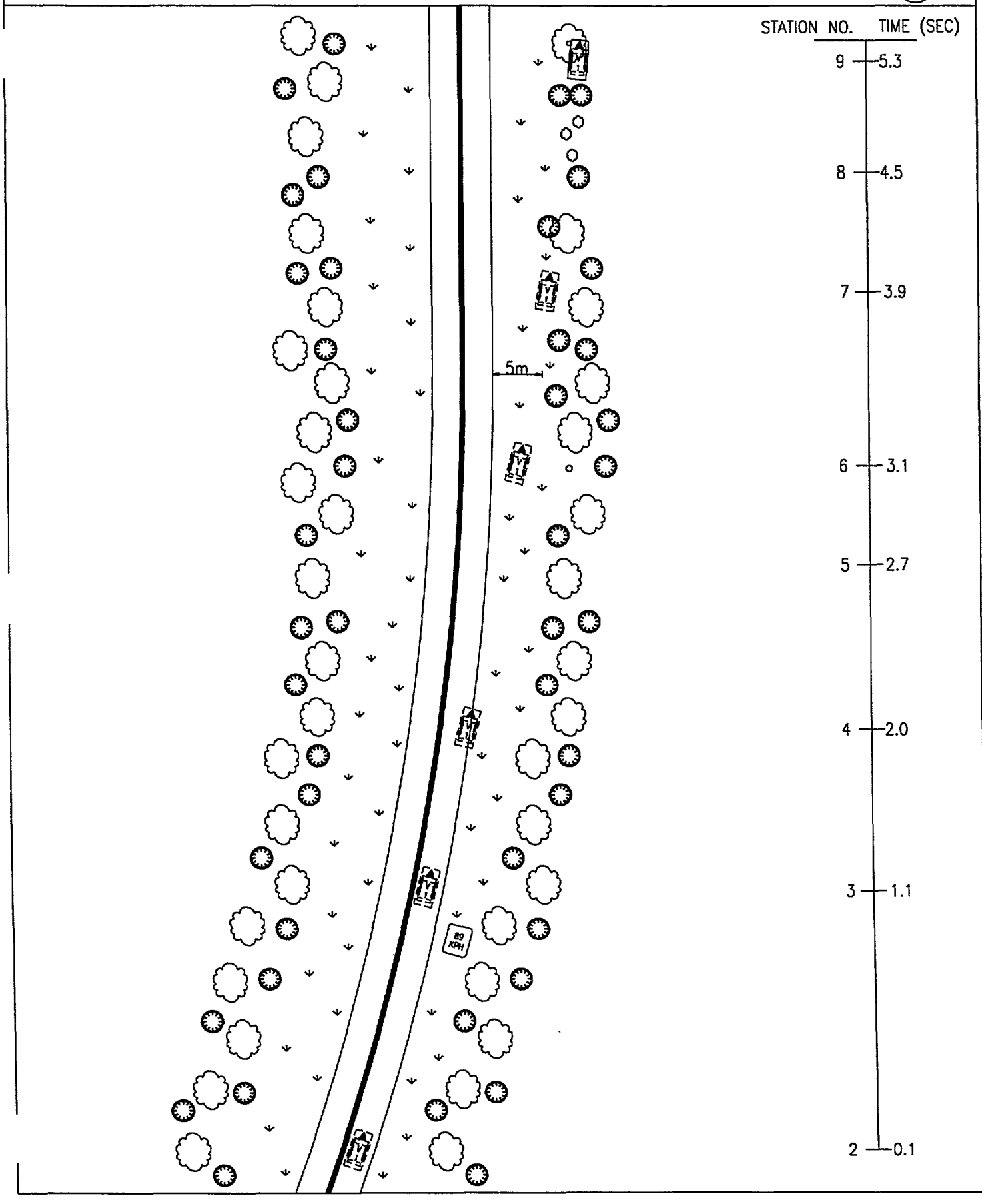
Roadway Edge:	1.74 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.74 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (-2 m) and 3 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 1 (-2 m) and 3 (-4 m).
- Initial velocity of the vehicle was 89 km/h.
- Stations 4 and 7 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number – Stratum 164H Indicate North



Scale: 1/500

CAUSAL *FACTOR:* *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	8-3-93	**Weather:**	Clear
Time:	1234	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	3(A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	24
Driver Sex:	Female
Impairment:	Fell Asleep

Vehicle Information

Year:	1989
Vehicle Make:	Chevrolet
Vehicle Model:	S-10, T-10

Roadway Information

Trafficway Type (Median):	Physical barrier	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	105 km/h

Departure Times

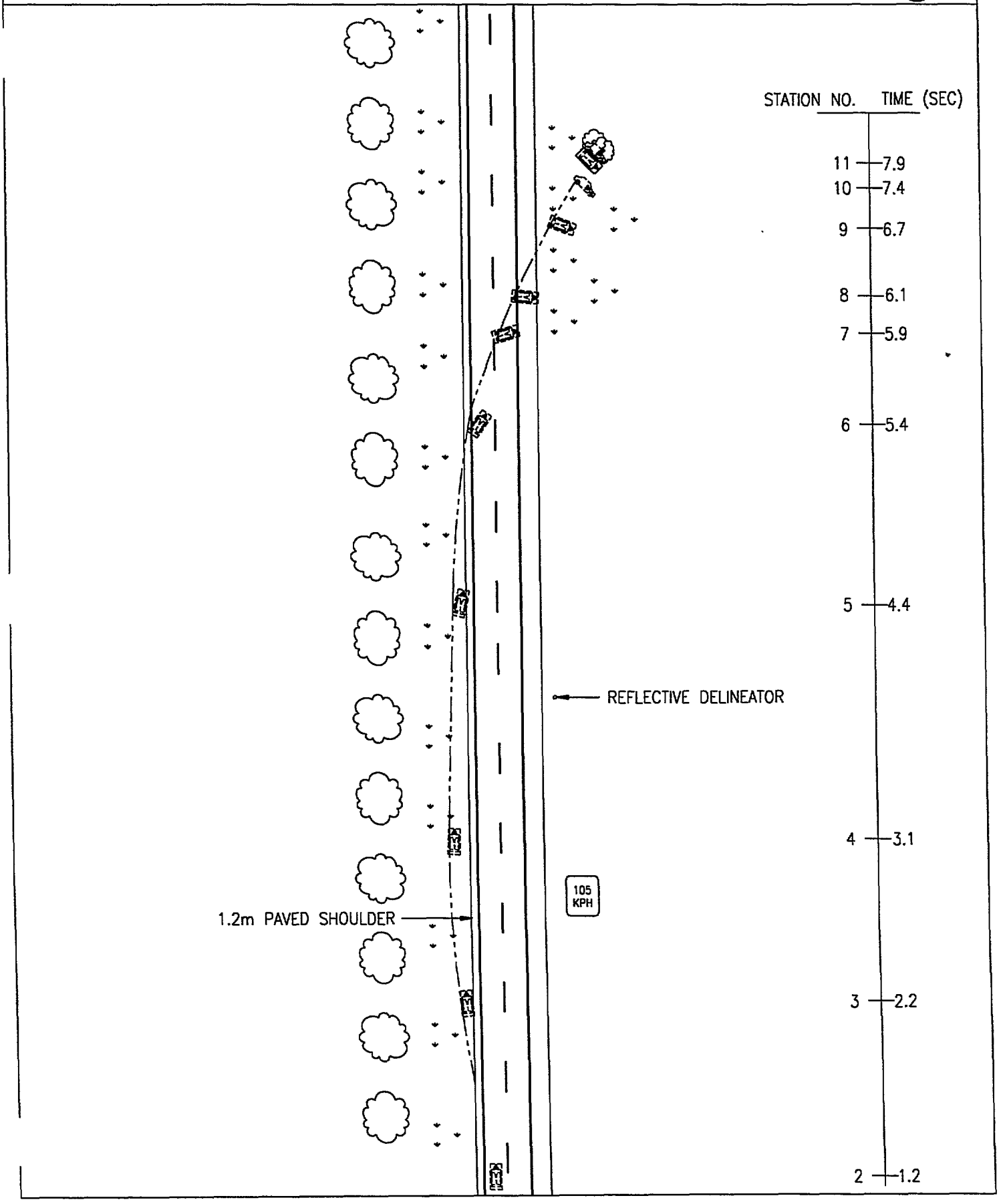
Roadway Edge:	1.69 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	2.34 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-39 m) and 3 (-17 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-53 m) and 3 (-10 m).
- Initial velocity of the vehicle was 113 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number – Stratum 165C Indicate North



Scale: 1/750

CAUSAL FACTOR: *Vehicle Speed - Speed and Driver inexperience*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	8-1-93	**Weather:**	Rain
Time:	1259	***Surface Condition:***	Wet
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity;	1 (C)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	16
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1987
Vehicle Make:	Nissan/Datsun
Vehicle Model:	Pathfinder

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Level
No. of Lanes:	1	***Speed Limit:***	40 km/h

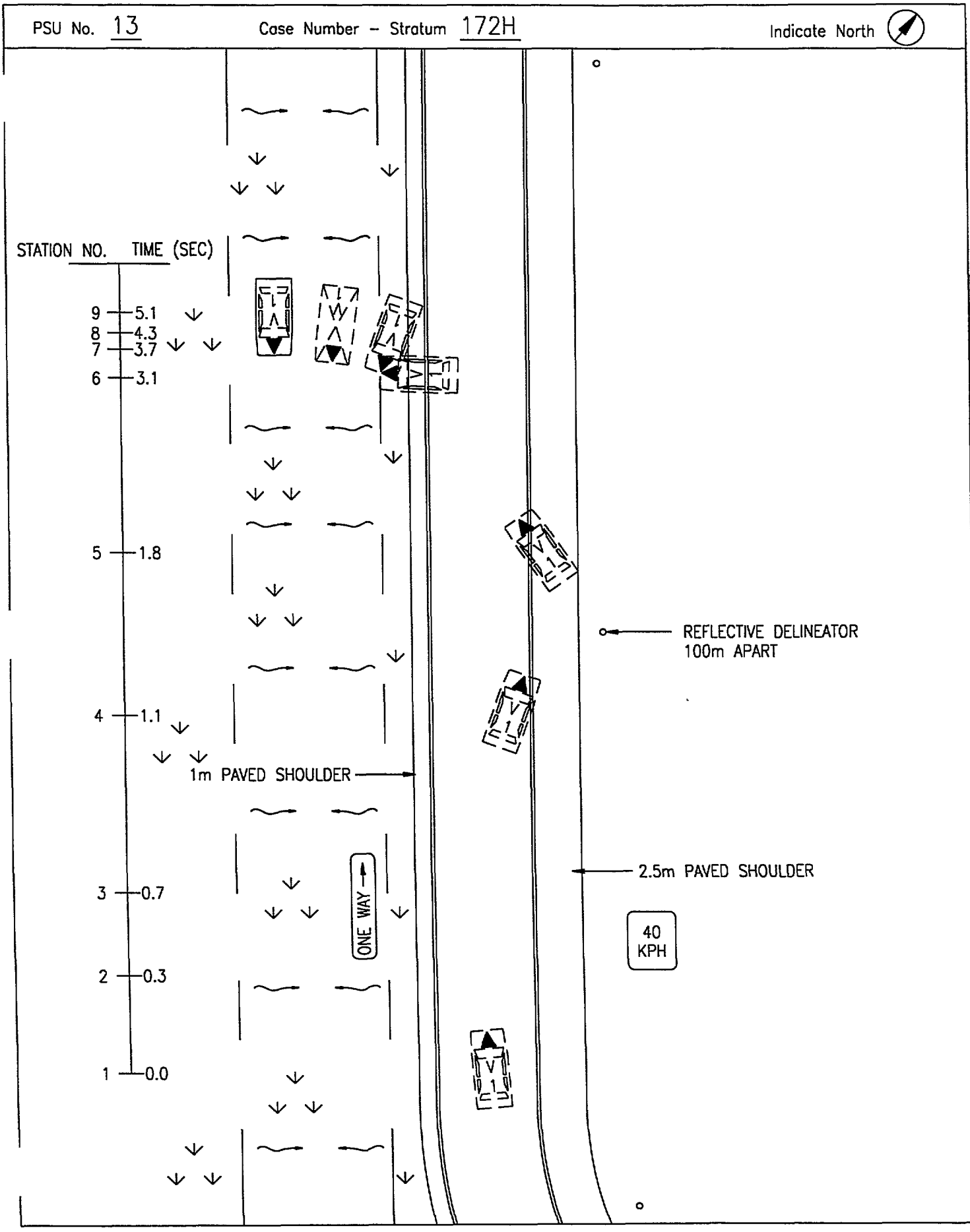
Departure Times

Roadway Edge:	0.91 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.90 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+3 m) and 4.
- Departure time for the shoulder edge was calculated between Stations 1 (+3 m) and 6.
- Initial velocity of the vehicle was 64 km/h.
- Stations 2 and 3 were added.

ACCIDENT COLLISION DIAGRAM



Scale: 1/250

CAUSAL FACTOR: *Lost Directional Control*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	9-2-93	**Weather:**	Rain
Time:	1910	**Surface Condition:**	Wet
Accident Type:	Control/Traction Loss	**Lighting:**	Daylight
Accident Severity:	3(A)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	25
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1986
Vehicle Make:	Mercury
Vehicle Model:	Topaz

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	89 km/h

Departure Times

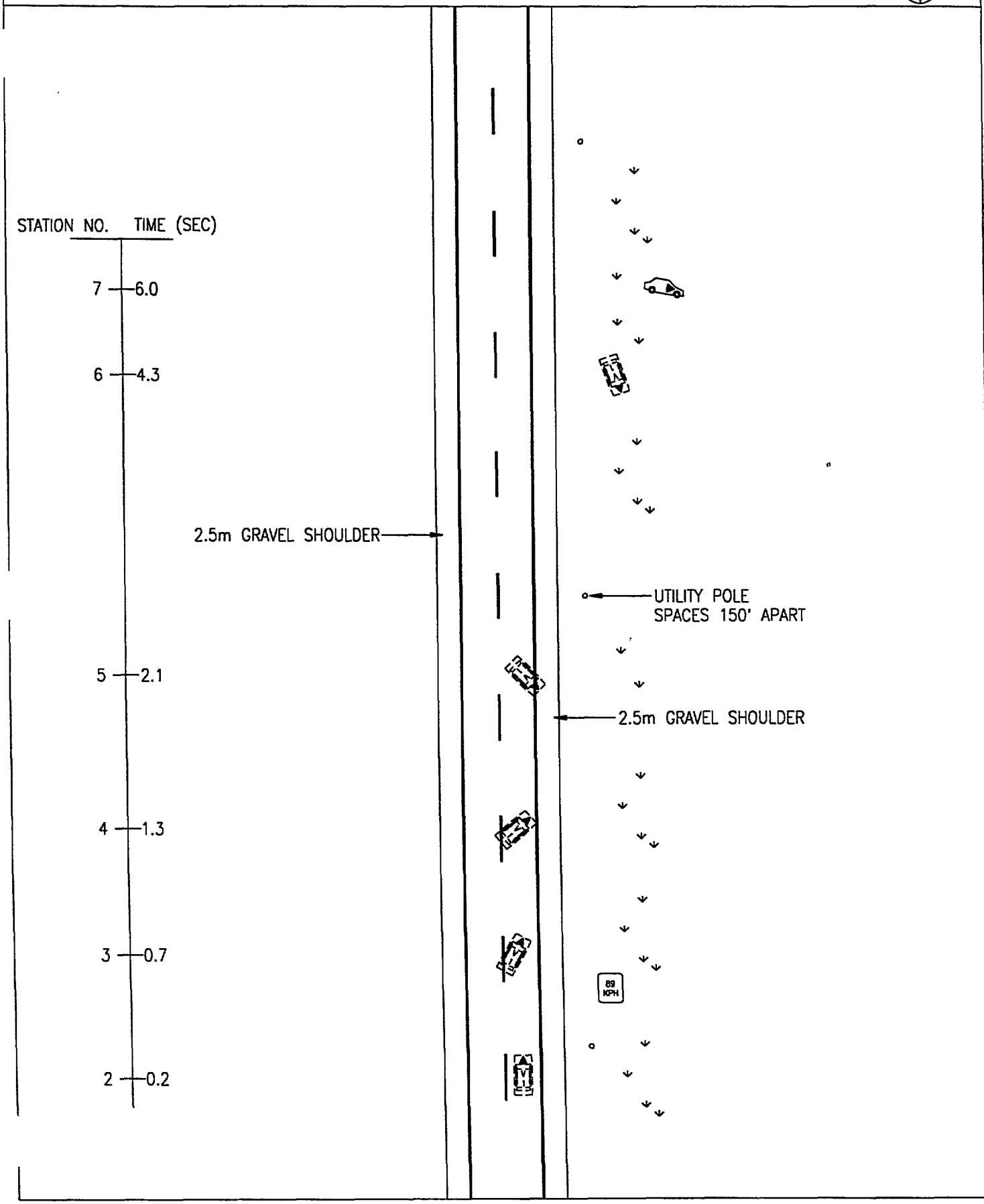
Roadway Edge:	1.29 sec	**Method:**	Straight Line Projection
Shoulder Edge:	2.35 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-6 m) and 4.
- Departure time for the shoulder edge was calculated between Stations 1 (-6 m) and 5 (+lO m).
- Initial velocity of the vehicle was 89 km/h.
- Station 1 is 6 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 13 Case Number – Stratum 197D Indicate North



Scale: 1/500

CAUSAL FACTOR: *Evasive Maneuver - Avoid Animal or Pedestrian*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	l-3-93	***Weather:***	Other (clouds)
Time:	0645	***Surface Condition:***	Dry
Accident Type:	Avoid Collision	***Lighting:***	Daylight
Accident Severity:	0 (0)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	36
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1993
Vehicle Make:	Ford
Vehicle Model:	Escort/EXP

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Left
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

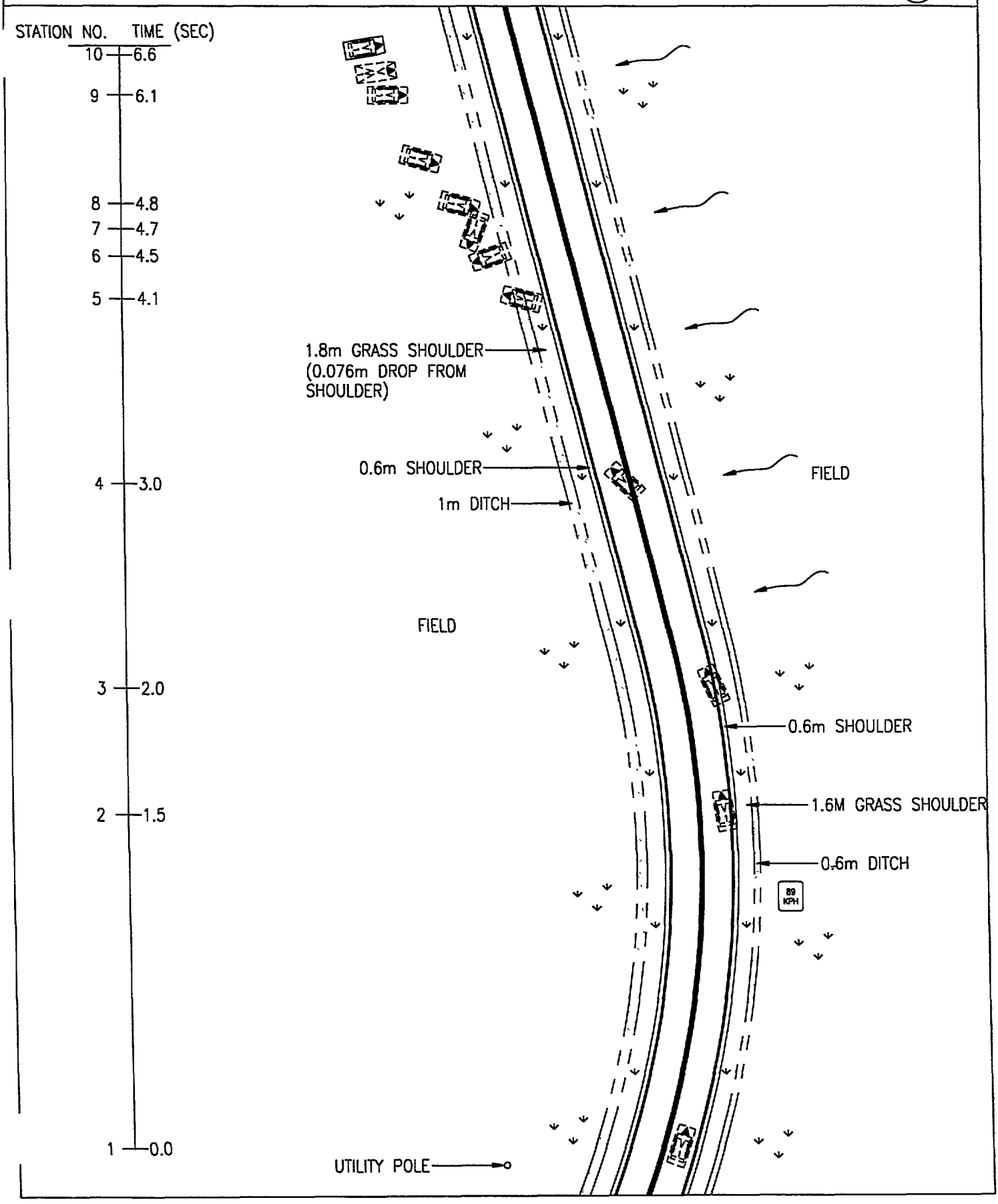
Roadway Edge:	0.45 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.61 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+24 m) and 2.
- Departure time for the shoulder edge was calculated between Stations 1(+24 m) and 2 (+4 m).
- Initial velocity of the vehicle was 89 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 43 Case Number – Stratum 014G Indicate North



Scale: 1/500

CAUSAL FACTOR: *Vehicle Failure*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	l-7-93	***Weather:***	Clear
Time:	1840	**Surface *Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accidenf Severify:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	18
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1980
Vehicle Make:	Nissan/Datsun
Vehicle Model:	Z-car, ZX

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	4	***Speed Limit:***	72 km/h

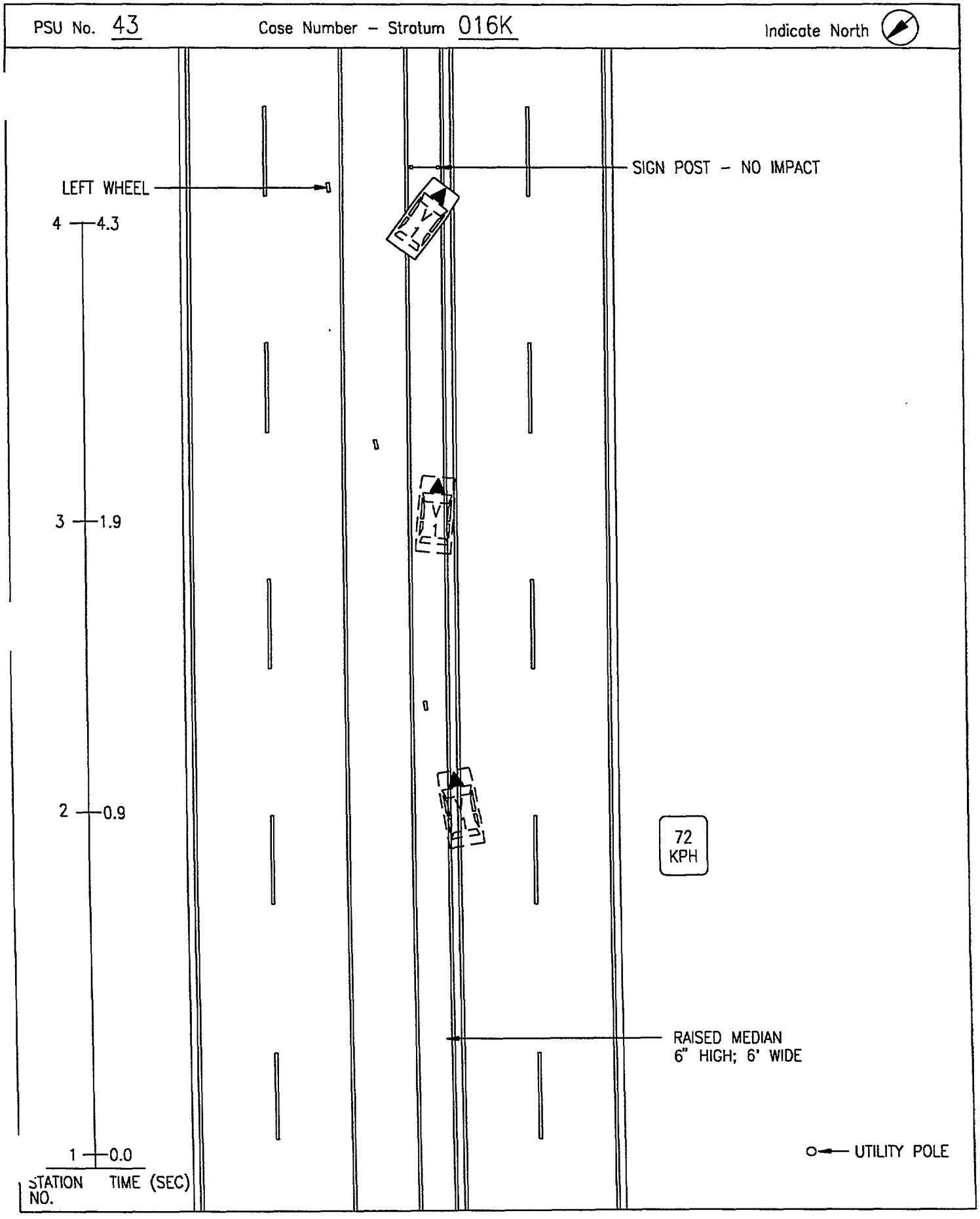
Departure Times

Roadway Edge:	0.50 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.92 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-18 m) and 2 (-8 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-18 m) and 2 (-2 m).
- Initial velocity of the vehicle was 72 km/h.
- Station 1 is 18 m behind Station 2.

ACCIDENT COLLISION DIAGRAM



Scale: 1/250

CAUSAL FACTOR: *Diver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Left*

General Accident information

Date:	7-4-93	***Weather:***	Clear
Time:	0522	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	0 (0)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	26
Driver Sex:	Male
Impairment:	Other (driver fatigued)

Vehicle Information

Year:	1984
Vehicle Make:	Pontiac
Vehicle Model:	J-2000/2000/ Sunbird

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Level
No. of Lanes:	1	***Speed Limit:***	89 km/h

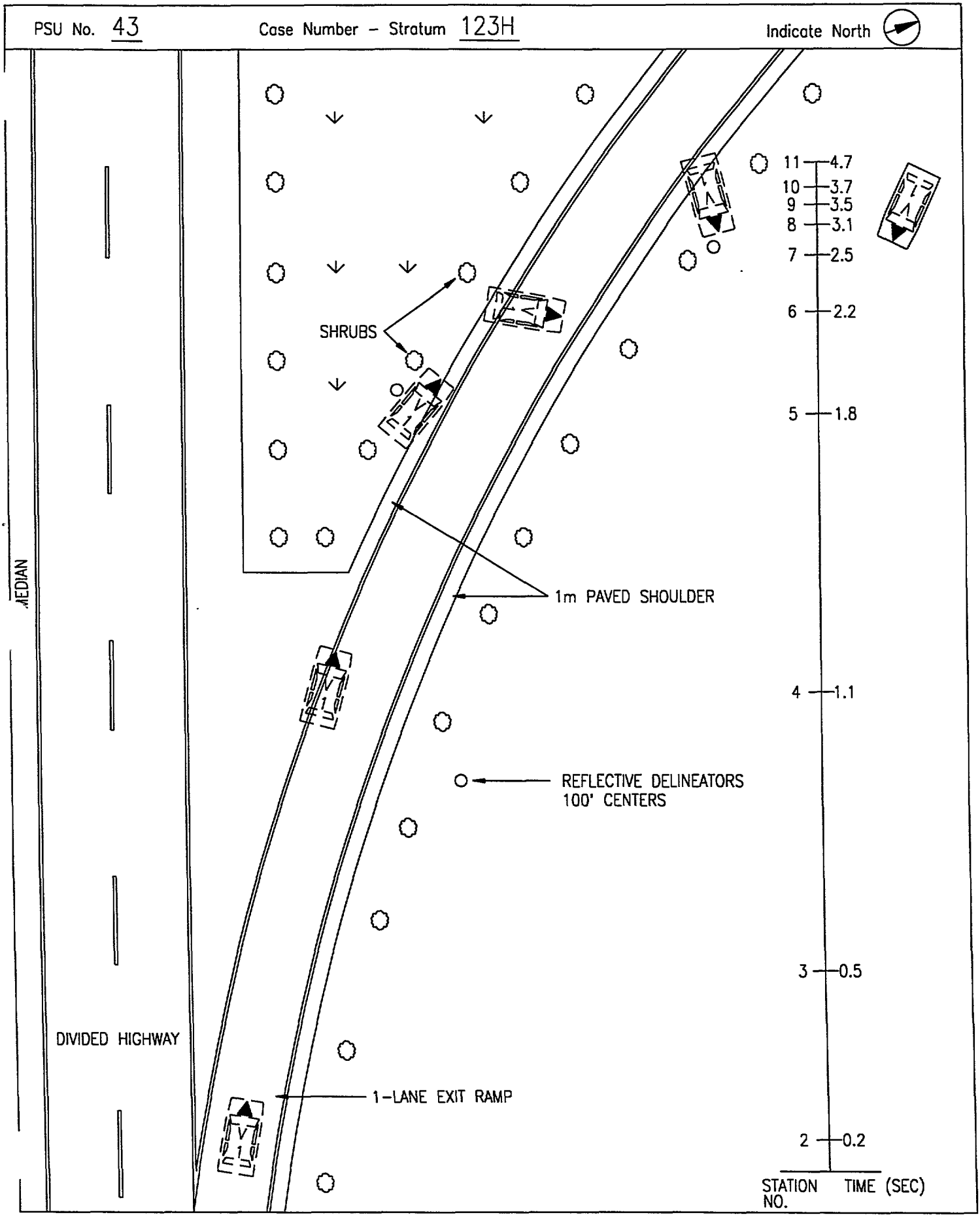
Departure Times

Roadway Edge:	0.64 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.25 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-4 m) and 4 (-12 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-4 m) and 5 (+4 m).
- Initial velocity of the vehicle was 89 km/h.
- Stations 3,7, 8 and 9 were added.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-7-93	**Weather:**	Clear
Time:	0012	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	4 (K)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	27
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1992
Vehicle Make:	Isuzu
Vehicle Model:	Amigo

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Left
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	72 km/h

Departure Times

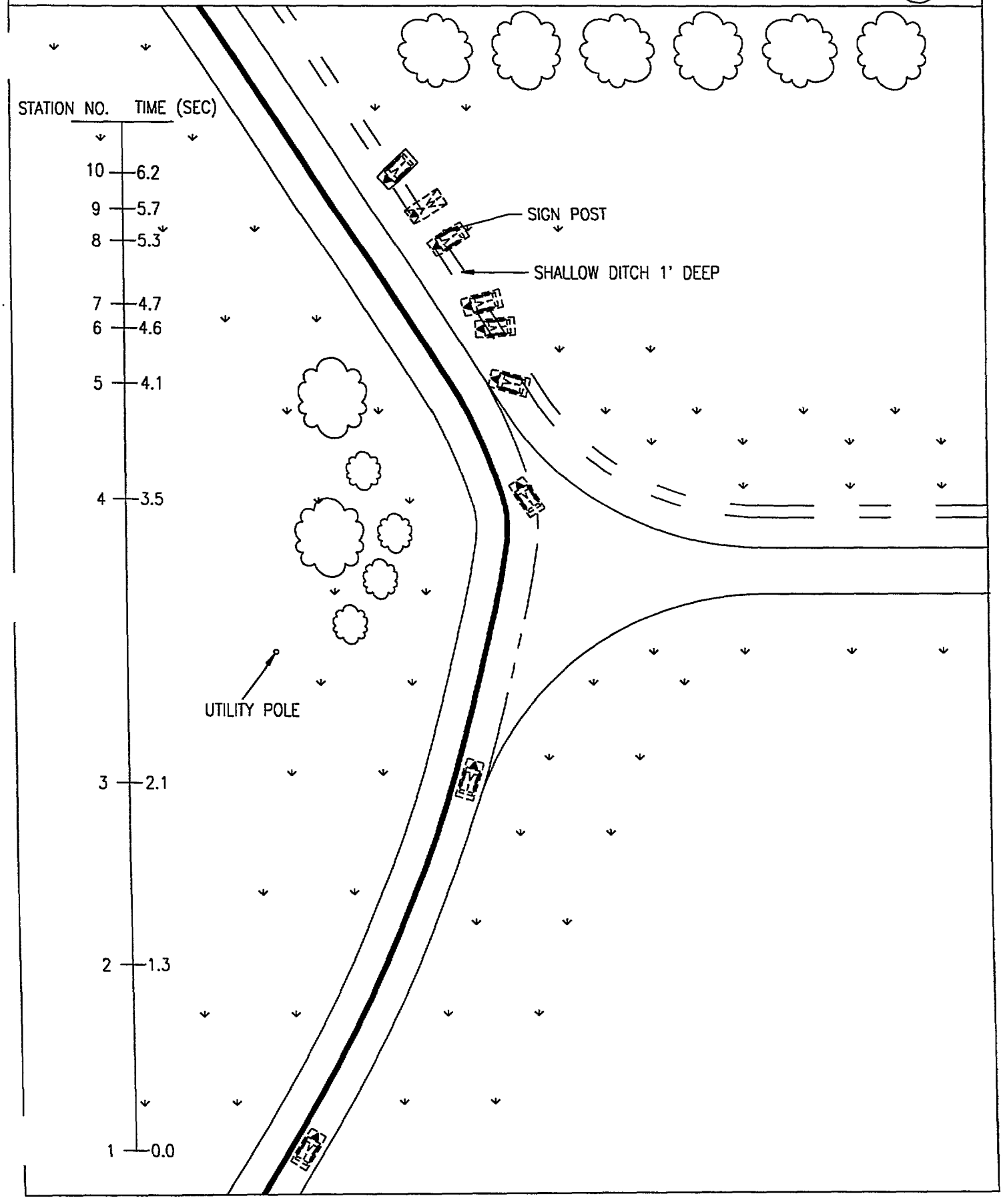
Roadway Edge:	0.83 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.33 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 (+8 m) and 4 (-5 m).
- Departure time for the shoulder edge was calculated between Stations 3 (+8 m) and 4 (+5 m).
- Initial velocity of the vehicle was 72 km/h.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 43 Case Number – Stratum 127A Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	l-4-93	***Weather:***	Clear
Time:	2140	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	4 (K)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	15
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1987
Vehicle Make:	Plymouth
Vehicle Model:	Horizon

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	48 km/h

Departure Times

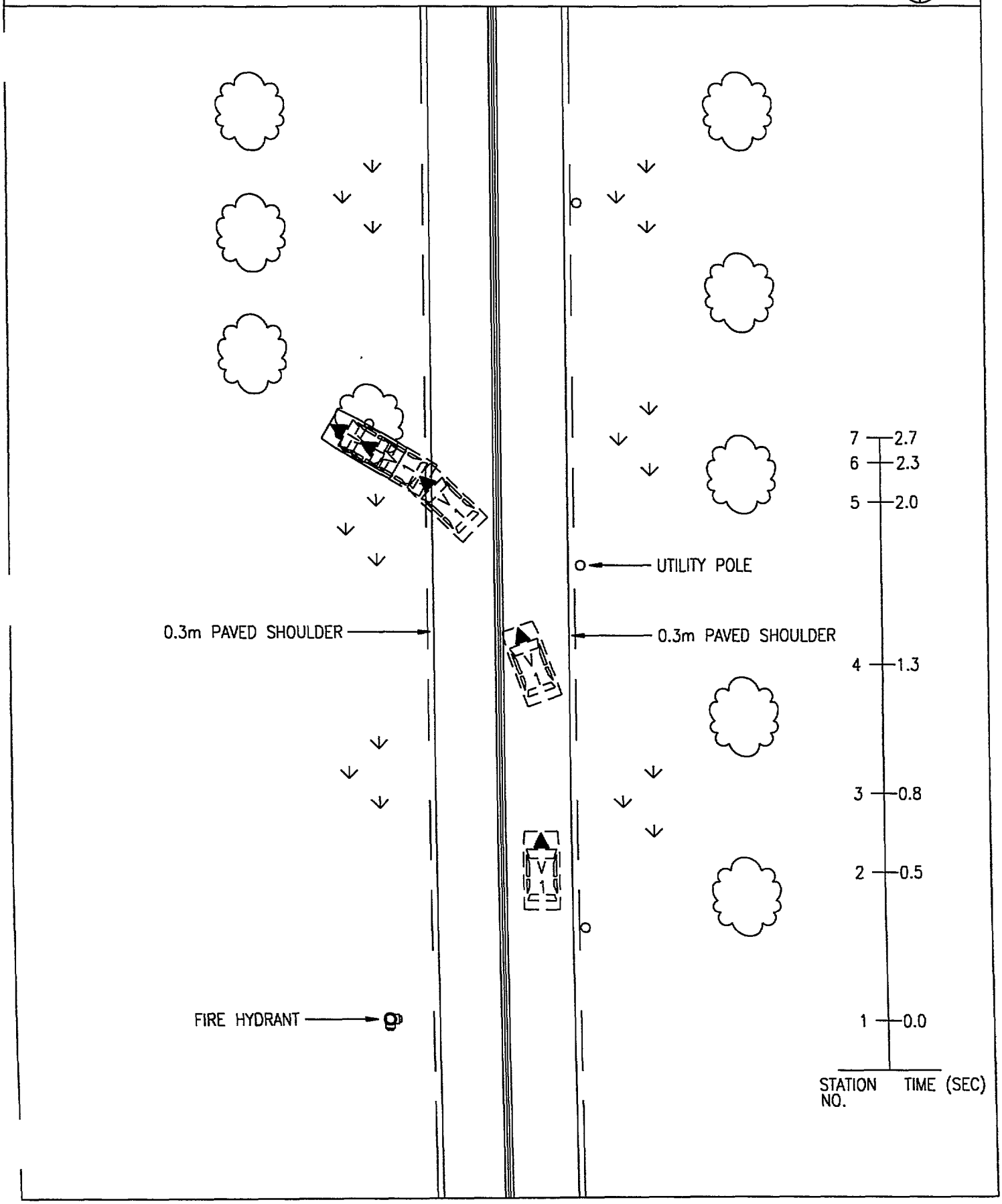
Roadway Edge:	2.07 sec	***Method:***	Straight Line Projection
Shoulder Edge:	2.09 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-8 m) and 5.
- Departure time for the shoulder edge was calculated between Stations 2 (-8 m) and 5 (+0.2 m).
- Initial velocity of the vehicle was 48 km/h.
- Station 1 is 8 m behind Station 2.
- Station 3 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 45 Case Number – Stratum 004B Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	2-5-93	**Weather:**	Other (clouds)
Time:	0020	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	0 (0)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	17
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1989
Vehicle Make:	Toyota
Vehicle Model:	4-Runner

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	48 km/h

Departure Times

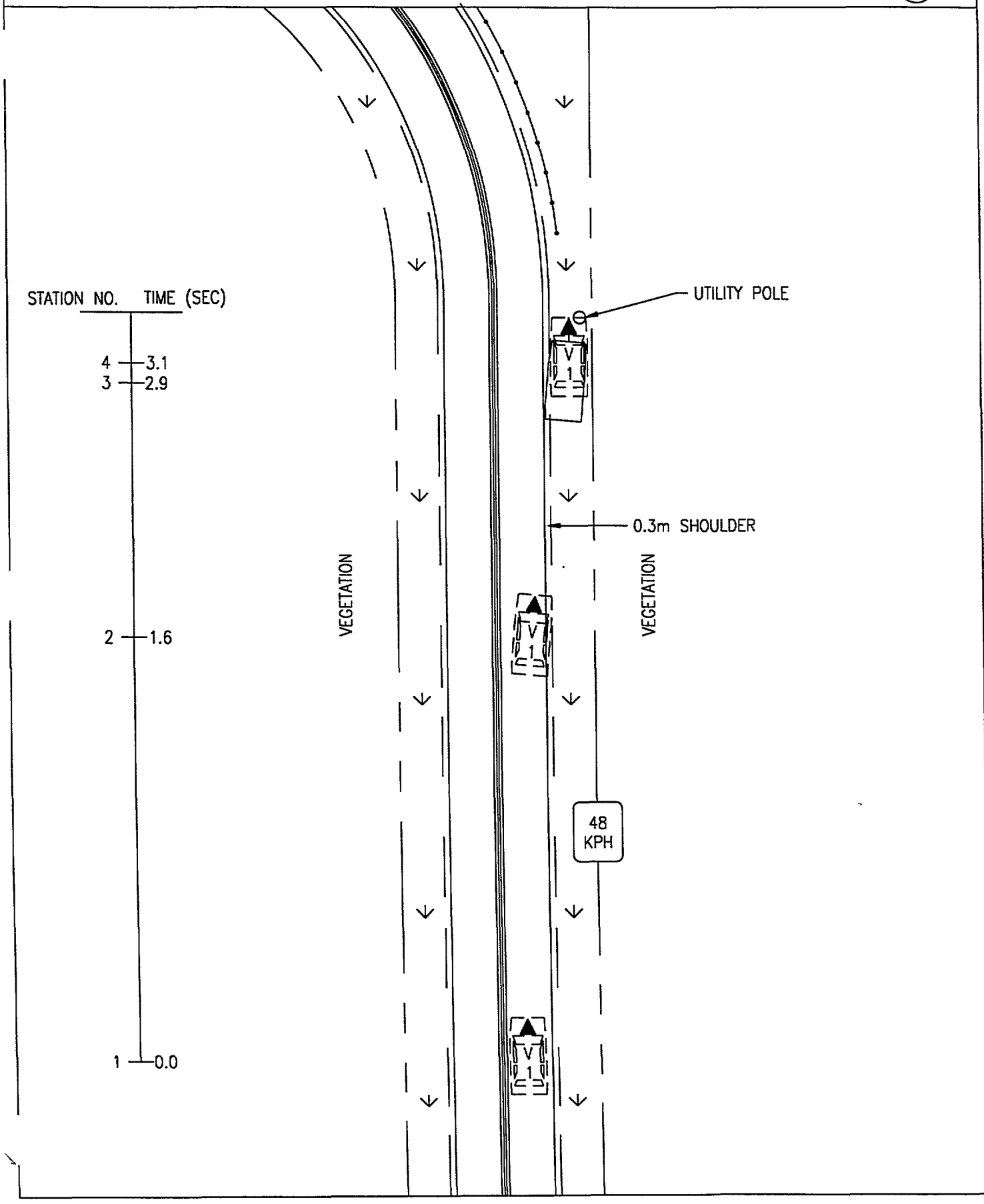
Roadway Edge:	0.81 sec	**Method:**	Arc Formula Derived
Shoulder Edge:	1.07 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+9 m) and 2 (-2 m).
- Departure time for the shoulder edge was calculated between Stations 1 (+8 m) and 2.
- Initial velocity of the vehicle was 48 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 45 Case Number – Stratum 039G Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Driver Inexperience*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-1-93	**Weather:**	Clear
Time:	2156	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	16
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1991
Vehicle Make:	Honda
Vehicle *Model:*	Civic/CRX

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	40 km/h

Departure Times

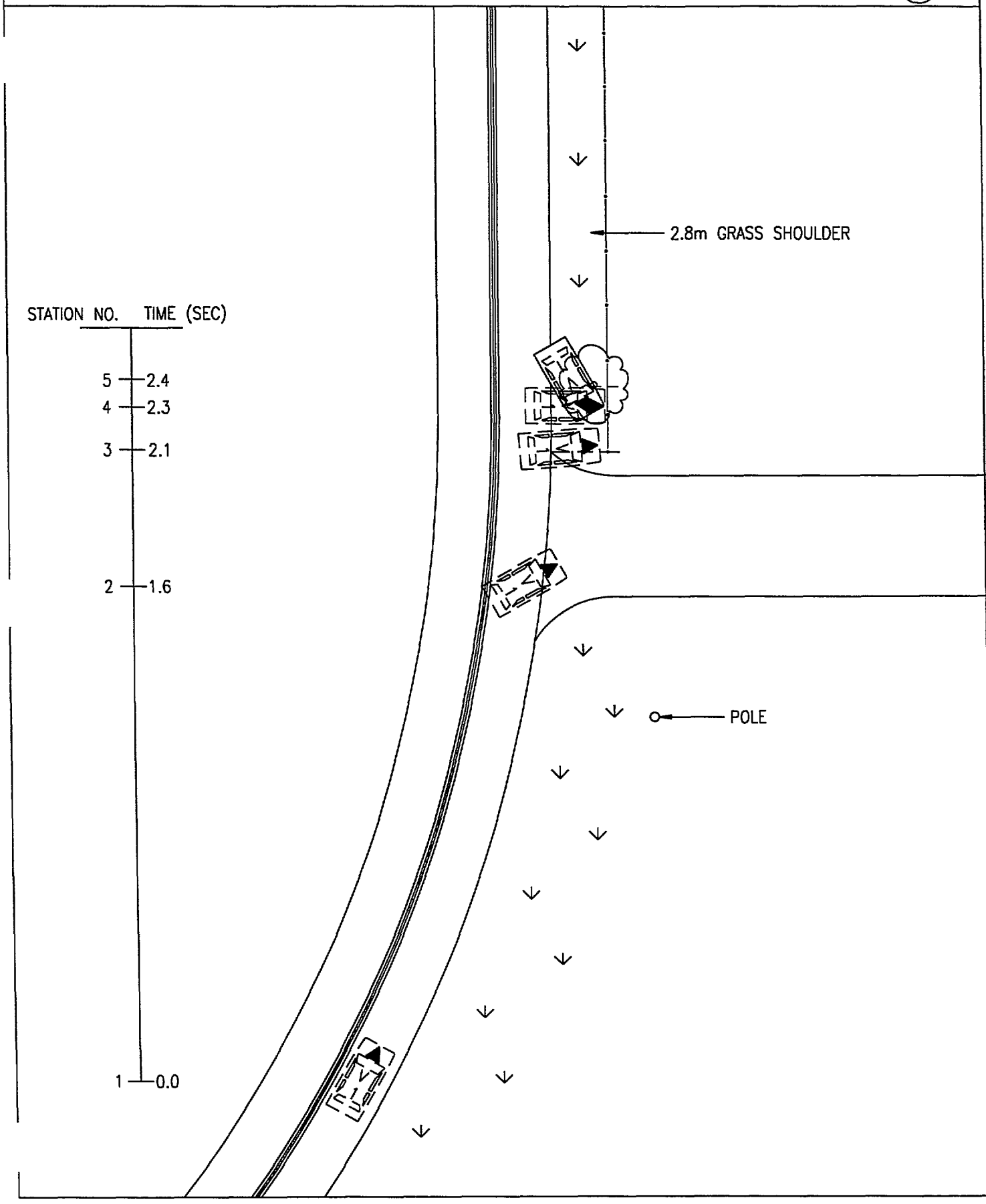
Roadway Edge:	1.21 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.21 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+5 m) and 2 (-2 m).
- Departure time for the shoulder edge was calculated between Stations 1 (+5 m) and 2 (-2 m).
- Initial velocity of the vehicle was 60 km/h.
- Velocity of 60 km/h was assumed since excessive speed was indicated as a causal factor.

ACCIDENT COLLISION DIAGRAM

PSU No. 45 Case Number – Stratum 147J Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-l-93	***Weather:***	Clear
Time:	1613	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3(A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	29
Driver Sex:	Female
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1987
Vehicle Make:	Dodge
Vehicle Model:	Dakota

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	64 km/h

Departure Times

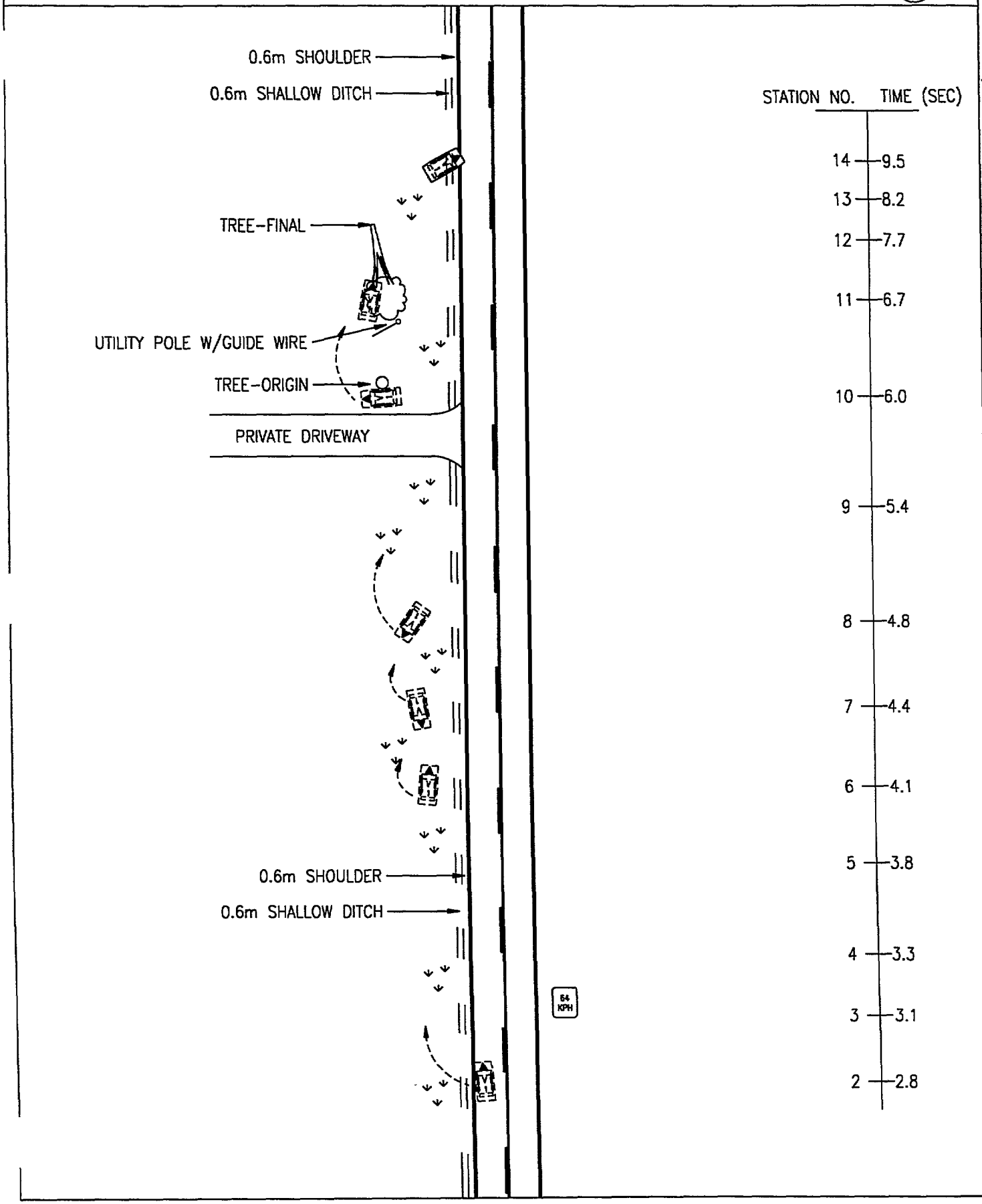
Roadway Edge:	2.81 sec	***Method:***	Straight Line Projection
Shoulder Edge:	2.99 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-50 m) and 2.
- Departure time for the shoulder edge was calculated between Stations 2 (-50 m) and 2 (+3 m).
- Initial velocity of the vehicle was 64 km/h.
- Station 1 is 50 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 45 Case Number – Stratum 148K Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-6-93	***Weather:***	Clear
Time:	2358	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Yes
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	17
Driver Sex:	Male
Impairmenf:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1984
Vehicle Make:	Ford
Vehicle *Model:*	Tempo

Roadway Information

Trafficway *Type (Median):*	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	56 km/h

Departure Times

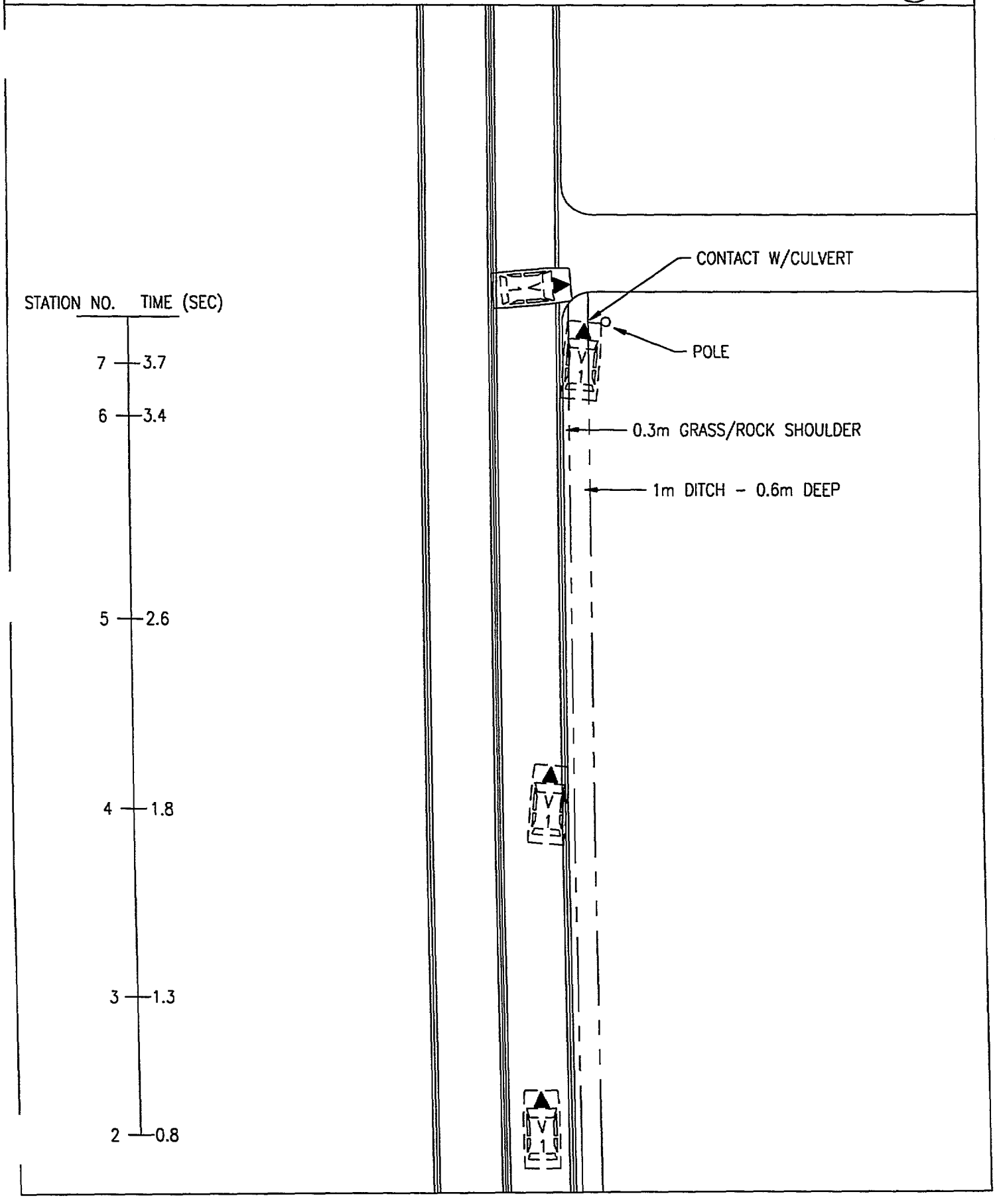
Roadway Edge:	1.78 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.78 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (- 12 m) and 4.
- Departure time for the shoulder edge was calculated between Stations 2 (-12 m) and 4.
- Initial velocity of the vehicle was 56 km/h.
- Stations 3,5 and 6 were added.
- Last station was eliminated.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 45 Case Number – Stratum 150K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-5-93	***Weather:***	Clear
Time:	2220	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	24
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1988
Vehicle *Make:*	Mazda
Vehicle Model:	Pickup

Roadway Information

Trafficway Type (Median):	Physical barrier	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	3	***Speed Limit:***	89 km/h

Departure Times

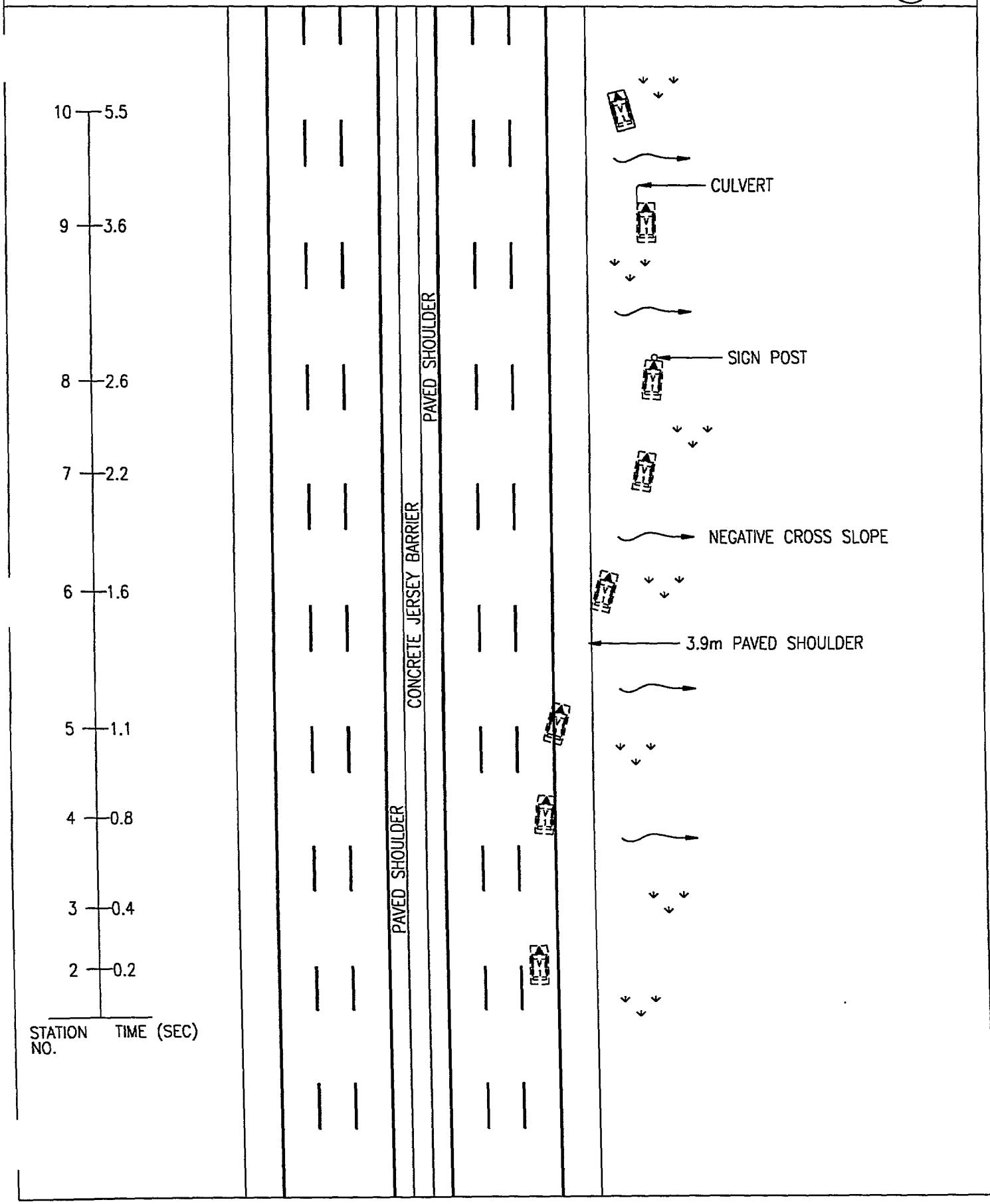
Roadway Edge:	0.79 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	1.63 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-4 m) and 4.
- Departure time for the shoulder edge was calculated between Stations 2 (-11 m) and 6 (-8 m).
- Initial velocity of the vehicle was 89 km/h.
- Station 3 was added.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 45 Case Number – Stratum 159K Indicate North



Scale: 1/500

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-l-93	**Weather:**	Clear
Time:	2336	**Surface Condition:**	D r y
Accident Type:	Drive Off Road	**Lighting:**	Yes
Accident Severity:	3(A)	**Land Use:**	Urban

Driver/Occupant Information

Driver Age:	23
Driver Sex:	Male
Impairment :	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1986
Vehicle Make:	Ford
Vehicle Model:	Escort/EXP

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Grade
No. of Lanes:	3	**Speed Limit:**	72 km/h

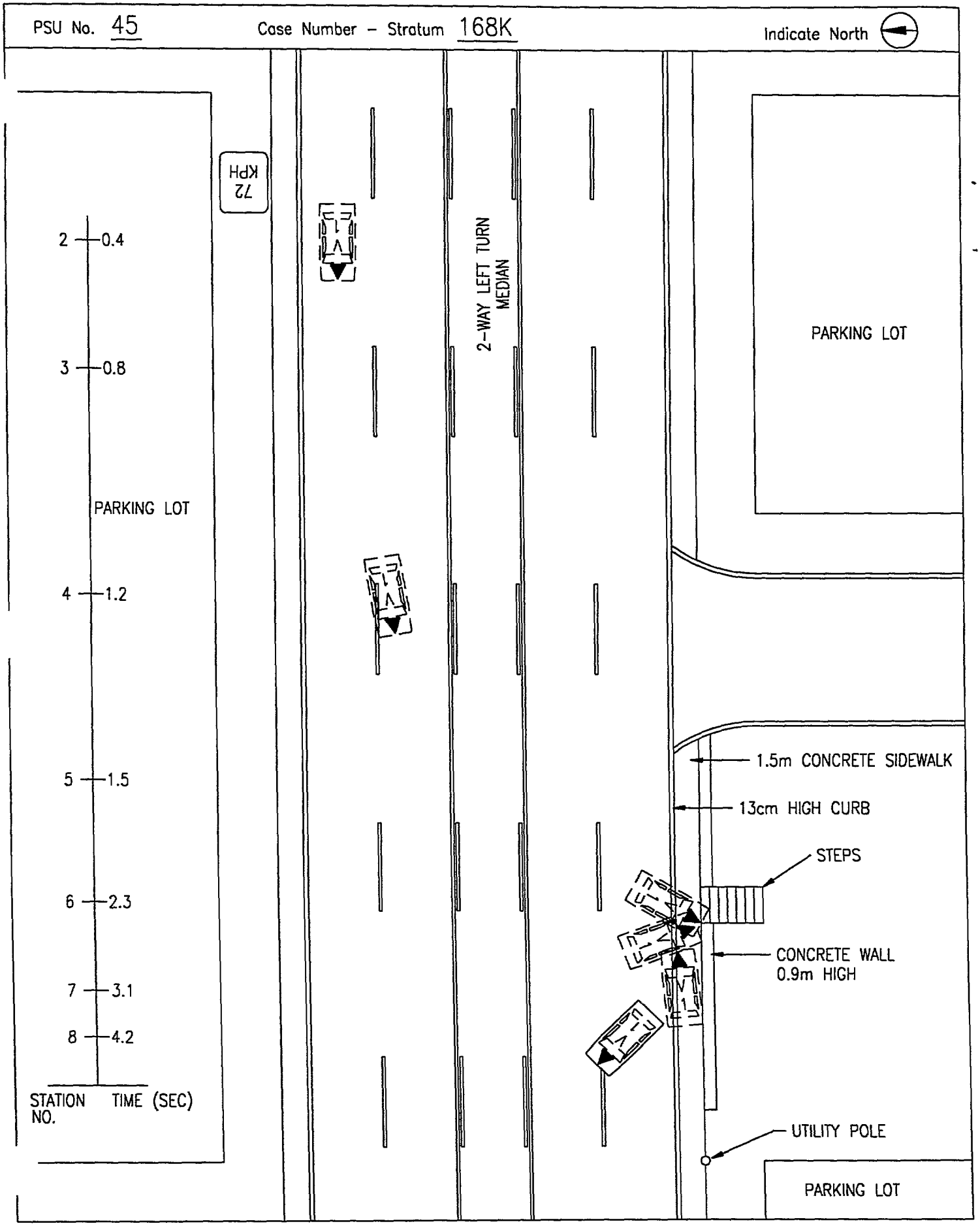
Departure Times

Roadway Edge:	2.22 sec	**Method:**	Straight Line Projection
Shoulder Edge:	2.22 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-8 m) and 6 (-2 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-8 m) and 6 (-2 m).
- Initial velocity of the vehicle was 72 km/h.
- Station 1 is 8 m behind Station 2.
- Stations 3 and 5 were added.

ACCIDENT COLLISION DIAGRAM



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	7-7-93	**Weather:**	Clear
Time:	0428	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	Yes
Accident Severity:	4 (K)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	20
Driver Sex:	Female
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1982
Vehicle Make:	Ford
Vehicle Model:	Mustang/ Mustang II

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Left
		Slope:	Grade
No. of Lanes:	4	**Speed Limit:**	80 km/h

Departure Times

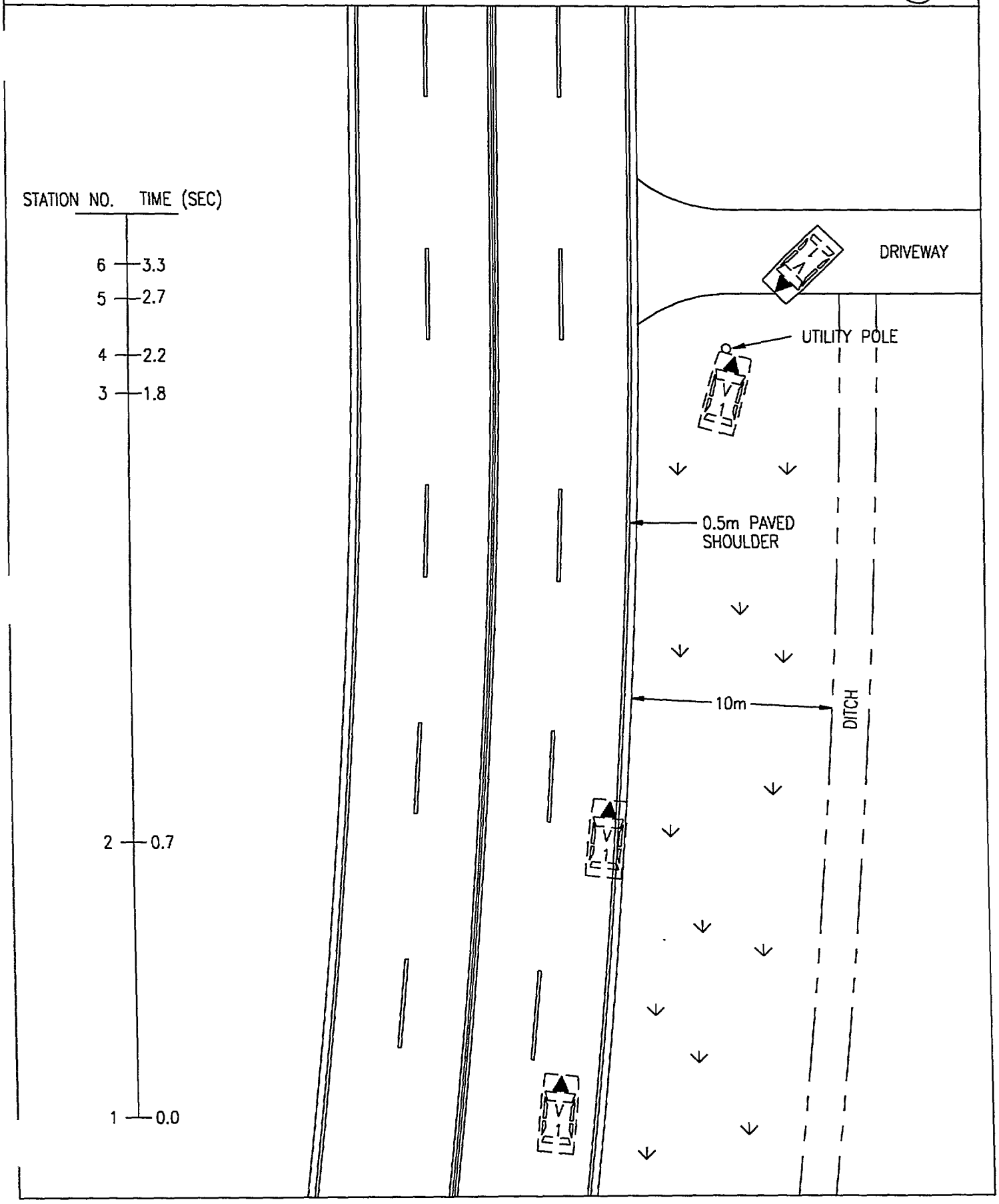
Roadway Edge:	0.58 sec	**Method**	Straight Line Projection
Shoulder Edge:	0.71 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 2 (-2 m).
- Departure time for the shoulder edge was calculated between Stations 1 and 2 (+l).
- Initial velocity of the vehicle was 80 km/h.
- Stations 4 and 5 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 45 Case Number – Stratum 177B Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Unsafe Driving Act*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	8-2-93	***Weather:***	Clear
Time:	1926	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	30
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1985
Vehicle Make:	Chevrolet
Vehicle Model:	Camaro

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of *Lanes:*	2	***Speed Limit:***	48 km/h

Departure Times

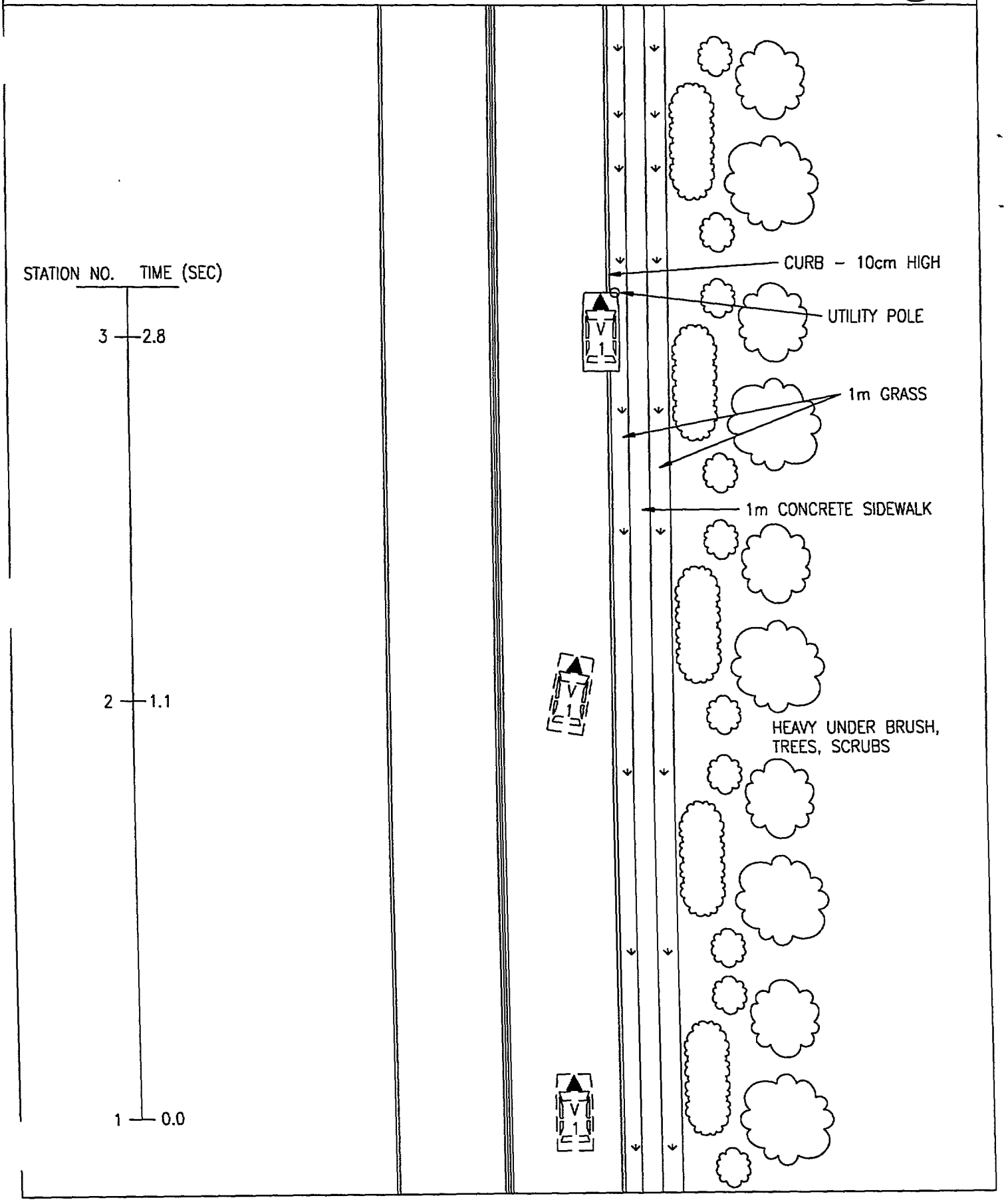
Roadway Edge:	0.80 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.80 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-10 m) and 2 (+6 m).
- Departure time for the shoulder edge was calculated between Stations 2 (- 10 m) and 2 (+6 m).
- Initial velocity of the vehicle was 70 km/h.
- Velocity of 70 km/h was assumed since excessive speed was indicated as a causal factor.

ACCIDENT COLLISION DIAGRAM

PSU No. 45 Case Number – Stratum 183K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	8-7-93	***Weather:***	Clear
Time:	0134	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	3 (A)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	21
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1981
Vehicle Make:	Toyota
Vehicle Model:	Celica

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	64 km/h

Departure Times

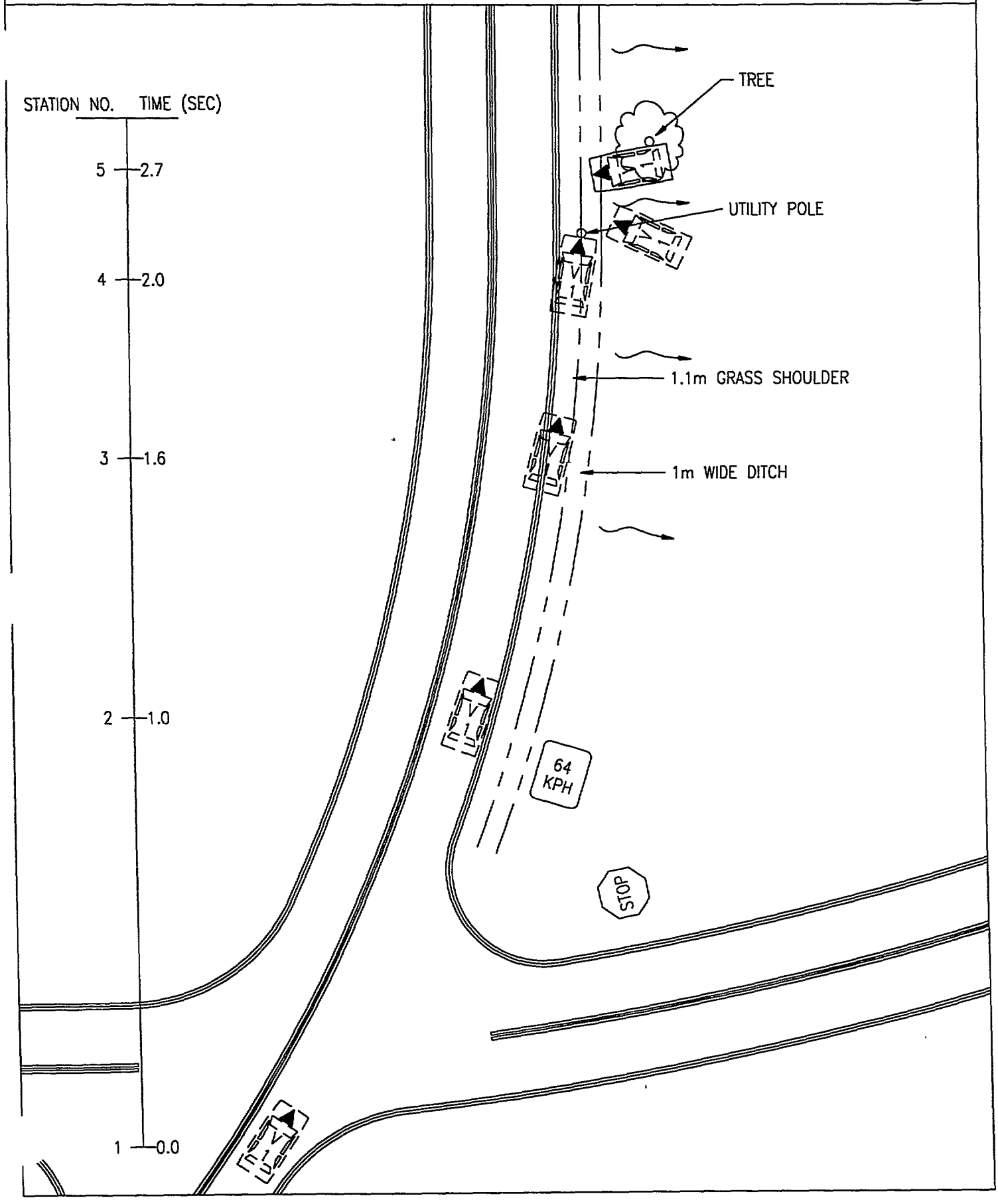
Roadway Edge:	0.72 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.72 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+l 1 m) and 2 (+4 m).
- Departure time for the shoulder edge was calculated between Stations 1 (+ 11 m) and 2 (+4 m).
- Initial velocity of the vehicle was 80 km/h.
- Velocity of 80 km/h was assumed since excessive speed was indicated as a causal factor.
- Second to last station was ommitted.

ACCIDENT COLLISION DIAGRAM

PSU No. 45 Case Number – Stratum 184K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Evasive Maneuver- Vehicle Encroaching into Lane - Other*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	l-l-93	***Wea ther:***	Rain
Time:	2350	***Surface Condition:***	Wet
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	30
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1991
Vehicle Make:	Ford
Vehicle Model:	Taurus

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	72 km/h

Departure Times

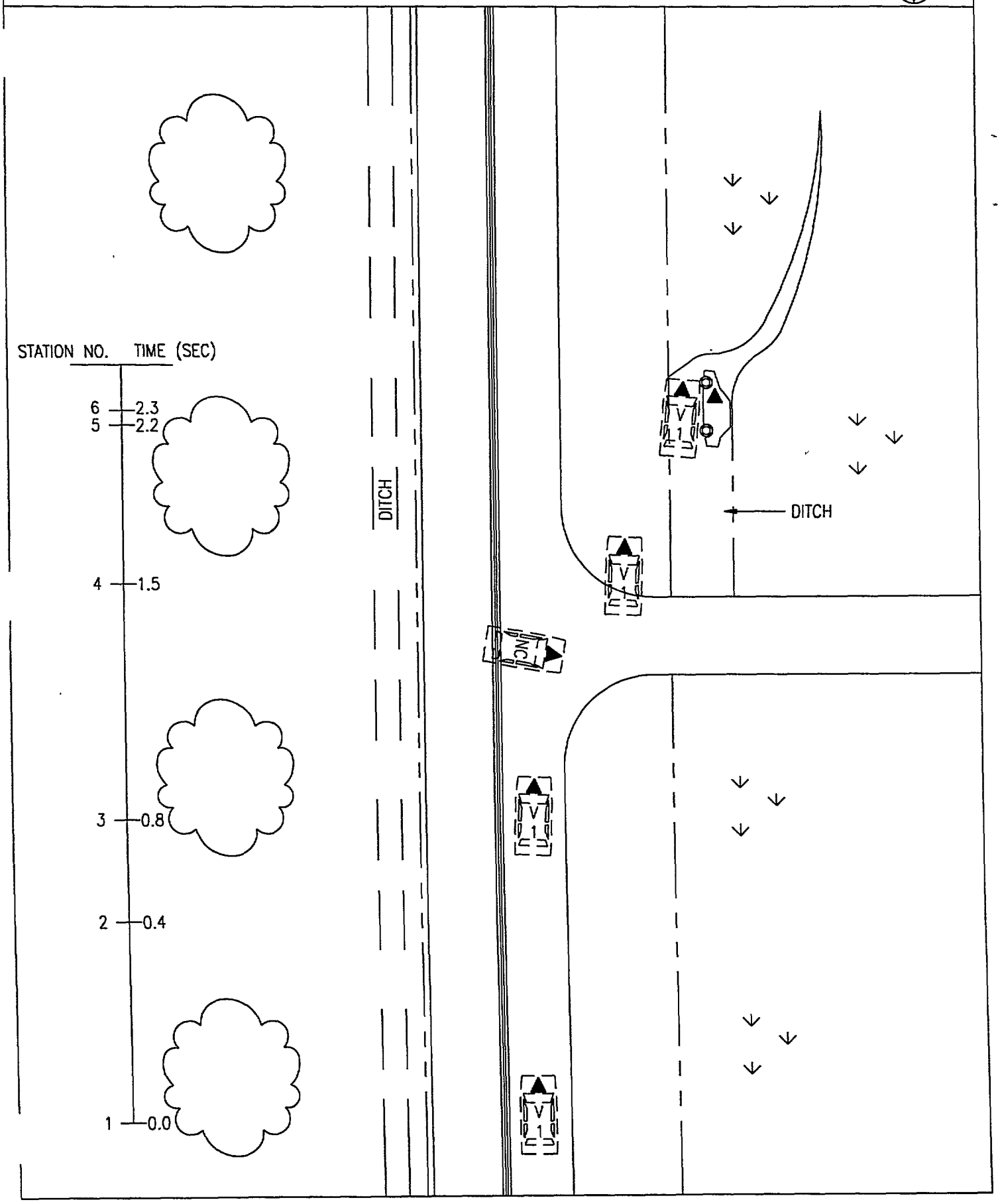
Roadway Edge:	0.25 sec	***Method***	Straight Line Projection
Shoulder Edge:	0.60 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 and 3 (+5 m).
- Departure time for the shoulder edge was calculated between Stations 3 and 3 (+lO m).
- Initial velocity of the vehicle was 72 km/h.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 005J Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver inattention*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	l-7-93	***Weather:***	Clear
Time:	0740	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	41
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1985
Vehicle Make:	Dodge
Vehicle Model:	Caravan

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed* Limit:**	40 km/h

Departure Times

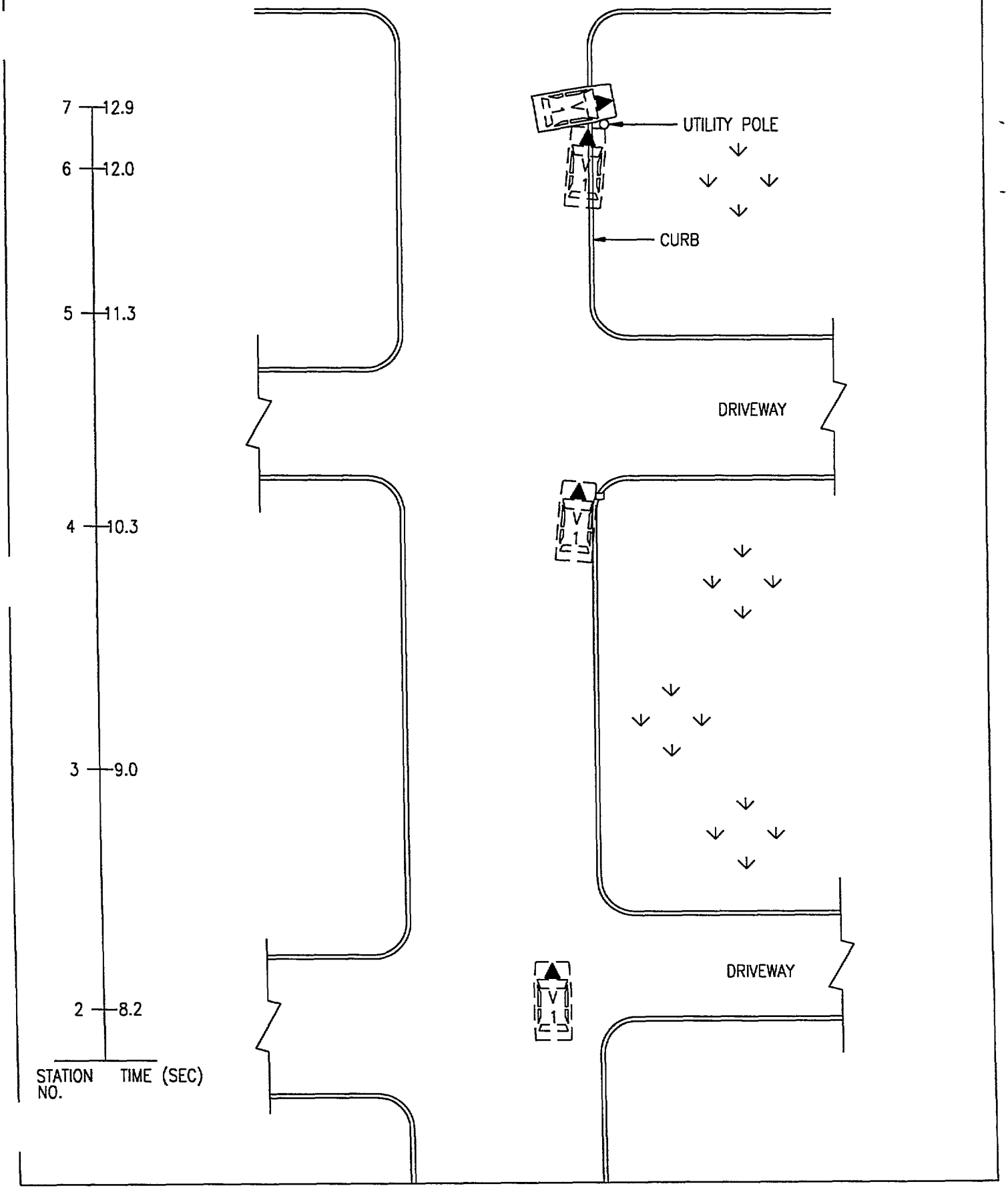
Roadway Edge:	10.26 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	10.26 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-9 1 m) and 4.
- Departure tune for the shoulder edge was calculated between Stations 2 (-9 1 m) and 4.
- Initial velocity of the vehicle was 40 km/h.
- Stations 3 and 5 were added.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 007K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Lost Directional Control*

ROADSIDE DEPARTURE: *Left*

General Accident information

Date:	2-2-93	***Weather:***	Rain
Time:	2235	***Surface Condition:***	Wet
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	23
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1992
***Vehicle* Make:**	Toyota
Vehicle Model:	MR-2

Roadway Information

***Trafficway Type* (Median):**	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	89 km/b

Departure Times

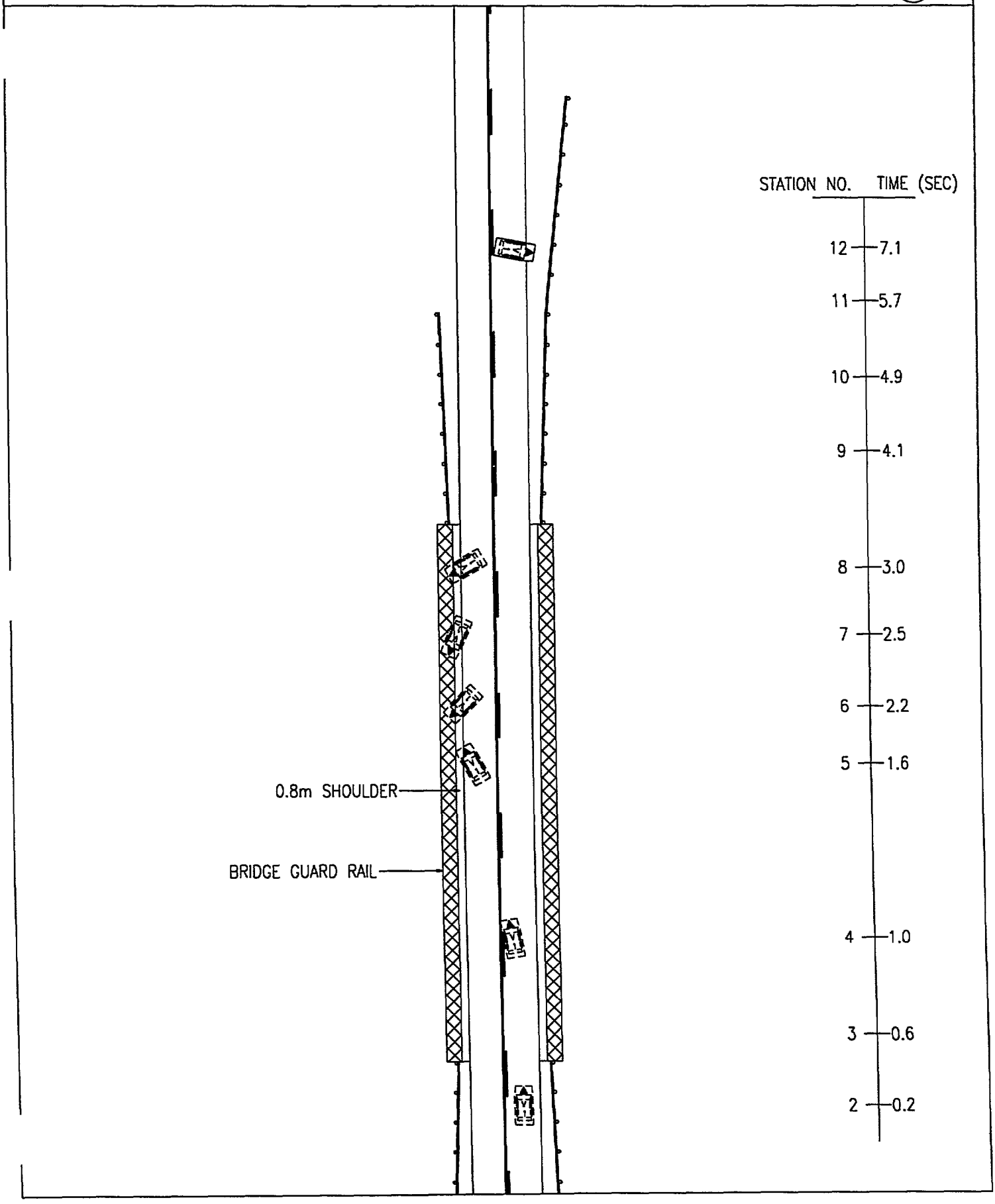
Roadway Edge:	1.59 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.63 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-4 m) and 5.
- Departure time for the shoulder edge was calculated between Stations 2 (-4 m) and 5 (+1 m).
- Initial velocity of the vehicle was 89 km/h.
- Station 1 is 4 m behind Station 2.
- Stations 3,9, 10 and 11 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 034J Indicate North



Scale: 1/500

CAUSAL FACTOR; *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	2-6-93	***Weather:***	Clear
Time:	0450	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	3 (A)	***Land User***	Rural

Driver/Occupant Information

Driver Age:	36
Driver Sex:	Male
Impairment:	Other (alcoh. consumption - BAC unknown)

Vehicle Information

Year:	1986
Vehicle Make:	Chevrolet
Vehicle Model:	S-10, T-10

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	64 km/h

Departure Times

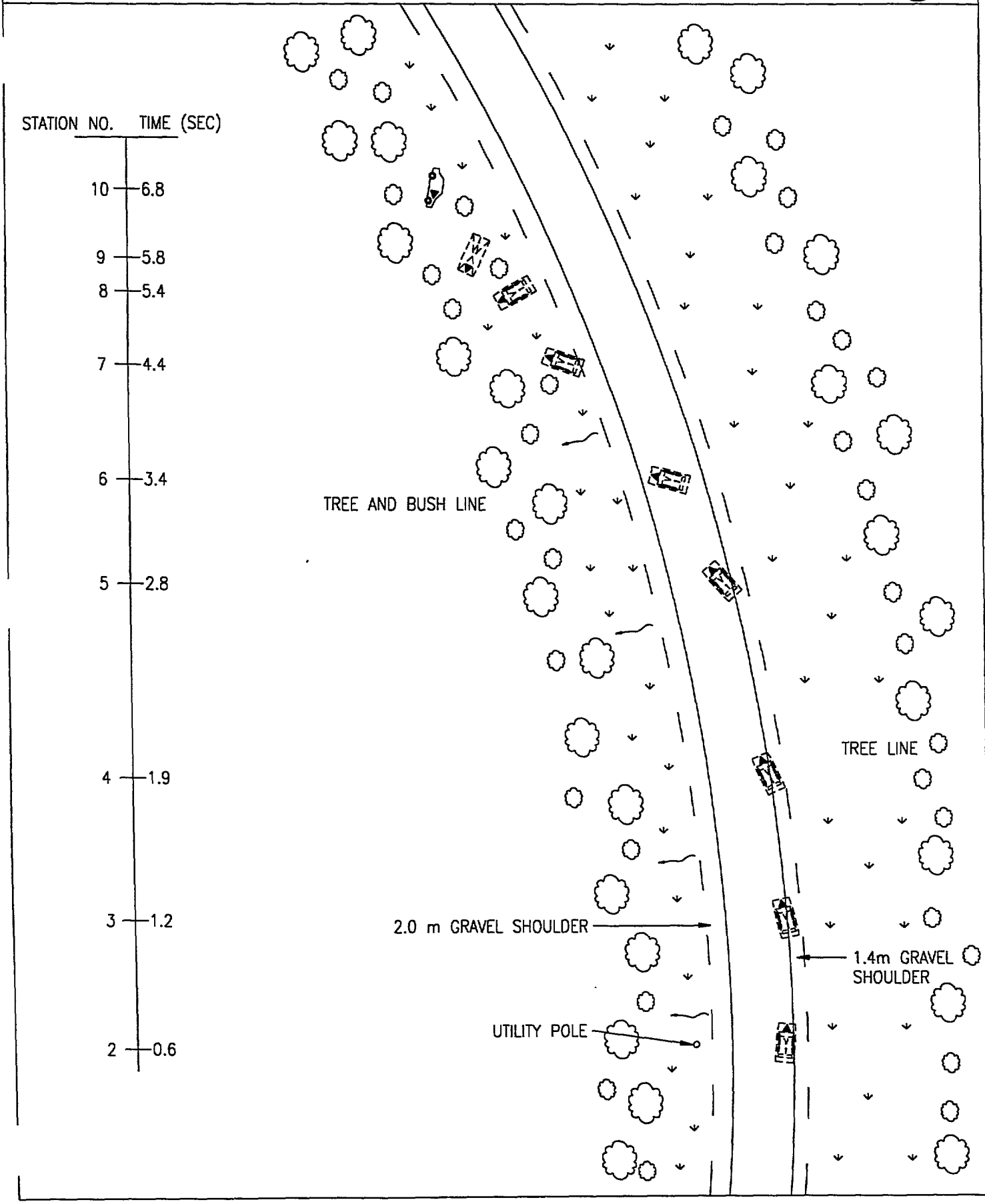
Roadway Edge:	0.57 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.35 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-10 m) and 2.
- Departure time for the shoulder edge was calculated between Stations 2 (- 10 m) and 4.
- Initial velocity of the vehicle was 64 km/h.
- Velocity of 80 km/h was assumed since excessive speed was indicated as a causal factor.
- Station 1 is 10 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 044K Indicate North



Scale: 1/500

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	4-6-93	***Weather:***	Rain
Time:	0120	***Surface Condition:***	Wet
Accident Type:	Drive Off Road	***Lighting:***	No
Accident Severity:	4 (K)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	34
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1983
Vehicle Make:	Buick
Vehicle Model:	Skylark

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	40 km/h

Departure Times

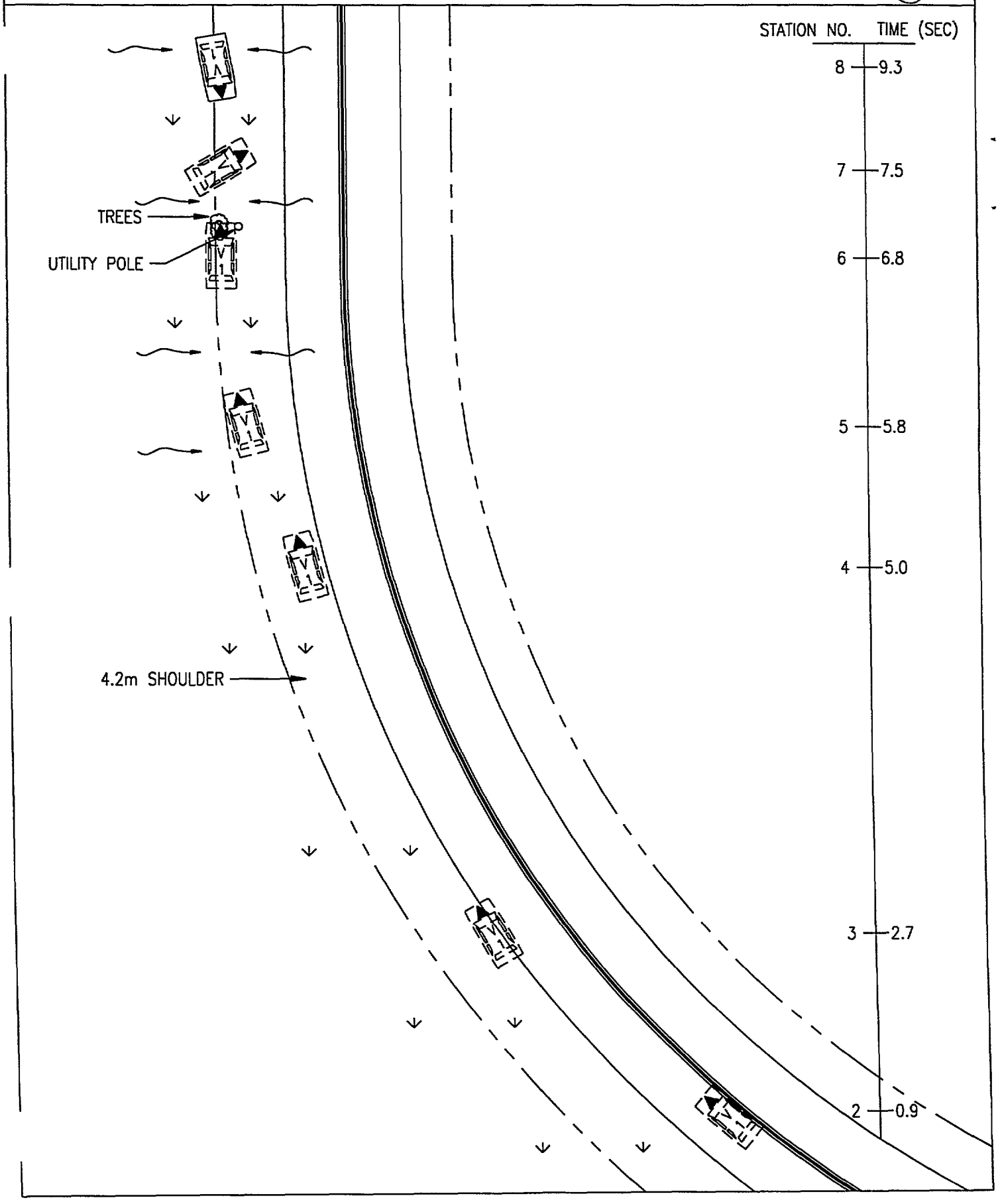
Roadway Edge:	1.76 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1 .76 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-10 m) and 3 (-10 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-10 m) and 3 (-10 m).
- Initial velocity of the vehicle was 40 km/h.
- Station 1 is 10 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 075B Indicate North



Scale: 1/300

CAUSAL FACTOR: *Lost Directional Confrol*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	4-3-93	***Weather:***	Rain
Time:	1555	***Surface Condition:***	Wet
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	30
Driver Sex:	Female
Impairment:	Unknown

Vehicle Information

Year:	1991
Vehicle Make:	Nissan/Datsun
Vehicle Model:	8 10/Maxima

Roadway information

Trafficway Type **(Median):**	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

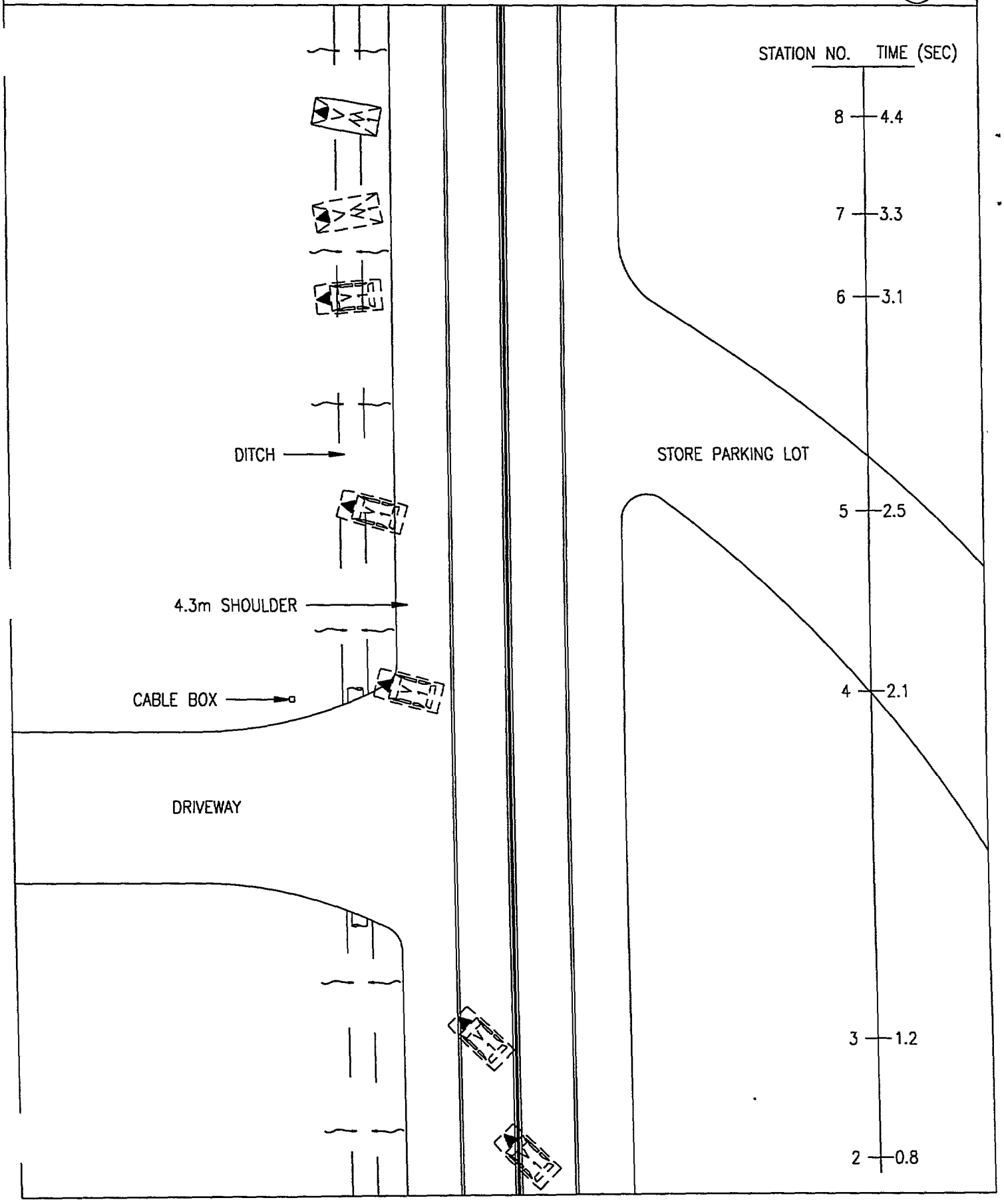
Roadway *Edge:*	1.15 sec	**Method:**	Straight Line Projection
Shoulder Edge:	2.00 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-20 m) and 3.
- Departure time for the shoulder edge was calculated between Stations 2 (-20 m) and 4 (-1 m).
- Initial velocity of the vehicle was 89 km/h.
- Station 1 is 20 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 085C Indicate North



Scale: 1/300

CAUSAL FACTOR: *Driver Inaffenfion*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	4-3-93	***Weather:***	Rain
Time:	0500	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	20
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1981
Vehicle Make:	Chevrolet
Vehicle Model:	Caprice/Impala

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	40 km/h

Departure Times

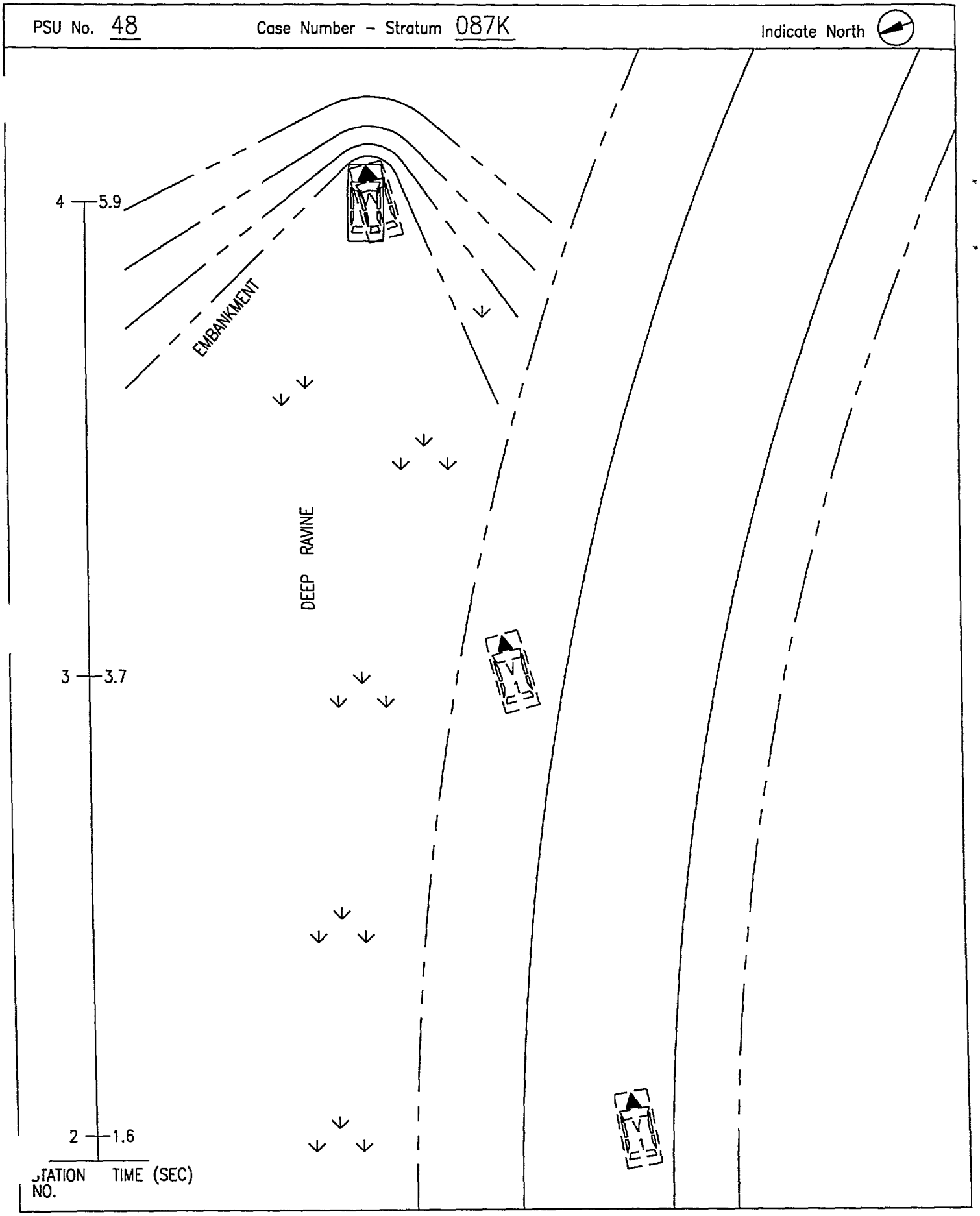
Roadway Edge:	2.91 sec	***Method***	Arc Formula Derived
Shoulder Edge:	2.91 sec (no shoulder)		

Assumptions:

- Departure tune for the roadway edge was calculated between Stations 2 (-18 m) and 3 (-9 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-18 m) and 3 (-9 m).
- Initial velocity of the vehicle was 40 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number - Stratum 087K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	4-4-93	***Weather:***	Clear
Time:	2010	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Yes
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	52
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1992
Vehicle Make:	Chevrolet
Vehicle Model:	Lumina

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	5	***Speed Limit:***	80 km/h

Departure Times

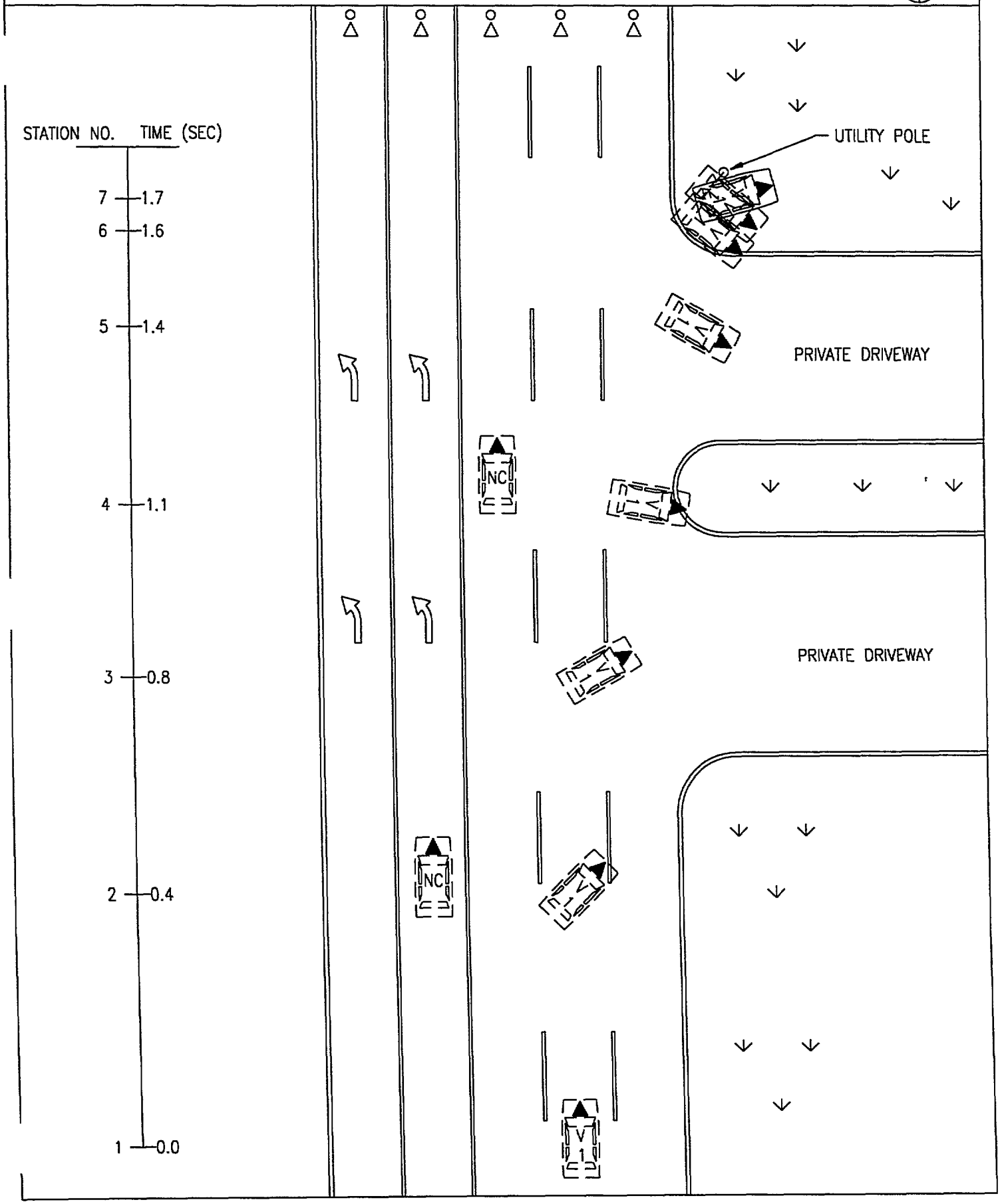
Roadway *Edge:*	1.06 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.06 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 4.
- Departure time for the shoulder edge was calculated between Stations 1 and 4.
- Initial velocity of the vehicle was 113 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 089J Indicate North



Scale: 1/250

CAUSAL FACTOR: *Evasive Maneuver - Avoid Animal or Pedestrian*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	5-l-93	***Weather:***	Clear
Time:	1655	***Surface Condition:***	Dry
Accident Type:	Avoid Collision	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	29
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1976
Vehicle Make:	Oldsmobile
Vehicle Model:	Cutlass

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	72 km/h

Departure Times

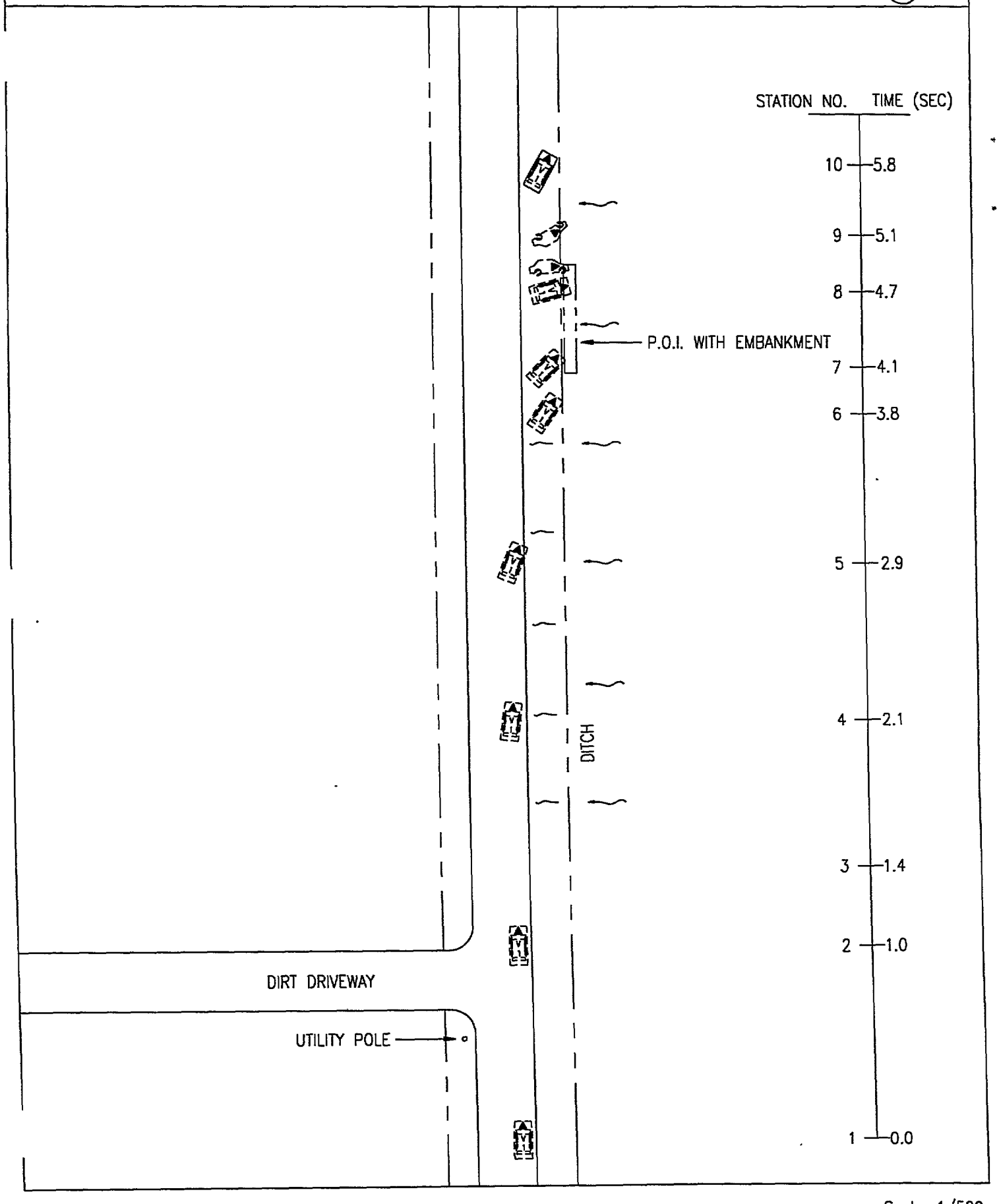
Roadway Edge:	0.80 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.80 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 4 and 5.
- Departure time for the shoulder edge was calculated between Stations 4 and 5.
- Initial velocity of the vehicle was 72 km/h.
- Station 3 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 108K Indicate North



Scale: 1/500

CAUSAL FACTOR: *Vehicle* Speed - Speed and *Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	5-7-93	***Weather:***	Clear
Time:	1858	***Surface Condifion:***	Dry
Accidenf Type:	Control/Traction Loss	***Lighting:***	Daylight
Accidenf Severity:	4 (K)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	22
Driver Sex:	Male
Impairment :	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1976
Vehicle Make:	Buick
Vehicle Model:	LeSabre

Roadwav Information

Trafficway Type (Median):	Not divided	***Aligment:***	Curve Left
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	72 km/h

Departure Times

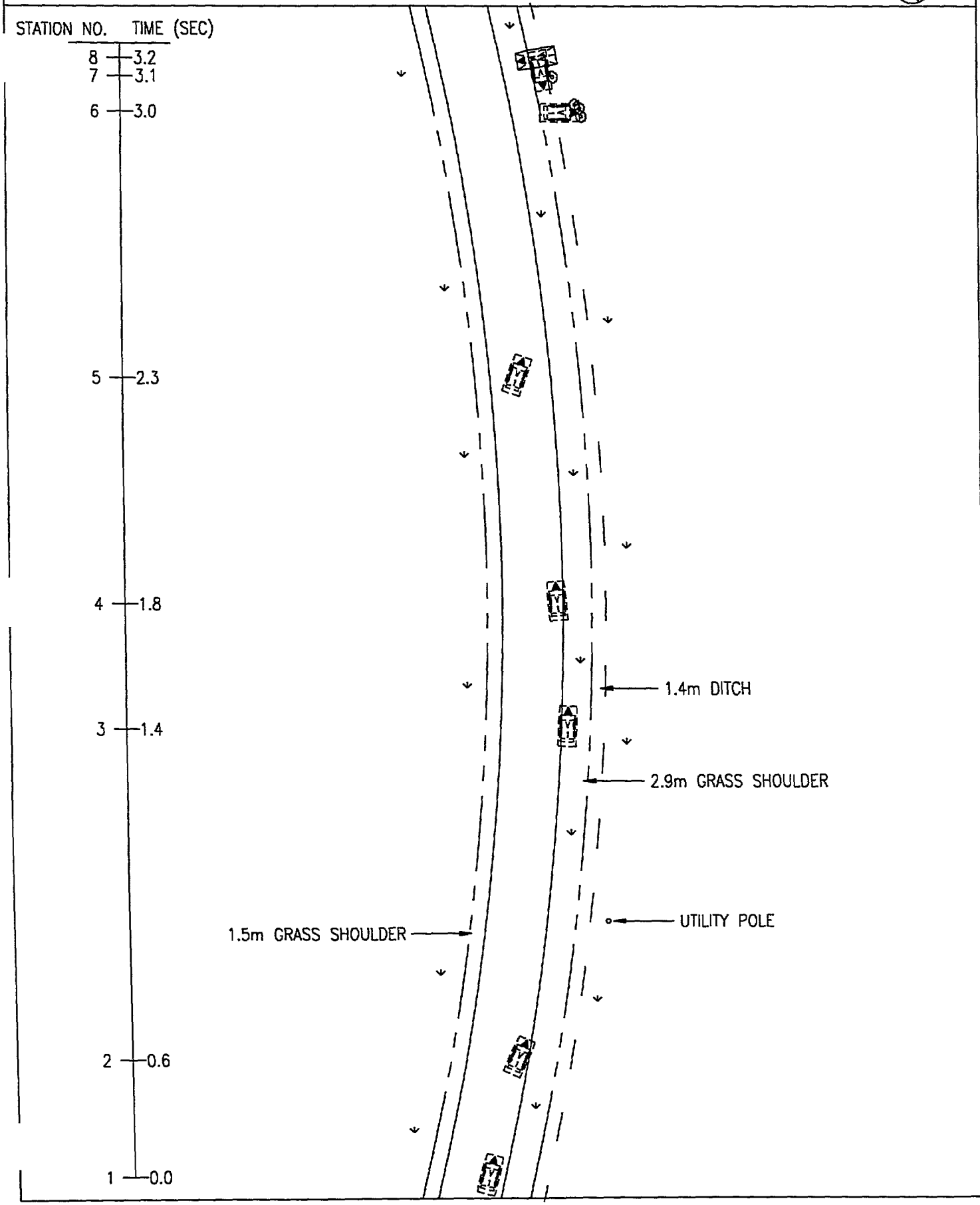
Roadway Edge:	0.64 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.64 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 2.
- Departure time for the shoulder edge was calculated between Stations 1 and 2.
- Initial velocity of the vehicle was 72 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 117B Indicate North



Scale: 1/500

CAUSAL FACTOR: *Lost Directional Control*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	6-l-93	***Weather:***	Clear
Time:	1140	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	0 (0)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	50
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1992
Vehicle Make:	Dodge
Vehicle Model:	Dakota

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	4	***Speed Limit:***	105 km/h

Departure Times

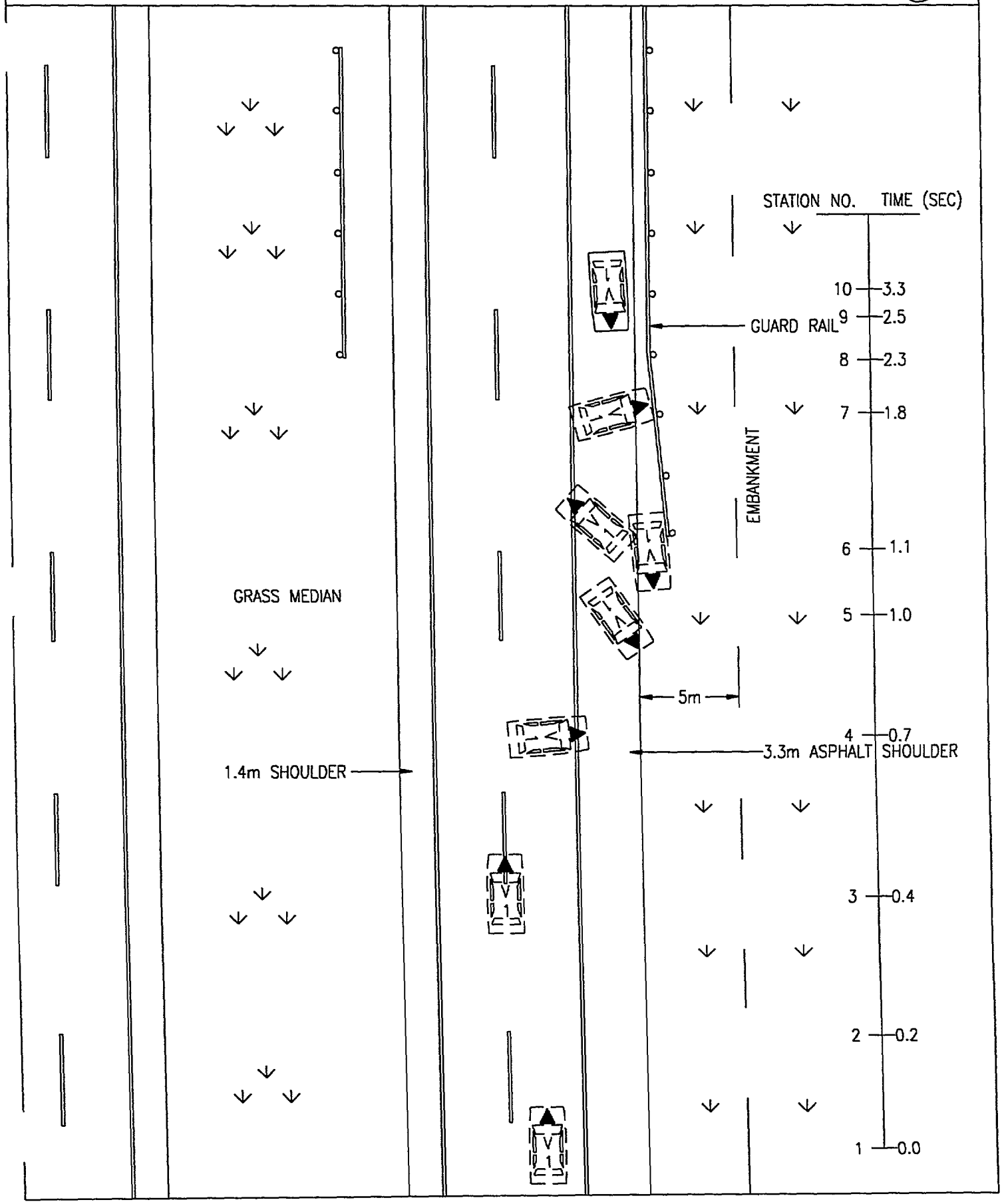
Roadway Edge:	0.73 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.96 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 4.
- Departure time for the shoulder edge was calculated between Stations 1 and 5.
- Initial velocity of the vehicle was 105 km/h.
- Stations 2,8 and 9 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 134G Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	6-3-93	***Weather:***	Clear
Time:	0330	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	18
Driver Sex:	Female
Impairment:	Fell Asleep

Vehicle information

Year:	1987
Vehicle Make:	Ford
Vehicle Model:	Ranger

Roadway Information

Trafficway Type **(Median):**	Physical barrier	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	4	***Speed Limit:***	105 km/h

Departure Times

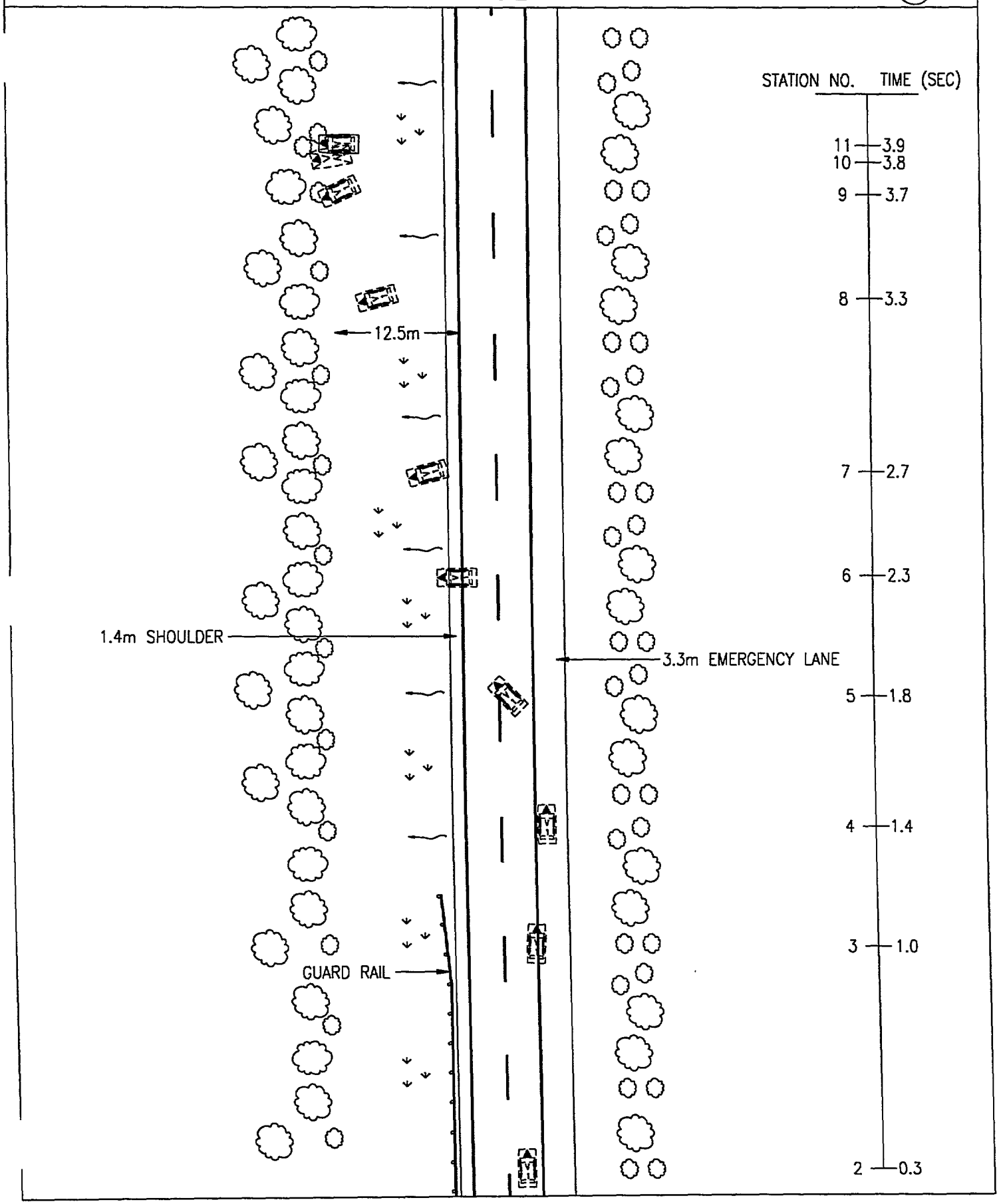
Roadway Edge:	0.87 sec	**Method:**	Arc Formula Derived
Shoulder Edge:	1.72 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-8 m) and 3 (-5 m).
- Departure tune for the shoulder edge was calculated between Stations 2 (+I0 m) and 6.
- Initial velocity of the vehicle was 105 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 48 Case Number – Stratum 136K Indicate North



Scale: 1/500

CAUSAL FACTOR: *Lost Directional Control*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	1-7-93	***Weather:***	Rain
Time:	0025	***Surface Condition:***	Wet
Accident Type:	Control/Traction Loss	***Lighting:***	Yes
Accident Severity:	4 (K)	***Land Use:***	Urban

Driver/Occupant information

Driver Age:	18
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1979
Vehicle Make:	Oldsmobile
Vehicle Model:	Cutlass

Roadway Information

Trafficway Type **(Median):**	Flush or curb	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	3	***Speed Limit:***	48 km/h

Deoarture Times

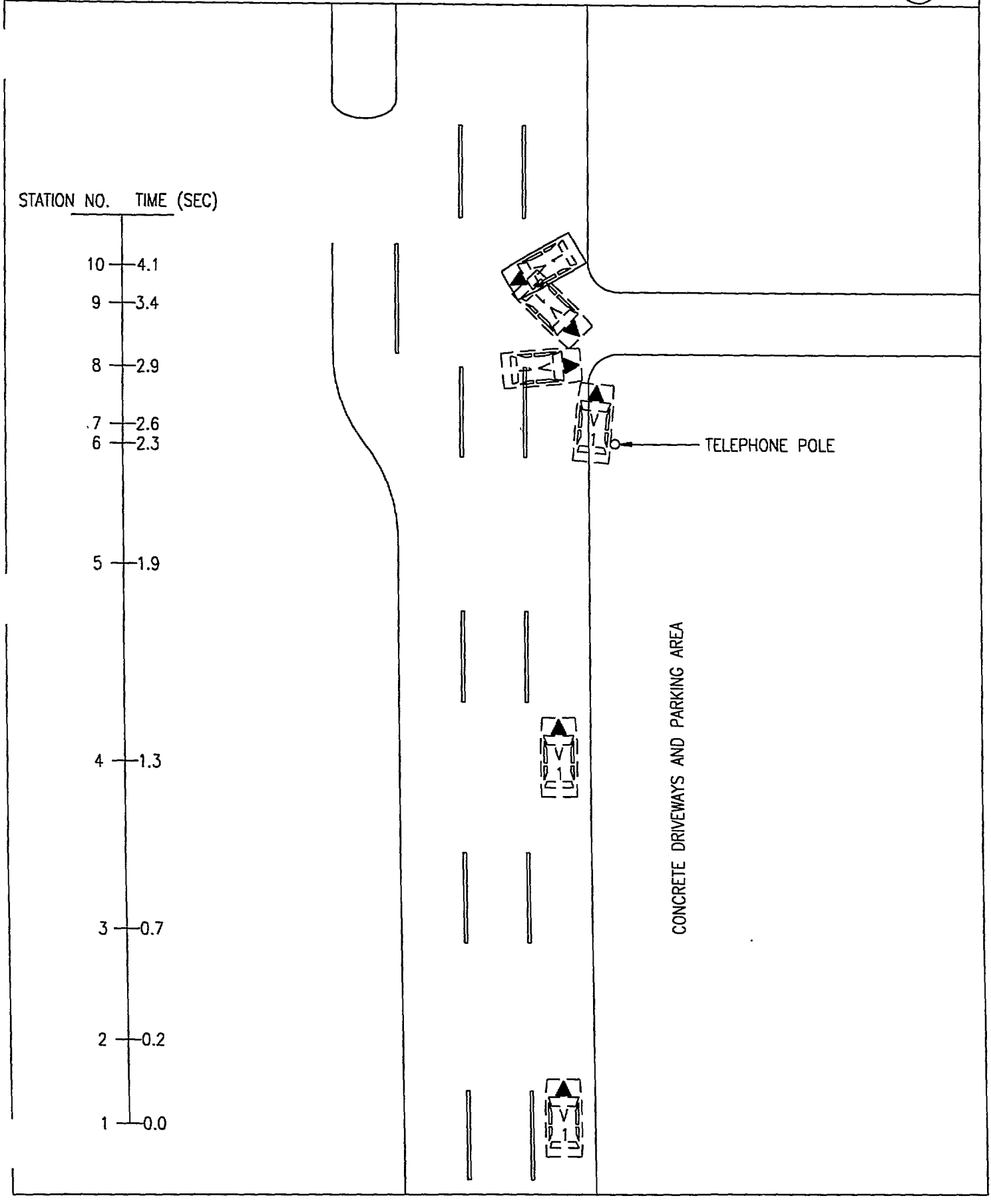
Roadway Edge:	0.54 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.07 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 4 and 7 (-10 m).
- Departure time for the shoulder edge was calculated between Stations 4 and 7 (-3 m).
- Initial velocity of the vehicle was 48 km/h.
- Stations 2,3,5 and 6 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 49 Case Number – Stratum 001B Indicate North



Scale: 1/250

CAUSAL FACTOR: Lost Directional Control

ROADSIDE DEPARTURE: Right

General Accident Information

Date:	1-1-93	**Weather:**	Rain
Time:	2326	**Surface Condition:**	Snow (slush/ice)
Accident Type:	Control/Traction Loss	**Lighting:**	Yes
Accident Severity:	0 (0)	**Land Use:**	Urban

Driver/Occupant information

Driver Age:	47
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1968
Vehicle Make:	Ford
Vehicle Mode/:	Mustang/ Mustang II

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Grade
No. of Lanes:	3	**Speed Limit:**	48 km/h

Departure Times

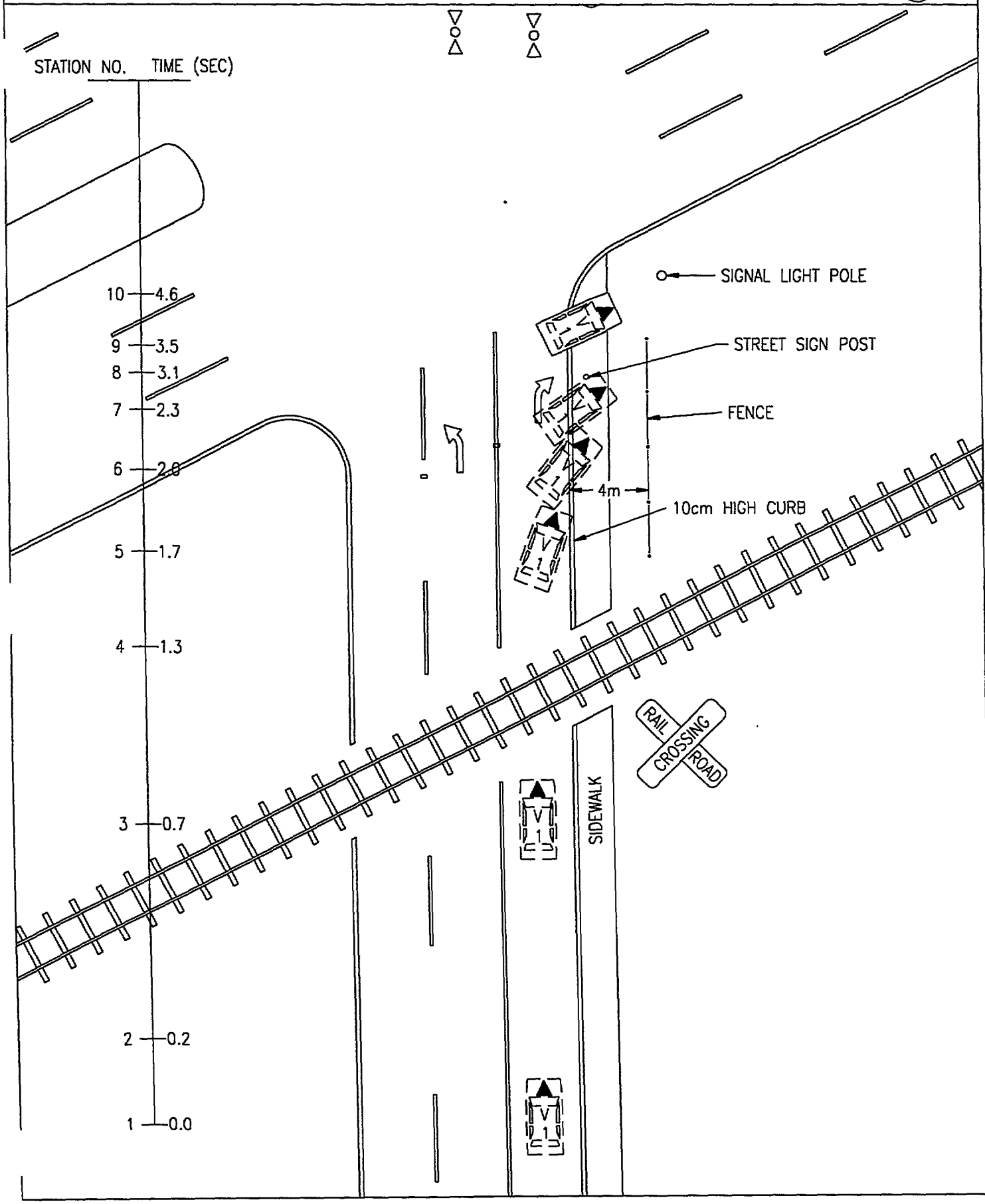
Roadway Edge:	0.83 sec	**Method:**	Straight Line Projection
Shoulder Edge:	0.83 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 (+3 m) and 5.
- Departure time for the shoulder edge was calculated between Stations 3 (+3 m) and 5.
- Initial velocity of the vehicle was 48 km/h.
- Stations 2,4, 8 and 9 were added.

ACCIDENT COLLISION DIAGRAM

PSU No. 49 Case Number – Stratum 014H Indicate North



Scale: 1/250

CAUSAL FACTOR.' *Evasive Maneuver - Vehicle Encroaching into Lane - Same Travel Direction*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	1-4-93	***Weather:***	Clear
Time:	2020	***Surface Condition:***	Dry
Accident Type:	Avoid Collision	***Lighting:***	Yes
Accident Severity:	2 (B)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	20
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1992
Vehicle Make:	Saturn
Vehicle Model:	SL

Roadway Information

Trafficway *Type (Median):*	Physical barrier	**Alignment:**	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	89 km/h

Departure Times

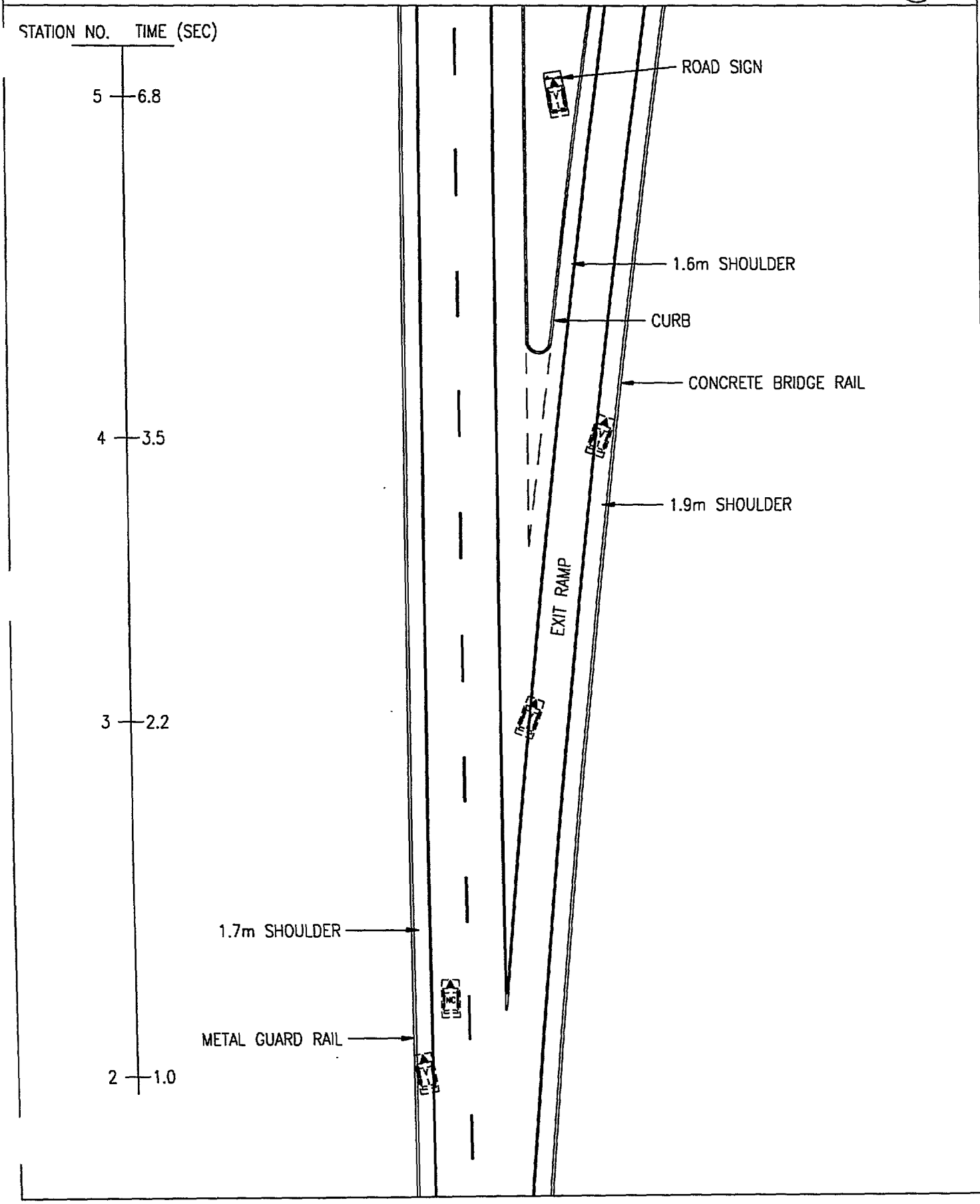
Roadway Edge:	0.65 sec	***Method:***	Straight Line Projection
Shoulder Edge:	2.03 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-24 m) and 2 (-8 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-24 m) and 2.
- Initial velocity of the vehicle was 89 km/h.
- Station 1 is 24 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 49 Case Number – Stratum 021E Indicate North



Scale: 1/500

CAUSAL FACTOR: *Lost Directional Control*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	4-4-93	***Weather:***	Rain
Time:	0550	***Surface Condition:***	Wet
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	1 (C)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	25
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1984
***Vehicle* Make:**	Nissan/Datsun
***Vehicle* Model:**	Pickup

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	4	***Speed Limit:***	56 km/h

Departure Times

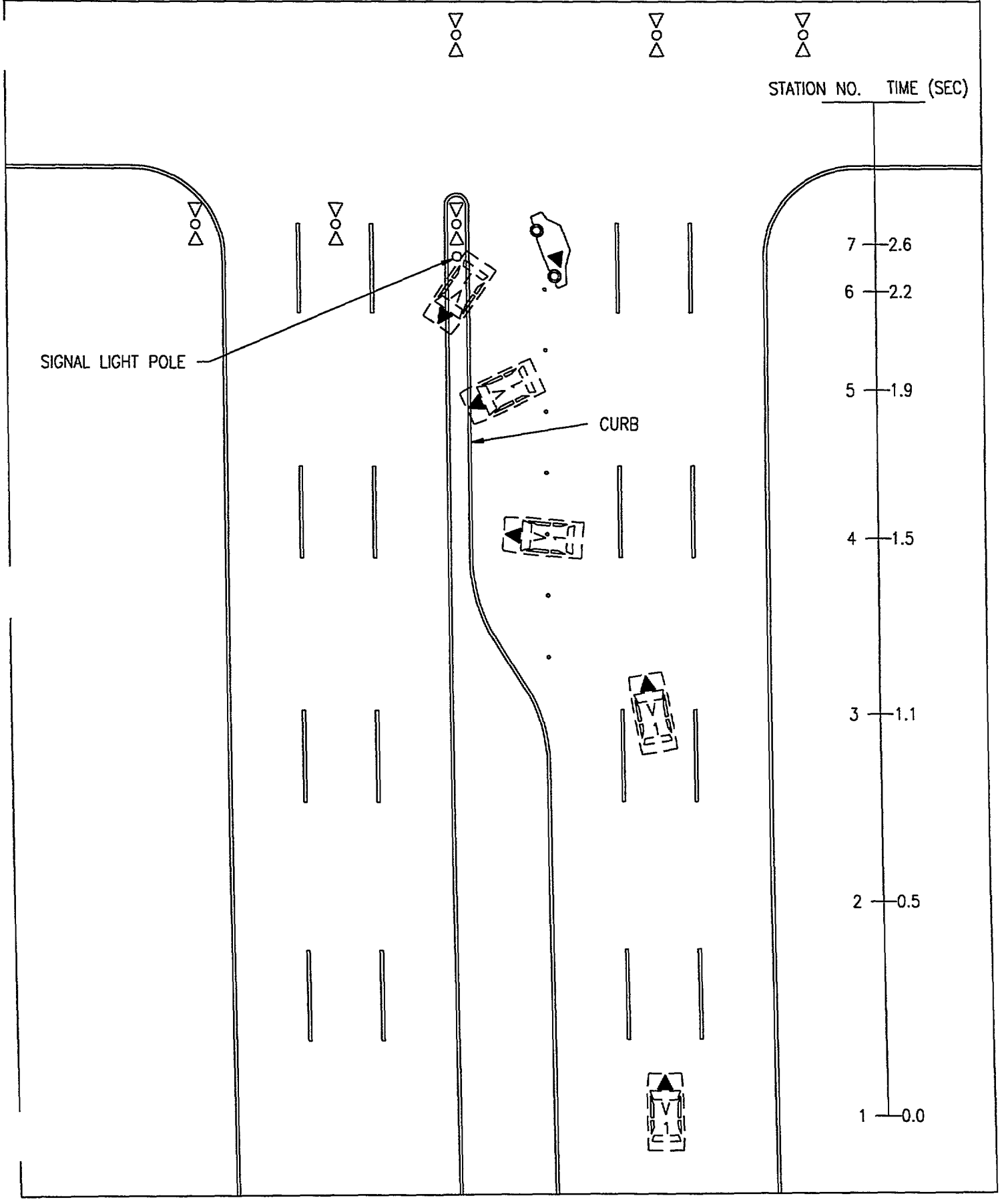
Roadway Edge:	1.58 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.58 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 (-17 m) and 5.
- Departure time for the shoulder edge was calculated between Stations 3 (- 17 m) and 5.
- Initial velocity of the vehicle was 80 km/h.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 49 Case Number – Stratum 086H Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	l-6-93	**Weather:**	Clear
Time:	1830	**Surface Condition:**	Dry
Accident Type:	Avoid Collision	**Lighting:**	Yes
Accident Severity:	3 (A)	**Land Use:**	Urban

Driver/Occupant Information

Driver Age:	51
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1991
Vehicle Make:	Chevrolet
Vehicle Model:	S-10, T-10

Roadway Information

Trafficway Type (Median):	Physical barrier	**Alignment:**	Curve Right
		Slope:	Grade
No. of Lanes:	1	**Speed Limit:**	89 km/h

Departure Times

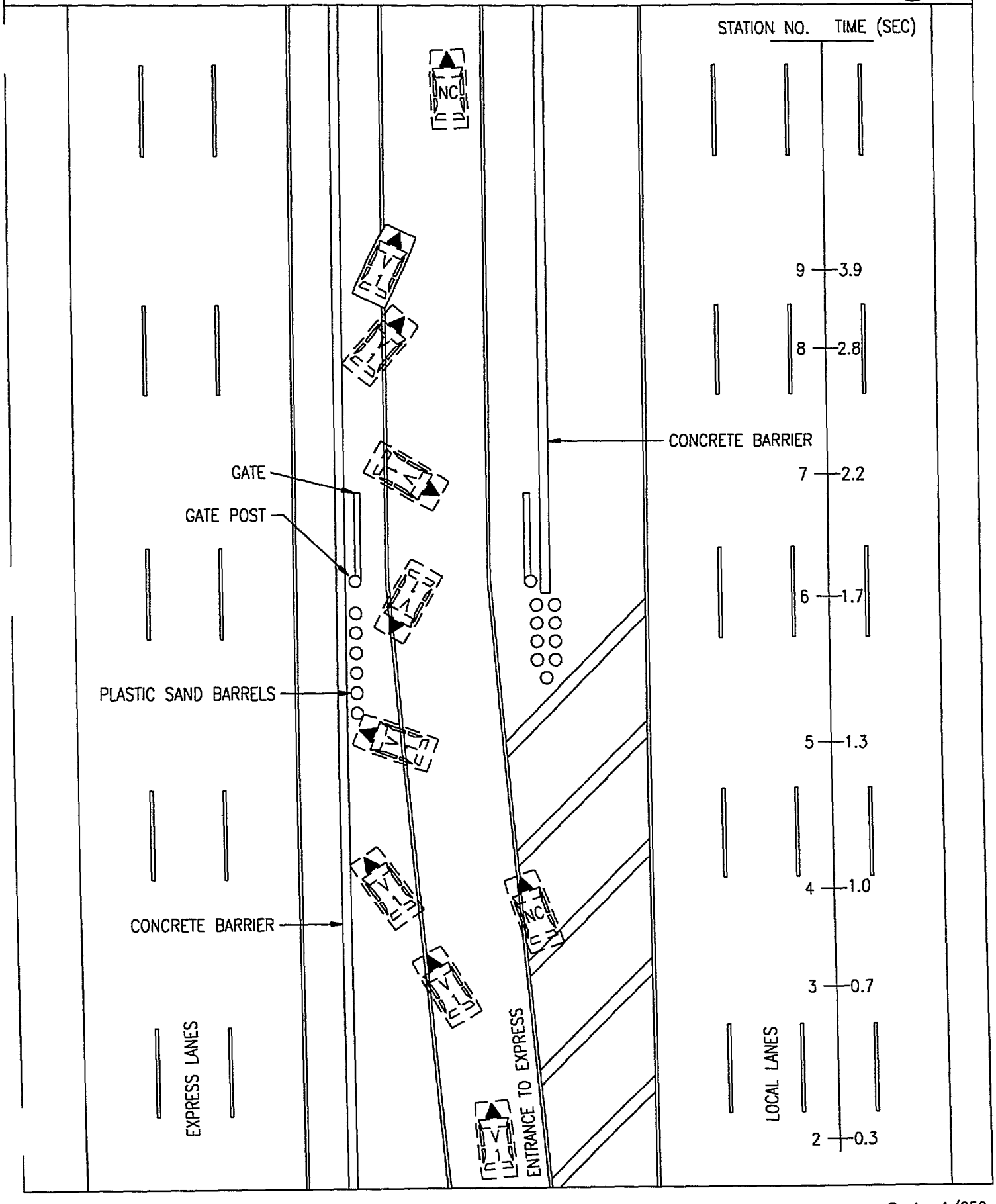
Roadway Edge:	0.66 sec	**Method:**	Straight Line Projection
Shoulder Edge:	0.91 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-8 m) and 3.
- Departure time for the shoulder edge was calculated between Stations 2 (-8 m) and 4.
- Initial velocity of the vehicle was 89 km/h.
- Station 1 is 8 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 72 Case Number – Stratum 007J Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Attempted to Initiate a 90 Degree Turn*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	3-4-93	**Weather:**	Snow (sleet/hail)
Time:	0047	**Surface Condition:**	Wet
Accident Type:	End Departure	**Lighting:**	Yes
Accident Severity:	3 (A)	**Land Use:**	Urban

Driver/Occupant Information

Driver Age:	31
Driver Sex:	Male
impairment:	None

Vehicle Information

Year:	1979
Vehicle Make:	Pontiac
Vehicle Model:	Bonneville/ Catalina

Roadway Information

Trafficway Type (Median):	Not divided	**Alignmen t:**	Straight
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	48 km/h

Departure Times

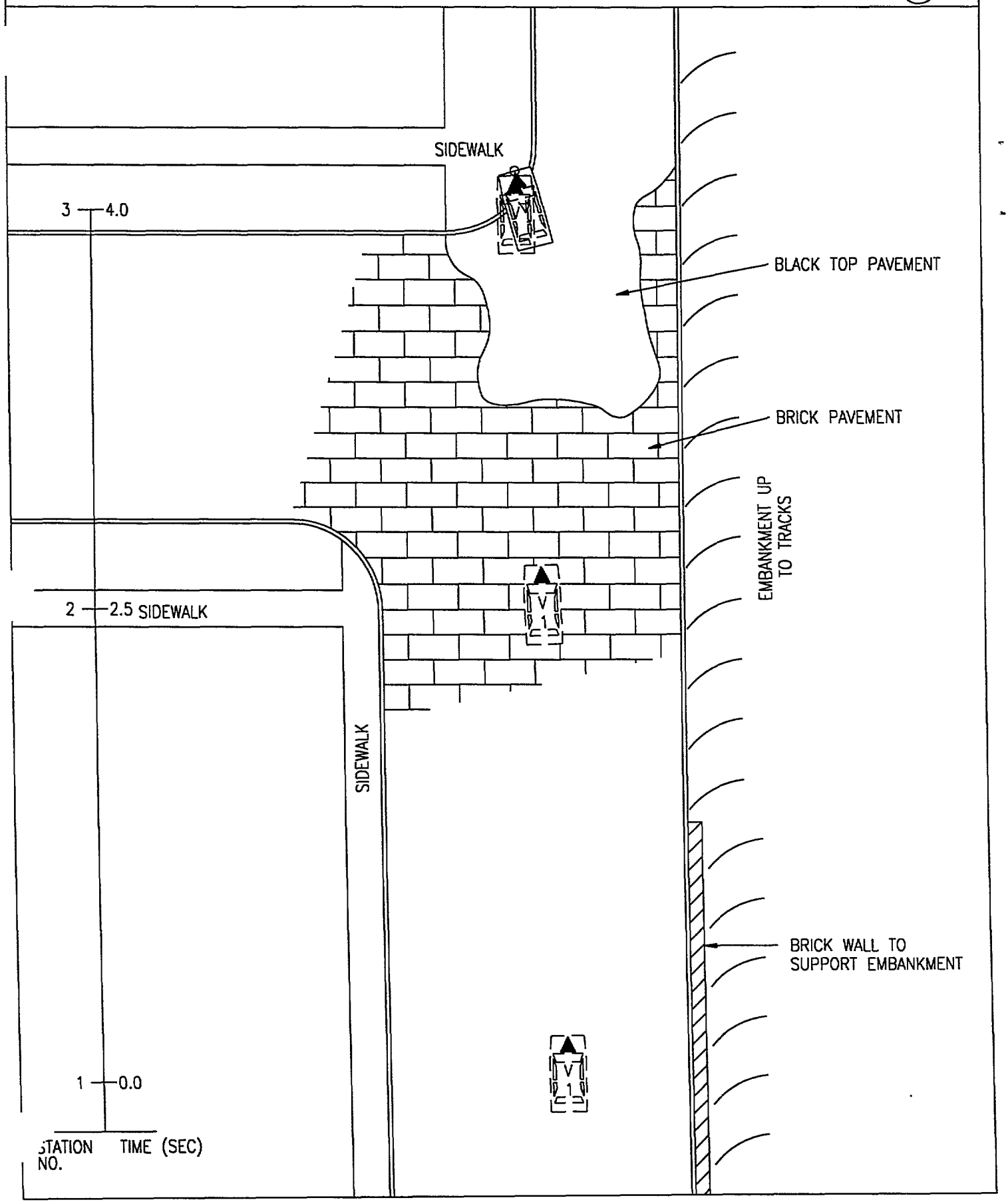
Roadway Edge:	1.08 sec	**Method**	Straight Line Projection
Shoulder Edge:	1.08 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (+3 m) and 3 (-3 m).
- Departure time for the shoulder edge was calculated between Stations 2 (+3 m) and 3 (-3 m).
- Initial velocity of the vehicle was 48 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 72 Case Number – Stratum 047K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	4-4-93	**Weather:**	Clear
Time:	0055	**Surface Condition:**	Dry
Accident Type:	Control/Traction Loss	**Lighting:**	Yes
Accident Severity:	3 (A)	**Land Use:**	Urban

Driver/Occupant Information

Driver Age:	47
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1983
Vehicle Make:	Plymouth
Vehicle Model:	Reliant(K)

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	56 km/h

Departure Times

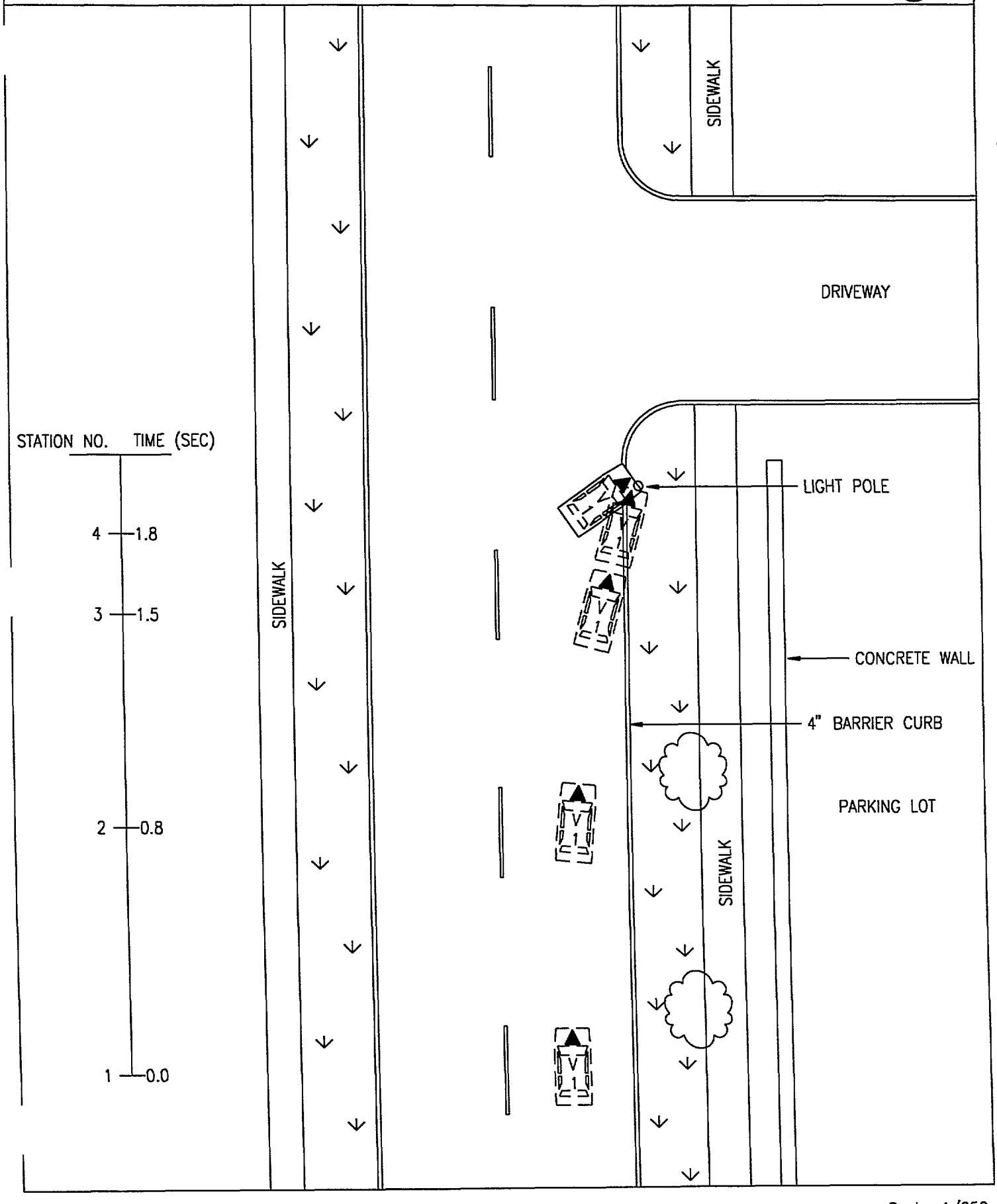
Roadway Edge:	1.38 sec	**Method**	Arc Formula Derived
Shoulder Edge:	1.38 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+2 m) and 3.
- Departure time for the shoulder edge was calculated between Stations 1 (+2 m) and 3.
- Initial velocity of the vehicle was 56 km/h.
- Last station was ommitted.

ACCIDENT COLLISION DIAGRAM

PSU No. 72 Case Number – Stratum 084K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	1-1-93	***Weather:***	Snow (sleet/hail)
Time:	1909	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	48
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1987
Vehicle Make:	Pontiac
Vehicle Model:	Grand Prix (RWD)

Roadway Information

Trafficway Type *(Median):*	Not divided	**Alignment:**	Curve Right
		Slope:	Level
No. of Lanes:	2	**Speed *Limit:***	48 km/h

Departure Times

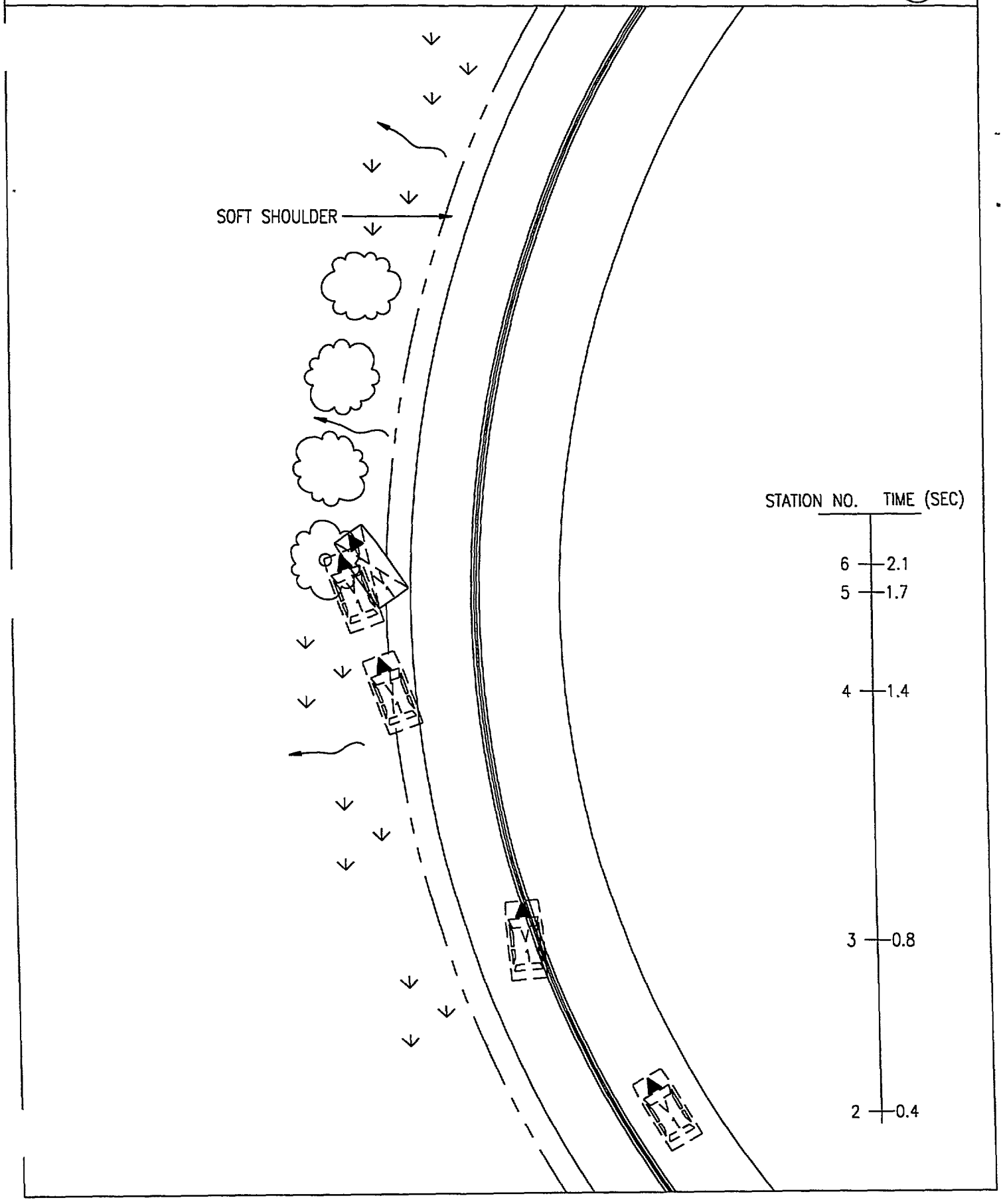
Roadway Edge:	1.20 sec	***Method***	Straight Line Projection
Shoulder Edge:	1.20 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-10 m) and 4 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-10 m) and 4 (-4 m).
- Initial velocity of the vehicle was 96 km/h.
- Station 1 is 10 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 73 Case Number – Stratum 011K Indicate North



Scale: 1/250

CAUSAL FACTOR: Driver Inattention

ROADSIDE DEPARTURE: Left

General Accident Information

Date:	2-6-93	**Weather:**	Clear
Time:	2000	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	4 (K)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	16
Driver Sex:	Male
Impairmen t:	None

Vehicle Information

Year:	1980
Vehicle Make:	Chevrolet
Vehicle Model:	Fullsize Blazer

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Level
No. of Lanes:	2	**Speed Limit:**	64 km/h

Departure Times

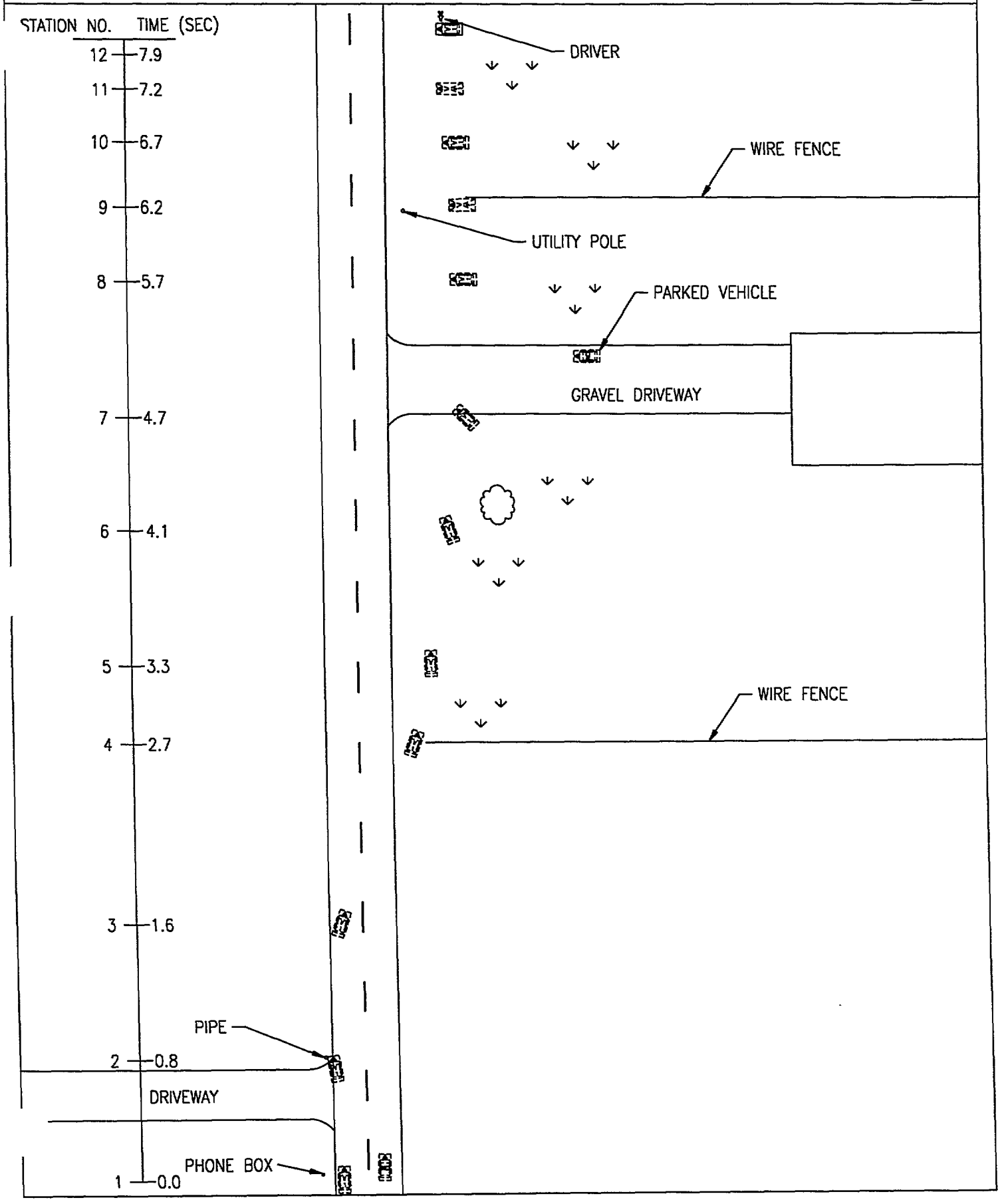
Roadway Edges	0.84 sec	**Method:**	Straight Line Projection
Shoulder Edger	0.84 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 2.
- Departure time for the shoulder edge was calculated between Stations 1 and 2.
- Initial velocity of the vehicle was 80 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 73 Case Number – Stratum 015B Indicate North



Scale: 1/750

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	2-2-93	***Weather:***	Clear
Time:	1848	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	68
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1980
Vehicle Make:	Chevrolet
Vehicle Model:	Caprice/Impala

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	48 km/h

Departure Times

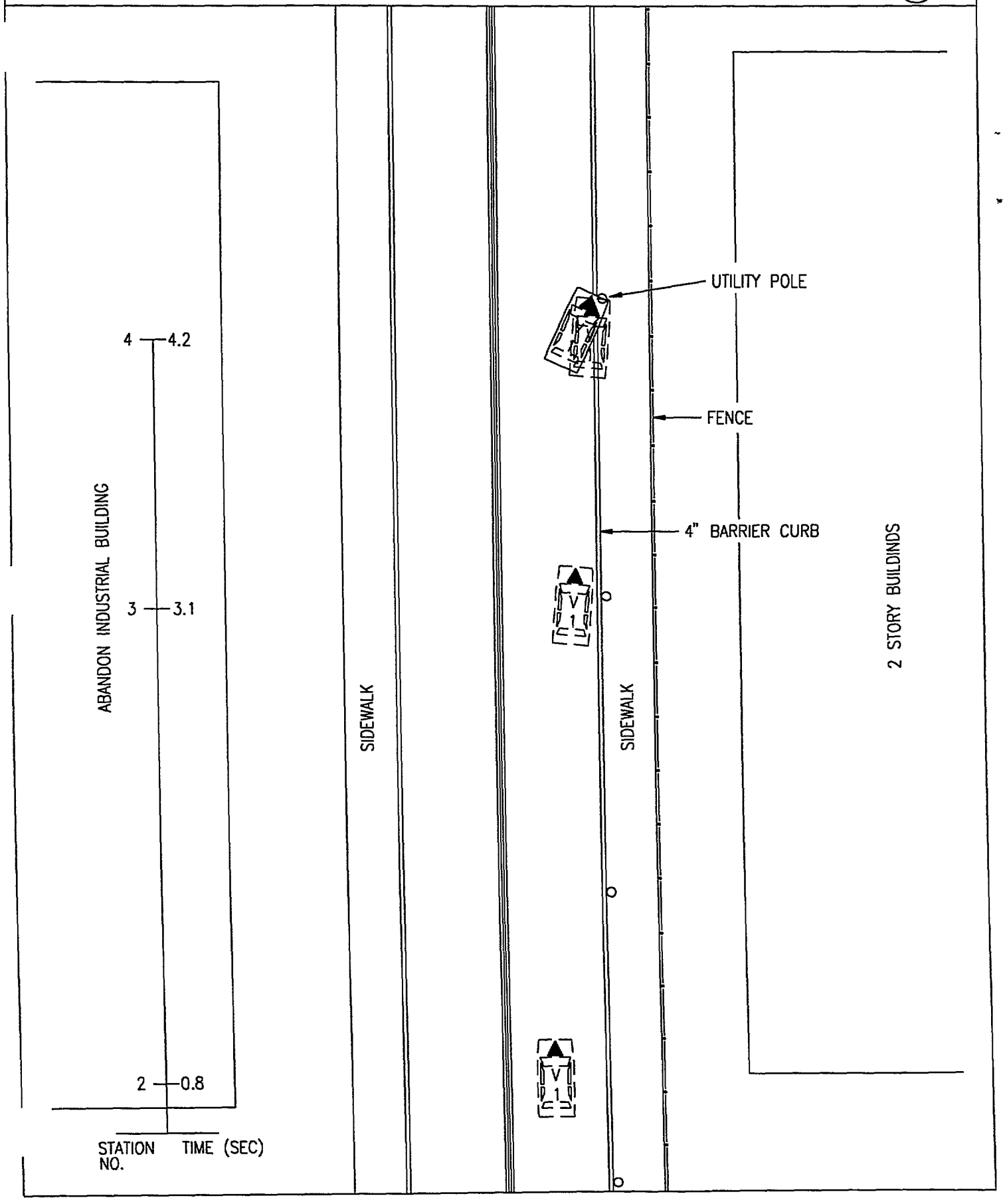
Roadway Edge:	2.83 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	2.83 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-11 m) and 3 (+3 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-11 m) and 3 (+3 m).
- Initial velocity of the vehicle was 48 km/h.
- Reference point and reference line were assumed to be the utility pole and south road edge, respectively.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 73 Case Number – Stratum 018K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Evasive Maneuver - Avoid Animal or Pedestrian*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	3-7-93	***Weather;***	Clear
Time:	1820	***Surface Condition:***	Dry
Accident Type:	Avoid Collision	***Lighting:***	Unknown
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	16
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1991
Vehicle Make:	Hyundai
Vehicle Model:	Excel

Roadway Information

Trafficwa y Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	64 km/h

Departure Times

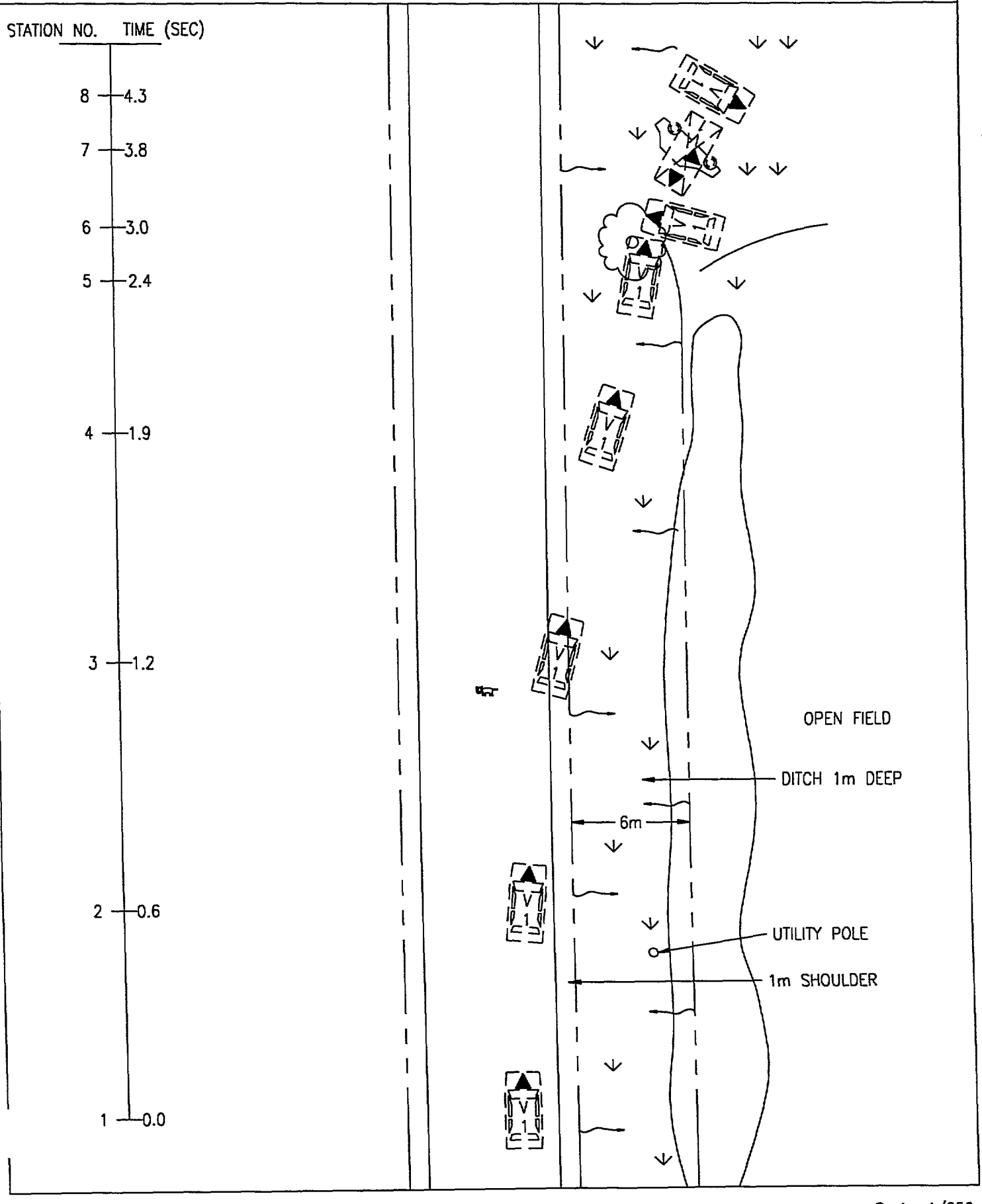
Roadway Edge:	0.66 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.10 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+3 m) and 2 (+4 m).
- Departure time for the shoulder edge was calculated between Stations 1 (+3 m) and 3 (-1 m).
- Initial velocity of the vehicle was 64 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 73 Case Number – Stratum 031J Indicate North



Scale: 1/250

CAUSAL FACTOR; *Lost Directional Control*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	3-7-93	***Weather:***	Snow (sleet/hail)
Time:	0815	***Surface Conditions***	Snow (slush/ice)
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	43
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1991
Vehicle Make:	Oldsmobile
Vehicle Model:	Cutlass (FWD)

Roadway Information

Trafficway Type **(Median):**	Not divided	***A lignmen t:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	64 km/h

Departure Times

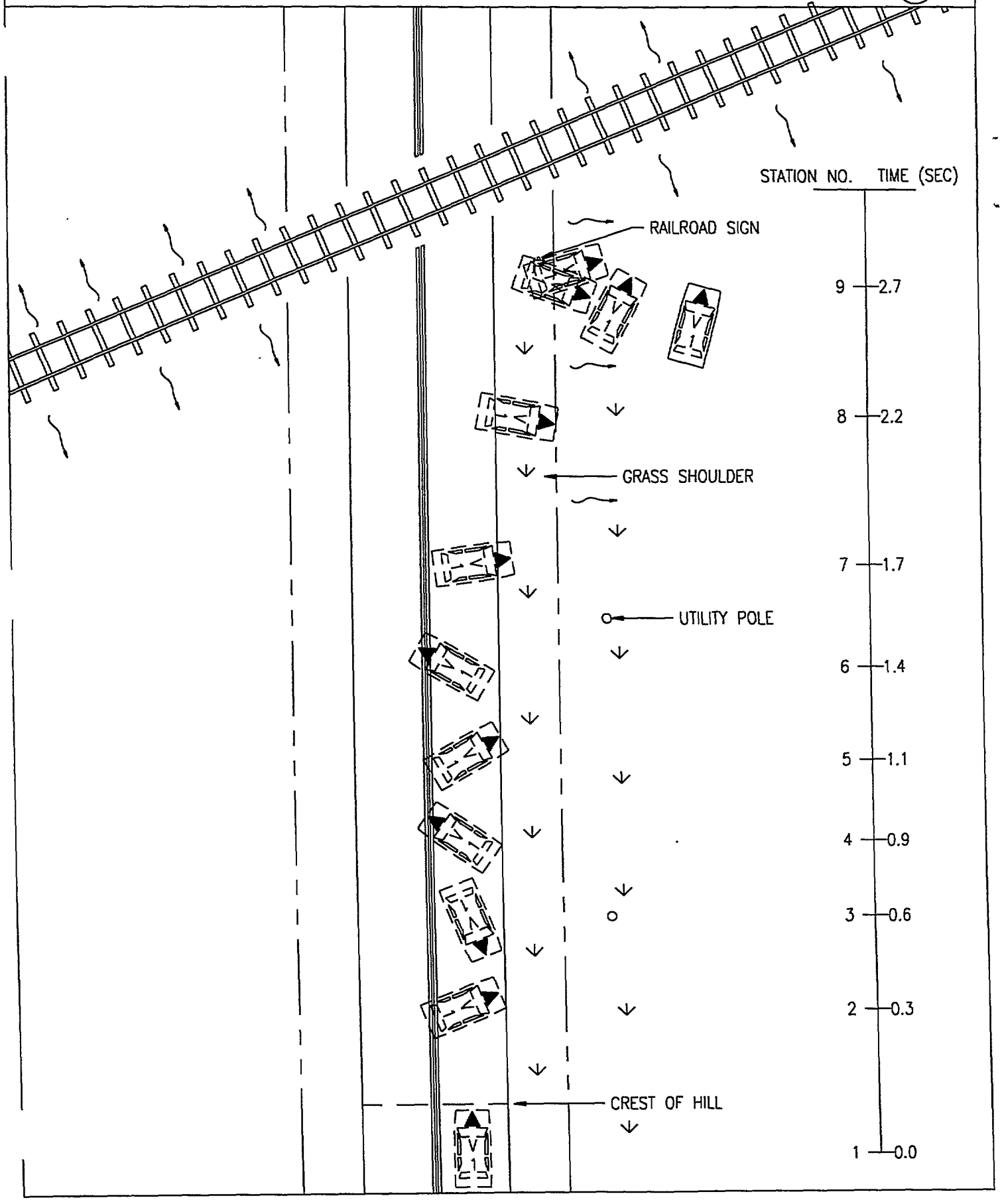
Roadway Edge:	1.54 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.54 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 7 (-3 m).
- Departure time for the shoulder edge was calculated between Stations 1 and 7 (-3 m).
- Initial velocity of the vehicle was 64 km/h.
- Last three stations were omitted.

ACCIDENT COLLISION DIAGRAM

PSU No. 73 Case Number – Stratum 038J Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	1-193	**Weather:**	Clear
Time:	0155	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	1 (C)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	46
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1977
Vehicle Make:	Oldsmobile
Vehicle Model:	Cutlass

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Left
		Slope:	Level
No. of Lanes:	2	**Speed Limit:**	48 km/h

Departure Times

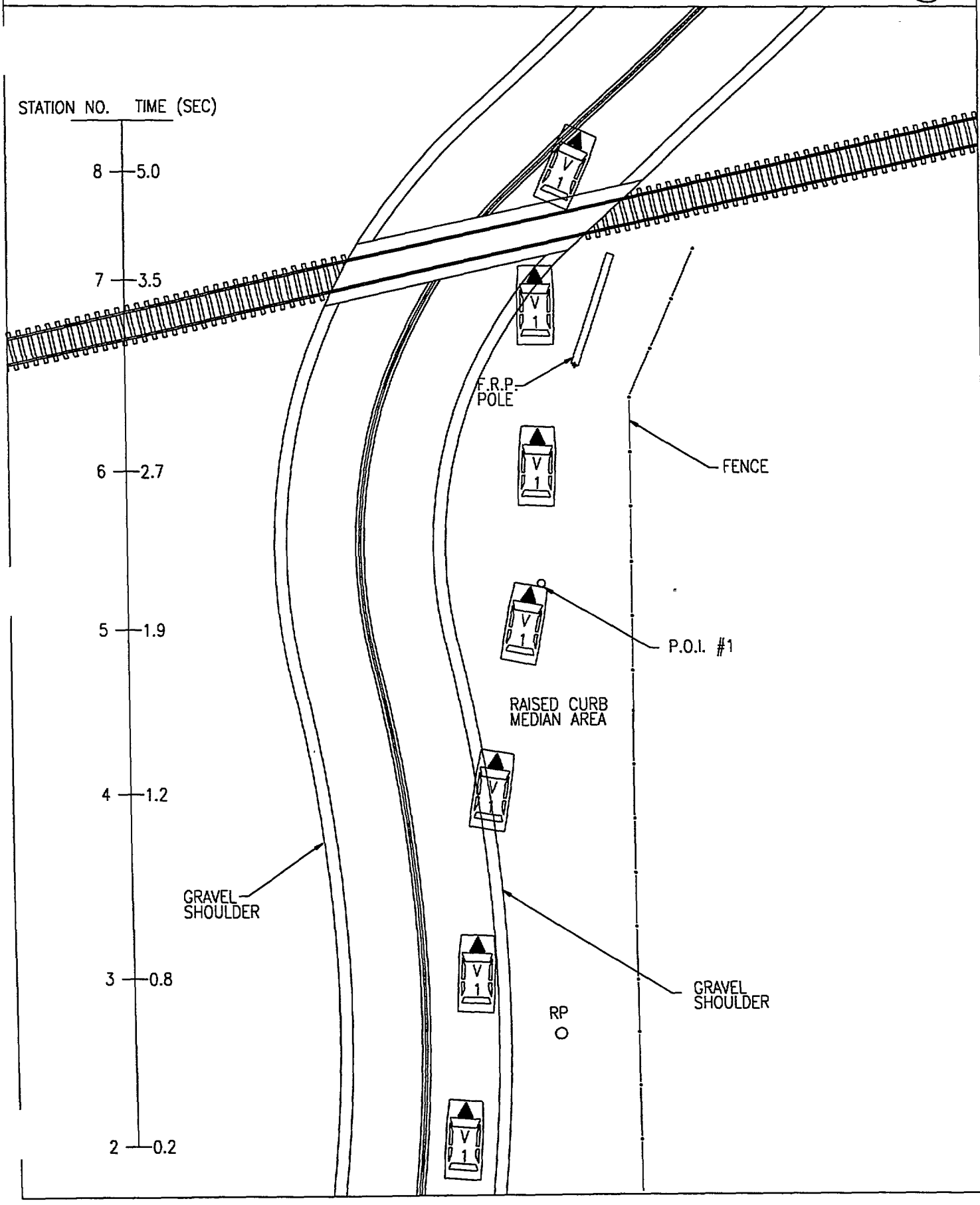
Roadway Edge:	0.81 sec	**Method:**	Arc Formula Derived
Shoulder Edge:	1.14 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-2 m) and 3.
- Departure time for the shoulder edge was calculated between Stations 2 (-4 m) and 4 (-6 m).
- Initial velocity of the vehicle was 48 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 75 Case Number – Stratum 010F Indicate North



Scale: 1/250

CAUSAL FACTOR: **Lost Directional Control**

ROADSIDE DEPARTURE: **Left**

General Accident Information

Date:	l-2-93	***Weather:***	Clear
Time:	1750	***Surface Condition:***	Snow (slush/ice)
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	1 (C)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	16
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1988
Vehicle Make:	Buick
Vehicle Model:	Regal

Roadway Information

Trafficway Type **(Median)** :	Not divided	***Alignment:***	Curve Right
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	56 km/h

Departure Times

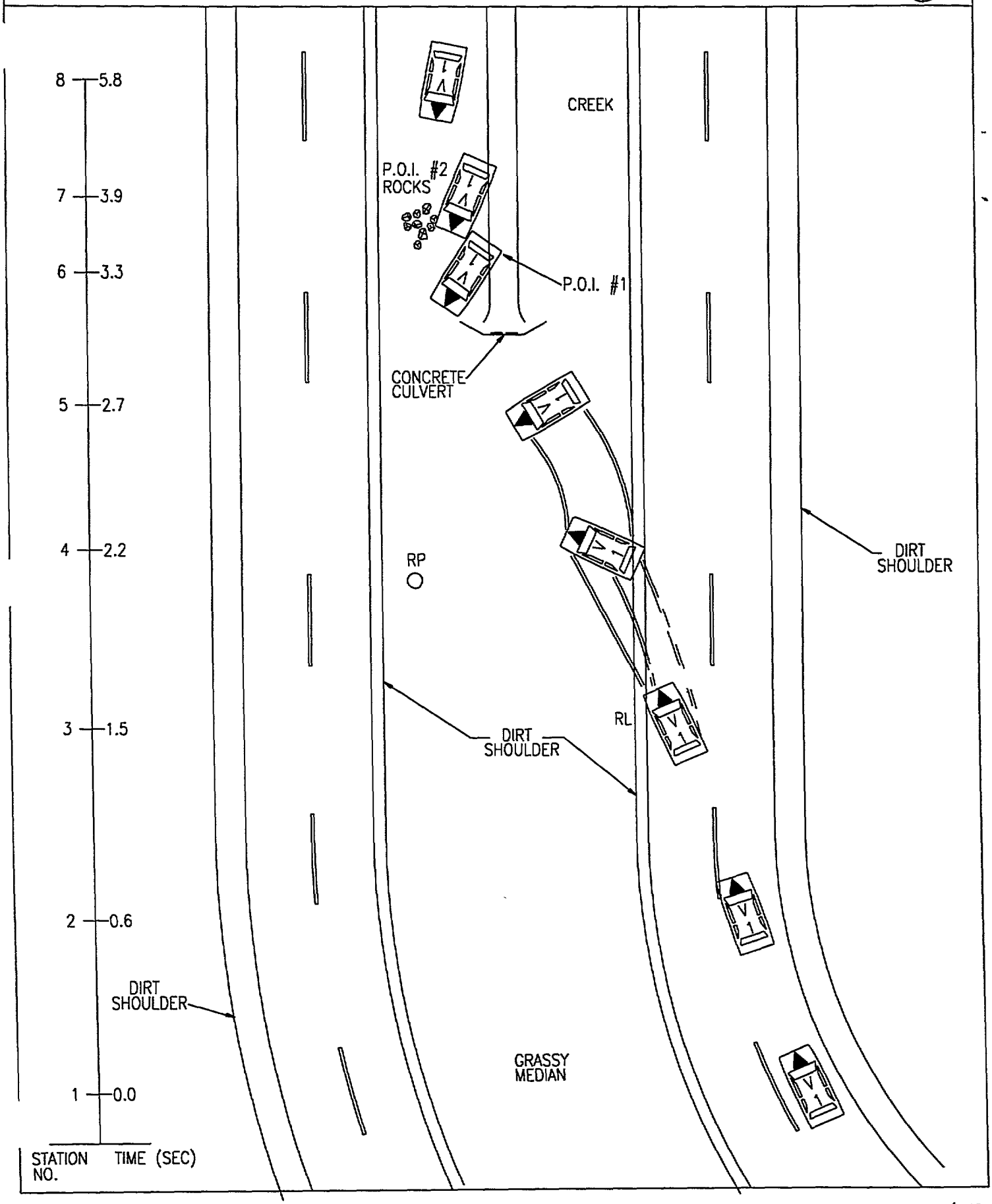
Roadway *Edge:*	1.50 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.65 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 3.
- Departure time for the shoulder edge was calculated between Stations 1 and 3 (+2 m).
- Initial velocity of the vehicle was 48 kmih.

ACCIDENT COLLISION DIAGRAM

PSU No. 75 Case Number – Stratum 014F Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	3-l-93	***Weather:***	Clear
Time:	2145	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	2 (B)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	19
Driver Sex:	Male
Impairment:	unknown

Vehicle Information

Year:	1974
Vehicle Make:	Ford
Vehicle Model:	Mustang/ Mustang II

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment;***	Curve Left
		Slope:	Grade
No. of Lanes:	2	***Speed* Limit:**	40 km/h

Departure Times

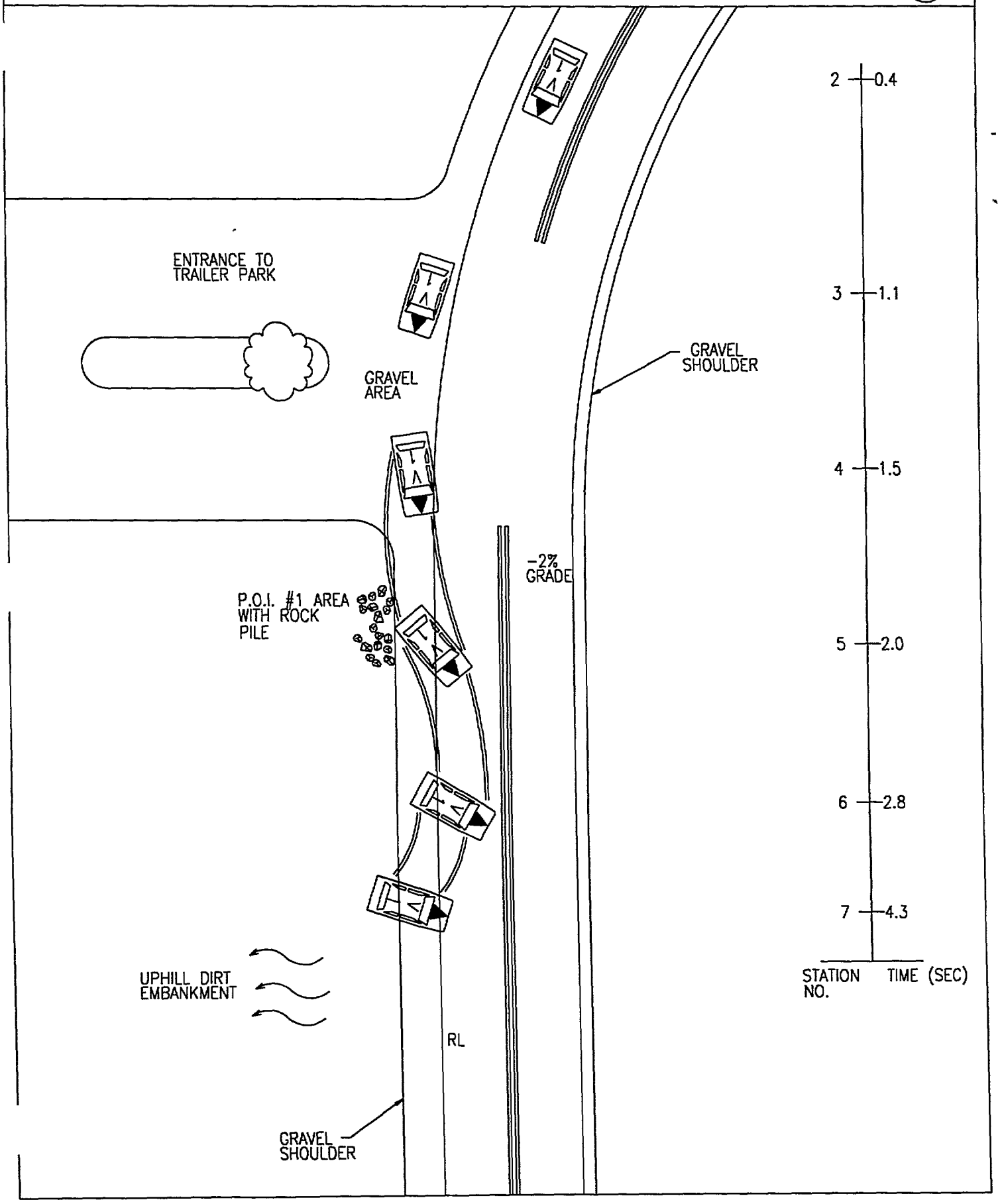
Roadway Edge:	0.77 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.54 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-7 m) and 3 (-6 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-2 m) and 4 (+4 m).
- Initial velocity of the vehicle was 60 km/h.
- Velocity of 60 km/h was assumed since excessive speed was indicated as a causal factor.
- Station 1 is 4 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 75 Case Number – Stratum 038H Indicate North



Scale: 1/250

CAUSAL FACTOR; **Vehicle Failure**

ROADSIDE DEPARTURE: **End Departure**

General Accident Information

Date:	3-4-93	***Weather:***	Clear
Time:	1525	***Surface Condition:***	Dry
Accident Type:	End Departure	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	64
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1993
Vehicle Make:	Jeep
Vehicle Model:	Cherokee (1984-on)

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	48 km/h

Departure Times

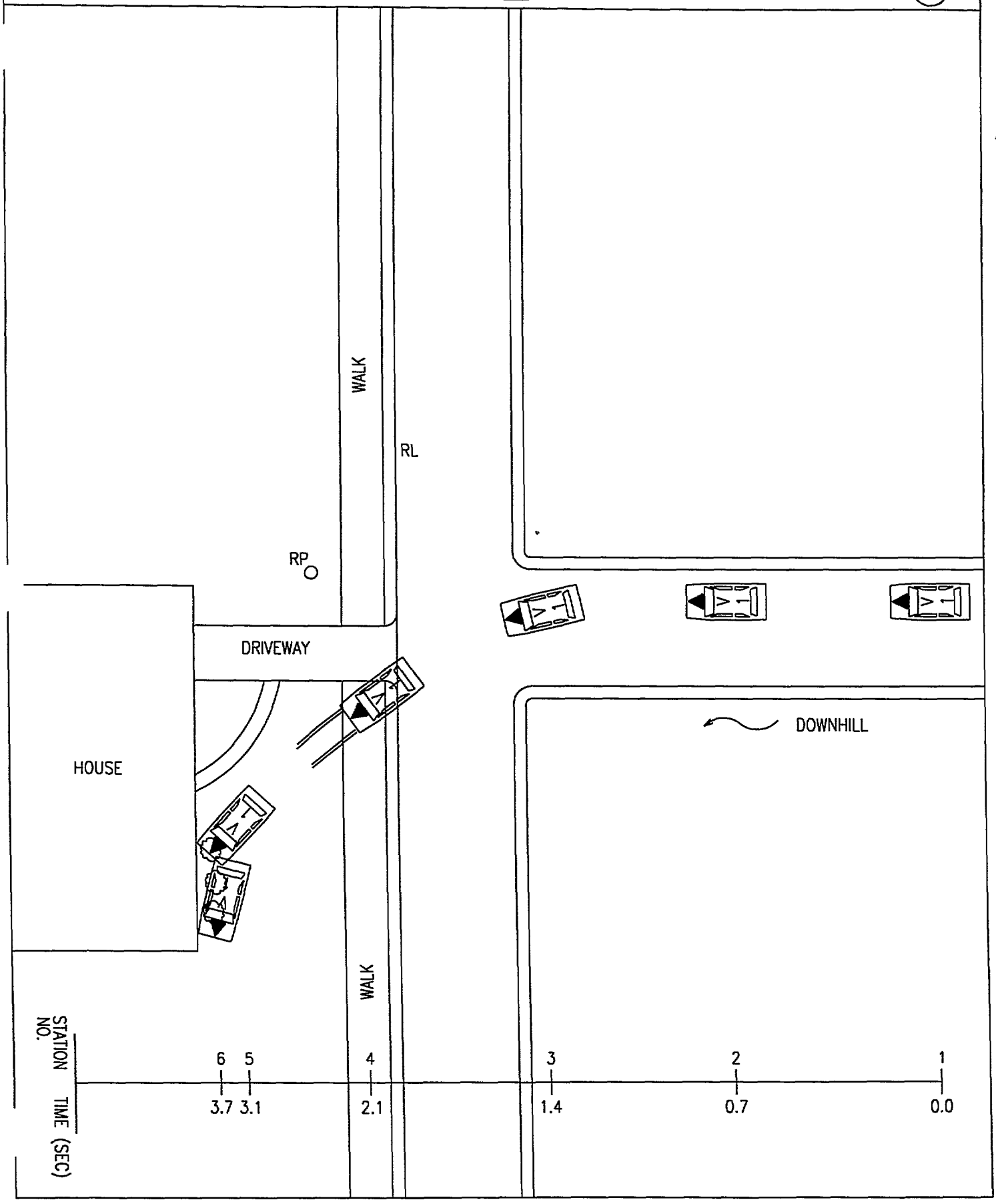
Roadway *Edge:*	0.72 sec	**Method:**	Straight Line Projection
Shoulder Edge:	0.72 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 (-3 m) and 4 (-3 m).
- Departure time for the shoulder edge was calculated between Stations 3 (-3 m) and 4 (-3 m).
- Initial velocity of the vehicle was 48 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 75 Case Number – Stratum 043J Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	4-3-93	**Weather:**	Clear
Time:	0200	***Surface Condition:***	Wet
Accident Type:	Control/Traction Loss	***Lighting:***	No
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	21
Driver Sex:	Female
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1990
Vehicle Make:	Chevrolet
Vehicle Model:	Nova/Geo Prizm

Roadway Information

Trafficway Type **(Median):**	Not divided	***Alignment:***	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	80 km/h

Departure Times

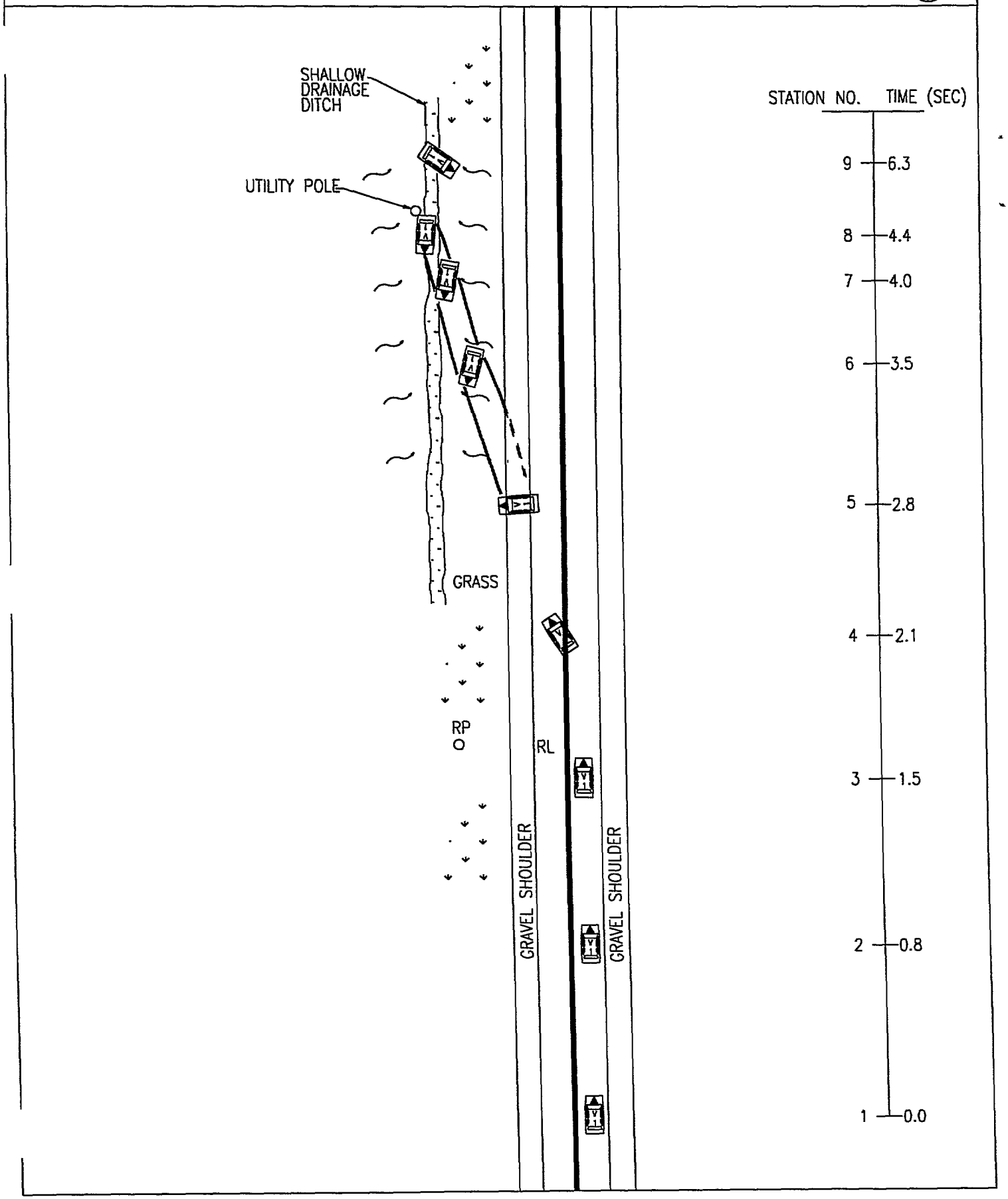
Roadway Edge:	2.02 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	2.47 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 (+7 m) and 4 (+4 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-9 m) and 5.
- Initial velocity of the vehicle was 80 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 75 Case Number – Stratum 055J Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	1-4-93	**Weather:**	Clear
Time:	2030	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	1 (C)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	22
Driver Sex:	Female
Impairment:	None

Vehicle Information

Year:	1992
Vehicle Make:	Volkswagon
Vehicle Model:	Jetta

Roadway information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Right
		Slope:	Level
No. of Lanes:	2	**Speed Limit:**	72 km/h

Departure Times

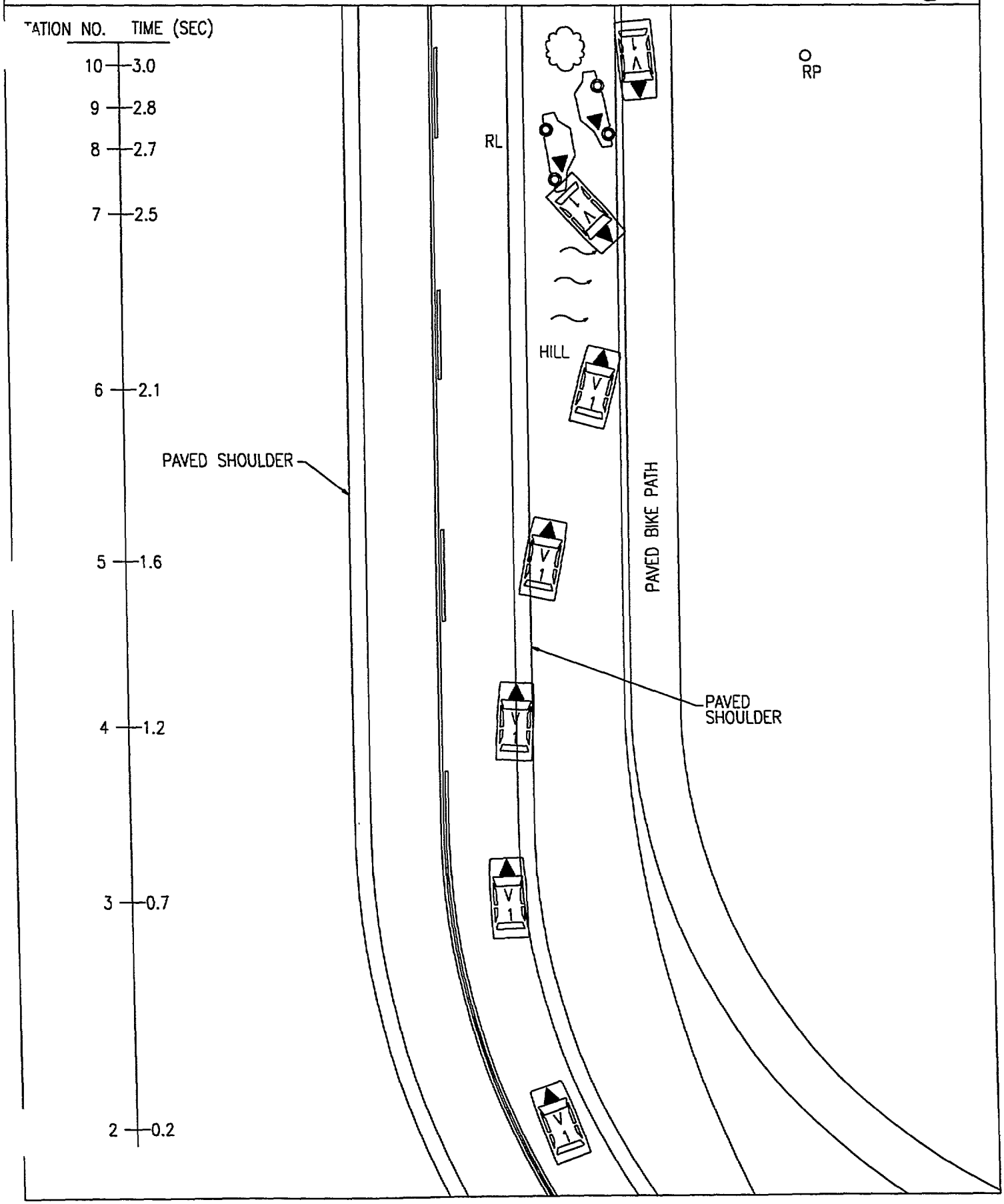
Roadway Edge:	0.71 sec	**Method**	Arc Formula Derived
Shoulder Edge:	1.00 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-3 m) and 3.
- Departure time for the shoulder edge was calculated between Stations 2 and 4.
- Initial velocity of the vehicle was 72 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 75 Case Number – Stratum 057E Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	2-l-93	**Weather:**	Rain
Time:	0213	**Surface Condition:**	Wet
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	2 (B)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	23
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1976
Vehicle Make:	Chevrolet
Vehicle Model:	Camaro

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Level
No. of Lanes:	2	**Speed Limit:**	64 km/h

Departure Times

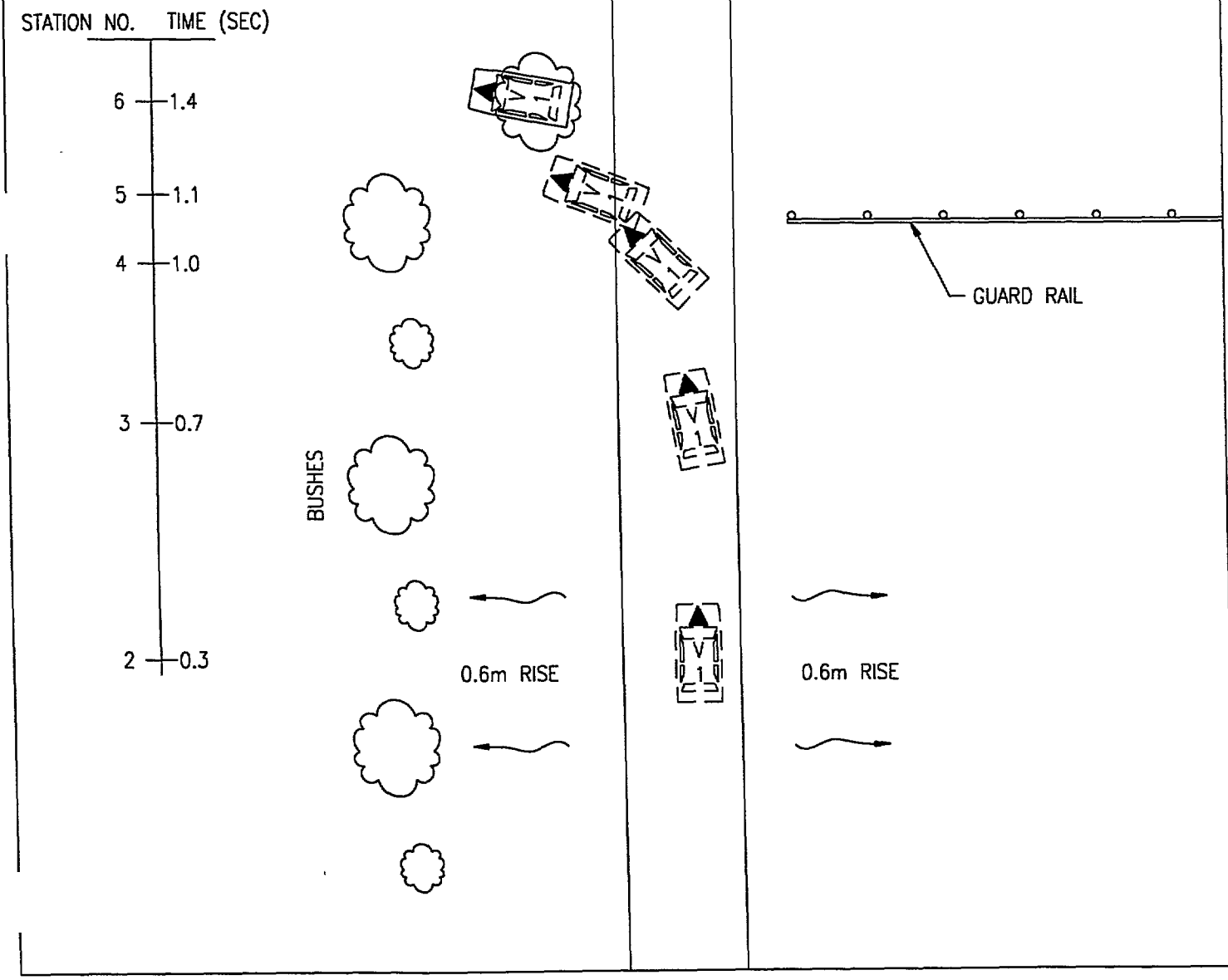
Roadway Edge:	1.10 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.10 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-6 m) and 4 (+2 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-6 m) and 4 (+2 m).
- Initial velocity of the vehicle was 80 km/h.
- Station 1 is 6 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 76 Case Number – Stratum 012F Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Inatten tion*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	9-7-93	***Weather:***	Clear
Time:	2058	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Yes
Accident Severity:	1 (C)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	46
Driver Sex:	Female
Impairmen t:	Other (driver fatigued)

Vehicle Information

Year:	1985
Vehicle Make:	Chevrolet
Vehicle Model:	G-series van

Roadway Information

Trafficway Type *(Median)*:	Not divided	**Alignment:**	Curve Right
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	40 km/h

Departure Times

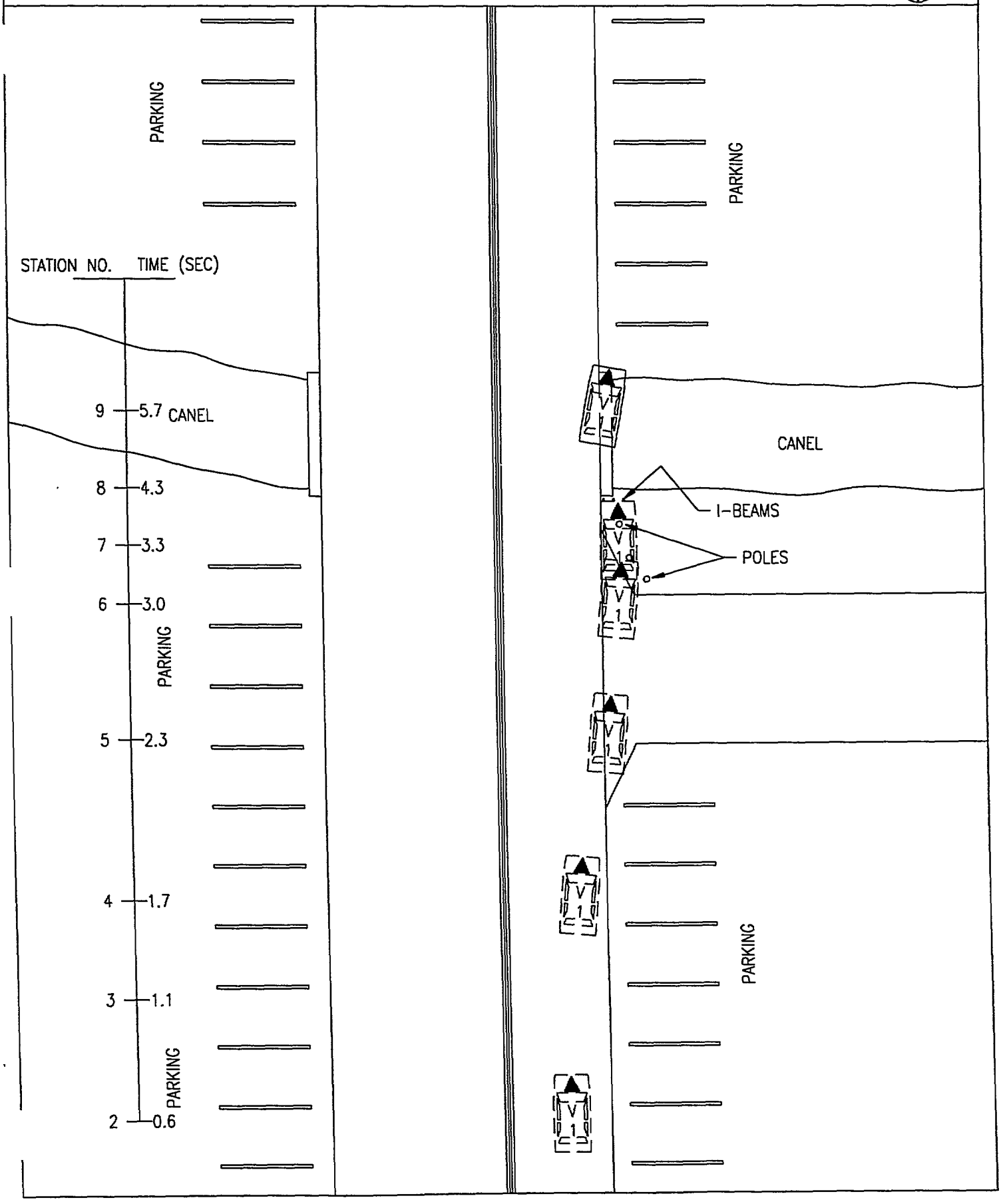
Roadway Edge:	2.09 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	3.13 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-7 m) and 4 (+4 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-5 m) and 7.
- Initial velocity of the vehicle was 40 km/h.
- Stations 3 and 8 were added.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 76 Case Number – Stratum 103H Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	4-6-93	**Weather:**	Clear
Time:	2230	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	3 (A)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	26
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1983
Vehicle Make:	Toyota
Vehicle Model:	Pickup

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Level
No. of Lanes:	2	**Speed Limit:**	80 km/h

Departure Times

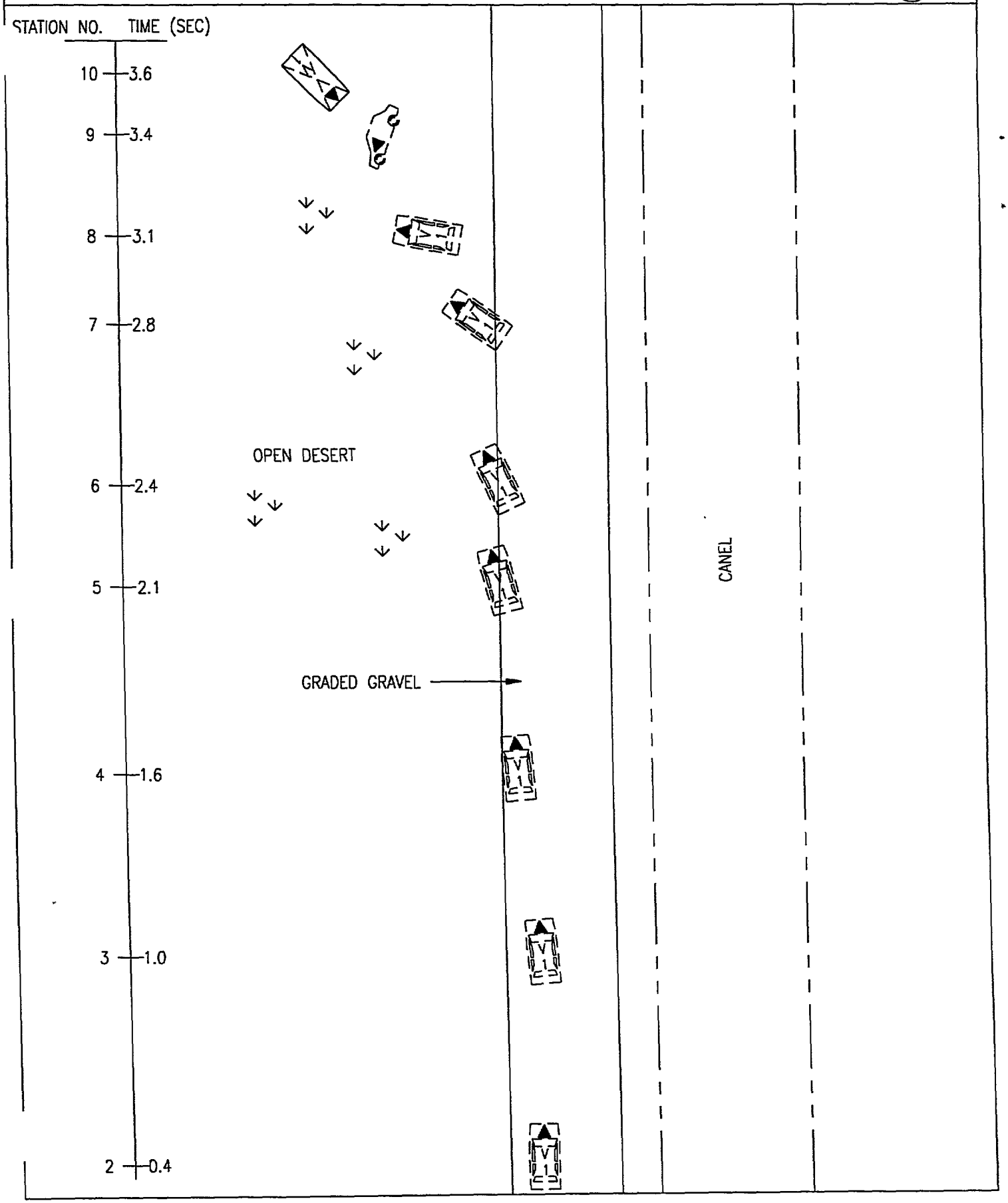
Roadway Edge:	1.58 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.58 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-10 m) and 4.
- Departure time for the shoulder edge was calculated between Stations 2 (-10 m) and 4.
- Initial velocity of the vehicle was 80 km/h
- Station 1 is 10 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 78 Case Number – Stratum 045K Indicate North



Scale: 1/300

CAUSAL FACTOR: *Vehicle Failure*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	4-2-93	***Weather:***	Clear
Time:	1520	***Surface Condifions***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	28
Driver Sex:	Male
Impairmen t:	None

Vehicle Information

Year:	1981
Vehicle Make:	Chevrolet
Vehicle Model:	C, K, R, V-series

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit;***	80 km/h

Departure Times

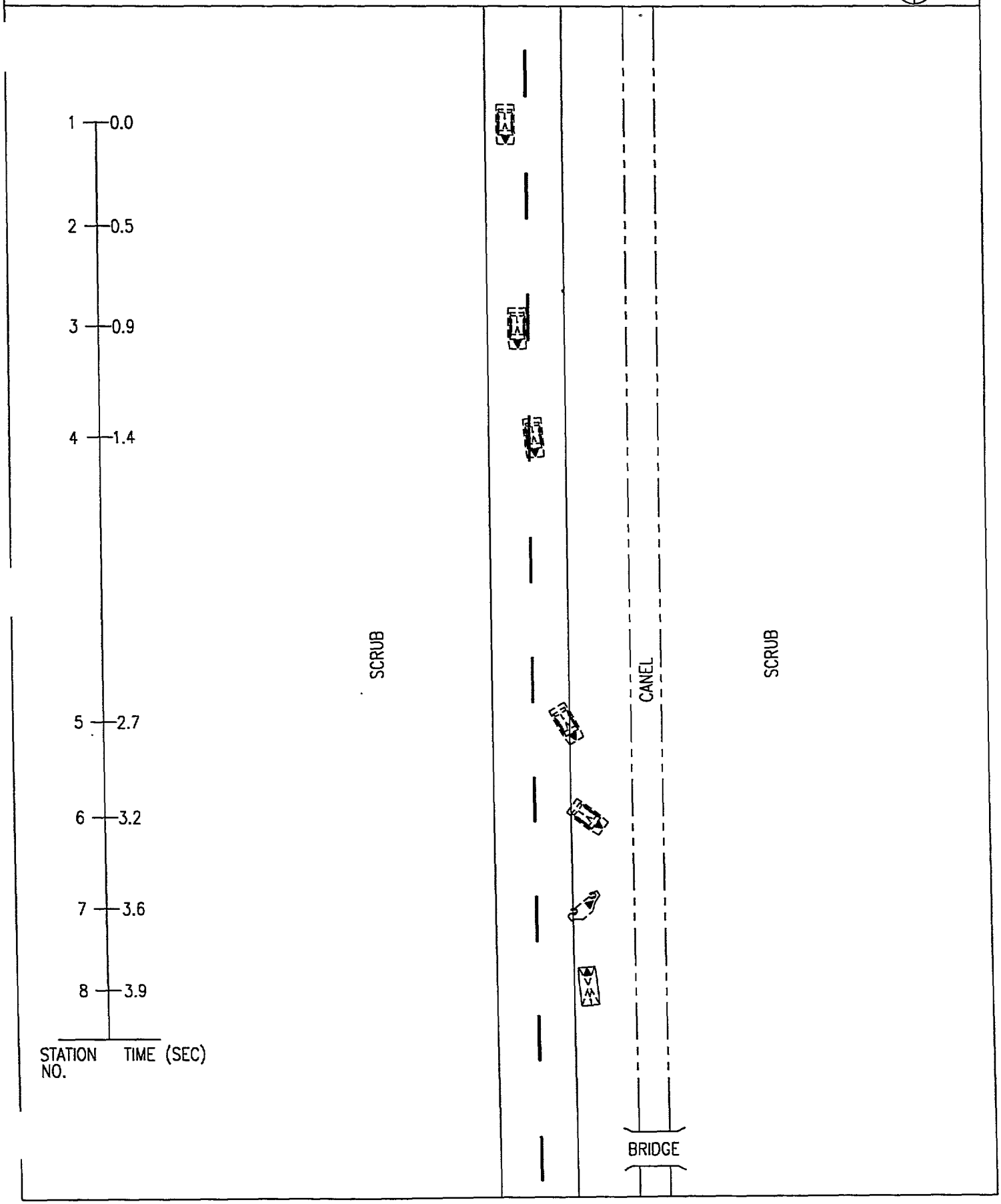
Roadway Edge:	1.84 sec	***Method:***	Straight Line Projection
Shoulder Edge:	1.84 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 (-4 m) and 5 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 3 (-4 m) and 5 (-4 m).
- Initial velocity of the vehicle was 80 km/h.
- Station 2 was added.

ACCIDENT COLLISION DIAGRAM

PSU No. 78 Case Number – Stratum 048K Indicate North



Scale: 1/500

CAUSAL FACTOR: *Vehicle Failure*

ROADSIDE DEPARTURE: ***Right***

General Accident Information

Date:	4-1-93	***Weather:***	Clear
Time:	1545	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Yes
Accident Severity:	1 (C)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	38
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1988
Vehicle Make:	Ford
Vehicle Model:	Ranger

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	80 km/h

Departure Times

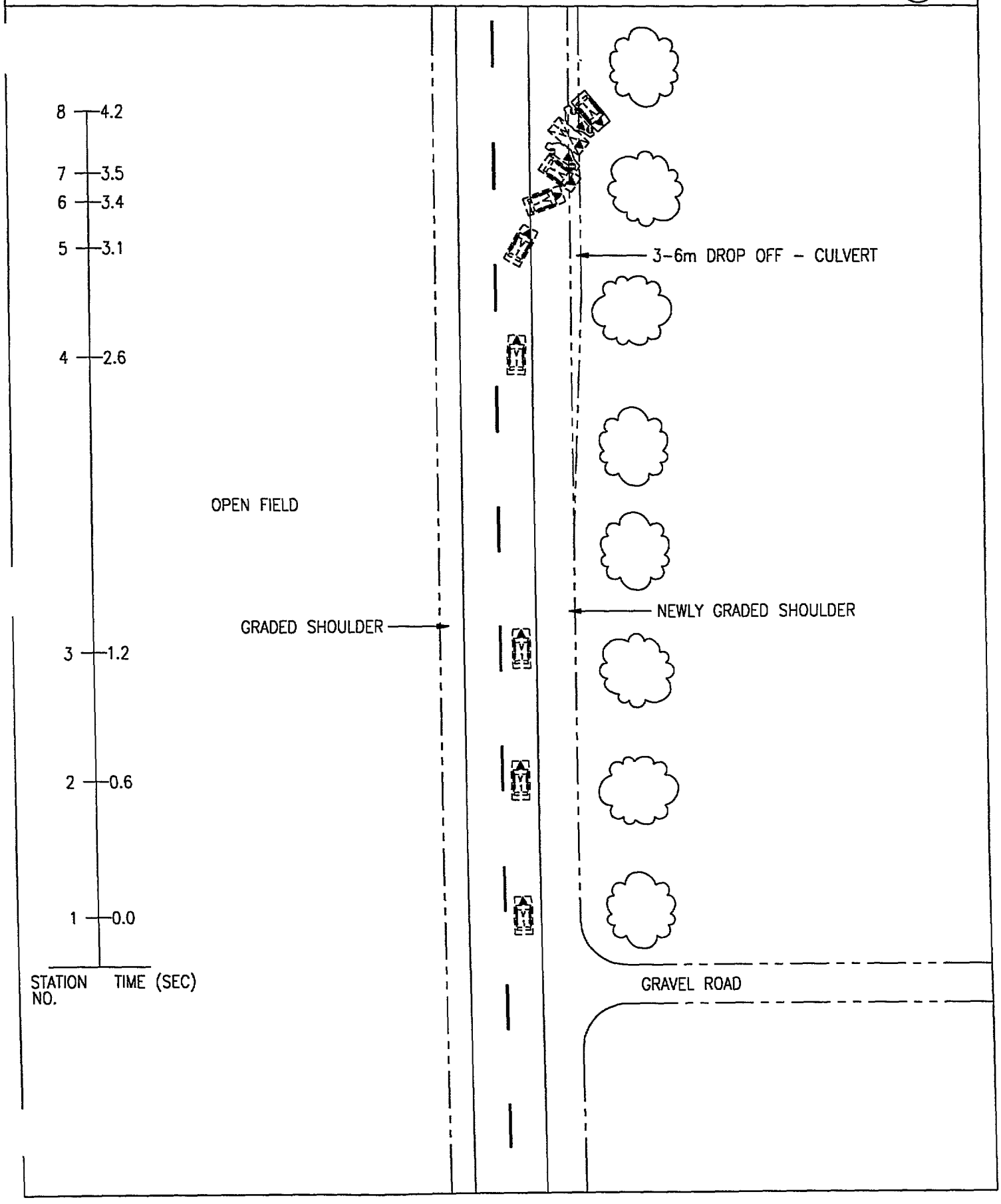
Roadway ***Edge:***	0.50 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.82 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 4 and 5.
- Departure time for the shoulder edge was calculated between Stations 4 and 7 (- 1 m).
- Initial velocity of the vehicle was 80 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 78 Case Number – Stratum 049F Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	5-7-93	***Weather:***	Clear
Time:	0203	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant information

Driver Age:	23
Driver Sex:	Male
Impairment:	Fell Asleep

Vehicle Information

Year:	1993
Vehicle Make:	Toyota
Vehicle Model:	Pickup

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	80 km/h

Departure Times

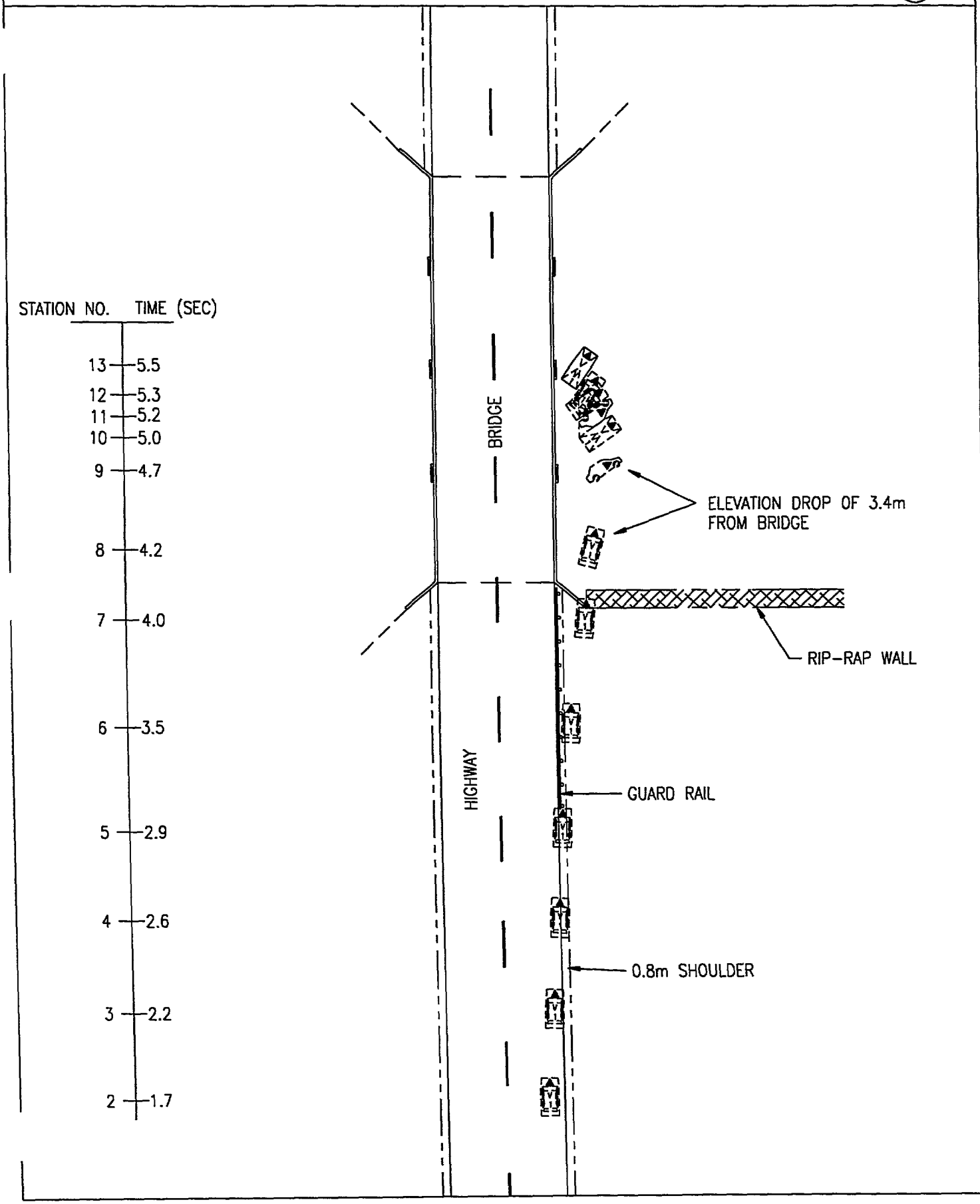
Roadway Edge:	2.16 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	2.50 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-38 m) and 3.
- Departure time for the shoulder edge was calculated between Stations 2 (-37 m) and 4.
- Initial velocity of the vehicle was 80 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 78 Case Number – Stratum 050J Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	3-4-93	***Weather.-***	Clear
Time:	0315	**Surface *Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	3(A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	19
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1993
Vehicle Make:	Mazda
Vehicle Model:	Pickup

Roadway Information

Trafficway Type (Median):	Physical barrier	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	105 km/h

Departure Times

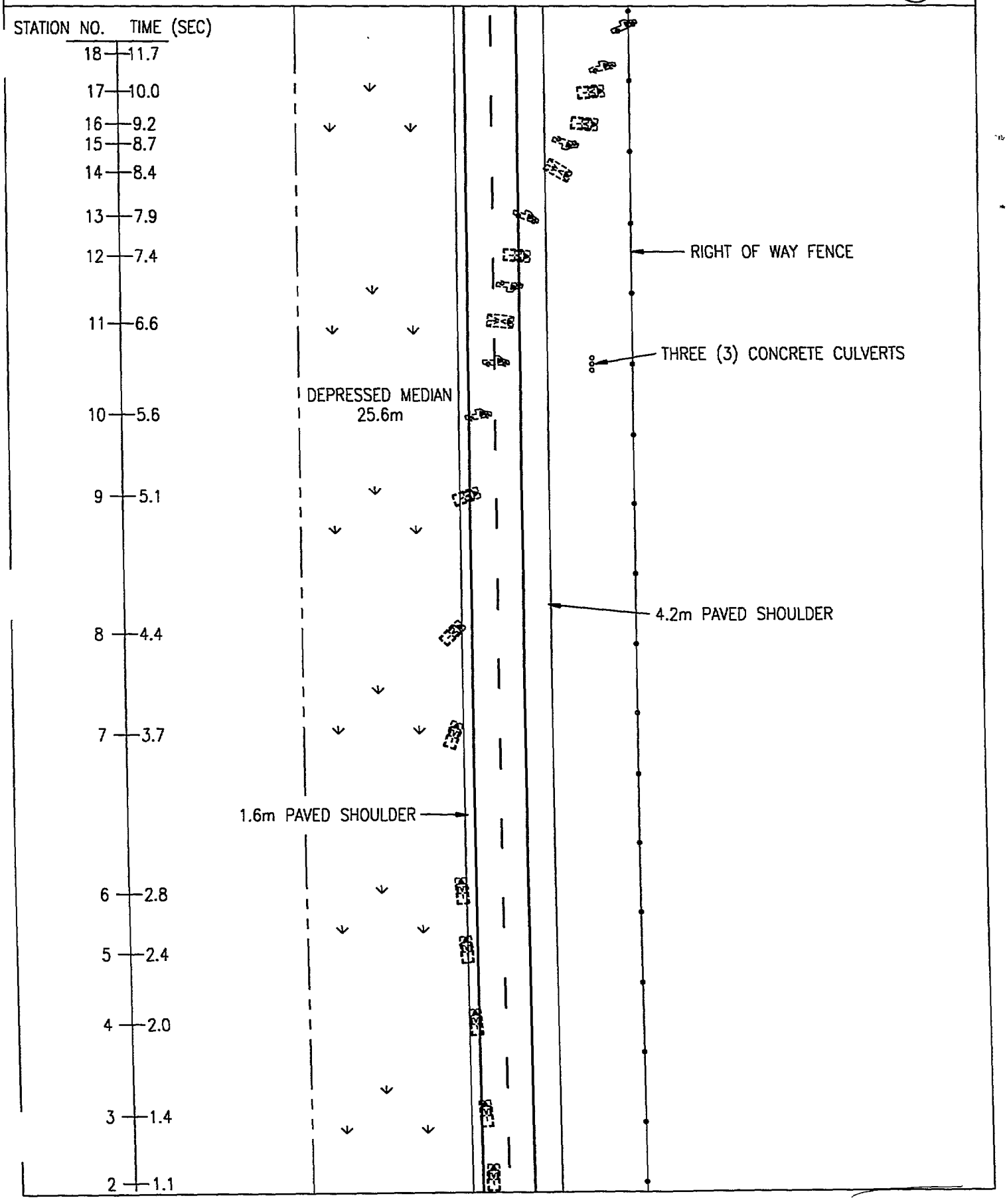
Roadway Edge:	1.42 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	2.11 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-3 1 m) and 3.
- Departure time for the shoulder edge was calculated between Stations 2 (-35 m) and 4 (+1 m).
- Initial velocity of the vehicle was 105 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 78 Case Number – Stratum 052J Indicate North



Scale: 1/750

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	4-3-93	**Weather:**	Clear
Time:	1330	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	Daylight
Accident Severify:	3 (A)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	25
Driver Sex:	Female
Impairmen f:	None

Vehicle Information

Year:	1981
Vehicle Make:	Chevrolet
Vehicle Model:	Citation

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Left
		Slope:	Level
No. of Lanes:	2	**Speed Limit:**	72 km/h

Departure Times

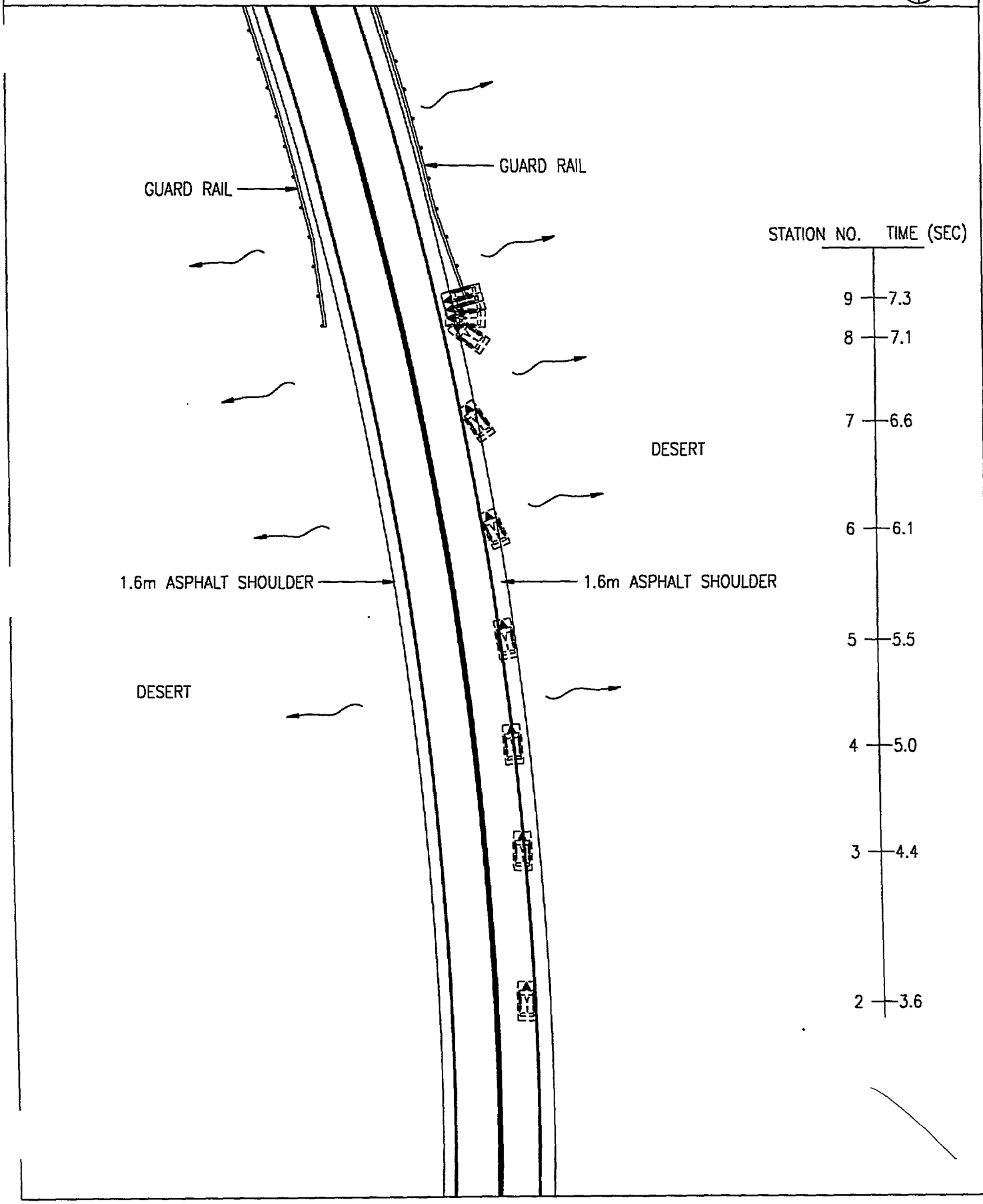
Roadway Edge:	3.87 sec	**Method:**	Arc Formula Derived
Shoulder Edge:	5.91 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-72 m) and 3 (-10 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-68 m) and 6.
- Initial velocity of the vehicle was 72 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 78 Case Number – Stratum 055K Indicate North



Scale: 1/500

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADS/DE DEPARTURE: *End Departure*

General Accident information

Date:	6-7-93	***Weather:***	Clear
Time:	1643	***Surface Condition:***	Dry
Accident Type:	End Departure	***Lighting:***	Daylight
Accident Severity:	2 (B)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	22
Driver Sex:	Male
Impairment:	Unknown

Vehicle Information

Year:	1987
Vehicle Make:	Oldsmobile
Vehicle Model:	Delta 88

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	40 km/h

Departure Times

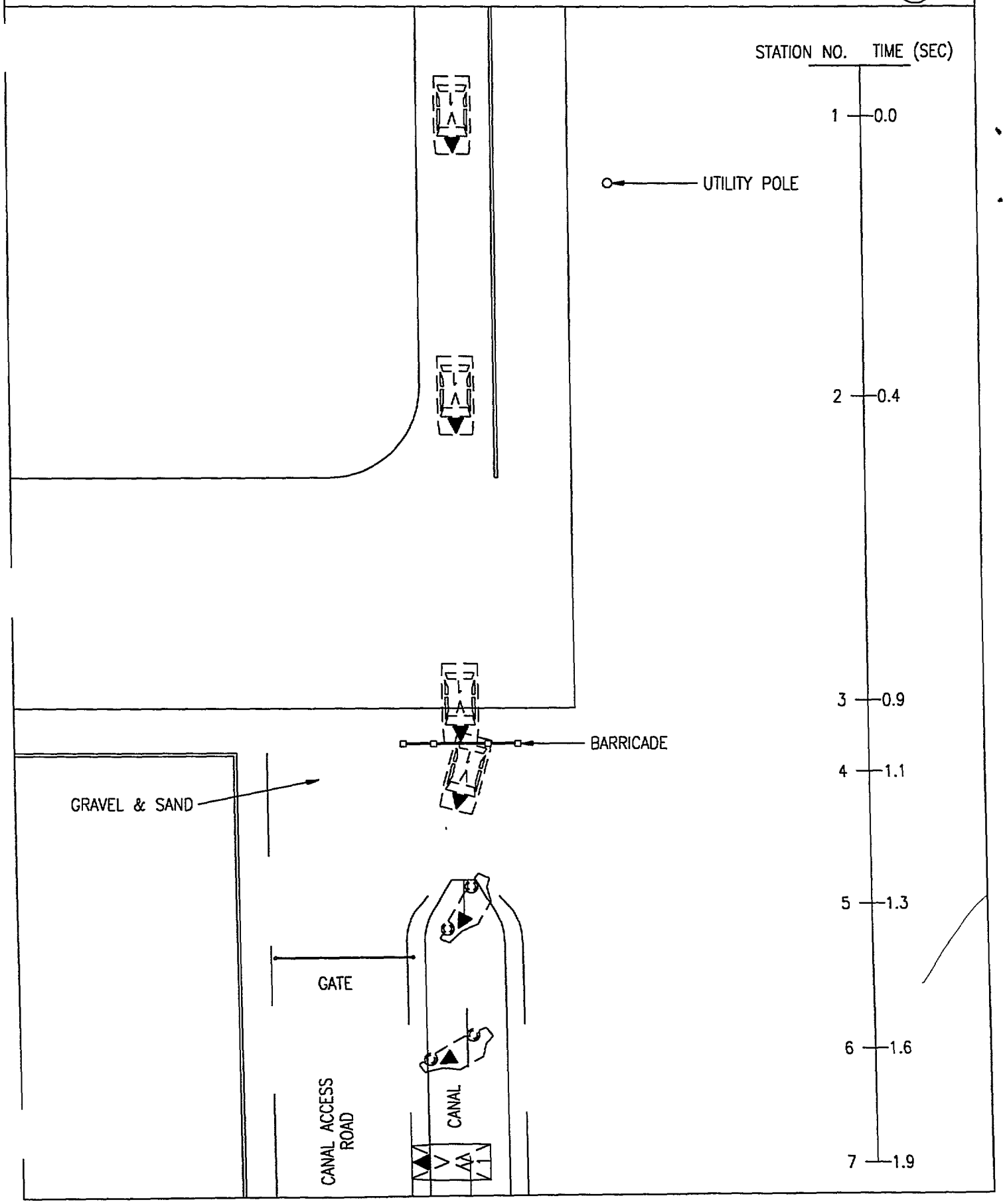
Roadway Edge:	0.51 sec	***Method:***	Straight Line Projection
Shoulder Edge:	0.51 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-2 m) and 3 (-2 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-2 m) and 3 (-2 m).
- Initial velocity of the vehicle was 114 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 78 Case Number – Stratum 063H Indicate North



Scale: 1/250

CAUSAL FACTOR; *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	5-7-93	**Weather:**	Clear
Time:	2055	**Surface Condition:**	Dry
Accident Type:	Control/Traction Loss	**Lighting:**	No
Accident Severity:	3 (A)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	28
Driver Sex:	Male
Impairment:	Fell Asleep

Vehicle Information

Year:	1969
Vehicle Make:	Mercury
Vehicle Model:	Montego

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Straight
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	105 km/h

Departure Times

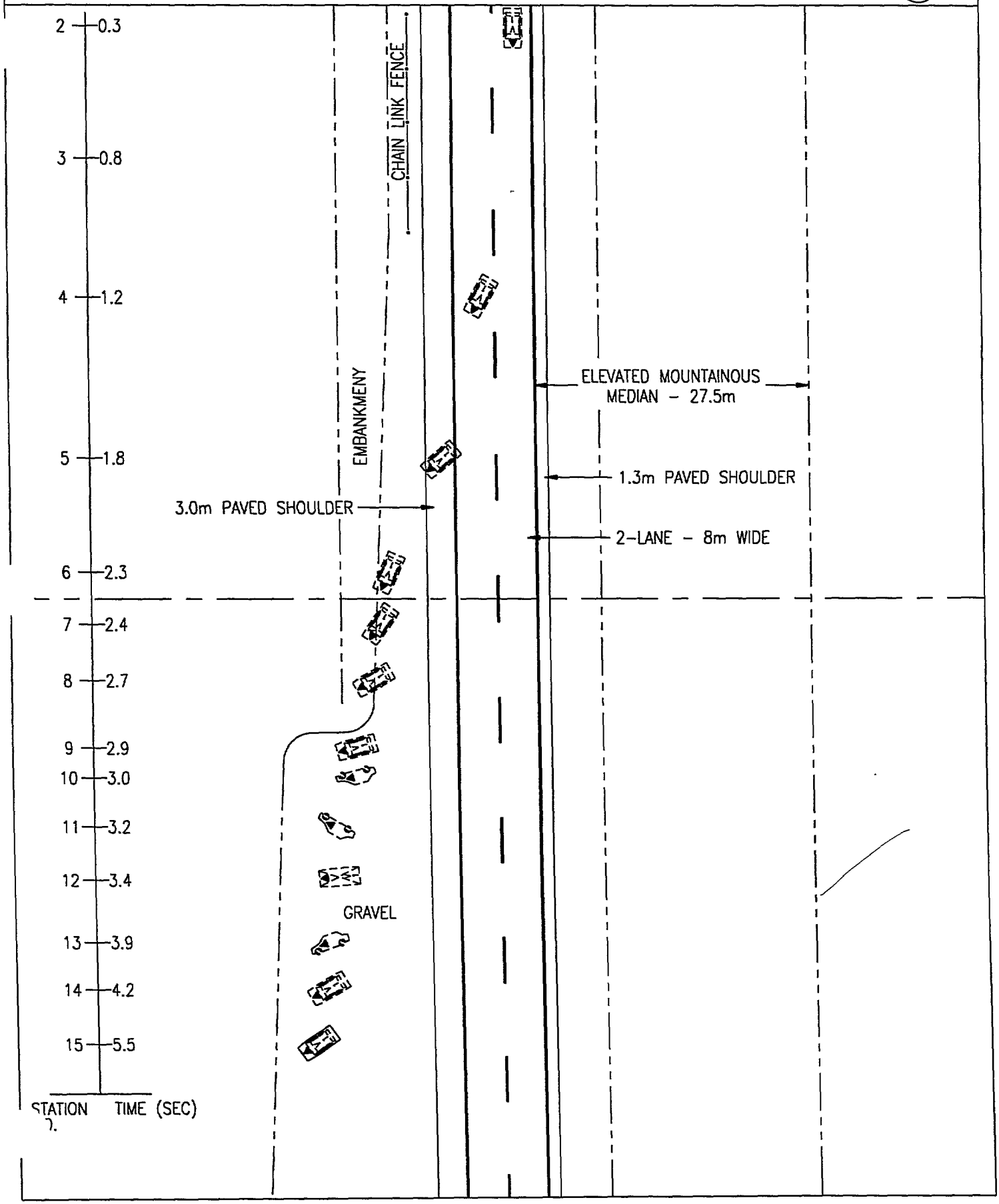
Roadway Edge:	1.62 sec	**Method:**	Straight Line Projection
Shoulder Edge:	1.85 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (- 10 m) and 4 (+ 10 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-10 m) and 5.
- Initial velocity of the vehicle was 105 km/h.
- Station 1 is 10 m behind Station 2.

ACCIDENT COLLISION DIAGRAM

PSU No. 78 Case Number – Stratum 073D Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Inattention*

ROADSIDE DEPARTURE: *Left*

General Accident Information

Date:	7-2-93	***Weather:***	Clear
Time:	1235	***Surface Condition:***	Dry
Accident Type:	Control/Traction Loss	***Lighting:***	Daylight
Accident Severity:	0 (0)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	34
Driver Sex:	Male
Impairmen t:	None

Vehicle Information

Year:	1991
Vehicle Make:	Nissan/Datsun
Vehicle Model:	200 SX/240 SX

Roadway Information

Trafficway Type (Median):	Physical barrier	**Alignment:**	Straight
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	105 km/h

Departure Times

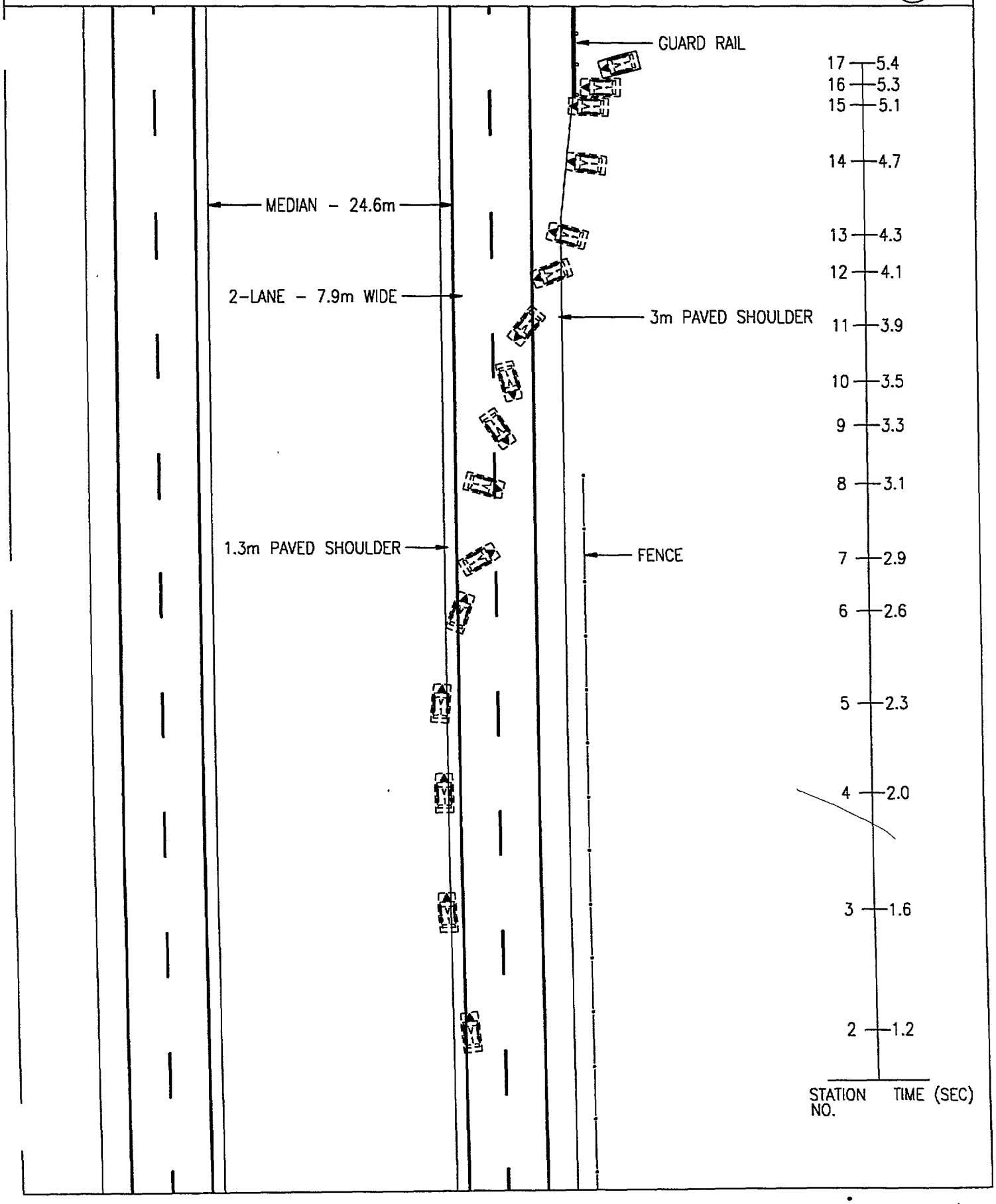
Roadway Edge:	1.17 sec	***Method***	Arc Formula Derived
Shoulder Edge:	1.67 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-34 m) and 2.
- Departure time for the shoulder edge was calculated between Stations 2 (-42 m) and 3 (-6 m).
- Initial velocity of the vehicle was 105 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 78 Case Number – Stratum 079G Indicate North



Scale: 1/500

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Fell Asleep*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	2-7-93	***Weather:***	Other (clouds)
Time:	0120	***Surface Condition:***	Wet
Accident Type:	Drive Off Road	***Lighting:***	Yes
Accident Severity:	0 (0)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	30
Driver Sex:	Male
Impairment:	Fell Asleep

Vehicle Information

Year:	1964
Vehicle Make:	Chevrolet
Vehicle Mode/:	C, K, R, V-series

Roadway Information

Trafficway Type (Median):	Flush or curb	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	7	***Speed Limit:***	56km/h

Departure Times

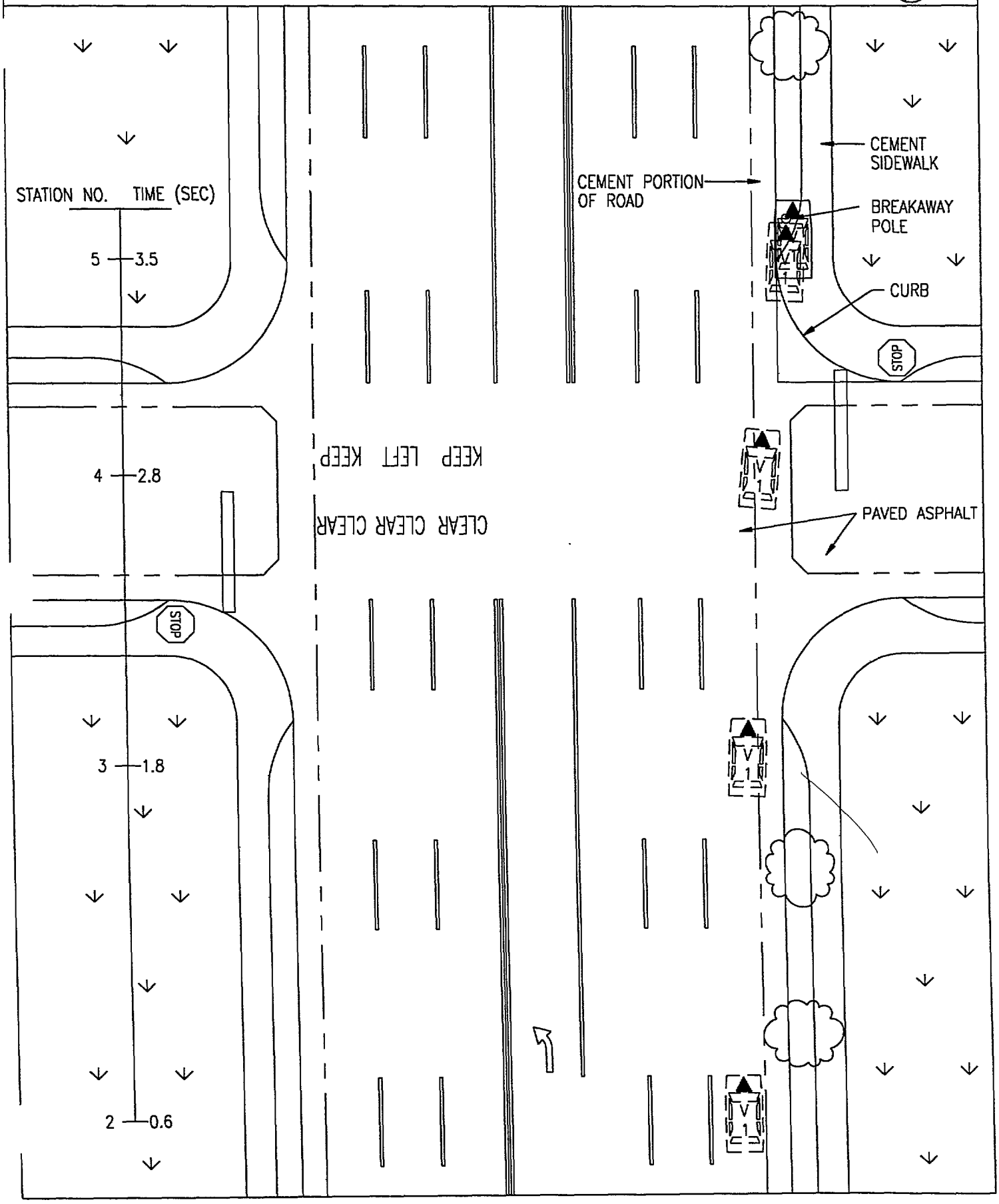
Roadway Edge:	1.53 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	3.41 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-10 m) and 3 (-5 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-13 m) and 4 (+6 m).
- Initial velocity of the vehicle was 56 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 79 Case Number – Stratum 050F Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADS/DE DEPARTURE: *Left*

General Accident Information

Date:	2-2-93	**Weather:**	Clear
Time:	2210	**Surface Condition:**	Dry
Accident Type:	Drive Off Road	**Lighting:**	No
Accident Severity:	2 (B)	**Land Use:**	Rural

Driver/Occupant Information

Driver Age:	26
Driver Sex:	Male
impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1979
Vehicle Make:	Mercury
Vehicle Model:	Cougar/XR7

Roadway Information

Trafficway Type (Median):	Not divided	**Alignment:**	Curve Right
		Slope:	Grade
No. of Lanes:	2	**Speed Limit:**	40 km/h

Departure Times

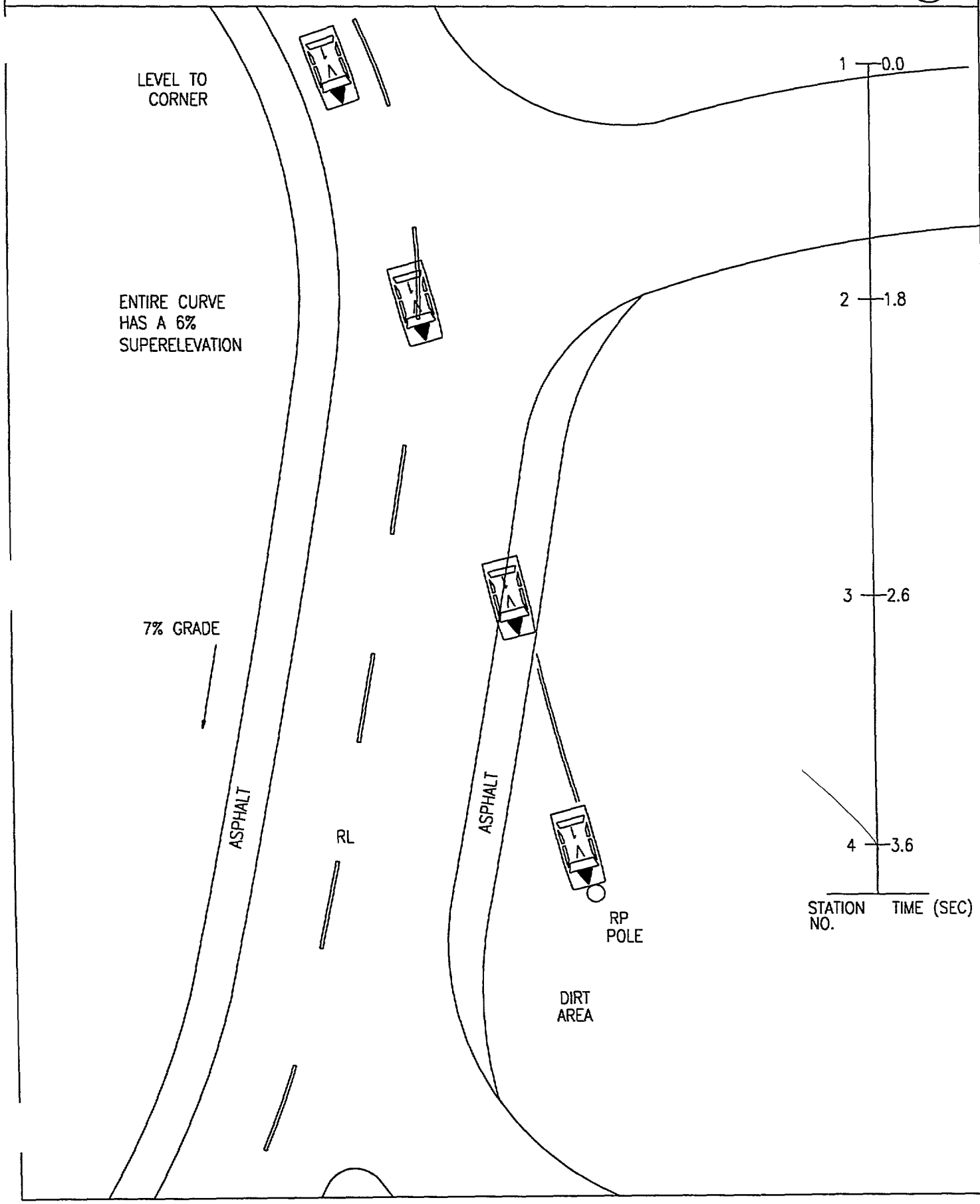
Roadway Edge:	2.20 sec	**Method:**	Straight Line Projection
Shoulder Edge:	2.65 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 3 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 1 and 3 (+l m).
- Initial velocity of the vehicle was 40 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 81 Case Number – Stratum 019F Indicate North



Scale:1/250

CAUSAL FACTOR: *Lost Directional Control*

ROADSIDE DEPARTURE: *Left*

General Accident information

Date:	l-6-93	***Weather:***	Clear
Time:	1000	***Surface Condition:***	Snow (slush/ice)
Accident Type:	Control/Traction Loss	***Lighting:***	Yes
Accident Severity:	0 (0)	***Land Use:***	Rural

Driver/Occupant information

Driver Age:	27
Driver Sex:	Male
Impairment:	None

Vehicle Information

Year:	1992
Vehicle Make:	Pontiac
Vehicle Model:	Grand Prix (FWD)

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Right
		Slope:	Level
No. of Lanes:	2	***Speed Limit:***	24 km/h

Departure Times

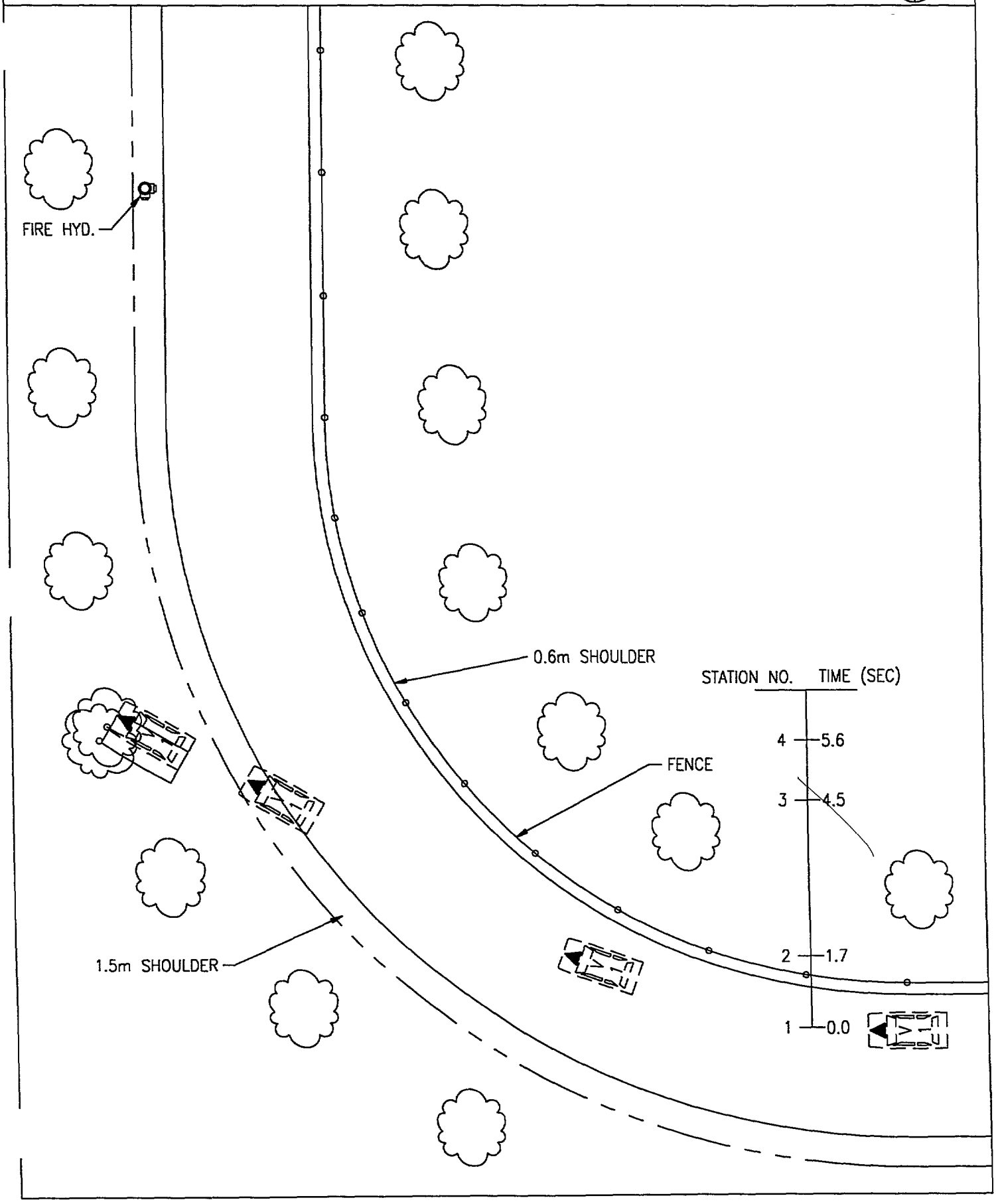
Roadway Edge:	2.76 sec	***Method:***	Straight Line Projection
Shoulder Edge:	3.51 sec		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (-4 m) and 3 (-4 m).
- Departure time for the shoulder edge was calculated between Stations 2 (-4 m) and 3 (+I m).
- Initial velocity of the vehicle was 24 km/h.

ACCIDENT COLLISION DIAGRAM

PSU No. 82 Case Number – Stratum 003G Indicate North



Scale: 1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Controi - Physical (seizure/passed out)*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	2-5-93	***Weather:***	Clear
Time:	1320	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3 (A)	***Land Use:***	Rural

Driver/Occupant Information

Driver Age:	67
Driver Sex:	Male
Impairment:	Physical (seizure/ passed out)

Vehicle Information

Year:	1971
Vehicle Make:	Nissan/Datsun
Vehicle Model:	Pickup

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Curve Left
		Slope:	Grade
No. of Lanes:	2	***Speed Limit:***	40 km/h

Departure Times

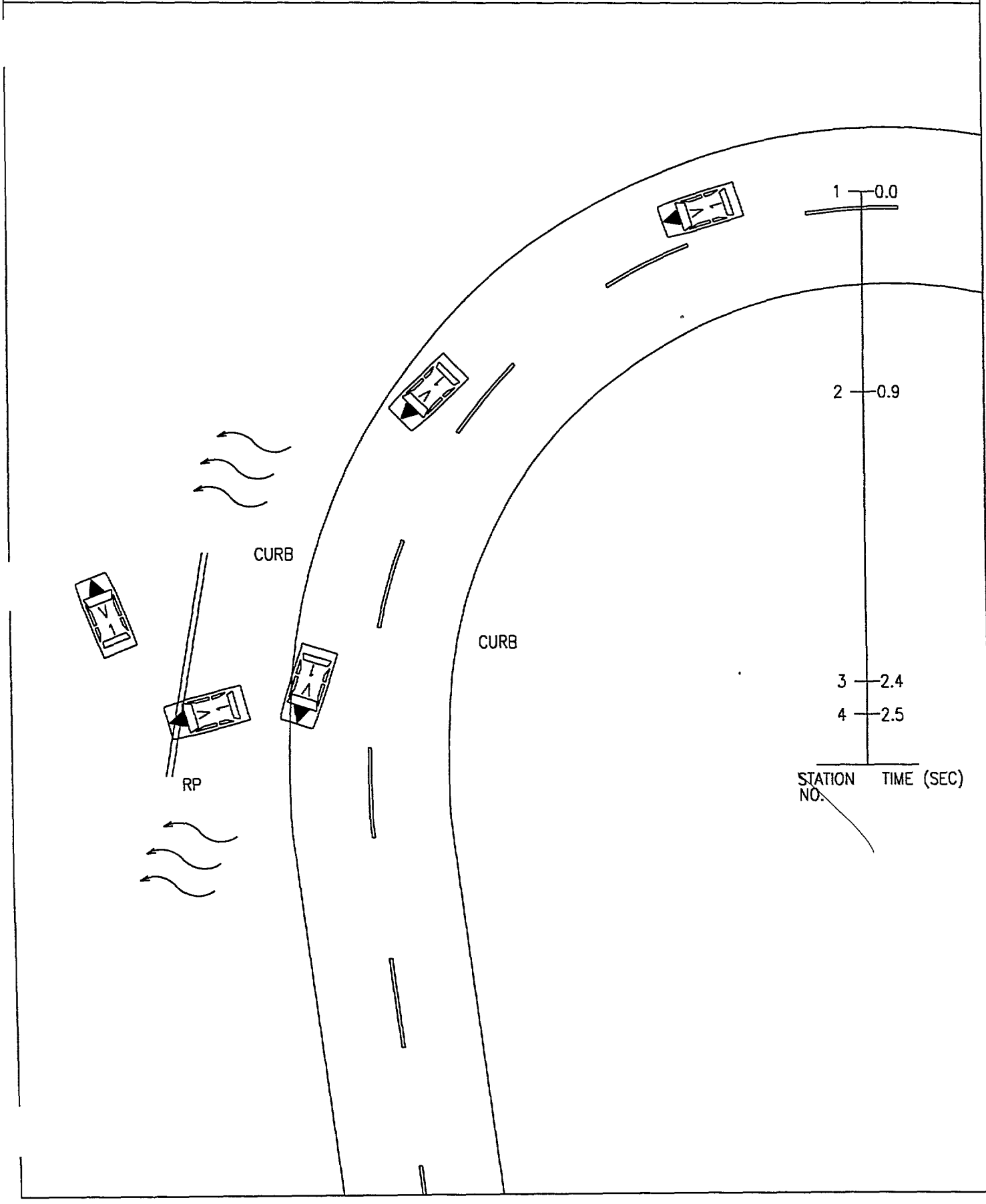
Roadway Edge:	0.71 sec	***Method:***	Arc Formula Derived
Shoulder Edge:	0.71 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 3 (-8 m) and 3.
- Departure time for the shoulder edge was calculated between Stations 3 (-8 m) and 3.
- Initial velocity of the vehicle was 40 km/h.
- Last station was omitted.

ACCIDENT COLLISION DIAGRAM

PSU No. 82 Case Number – Stratum 017K Indicate North



200

Scale:1/250

CAUSAL FACTOR: *Driver Relinquishes Steering Control - Intoxicated*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	4-l-93	**Weather:**	Rain
Time:	1809	**Surface Condition:**	Wet
Accident Type:	Control/Traction Loss	**Lighting:**	Daylight
Accident Severity:	3 (A)	**Land Use:**	Urban

Driver/Occupant Information

Driver Age:	59
Driver Sex:	Male
Impairment:	Intoxicated (alcohol/ other illicit drugs)

Vehicle Information

Year:	1986
Vehicle Make:	Chrysler
Vehicle Model:	LeBaron

Roadway Information

Trafficway Type (Median):	Flush or curb	**Alignment:**	Curve Left
		Slope:	Grade
No. of Lanes:	3	**Speed Limit:**	48 km/h

Departure Times

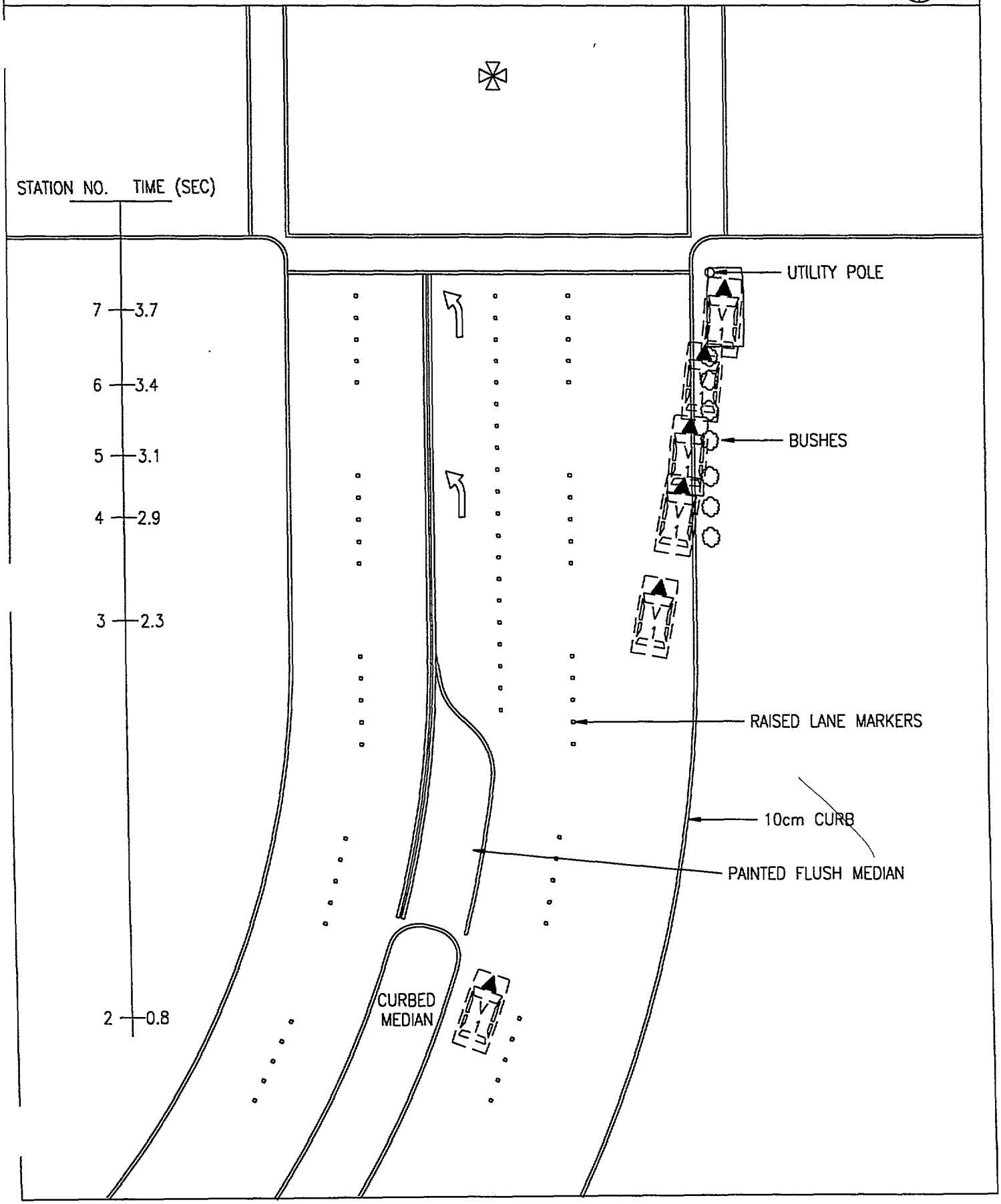
Roadway Edge:	2.93 sec	**Method:**	Arc Formula Derived
Shoulder Edge:	2.93 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 2 (- 11 m) and 4.
- Departure time for the shoulder edge was calculated between Stations 2 (-11 m) and 4.
- Initial velocity of the vehicle was 48 km/h.
- Station 1 extends beyond scope of page.

ACCIDENT COLLISION DIAGRAM

PSU No. 82 Case Number – Stratum 060K Indicate North



Scale: 1/250

CAUSAL FACTOR: *Vehicle Speed - Speed and Alcohol*

ROADSIDE DEPARTURE: *Right*

General Accident Information

Date:	6-4-93	***Weather:***	Clear
Time:	0530	***Surface Condition:***	Dry
Accident Type:	Drive Off Road	***Lighting:***	Daylight
Accident Severity:	3(A)	***Land Use:***	Urban

Driver/Occupant Information

Driver Age:	19
Driver Sex:	Male
Impairment:	Other (alcoh. consumption - BAC unknown)

Vehicle Information

Year:	1985
Vehicle Make:	Honda
Vehicle Model:	Civic/CRX

Roadway Information

Trafficway Type (Median):	Not divided	***Alignment:***	Straight
		Slope:	Level
No. of Lanes:	3	***Speed Limit:***	48 km/h

Departure Times

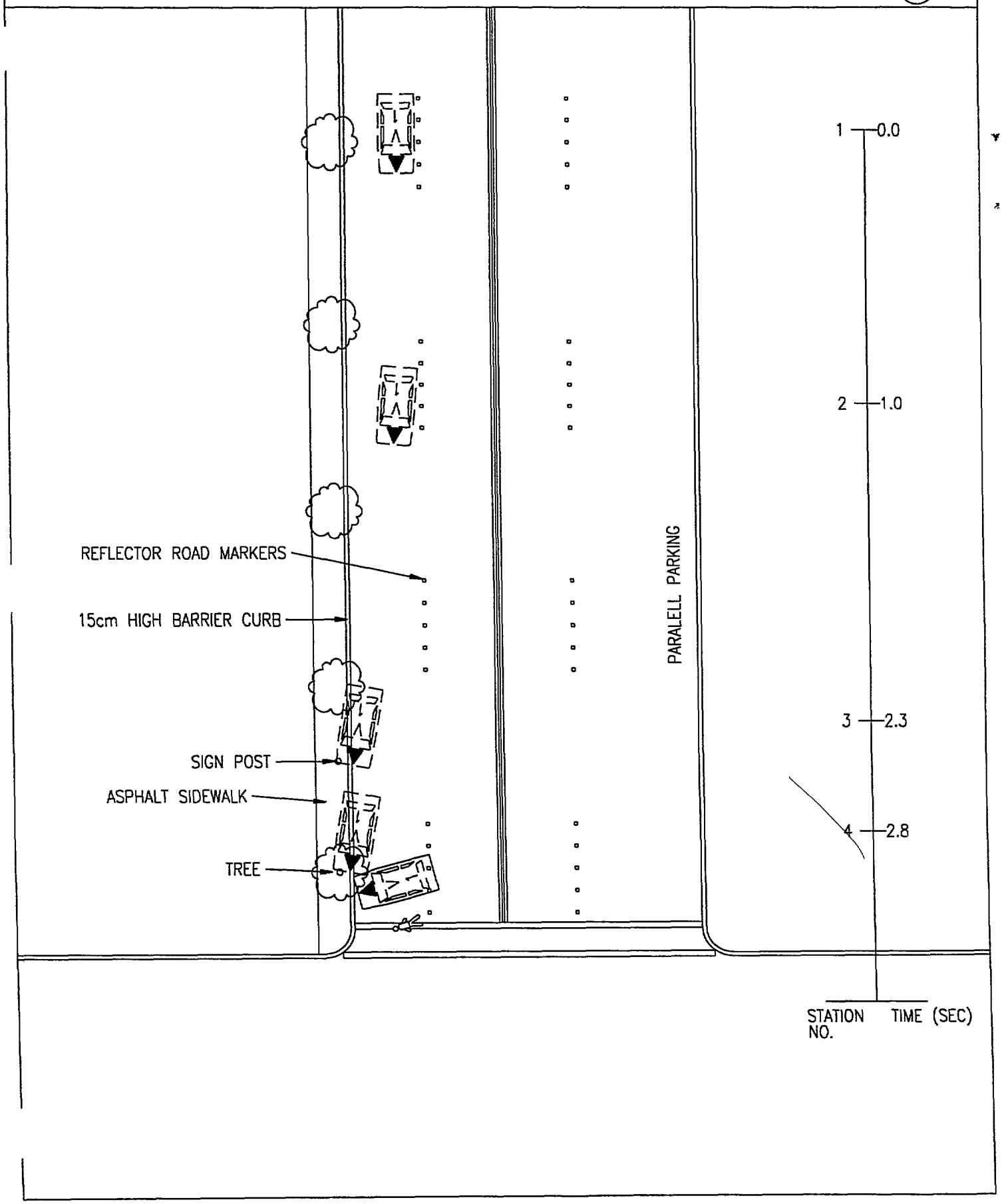
Roadway Edge:	1.53 sec	***Method***	Straight Line Projection
Shoulder Edge:	1.53 sec (no shoulder)		

Assumptions:

- Departure time for the roadway edge was calculated between Stations 1 and 3 (-10 m).
- Departure time for the shoulder edge was calculated between Stations 1 and 3 (-10 m).
- Initial velocity of the vehicle was 48 km/h.
- Last station was omitted.

ACCIDENT COLLISION DIAGRAM

PSU No. 82 Case Number – Stratum 082K Indicate North



Scale: 1/250

Description of Functional Goals

SUMMARY TABLE

Preliminary Functional Goals for a Run-Off-Road Collision Avoidance Countermeasure

Goal Number	Functional Goal Description
(1)	Monitor vehicle dynamic status
(2)	Determine geometric characteristics of upcoming roadway segment
(3)	Determine vehicle position/orientation relative to roadway
(4)	Determine driver intention
(5)	Detect degraded roadway condition
(6)	Process data to determine acceptable speed for approaching roadway segment
(7)	Detect potential for roadway departure
(8)	Present phased alarm to driver
(9)	Determine driver state
(10)	Modulate driver control input
(11)	Maintain/regain safe vehicle attitude

(1) Monitor Vehicle Dynamic Status

The countermeasure would have the ability to monitor the dynamic status of the vehicle. The dynamic status is defined as the motion and directional vector that the vehicle is experiencing at any given time. Equipment on-board the vehicle will determine vehicle speed, and accelerations along vehicle lateral and longitudinal axes. Additional equipment will monitor vehicle heading (direction that the vehicle is traveling) and the radius of curvature of the vehicle path. These functions will monitor vehicle dynamic status data during vehicle operation. This feature has potential for use in countermeasures applicable to crash types other than roadway departure crashes.

(2) Determine Geometric Characteristics of Upcoming Roadway Segment

Equipment on-board the vehicle or in the infrastructure would determine the following characteristics of the approaching roadway segment:

- Number of roadway lanes
- Lane width
- Roadway alignment (straight versus right/left curve)
- Curvature of roadway segment
- Roadway superelevation
- Presence of exits or cross streets

This information can be used by computers on-board the vehicle to assemble a situation map of the roadway segment that the vehicle is about to traverse. This function is identified as "roadway preview" and this function establishes the conditions through which the vehicle must travel. In conjunction with the first function, monitor vehicle dynamic status, computers on-board the vehicle would determine if the vehicle is traveling at a speed appropriate for the approaching roadway segment. The function of determining the presence of exits or cross streets would allow the countermeasure to infer if a potential roadway departure by the driver is a change of trafficway to an exit or cross street rather than an actual departure, Many of the informational items listed above may be included as part of an on-board map database.

(3) Determine Vehicle Position/Orientation Relative to Roadway

The countermeasure would determine the position of the vehicle within the context of the roadway on which it is traveling. The position of the vehicle would be determined with respect to the distance to the roadway segment where roadway departure may occur, such as an approaching curve. Another feature is the determination of the alignment of the vehicle's travel path in relation to the current roadway segment. This may be used by the countermeasure to monitor driver control behavior and to determine when a lane deviation is indicative of an imminent departure rather than a normal vehicle drift within the lane.

Other features that the countermeasure would have are the ability to determine the travel lane that the vehicle is occupying and the vehicle's lateral position within the lane. This information is vital to accurately determining imminent roadway/lane departure.

(4) Determine Driver Intention

The countermeasure would differentiate between a driver intention to perform a roadway departure and the following maneuvers:

- Evasive maneuver to avoid a vehicle, object, or animal in the roadway
- Turning at a cross street
- Pulling off to side of roadway (non-evasive maneuver)

The countermeasure would monitor vehicle dynamic state and driver control actions to determine intention. For example, the countermeasure may detect the vehicle proceeding to the right edge of the roadway accompanied by a deceleration. On reviewing the digital map data on-board, the countermeasure determines that a cross street is ahead at a distance of 100 feet. The countermeasure monitors the vehicle's deceleration and distance to the cross street and recognizes that the driver is slowing to perform a right turn at the cross street. Upon determining that the driver is exercising control of the vehicle, and that the vehicle is operating within a nominal range, no warning is issued.

(5) Detect Degraded Roadway Condition

The countermeasure would determine if the roadway surface is degraded by environmental factors such as water, snow, or ice. This function may be accomplished by equipment on-board the vehicle or sensors in the roadway.

(6) Process Data to Determine Acceptable Speed for Approaching Roadway Segment

The countermeasure would acquire details of the configuration of the approaching roadway segment, the condition of the roadway, and the dynamic state of the vehicle and determine an acceptable travel velocity for this segment. As the vehicle approaches the segment, the countermeasure would monitor any change in dynamic state to determine if the vehicle is responding to the roadway configuration and conditions. If the driver does not respond to the configuration and conditions, an alert would be issued.

(7) Detect Potential for Roadway Departure

The countermeasure would process the following data to determine the potential for the vehicle to depart the roadway and to determine the immediacy of the impending departure.

- Roadway configuration
- Vehicle position on roadway
- Vehicle path
- Vehicle dynamic state
- Driver intention

(8) Present Phased Alarm to Driver

The countermeasure would determine the immediacy of the impending roadway departure and present a phased alarm to the driver. The intensity level of individual steps in the alarm sequence would be based upon the system's estimate of the remaining time to departure. These intensity levels may be summarized as follows:

- *Passive Alert*

Audio or visual message to the driver providing an alert of potential roadway departure. The message could be provided through either medium or through a combination of both mediums where the second medium is used to reinforce the alert provided by the first medium. For example, an audio alert could be reinforced by a redundant message conveyed as a visual cue projected to a heads-up display. Both message forms would be accompanied by indication of appropriate driver response (e.g., steer in a particular direction).

- *Haptic Warning*

In this modality, the warning is conveyed through excitation of the driver's seat, excitation of vehicle controls, and/or by increasing the force levels required to operate vehicle controls. Potential examples include shaking of the driver's seat, shaking of the steering wheel, vibration of the brake/accelerator pedals, and/or increasing the force levels required to turn the steering wheel/depress the accelerator pedal. Haptic warnings are likely to be very effective in cases associated with the Driver Inattention causal factor.

- *Active Warning*

In this warning modality, the countermeasure provides momentary intervention control inputs to primary vehicle controls (e.g., steering, brakes, and throttle). This warning intensity level would be utilized in circumstances where no response is received from the driver with respect to initial alerts/warnings and the threat of roadway departure is imminent. The inputs provided by the countermeasure are limited in time duration and are intended merely guide the driver in maintaining/regaining vehicle control.

(9) Determine Driver State

The countermeasure would monitor the behavior that the driver exhibits in controlling the vehicle. These behaviors are manifested in the way in which the driver normally initiates steering, braking, and throttle inputs, or in the resulting vehicle behavior. For example, the system may monitor the driver's behavior by determining the current position of the vehicle in the travel lane and comparing this position to the driver's normal or preferred position. Deviations from the normal pattern of behavior exhibited by the driver can indicate an altered driver state.

(10) Modulate Driver Control Input

The countermeasure would determine appropriate ranges of driver control inputs for functions such as steering, braking, and throttle. This function, when applied to the steering, can assist the driver by modulating the steering that may be initiated to regain control after an evasive maneuver. In the aerospace industry, this is termed "pilot induced oscillation", where a pilot's input to the control stick leads to a series of increasing magnitude oscillations. In this application, the countermeasure would utilize other available data such as the position of the vehicle on the roadway, configuration of the approaching roadway segment, and driver intention to determine if the control input is appropriate. This input may be to the steering wheel, brake pedal, or accelerator pedal. The countermeasure would determine if the input is within a range of acceptable inputs and either modulate the input to damp unwanted actions or amplify the input to prevent the crash. An example of this modulation is the driver initiating a large steering input while the vehicle is traveling at 65 mph. The countermeasure, sensing the input, would determine the consequences of this input at the given travel velocity. If the countermeasure determines that the input is excessive, it would limit the magnitude of the input or increase the time duration over which the input is produced.

(11) Maintain/Regain Safe Vehicle Attitude

The countermeasure would recover a "safe" vehicle attitude by active control of vehicle control functions If no response is received with respect to initial warning forms, the countermeasure would assume steering, braking, and throttle control. The countermeasure would control vehicle dynamic state and attitude until the driver exercises control over vehicle functions, or if the driver does not exercise control, the countermeasure maintains vehicle control to regain a "safe" attitude. Once a safe attitude is attained, the countermeasure would slow the vehicle and guide it to the side of the road. Again, this function would only be exercised if there is no driver response to warnings.