

If a vision disability is preventing you from reading the following document,
call the Department of Public Works at (603)528-6379 for assistance.

CARTOGRAPHIC ASSOCIATES, INC.

CONTROL REPORT
GPS SURVEY
FOR THE CITY OF
LACONIA, NEW HAMPSHIRE
MAPPING PROJECT

PREPARED FOR:
CARTOGRAPHIC ASSOCIATES, INC.
11 PLEASANT STREET
P.O. BOX 267
LITTLETON, NEW HAMPSHIRE 03561-0267
800-322-4540
www.cai-info.com

PREPARED BY
COSTELLO, LOMASNEY & DE NAPOLI, INC.
CONSULTING ENGINEERS
MANCHESTER, NH

Contract between City of Laconia and Cartographic Associates, Inc.
Supplement A

As referenced in Section 1. CONTRACTING OF THE CONTRACTOR ; SERVICES TO BE RENDERED., the following modifications, selections, additions, or deletions are made to the CAI Proposal dated February 25, 1998:

1. The "Basic Product" is the chosen alternative, photo scale at 1"=500', mapping scale at 1"=50' and 1"=100' as indicated.
2. Page 3, Item 2 - Along with complete sets of blue line prints bound in durable books CAI will provide the City with one set of 24" x 36" mylars and a set of paper prints reduced to 11" x 17".
3. Page 3, Items 3 and 4 - the street and index map shall be produced at a 1"=1,000' scale. The index map shall be adjusted to an appropriate even number scale to fit a 24" x 36" sheet format for inclusion with tax map books.
4. Page 5, V. - CAI and the City shall develop a specific schedule for the delivery and return of check plots for the planimetric mapping and tax map sheets.
5. Page 6, Section 4. - All subcontractors, including those of ADM shall be listed and proof of insurance provided in the required amounts.
6. Page 9, Options - The City may decide to delete the GPS locationing of any features at a later date.
7. Page 11, Section 1.2 - Ownership status of each parcel shall be as of April 1, 1999 and delivery of final maps on or before April 30, 1999.
8. Page 11, Section 2.1 - Office space will be provided on an as-needed and as-available basis. It is assumed that the City will accommodate CAI, however, space will not be dedicated.
9. Page 13, Section 3.8 - Certificate of calibration for the camera is required.
10. Page 14, Section 3.13 - Delete delivery of rectified photos. Also the City will not require photo enlargements.
11. Page 15, Section 4.1.1. - Differential leveling will not be required. Elevations will be obtained by GPS. A minimum of five well spaced NHDOT permanent benchmarks, (if able to be occupied) will be tied into by GPS to insure vertical accuracy to ± 2 centimeters. Monumentation - The City will work with CAI to determine sites for permanent monuments. The city shall be responsible for the cost of purchasing and setting granite bounds. The purpose is to achieve as many permanent monuments as possible while maintaining the integrity of desired photo control.
12. Generated digital files for the horizontal and vertical survey including raw GPS data and adjustment files will be a deliverable item and will be reviewed by the NHDOT Geodetic Section to ensure accuracy's are met.
13. Page 16, 4.2.4 - Final coordinate listing in NAD 1983, 1996 adjustment, Vertical elevations in NAVD88.
14. Page 22, Section 7.1 - Sheet formats will be approved by the City.
15. Page 28, Section 8 - Parcel numbering will be as approved by the City.
16. Page 29, Section 9.2 - All database files shall be submitted in Microsoft Access.
17. Page 33, Section 13.2 - Both parties agree that no licensing agreement will be required.
18. Page 33, Section 14 - The following deliverables will be included at no charge: 1) ward and zoning district layers shall be provided at the 1"=1,000' scale, 2) a street number layer will be added to the base map, and 3) if water levels permit, the contour of the mean high water level as determined by the Water Resources Bureau of the NH Dept. of Environmental Services for Lake Winnepesaukee, Lake Opechee, Paugus Bay and Lake Winnisquam shall be a layer of the base map.

LACONIA, NEW HAMPSHIRE

GPS GROUND CONTROL SURVEY FOR PHOTOGRAMMETRICALLY- PRODUCED TOPOGRAPHIC MAPPING

SCOPE OF SURVEY PROJECT

This surveying assignment included the establishment of horizontal coordinates and elevations for twenty-two permanent monumented control points, identified as LAC-I through LAC-22, and temporary points for photo control, identified as LAC-101 through LAC-146. The points were pre-targeted.

SURVEY DATE

April 21 through April 24, 1998.

HARDWARE/SOFTWARE/OPERATIONAL MODE

Hardware

4 - Leica System 300 dual frequency sensors.

Software

Leica SKI software package (Ver. 2.1).

Operational Mode

Static observation of a minimum of four satellites simultaneously.

HORIZONTAL/VERTICAL CONTROLS UTILIZED

For horizontal controls, the survey was based on three HARN (NAD83/96) points designated by the New Hampshire Department of Transportation (NHDOT) and the National Geodetic Survey (NGS) as stations 307-0460, 329-0220 & CONCORD BASE STATION (a/k/a NHDOT BASE) located in Milton, New Hampton and Concord, respectively. Station NHDOT BASE is a continuously operating base receiver located on the John O. Morton building in Concord and is maintained by the NHDOT. Vertical control was based on five known stations in and around the City of Laconia. These vertical stations are published by the NHDOT on the National Geodetic Vertical Datum of 1929 (NGVD29) and were converted to the North American Vertical Datum of 1988 (NAVD88) by a NGS conversion program named Vertcon. It should be noted that the NAVD88 datum is approximately 0.43 feet lower than NGVD29 within the surveyed area.

Information provided by the New Hampshire Department of Transportation and the National Geodetic Survey on these control points is included in Appendix A of this report.

DISCUSSION OF SURVEY

This GPS control survey is a three network design and was performed utilizing the static operational mode with 15° elevation mask. The following briefly outlines the three networks:

- Network 1 consisted of three HARN points and points LAC-2, LAC-12, LAC-18 & LAC-21 with three hour sessions and 10 sec. recording rate for establishment of horizontal control based on the HARN datum.
- Network 2 consisted of points LAC-1 through LAC-22, 329-0220 & 295-0070 with forty five minute sessions and 5 sec. recording rate for establishment of horizontal and vertical control for twenty two permanently monumented control points.
- Network 3 consisted of points LAC-101 through LAC-146 with twenty five minute sessions and 5 sec. recording rate for establishment of horizontal and vertical control for photo control points.

Network design configurations are included in Appendix C of this report.

Eight published vertical points were initially observed during Network 2 sessions. Three of the eight vertical points did not fit the network adjustment. These vertical differences are tabulated and included in Appendix C of this report. Geoid 96 was used to obtain the orthometric heights for the vertical values tabulated in the Horizontal and Vertical Control sheet also included in Appendix C of this report.

APPENDIX A

**NATIONAL GEODETIC SURVEY AND
NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION**

CONTROL POINT DATA SHEETS

NEW HAMPTON

National Geodetic Survey, Retrieval Date = SEPTEMBER 3, 1997
FBN - This is a Candidate for Federal Base Network Control.

DESIGNATION - 329 0220 PID - OC2812
STATE/COUNTY- NH/BELKNAP USGS QUAD - WINNISQUAM LAKE (1987)

CURRENT SURVEY CONTROL

NAD 83(1996)-	43 37 20.78355(N)	071 36 09.93845(W)	ADJUSTED
NAVD 88	- 180.3 (meters)	592. (feet)	GPS OBS

X	-	1,459,548.098 (meters)	COMP
Y	-	-4,388,269.387 (meters)	COMP
Z	-	4,377,924.956 (meters)	COMP
LAPLACE CORR	-	-0.51 (seconds)	DEFLEC96
ELLIP HEIGHT	-	153.00 (meters)	GPS OBS
GEOID HEIGHT	-	-27.30 (meters)	GEOID96

← OBTAINED FROM NHDOT 4/98

HORZ ORDER - B
ELLIP ORDER - FIRST CLASS I

ORTHO HEIGHT = 180.457m (NGVD29)

The horizontal coordinates were established by GPS observations and adjusted by the National Geodetic Survey in July 1997.

The orthometric height was determined by GPS observations.

The X, Y, and Z were computed from the position and the ellipsoidal ht.

The Laplace correction was computed from DEFLEC96 derived deflections.

The ellipsoidal height was determined by GPS observations and is referenced to NAD 83.

The geoid height was determined by GEOID96.

	North	East	Units	Scale	Converg.
SPC NH	- 124,694.087	305,157.876	MT	0.99996699	+0 02 38.7
UTM 19	- 4,833,231.275	290,003.666	MT	1.00014245	-1 47 46.7

SUPERSEDED SURVEY CONTROL

NAD 83(1986)- 43 37 20.78960(N) 071 36 09.94015(W) ADJUSTED

Superseded values are not recommended for survey control. NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums. See file format.dat to determine how the superseded data were derived.

MARKER: DD = SURVEY DISK

SETTING: 66 = SET IN ROCK OUTCROP

STAMPING: 329 0220

STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD POSITION/ELEVATION WELL

SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR SATELLITE OBSERVATIONS - October 13, 1992

HISTORY	- Date	Condition	Recov. By
HISTORY	- 1990	MONUMENTED	NHDOT

HISTORY - 19921013 GOOD

NGS

STATION DESCRIPTION

DESCRIBED BY NATIONAL GEODETIC SURVEY 1992

THE STATION IS LOCATED ABOUT 7.7 KM (4.80 MI) NORTH FROM NORTH SANBORN, 6.0 KM (3.70 MI) WEST FROM MERIDITH CENTER, 1.1 KM (0.70 MI) WEST FROM THE MEREDITH/NEW HAMPTON TOWN LINE AND IN NEW HAMPTON. OWNERSHIP--STATE RIGHT-OF-WAY.

TO REACH THE STATION FROM THE STATE ROUTE 104 BRIDGE OVER THE PEMIGEWASSET RIVER AT THE BRISTOL/NEW HAMPTON TOWN LINE, GO EAST FOR 1.85 KM (1.15 MI) ON ROUTE 104 TO THE I-93 OVERPASS BRIDGE. CONTINUE STRAIGHT AHEAD AND GO EAST FOR 3.8 KM (2.35 MI) ON ROUTE 104 TO SMITTYS PLACE RESTAURANT AND THE STATION ON THE RIGHT.

THE STATION IS A STANDARD NHDOT DISK STAMPED--329 0220--, SET INTO THE TOP OF A 13-FT X 40-FT LEDGE OUTCROP FLUSH WITH THE GROUND AND 1.0 M (3.3 FT) ABOVE THE HIGHWAY. 11.3 M (37.1 FT) SOUTH FROM THE CENTER OF THE HIGHWAY, 10.2 M (33.5 FT) EAST FROM THE EAST EDGE OF THE ASPHALT ENTRANCE TO THE RESTAURANT, 33.5 M (109.9 FT) WEST FROM POWER POLE NH COOP/125/79/4/85-1/NET, AND 22.9 M (75.1 FT) NORTHEAST FROM THE NORTHWEST CORNER OF THE RESTAURANT.

MILTON

National Geodetic Survey, Retrieval Date = SEPTEMBER 3, 1997

CBN - This is a Cooperative Base Network Control Station.

DESIGNATION - 307 0460

PID - OC2811

STATE/COUNTY- NH/STRAFFORD

USGS QUAD - MILTON (1984)

CURRENT SURVEY CONTROL

NAD 83(1996)-	43 27 30.67087(N)	070 59 38.82114(W)	ADJUSTED
NAVD 88 -	169.7 (meters)	557. (feet)	GPS OBS

X	- 1,510,164.117	(meters)	COMP
Y	- 4,384,372.582	(meters)	COMP
Z	- 4,364,715.911	(meters)	COMP
LAPLACE CORR	- 1.54	(seconds)	DEFLEC96
ELLIP HEIGHT	- 142.79	(meters)	GPS OBS
GEOID HEIGHT	- 26.82	(meters)	GEOID96

HORZ ORDER - B

ELLIP ORDER - FIRST CLASS I

The horizontal coordinates were established by GPS observations and adjusted by the National Geodetic Survey in July 1997.

The orthometric height was determined by GPS observations.

The X, Y, and Z were computed from the position and the ellipsoidal ht.

The Laplace correction was computed from DEFLEC96 derived deflections.

The ellipsoidal height was determined by GPS observations and is referenced to NAD 83.

The geoid height was determined by GEOID96.

	North	East	Units	Scale	Converg.
SPC NH	- 106,700.372	354,429.063	MT	1.00000309	+0 27 45.4
SPC ME W	- 69,785.735	833,034.873	MT	1.00002181	-0 34 09.0
UTM 19	- 4,813,666.072	338,674.824	MT	0.99992014	-1 22 18.9

SUPERSEDED SURVEY CONTROL

NAD 83(1986)- 43 27 30.67625(N) 070 59 38.82610(W) ADJUSTED

Superseded values are not recommended for survey control. NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums. See file format.dat to determine how the superseded data were derived.

MARKER: DD = SURVEY DISK

SETTING: 0 = UNSPECIFIED SETTING

STAMPING: 307 0460

STABILITY: D = MARK OF QUESTIONABLE OR UNKNOWN STABILITY

SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR SATELLITE OBSERVATIONS - July 06, 1992

HISTORY	- Date	Condition	Recov. By
HISTORY	- 1989	MONUMENTED	NHDOT

STA 307.0460

HISTORY	- 19891001	GOOD	NHDOT
HISTORY	- 19920706	GOOD	

STATION DESCRIPTION

DESCRIBED BY NH DEPT OF TRANSP 1989

THE STATION IS LOCATED IN MILTON, 2.7 KM (1.65 MI) WEST OF THE MAINE/NEW HAMPSHIRE STATE LINE, 2.3 KM (1.40 MI) SOUTH OF LASKEY CORNER, AND 16.5 KM (10.25 MI) NORTH OF ROCHESTER. OWNERSHIP-- STATE RIGHT-OF-WAY.

TO REACH THE STATION FROM THE JUNCTION OF STATE ROUTE 11 AND THE SPAULDING TURNPIKE (ROUTE 16) IN ROCHESTER, GO NORTH FOR 6.6 KM (4.10 MI) ON THE TURNPIKE TO THE ROCHESTER/MILTON TOWN LINE. CONTINUE STRAIGHT AHEAD AND GO NORTH FOR 9.2 KM (5.70 MI) ON THE TURNPIKE TO THE BRIDGE OVER THE RAILROAD TRACKS. CONTINUE STRAIGHT AHEAD AND GO NORTH FOR 0.9 KM (0.55 MI) ON THE TURNPIKE TO THE STATION ON THE RIGHT.

THE STATION IS A STANDARD NHDPWH DISK STAMPED---307 0460---, SET INTO THE TOP OF A 4.5-FT LONG, 15-CM SQUARE GRANITE MONUMENT FLUSH WITH THE GROUND. 10.7 M (35.1 FT) EAST FROM THE EAST EDGE OF PAVEMENT OF THE TURNPIKE, 39.3 M (128.9 FT) WEST FROM THE STATE RIGHT-OF-WAY FENCE, 69.5 M (228.0 FT) NORTH FROM A STONE HEADWALL ON THE EAST SIDE OF THE TURNPIKE, 11.0 M (36.1 FT) NORTH-NORTHWEST FROM THE CENTER OF A SMALL CLUMP OF TREES, AND 79.6 M (261.2 FT) SOUTH FROM THE WEST END OF A STONE WALL AT THE WOODS LINE.

STATION RECOVERY (1992)

RECOVERED IN GOOD CONDITION.

CONCORD

* National Geodetic Survey, Retrieval Date = NOVEMBER 5, 1997 *

DESIGNATION - CONCORD BASE STATION
STATE/COUNTY- NH/MERRIMACK

PID - AD9917
USGS QUAD - CONCORD (1985)

CURRENT SURVEY CONTROL

NAD 83(1996)	- 43 12 47.12517(N)	71 31 11.61419(W)	ADJUSTED
NAVD 88	- 114.8 (meters)	377. (feet)	GPS OBS
NAVD 88	- 114.64 (meters)	376.11 (feet)	NHDOT LEVELS
X	- 1,475,786.547 (meters)		COMP
Y	- 4,415,755.490 (meters)		COMP
Z	- 4,344,844.917 (meters)		COMP
LAPLACE CORR-	2.55 (seconds)		DEFLEC96
ELLIP HEIGHT -	87.21 (meters)		GPS OBS
GEOID HEIGHT -	-27.42 (meters)		GEOID96

HORZ ORDER - A

ELLIP ORDER - SECOND CLASS I

	North	East	Units	Scale	Converg.
SPC NH	- 79,224.982	311,926.243	MT	0.99996842	+0 06 01.8
UTM 19	- 4,787,561.535	295,314.668	MT	1.00011541	-1 43 33.6

SUPERSEDED SURVEY CONTROL:

NAD 83(1986)	- 43 12 47.1360(N)	071 31 11.6159(W)	NHDOT
NGVD 29	- 114.82 (meters)	376.72 (feet)	NHDOT

The horizontal coordinates were established by GPS observations and adjusted by the National Geodetic Survey in July 1997.

This is a SPECIAL STATUS position. See SPECIAL STATUS under the DATUM ITEM on the data sheet items page.

The orthometric height was determined by GPS observations.

Additional leveling data from the NHDOT was used to determine NAVD88 height.

The X, Y, and Z were computed from the position and the ellipsoidal ht.

The Laplace correction was computed from DEFLEC96 derived deflections.

The ellipsoidal height was determined by GPS observations and is referenced to NAD 83.

The geoid height was determined by GEOID96.

STABILITY: A = MOST RELIABLE AND EXPECTED TO HOLD POSITION/ELEVATION WELL

HISTORY - 1996 MONUMENTED BY NHDOT

STATION DESCRIPTION:

DESCRIBED BY NH DOT, 1996 (KLH)

THE STATION IS LOCATED ON THE JOHN O MORTON BUILDING AT 1 HAZEN DRIVE, CONCORD, NH 03302. THE STATION IS THE TOP CENTER OF A 5/8-INCH BOLT WELDED TO THE TOP OF A HEAVY METAL BRACKET PERMANENTLY MOUNTED TO THE NORTHEAST FACE OF THE BRICK ELEVATOR SHAFT OF THE BUILDING. A TRIMBLE GEODETIC L1/L2 ANTENNA WITH GROUND PLANE ON A 4.00-FOOT POLE IS ATTACHED TO THE BRACKET. FOR ADDITIONAL INFORMATION CONTACT THE NEW HAMPSHIRE GEODETIC SURVEY SECTION, NHDOT, PO BOX 483, CONCORD, NH 03302. PHONE 603-271-1600.

03/25/98

NH DEPARTMENT OF TRANSPORTATION - GEODETIC CONTROL DATABASE

NAD83/86 COORDINATE SYSTEM - NGVD29 VERTICAL DATUM

PHONE: 603-271-1600 P.O. BOX 483, CONCORD, NH 03302

TOWN NAME: GILFORD

TOWN NUMBER: 169

UNITS: METERS

STATION	SEQ	LATITUDE	LONGITUDE	NORTHING	EASTING	HORZ DATA Ord. Agn	HEIGHT VERT. DATA Ord. Type	GEOID HEIGHT	M C
AG 15	0	43°34'20.80879"	71°21'20.40574"	119184.841	325121.593	31 NHDOT	159.620 50 TRIG	-27.567	X
J 4 1933	0	43°34'19"	71°25'21"	119110	319720	0	157.724 21 DIFF		X
J 4 RESET 1958	0	43°34'19"	71°25'21"	119110	319720	0	158.625 21 DIFF		N
741 RESET 1964	10	43°32'51"	71°24'30"	116410	320890	0	225.538 31 DIFF		X
L 4 1933	20	43°34'31"	71°20'58"	119500	325620	0	157.816 11 DIFF		G
DG 46	30	43°33' 0.55915"	71°26'58.22135"	116684.167	317548.111	41 MON-N	227.988 21 DIFF	-27.620	G
DG 47	40	43°32'57.24655"	71°26'45.34481"	116582.698	317837.415	41 MON-N	254.872 21 DIFF	-27.616	G
DG 57	50	43°31'17.69714"	71°26'35.15373"	113511.117	318074.428	41 MON-N	230.861 21 DIFF	-27.587	G
D3 56	60	43°31'24.72862"	71°26'33.18351"	113728.234	318118.089	41 MON-N	229.692 31 DIFF	-27.588	G
K 4 1933	70	43°35' 4"	71°23'19"	120510	322460	0	158.535 11 DIFF		G
SKS 20 USGS 1954	80	43°33'58"	71°25'58"	0	0	0	0.000 0		?
SKS 21 USGS 1954	90	43°31' 3"	71°24'50"	0	0	0	0.000 0		?
AG 14	100	43°33'31.51048"	71°19'39.67220"	117672.276	327388.069	31 NHDOT	159.834 31 DIFF	-27.544	X
AG 15 RESET	110	43°34'20.59990"	71°21'18.13043"	119178.596	325172.671	21 NHDOT	159.064 21 DIFF	-27.567	G
AG 16	120	43°34'23.64364"	71°21'28.98515"	119271.611	324928.762	31 NHDOT	157.746 31 DIFF	-27.569	N
AG 17	130	43°34'51.04488"	71°23'18.79917"	120108.550	322461.943	31 NHDOT	177.126 31 DIFF	-27.600	X
AG 18	140	43°34'45.84724"	71°23'46.44975"	119946.098	321842.124	31 NHDOT	156.255 31 DIFF	-27.603	X
AG 19	150	43°34'34.64920"	71°24'11.44097"	119598.712	321282.528	21 NHDOT	157.457 21 DIFF	-27.604	G
LCI AP STA C 1974	160	43°34'33.21936"	71°24'35.59876"	119552.889	320740.643	21 NHDOT	157.117 21 DIFF	-27.609	G
LCI AP STA A-2 197	170	43°34'12.42140"	71°25'44.82210"	118906.420	319189.320	40 NOS	166.000 50 TRIG		?
MART TOWER	180	43°33'57.42474"	71°25'44.95303"	118443.598	319187.708	44 NHDOT	190.000 99 MAP	-27.614	G
LCI AP STA L 1965	190	43°33'20.90060"	71°24'49.70091"	117320.079	320431.024	30 NGS	296.600 50 TRIG	-27.584	X
LCI AP ARP 1965	200	43°34'25.41607"	71°25'20.15813"	119309.056	319741.579	30 NGS	163.874 20 DIFF	-27.611	G
LCI AP STA A 1965	210	43°34' 2"	71°25'40"	118580	319300	0	165.791 20 DIFF		X
LCI AP STA J 1965	220	43°35'16.76424"	71°25'16.29386"	120893.979	319823.604	30 NGS	193.300 50 TRIG	-27.630	G
AIRPORT BCN LACONI	230	43°34' 5.58638"	71°25'30.24933"	118696.426	319516.935	40 NGS	0.000 0	-27.613	G
DG 43 1961	240	43°33'46.67840"	71°26'30.55035"	118109.108	318165.377	30 NGS	158.538 31 DIFF	-27.624	X
DG 44 1961 →	250	43°33'53.28588"	71°26'15.63888"	118313.936	318499.453	30 NGS	163.748 31 DIFF	-27.622	G
GUNSTOCK 1860	260	43°31' 4.05086"	71°22' 9.55110"	113108.652	324040.573	10 NHDOT	726.229 40 GPS	-27.513	G
GUNSTOCK 1860 ECC	270	43°31' 4.63809"	71°22' 9.69521"	113126.763	324037.271	21 NHDOT	725.830 50 TRIG	-27.513	G
MT BELKNAP LOT 195	280	43°31' 4.60235"	71°22' 9.71162"	113125.659	324036.907	40 NGS	730.000 99 MAP	-27.513	G
B 44 1965	290	43°33'53"	71°26' 3"	118310	318780	0	164.812 20 DIFF		G
169-0300	300	43°33'59.97871"	71°20'20.17961"	118547.193	326475.489	21 NHDOT	187.940 21 DIFF	-27.554	G
169-0310	310	43°34' 7.00624"	71°20'33.34682"	118762.912	326179.168	21 NHDOT	191.198 21 DIFF	-27.558	G
169-0320	320	43°34'11.60536"	71°20'48.39302"	118903.539	325840.991	21 NHDOT	188.992 21 DIFF	-27.561	G
169-0330	330	43°34'16.93544"	71°20'55.29530"	119067.437	325685.481	21 NHDOT	182.181 21 DIFF	-27.563	G
169-0340	340	43°34'25.14686"	71°21'39.75024"	119317.110	324687.046	21 NHDOT	190.506 21 DIFF	-27.571	G
169-0350	350	43°31'43.71585"	71°20'18.21504"	114342.151	326536.174	21 NHDOT	340.042 31 DIFF	-27.515	G
169-0360	360	43°31'45.53899"	71°20'29.12631"	114397.452	326290.949	21 NHDOT	347.473 31 DIFF	-27.516	G
169-0370	370	43°32'20.52418"	71°20'53.12593"	115475.044	325747.923	21 NHDOT	334.494 31 DIFF	-27.527	G
169-0380	380	43°32'29.97379"	71°20'57.77996"	115766.269	325642.325	21 NHDOT	328.221 31 DIFF	-27.530	G
169-0390	390	43°32'55.80057"	71°21'24.71873"	116561.031	325034.593	21 NHDOT	284.601 31 DIFF	-27.540	G
169-0400	400	43°33' 2.84615"	71°21'32.63418"	116777.805	324856.111	21 NHDOT	279.225 31 DIFF	-27.543	G
169-0410	410	43°33'51.65422"	71°23'12.53307"	118276.156	322608.694	21 NHDOT	246.136 31 DIFF	-27.572	G
169-0420	420	43°33'49.88988"	71°23'23.55344"	118220.878	322361.566	21 NHDOT	236.486 31 DIFF	-27.573	G
169-0430	430	43°34'15.13201"	71°23'47.41728"	118998.118	321823.498	21 NHDOT	159.756 31 DIFF	-27.586	G

03/25/98

NH DEPARTMENT OF TRANSPORTATION - GEODETIC CONTROL DATABASE

NAD83/86 COORDINATE SYSTEM - NGVD29 VERTICAL DATUM

PHONE: 603-271-1600 P.O. BOX 483, CONCORD, NH 03302

TOWN NAME: LACONIA

TOWN NUMBER: 245

UNITS: METERS

STATION	SEQ	LATITUDE	LONGITUDE	NORTHING	EASTING	HORZ DATA Ord. Agn	HEIGHT VERT DATA Ord. Type	GEOID HEIGHT	M C	D M
LACONIA TALL BAPT	0	43°31'44.23657"	71°28'16.85737"	114324.399	315788.547	40 NGS	0.000 0	-27.625	N	3
LACONIA TALL WHITE	0	43°31'45.91775"	71°28'15.10809"	114376.374	315827.704	40 NGS	0.000 0	-27.625	N	3
B 10 NH	10	43°30'50"	71°28' 9"	112660	315980	0	199.728 21	DIFF	G	3
245-0020	20	43°32'10"	71°28' 4"	115130	316070	0	153.013 31	DIFF	G	3
245-0030	30	43°31'52"	71°28' 3"	114550	316100	0	152.614 31	DIFF	G	3
DM 2 RESET	40	43°30'41.10546"	71°27'34.73876"	112378.403	316739.137	41 MON-N	200.838 21	DIFF	G	3
DG 22	50	43°36'34.28627"	71°28'14.55528"	123275.790	315819.138	41 MON-N	219.981 31	DIFF	G	3
DG 23	60	43°36'28.93821"	71°28' 4.88090"	123111.256	316036.475	41 MON-N	215.311 31	DIFF	G	3
DG 30	70	43°34'53.94149"	71°26'36.91062"	120184.542	318017.071	41 MON-N	193.265 31	DIFF	G	3
DG 31	80	43°34'59.27558"	71°26'41.61449"	120348.876	317911.102	41 MON-N	187.413 31	DIFF	G	3
B 17 1935	90	43°33'46"	71°26'58"	118090	317550	0	158.300 21	DIFF	N	3
C 17 1935	100	43°35'25"	71°27'43"	121140	316530	0	164.292 21	DIFF	X	3
D 17 1935	110	43°36'13"	71°27'18"	122620	317090	0	161.268 21	DIFF	G	3
E 2 1934	120	43°30'19"	71°27' 1"	111690	317500	0	194.266 31	DIFF	N	3
503 USGS	130	43°31'50"	71°28'20"	114500	315720	0	153.333 21	DIFF	G	3
520 USGS	140	43°36'30"	71°27'35"	0	0	0	158.638 31	DIFF	G	3
506 USGS = 507?	150	43°33' 5"	71°27'39"	116820	316630	0	154.414 20	DIFF	G	3
D 4 1933	160	43°31'27"	71°28'33"	113790	315430	0	148.572 12	DIFF	X	3
D 4 RESET 1972	170	43°31'27"	71°28'33"	113790	315430	0	149.898 21	DIFF	G	3
TBM 569 569.635	180	43°31' 5"	71°27'43"	0	0	0	173.625 31	DIFF	G	3
E 4 1933	190	43°31'45"	71°28'22"	114350	315670	0	155.439 21	DIFF	G	3
F 4 1933	200	43°31'46"	71°28'10"	114380	315940	0	154.792 21	DIFF	G	3
G 4 1933	210	43°32'51"	71°27'46"	116390	316480	0	158.810 21	DIFF	G	3
H 4 1933	220	43°32'57"	71°27'43"	116570	316540	0	155.833 21	DIFF	G	3
PUMP 1933	230	43°33'10"	71°27'38"	116970	316660	0	153.934 21	DIFF	G	3
X 35 1955	240	43°36'36"	71°28'23"	123330	315630	0	229.455 21	DIFF	G	3
G 4 RESET 1984	250	43°32'51"	71°27'46"	116390	316480	0	158.227 21	DIFF	G	3
S 30 1942	260	43°36'57"	71°28'51"	123980	315000	0	210.212 21	DIFF	X	3
245-0270	270	43°30'28.14022"	71°27'40.38209"	111977.971	316613.371	21 NHDOT	226.178 21	DIFF	-27.598	G
245-0280	280	43°31' 4.21960"	71°27' 0.94235"	113093.657	317496.375	21 NHDOT	207.192 21	DIFF	-27.592	G
245-0290	290	43°30'43"	71°27'34"	112440	316760	0	195.321 21	DIFF	G	3
245-0300	300	43°30'47"	71°27'18"	112560	317110	0	191.183 21	DIFF	X	3
A 44 1965	310	43°33'34"	71°27'14"	117720	317190	0	155.255 20	DIFF	G	3
C 17 RESET 1966	320	43°35'25"	71°27'43"	121140	316530	0	167.786 21	DIFF	?	3
DM 1	330	43°30'31.28153"	71°27'36.95290"	112075.105	316690.157	36 BM-61	217.238 31	DIFF	-27.597	G
R 30 1942	340	43°36'36"	71°28'23"	123330	315630	0	225.094 21	DIFF	G	3
E 1 1934	350	43°30'50"	71°27'26"	112650	316930	0	178.111 21	DIFF	G	3
LAKEPORT GAGING ST	360	43°32'57"	71°27'54"	0	0	0	0.000 0			G

3/25/98

NH DEPARTMENT OF TRANSPORTATION - GEODETIC CONTROL DATABASE

NAD83/86 COORDINATE SYSTEM - NGVD29 VERTICAL DATUM

PHONE: 603-271-1600 P.O. BOX 483, CONCORD, NH 03302

TOWN NAME: MEREDITH

TOWN NUMBER: 295

UNITS: METERS

STATION	SEQ	LATITUDE	LONGITUDE	NORTHING	EASTING	HORZ DATA Ord. Agn	HEIGHT 21	VERT DATA Ord. Type	GEOID HEIGHT	M D C M
295-0010	10	43°38'26"	71°31'19"	126720	311680	0	214.940	21 DIFF		G 3
295-0020	20	43°38' 3"	71°31'58"	126010	310800	0	201.319	21 DIFF		G 3
295-0030	30	43°37'25"	71°33'24"	124830	308880	0	171.859	21 DIFF		G 3
295-0040 = 295-023	40	43°37'50"	71°34'44"	125590	307080	0	170.521	21 DIFF		G 3
B 5	50	43°35'11"	71°37'33"	120680	303300	0	220.529	21 DIFF		G 3
B 19	60	43°34'53.49197"	71°37'33.28605"	120147.296	303291.490	36 T10-N	219.356	31 DIFF	-27.656	N 3
DG 4 RESET →	70	43°38'46.37773"	71°30' 4.60162"	127346.959	313343.301	21 NHDOT	208.323	21 DIFF	-27.702	G 3
DG 4	80	43°38'46"	71°30' 5"	127340	313340	0	0.000	0		X 3
DK 2	90	43°38'23.11335"	71°31'51.60702"	126624.636	310946.407	41 MON-N	230.334	31 DIFF	-27.703	G 3
DK 3	100	43°38'18.74541"	71°31'43.84100"	126490.121	311120.692	41 MON-N	225.798	21 DIFF	-27.703	G 3
DG 13	110	43°37'54.16291"	71°29'11.97916"	125737.983	314526.102	36 BM-61	184.546	21 DIFF	-27.695	G 3
DG 14	120	43°37'47.84912"	71°29'13.04244"	125543.079	314502.689	41 MON-N	194.119	21 DIFF	-27.695	G 3
D 29 1942	130	43°41'10.22393"	71°27'28.76903"	131794.163	316824.458	21 NHDOT	173.929	20 DIFF	-27.687	G 3
C 29 1942	140	43°40'54.43736"	71°28' 1.21443"	131305.173	316098.983	21 NHDOT	181.746	20 DIFF	-27.691	G 3
B 29 1942	150	43°40'26"	71°29' 1"	130420	314760	0	223.404	20 DIFF		X 3
A 29 1942	160	43°39'40"	71°29'40"	129000	313890	0	158.370	21 DIFF		X 3
Y 28 1942	170	43°38' 8.95690"	71°29'25.01961"	126193.921	314232.816	21 NHDOT	213.317	12 DIFF	-27.697	G 3
B 34 1955	180	43°39' 0"	71°30' 8"	127770	313270	0	167.260	21 DIFF		G 3
C 34 1955	190	43°38'52"	71°30'24"	127520	312910	0	166.647	21 DIFF		G 3
D 34 1955	200	43°39' 2"	71°31'31"	127830	311410	0	167.266	21 DIFF		G 3
525 USGS 1935	210	0° 0' 0"	0° 0' 0"	0	0	0	0.000	0		X 3
E 17 1935	220	43°37'29"	71°29'14"	124960	314480	0	226.848	21 DIFF		X 3
SPINDLE USGS 1954	230	43°37'50.19990"	71°27'15.17958"	125621.866	317144.607	35 USGS	217.320	50 TRIG	-27.682	G 3
A 34 1955	240	43°39' 2"	71°29'55"	127830	313560	0	168.384	12 DIFF		G 3
F 17 1935	250	43°38'20.46140"	71°29'53.76755"	126547.629	313587.723	21 NHDOT	255.778	12 DIFF	-27.700	G 3
B 6	260	43°38'22"	71°30' 1"	126600	313460	0	248.996	31 DIFF		N 3
B 7	270	43°38'11"	71°30' 2"	126260	313440	0	257.426	21 DIFF		G 3
MS 1	280	43°39'51.78749"	71°29'28.38478"	129367.277	314150.680	41 MON-N	204.840	31 DIFF	-27.700	G 3
Z 28 1942	290	43°39' 2"	71°29'55"	127830	313560	0	167.800	21 DIFF		X 3
C 2	300	43°40'13.68717"	71°30' 9.77108"	130047.414	313222.115	41 MON-N	172.786	21 DIFF	-27.701	G 3
C 3	310	43°40'22.43087"	71°30'16.88701"	130310.774	313062.192	41 MON-N	174.584	31 DIFF	-27.701	G 3
549 USGS MEREDITH	320	43°39' 0"	71°30' 8"	127770	313270	0	167.344	21 DIFF		X 3
DG 3	330	43°39' 1.67930"	71°29'52.89344"	127819.718	313604.731	41 MON-N	175.763	31 DIFF	-27.701	G 3
B 29 RESET 1989	340	43°40'31"	71°28'55"	130590	314930	0	221.269	21 DIFF		G 3
295-0350	350	43°38'12.44564"	71°29'29.70123"	126301.366	314127.653	21 NHDOT	220.234	21 DIFF	-27.698	G 3
295-0360	360	43°38'34.93692"	71°30' 4.56104"	126993.880	313344.914	21 NHDOT	230.352	21 DIFF	-27.701	G 3
295-0370	370	43°38'42.45339"	71°30' 5.56369"	127225.805	313321.982	21 NHDOT	215.875	21 DIFF	-27.702	G 3
295-0380	380	43°39' 7.93174"	71°29'48.82364"	128012.864	313695.537	21 NHDOT	165.951	21 DIFF	-27.701	G 3
295-0390	390	43°39'57.75054"	71°29'24.30601"	129551.500	314241.669	21 NHDOT	204.228	21 DIFF	-27.699	G 3
295-0400	400	43°40'13.14326"	71°29'13.31054"	130027.074	314486.975	21 NHDOT	225.216	21 DIFF	-27.698	G 3
295-0410	410	43°40'20.34354"	71°29'10.53778"	130249.422	314548.607	21 NHDOT	232.127	21 DIFF	-27.697	X 3
295-0420	420	43°40'23.85997"	71°29' 8.22931"	130358.058	314600.082	21 NHDOT	232.273	21 DIFF	-27.697	G 3
295-0430	430	43°40'39.24851"	71°28'28.26571"	130834.988	315494.193	21 NHDOT	206.551	21 DIFF	-27.694	X 3
295-0440	440	43°40'53.27610"	71°28' 6.78695"	131269.036	315974.263	21 NHDOT	185.334	21 DIFF	-27.692	G 3
295-0450	450	43°37'30"	71°32'30"	124990	310130	0	185.557	21 DIFF		G 3
295-0460	460	43°37'26"	71°33'10"	124870	309230	0	164.980	21 DIFF		G 3

APPENDIX B

LOCATION SKETCHES FOR CONTROL POINTS

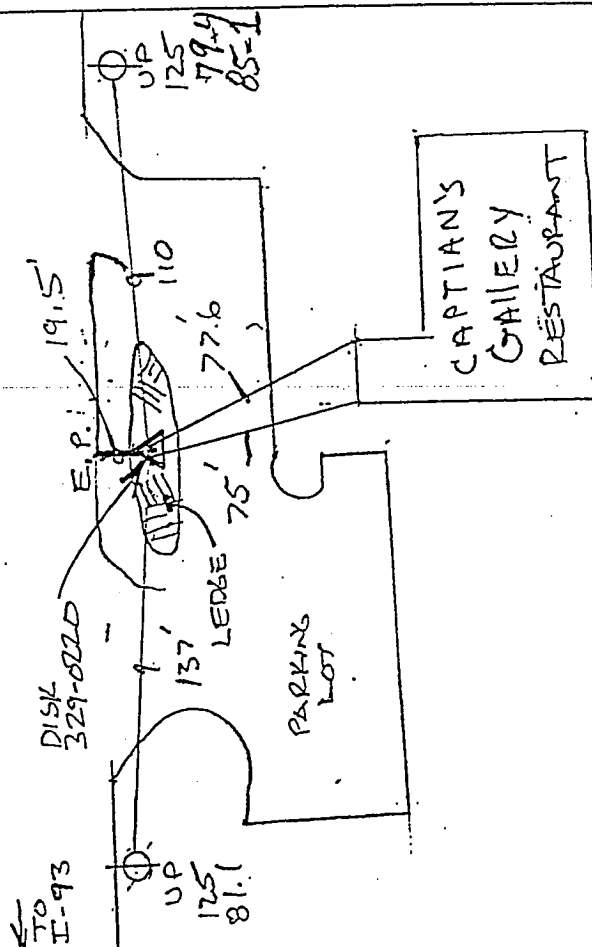
SKETCH SET IN GRANITE BOUND FLUSH W/GROUND

NEW HAMPTON

9/25/21
WJW

ROUTE 104

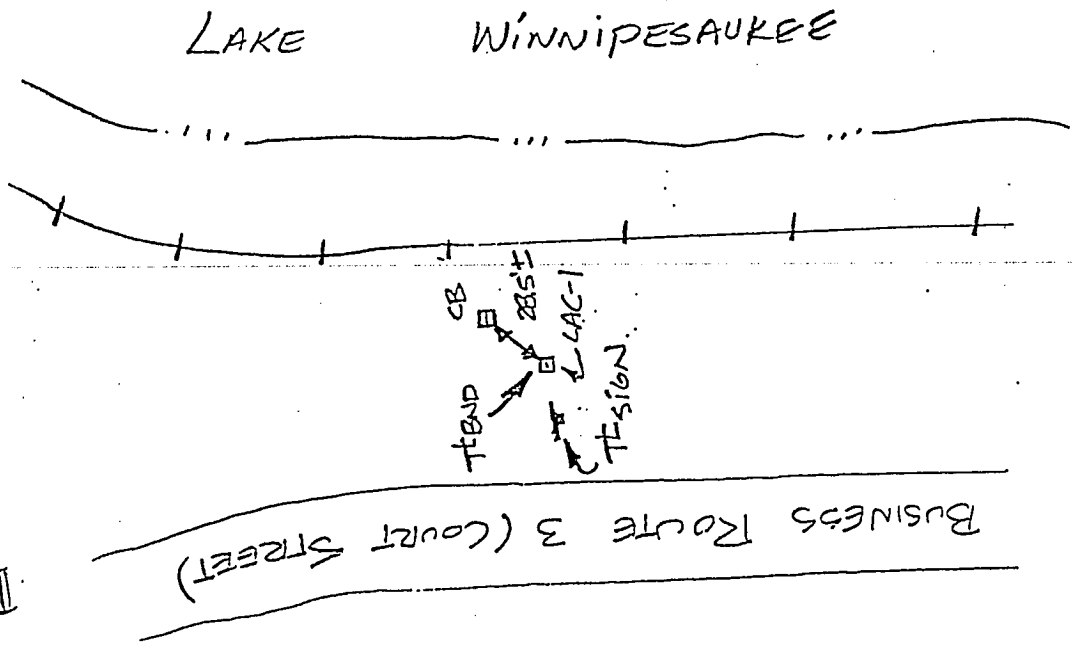
↑
10
METH



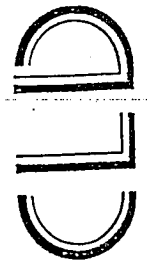
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

Geotek Corporation & its Affiliates
Consulting Engineers & Surveyors
340 Commercial Street
Lawrence, MA 01904
(603) 688-8773 FAX (603) 688-8807

SKETCH LAC-1 DA IN T/L BOUND BELMONT/LACONIA



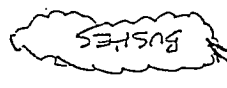
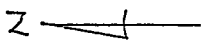
- 2.3' NLY T SIGN
- 11.8' OFF ER.



Costello Lomax & de Napoli Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902

SKETCH LAC-2

NHDOT DISK 245-0270



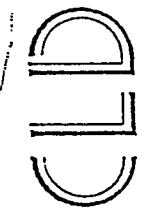
COLLEGE LANE

ROUTE 106

LAC-2
NHDOT DISK
245-0270
0.4' BELOW GRADE

N.H. COMMUNITY
TECHNICAL
COLLEGE AT
LACONIA

DRIVE

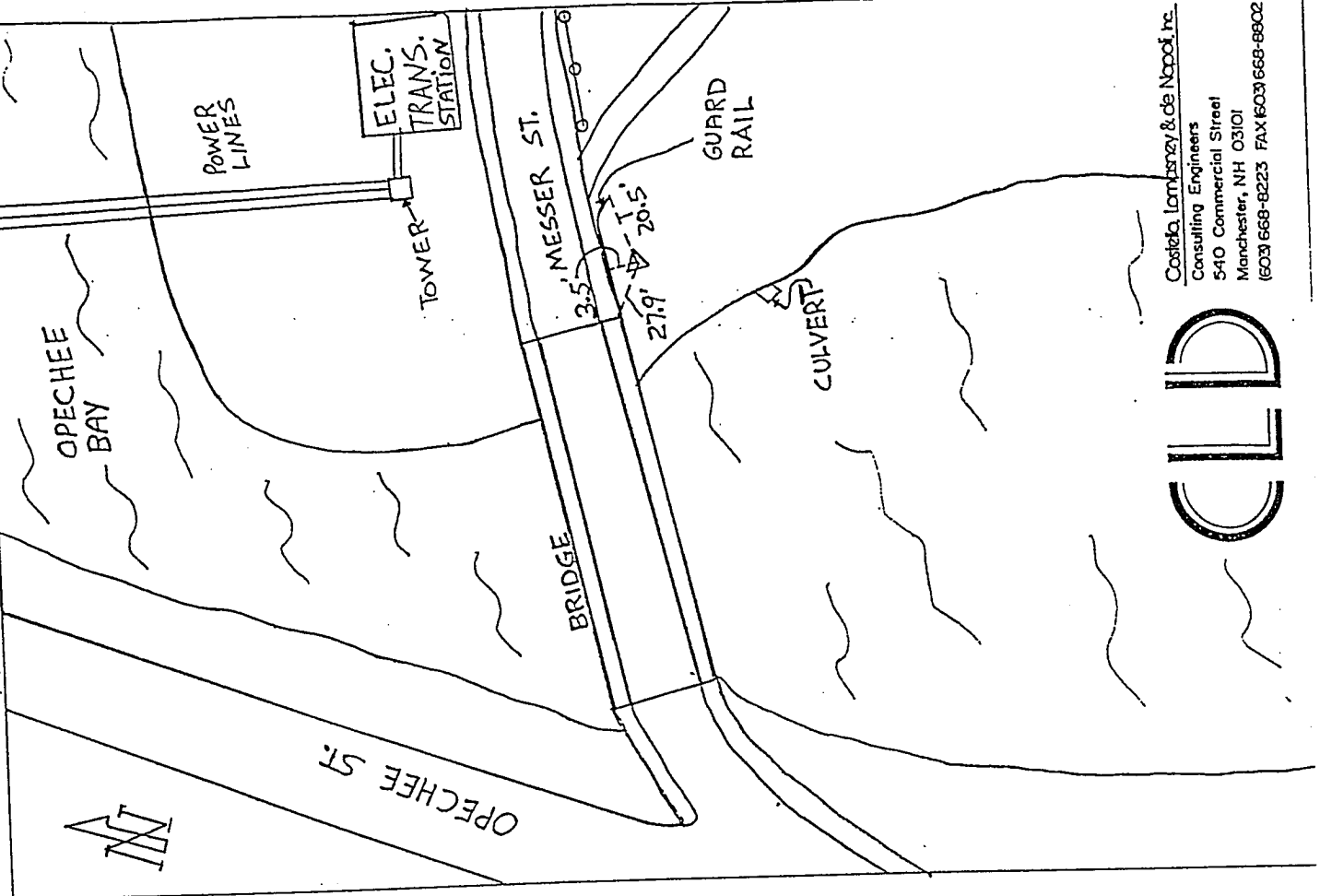


Costello Lomax & de Napoli Inc.
Consulting Engineers & Surveyors
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902

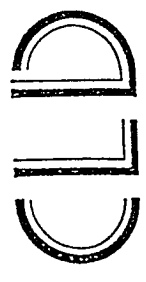
ROUTE 106

TO BELMONT

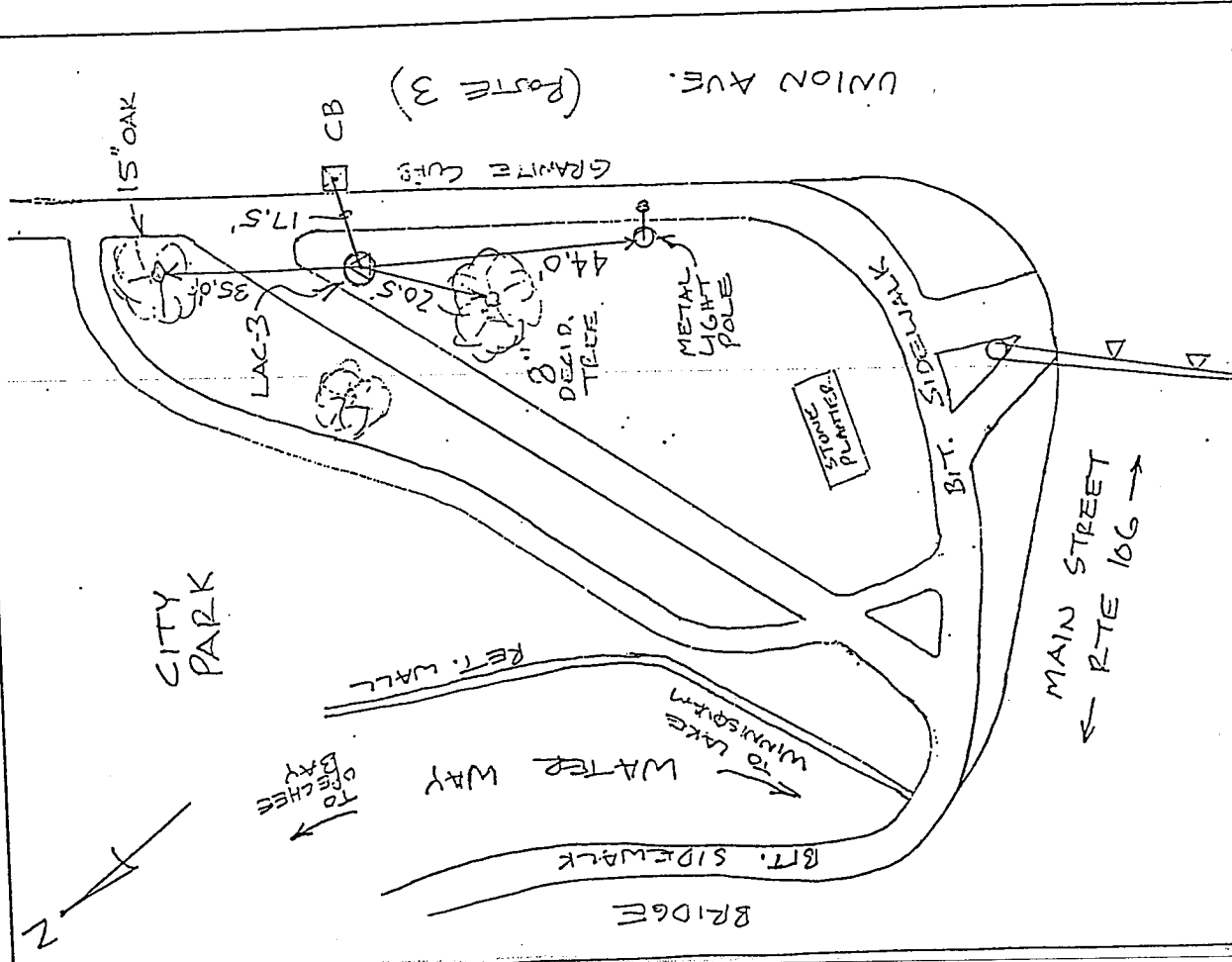
SKETCH LAC-4 6"X6" GRANITE BOUND w/LACONIA DISC
FLUSH w/GROUND



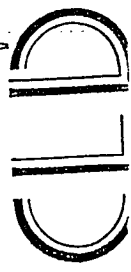
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



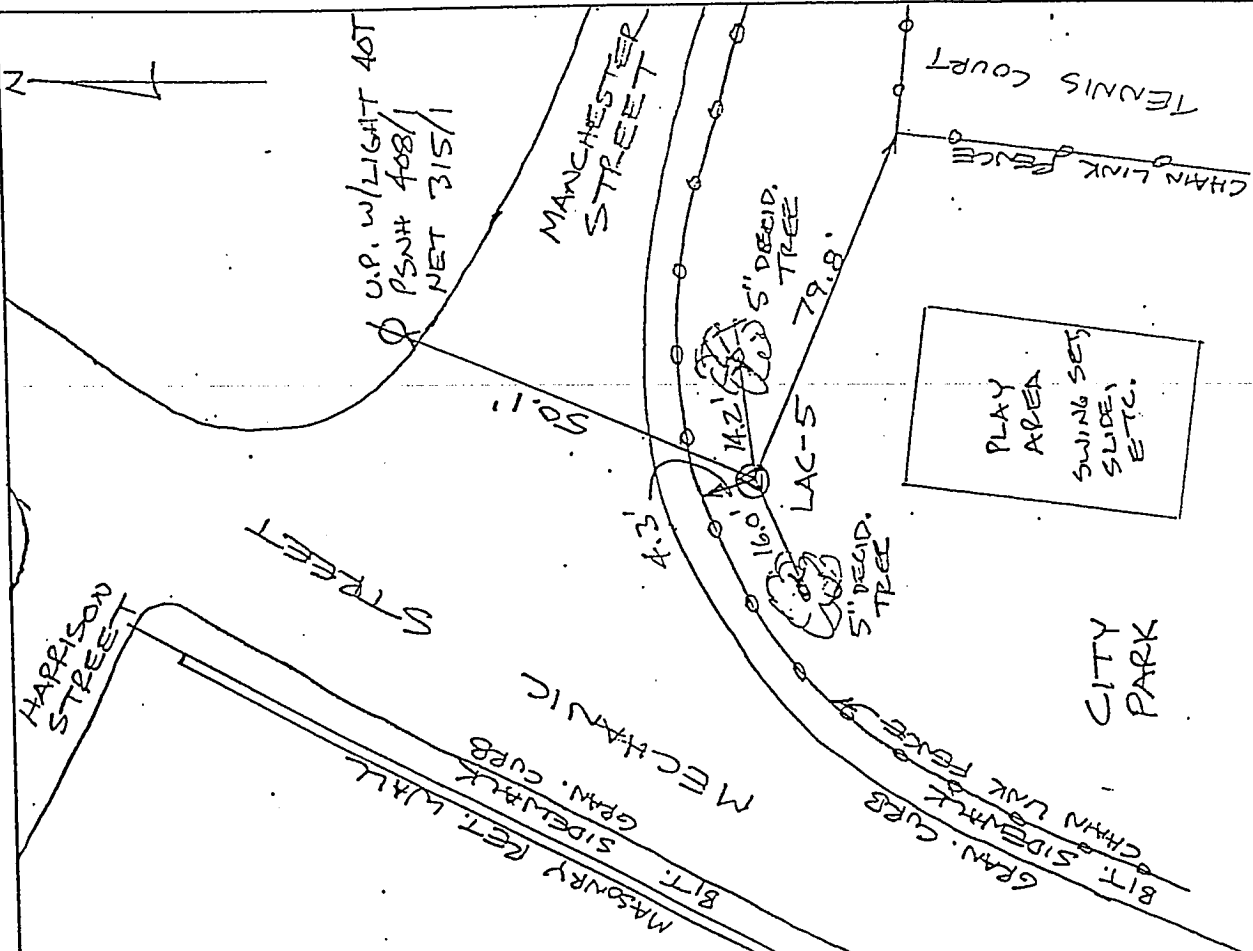
SKETCH LAC-3 CITY OF LACONIA DISC SET IN
6" SQ. GRAN. BOUND IN 1' DIA. MON. BOX



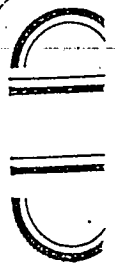
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



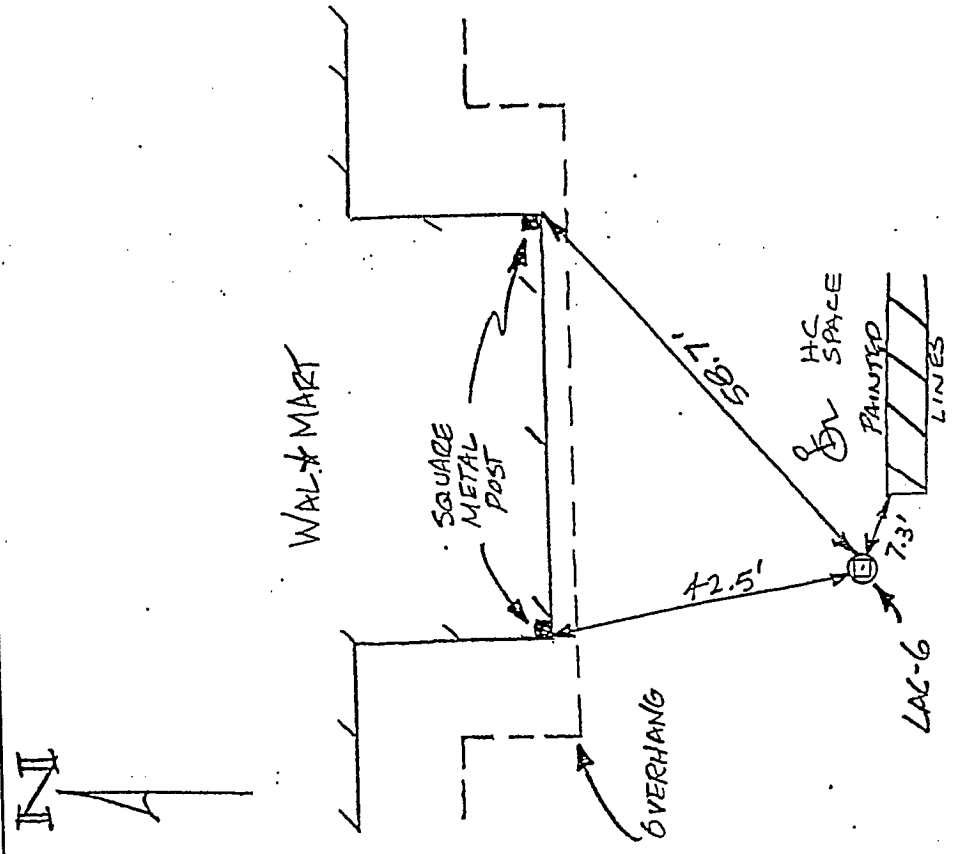
SKETCH LAC-5 CITY OF LACONIA DISK SET IN A 6" SQ. GRAN. BND. IN A 12" MON. BOX



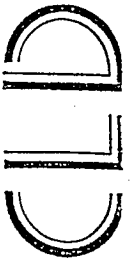
Costello, Lamonzy & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101



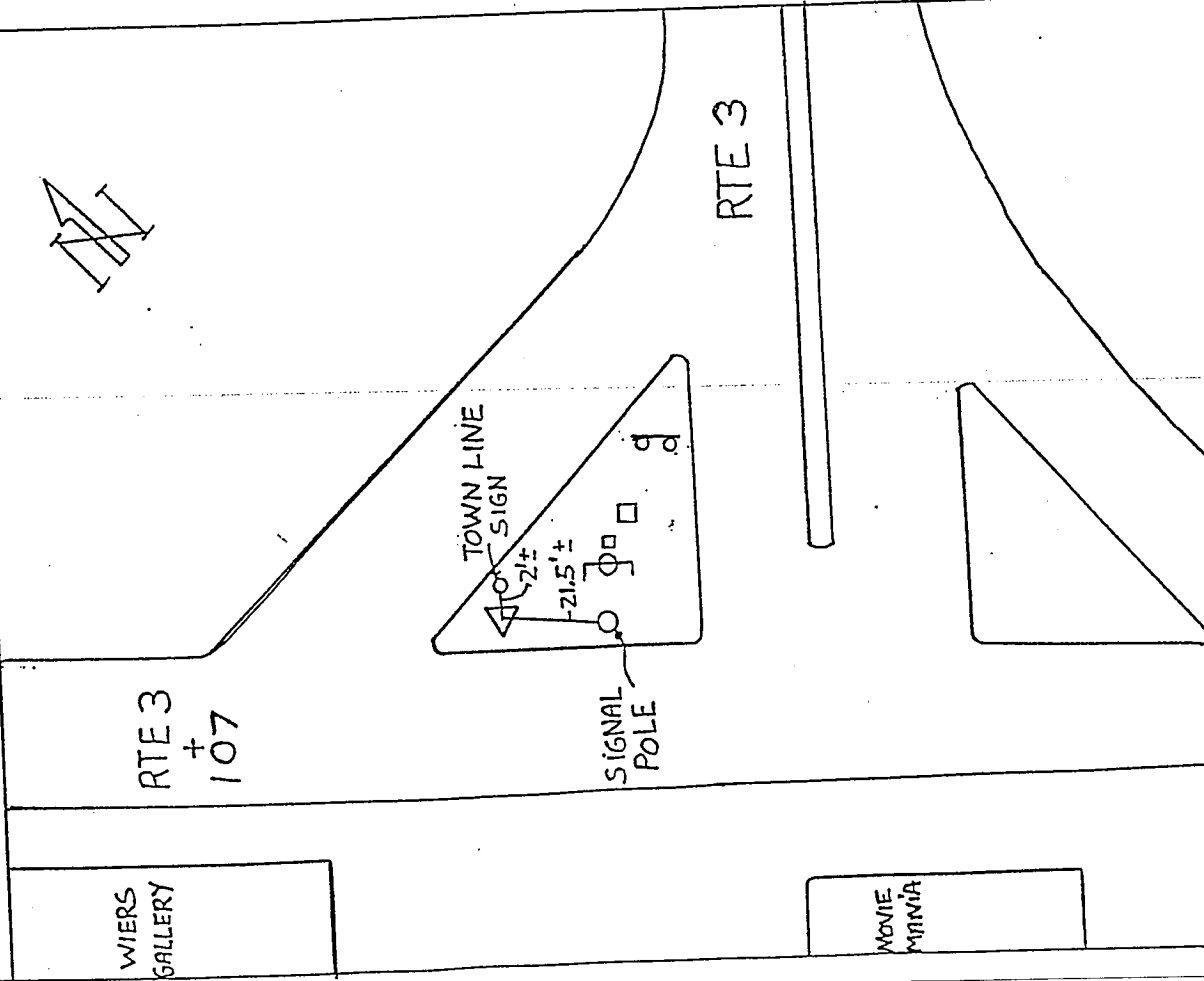
SKETCH LAC-6 DH IN 8" SQ. CONC. ENCL IN MON. BOX IN PARKING LOT



Costello, Lamonzy & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



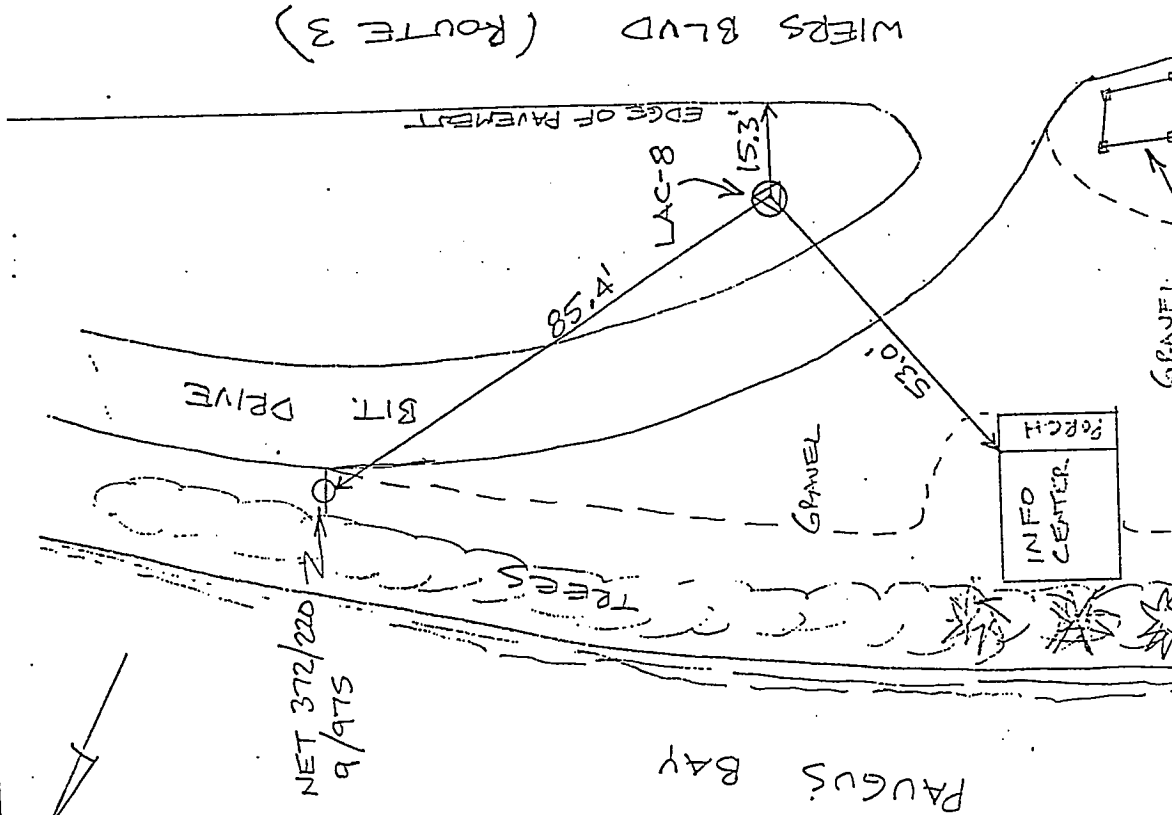
SKETCH LAC-7 GRANITE BOUND w/O.H. 2.7'H



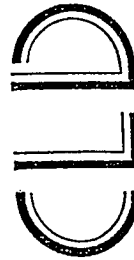
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



SKETCH LAC-8 2" DIA. CITY OF LACONIA DISK SET IN 6" SQ. GRAN. BND. IN 12" DIA. MON. SK

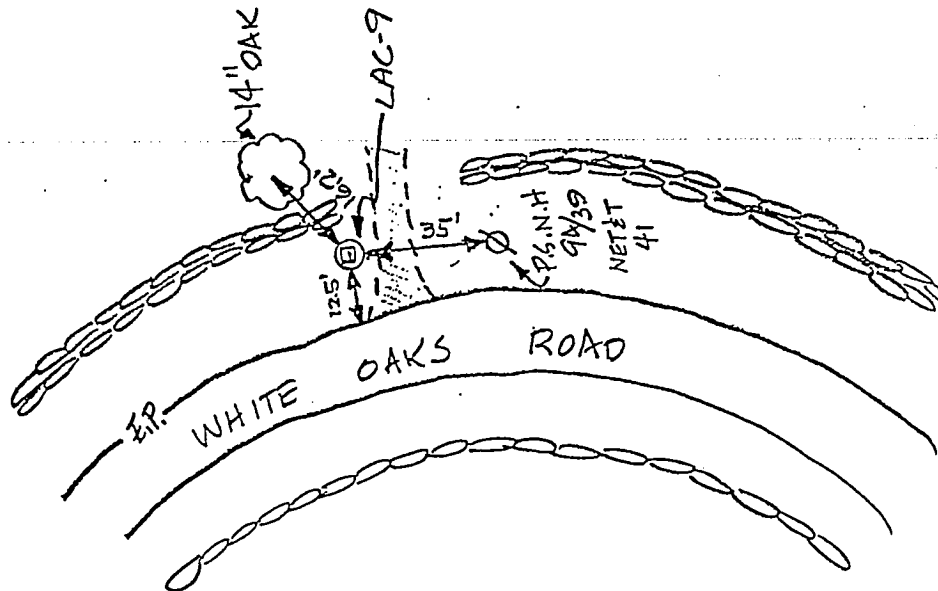


Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



SKETCH LAC-9

IN
A

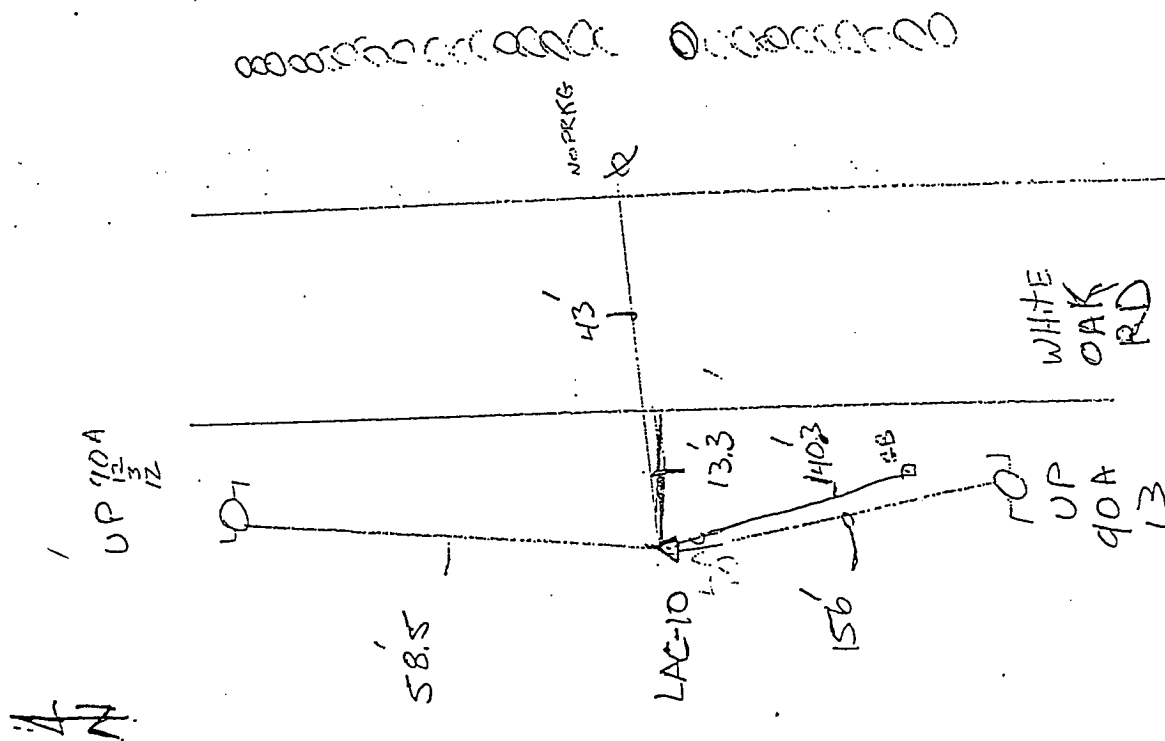


Costello, Lamorey & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902

CILD

SKETCH LAC-10

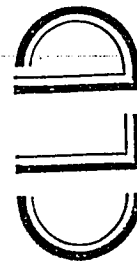
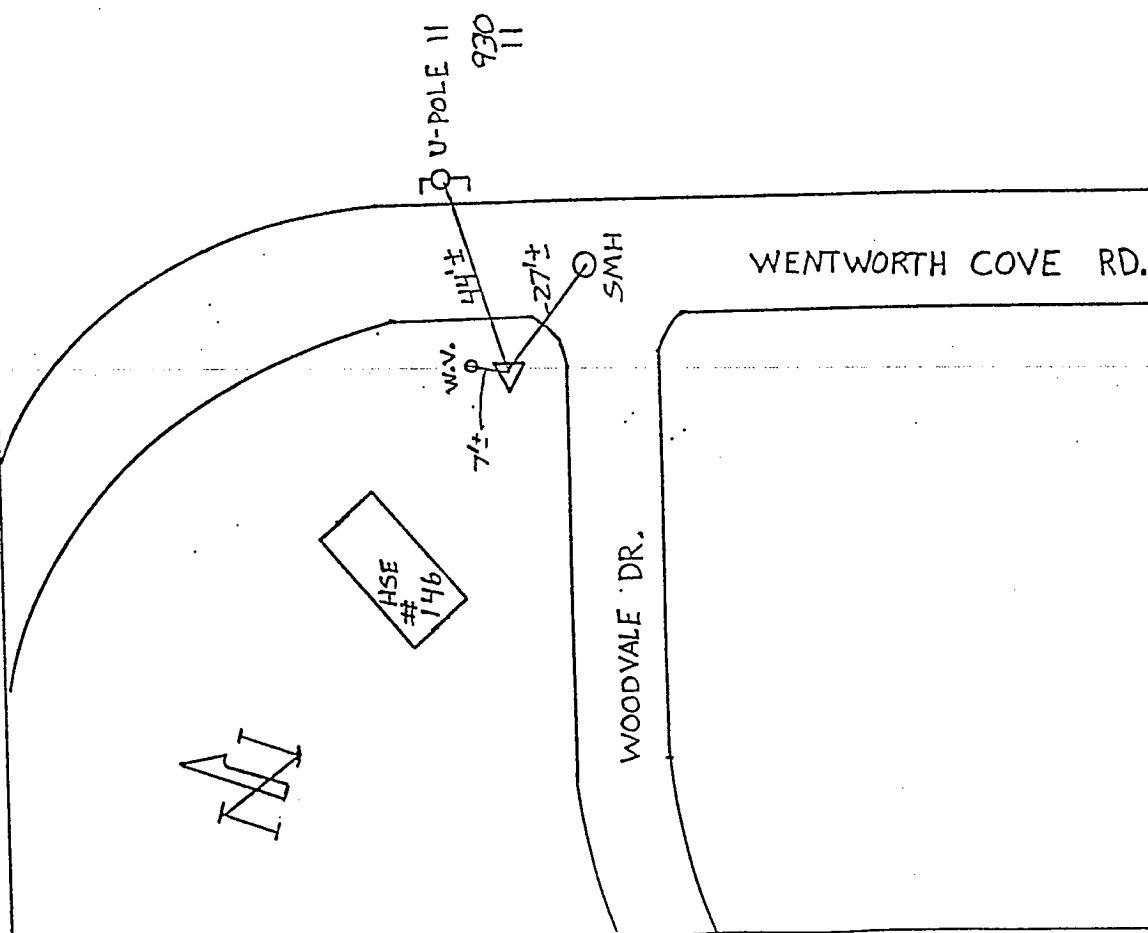
CITY DISK IN 6" SQ.
GRANITE END. IN MON.
BOX



Costello, Lamorey & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902

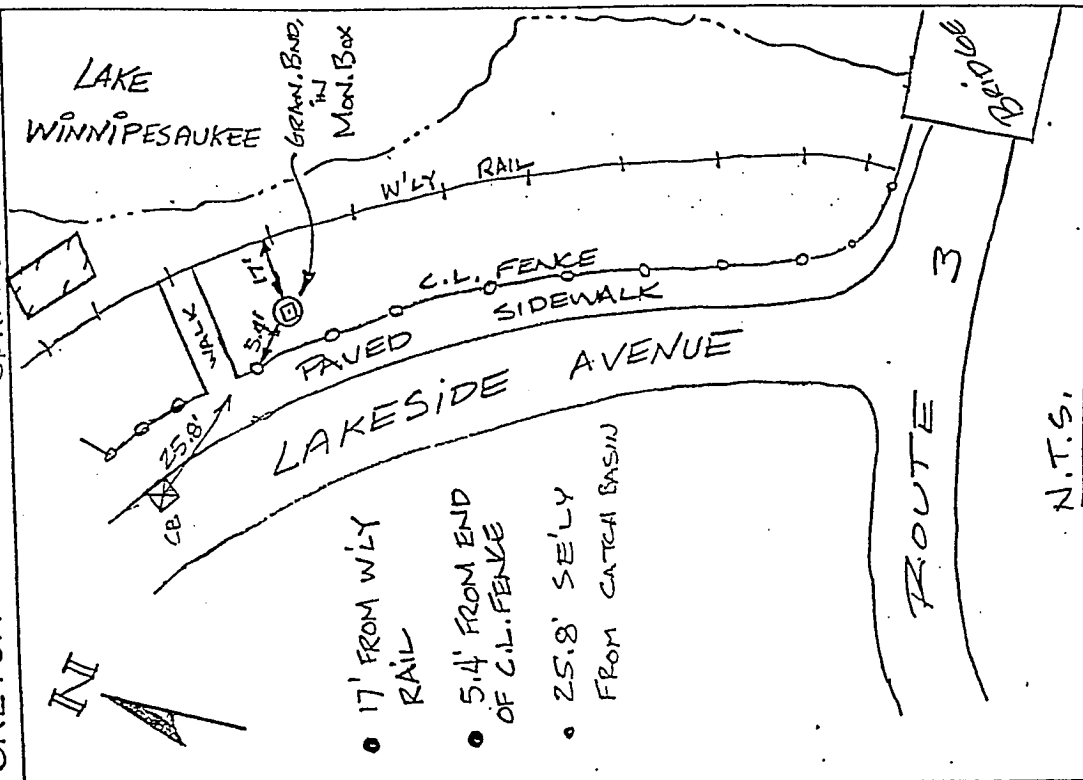
CILD

SKETCH LAC-11 GRAN. BOUND W/CITY OF LACONIA DISC
IN MONUMENT BOX.

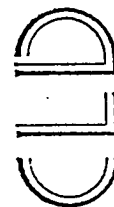


Costello Lomax & de Nooij, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

SKETCH LAC-12 CITY DISK IN C.S. GRAN. BND. IN MON. BOX

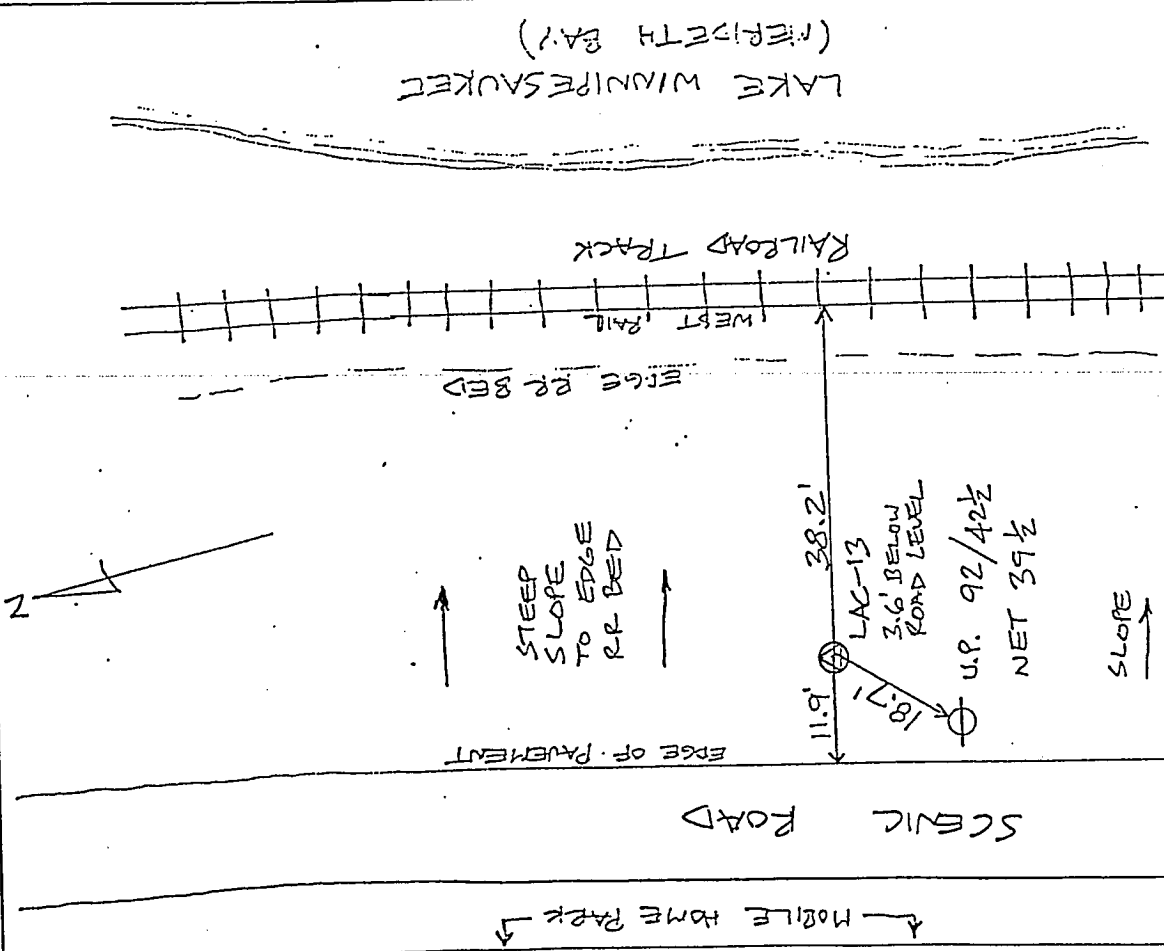


- 17' FROM W'LY RAIL
- 5.4' FROM END OF C.L. FENCE
- 25.8' SE'LY FROM CATCH BASIN



Costello Lomax & de Nooij, Inc.
Consulting Engineers & Surveyors
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

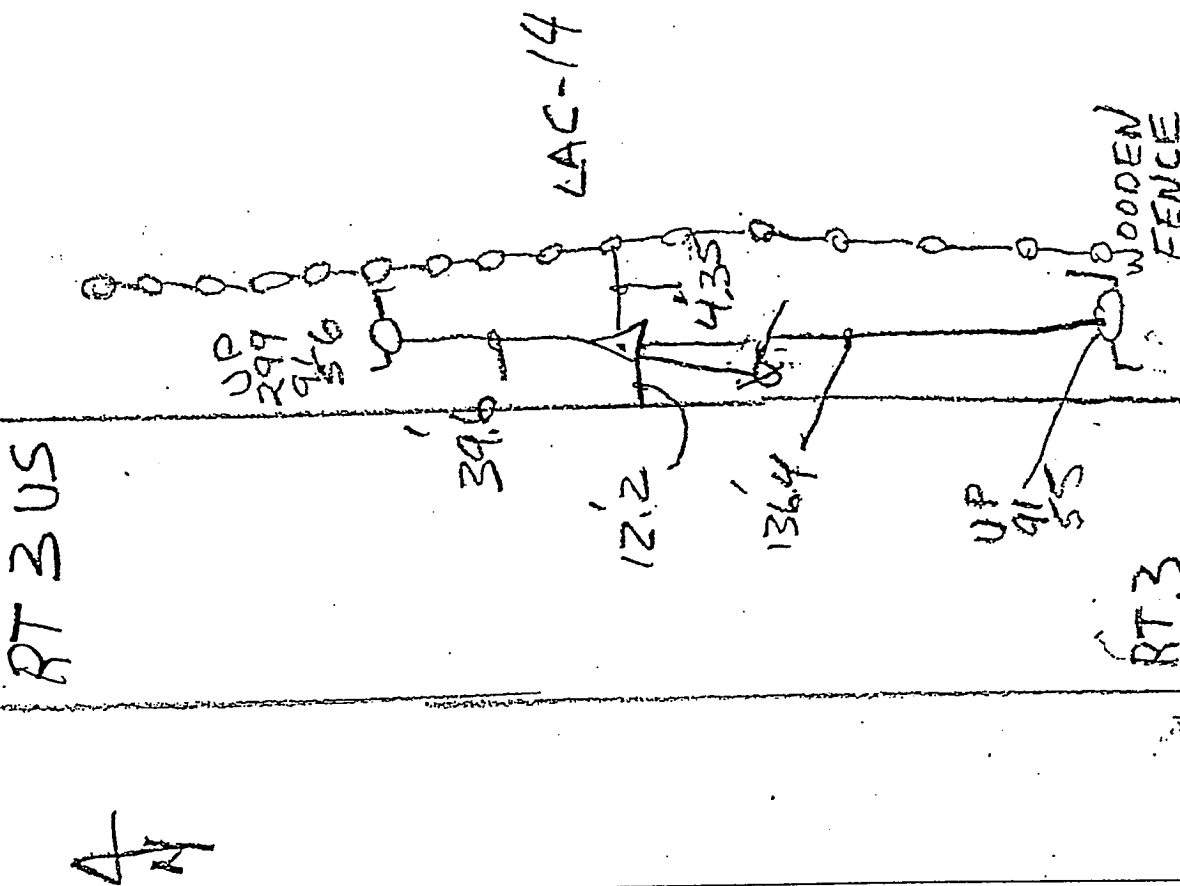
SKETCH LAC-13 CITY OF LACONIA DISK SET IN 6" SQ. GRANITE BOUND IN 12" MON. BOX



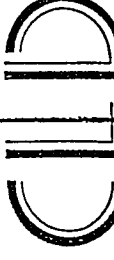
Costello, Lomanzy & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



SKETCH LAC-14 CITY DISK IN 6" SQ. GRAN. BND. IN MON. BOX

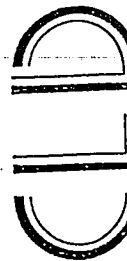
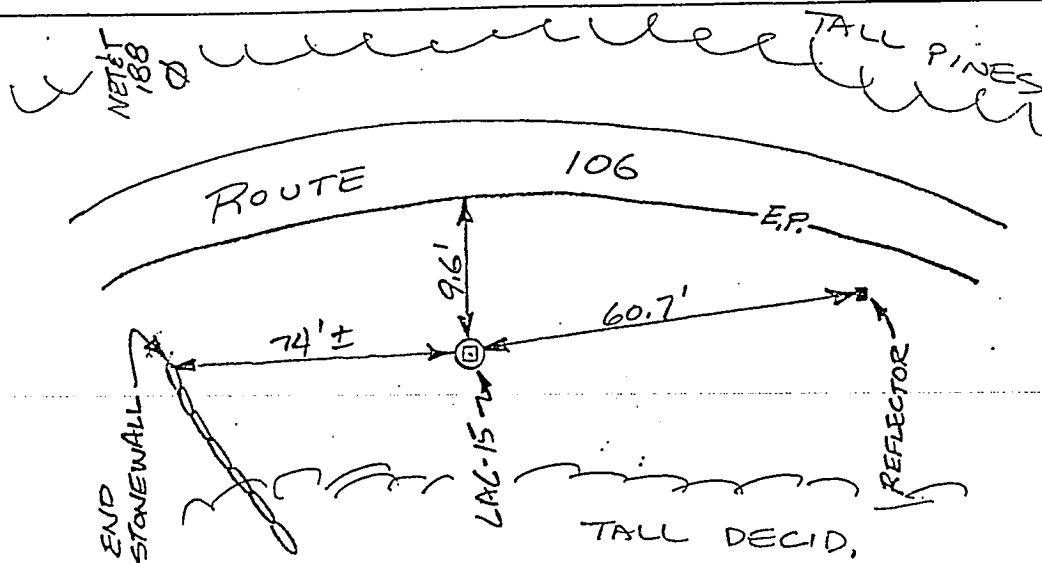
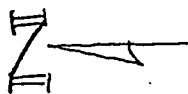


Costello, Lomanzy & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



SKETCH LAC-15

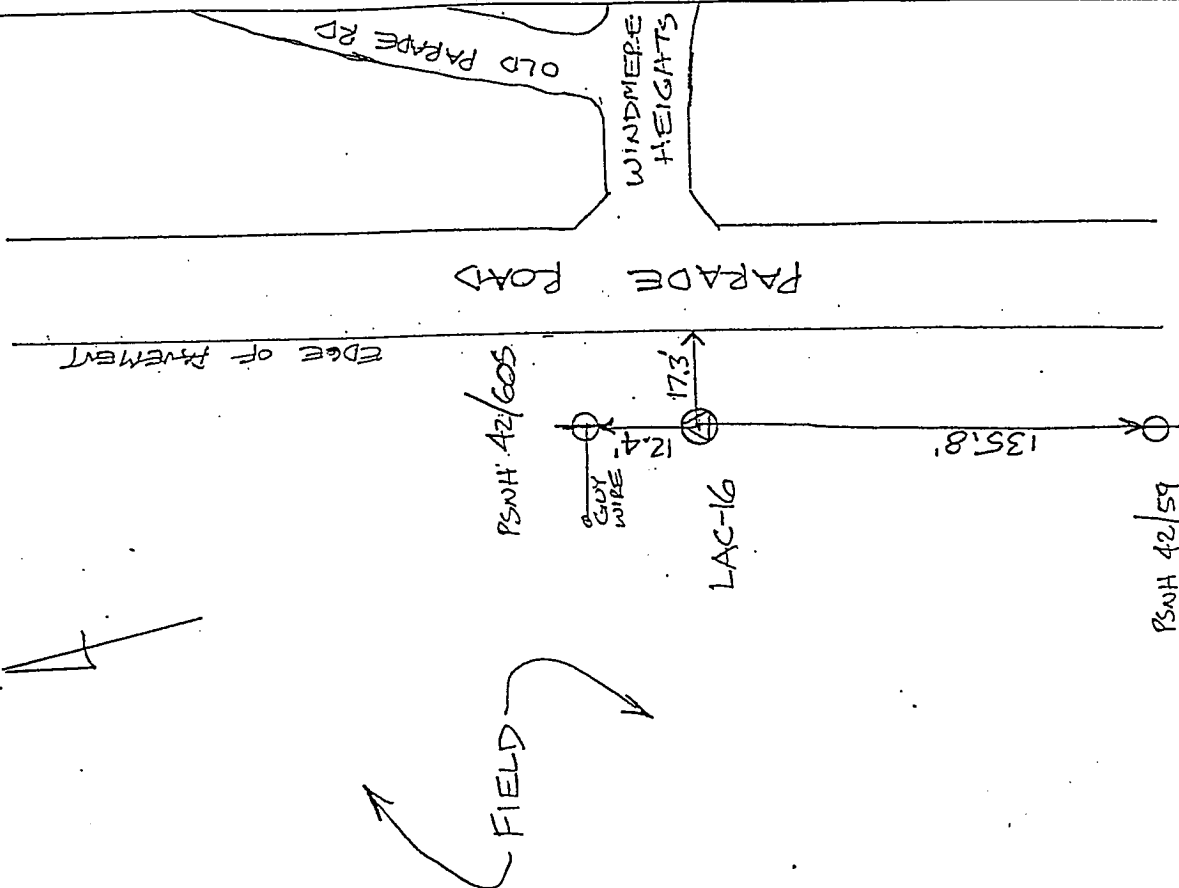
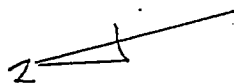
CITY DISK IN 6" SQ. GRAM. BND IN MON. BOX



Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

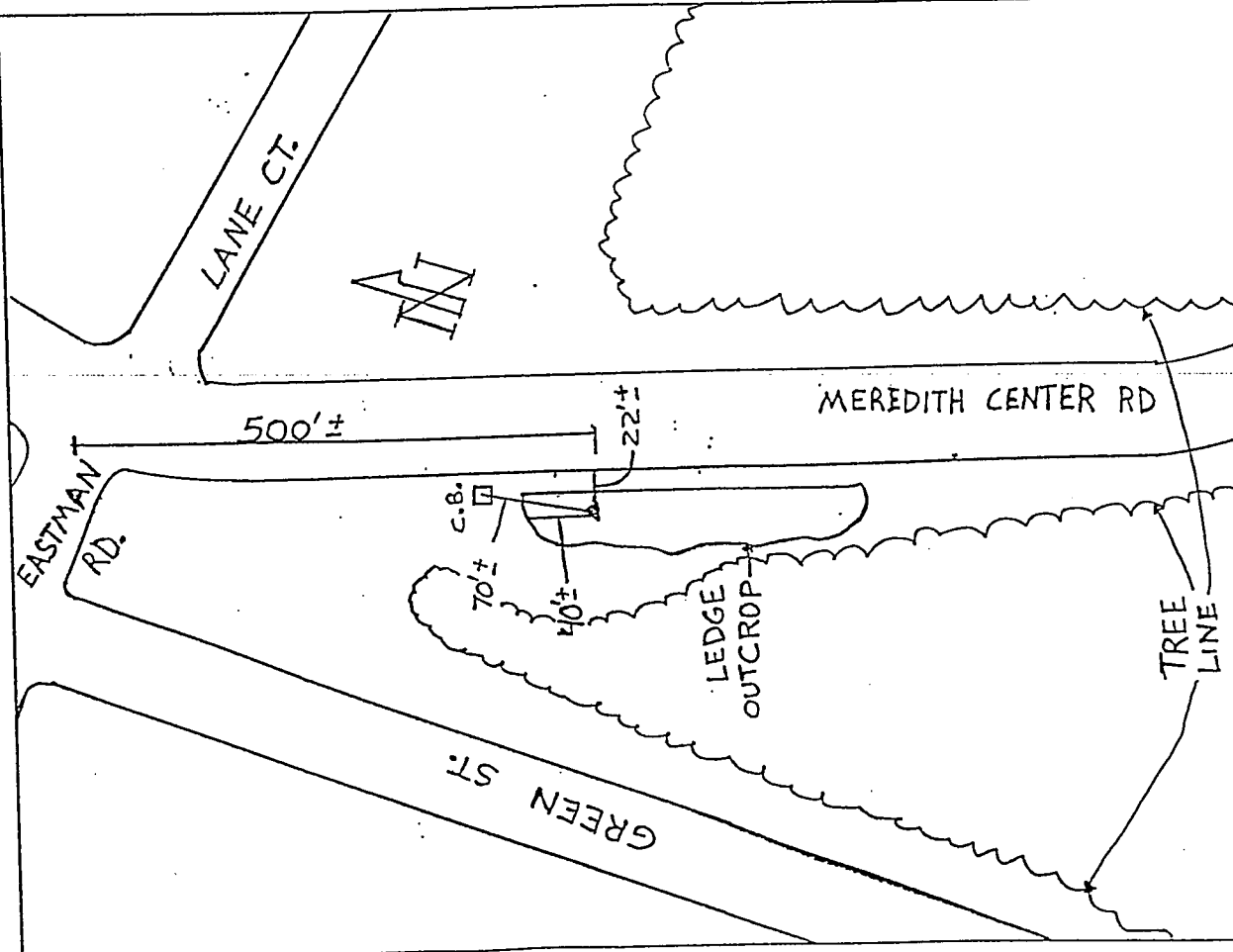
SKETCH LAC-16

CITY OF LACONIA DISK SET IN A 6" SQ. GRAM. BND IN MON. BOX

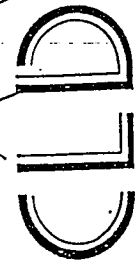


Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

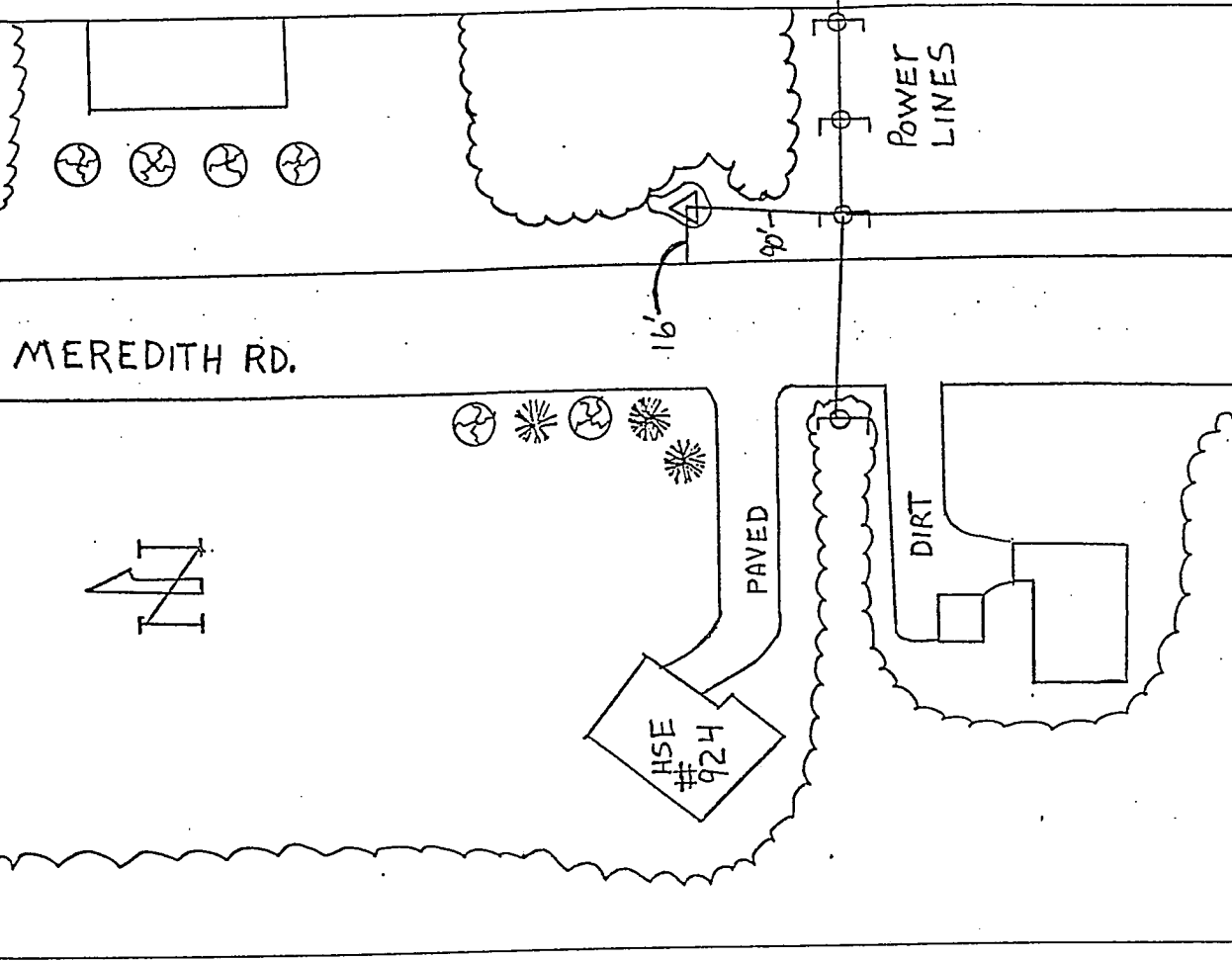
SKETCH LAC-17 CITY OF LACONIA DISC IN LEDGE OUTCROP



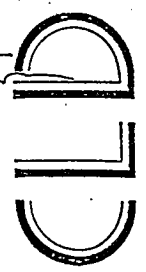
Costello, Lomazny & de Napoli, Inc.
 Consulting Engineers
 540 Commercial Street
 Manchester, NH 03101
 (603) 668-8223 FAX (603) 668-8902



SKETCH LAC-18 CITY OF LACONIA DISC IN LEDGE OUTCROP



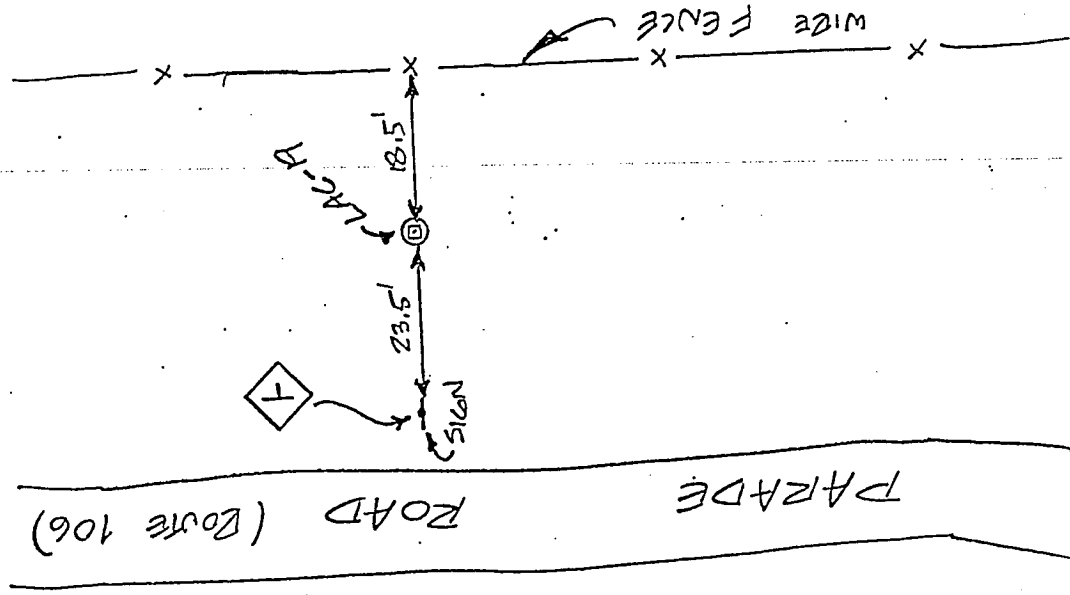
Costello, Lomazny & de Napoli, Inc.
 Consulting Engineers
 540 Commercial Street
 Manchester, NH 03101
 (603) 668-8223 FAX (603) 668-8902



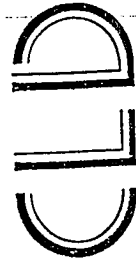
SKETCH LAC-19 CITY DISK IN 6" SQ. GRAN-BND IN MON. BOX

INT. 32.5' ± OFF EP

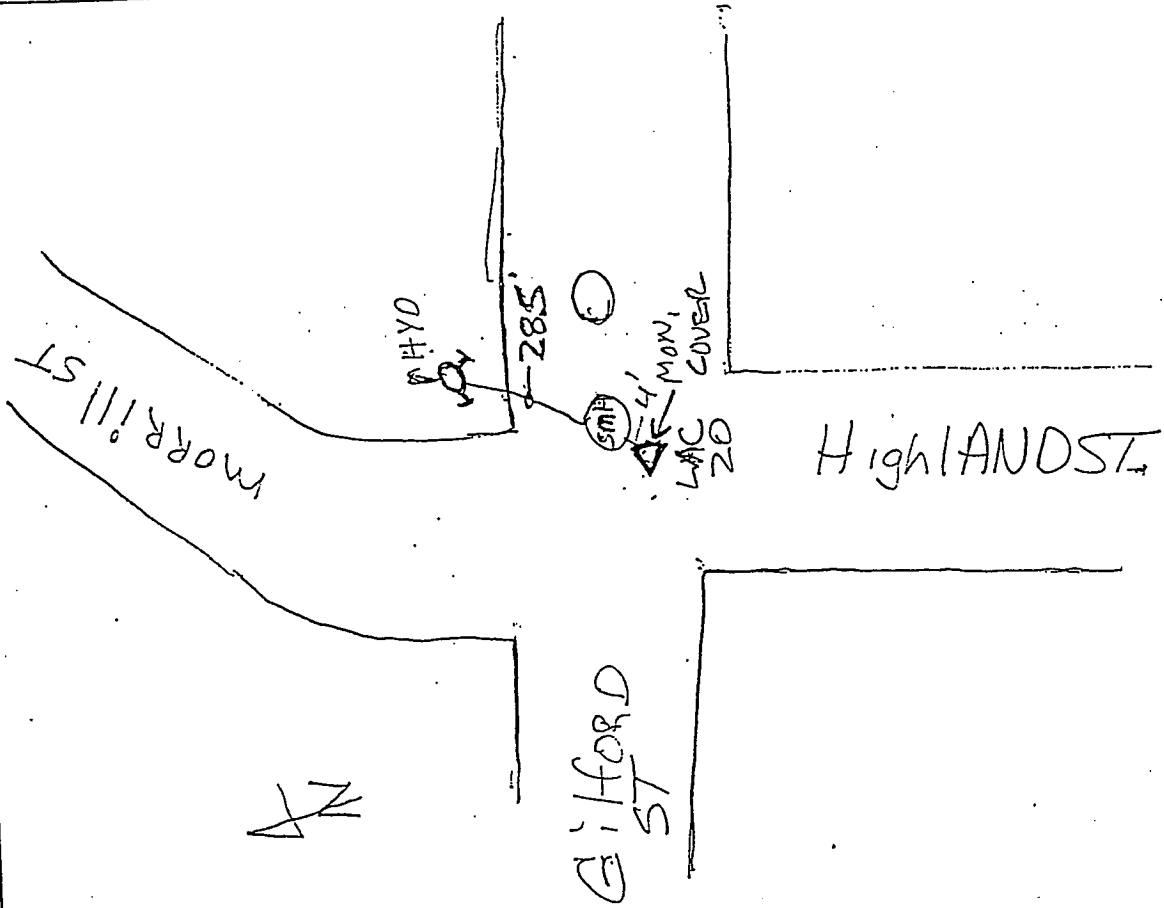
4



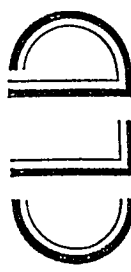
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



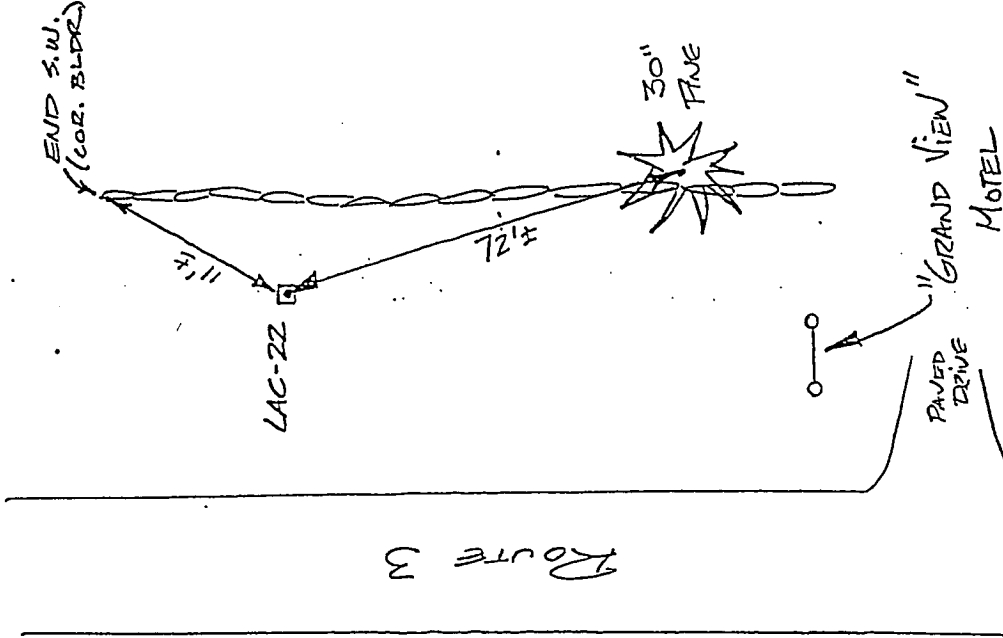
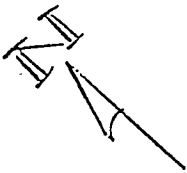
SKETCH LAC-20 BOUND IN STREET INTERSECTION IN MON. BOX



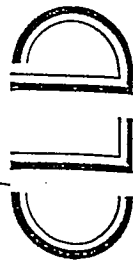
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



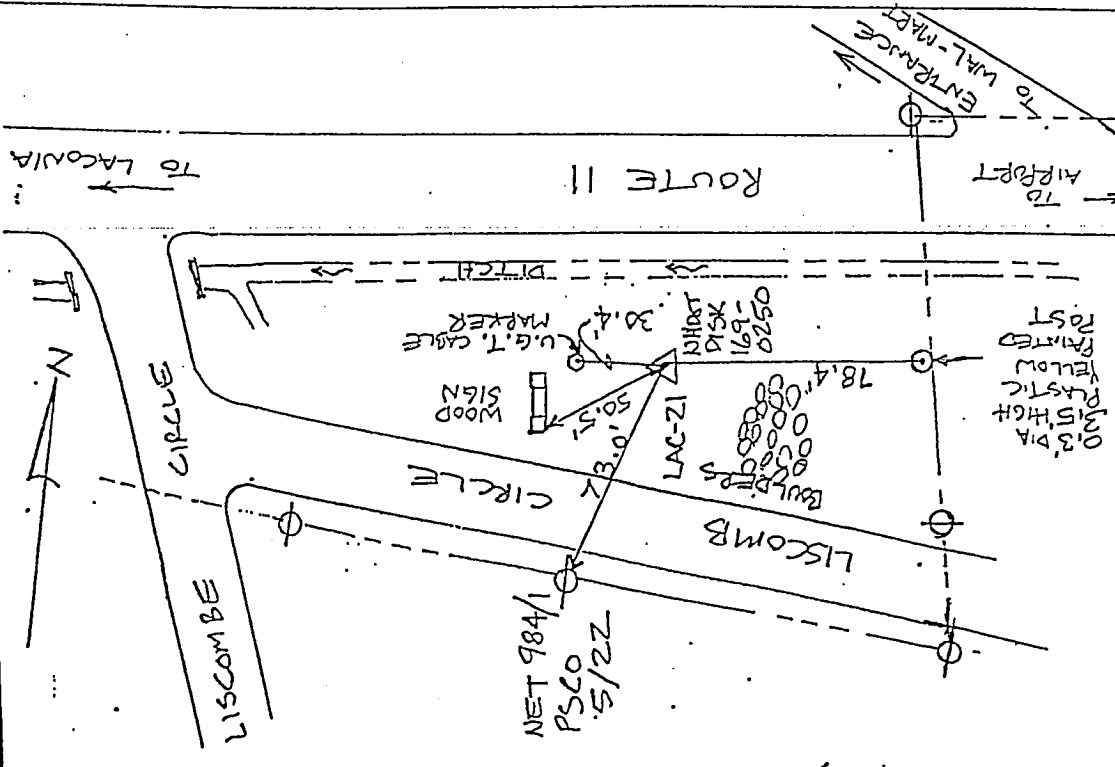
SKETCH LAC-22 NADOT DISK 245-0060
6" SQ. GRAN. BND. (DG 23)



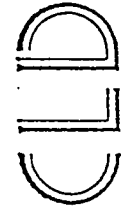
Coskata Lomax & Co. Napol, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8002



SKETCH LAC-21 NADOT DISK 169-0250
STA DG 44 1961 (GILEGRO)

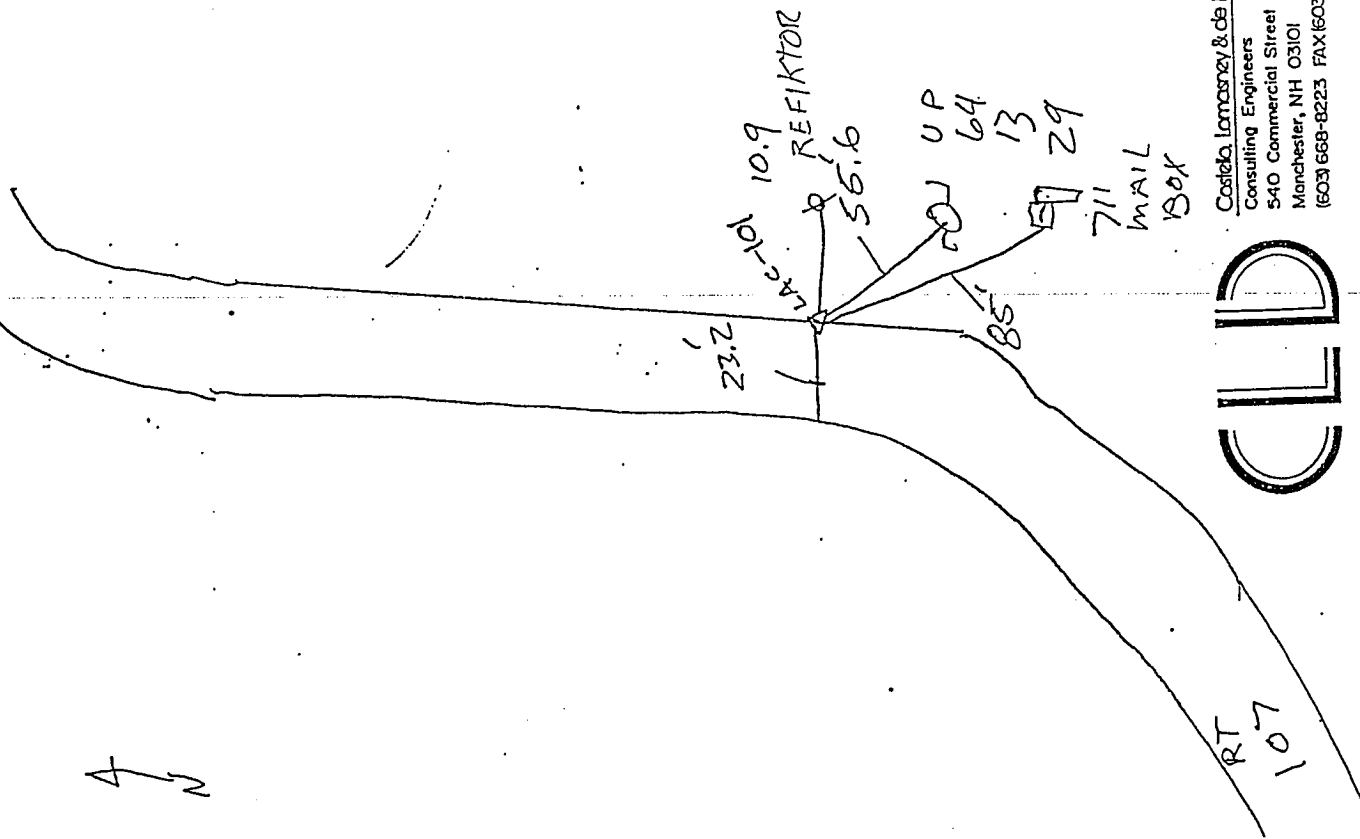
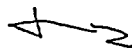


Coskata Lomax & Co. Napol, Inc.
Consulting Engineers & Surveyors
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8002



SKETCH LAC-101 SPIKE WITH WASHER

EAST SIDE



CLD

Costello, Lomasney & de Napoli Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

SKETCH LAC-102 SPIKE+WASHER

RTE
107

BUI'S
PARK

FRANK BEAN RD.

SMH

① -24'±

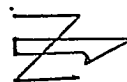
△ LAC-102

① -10'±

C.B.

EMPTY
LOT

STORAGE
UNITS

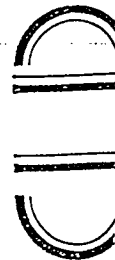
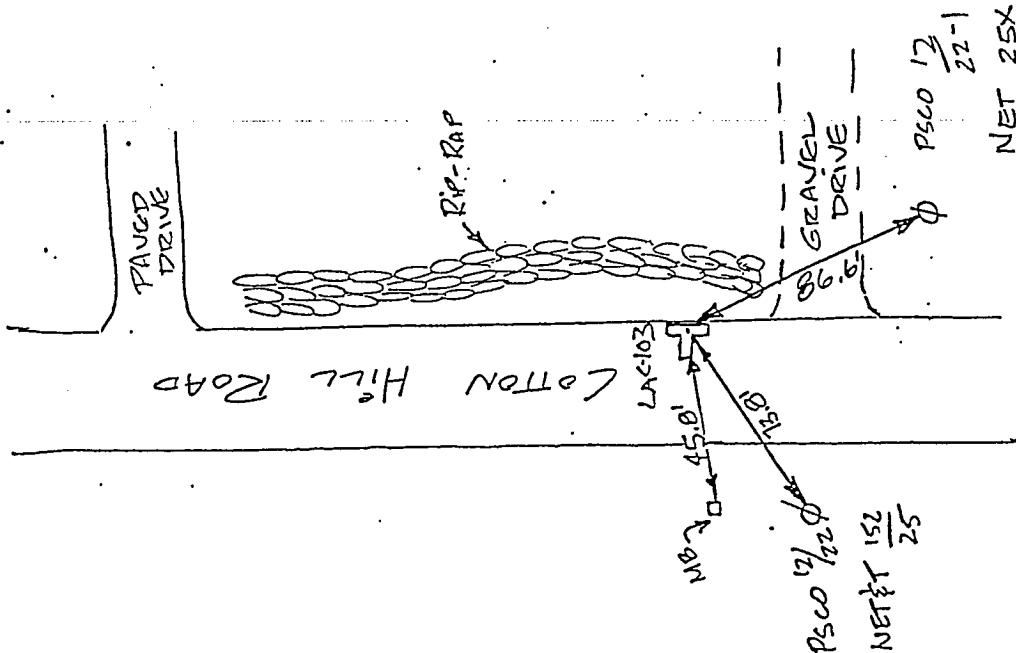


CLD

Costello, Lomasney & de Napoli Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

SKETCH LAC-103

SPIKE W/WASHER

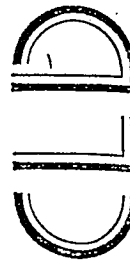
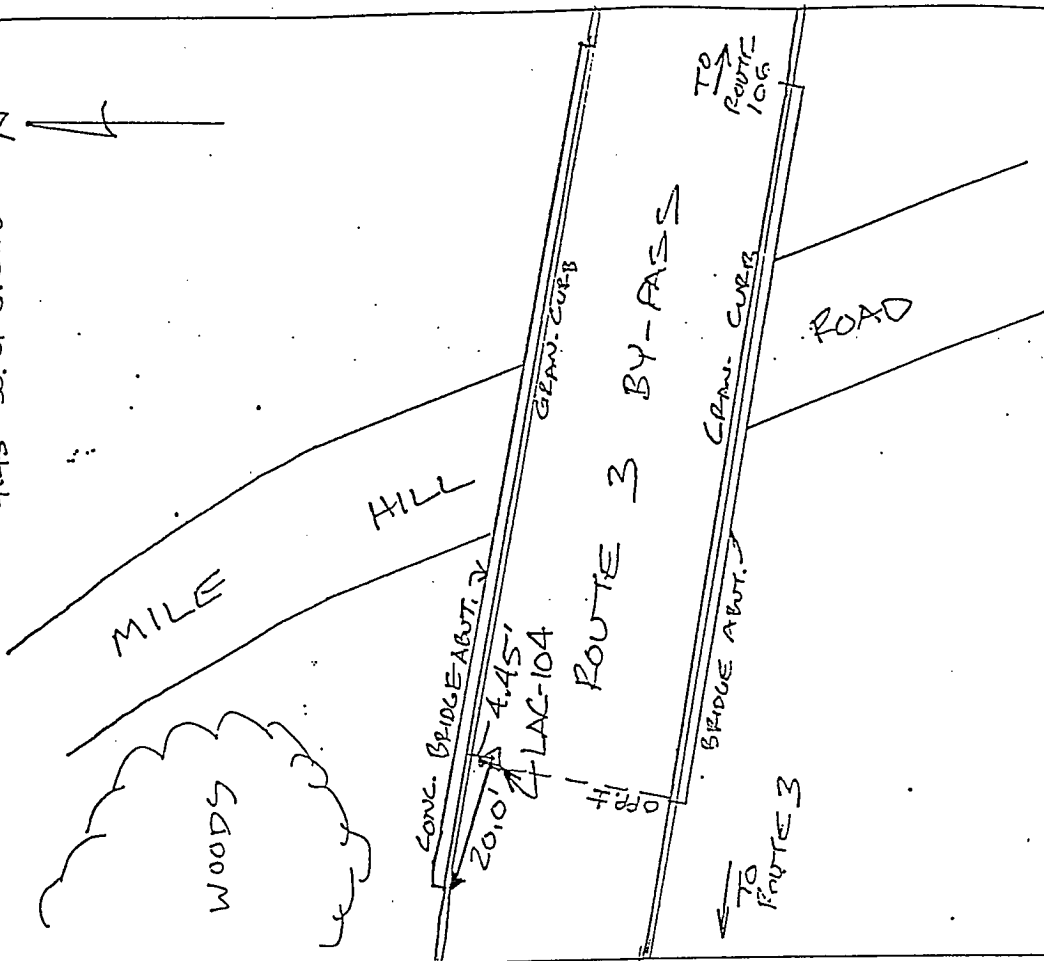
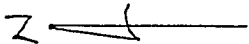


Costello, Lamorey & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902

SKETCH LAC-104

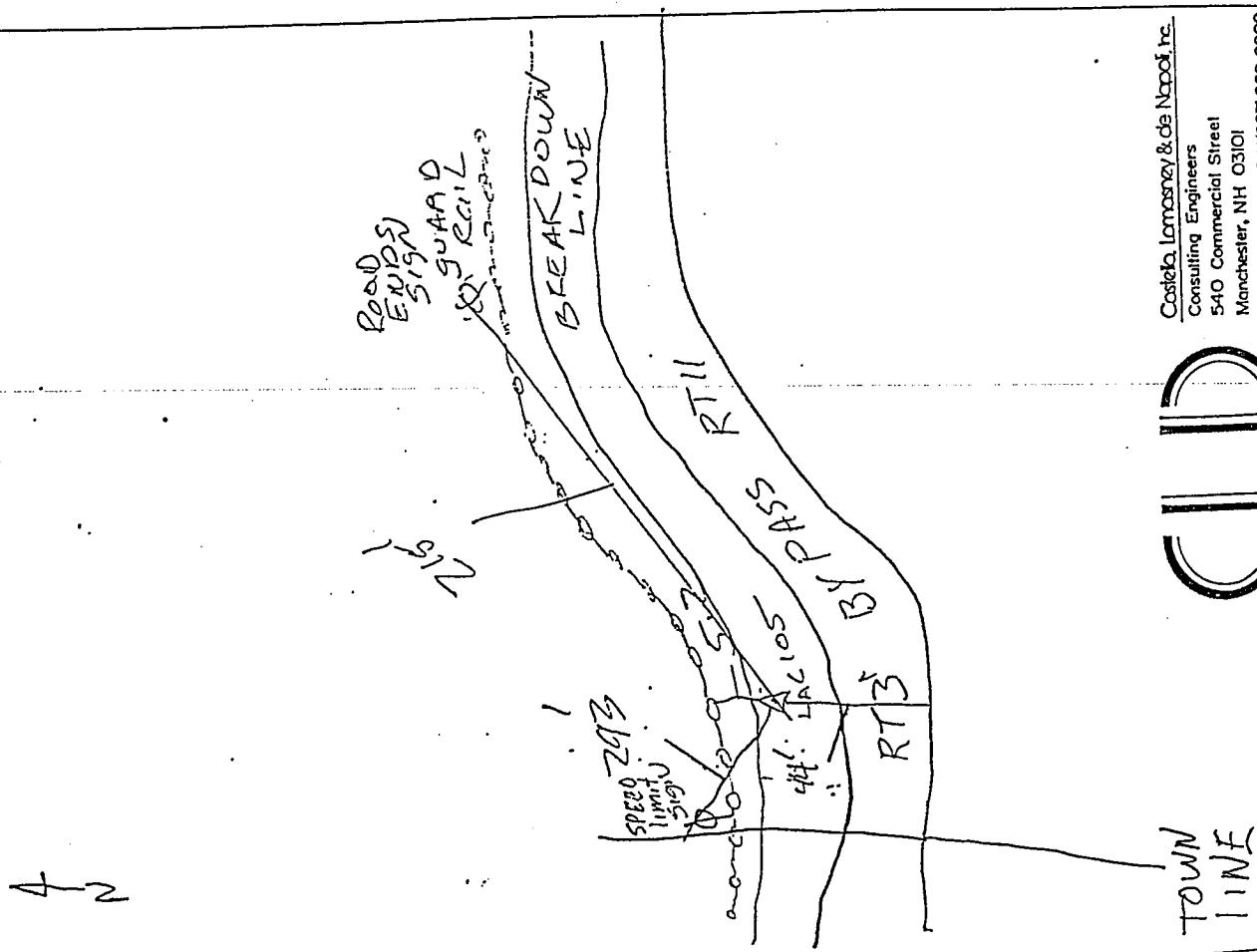
SPIKE W/WASHER SET
IN BRIDGE SHOULDER.
NIN' END OF PAVED DRIVE.

4.45' SO. OF G. CURB

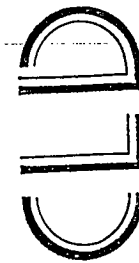


Costello, Lamorey & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902

SKETCH LAC-105 ON NORTH SIDE OF RD PK & WASHOR (ROUTE 3 BY-PASS)

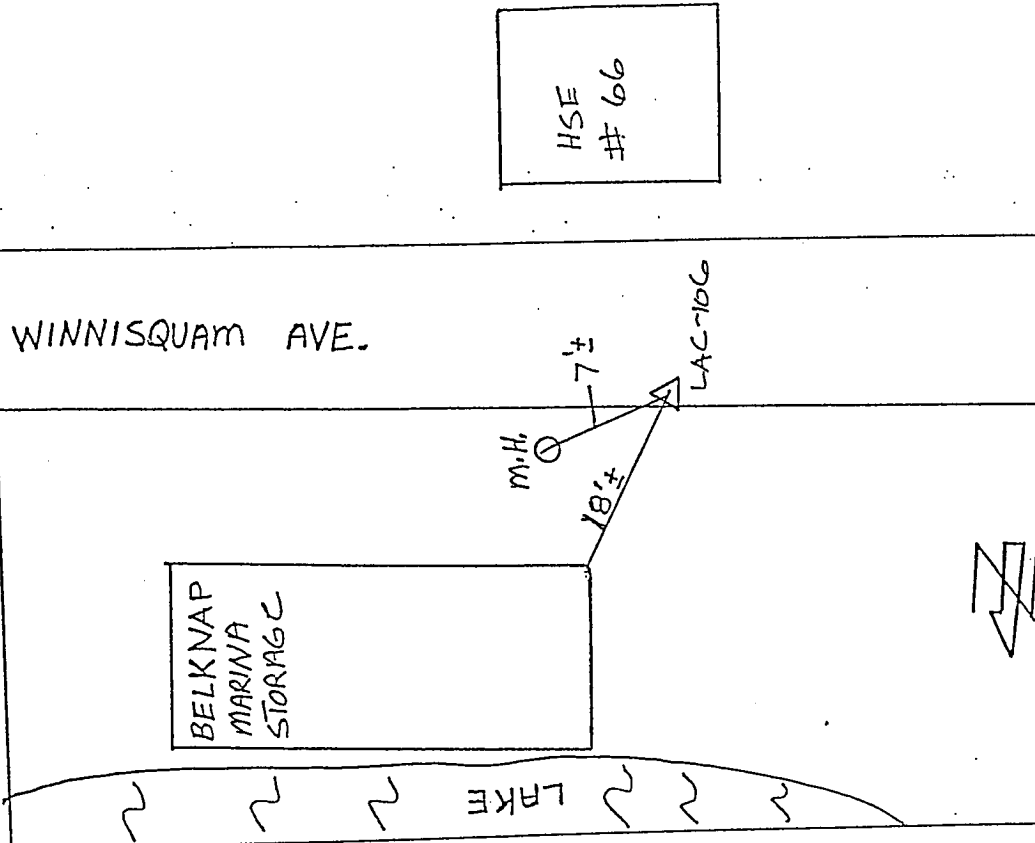


Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

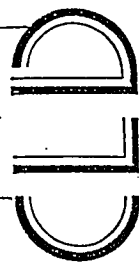


TOWN
LINE

SKETCH LAC-106 PK & WASHOR

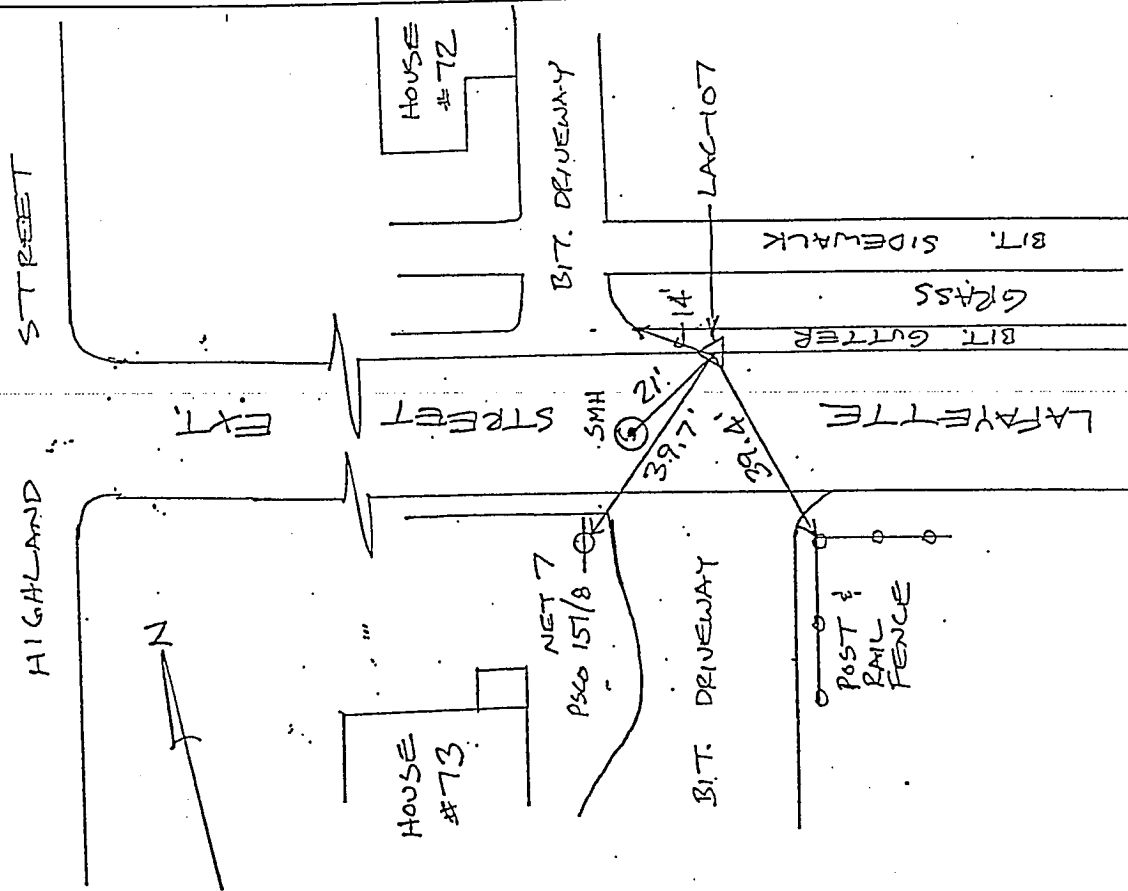


DEAD
END

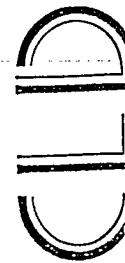


Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

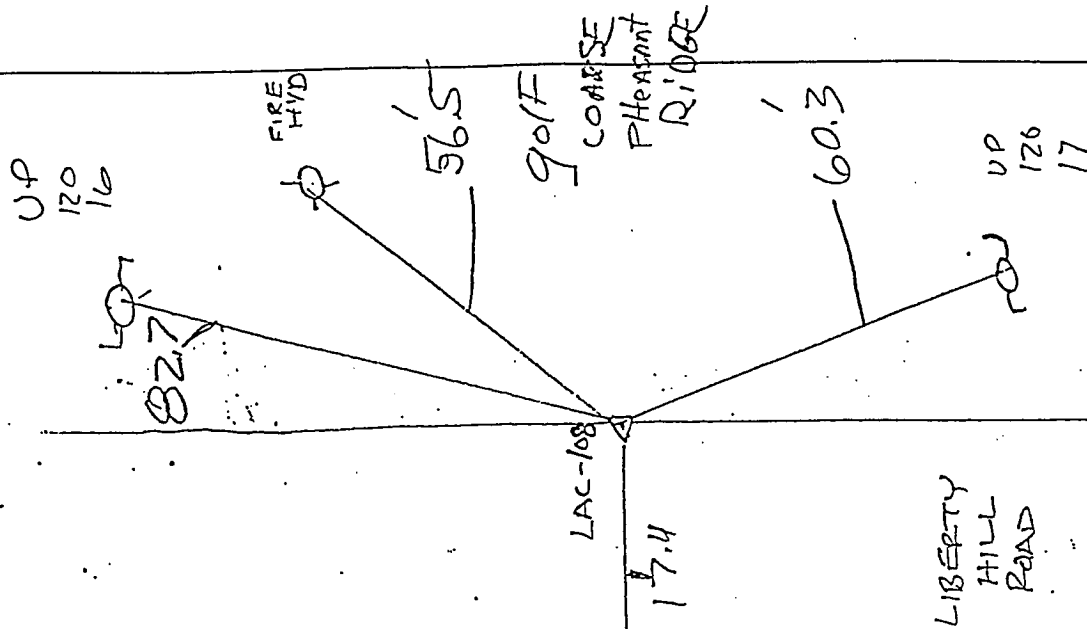
SKETCH LAC-107
SPIKE W/ WASHER SET ON
NO. SIDE LAFAYETTE ST. EXT.



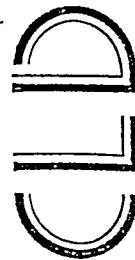
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



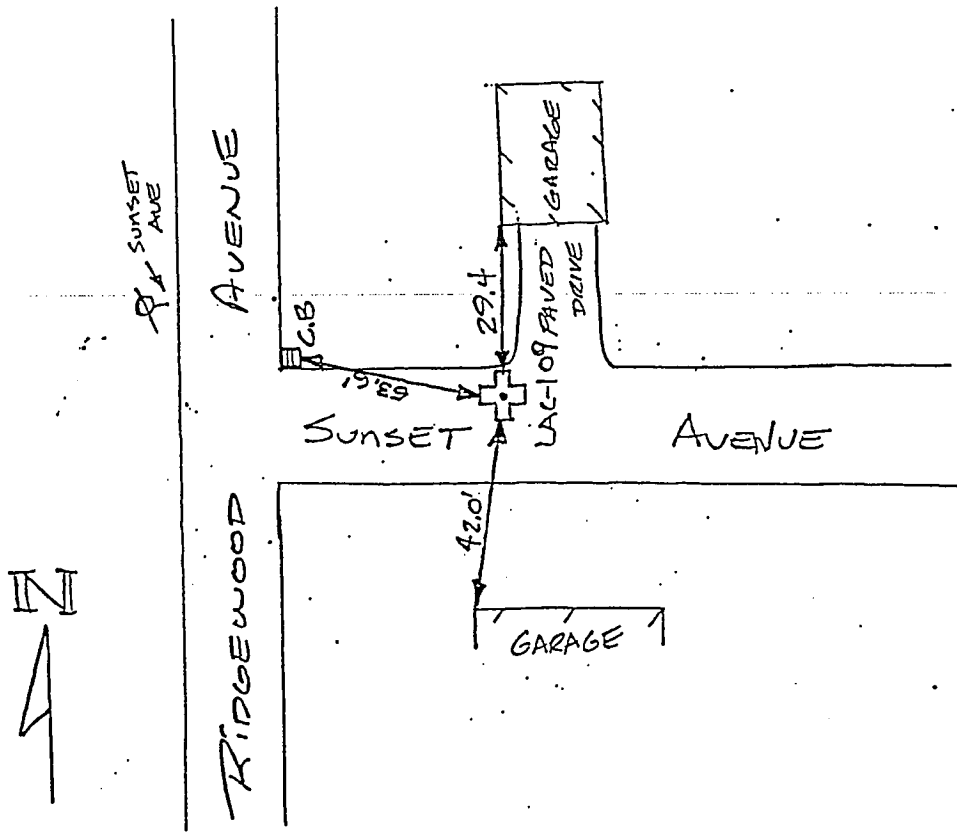
SKETCH LAG-108
SPRUE WITH WASHER EAST SIDE RD



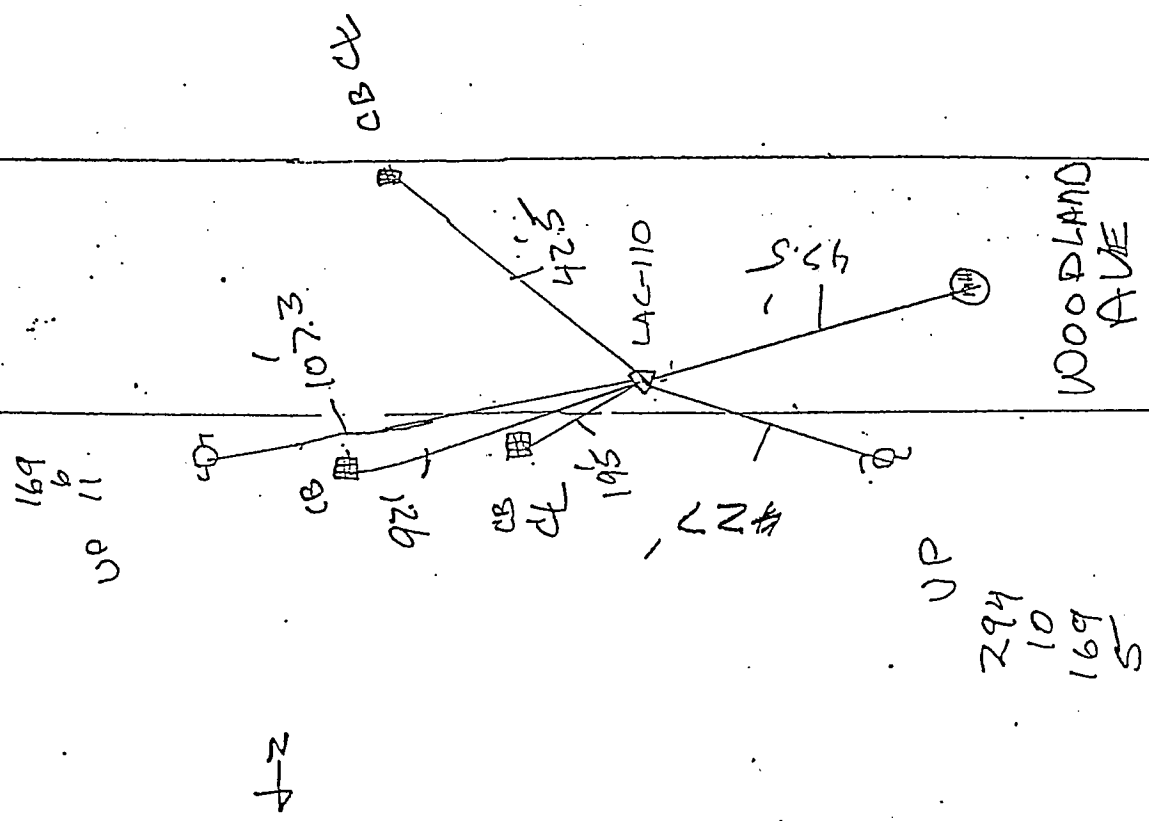
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 658-8223 FAX (603) 658-8902



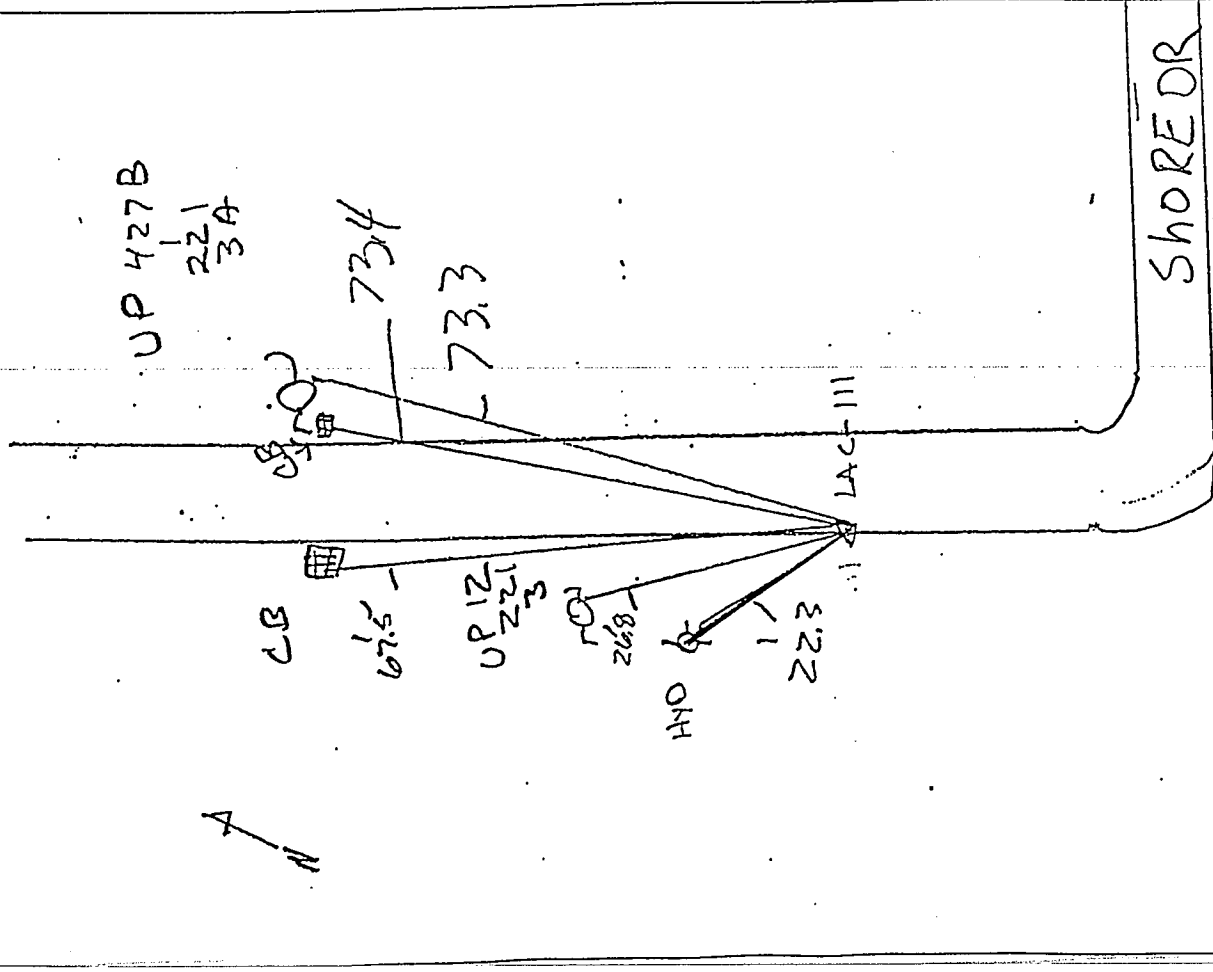
SKETCH LAC-109 SPIKE W/ WASHER



SKETCH LAC-110
 PK DATA SHEET
 EDGE OF RD. NORTH SIDE

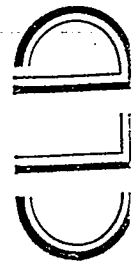


SKETCH LAC-111 PK WITH WASHK ON THE WEST EDGE OF RD

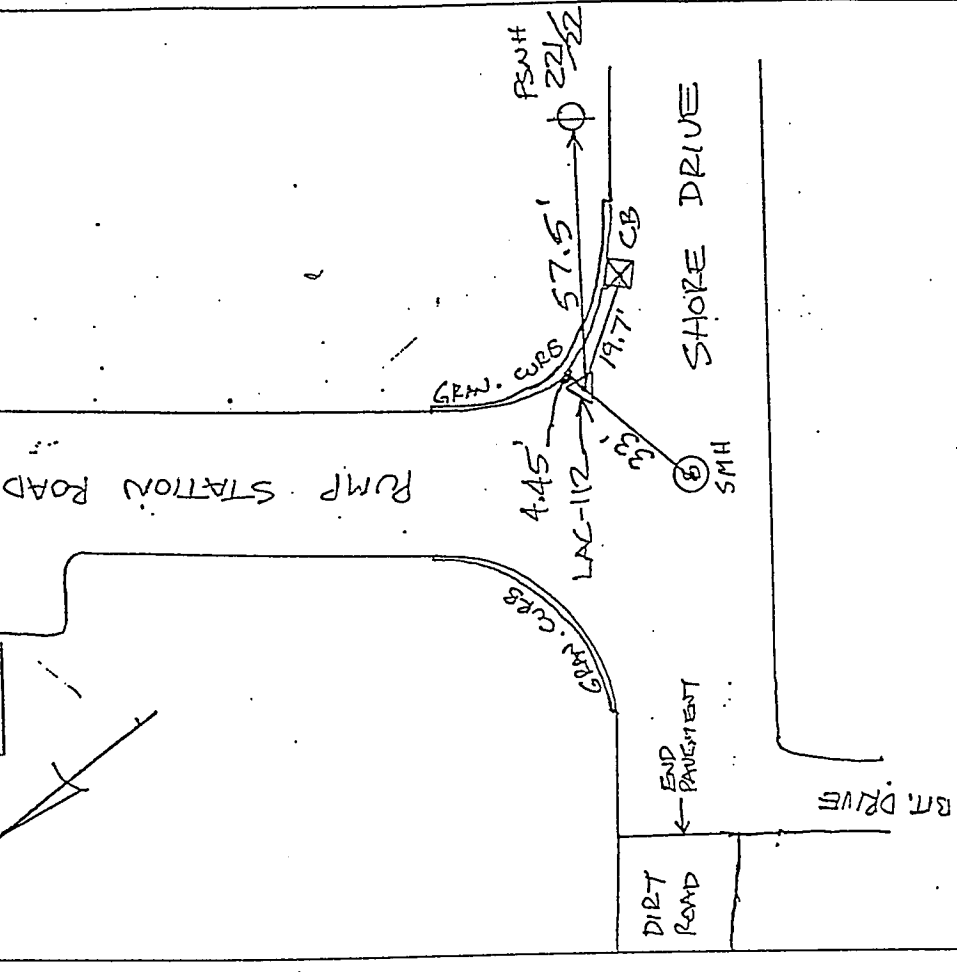


SHORE DR

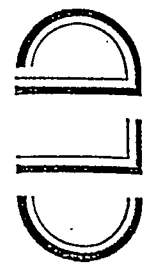
Costello, Lamorey & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



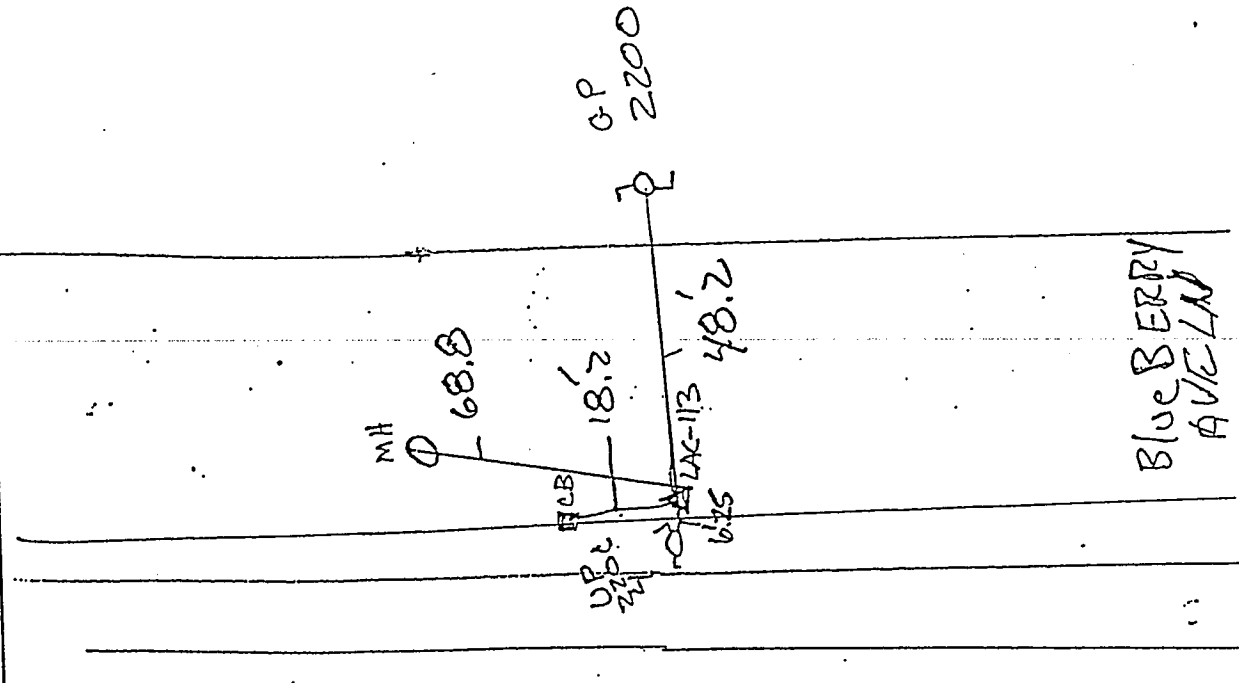
SKETCH LAC-112 SPIKE W/WASHER SET 4.45' W. OF CURB AT INT. OF PUMP STA. RD. & SHORE DRIVE



Costello, Lamorey & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

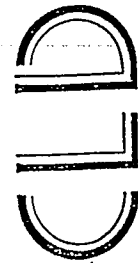


SKETCH LAC-113 SPIREW/WASHER
EDGE OF NORTH SIDE



SIDE WALK

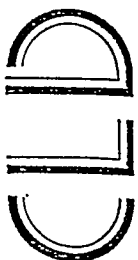
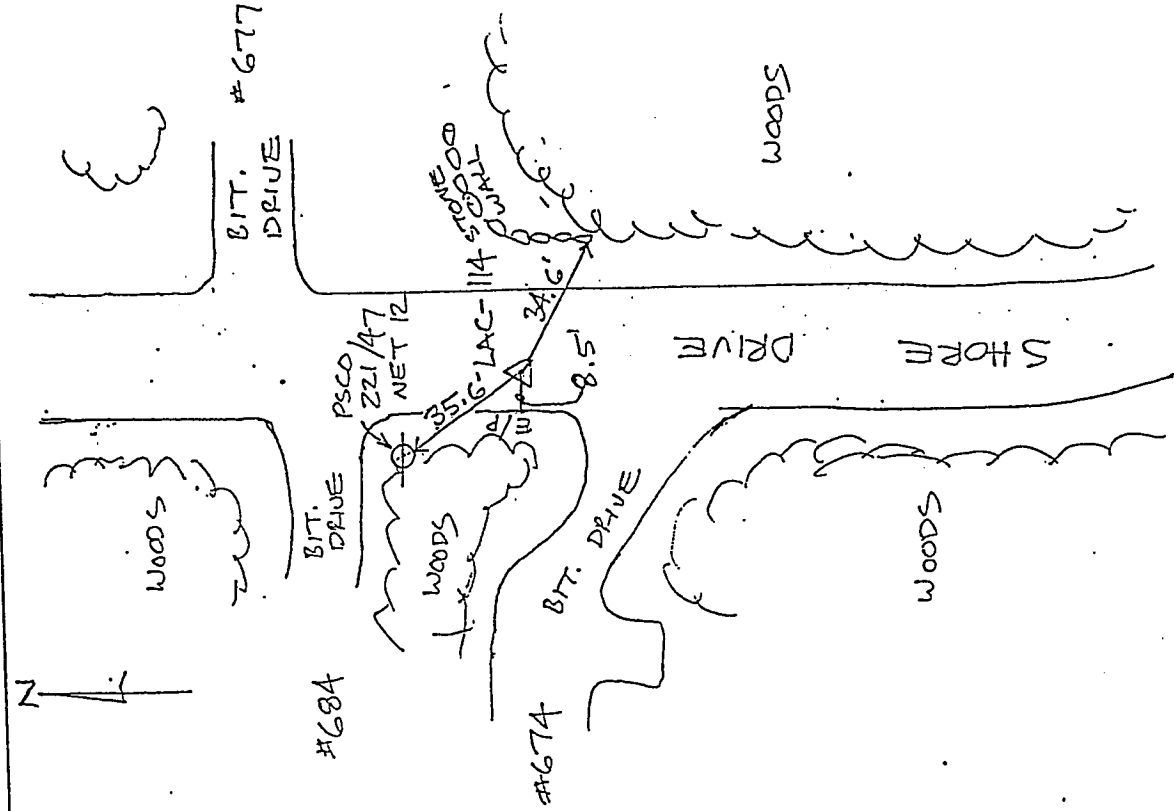
BLUE BERRY
AVE LAD



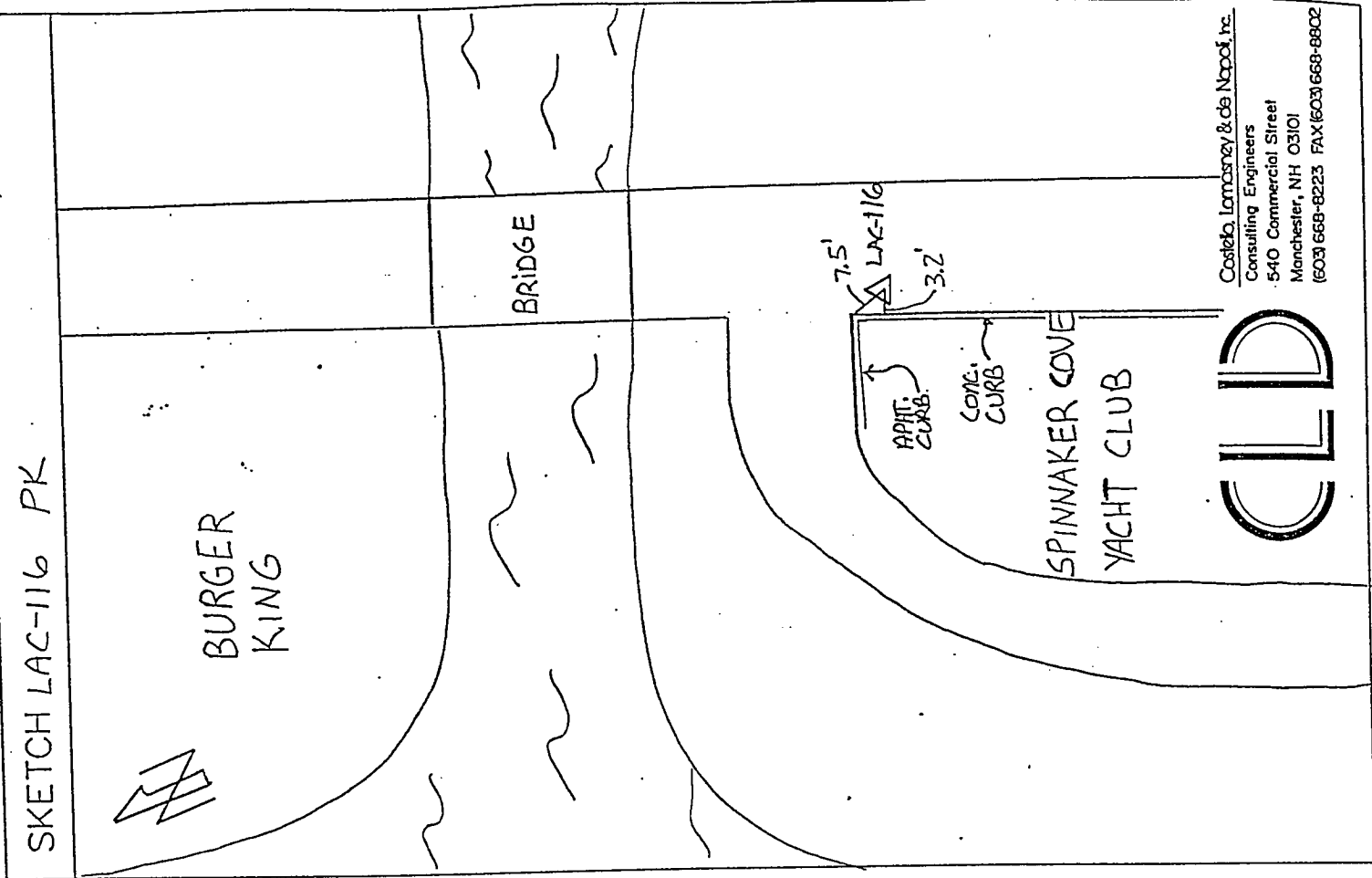
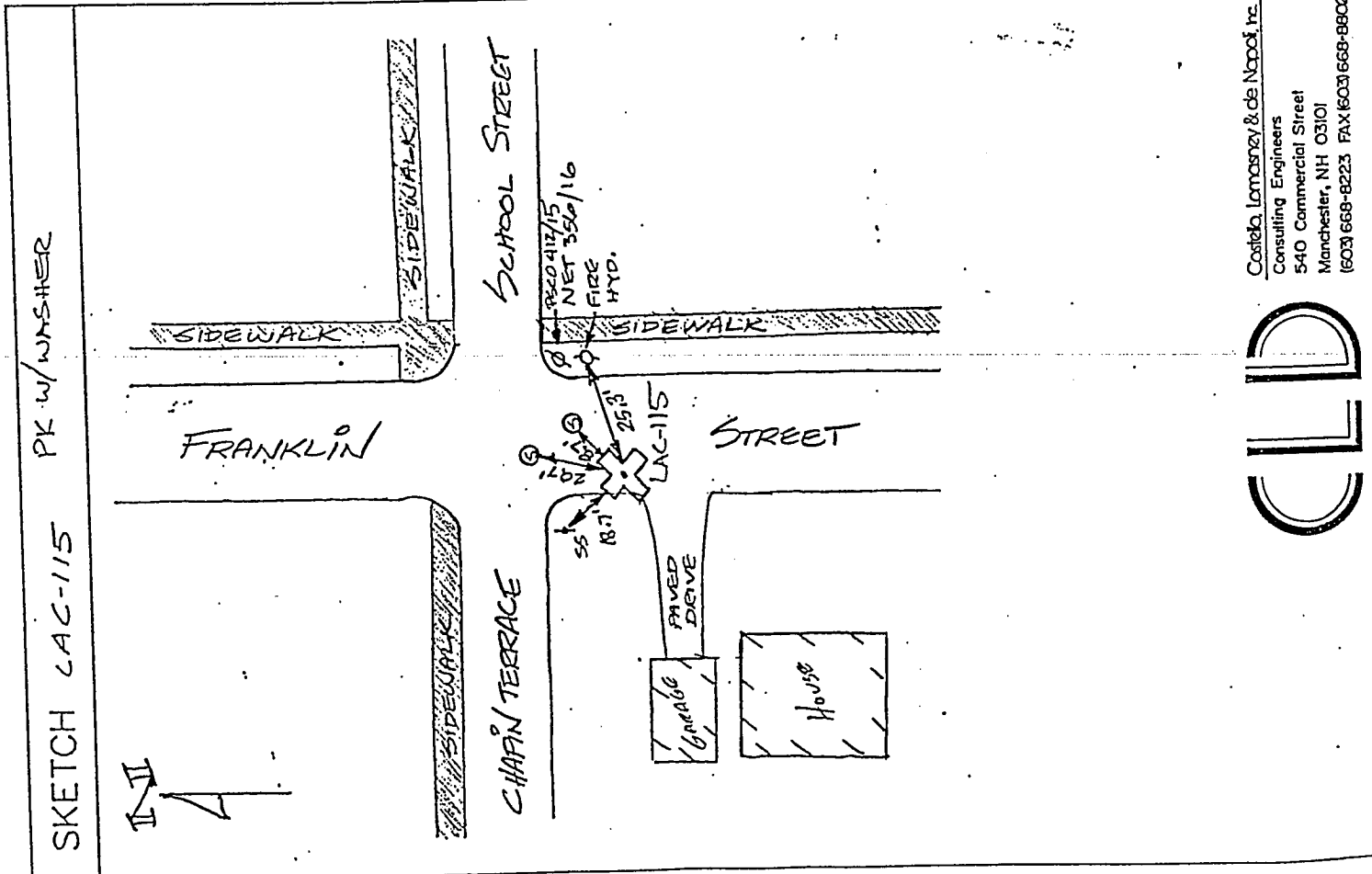
Costello, Lamosney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902

SKETCH LAC-114

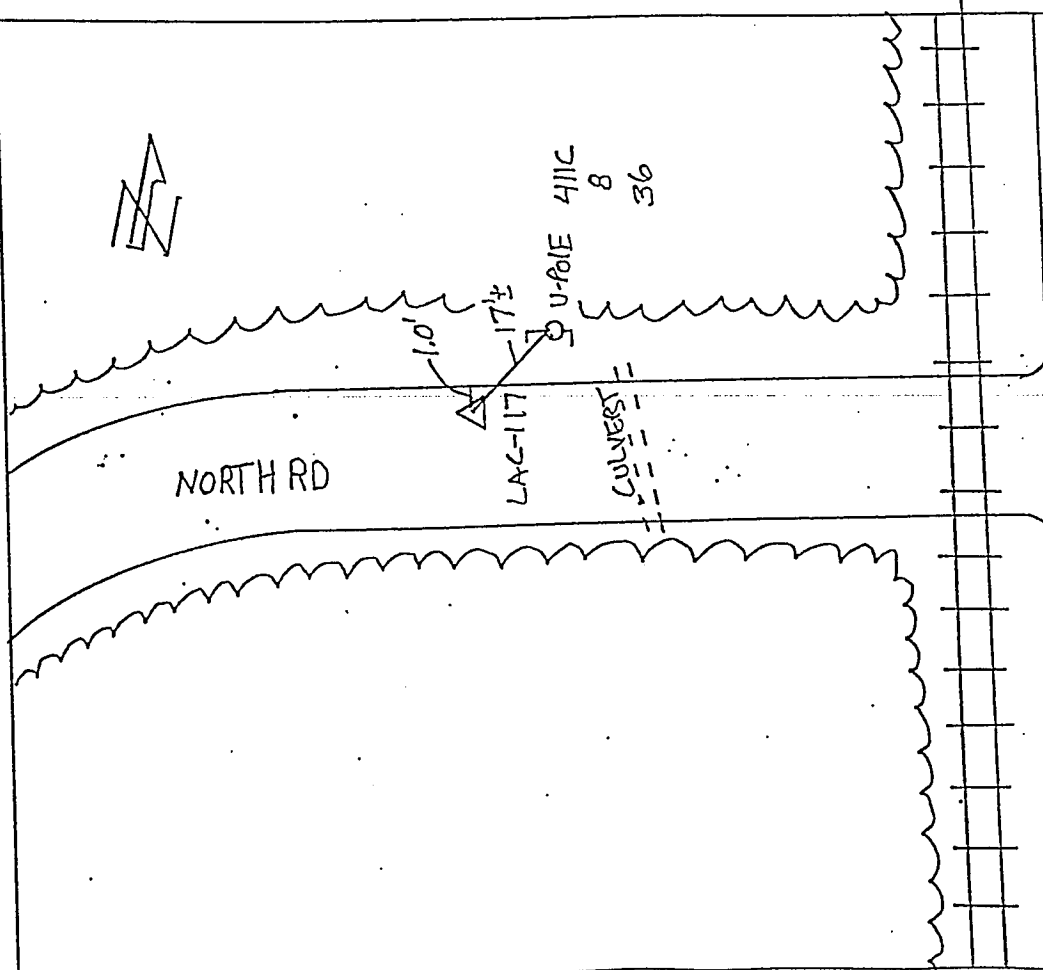
PK W/ WASHIR-547 IN
ROAD BETWEEN E & WEST
EDGE OF SHADY DRIVE



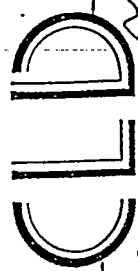
Costello, Lamosney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



SKETCH LAC-117 SPIKE w/WASHER

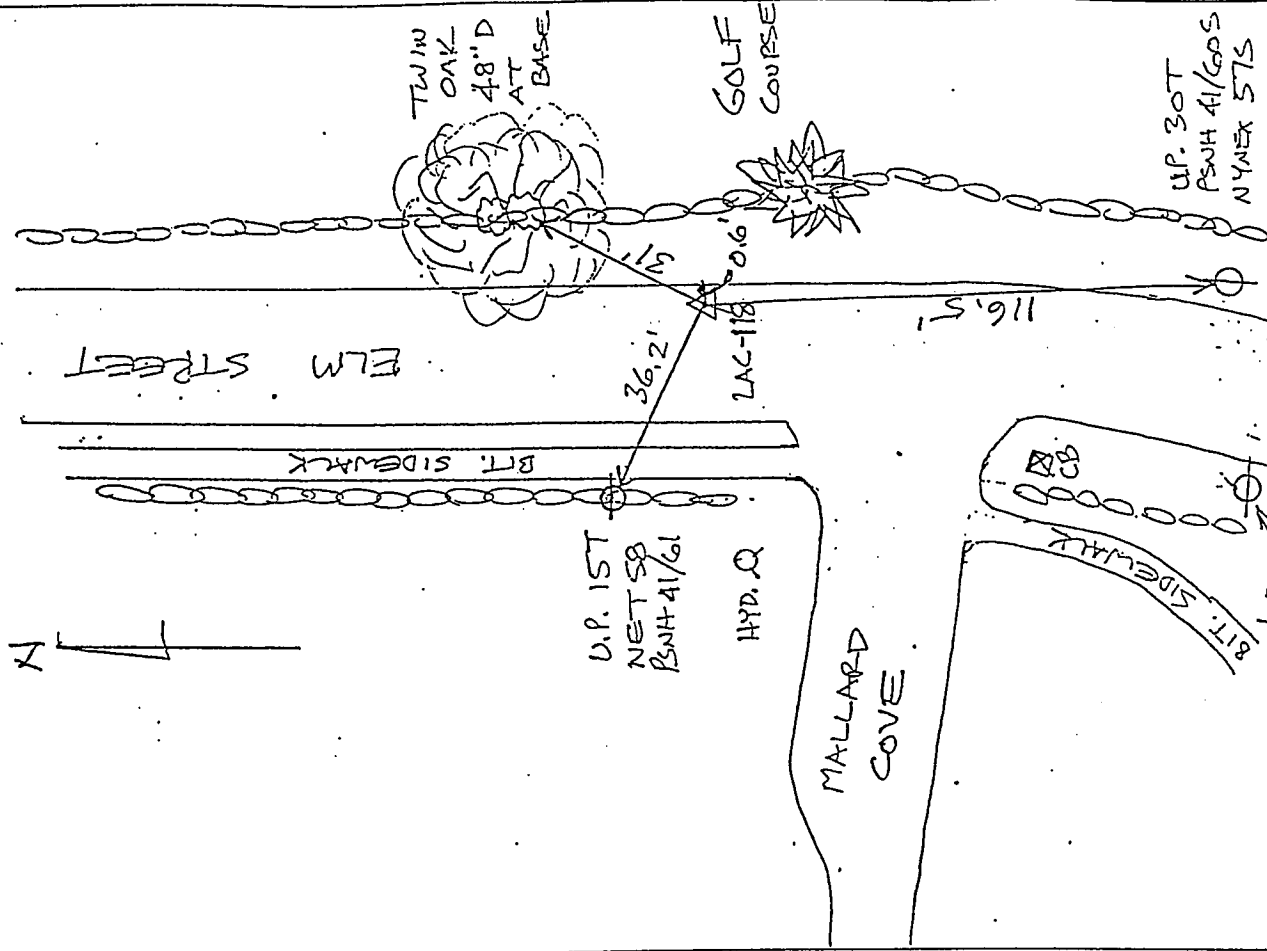


Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902

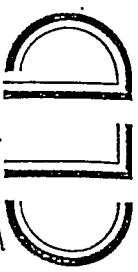


SKETCH LAC-118

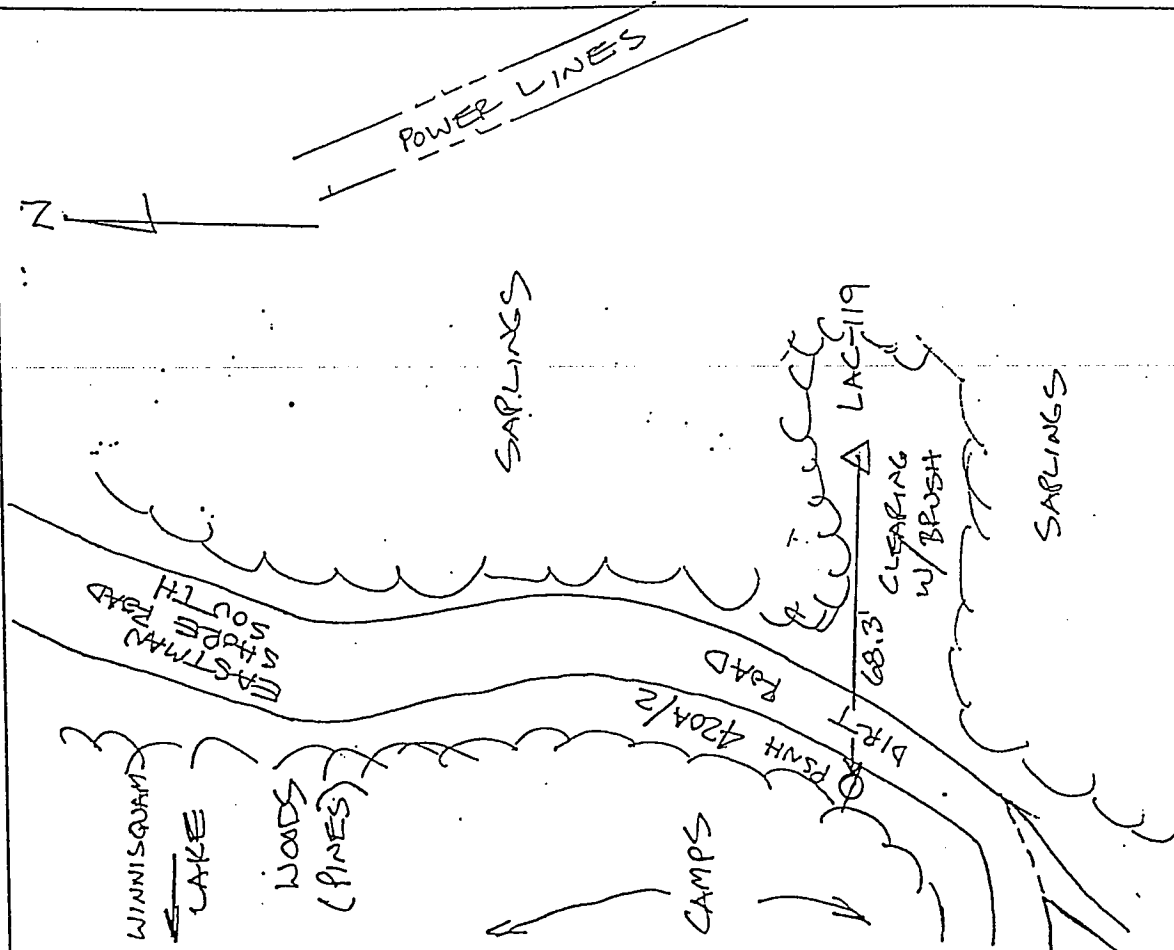
RK. W/WASHER SET AT EAST EDGE OF ELM ST.



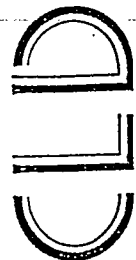
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



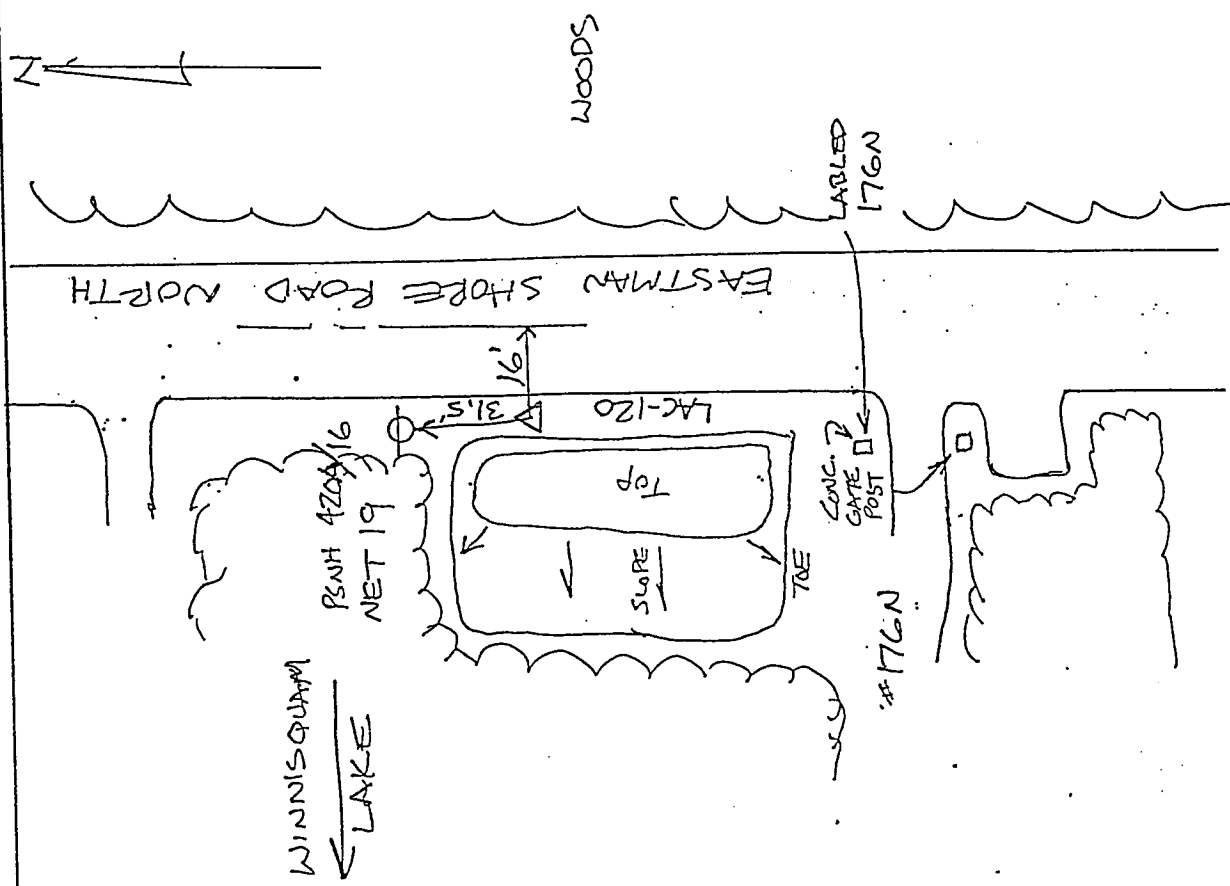
SKETCH LAC-119 SPIKE SET IN GROUND EAST OF DIRT ROAD AT CAMPS



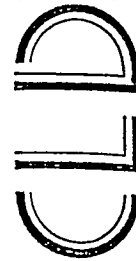
Costello, Lamorey & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



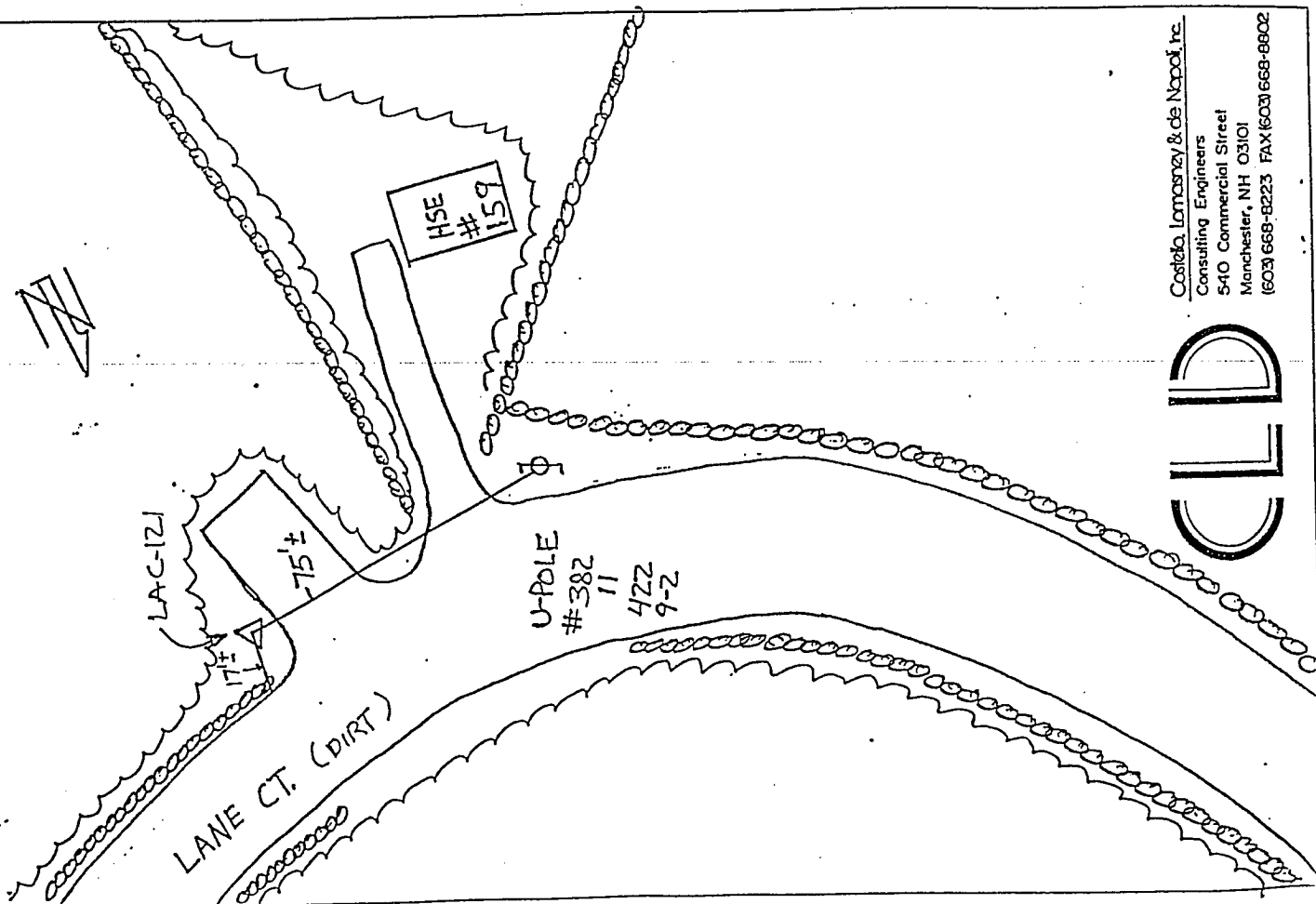
SKETCH LAC-120 NAIL IN 1.75" SQ. WOOD NUB 16' WEST OF DIRT ROAD



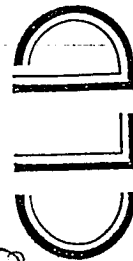
Costello, Lamorey & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



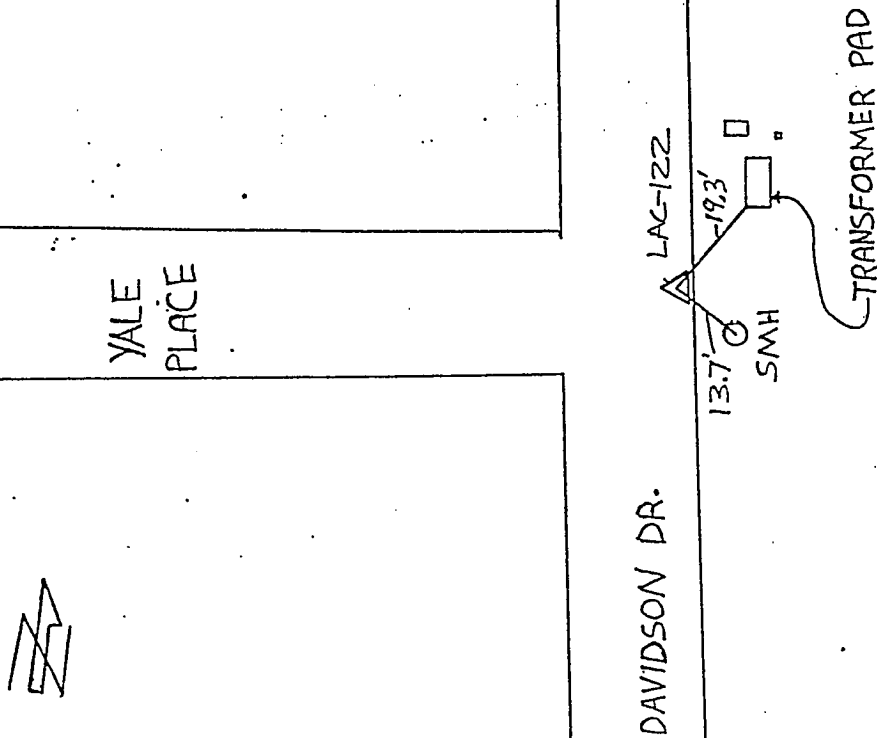
SKETCH LAC-121 MASON NAIL IN HUB



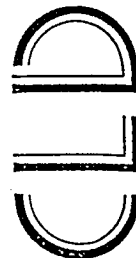
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



SKETCH LAC-122 PK NAIL



Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



SKETCH LAC-123 PK NAIL



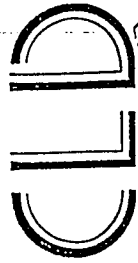
GRAVEL PARKING AREA

TENNIS COURT

LAC-123

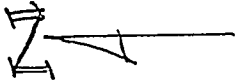
1.0' COW PATH LN.

LAKE



Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

SKETCH LAC-124 PK W/WASHER



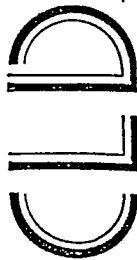
1.2' OFF E.P.

PARADE ROAD (ROUTE. 106)

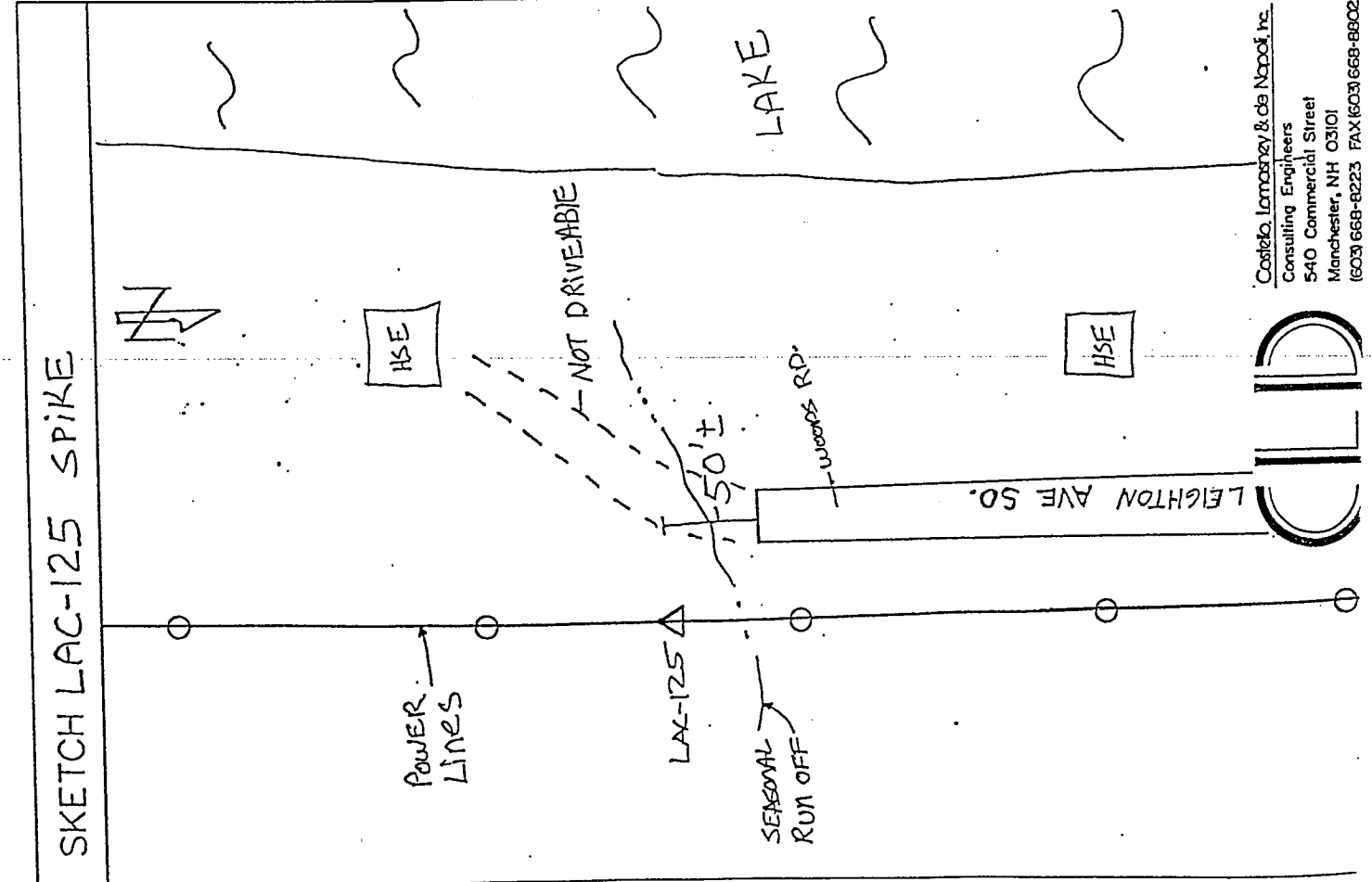
LAC-124

PSCO 42
36
NET 122

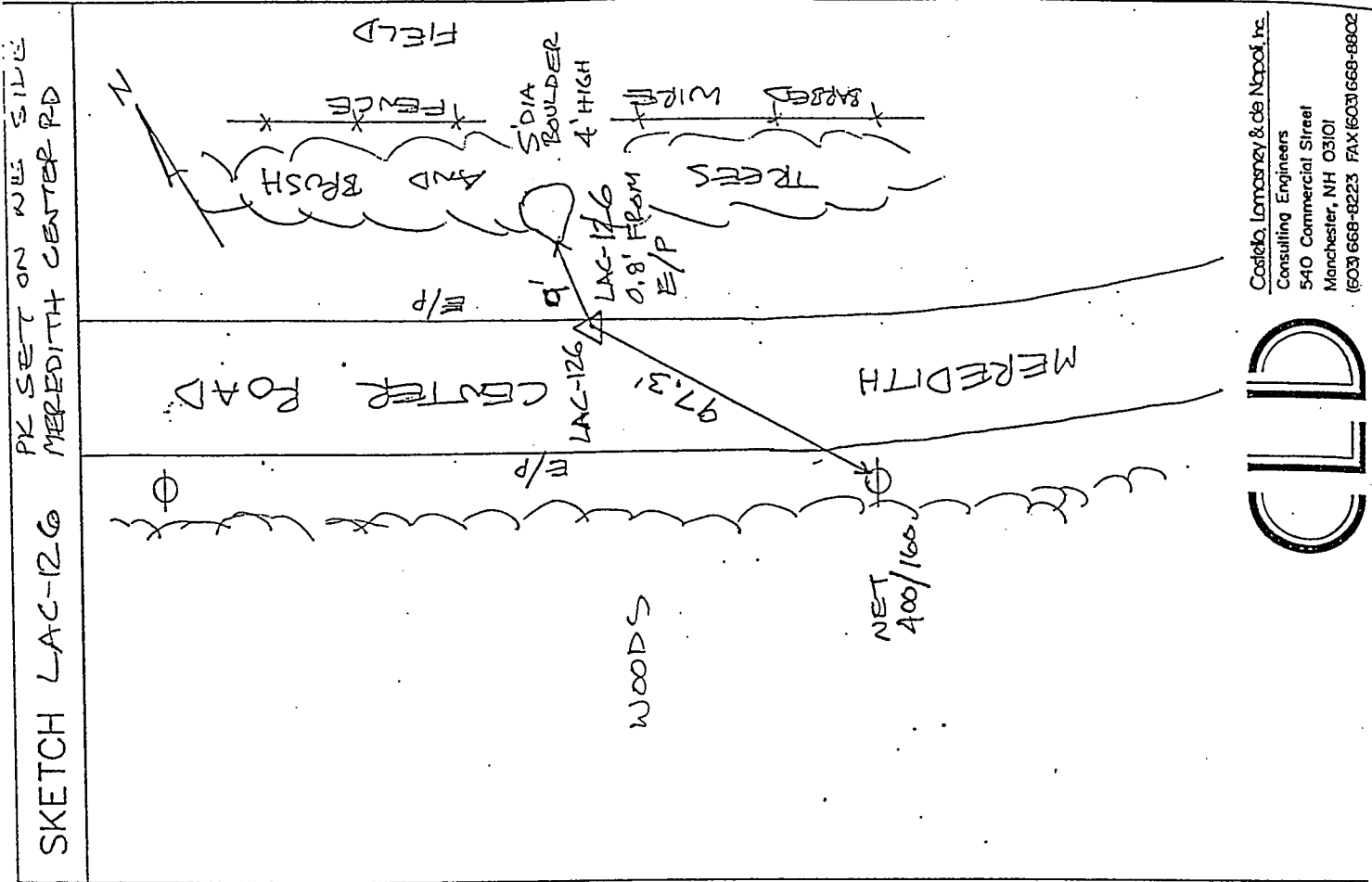
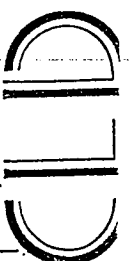
PSCO 42
35
NET 121



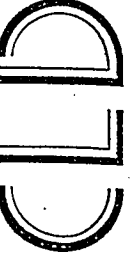
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



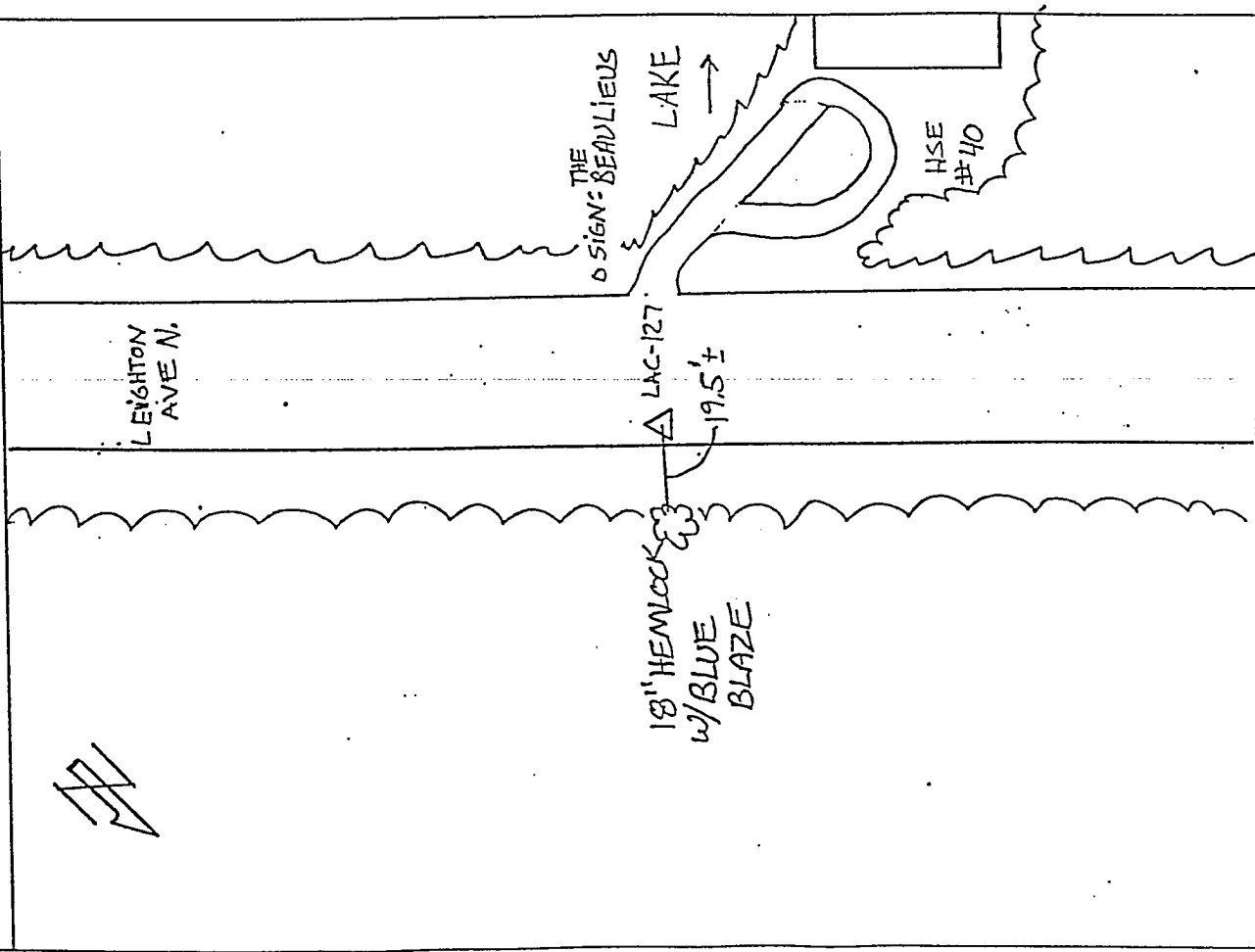
Costello, Lomasney & de Napoli, Inc.
 Consulting Engineers
 540 Commercial Street
 Manchester, NH 03101
 (603) 668-8223 FAX (603) 668-8902



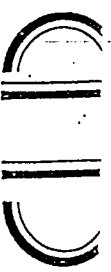
Costello, Lomasney & de Napoli, Inc.
 Consulting Engineers
 540 Commercial Street
 Manchester, NH 03101
 (603) 668-8223 FAX (603) 668-8902



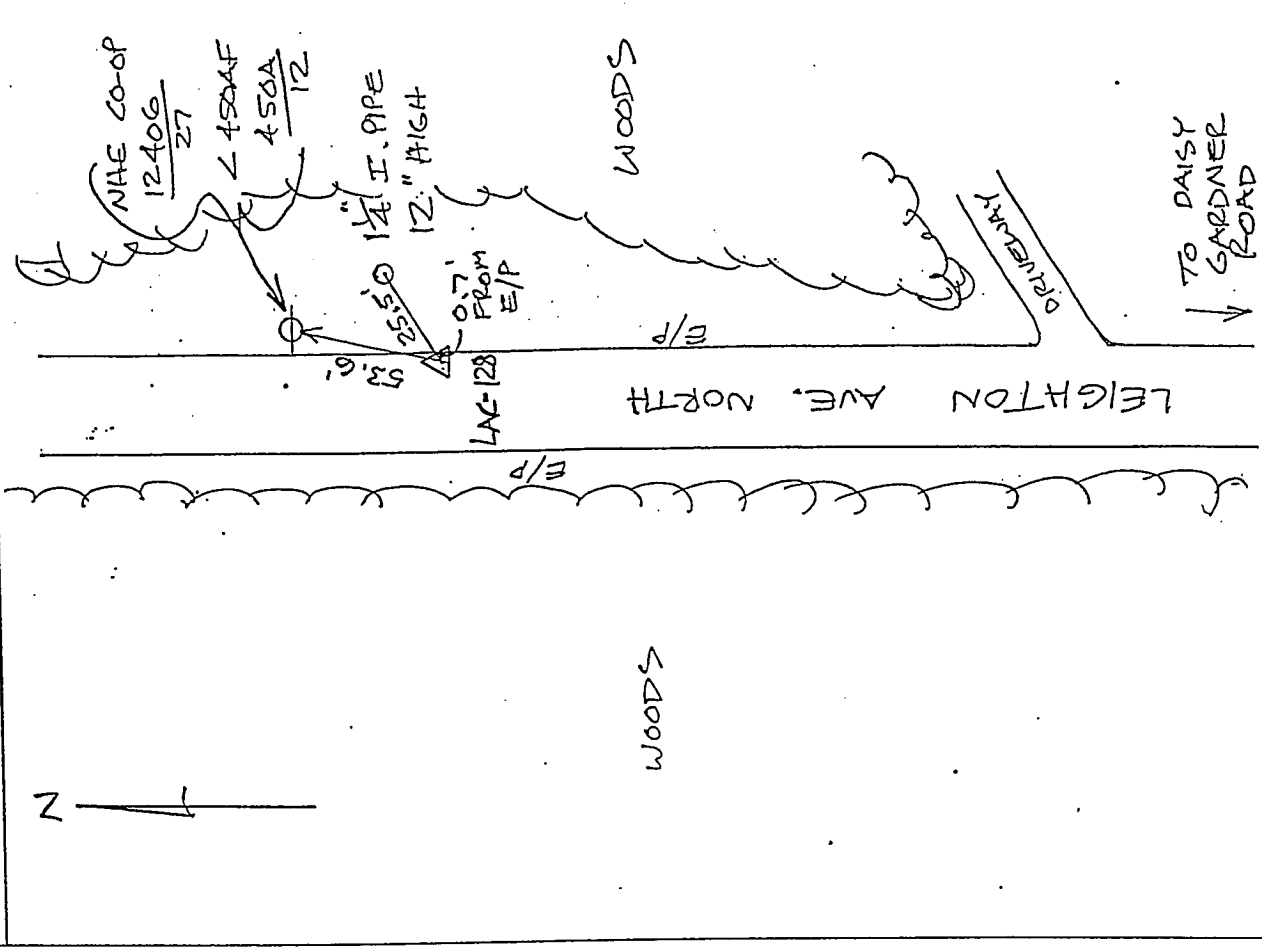
SKETCH LAC-127 PK NAIL



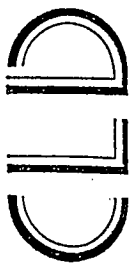
Costello, Lomazny & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101



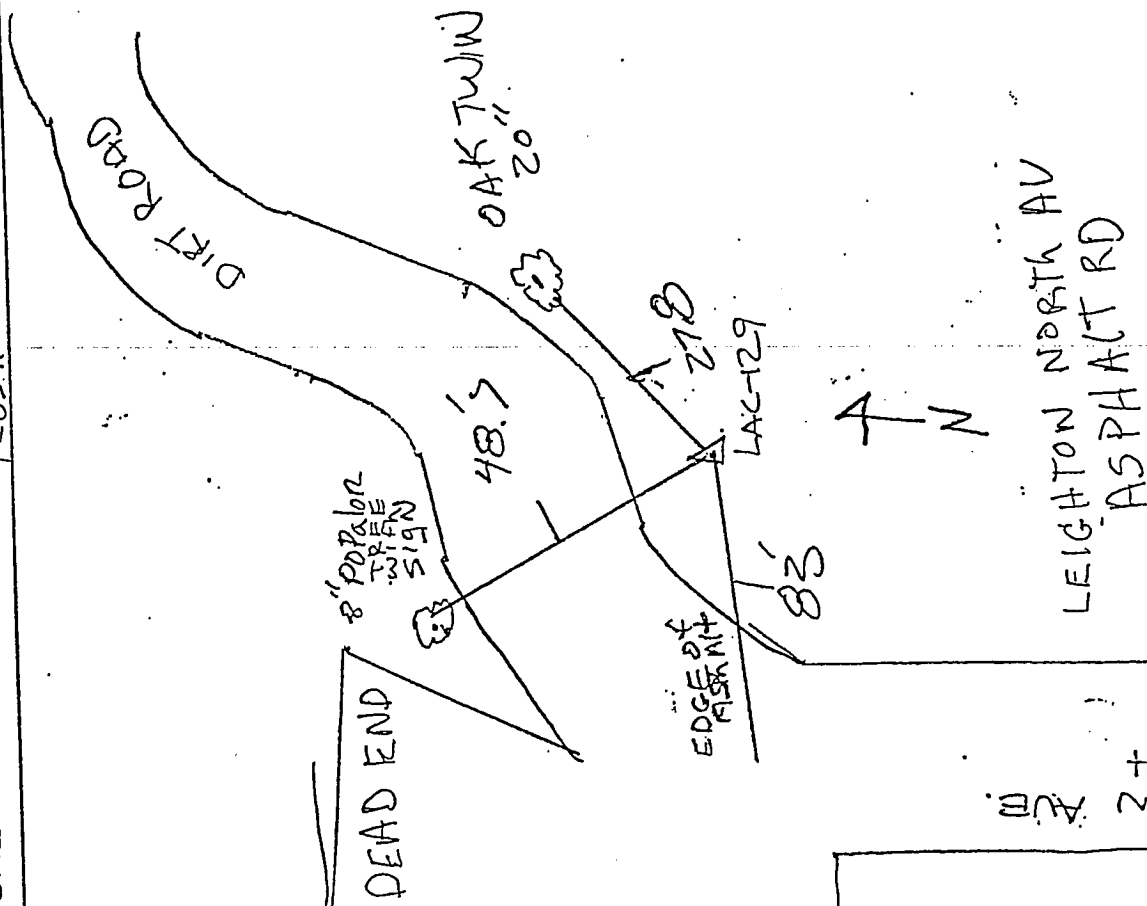
SKETCH LAC-128 PK SET ELY SIDE OF ROAD



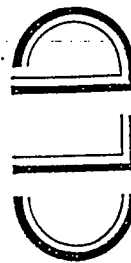
Costello, Lomazny & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



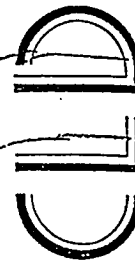
SKETCH
LAW 150 PK 15 ON WEST SIDE OF RD



Castello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

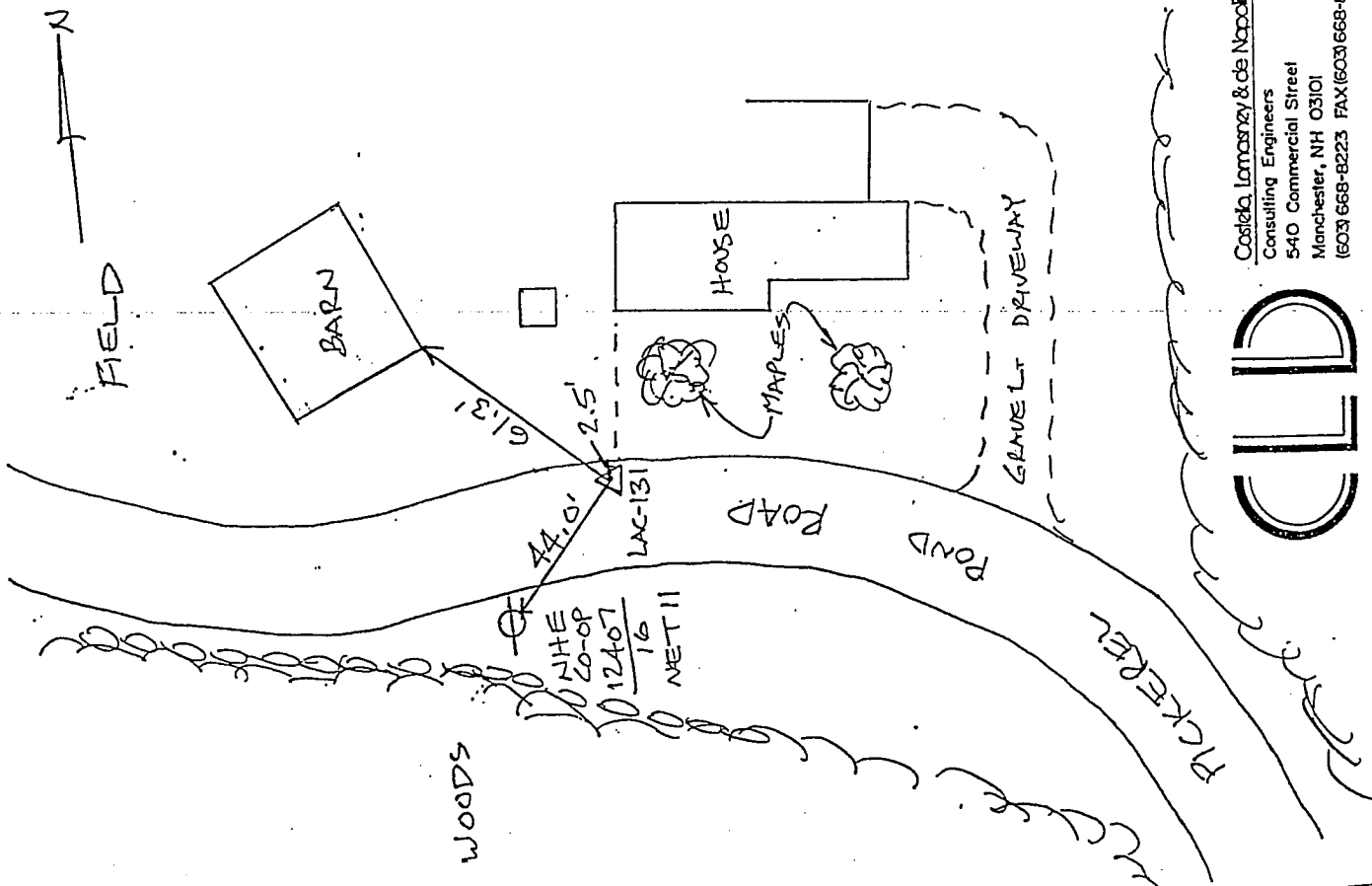


Costello, Lamasz & de Napof, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

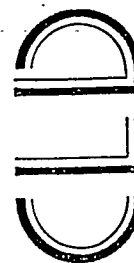


(603) 668-8223 FAX (603) 668-8802

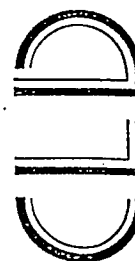
SKETCH LAC-132



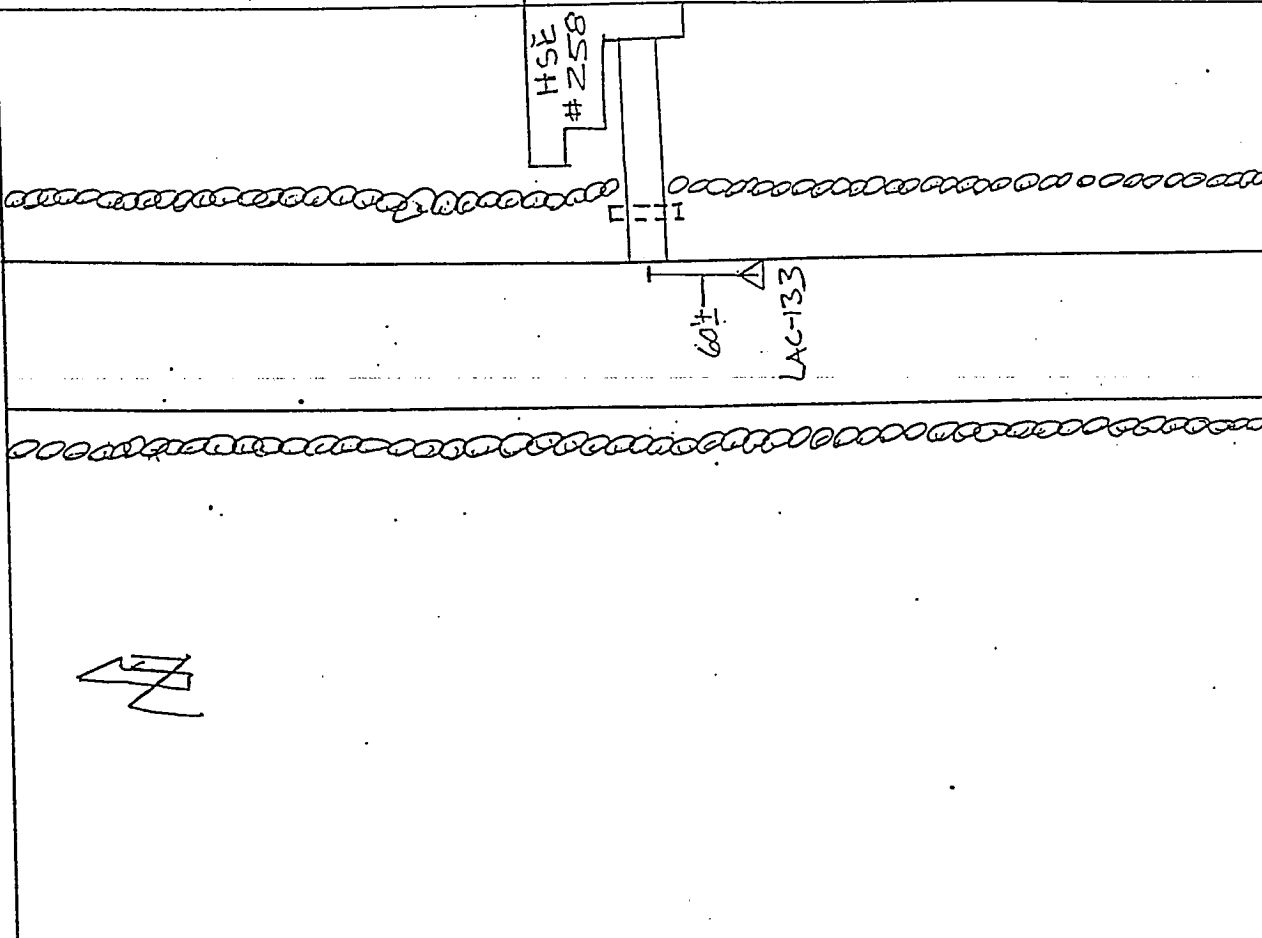
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



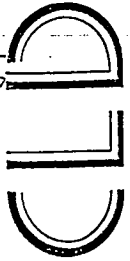
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



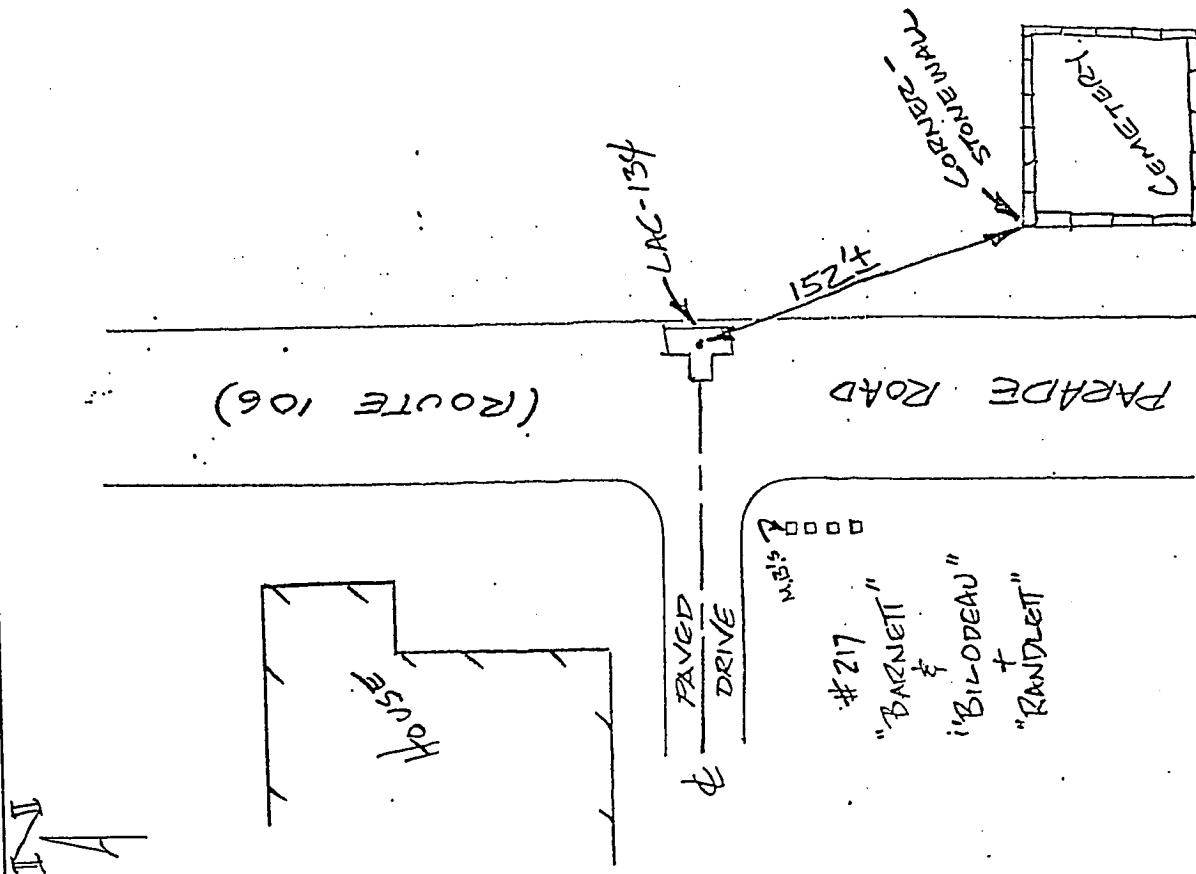
SKETCH LAC-133 PK NAHL



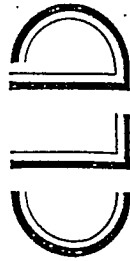
Costello, Lomasney & de Napoli, Inc.
 Consulting Engineers
 540 Commercial Street
 Manchester, NH 03101
 (603) 668-8223 FAX (603) 668-8002



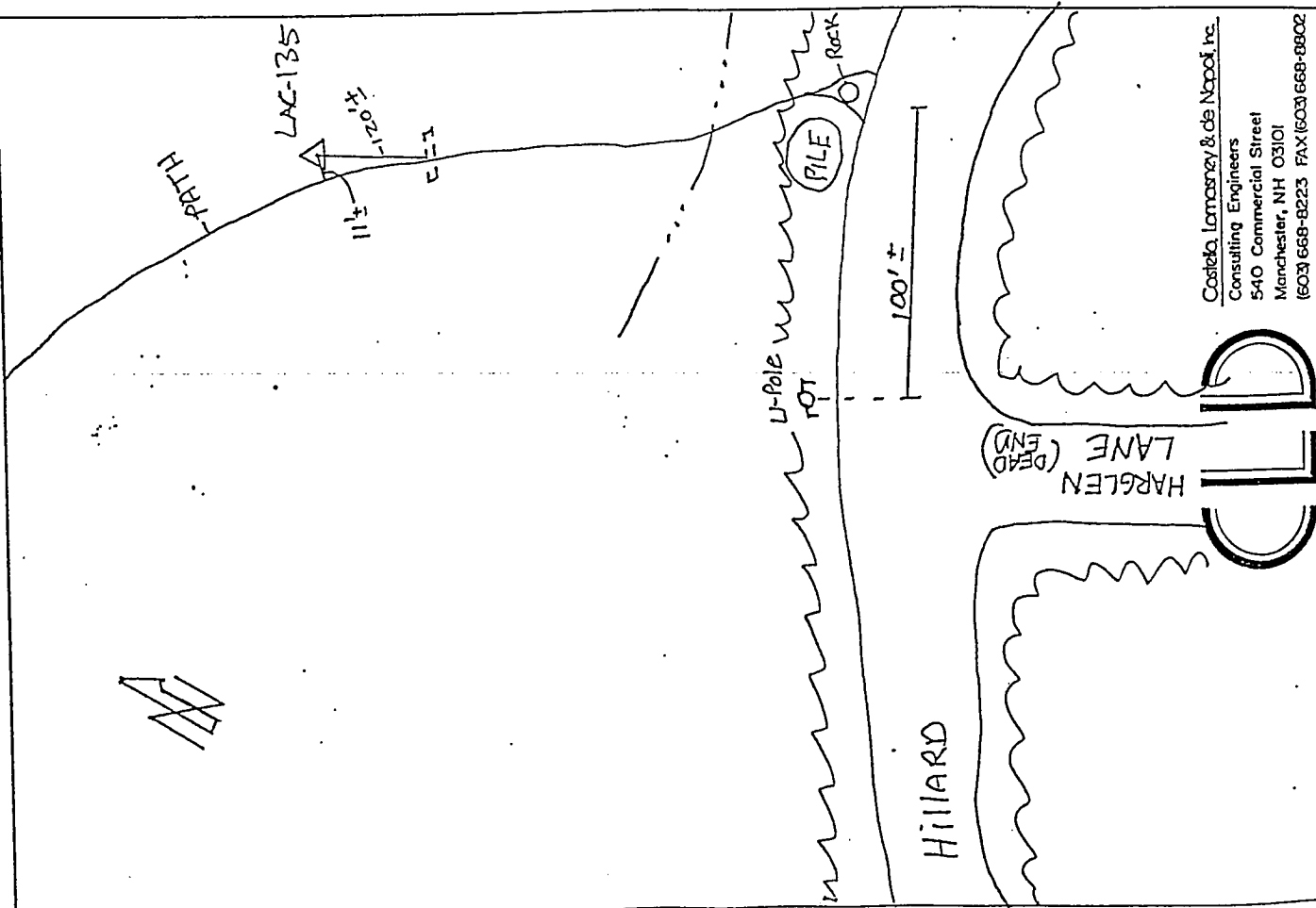
SKETCH LAC-134 PK W/WASHER EAST SIDE OF ROAD



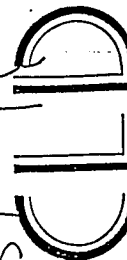
Costello, Lomasney & de Napoli, Inc.
 Consulting Engineers
 540 Commercial Street
 Manchester, NH 03101
 (603) 668-8223 FAX (603) 668-8002



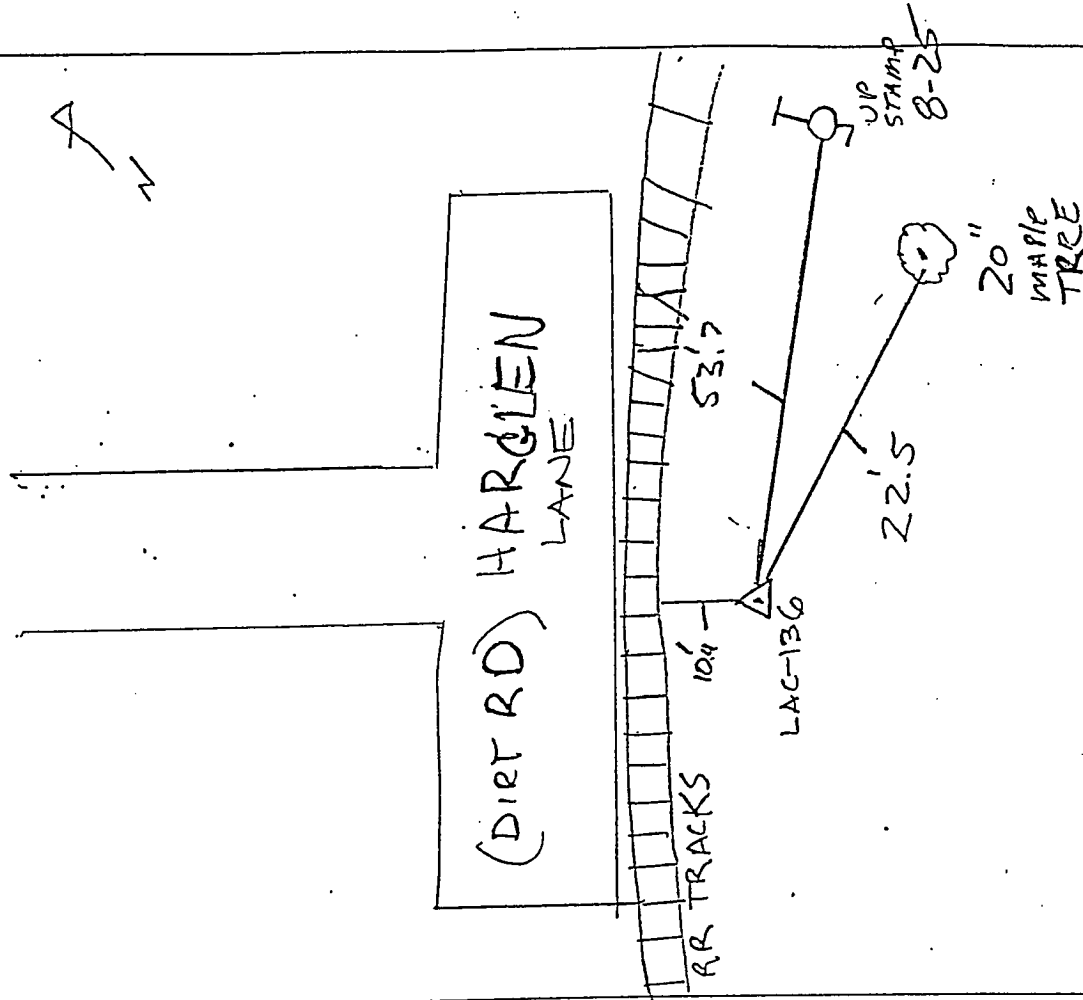
SKETCH LAC-135 SPIKE



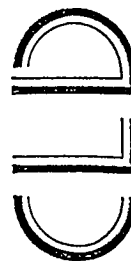
Costello, Lamasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902



SKETCH LAC-136 SPIKE SET IN GROUND



Costello, Lamasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8902

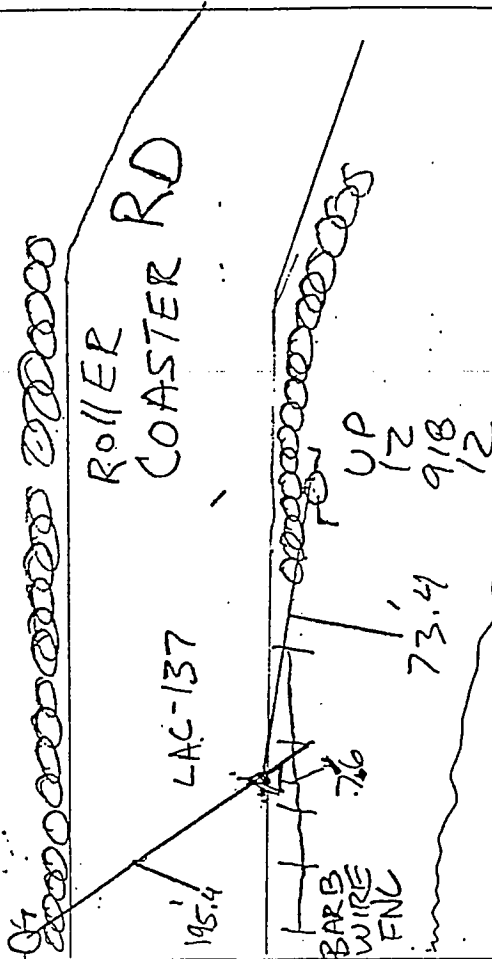


SKETCH LAG-137 SPIKE SETC SO. SIDE OF ROAD

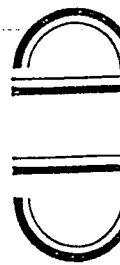
4
N

MAYBE
12
13

UP 12
918
13



BEAVER
POND

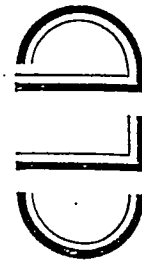
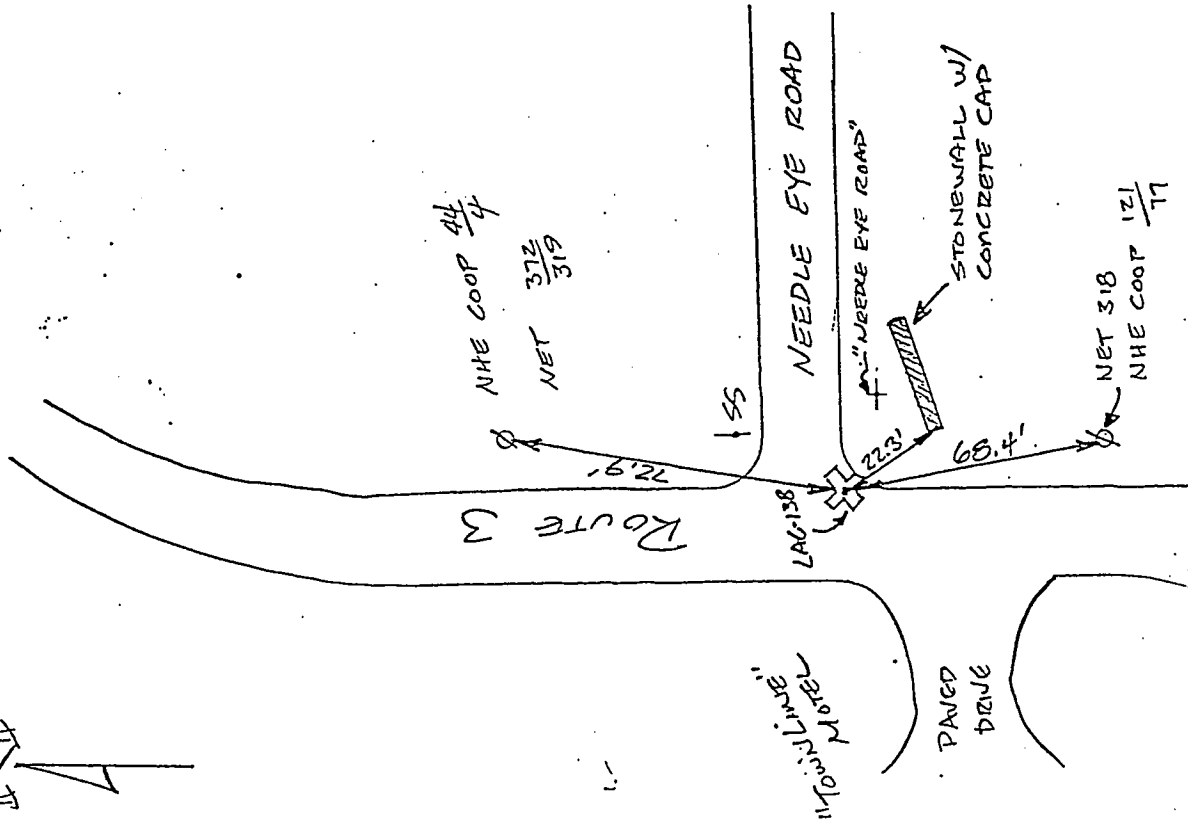


Costello, Lamoreaux & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

SKETCH LAG-138

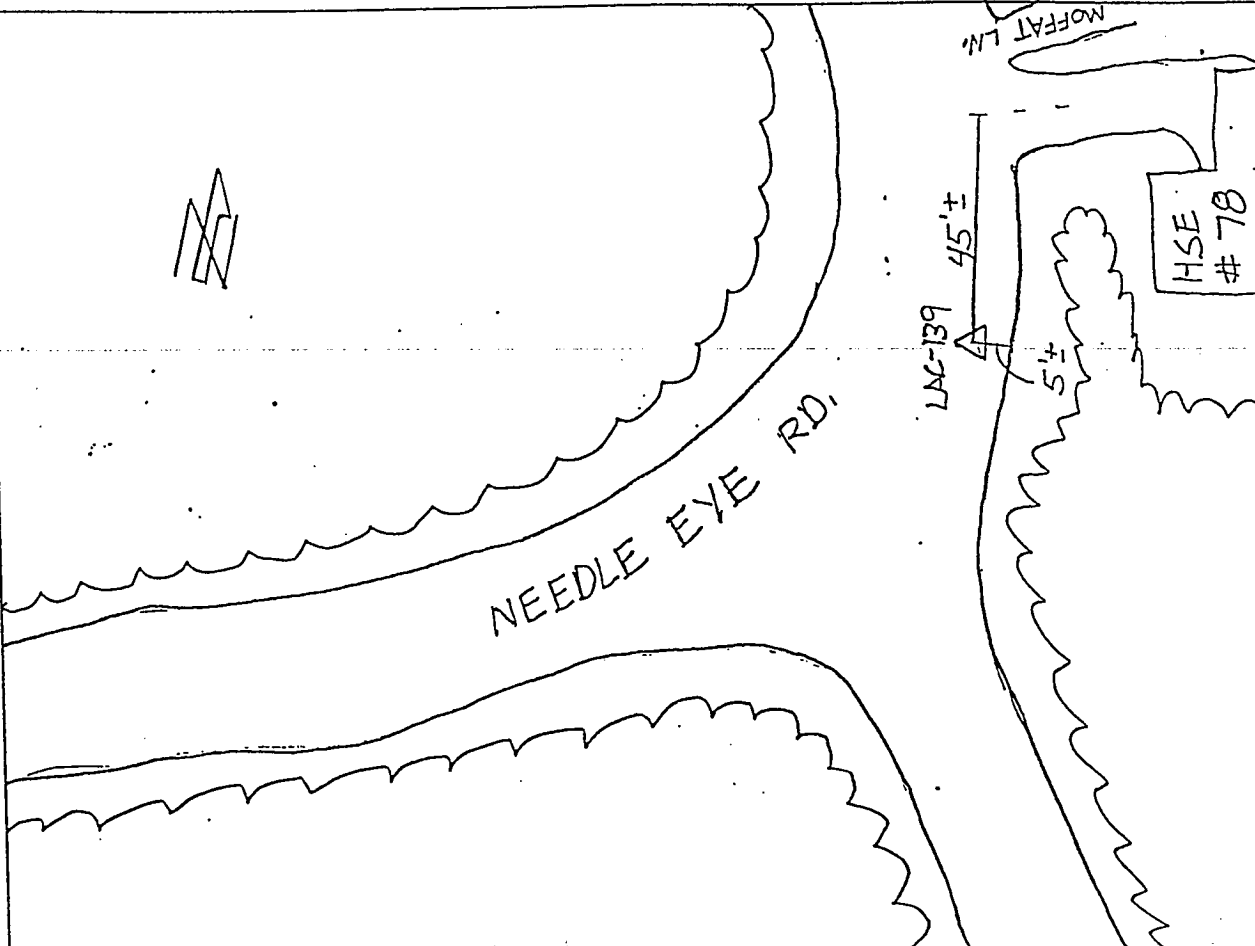
PK @ SE COR. OF
INTERSECTION

4
N



Costello, Lamoreaux & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

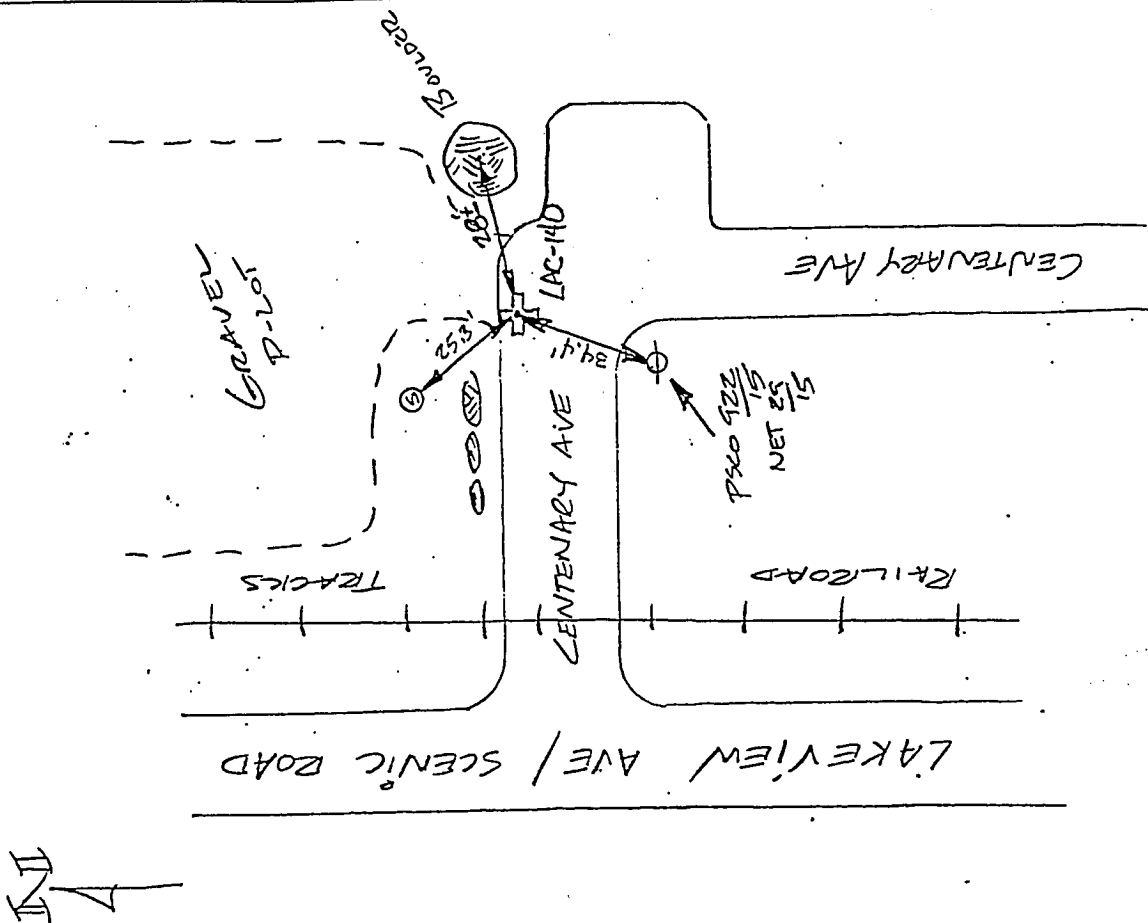
SKETCH LAC-139 PK NAIL



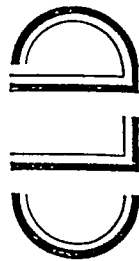
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



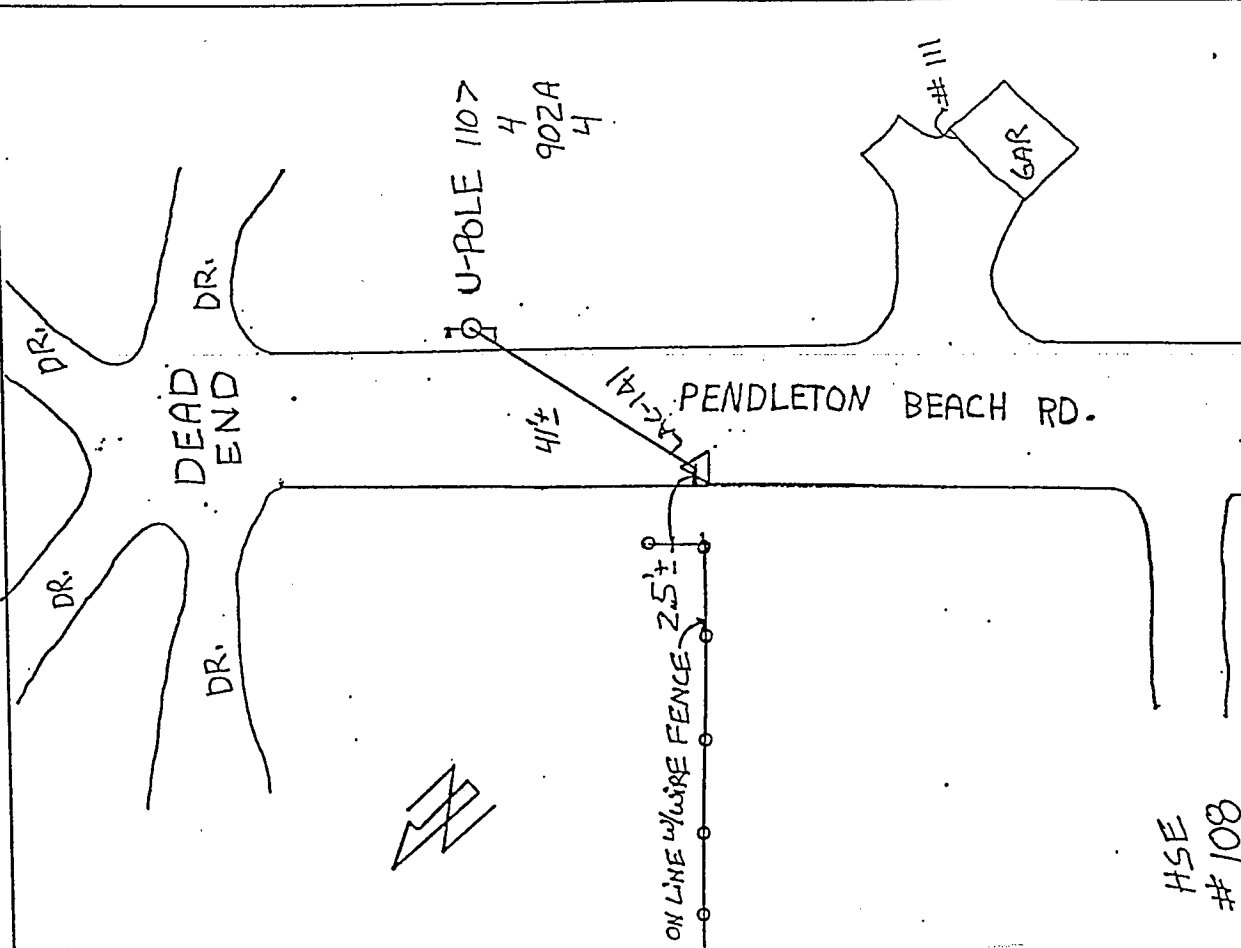
SKETCH LAC-140 PK SET @ NO. SIDE OF ROAD



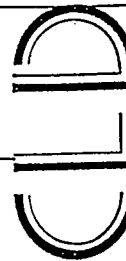
Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



SKETCH LAC-141 PK NAIL

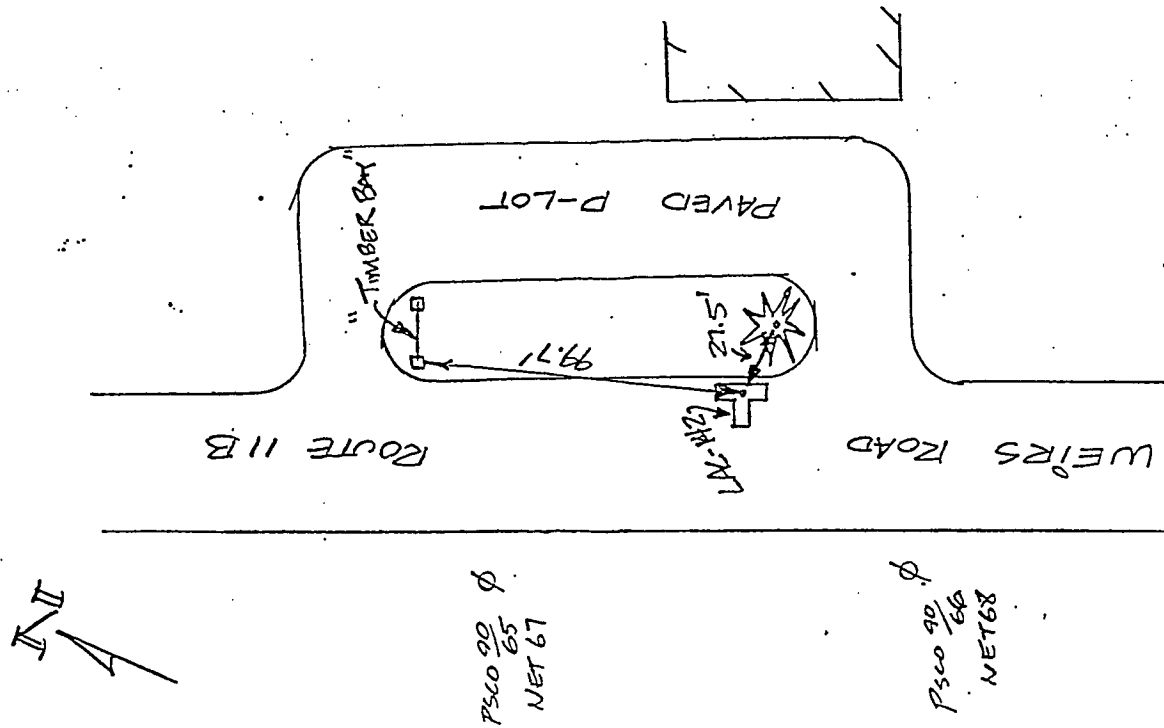


Cosiglio, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

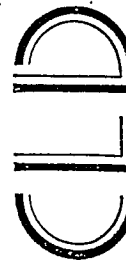


SKETCH LAC-142

PK SET @ EAST
SIDE OF ROAD

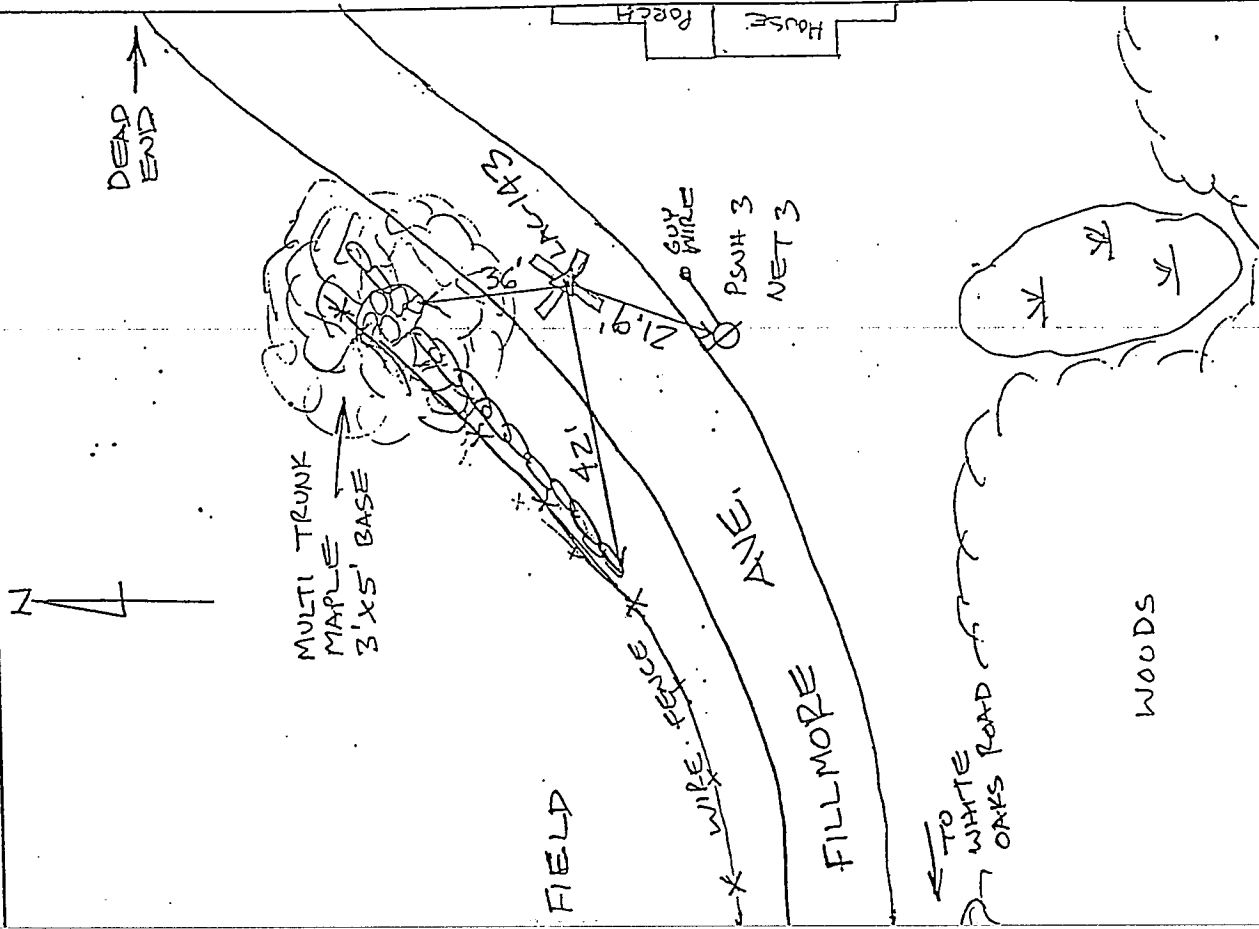


Cosiglio, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



SKETCH LAC-144 PK NAIL

SKETCH LAC-143



Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

3
RTE.

ENTRANCE TO SUNSET BAY
CONDO'S

W.V. FIRE HYD.

12/2

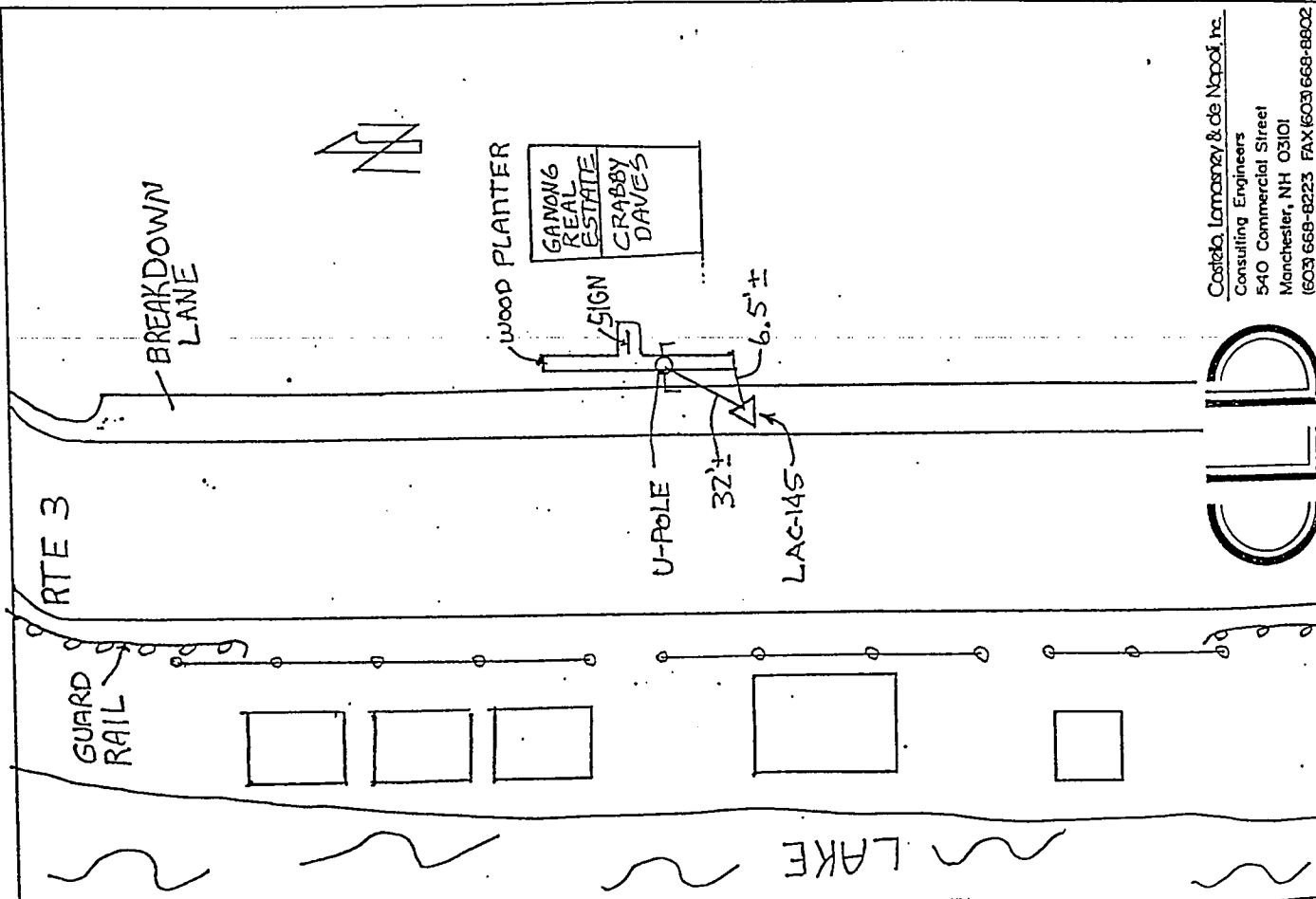
451-11.51

77
+1

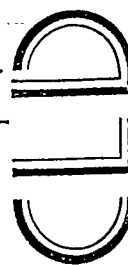
USGS
DISC
C-17
IN BOULDER

Costello, Lamasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802

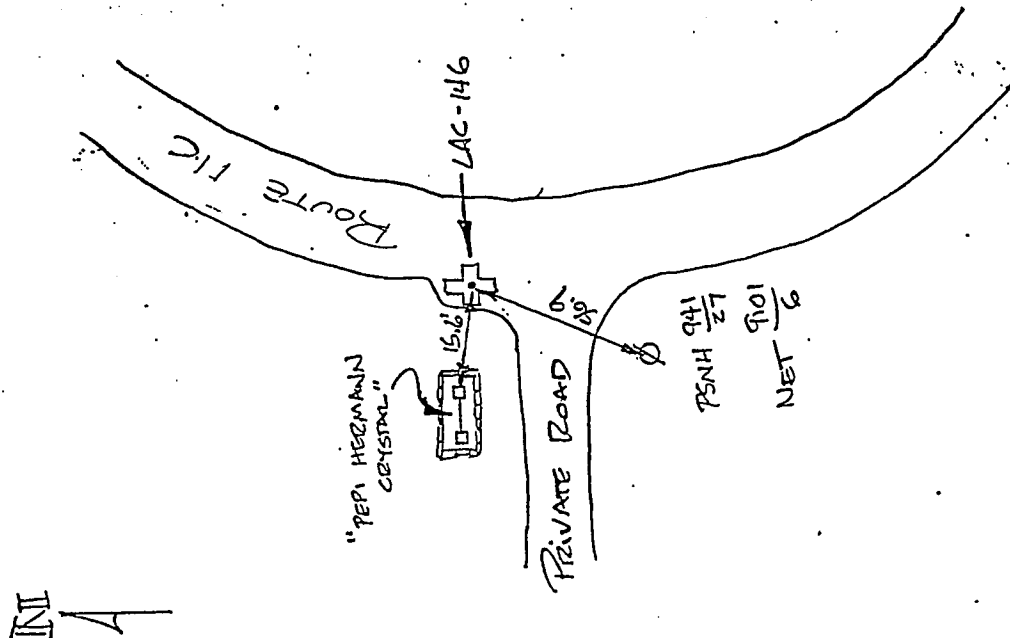
SKETCH LAC-145 PK NAIL



Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



SKETCH LAC-146 PK NAIL



Costello, Lomasney & de Napoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603) 668-8223 FAX (603) 668-8802



APPENDIX C

**CLD-ESTABLISHED POINTS
TABULATION OF COORDINATES AND ELEVATIONS**

98-132 LACONIA, NH
MAY 13, 1998 (REV. 5/28/98)



VERTICAL DIFFERENCE BETWEEN PUBLISHED HEIGHTS AND ADJUSTED GPS NETWORK

<u>NHDOT Station</u>	<u>A/K/A</u>	<u>CLD Station</u>	<u>Ortho Height NGVD29</u>	<u>Ortho Height NAVD88</u>	<u>VERTCON 2.0 NAVD88 - NGVD29 (meters)</u>	<u>CLD Network Adj. Height</u>	<u>Published - CLD</u>	<u>Geoid 96</u>
329-0220	NEW HAMPTON	329-0220	180.457m	180.342m	-0.115	HELD		-27.304
295-0070	DG 4 RESET	295-0070	208.323m	208.195m	-0.128	HELD		-27.324
245-0020		Elev. Transferred to LAC-4	153.013m	152.879m	-0.134	HELD		-27.240
245-0060	DG 23	LAC-22	215.311m	215.181m	-0.130	215.268m	-0.087m	-27.298
245-0080	DG 31	Elev. Transferred to LAC-9	187.413m	187.280m	-0.133	HELD		-27.257
245-0110	D 17	Elev. Transferred to LAC-12	161.268m	161.136m	-0.132	161.188m	-0.052m	-27.291
245-0270		LAC-2	226.178m	226.048m	-0.130	HELD		-27.205
169-0250	DG 44	LAC-21	163.748m	163.616m	-0.132	163.582m	+0.034m	-27.234

**98-132 LACONIA, NEW HAMPSHIRE
HORIZONTAL AND VERTICAL CONTROL**

Horizontal Datum: NAD83/96

Vertical Datum: NAVD88

Unit: Survey Feet

Coordinate type: Grid

Reference ellipsoid: WGS 1984

Projection set: New Hampshire 2800



Note:

Coordinate values (X,Y,Z) tabulated below are a result of a GPS survey, utilizing four Leica System 300 dual-frequency sensors*, performed during April, 1998 by Costello, Lomasney & de Napoli, Inc. (CLD). Stations LAC-1 thru LAC-22 are permanent monumented control points and Stations LAC-101 thru LAC-146 are temporary points set for photo control. The City of Laconia control network is tied to three HARN (NAD83/96) stations located in Concord, Milton and New Hampton.

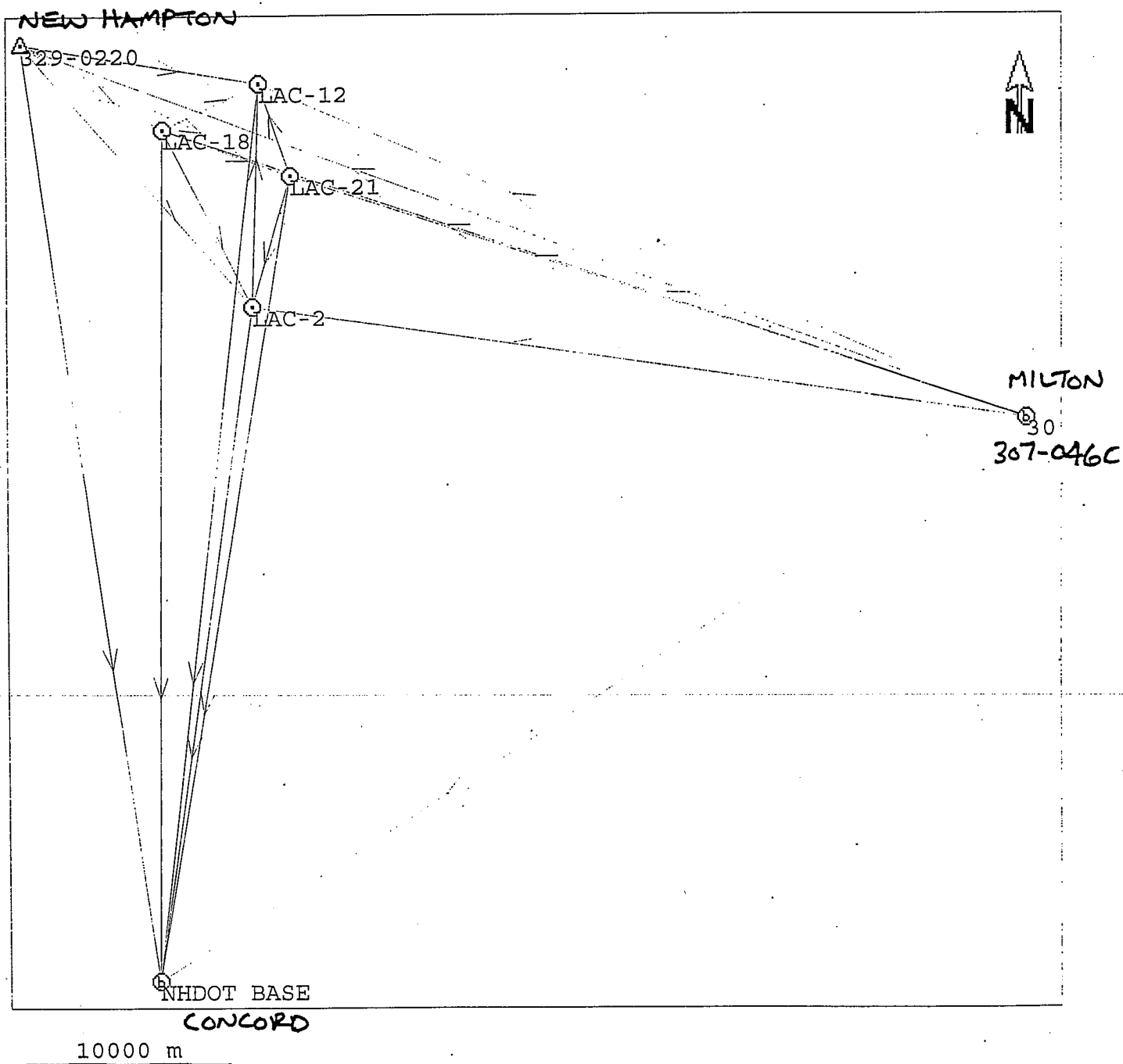
*Station NHDOT BASE in Concord is a continuously operating Trimble 4000SSE dual-frequency receiver.

<u>Station</u>	<u>Northing</u>	<u>Easting</u>	<u>Station Elevation</u>	<u>Ground Elevation</u>	<u>Description</u>
307-0460	350066.1370	1162822.6833			NHDOTDisk/Bnd.(MILTON)
329-0220	409100.5167	1001172.1311	591.67		NHDOTDisk/Ledge(NEWHAMPTON)
NHDOTBASE	259923.9633	1023378.0151			NHDOTBaseStation(CONCORD)
295-0070	417803.1391	1028027.3177	683.05		NHDOTDisk/Bnd.(DG4)
LAC-1	371202.1638	1032624.9404	505.98	505.78	T/LBnd.
LAC-2	367380.2703	1038756.0373	741.63	742.13	NHDOTDisk/Bnd.245-0270
LAC-3	374084.0920	1036918.9850	498.71	498.91	CityDisk/Bnd.
LAC-4	377611.0385	1036846.5446	500.67	500.67	CityDisk/Bnd.
LAC-5	382006.0463	1038877.1112	520.55	520.75	CityDisk/Bnd.
LAC-6	388730.3752	1044694.1069	562.36	562.76	D.H./8"Conc.Bnd.
LAC-7	387413.5930	1041978.8466	520.58	517.98	T/LConc.Bnd.
LAC-8	399449.0743	1038627.7798	518.10	518.30	CityDisk/Bnd.
LAC-9	394129.5208	1043404.4822	633.29	633.59	CityDisk/Bnd.
LAC-10	399967.5178	1042136.5407	727.49	727.99	CityDisk/Bnd.
LAC-11	402879.3062	1045602.0913	523.45	523.60	CityDisk/Bnd.
LAC-12	402871.6636	1039737.6345	520.45	520.60	CityDisk/Bnd.
LAC-13	408057.6607	1036863.5972	524.90	525.00	CityDisk/Bnd.
LAC-14	406467.9652	1033936.7496	719.82	720.02	CityDisk/Bnd.
LAC-15	402651.7476	1029099.1662	750.28	750.48	CityDisk/Bnd.
LAC-16	395725.6267	1030189.2923	813.66	813.86	CityDisk/Bnd.
LAC-17	388599.4564	1029630.7242	686.98	686.98	CityDisk/Ledge
LAC-18	395536.1866	1024101.1791	777.82	777.82	CityDisk/Ledge
LAC-19	384747.8241	1031355.9197	566.09	566.59	CityDisk/Bnd.
LAC-20	376626.1464	1039321.0439	524.14	524.54	D.H./5"X7"Bnd.
LAC-21	388167.9106	1044943.1094	536.69	536.89	NHDOTDisk/Bnd.169-0250(DG44)
LAC-22	403906.2026	1036864.1192	706.26	705.93	NHDOTDisk/Bnd.245-0060(DG23)
LAC-101	365058.7266	1042341.0416	682.40	682.40	Spike/Washer
LAC-102	368103.0109	1041370.7847	633.36	633.36	P.K./Washer
LAC-103	369672.3740	1043119.4633	748.52	748.52	P.K./Washer
LAC-104	369598.7955	1036630.6442	656.06	656.06	Spike/Washer
LAC-105	370324.7696	1034095.9856	599.74	599.74	P.K./Washer

<u>Station</u>	<u>Northing</u>	<u>Easting</u>	<u>Station Elevation</u>	<u>Ground Elevation</u>	<u>Description</u>
LAC-106	372937.1607	1034155.5500	484.28	484.28	P.K./Washer
LAC-107	373750.3429	1039587.3558	592.92	592.92	Spike/Washer
LAC-108	372161.7616	1043477.5555	753.69	753.69	Spike/Washer
LAC-109	377256.0424	1042193.8093	629.34	629.34	Spike/Washer
LAC-110	377691.4371	1039037.6261	537.94	537.94	P.K./Washer
LAC-111	376063.9681	1033070.1509	503.65	503.65	P.K./Washer
LAC-112	378551.6713	1030645.7569	490.06	490.06	Spike/Washer
LAC-113	379066.6580	1032217.7649	542.31	542.31	Spike/Washer
LAC-114	381831.0703	1028881.9883	524.06	524.06	P.K./Washer
LAC-115	383111.2147	1036009.1402	534.63	534.63	P.K./Washer
LAC-116	385751.7502	1040502.2687	513.27	513.27	P.K.Nail
LAC-117	388966.6343	1036906.7853	533.93	533.93	P.K./Washer
LAC-118	387339.8645	1033850.1794	534.49	534.49	P.K./Washer
LAC-119	386401.1340	1027730.8446	501.93	501.93	Spike
LAC-120	389273.4974	1026108.3130	522.25	522.25	Hub/Nail
LAC-121	390492.7473	1033312.1575	540.27	540.27	Hub/Nail
LAC-122	392274.6620	1036620.8499	541.10	541.10	P.K.Nail
LAC-123	395724.2849	1035893.7018	523.80	523.80	P.K.Nail
LAC-124	392190.2851	1030122.5587	721.78	721.78	P.K./Washer
LAC-125	391833.7136	1023621.8194	536.14	536.14	Spike
LAC-126	392923.1008	1026556.9517	698.71	698.71	P.K.Nail
LAC-127	393664.6257	1022360.5036	501.95	501.95	P.K.Nail
LAC-128	395981.7138	1020460.0223	509.49	509.49	P.K.Nail
LAC-129	398303.8606	1019535.3447	494.43	494.43	Spike
LAC-130	398818.9680	1023804.8415	683.95	683.95	P.K.Nail
LAC-131	399403.7445	1027386.3848	694.33	694.33	P.K.Nail
LAC-132	398999.4239	1029537.8227	845.41	845.41	P.K./Washer
LAC-133	401637.6932	1023031.7963	697.12	697.12	P.K.Nail
LAC-134	405234.0220	1027791.0451	630.14	630.14	P.K./Washer
LAC-135	401104.4940	1034390.8344	517.94	517.94	Spike
LAC-136	399584.8048	1036027.8013	514.74	514.74	Spike
LAC-137	406151.2851	1031719.0852	596.23	596.23	Spike/Washer
LAC-138	409334.5272	1032227.1536	699.52	699.52	P.K.Nail
LAC-139	411082.0828	1034352.3353	554.09	554.09	P.K.Nail
LAC-140	405191.9348	1038061.3823	516.82	516.82	P.K.Nail
LAC-141	404405.2003	1043271.7767	513.86	513.86	P.K.Nail
LAC-142	399090.3266	1047165.4340	526.82	526.82	P.K.Nail
LAC-143	397525.0509	1043751.4340	603.25	603.25	P.K.Nail
LAC-144	397555.6299	1038499.2051	535.66	535.66	P.K.Nail
LAC-145	393304.0383	1040632.3681	513.06	513.06	P.K.Nail
LAC-146	391782.6248	1046128.4394	563.71	563.71	P.K.Nail

Adjustment printout

Network 1: LACONIA - HARN TIE IN

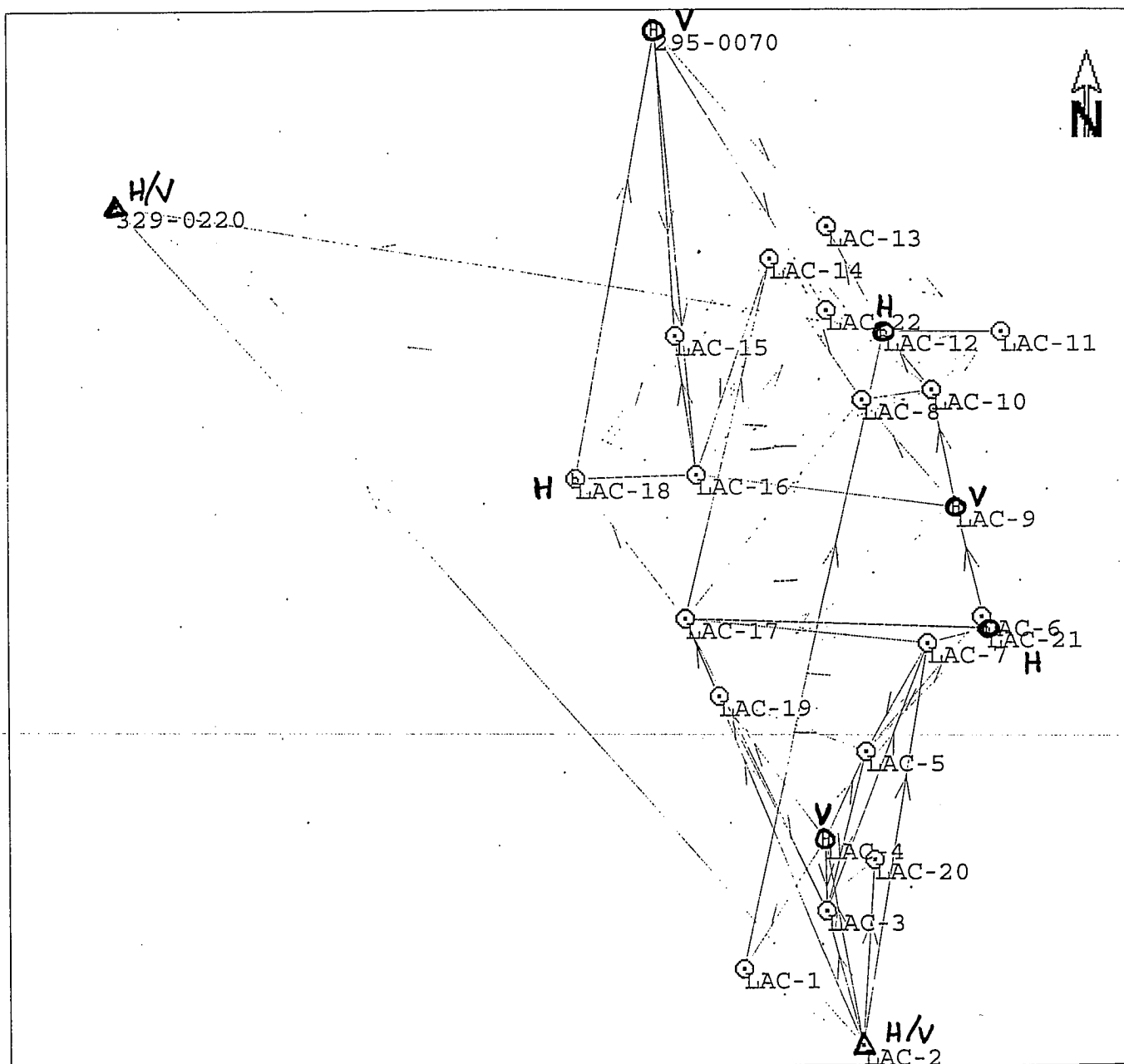


Adjustment printout

Network 2: LACONIA - Control Network

H = HORIZONTAL POSITION HELD

V = VERTICAL HEIGHT HELD



Adjustment printout

Network **3**: LACONIA - Photo Control Net

