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GPS CONTROL SURVEY REPORT

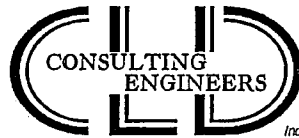
LACONIA, NEW HAMPSHIRE

October 2000

CLIENT:

**City of Laconia
Department of Public Works
45 Beacon Street East
Laconia, NH 03246**

Prepared by



CLD Consulting Engineers, Inc.
Manchester, New Hampshire

LACONIA, NH

GPS CONTROL SURVEY FOR ESTABLISHING ADDITIONAL PERMANENT MONUMENTED CONTROL

SCOPE OF SURVEY PROJECT

This surveying assignment included the establishment of horizontal coordinates and elevations for twenty new permanently monumented control points, identified as LAC-201 through LAC-220.

SURVEY DATE : July 7, 2000

HARDWARE/SOFTWARE/OPERATIONAL MODE

Hardware

3 - Leica System 300 dual frequency sensors.

Software

Leica SKI software package (Ver. 2.3).

Operational Mode

Rapid static observation of a minimum of four satellites simultaneously.

HORIZONTAL/VERTICAL CONTROLS UTILIZED

For horizontal and vertical control, the survey was based on existing stations LAC-2, LAC-4, LAC-12, LAC-14, LAC-16, LAC-19, LAC-21 and LAC-22 which were previously established on the North American Datum of 1983/96 (NAD 83/96) and on the North American Vertical Datum of 1988 (NAVD 88) for the City of Laconia in a 1998 GPS control survey and published in a report dated May 1998. All coordinate values are in survey feet.

DISCUSSION OF SURVEY

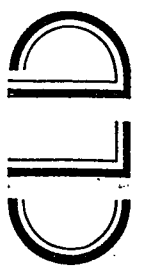
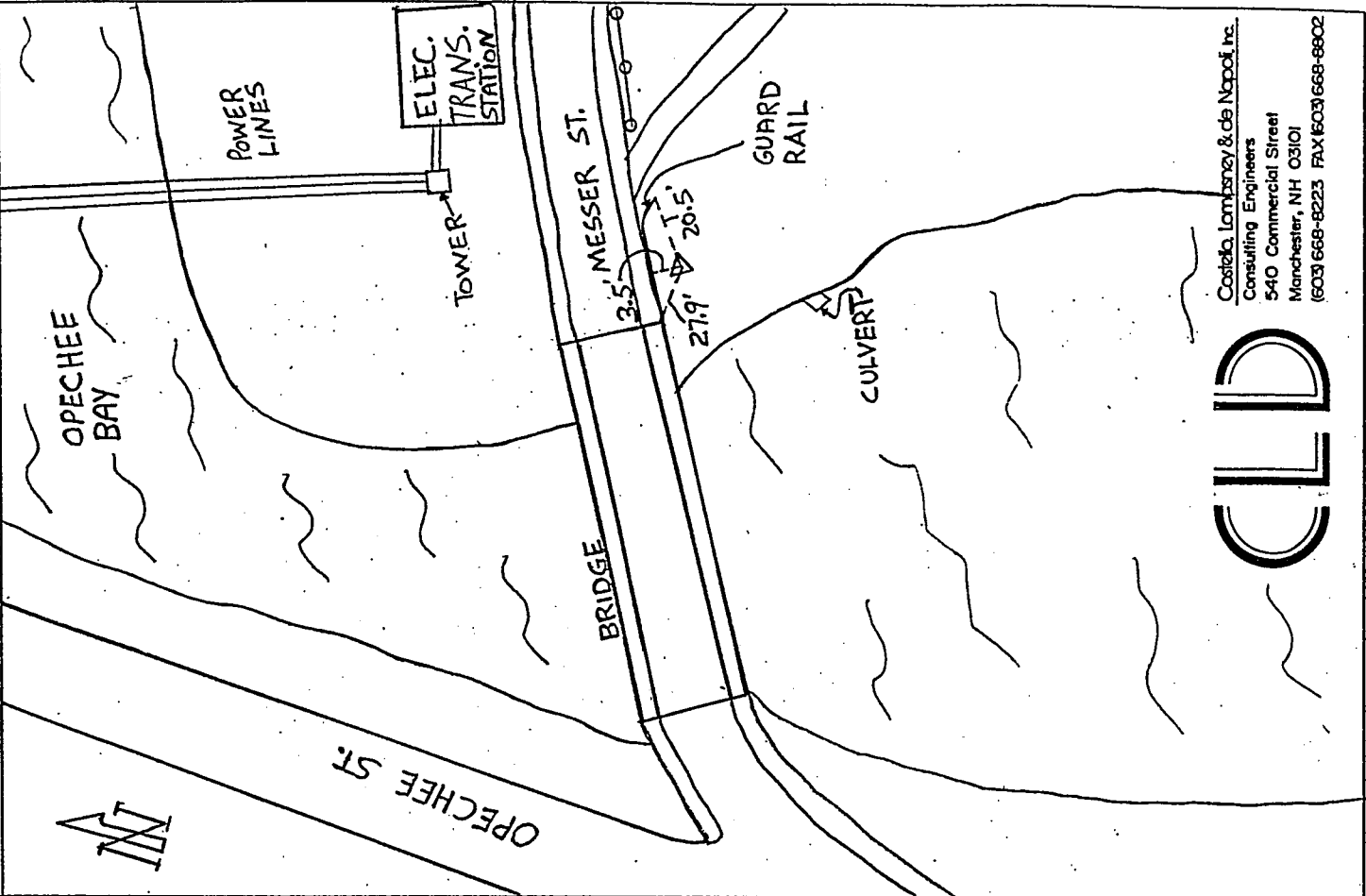
This was a routine GPS control survey utilizing the rapid static operational mode with an elevation mask of 15° and observation sessions of approximately 20 minutes in duration per baseline.

The Horizontal and Vertical Control sheet included in Appendix B of this report contains a tabulation of the coordinate values of the newly established control points. In conforming with the original 1998 survey, Geoid 96 was used to obtain the orthometric heights of the vertical values.

APPENDIX A

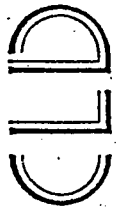
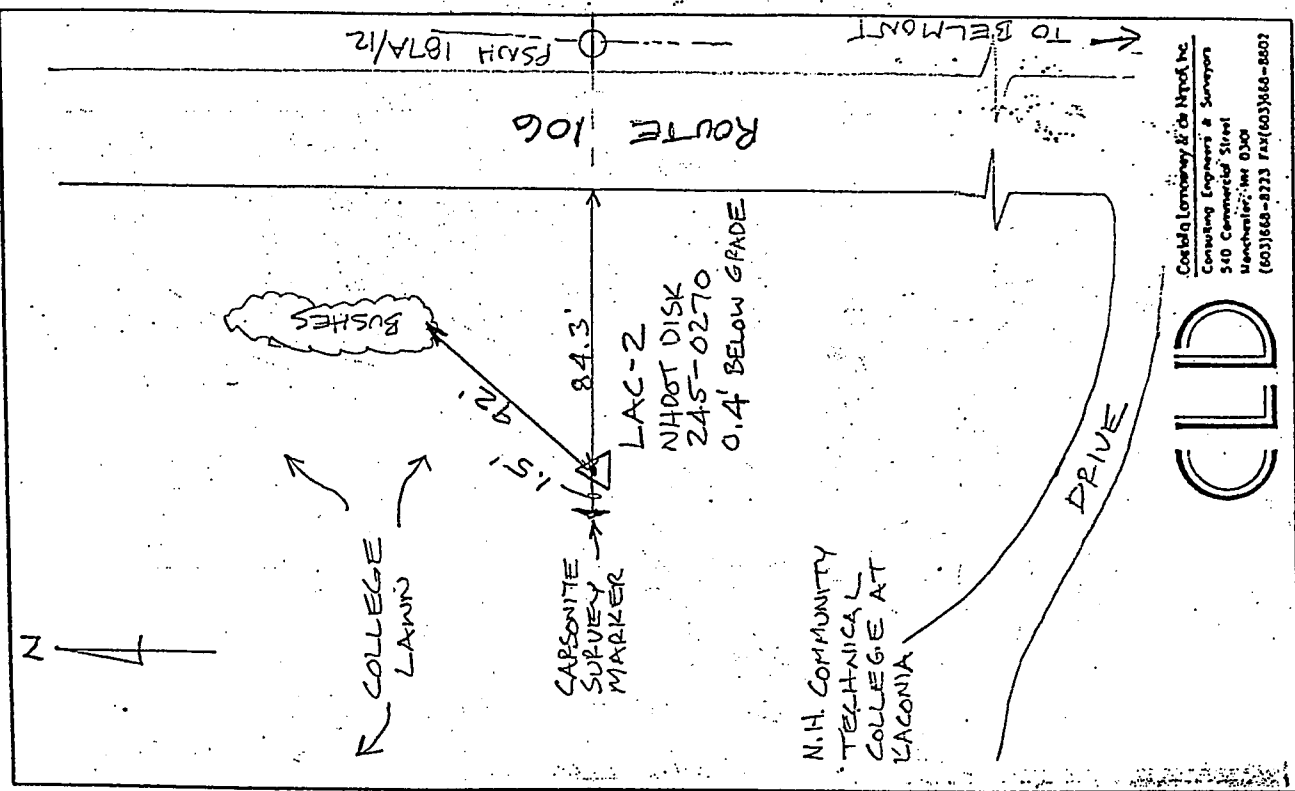
LOCATION SKETCHES FOR CONTROL POINTS

SKETCH LAC-1
6"x6" GRANITE BOARD w/ACRONIA INK
FLUSH w/GROUND



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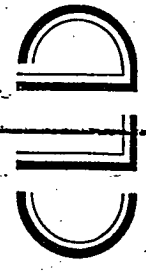
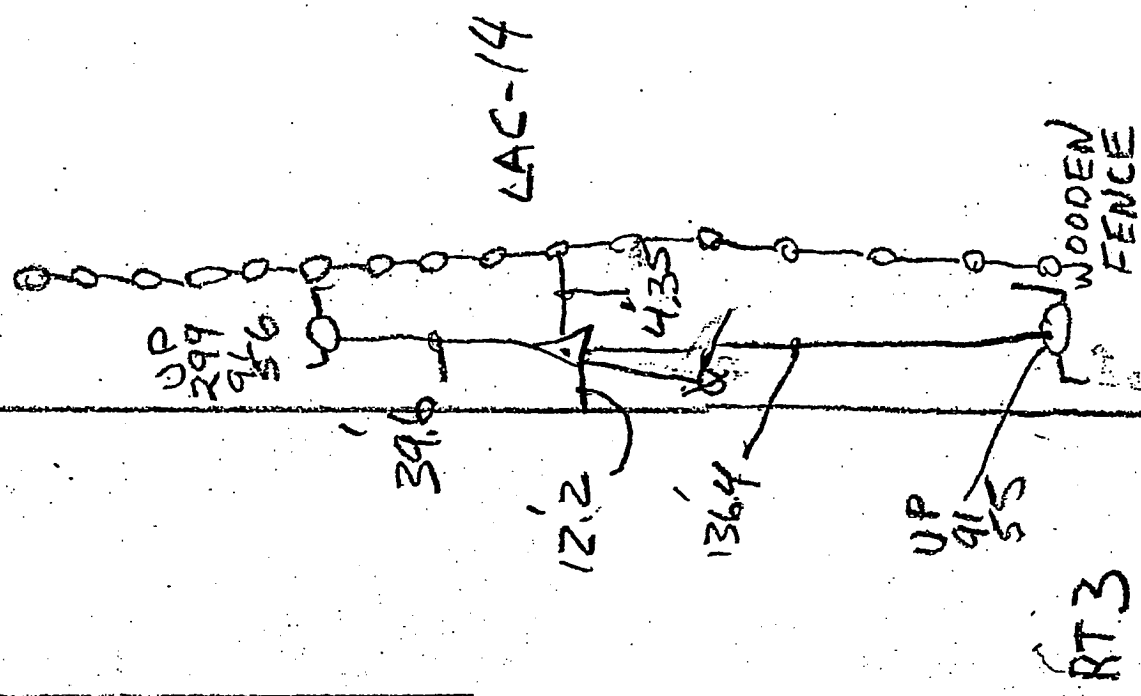
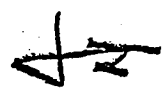
SKETCH LAC-2
NHDOT DISK 245-0270



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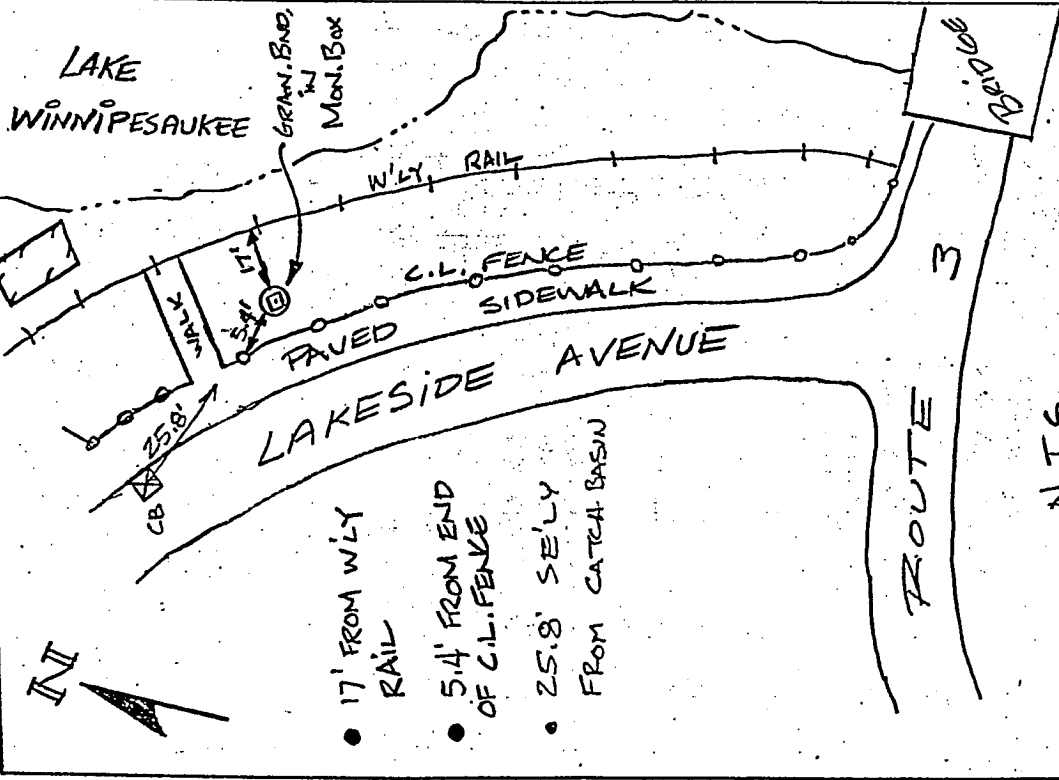
SKETCH LAC-14 CITY DISK IN GRAN. BND. IN MON. BOX

RT 3 BUS



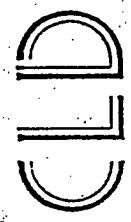
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SKETCH LAC-12 CITY DISK IN GRAN. BND. IN MON. BOX



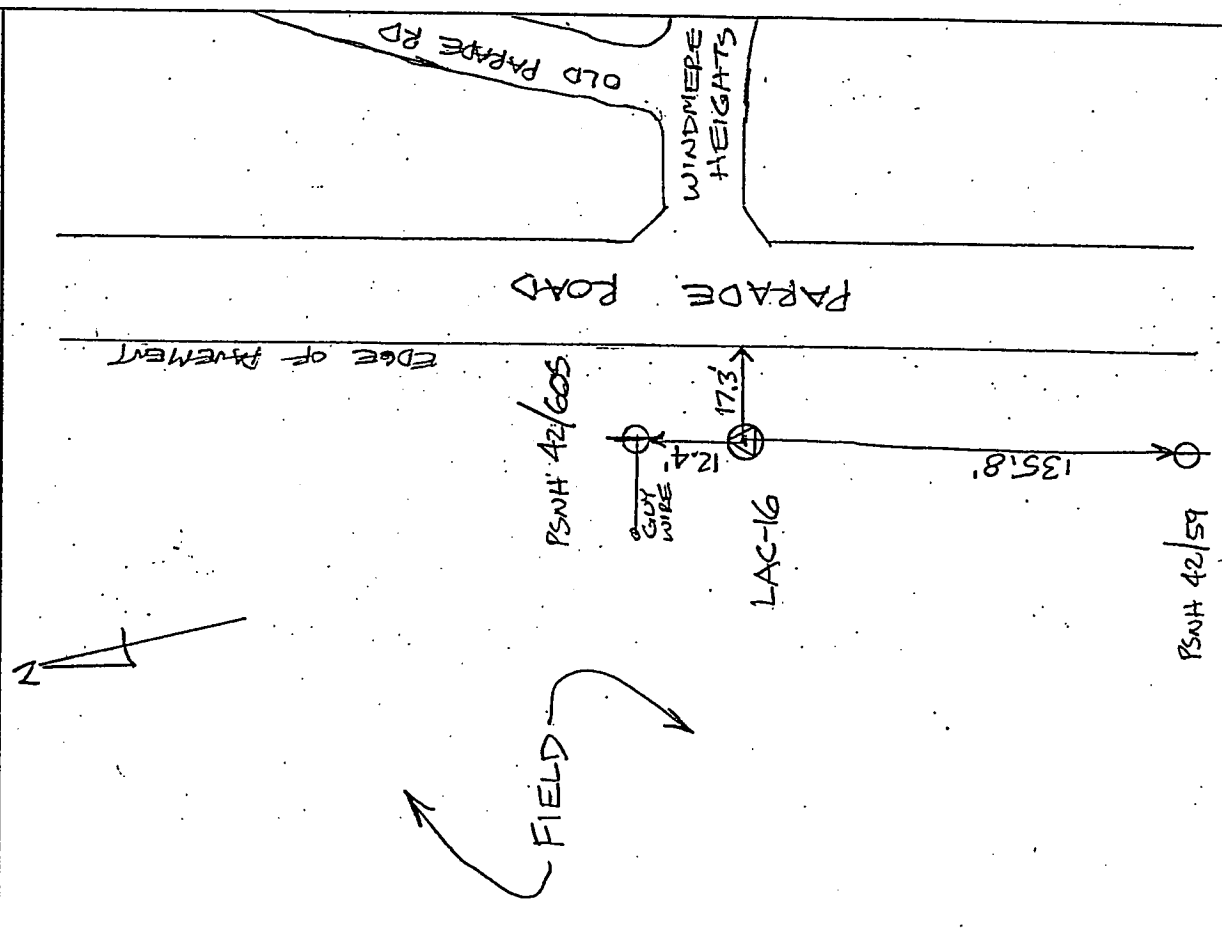
- 17' FROM W'LY RAIL
- 5.4' FROM END OF C.I. FENCE
- 25.8' SE'LY FROM CATCH BASIN

N.T.S.

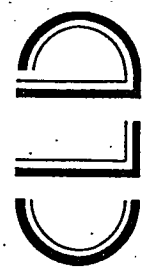


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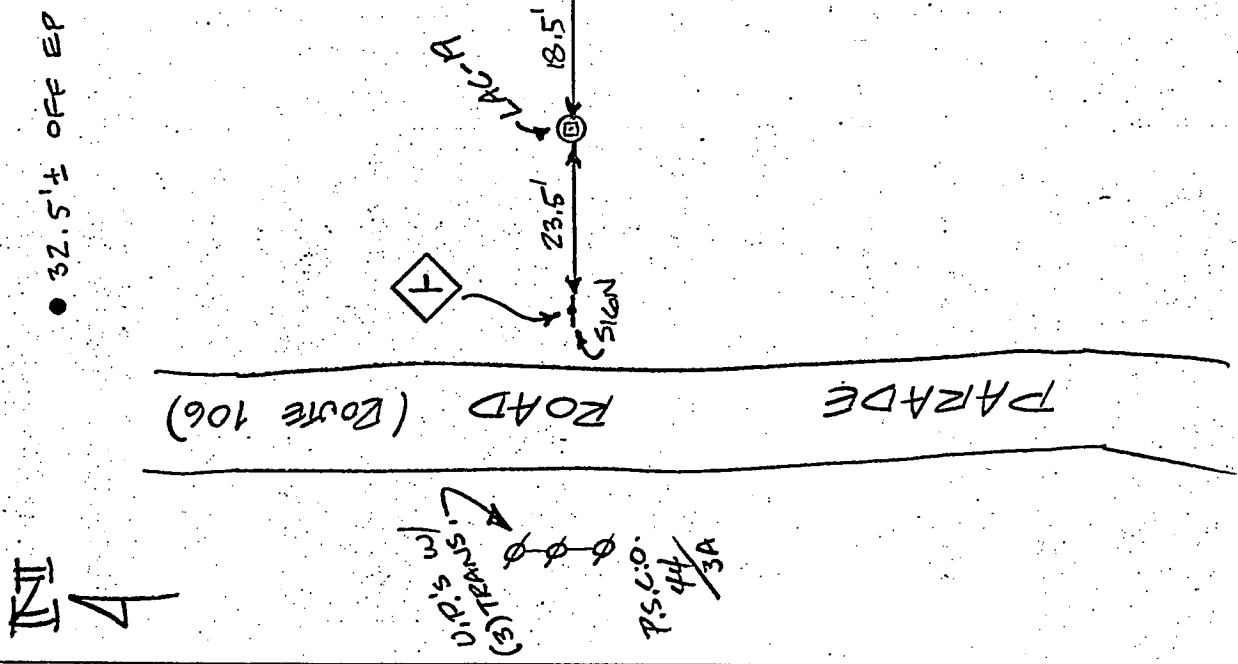
SKETCH LAC-16 CITY OF LACONIA DISK SET IN A 6" SQ. GRAN. BAND IN MON. BOX



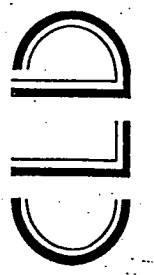
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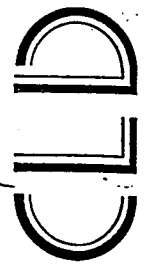
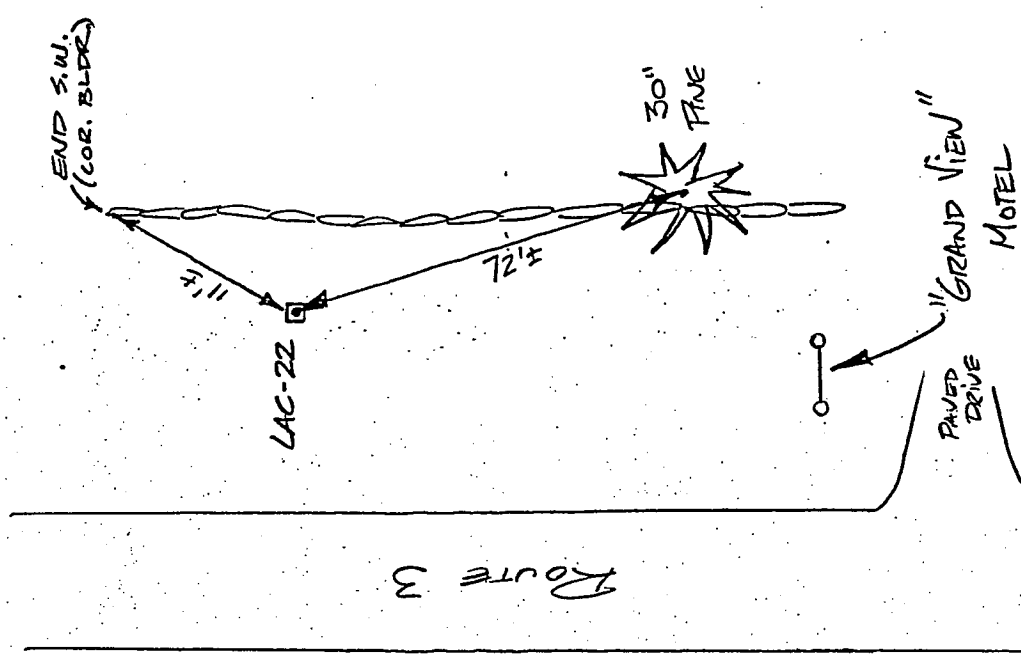
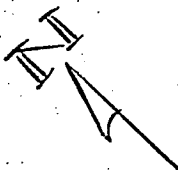
SKETCH LAC-19 CITY DISK IN 6" SQ. GRAN. BAND IN MON. BOX



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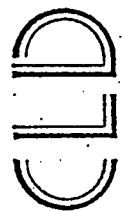
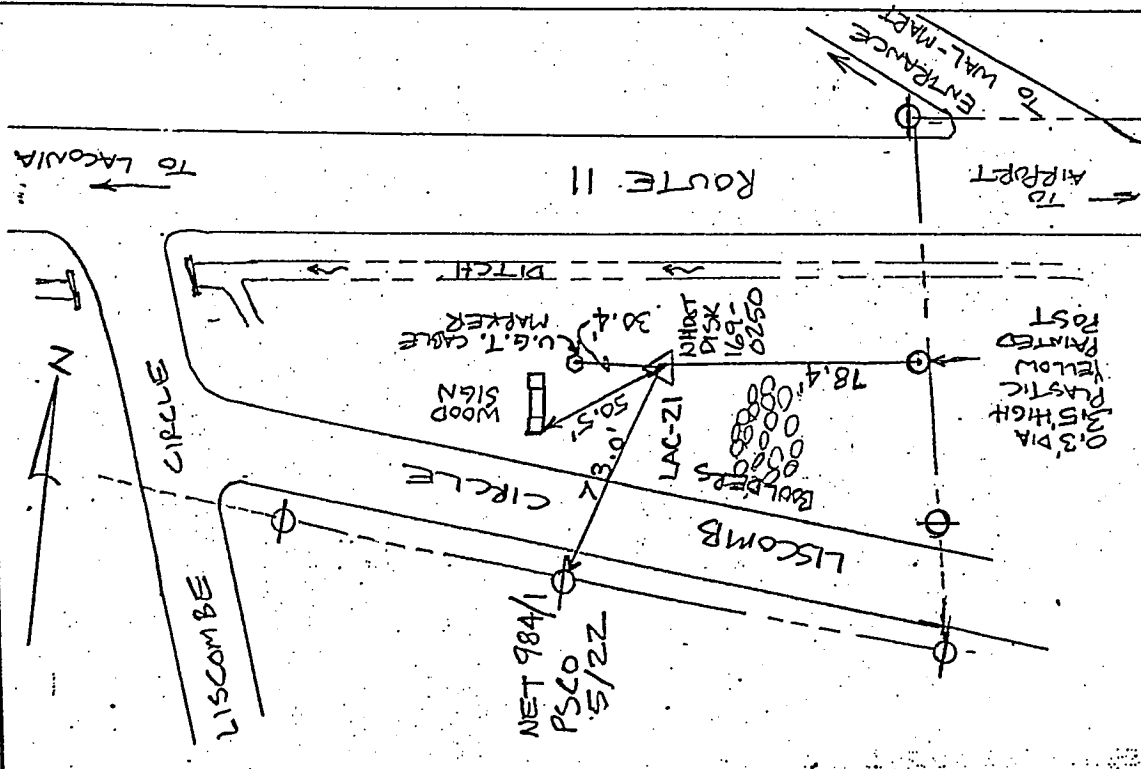


SKETCH LAC-22 NADOT DISK 169-0250
 6" SQ. GRAN. BND. (DG. 23)



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 Consulting Engineers
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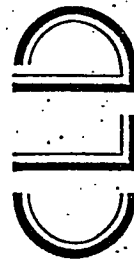
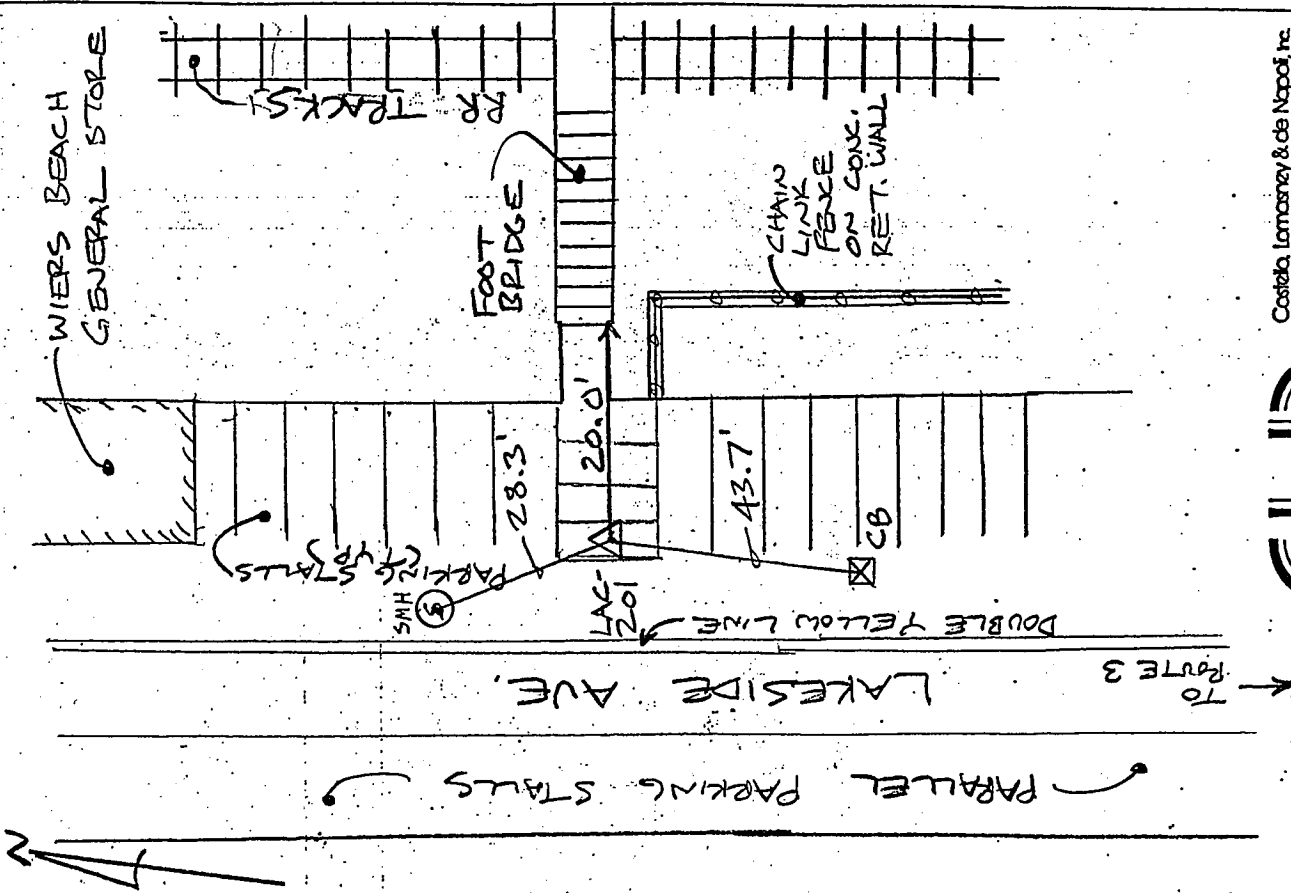
SKETCH LAC-21 NADOT DISK 169-0250
 STA DG 44 1961 (GILFORD)



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SKETCH LAC-201

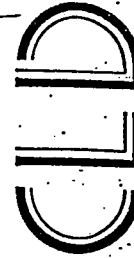
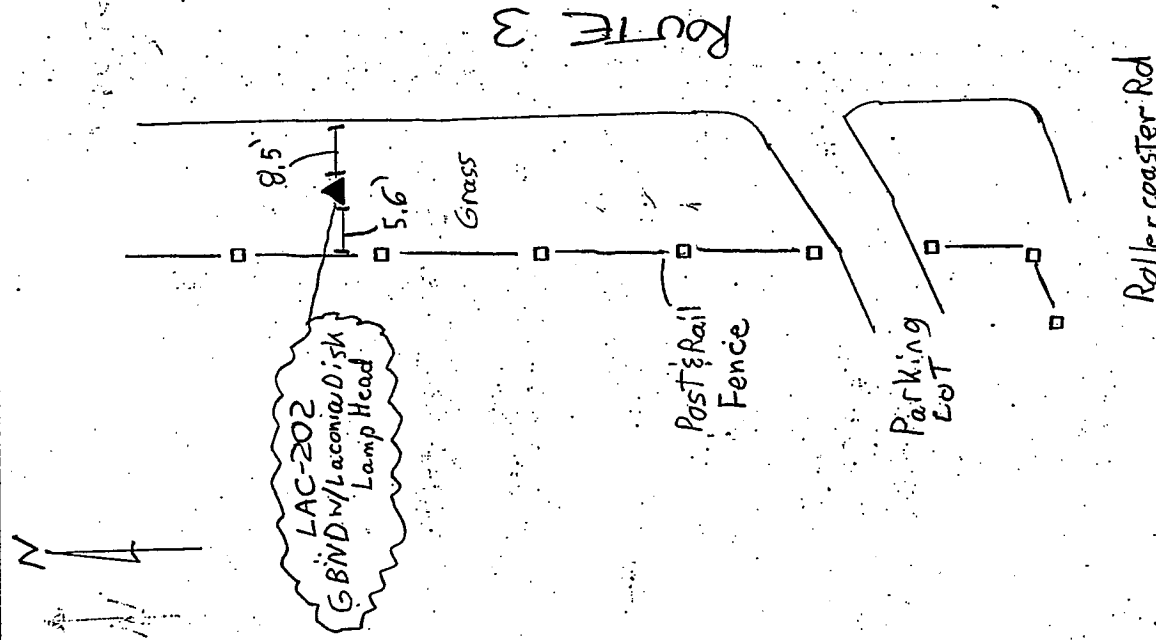
CITY DISK / G. BAND
IN MON. BOX



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Consulting Engineers
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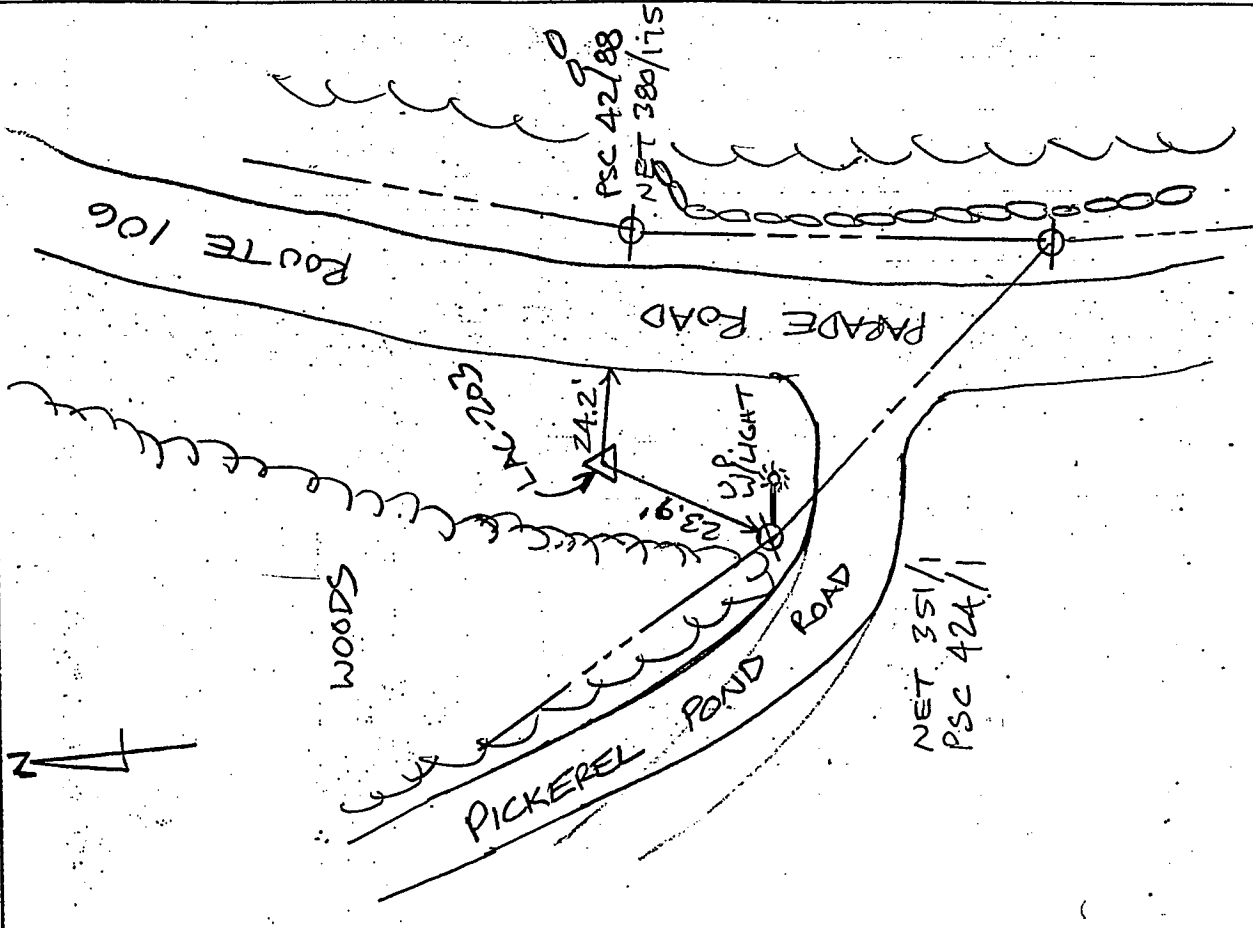
SKETCH LAC-202

GBNDw/Laconia Disk
Lamp Head

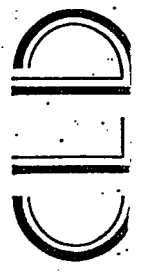


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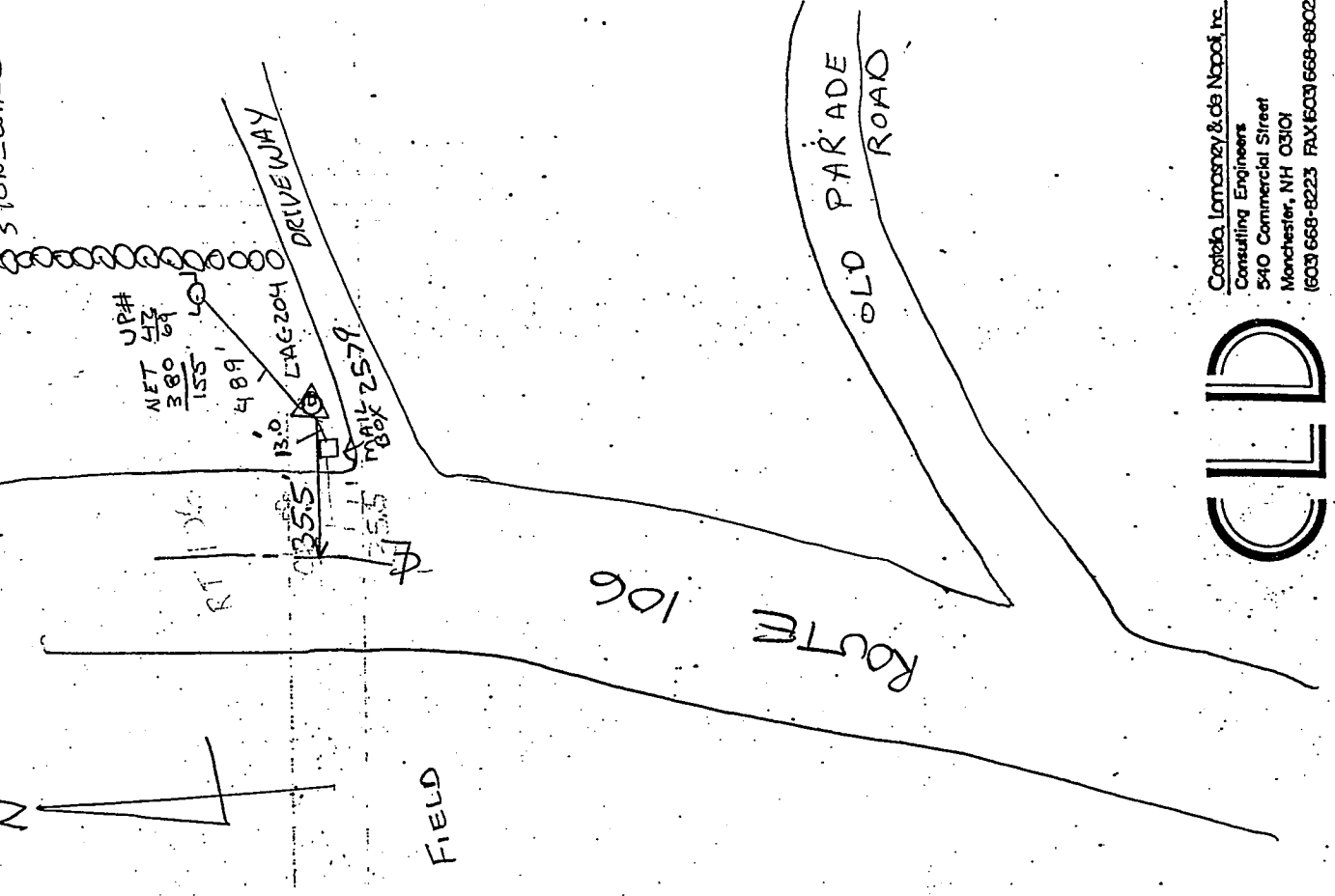
SKETCH LAC-203 CITY DISK/G.B.M.D
IN MON. BOX



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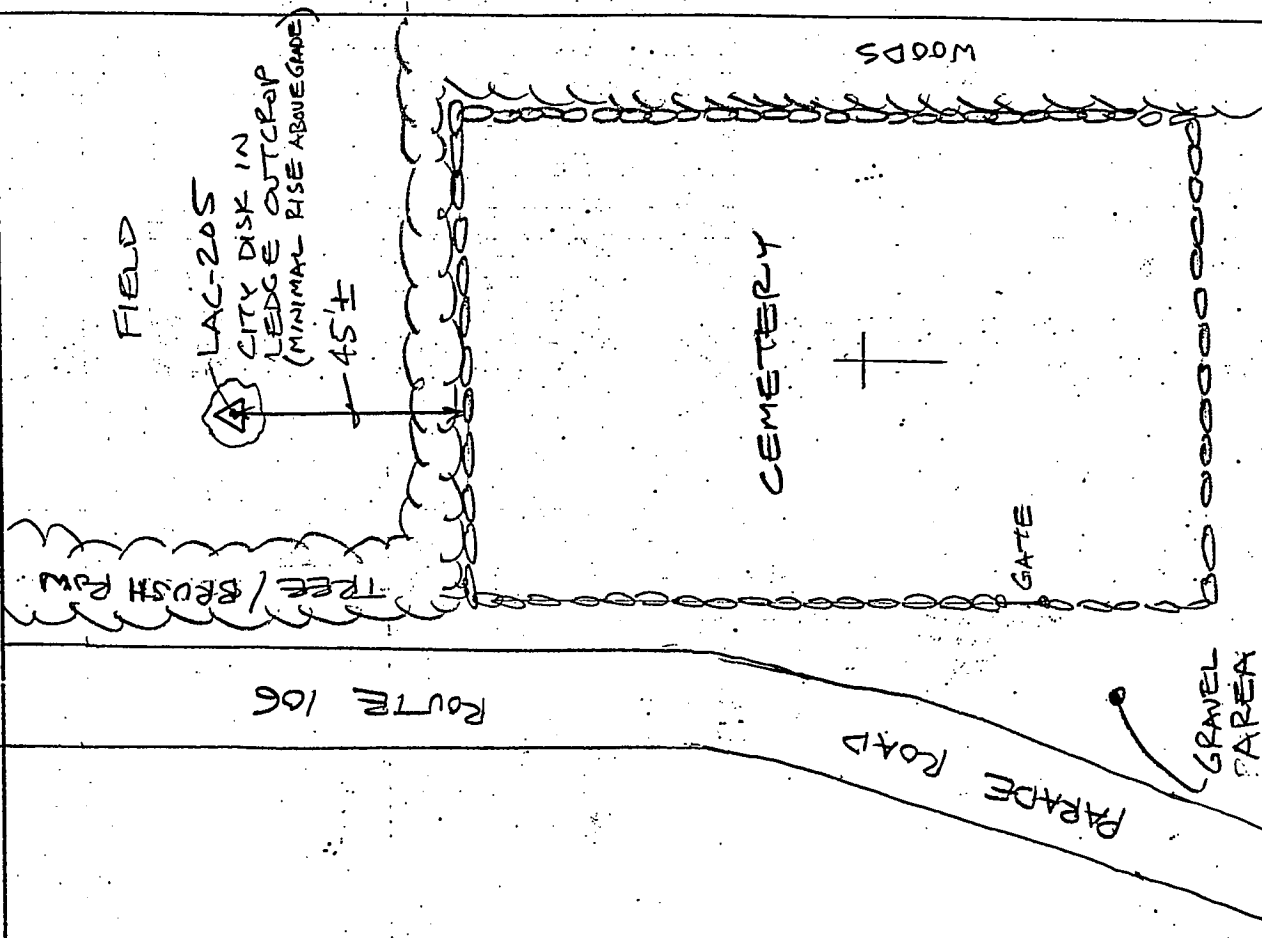
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IN MON. BOX



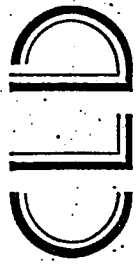
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Consulting Engineers
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SKETCH LAC-205 CITY DISK IN LEDGE OUTCROP

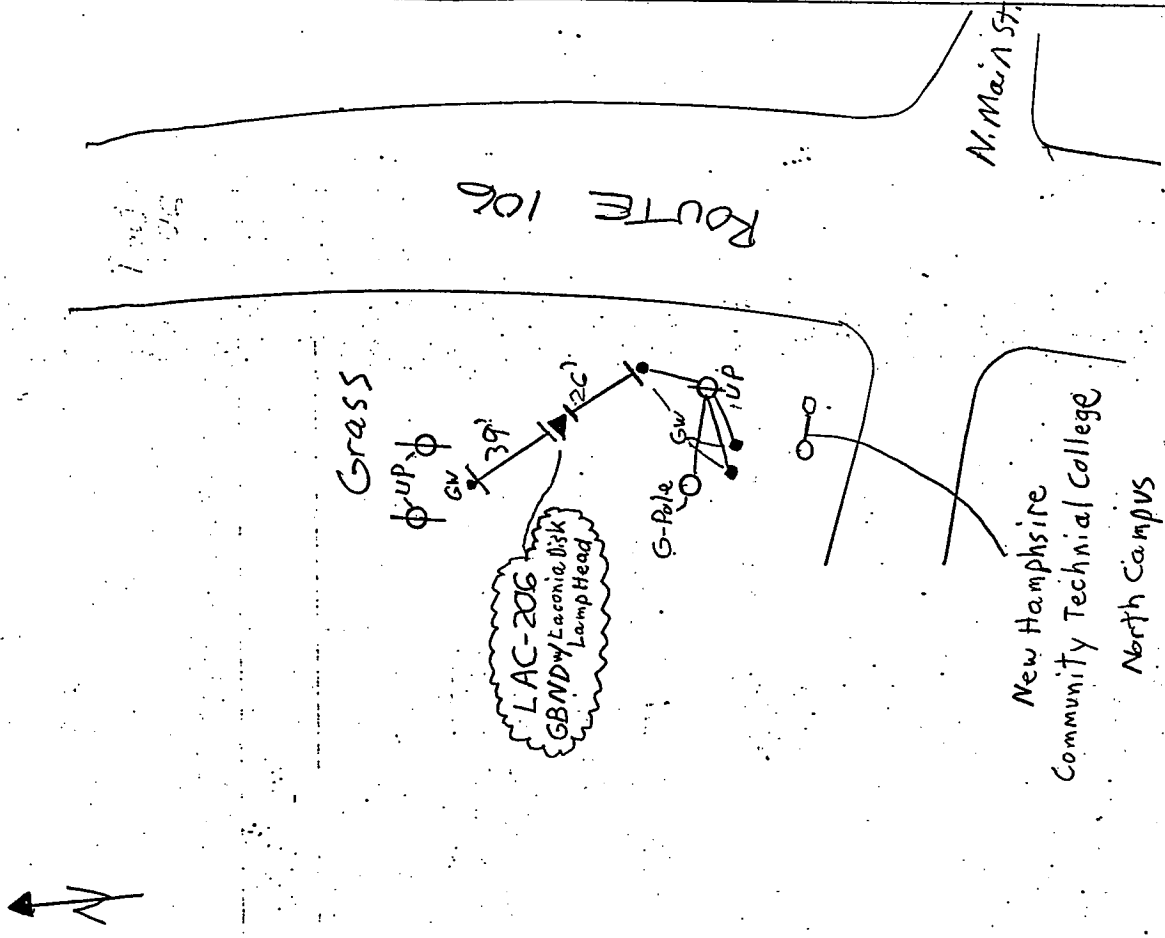


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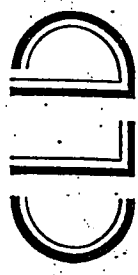


SKETCH LAC-206

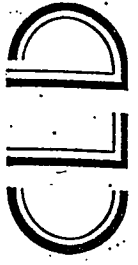
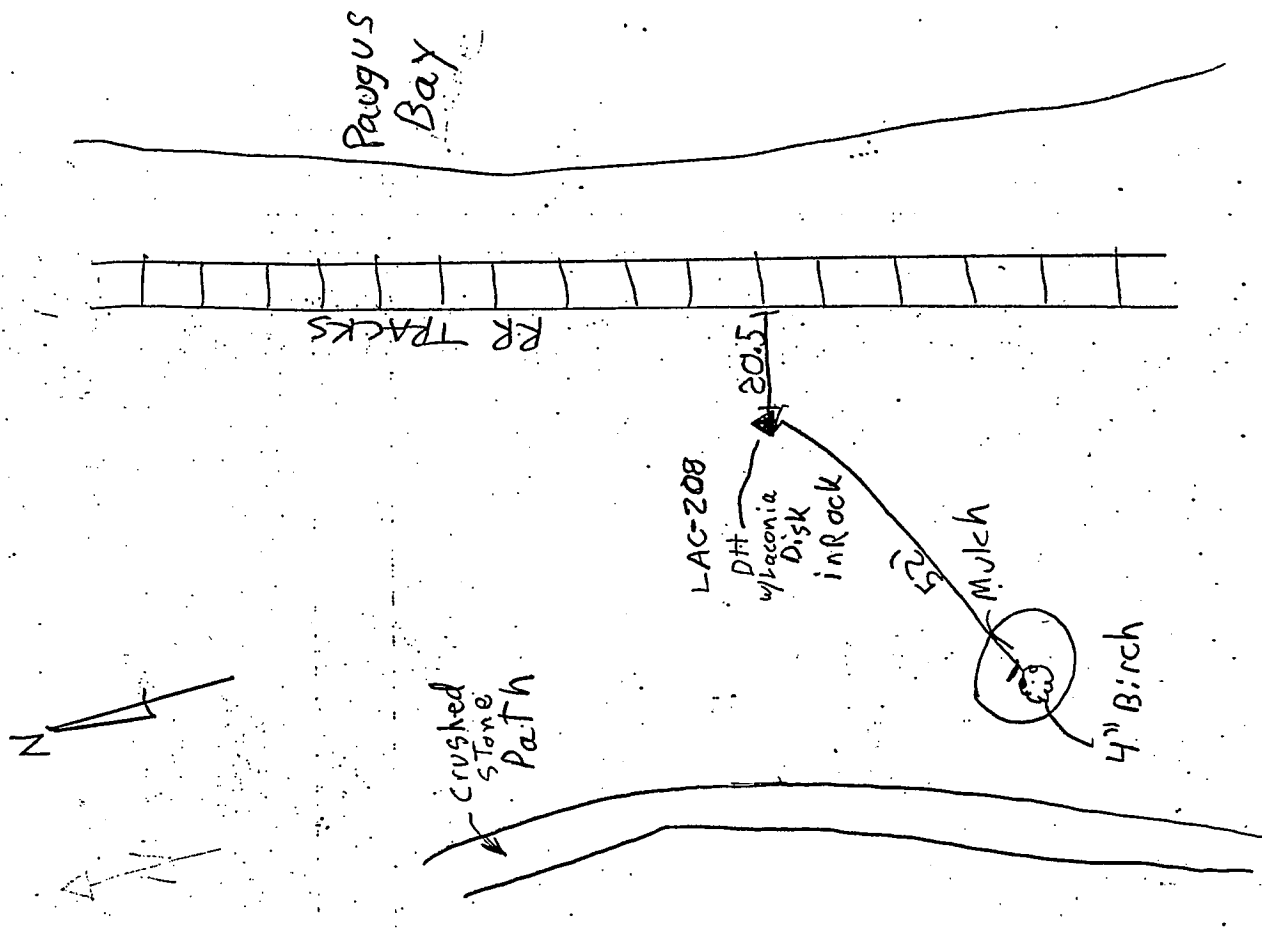
GBND w/ Lacoia Disk Lamp Head



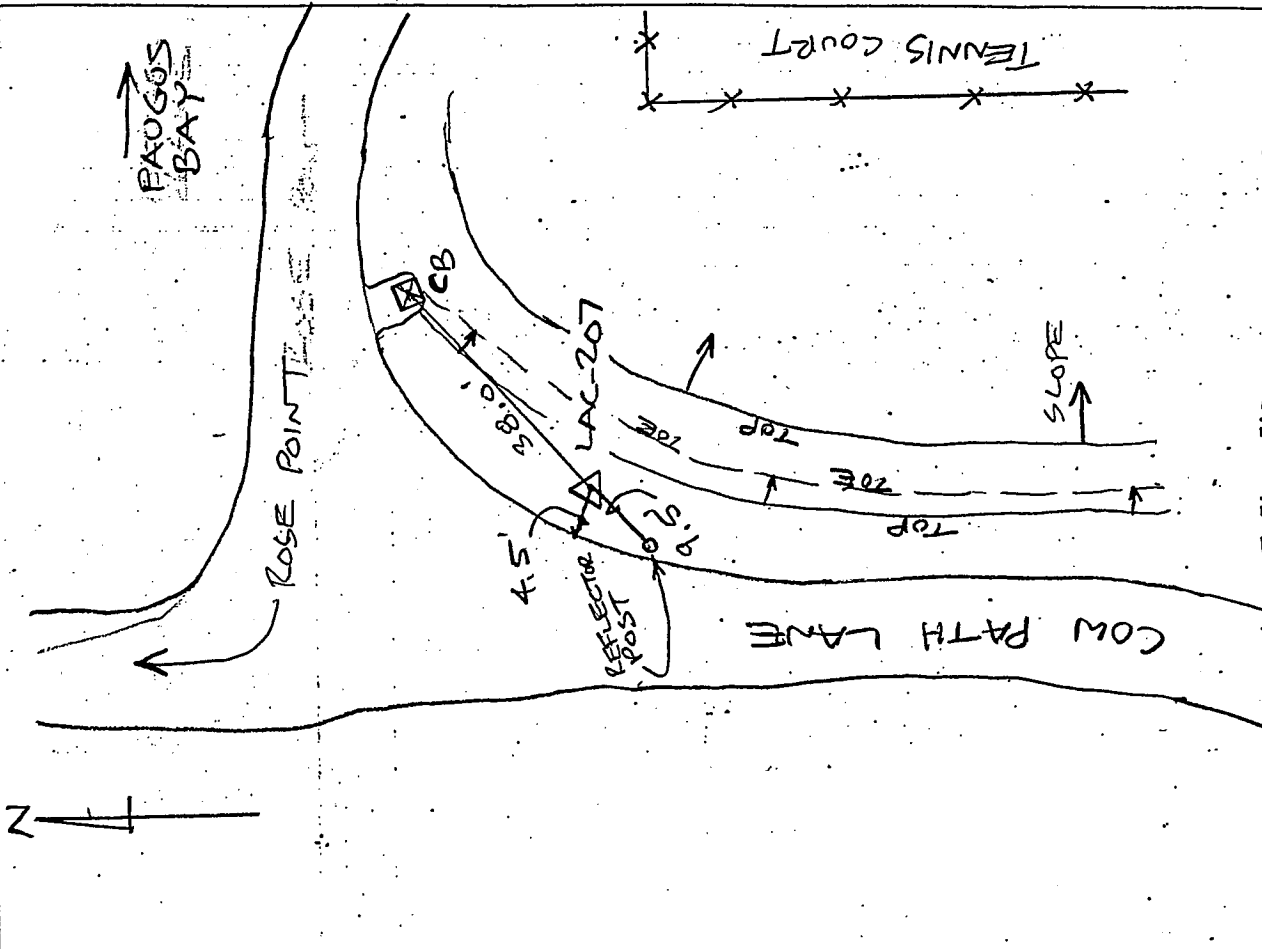
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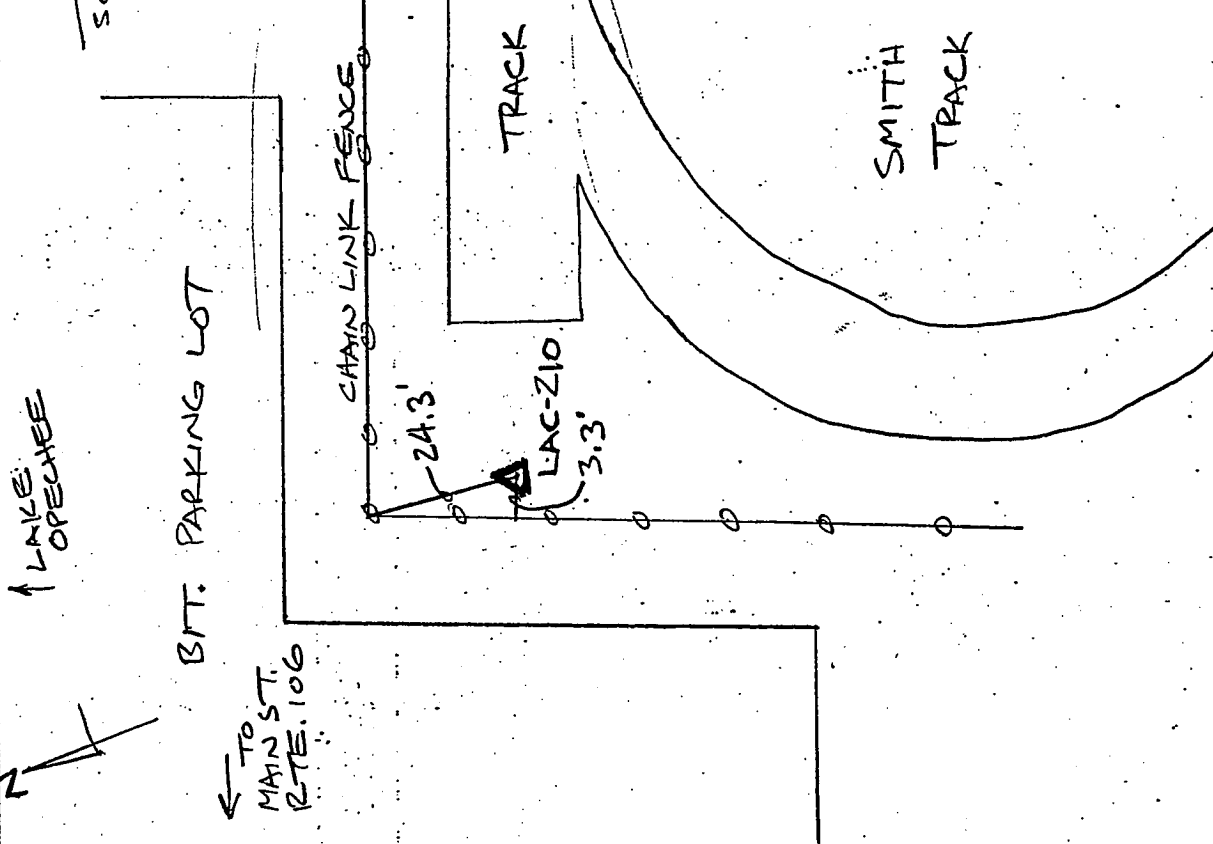
SKETCH LAC-208 DH w/Laconia Disk in Rock



SKETCH LAC-207 CITY DISK / G. BAND IN MON. BOX



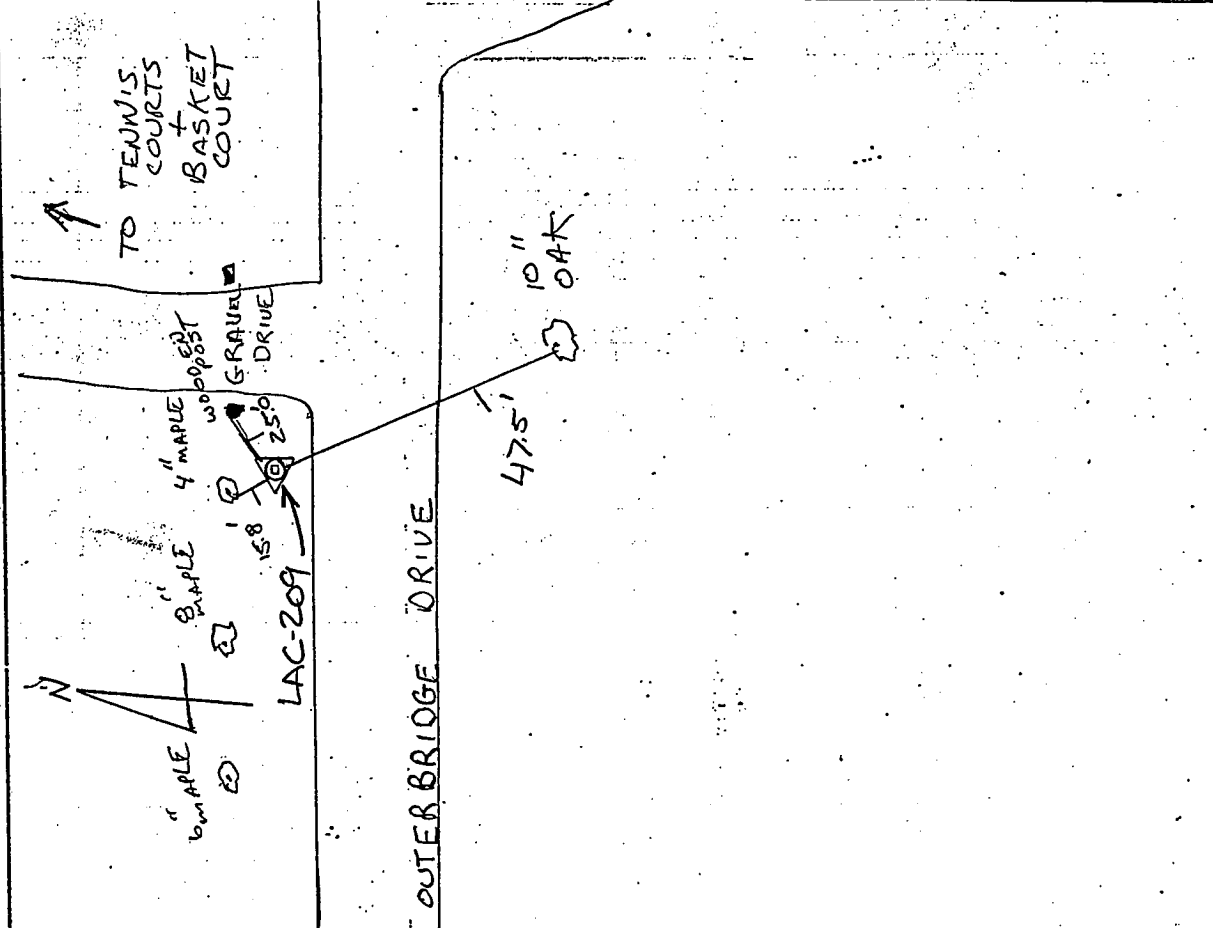
SKETCH LAC-210 CITY DISK/G.BND IN MON. BOX



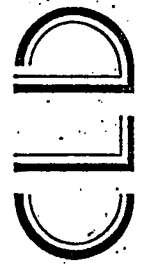
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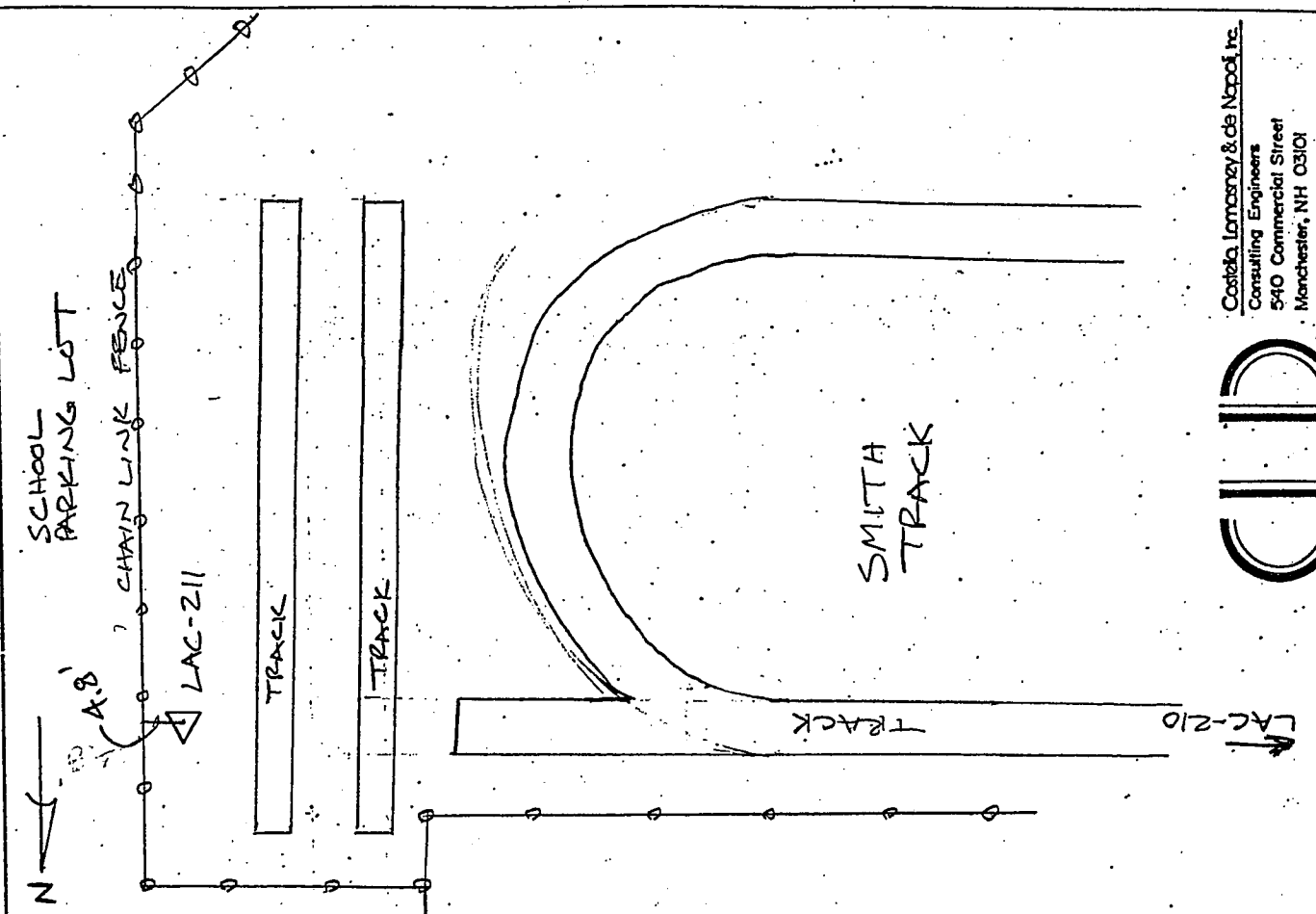
SKETCH LAC-209 CITY DISK/G.BND IN MON. BOX



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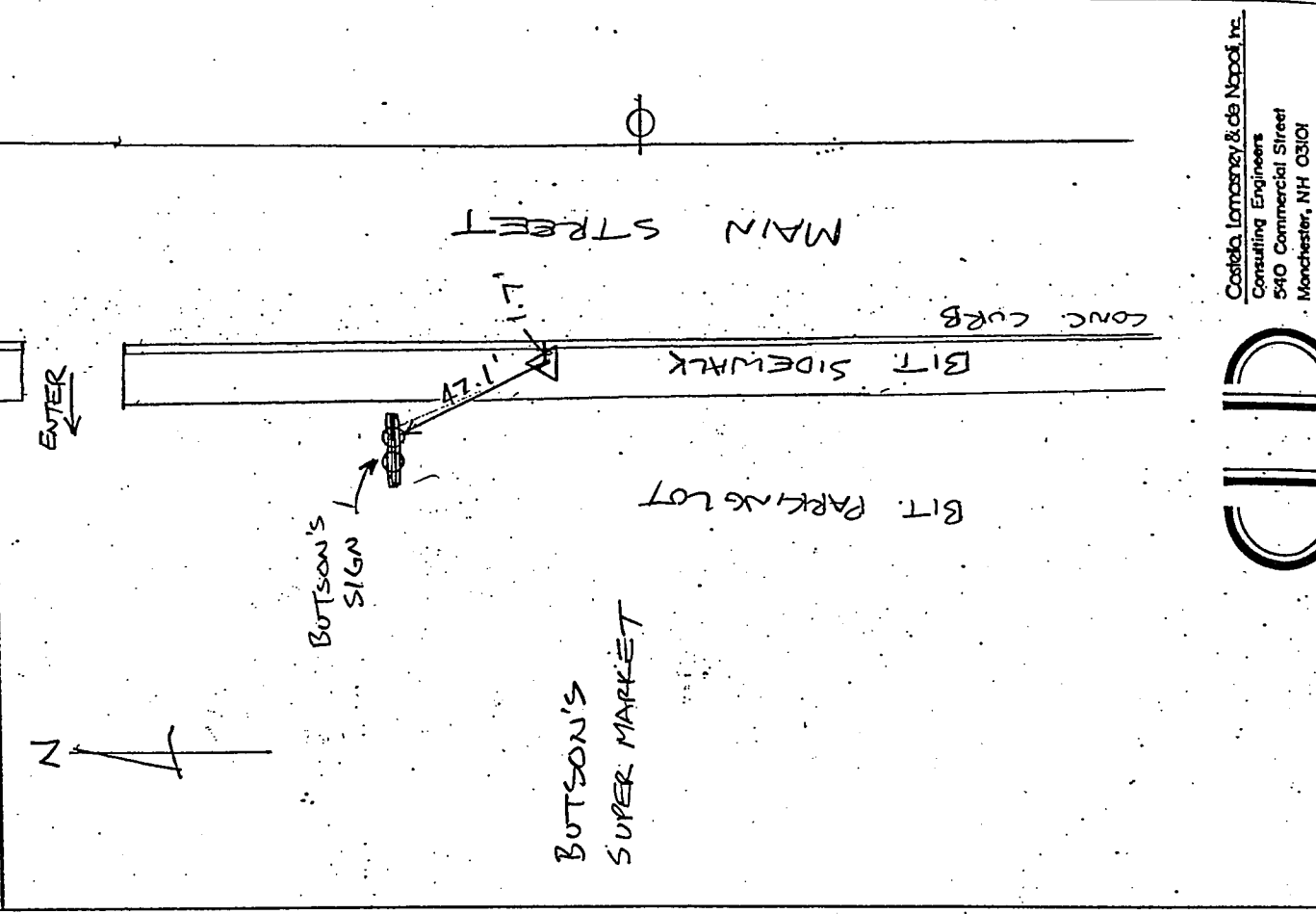
SKETCH LAC-211 CITY DISK/G.BND IN MON. BOX @ SMITH TRACK



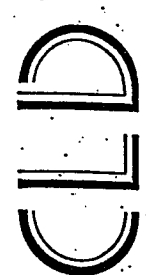
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SKETCH LAC-212 CITY OF LACONIA DISK/E.BND IN MON. BOX

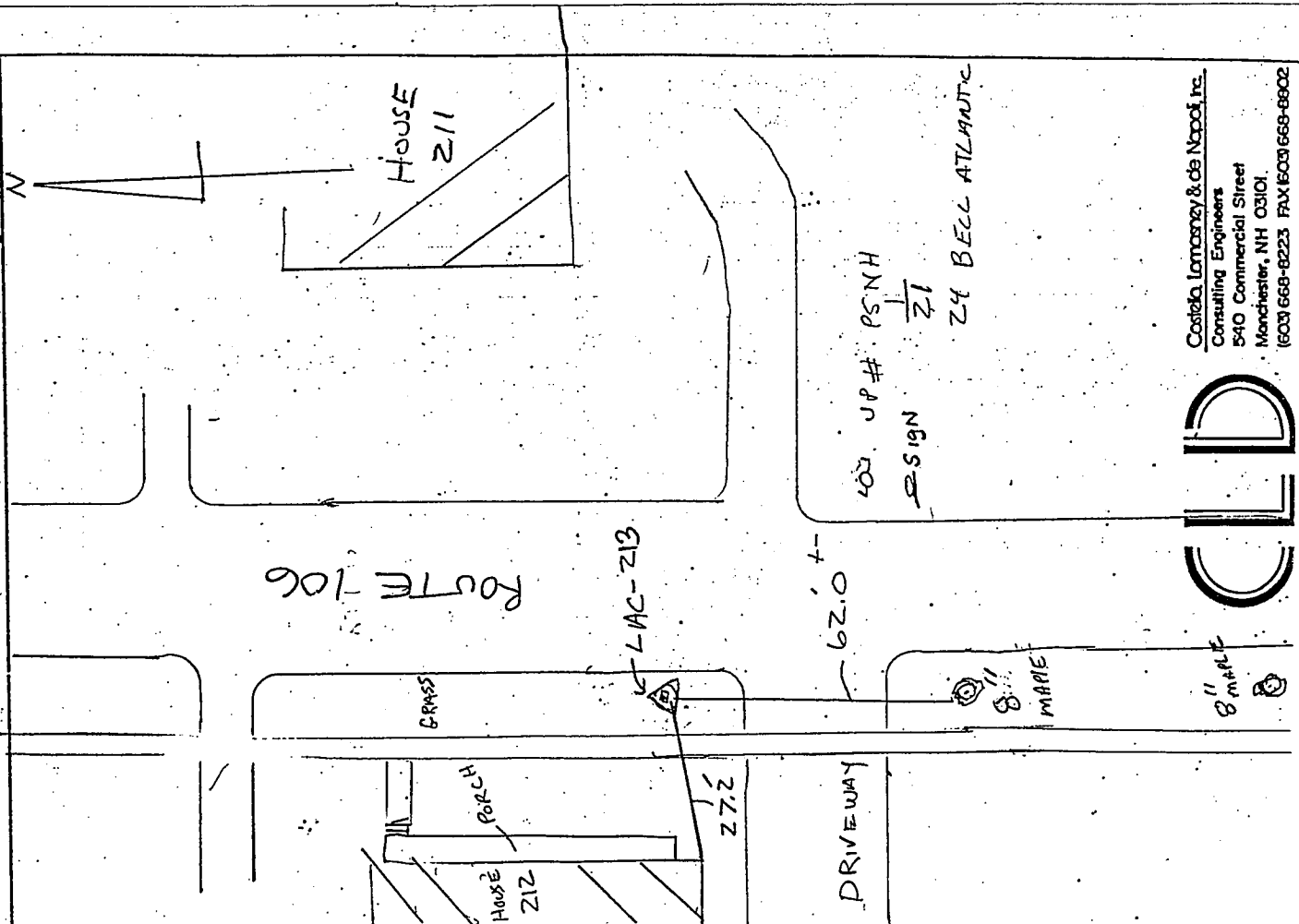


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SKETCH LAC-213

CITY DISK/G-BND
IN MON. DISK

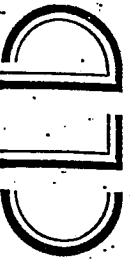
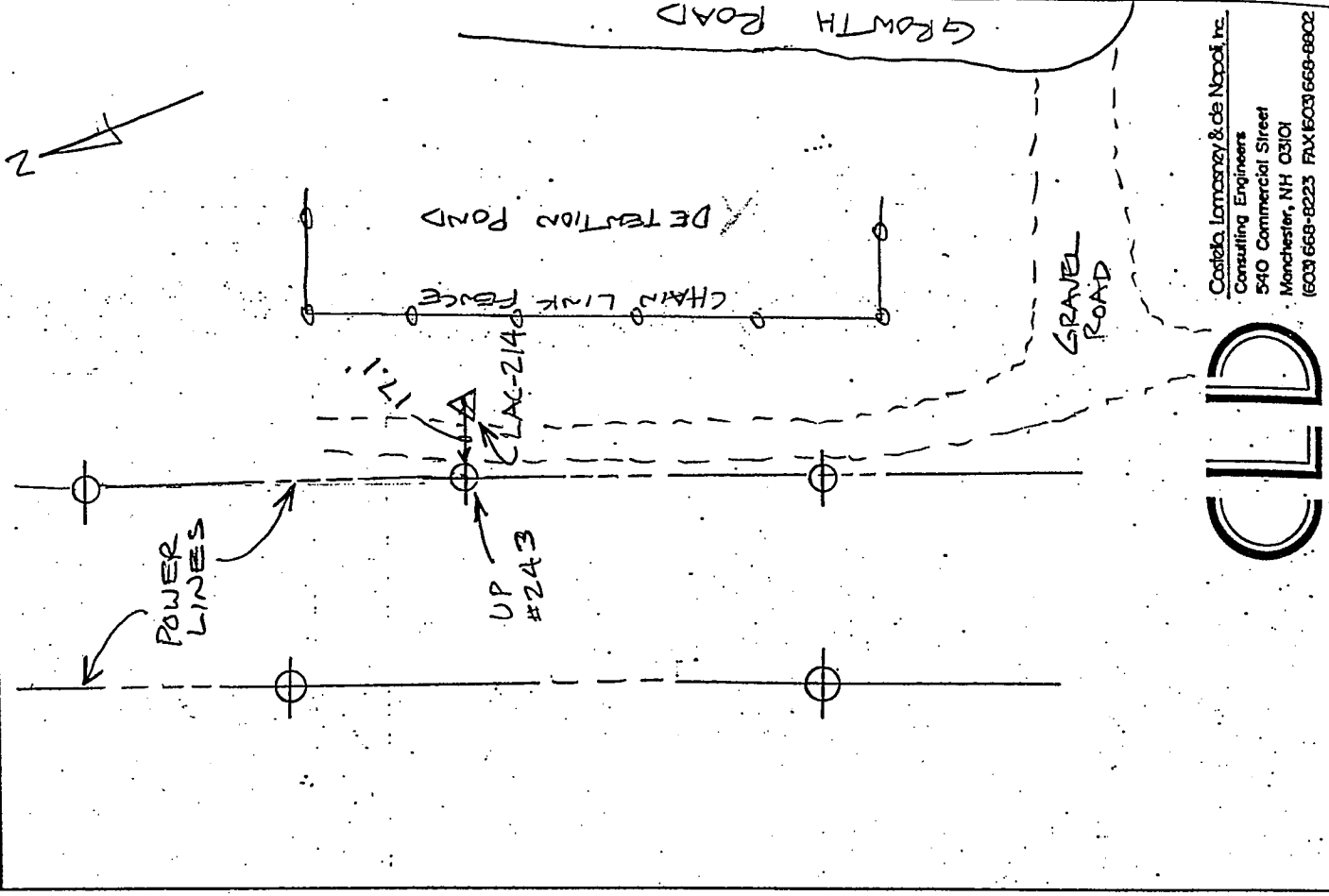


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SKETCH LAC-214

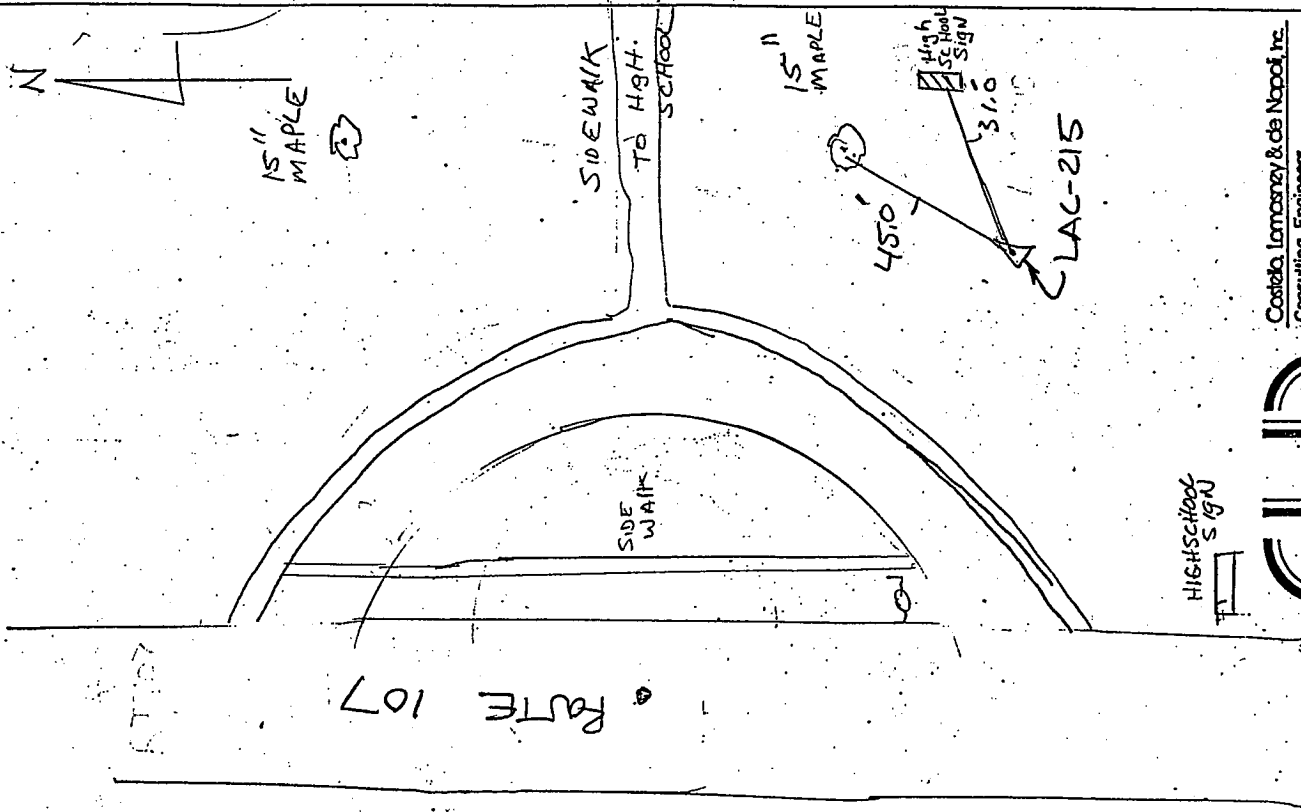
CITY DISK/G-BND
IN MON. BOX



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SKETCH LAC-215

CITY DISK/G. BAND
IN MON. BOX

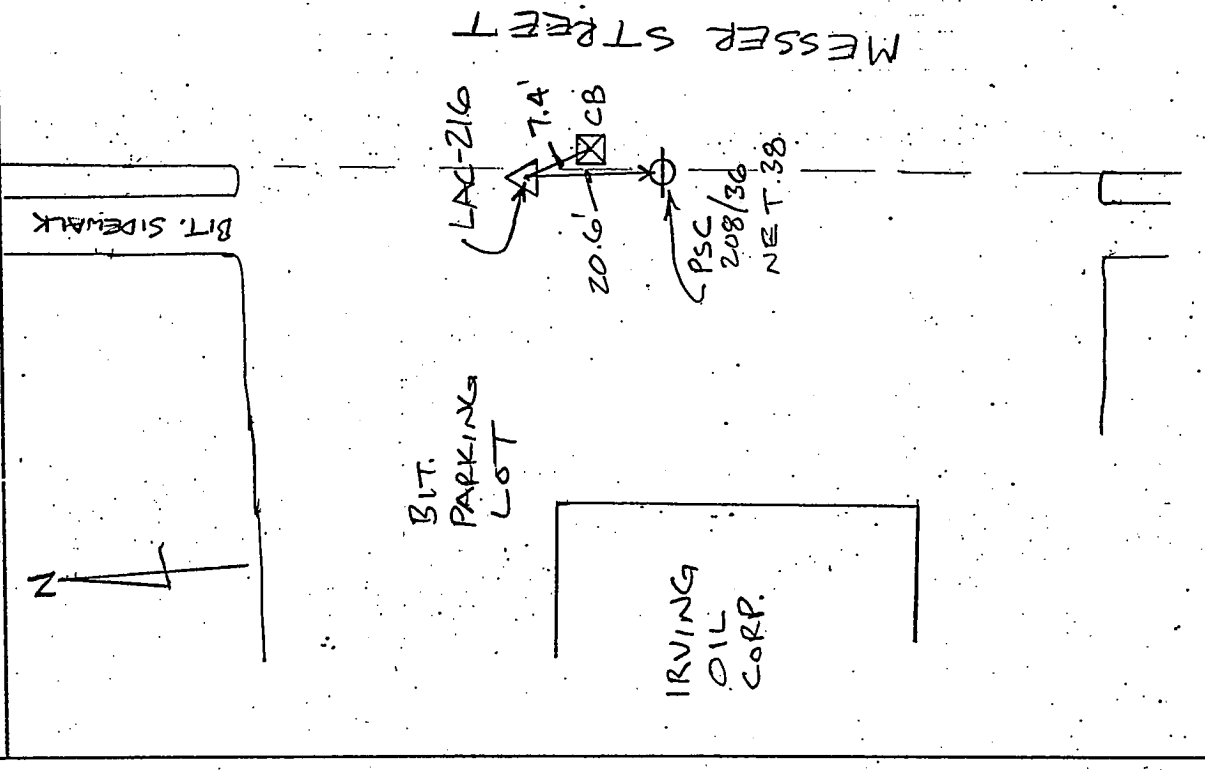


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SKETCH LAC-216

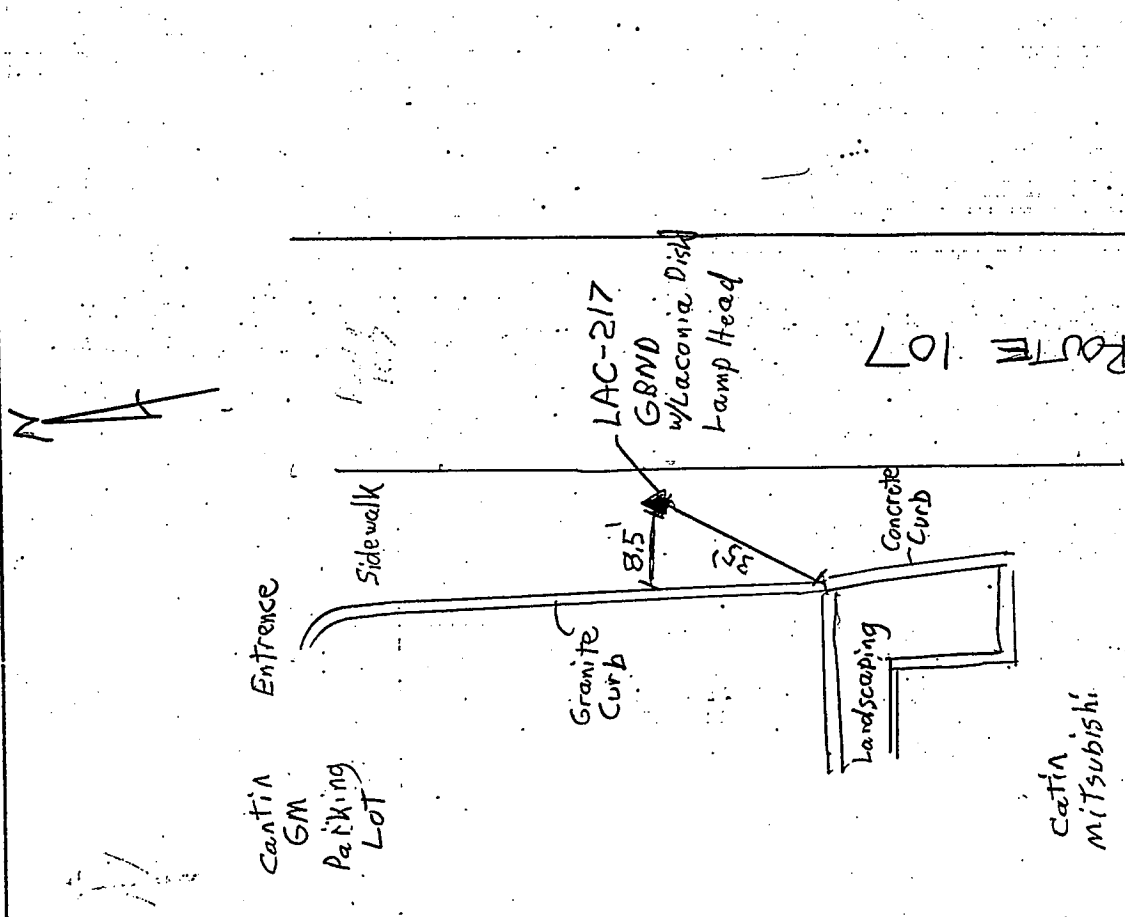
CITY DISK/G. BAND
IN MON. BOX



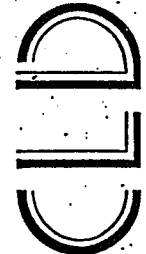
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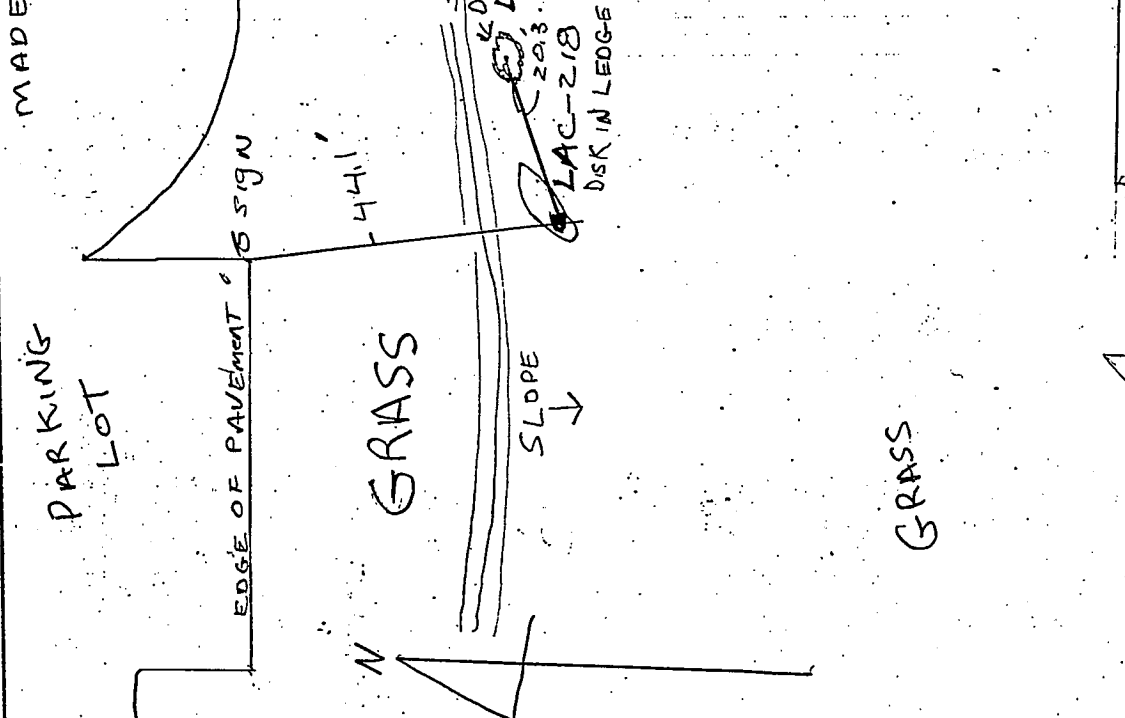
SKETCH LAC-217
 GBND w/ Lamp Head in sidewalk
 session 5



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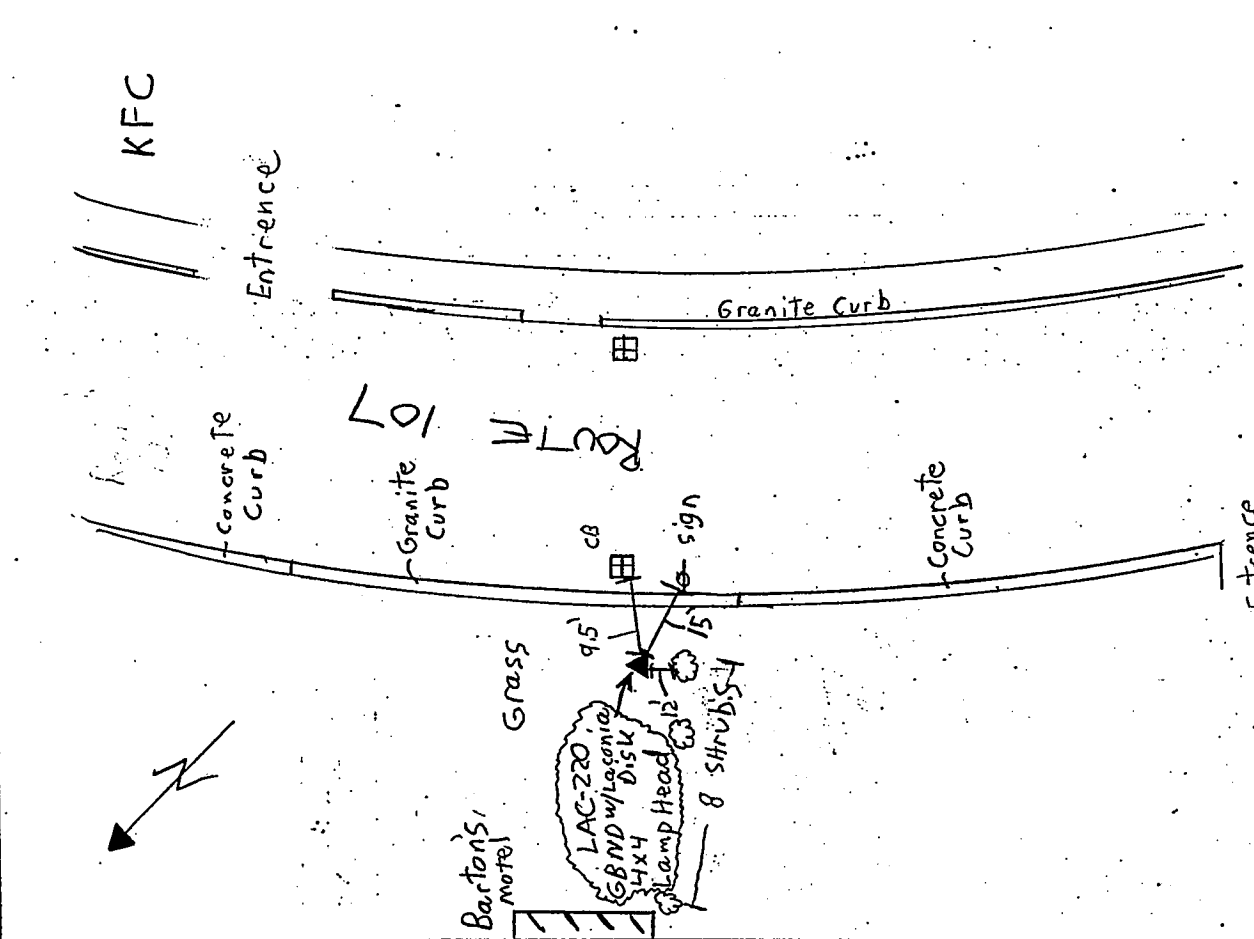
SKETCH LAC-218
 CITY DISK IN LEDGE



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SKETCH LAC-220
 HX4 GBND w/ Laconia Disk Lamp Head
 Session 6-7



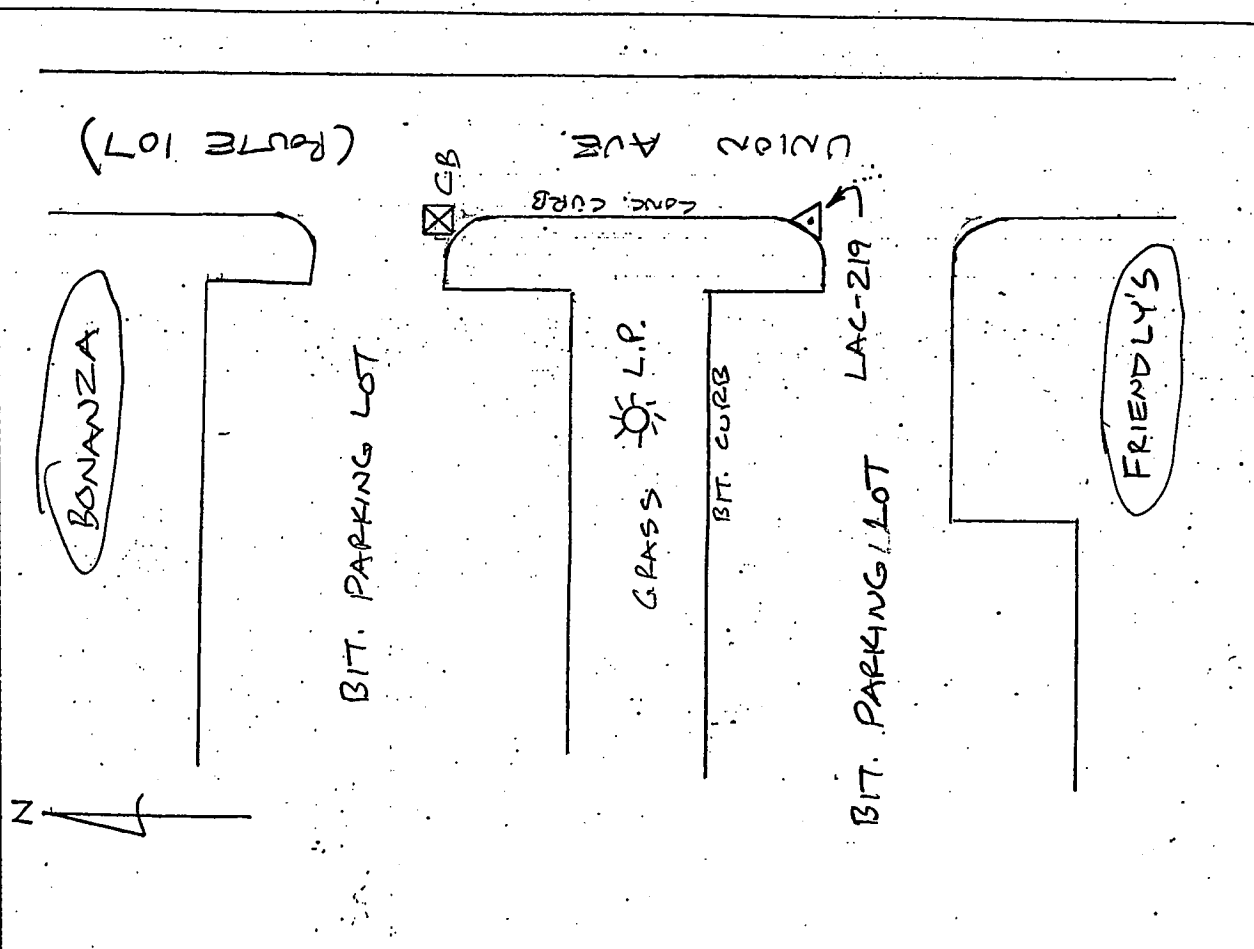
John's
 CORVETTE
 Service

Entrance

CLD

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SKETCH LAC-219
 CITY DISK/G.BND
 IN MON. BOX



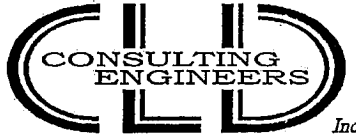
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APPENDIX B

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

**00-188 LACONIA, NEW HAMPSHIRE
HORIZONTAL AND VERTICAL CONTROL
Additional permanent control survey
supplementing 1998 establishment of
permanent control.**



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Maine • New Hampshire • Vermont

Inc.

Horizontal Datum: NAD 83/96
Vertical Datum: NAVD 88
Unit: Survey Feet
Coordinate type: Grid
Reference ellipsoid: WGS 1984
Projection set: New Hampshire

Note:

Coordinate values (X,Y,Z) tabulated below are a result of a GPS survey, utilizing three Leica System 300 dual-frequency sensors, performed on July 6, 2000 by CLD Consulting Engineers, Inc. Stations LAC-2 through LAC-22 are existing monumented control points established by previous GPS survey performed during April 1998 by CLD Consulting Engineers, Inc. and were held in the adjustment of the newly established monumented control points designated below as Stations LAC-201 through LAC-220.

Date of tabulation: October 2000

<u>Station</u>	<u>Northing</u>	<u>Easting</u>	<u>NAVD 88 Sta. Elev.</u>	<u>Description</u>
LAC-2	367380.27	1038756.04	741.63	NHDOTDisk/Bnd.245-0270
LAC-4	377611.04	1036846.54	500.67	CityDisk/Bnd.
LAC-12	402871.66	1039737.63	520.45	CityDisk/Bnd.
LAC-14	406467.97	1033936.75	719.82	CityDisk/Bnd.
LAC-16	395725.63	1030189.29	813.66	CityDisk/Bnd.
LAC-19	384747.82	1031355.92	566.09	CityDisk/Bnd.
LAC-21	388167.91	1044943.11	536.69	NHDOTDisk/Bnd.169-0250(DG44)
LAC-22	403906.20	1036864.12	706.26	NHDOTDisk/Bnd.245-0060(DG23)
LAC-201	404217.75	1038817.46	541.25	CityDisk/Bnd.
LAC-202	407464.80	1033282.08	643.17	CityDisk/Bnd.
LAC-203	399739.84	1029240.89	850.16	CityDisk/Bnd.
LAC-204	396853.20	1030375.69	863.43	CityDisk/Bnd.
LAC-205	388365.00	1032087.43	566.27	CityDisk/Ledge
LAC-206	385669.20	1031478.61	565.37	CityDisk/Bnd.
LAC-207	395874.42	1035648.98	555.42	CityDisk/Bnd.
LAC-208	391436.50	1036799.10	511.12	CityDisk/Ledge
LAC-209	390521.25	1034182.08	569.53	CityDisk/Bnd.
LAC-210	377648.24	1034958.74	506.29	CityDisk/Bnd.
LAC-211	377514.32	1035555.40	507.65	CityDisk/Bnd.
LAC-212	373362.66	1037012.72	497.40	CityDisk/Bnd.
LAC-213	371445.63	1037883.35	519.82	CityDisk/Bnd.
LAC-214	371864.14	1040764.91	631.99	CityDisk/Bnd.
LAC-215	377133.17	1038298.22	510.57	CityDisk/Bnd.
LAC-216	379235.78	1037417.98	515.28	CityDisk/Bnd.
LAC-217	380291.68	1037606.83	517.75	CityDisk/Bnd.
LAC-218	382101.06	1037250.04	506.37	CityDisk/Ledge
LAC-219	385443.15	1040357.31	533.60	CityDisk/Bnd.
LAC-220	386913.91	1041085.61	510.22	CityDisk/Bnd.