GDOT

Surveyor's

Guide

To

CAiCE

Georgia Department of Transportation

Third Edition, Version 1.2

Current with
CAiCE Visual Transportation 10

Current Revision Date: 12/01/12

Table of Contents

March 15, 2006

Section 1 – Standard Conventions

I. Object Numbering and Naming

A. Point Numbering

Point numbering for the Location Survey should begin with the lowest available point number. In some cases this will be the first number higher than the control survey (ref. CTL File). This also applies to computed and digitized points. Point numbering should always be done consecutively. Once a point number has been used with any given alpha prefix (***SVXO***1), it may not be used again with any other alpha prefix (***SVXA***1, ***EP***1, ***PRP***1, etc.). This applies **ONLY** to field Location Survey points.

Point numbers 1 - 9,999 are reserved for survey activities and data processing. However, if more points are required, the numbering should continue consecutively as needed.

When additional survey data is gathered in the field, the point numbers should begin with the lowest number which has not already been submitted to design. However, once the total number of survey points has reached the 9,999 point limit, the Survey Data Engineer should contact the designer and obtain a starting point number and the next available chain number.

Each time additional survey data is gathered, the new data should be added to the original database. This database is to be maintained by the District.

If the location survey exceeds 9,999 points, it shall be the responsibility of the designer to re-number his design points.

A gap in point numbering should only exist where the location survey points total less than 9,999. All other numbering gaps should be minimized.

B. Standard CAiCE Survey Prefixes

The prefix for CEAL DMM files converted to CAiCE SRV files using the **DMMTOSRV** program will be as follows:

"DM" + "segment letter"

where *"segment letter"* corresponds to the CAiCE project segment through which the SRV file will be imported (ie: *DMA, DMB,* etc.).

The prefix for SMI ASC files converted to CAiCE SRV files using the **ASCSRV** program will be as follows:

"SV" + "segment letter"

where *"segment letter"* corresponds to the CAiCE project segment through which the SRV file will be imported (ie: *SVA, SVB,* etc.). This prefix is automatically assigned by the ASCSRV program.

The prefix for objects generated in CAiCE while processing the survey data will be as follows:

"SV" + "segment letter"

where *"segment letter"* corresponds to the CAiCE project segment currently being processed (ie: *SVA, SVXO, SVXA* etc.)

II. CAiCE Segment Naming Conventions

The number of CAiCE project segments to be created will be based on the number of survey files, with one segment being created for each survey file.

A. Original Survey Data

All original survey data will be imported through segments beginning with the single alpha character "A" and continuing through the number of alpha characters ("B", "C", etc.) needed to cover the number of original survey files (See diagram below).

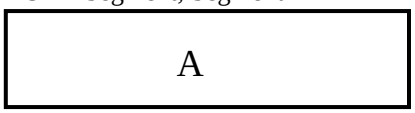
Field Surveyed Projects:

Full field survey projects will usually consist of only ONE original survey file, therefore, only ONE segment will be created initially, segment "A" (See diagram below).

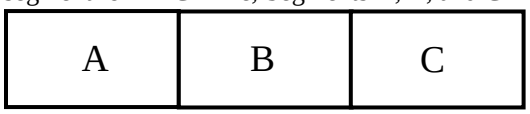
Aerial Mapped Projects:

Mapping projects may consist of multiple original survey files coming from the stereo plotter. This is due to breaking lengthy mapping projects into workable size units, thus creating multiple files that comprise the entire project. Therefore, multiple segments may need to be created beginning with the alpha character "A" and continuing through the number of alpha characters needed to cover the number of survey files ("B", "C", etc.) (See diagram below).

ONE Survey File (ASC File), so only ONE Segment, Segment "A"



Multiple survey files due to file sizes, so ONE segment for EACH file, Segments A, B, and C



B. Original Field Enhancements and Additional Survey Data Segments

All field enhancement and additional data segments will be designated as such by a two letter segment name beginning with "X". The second letter will be based on the type of field survey data as described below.

Original Field Enhancements to Mapping Data:

Original field enhancement segments will conform to the following segment naming convention:

"X" = Field survey data segment
"O" = (O)riginal enhancements

Additional Survey Data:

Additional survey data segments will conform to the following segment naming convention:

"X" = Field survey data segment
"A" = First field enhancement data

Additional field enhancement survey data segments will simply be as follows:

"X" = Field survey data segment
"B" = Second field enhancement data

"X" = Field survey data segment
"C" = Third field enhancement data

and so forth. Conforming to these standard segment naming conventions provides an easy method of tracking and logging all survey data for a project.

NOTE: Field survey data (original enhancements to mapping or requested additional data) collected for a single submission over multiple days will be combined into ONE survey file (ONE ASC file resulting in ONE SRV file) and imported into CAiCE through ONE field segment (XO, XA, XB, etc.). In other words, one day's field work does not constitute a segment. All field work for a single submission will be completed and combined into ONE survey file for importing and/or submission. See Section on "Reviewing Daily Survey Work" for process information.

III. CAiCE Zone Conventions

Zones in CAiCE are equivalent to levels in Microstation or layers in AutoCAD. Zones allow for grouping of data and are used within the Department for grouping the various types of survey data.

Table 1.1 shows the zone specifications currently used within the Department.

Table 1.1

Zone	Source	Attribute	Description
1 – 9	G.O. and District Design Offices	2D – "F"	Design data
10 – 49	Aerial mapping or field	3D – "G"	Original segment data
50	District Field Survey/SDE	2D – "F"	Property (Geometry Chains)
51	District Field Survey/SDE	3D – "G"	3D Topographic data
52	District Field Survey/SDE	2D/3D – "F"	2D/3D Planimetric data

Zones 1-9 are reserved for use by design. Zones 10-49 will be used for the original Environment/Location stereo plotter SRV segment files or the original field surveyed SRV files. Each original survey data segment will correspond to a standard zone (ie: Segment "A" will correspond to Zone 10, Segment "B" will correspond to Zone 11,etc.) as shown in **Table 1.2**.

Table 1.2

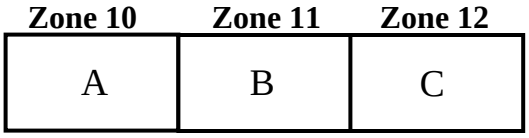
Segment	Zone		Segment	Zone
A	10		N	23
B	11		O	24
C	12		P	25
D	13		Q	26
E	14		R	27
F	15		S	28
G	16		T	29
H	17		U	30
I	18		V	31
J	19		W	32
K	20		X	33
L	21		Y	34
M	22		Z	35

The topo data in an original field surveyed SRV file or in an enhanced mapping SRV file, which will be on zones 51-52, will need to be moved to the correct segment zones as discussed on the following page.

A. Original Survey Data

Mapping Projects:

Original survey data will normally come to the Survey Data Engineer as a SRV file which will be produced by the Photogrammetry Section of the Office of Environment/Location. The original survey data will be broken down into CAiCE zones by the photogrammetrist and will need to be directly imported into CAiCE using the *CAiCE Project Management System*. The original survey data will occupy Zones starting with 10 and continuing through the number of zones needed to cover the number of original survey segments (ie: 11, 12, etc.).



Field Surveyed Projects:

The original survey data will be in the form of a single field surveyed SRV file converted from an ASC file by using ASCSRV. In this case, the original survey data will occupy Zones 51 – 52 (See 3D Topographic Data and 2D/3D Planimetric Data below) based on the ASCSRV.TBL file and will need to be moved to the correct segment zone which will typically be Segment "A" or Zone 10.

B. Property Survey Data

Property points will come in from the field in the field enhanced SRV file or in the original field surveyed SRV file on **Zone 50**. These will be 2D ("F") points that define any property corners found, property points on line, etc.

C. 3D Topographic Data

Data that will go to the DTM will come in from the field in the enhanced survey file or in the original field surveyed SRV file on **Zone 51**. This data will be moved to the correct segment zone later.

D. 2D/3D Planimetric Data

Data that has an attribute of "F" (other than property data) that will come in from the field in the enhanced survey file or in the original field surveyed SRV file will go to **Zone 52**. This data will be moved to the correct segment zone later.

IV. Project and File Naming Conventions

A. Project Name

All project names in CAiCE will be the P.I. Number of the project. For projects with **new** *TPRO* project numbers, the CAiCE project name will be the **last** six digits of the *TPRO* project number (ie: *TPRO* project number = 0001234 so CAiCE project name = 001234)

B. File Names

1) SRV Files

All CAiCE SRV filenames will conform to the standard, required CAiCE format of :

"ProjectName" + "SegmentLetter" .SRV

where *"ProjectName"* is the P.I. Number of the project and *"SegmentLetter"* is the segment through which the SRV file will be imported into CAiCE (ie: 123456A.SRV, 123456XO.SRV, etc.).

2) DTM File

When additional data is submitted to Design, a file of the new and revised DTM is also submitted along with the new, combined SRV file as documented below. The filename of the DTM file will be automatically assigned by the macro as *Exist.zip*.

3) Property KCM Files

When additional/revised property is submitted to Design as documented in **Section 3**, the entire property data is submitted in the form of a CAiCE KCM file. The file naming scheme for the KCM file is as follows:

PI # + PR.KCM

ie: 123456PR.KCM

V. GDOT Standard Survey Feature Codes

SMI Code	Description	Feature Code	Zone	Point Type	Chain Type
1	TERRAIN POINT ON BREAK LINE	TPBL	51		G
2	RANDOM TERRAIN POINT	TRP	51	G	
3	RIGHT-OF-WAY MARKER FOUND	RWM	50	F	
4	RIGHT-OF-WAY POINT COMPUTED	RWC	50	F	
5	RIGHT-OF-WAY UTILIT COMPANY	RWU	50	F	
6	RIGHT-OF-WAY, EXISTING	RWE	50	F	
7	POINT ON EASEMENT LINE	POEL	50	F	
8	PROPERTY CORNER FOUND	PCF	50	F	
9	PROPERTY POINT ON LINE	PPOL	50	F	
10	PROPERTY POINT COMPUTED	PPC	50	F	
15	POINT ON TANGENT, EXISTING	APOT	50	F	
16	POINT OF CURVATURE,EXISTING	APOC	50	F	
17	POINT ON CURVE, EXISTING	APC	50	F	
18	POINT OF TANGENCY, EXISTING	APT	50	F	
19	POINT OF INTERSECTION	API	50	F	
20	ALIGNMENT CENTERLINE	ACL	52		F
24	EDGE OF DIRT ROAD	TEDR	51		G
25	EDGE ASPHALT DRIVE	TEAD	51		G
26	EDGE CONCRETE DRIVE	TECD	51		G
27	EDGE ASPHALT PAVEMENT	TEAP	51		G
28	EDGE ASPHALT SHOULDER	TEAS	51		G
29	EDGE CONCRETE PAVEMENT	TECP	51		G
30	EDGE SURFACE TREATMENT ROAD	TEST	51		G
31	CURB, ASPHALT	TAC	51		G
32	CURB, HEADER	THC	51		G
33	CURB & GUTTER, TOP	TCGT	51		G
34	CURB & GUTTER, F/L	TCGF	51		G
35	V-GUTTER	TVG	51		G
36	BRIDGE APPROACH SLAB, EDGE	TBAS	51		G
37	BRIDGE END, CENTER	TBRDG	52		F
38	BRIDGE END, CORNER	TBRDG	52		F
39	BRIDGE COLUMN, CENTER	TCOLC	52	F	
40	BRIDGE COLUMN, EDGE	TCOLE	52	F	
41	BRIDGE GUTTER LINE	TBGL	52		F
42	BRIDGE CENTERLINE	TBCL	52		F
43	ENDROLL	TENDROLL	51		G
44	BRIDGE CAP	TBCAP	52	F	
45	SINGLE CATCH BASIN,Gutr F/L	DCB	52	F	
47	DOUBLE CATCH BASIN,Gutr F/L	DDCB	52	F	
49	DROP INLET, TOP	DDI	52	F	
50	SPUR DIKE	DSPURDK	51		G
51	TOP OF WATER ELEVATION	DWE	52	F	

SMI Code	Description	Feature Code	Zone	Point Type	Chain Type
52	STREAM CENTER, F/L	DSC	51		G
53	STREAM EDGE	DSE	51		G
54	STREAM BANK TOP	DSB	51		G
55	DAM, TOP	DDT	51		G
56	DAM, TOE	DADB	51		G
57	OBSCURED AREA	OBSC	51		G
58	CULVERT END, F/L	DCEF	52		F
59	HEAD WALL, END	DHWE	52		F
60	CULVERT, WINGWALL END	DCWE	52		F
61	EDGE OF WATER	DEW	52		F
62	SWAMP EDGE	DSWE	52		F
63	WETLAND BOUNDARY	DWB	52		F
68	STRAIN POLE	USTRPOL	52	F	
69	ELECTRICAL BOX	UELBOX	52		F
70	OVERHEAD ELECTRICAL LINE	UOEL	52		F
71	OVERHEAD TELEPHONE LINE	UOTL	52		F
72	POWER POLE, CENTER	UPP	52	F	
73	LIGHT POLE, CENTER	ULP	52	F	
74	TELEPHONE POLE, CENTER	UTP	52	F	
75	TELEPHONE PEDESTAL, CENTER	UTPD	52	F	
76	GUY POLE, CENTER	UGP	52	F	
77	POLE ANCHOR	UPGA	52	F	
78	YARD LIGHT, ELECTRICAL	UYLE	52	F	
79	YARD LIGHT, GAS	UYLG	52	F	
80	WATER METER, CENTER	UWM	52	F	
81	WATER VALVE, CENTER	UWV	52	F	
82	FIRE HYDRANT, CENTER	UFH	52	F	
83	MANHOLE STORM SEWER, TOP	UMHST	52	F	
84	MANHOLE STORM SEWER, F/L	UMHSTF	52	F	
85	MANHOLE, TELEPHONE, TOP	UMHT	52	F	
86	MANHOLE, ELECTRICAL, TOP	UMHE	52	F	
87	MANHOLE, SANIARY SEWER, TOP	UMHSS	52	F	
88	MANHOLE, SANITARY SEWER,F/L	UMHSSF	52	F	
89	SANITARY SEWER LINE, CENTER	USSL	52	F	
90	GAS METER, CENTER	UGM	52	F	
91	GAS VALVE, CENTER	UNGV	52	F	
92	GAS VENT PIPE	UNGVP	52	F	
93	GAS LINE MARKER	UNGLM	52	F	
95	WALL FACE	TWF	52		F
96	WALL FACE, TOP	TWFT	51		G
97	WALL FACE, BOTTOM	TWFB	51		G
98	IRRIGATION PIVOT POINT	TIRRPVTP	52	F	
99	IRRIGATION LIMITS	TIRRLMT	52	F	
100	SIGN, CENTER	TS	52	F	

SMI Code	Description	Feature Code	Zone	Point Type	Chain Type
101	GASOLINE MONITORING WELL	TGMW	52	F	
102	GASOLINE FILLER VALVE	TGFV	52	F	
103	GASOLINE VENT PIPE	TGVP	52	F	
104	GASOLINE PUMP	TGP	52	F	
105	GASOLINE STORAGE TANK, END	TGST	52		F
106	GASOLINE PUMP ISLAND	TGPI	52		F
107	CANOPY	TCAN	52		F
108	BUILDING CORNER	TBLD	52		F
109	BUILDING ROOF LINE CORNER	TBLDRL	52		F
110	HOUSE CORNER	THCR	52		F
111	HOUSE ROOF LINE CORNER	THRL	52		F
112	MOBILE HOME CORNER	TMHCR	52		F
113	MOBILE HOME ROOF LINE CORNR	TMHRL	52		F
115	WOODS LINE	TWL	52		F
116	CULTIVATION LINE	TCUL	52		F
117	FENCE, FIELD WIRE	TFFW	52		F
118	FENCE, BARB WIRE	TFBW	52		F
119	FENCE, WOOD	TFW	52		F
120	RAILROAD, TOP OF RAIL	TRCR	52		F
121	RAILROAD, CENTERLINE	TRCL	52		F
122	CEMETERY LINE	TCEM	52		F
123	GRAVE	TGRV	52		F
124	GUARD RAIL	TGR	52		F
125	SIGN, END	TS	52		F
126	SATELLITE DISH	TSATDSH	52	F	
127	LIMIT LINE	TLIML	51		G
128	CONSTRUCTION BOUNDARY, ACTV	TCBA	51		G
129	CONSTRUCTION BOUNDARY, FIND	TCBF	51		G
130	COUNTY LINE	BCOL	50		F
131	CITY LIMIT LINE	BCTL	50		F
132	LAND DISTRICT LINE	BLDL	50		F
133	LAND LOT LINE	BLLL	50		F
134	STATE LINE	BSL	50		F
150	Surv Defn'd	X	51	G	
151	Surv Defn'd	X	51	G	
152	Surv Defn'd	X	51	G	
153	Surv Defn'd	X	51	G	
154	Surv Defn'd	X	51	G	
155	Surv Defn'd	X	51	G	
156	Surv Defn'd	X	52	F	
157	Surv Defn'd	X	52	F	
158	Surv Defn'd	X	52	F	
159	Surv Defn'd	X	52	F	
160	Surv Defn'd	X	52	F	

SMI Code	Description	Feature Code	Zone	Point Type	Chain Type
161	Surv Defn'd	X	52	F	
162	Surv Defn'd	X	52	F	
163	Surv Defn'd	X	52	F	
164	Surv Defn'd	X	52	F	
165	Surv Defn'd	X	52	F	
166	Surv Defn'd	X	52	F	
167	Surv Defn'd	X	52	F	
168	Surv Defn'd	X	52	F	
169	Surv Defn'd	X	52	F	
170	Surv Defn'd	X	52	F	
171	Surv Defn'd	X	51		G
172	Surv Defn'd	X	51		G
173	Surv Defn'd	X	51		G
174	Surv Defn'd	X	51		G
175	Surv Defn'd	X	51		G
176	Surv Defn'd	X	52		F
177	Surv Defn'd	X	52		F
178	Surv Defn'd	X	52		F
179	Surv Defn'd	X	52		F
180	Surv Defn'd	X	52		F
181	Surv Defn'd	X	52		F
182	Surv Defn'd	X	52		F
183	Surv Defn'd	X	52		F
184	Surv Defn'd	X	52		F
185	Surv Defn'd	X	52		F
186	Surv Defn'd	X	52		F
187	Surv Defn'd	X	52		F
188	Surv Defn'd	X	52		F
189	Surv Defn'd	X	52		F
190	Surv Defn'd	X	52		F
191	Surv Defn'd	X	52		F
192	Surv Defn'd	X	52		F
193	Surv Defn'd	X	52		F
194	Surv Defn'd	X	52		F
195	Surv Defn'd	X	52		F
196	Surv Defn'd	X	52		F
197	Surv Defn'd	X	52		F
198	Surv Defn'd	X	52		F
199	Surv Defn'd	X	52		F
200	DRAINAGE PIPE, F/L,C	DP	52	F	F
201	DRAINAGE PIPE, F/L,M	DP	52	F	F
202	DRAINAGE PIPE, F/L,P	DP	52	F	F
210	SIDEWALK, CENTER	TSW	52		F
211	FENCE, CHAIN LINK	TFCL	52		F

SMI Code	Description	Feature Code	Zone	Point Type	Chain Type
212	TREE, CENTER	TTRE	52	F	
213	WELL	TWELL	52	F	
225	DIRT ROAD, C/L	TDR	51		G
227	DIRT DRIVE, C/L	TDD	51		G
235	MILE POST, RAILROAD	TMPR	52	F	
236	KM POST, HIGHWAY	TKMP	52	F	
237	MILE POST, HIGHWAY	TMPH	52	F	
240	NGS CONTROL MONUMENT	SNGSCM	52	F	
241	LOCATION CONTROL MONUMENT	SLCM	52	F	
242	LOCATION CONTROL DELTA	SLCD	52	F	
243	DISTRICT CONTROL DELTA	SDCD	52	F	
244	CONTROL RE-SHOT FOR CHECK	SCCHK	52	F	
245	BENCHMARK	SBNCHMK	52	F	
250	Miscellaneous	MISC	52	F	

Additional standard feature codes used for storing geometry chains in CAiCE are as follows:

PAR Property parcel chains generated by the SDE

CONSTCL Construction centerline chain **provided by the Design office** on new location projects.

VI. GDOT Standard Photogrammetric Feature Codes

AMSA Feature Code	CAiCE Topo Attrib.	CAiCE Feature Code
150	FP	BORDER
151	GP	DITCH
152	GP	EPSHLD
153	GP	EP
154	GP	TOC
155	GP	BOC
156	GP	CL
157	GP	CLIP
158	GP	RANDOM
159	GP	OBSC
160	GP	LAKE
161	GP	RRCL
162	GP	RIVERED
163	GP	TOWALL
164	GP	BOWALL
165	GP	BREAKLIN
166	GP	CONSTRB
5	GP	PAVEROAD
6	GP	PAVESHLD
8	GP	CURBROAD

AMSA Feature Code	CAiCE Topo Attrib.	CAiCE Feature Code
35	GP	CURBPARK
43	GP	DITCH
63	GP	PVDDRAIN
241	GP	TOC
242	GP	BOC
243	GP	BREAKLIN
244	GP	DEADIN
245	GP	RANDOM
246	FP	BORDER

VII. Standard File Download Locations

All GDOT standard CAiCE files can be downloaded internally from the GDOT "*R.O.A.D.S.*" Homepage. For the Address or Location at the top, enter *TOPPS*. Then, make the following selections from the screens that follow:

- *GDOT Internal Web Server*
- *DOT Division and Office Pages*
- *Preconstruction Division*
- *R.O.A.D.S. Homepage*
- *Software Specific Files & Documentation*
- *Civil Design Software*
- *CAiCE Standard Files*
- *CAiCE Standard Files Download*

OR

Go straight to the link by typing the following address in the URL field of your browser:
http://www.dot.state.ga.us/dot/preconstruction/R-O-A-D-S/SWFilesDocs/SW_Design/SW_Design_KC_Files/index.shtml

A file called **CAICEALL.EXE** is available that will allow you to update all of the CAiCE standard files with one file. Download the file, execute it and specify the root drive of the CAiCE directory (default is **C:**) and the files will be updated. This file is updated frequently. It is advisable to check the Web site weekly for the latest revisions. The latest revisions can be viewed by clicking on the "CAiCEALL History (Brief)" link, but a complete history of all revisions to the standard files can be viewed by clicking on the "CAICEALL History (Full)" link on the download page.

Section 2 – Reviewing Daily Survey Work

The process of gathering field survey data will almost always involve multiple days of survey work. Periodically, the survey data will need to be brought into CAiCE and reviewed for accuracy. The process for reviewing the daily work is documented below.

NOTE: Field survey data (original enhancements to mapping or requested additional data) collected for a single submission over multiple days will be combined into ONE survey file (ONE ASC file resulting in ONE SRV file) and imported into CAiCE through ONE field segment. In other words, one day's field work does not constitute a segment. All field work for a single submission will be completed and combined into ONE survey file for importing and/or submission.

I. Create a CAiCE Project

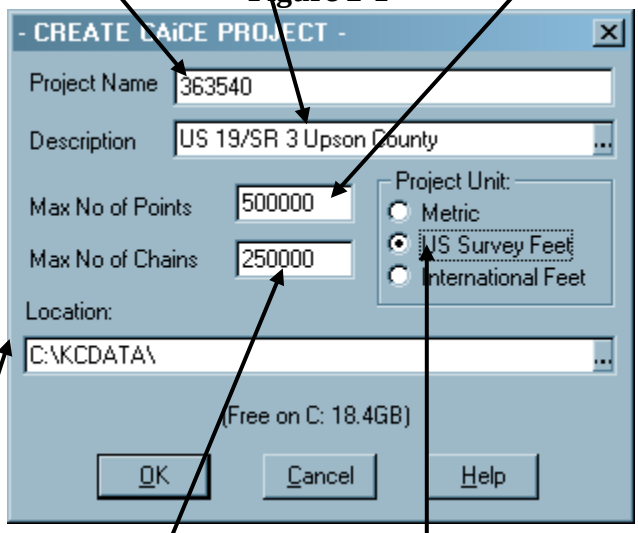
The project created can be a "bogus" project simply used for reviewing survey data on ANY project (*"DAILY"*, *"BOGUS"*, etc.). This project will be created once and used for reviewing all project data. If desired, the Surveyor could create two projects called *"ENGLISH"* and *"METRIC"* for reviewing data for both units.

File=>Project Manager: Displays the *CAiCE Project Management System* dialog

From *CAiCE Project Management System*, select ***Project =>Create***

In the *Create CAiCE Project* dialog (see **Figure 2-1**), enter the **Project Name, Description (optional)**, **Max No of Points (500000),**

Figure 2-1



Max No of Chains (250000), Project Unit, and the project **Location (KCDATA directory)** and click on **OK**.

Set the *System Settings* as desired and click on **OK**.

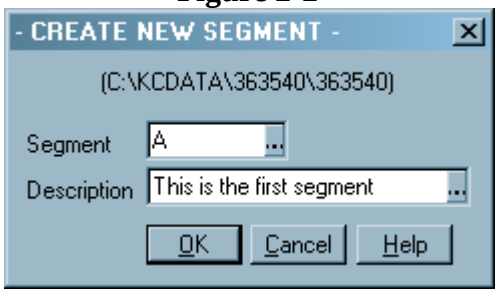
II. Create a New Project Segment

Since this project will only be used to review daily survey data, a single segment called *"A"* can be created for importing survey data through. This segment will be created once and used for importing all survey data.

From the *CAiCE Project Management System* dialog with the new project highlighted, select ***Segment=>Create***.

In the *Create New Segment* dialog (see **Figure 2-2**), enter the **Segment "A"** and then click on **OK**.

Figure 2-2



In the *CAiCE Project Management System* dialog click on **Close**.

III. Attach the standard Feature Table, Cell File, and Command Table

To attach the Command Table: ***Tools=>Attach=>Command Table***

DEFAULT.CTB = CAiCE-supplied command table

To attach the Feature Table: ***Tools=>Attach=>Feature Table (.FTB)***

GDOT20.FTB = English 20 Scale
GDOT50.FTB = English 50 Scale
GDOT100.FTB = English 100 Scale
GDOT250.FTB = Metric 250 Scale
GDOT500.FTB = Metric 500 Scale

Note: A file with the .FTM extension is used to control alignment chain features. This file will automatically be attached with the .FTB file.

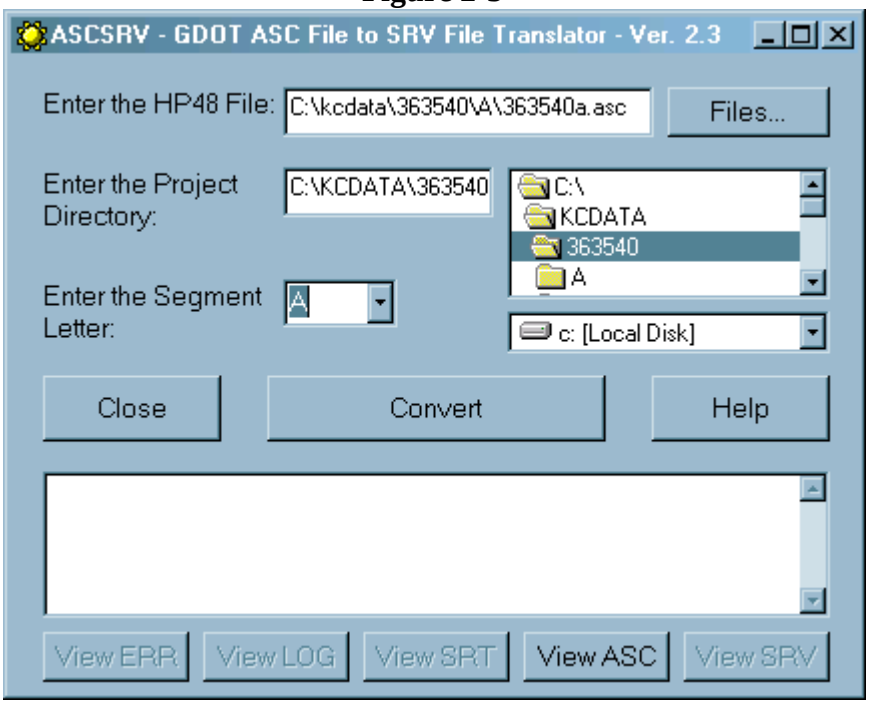
To attach the Cell Library: ***Tools=>Attach=>Cell File (.CCL or .CEL)***

SDE.CCL = English CAiCE Cell File
SDEM.CCL = Metric CAiCE Cell File

IV. Convert the ASC File using *ASCSRV*

Run the ***ASCSRV*** program: ***Tools*** => ***Custom Tools*** => ***ASCSRV*** to display the *ASCSRV – GDOT ASC File to SRV File Translator* dialog (see **Figure 2-3**).

Figure 2-3



Click the **Help** button to display the on-line .PDF help file for the program.

The files ***.SRV, *.SRT, *.LOG,** and possibly ***.ERR** will be created in the project segment directory (*c:\kcdata\daily\A*).

The header information from the ASC file will be written to the SRV file. All point names will have a prefix of *"SV + Segment Letter" (SVA)* where the segment letter is specified in the input to the program. All points and survey chains are assigned a *zone* (similar to a level in MicroStation) based on whether the data is Property (Zone 50), 3D Topographic data (Zone 51), or 2D/3D Planimetric data (Zone 52).

The ***ASCSRV*** Installation Program is available for download at the following WEB address:

http://www.dot.state.ga.us/dot/preconstruction/R-O-A-D-S/SWFilesDocs/SW_Design/SW_Design_KC_Files/index.shtml

V. Check for an ERR file created from *ASCSRV*

The ERR file will be created in the project segment directory along with the SRV, SRT, and LOG file. If an ERR file is created, then make necessary corrections to the ASC file, delete the segment files (SRV, SRT, ERR, LOG), and rerun *ASCSRV* until no ERR file exists.

VI. Check the LOG file for long chains

Make a note of any chains with lengths greater than 240 characters as noted in the LOG file. These chains will be "chopped-off" at 240 characters and the remainder of the chain list will be assigned the next highest available chain number. Therefore, no renumbering of chains is necessary anymore.

VII. Import the SRV File

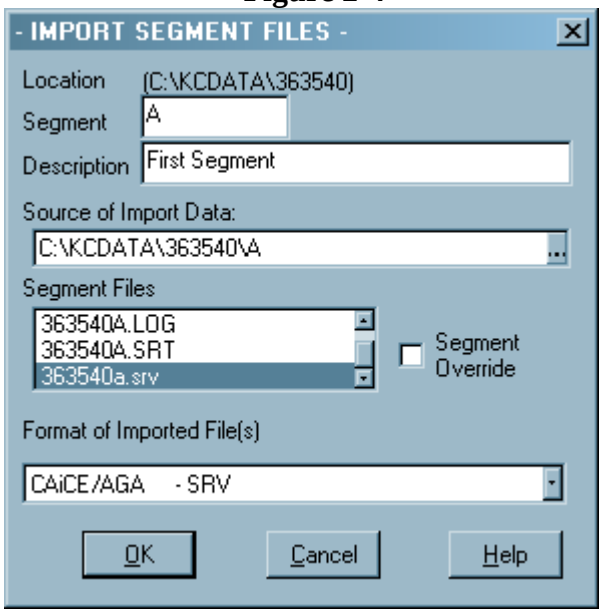
File=>Project Manager: Displays the *CAiCE Project Management System* dialog

Click on the new project to highlight it and then click on the segment to import to highlight it.

From *CAiCE Project Management System*, select ***Segment =>Import***

In the *Import Segment Files* dialog (see **Figure 2-4**), select the **Source of Import Data** to be the segment directory to import from, set the **Format of Imported File(s)** as **"CAiCE/AGA –SRV"**, click on the SRV file in the **Segment Files** field, and then click on **OK** to import the file. Click on **Yes** to proceed and **OK** after the conversion is complete.

Figure 2-4



Click on the **Close** button when importing of files is complete.

This pulls in all of the points and survey chains in the SRV files into the CAiCE project database with the correct feature code and zones.

VIII. View the Survey Points and Chains

Use the CAiCE viewing commands to review the survey data.

View=>Points
View=>Survey Chains

IX. Resolve Survey Chain Crossings

If crossings exist, make sure all crossings are resolved and corrections are made to the ASC file. If the cause of the crossings is not obvious, then further field investigation must be done.

Geometry=>Survey Chains=>Resolve Survey Chain Crossings

NOTE for the Trim Chain(s) option: A point will get inserted into the chain when it is trimmed. Enter the name of the chain point that will be trimmed in the **Prefix** field under the **New Point** group to ease in correcting the ASC file.

NOTE for the Edit Chain option: When the *Advanced Survey Chain Editor* dialog appears, enter the **Name** of the point being moved or edited in the **New Point** field under the **Defaults** group.

NOTE: If crossings are found, they MUST be corrected in the ASC file!

X. Create the DTM Database

DTM=>DTM Database Manager

Enter **"EXIST"** for the **Name** and **Feature** and click on **Create** and then on **OK.**

XI. Load the DTM Database

DTM=>Load DTM Database=>From Survey Points and Chains

Leave everything set to **"ALL"** and click on **OK**.

XII. Build Triangles

DTM=>Build Triangles

XIII. View the DTM Surface

View=>DTM=>Triangles

The triangles can also be rendered and viewed in perspective if desired.

XIV. Delete the DTM Database

DTM=>DTM Database Manager=>Delete

XV. Reset the Project

File=>Project Manager

(From *CAiCE Project Management System)* ***Project=>Reset***

This will set the project back to its' original state before any work was done.

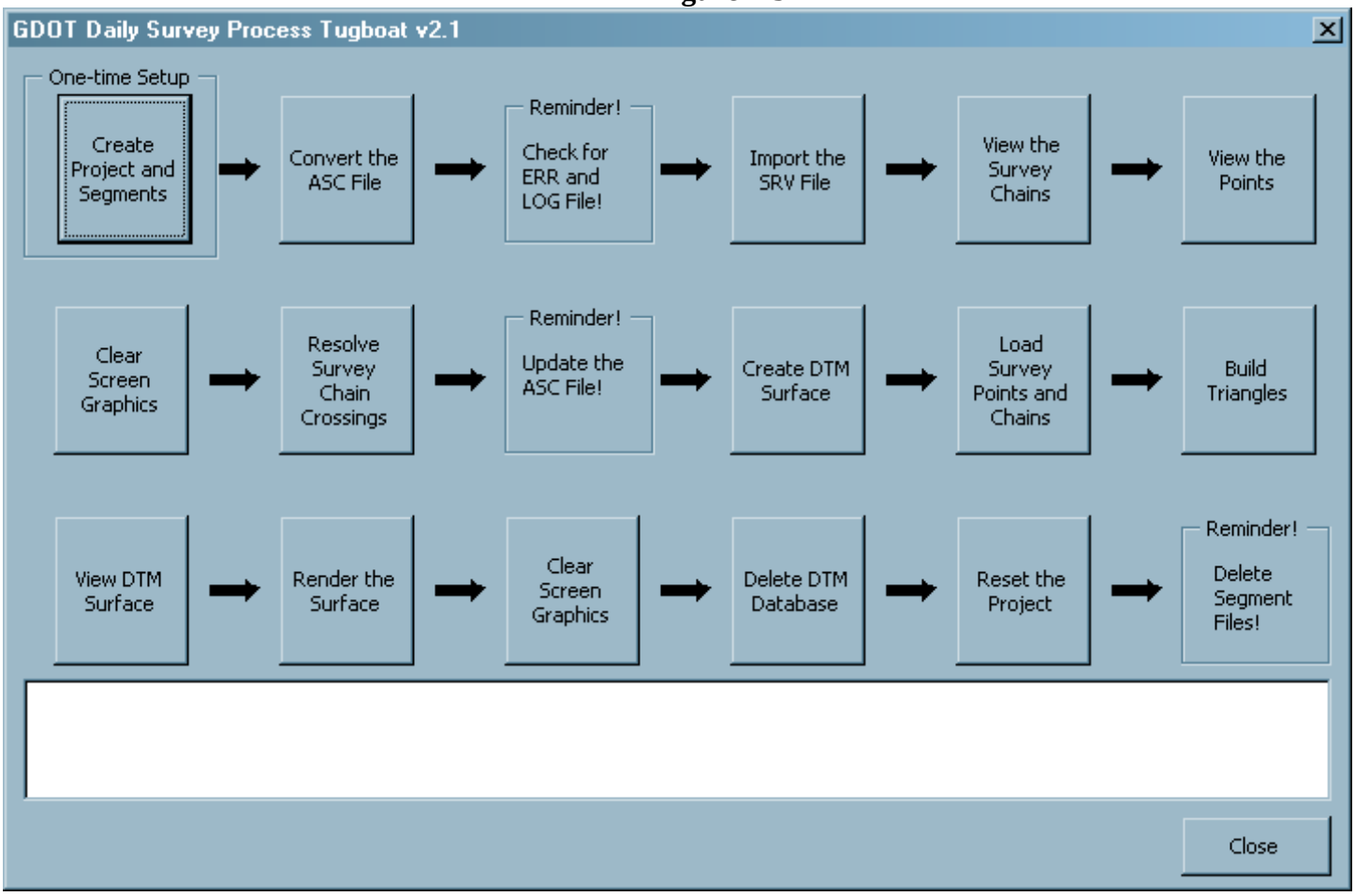
XVI. Delete the Segment Files

In the project segment directory, delete the SRV, SRT, ERR, and LOG files.

XVII. Daily Survey Process Tugboat

A macro has been created that provides a step by step guide through the daily process of checking survey data. This macro is called the *GDOT Daily Survey Process Tugboat* and is found in the **Tools =>Custom Tools=>GDOT Macro Menu** on the *Utilities* tab. Click on the *Daily Survey Process* button to display the tugboat macro (see **Figure 2-5**).

Figure 2-5



The tugboat will lead you through the daily process of importing, checking and viewing your survey data. Clicking on the step will bring up the dialog box associated with that step. As a step is finished, the button will be grayed out, so that you will know the next step to take.

Section 3 – Final Processing

If property is to be stored by the Surveyor, then the steps in this section must be followed. The project and segment must be created according to GDOT standards for processing the property data. This section assumes that all the survey points and chains have been reviewed and corrected. It is also assumed that the DTM has been created and verified.

I. Create the New Project and Segments

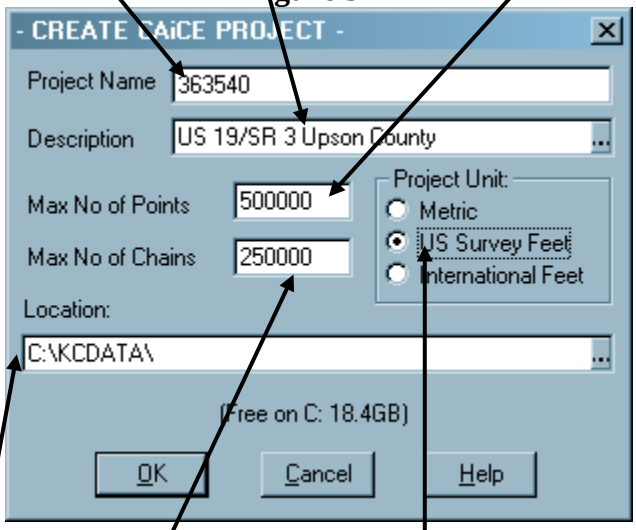
A. Create the Project with the PI Number as the name (363540)

File*=>*Project Manager: Displays the *CAiCE Project Management System* dialog

From *CAiCE Project Management System*, select ***Project* =>*Create***

In the *Create CAiCE Project* dialog (see **Figure 3-1**), enter the **Project Name, Description**, **Max No of Points (500000),**

Figure 3-1



Max No of Chains (250000), Project Unit, and the project **Location (KCDATA directory)** and click on **OK**.

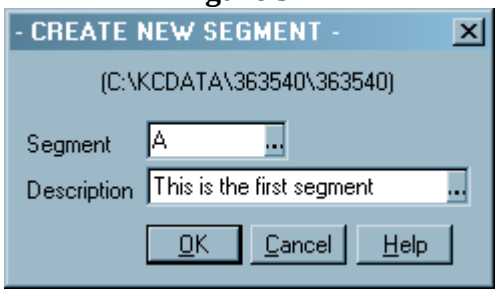
Set the *System Settings* as desired and click on **OK**.

B. Create the segment

From the *CAiCE Project Management System* dialog with the new project highlighted, select ***Segment*=>*Create***.

In the *Create New Segment* dialog (see **Figure 3-2**), enter the **Segment "A"** and then click on **OK**.

Figure 3-2



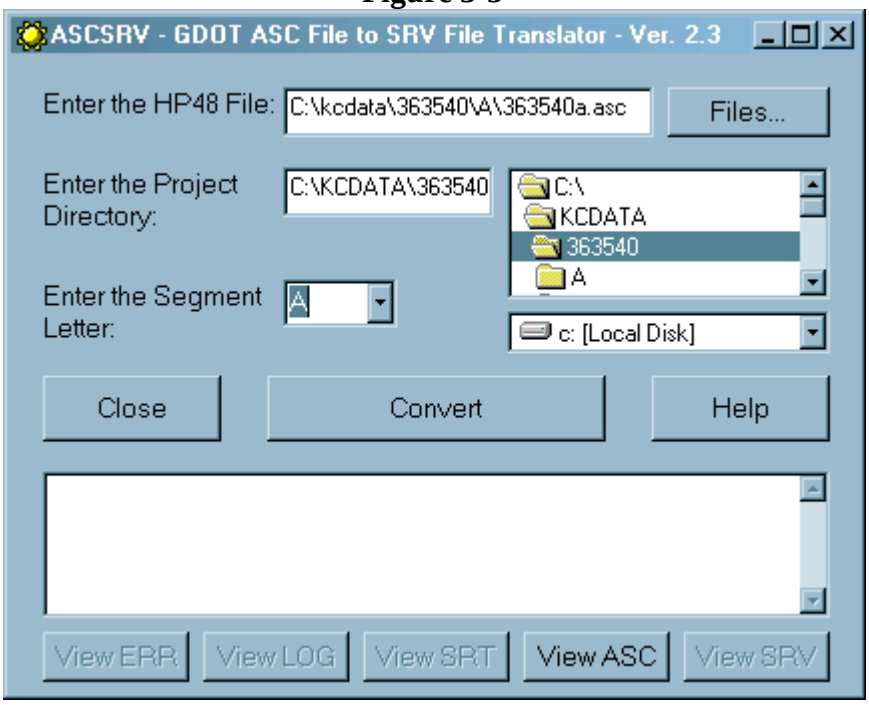
In the *CAiCE Project Management System* dialog click on **Close**.

II. Convert the Survey Data

NOTE: The Surveyor should check the field survey file (.ASC) to ensure that an error file is not created when the *ASCSRV* program is executed.

Run the ***ASCSRV*** program: ***Tools*** => ***Custom Tools*** => ***ASCSRV*** to display the *ASCSRV – GDOT ASC File to SRV File Translator* dialog (see **Figure 3-3**).

Figure 3-3



Click the **Help** button to display the on-line .PDF help file for the program.

The files ***.SRV, *.SRT, *.LOG,** and possibly ***.ERR** will be created in the project segment directory (*c:\kcdata\daily\A*).

The header information from the ASC file will be written to the SRV file. All point names will have a prefix of *"SV + Segment Letter"* (*SVA)* where the segment letter is specified in the input to the program.

III. Import the SRV file into the CAiCE Database

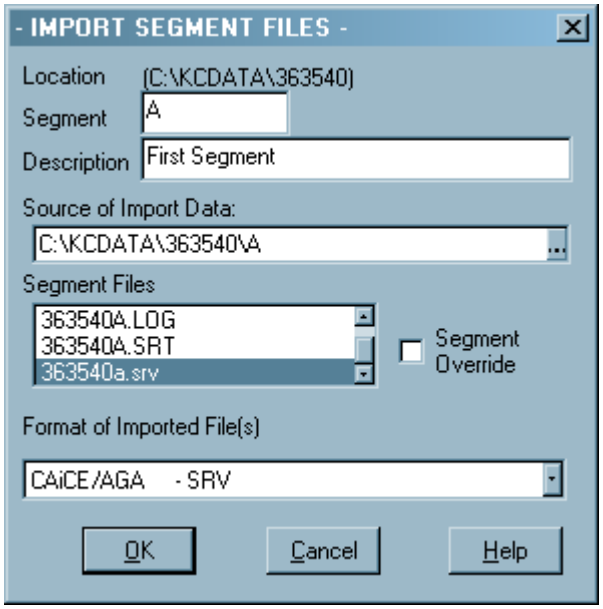
File*=>*Project Manager: Displays the *CAiCE Project Management System* dialog

Click on the new project to highlight it and then click on the segment to import to highlight it.

From *CAiCE Project Management System*, select ***Segment =>Import***

In the *Import Segment Files* dialog (see **Figure 3-4**), select the **Source of Import Data** to be the segment directory to import from, set the **Format of Imported File(s)** as **"CAiCE/AGA –SRV"**, click on the SRV file in the **Segment Files** field, and then click on **OK** to import the file. Click on **Yes** to proceed and **OK** after the conversion is complete.

Figure 3-4



Click on the **Close** button when importing of files is complete.

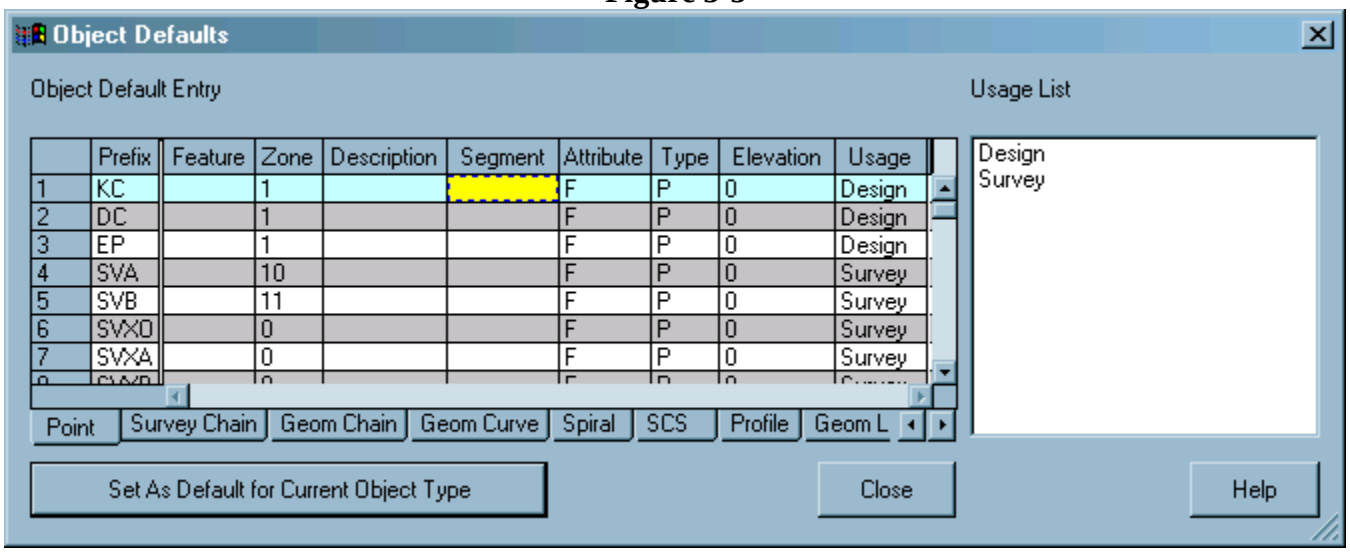
This pulls in all the points and survey chains in the SRV files into the CAiCE project database with the correct feature code and zones.

IV. Object Default Settings

Object defaults (prefix, feature code, zone, etc.) can be set up front and then all commands used in CAiCE will automatically come up with those defaults set. This keeps the user from having to enter the default prefixes, etc. every time a command is run in CAiCE. This is especially helpful when repetitively storing objects with the same prefix, feature code, zone, etc., such as in the process of storing property. There are different settings for points, survey chains, etc. To access the object default settings, use the command:

Settings*=>*Object Defaults to view the dialog shown in **Figure 3-5**.

Figure 3-5



As shown above, a standard file has been setup for GDOT that reflects some of the most frequently used prefixes and zones where possible. The only prefixes used in Design are "KC, DC, and EP", with "KC" reflected at the top of each object type's listing. **The other prefixes pertain to survey**. Simply select the desired prefix from the list and then **enter additional information like the feature code, zone, and attribute**. Once the attributes are set as desired for one type of object (points, survey chains, etc.), click on the ***Set As Default for Current Object Type*** button to activate the settings before going to the next object type. Different types of objects can be selected by clicking on the tabs at the bottom of the dialog (*Point, Survey Chain*, etc.).

NOTES:

1) To have the default prefixes, etc. available, the latest **CAICEALL.EXE** file must be downloaded from the Homepage and ran to load the files into the CAICE directory.
2) The standard settings shown above reflect only the standard prefixes in most cases. Therefore, the other information must be filled-in by the user such as **Feature Code, Zone, and Attribute**.

V. Property Data

A. Survey and Information Gathering Procedures

1. Parcel Data

1-a. The District shall provide the property information for all parcels within the limits of the project.

1-b. All parcels must be chained clockwise and the chains must close (first and last point number must be the same). The chain should be a graphic representation of all corners of the parcel as defined in the deed or plat. Property corners and lines which lie within the "right-of-way take", should be located by field survey if possible. If they cannot be found, their position should be computed from the deed or plat. The positions of corners which do not lie within the "right-of-way take" can be determined by digitizing from a plat or tax map, or by computation.

1-c. The chain for the parcel must contain sufficient information to accurately locate all curved property lines. The beginning and the ending point of each curve should be equated to a point number and those numbers must be included in the parcel chain.

1-d. The District shall provide the official area in acreage (Land Hectares when job is done in metric) for each parcel in the **Property Statistic Report** (**.XLS**). This area, which is to be taken from the deed or plat, is to be used by the designer. The area which can be computed from the parcel chain is **not the official area** and therefore is **not** to be used in design. If an acreage is not provided on the deed or plat, the District shall be responsible for computing this area from a legal description.

1-e. If a parcel is split by the proposed right-of-way, or if existing access to the parcel is eliminated, all available access to a public roadway for the remaining parcel(s) should be identified by the surveyor or the Survey Data Engineer and a comment about this access should be added as an explanatory note in the **Property Design File** (**PROP.DGN**) **(i.e. "access to County Road #77" - shown at the appropriate place in the file**).

1-f. **No** deeds, plats or tax maps are to be submitted as part of the automated survey material. However, on occasion, tax maps and property owner names may be required prior to the survey in order to prepare public hearing displays. When this need arises, a request for this information will be made by letter. The submittal of these tax maps is not to be considered as part of the **"normal"** location survey material.

1-g. The following information for each parcel shall be provided in a **Property Statistic Report** (**.XLS**) File. The filename and location shall be provided to the designer. **No** printout of this file should be submitted.

- Land District/Section Number (See Note).
- Land Lot Number (See Note).
- Georgia Militia District (GMD).
- Block Number.
- Tax Map Number.
- Tax Map Parcel Number.
- Parcel Chain Number (This will be the chain number for the parcel).
- Area in acres (as recorded in the deed or plat).
- Book and Page Number of where the deed is recorded.
- Book and Page Number of where the Plat is recorded.
- Property Owner's Name and Address.

NOTE: Parcels not described by this system will be described by the legal description contained in the deed.

1-h. Explanatory notes (**Parcel Chain Number, Prescription R/W, Easements, etc.**) should be added to the **Property Design File** (**PROP.DGN**). Additional text must have the correct attributes and level as indicated by the state-wide attributes and level conventions.

2. Right-of-Way (deeded/prescriptive) and Easement

2-a. The District shall provide all information about existing right-of-ways for public roadways (including railroads) located within the limits of the project.

2-b. The right-of-way data shall be chained.

2-c. The following procedures should be followed for surveying deeded Right-of-Way:

- Locate the centerline alignment of the road that was used to describe the deeded right-of-way coordinating at least two (2) points on all tangents and three (3) points on all curves. It is very important to determine if any widening has taken place since the deed centerline was established. If widening was not symmetrical, use available field evidence to establish the deed centerline.

- All existing right-of-way markers should be coordinated.

- All existing property corners which will be used to determine the property take will be coordinated either by field survey or by computation from a deed or plat. All property points not directly impacting the **"take"** can be digitized from the deed, plat, or tax map.

- The **Property Design File** (**PROP.DGN**) provided by the District **must** contain a notation which states that the "right-of-way is claimed by prescription".

2-d. The following procedures should be followed in developing the Property/Right-of-Way database for roads with deeded right-of-way:

- The alignment of the existing road should be determined by using the tangent and curve points from the field survey. Degrees of curves should be computed by using the field points, and then compared to old plans, and then an appropriate degree assigned to the curve.

- The Department's right-of-way should then be set to correspond with this alignment.

- At this point the differences between the Department's right-of-way and the existing right-of-way markers and property information should be evaluated. Major discrepancies should receive further investigation.

- When the District creates a chain from the field survey file, all corners and boundaries which conflict with the right-of-way should be projected or terminated to conform precisely with the deeded right-of-way (See Attachment A).

- The parcel chain should contain the newly created points which conform to the right-of-way. The chain should **not** include any property points that conflict with this right-of-way. These conflicting points should be retained in the data file as part of the project records.

- All existing right-of-way markers which conflict with the true position of the right-of-way are not to be used in any chains but are to be retained in the data files as part of the project records.

- Since there will be property and right-of-way points residing in the data file which are not included in any chains, the Survey Data Engineer should use caution before **"plotting all points"**.

2-e. The following procedures should be followed for surveying a public roadway that does **not** have a deeded right-of-way:

- The surveyor will notify the Preconstruction Engineer in writing that the roadway does not have a deeded right-of-way.

- Locate the centerline alignment of the road by coordinating at least two (2) points on all tangents and three (3) points on all curves.

- Coordinate the limits of the area along the roadway which is maintained by the Department or by the local government (**e.g., back of ditch to back of ditch**). This area may be claimed by prescription if it meets the legal requirements.

- The surveyor is to document on a tax map, or other drawing, all areas for which the Department or a local government does not have deeded title.

2-f. The following procedures should be followed in developing the Property/Right-of-Way database for roads with **no** deeded right-of-way:

- The District shall create property chains from the field survey file that include all property corners (field located, computed, or digitized) which identify parcels.

- The District shall create chains from the field survey file that reflect the right-of-way that is considered to have been acquired by prescription***** (possession).

- The property and right-of-way chains shall show the conflicts between the property lines and these limits of the "claimed" (prescriptive) right-of-way. (See Attachment B)

- The **Property Design File** (**PROP.DGN**) provided by the District **must** contain a notation which states that the "right-of-way is claimed by prescription".

2-g. Easement right-of-ways for utility companies should be surveyed and chained.

2-h. Explanatory notes should be added to the **Property Design File** (**PROP.DGN**). The text must have the correct attributes and level as indicated by the statewide attributes and level conventions.

* Prescriptive R/W is acquired by long uninterrupted use (in GA usually 7 years).

3. BOUNDARY LINES

3-a. The District should provide the following types of boundary lines:

- State
- County
- City
- Land Lot
- Public Lands

3-b. The boundary lines shall be chained.

3-c. Explanatory notes should be added to the **Property Design File** (**PROP.DGN**). The text must have the correct attributes and level as indicated by the statewide attributes and level conventions.

B. Processing Property Data in CAiCE

1. Using English units plats and old English units plans (Applies to METRIC projects ONLY!)

If the property is going to be chained together using English plats and the project is a Metric project, then the property will need to be converted to English to use the plat dimensions. To do this, the property points will be converted to English units, chained together, and converted back to Metric units.

The *ASCSRV* program automatically assigns Zone 50 to all the standard property features. These feature codes are shown **Table 3.1**.

Table 3.1

SMI Code	CAiCE Feature Code
3	RWM
4	RWC
5	RWU
6	RWE
7	POEL
8	PCF
9	PPOL
10	PPC
15	APOT
16	APOC
17	APC
18	APT
19	API

- **Archive the current project.**
  File=>Project Manager: Displays the *CAiCE Project Management System* dialog

  From *CAiCE Project Management System*
  Project=>Archive

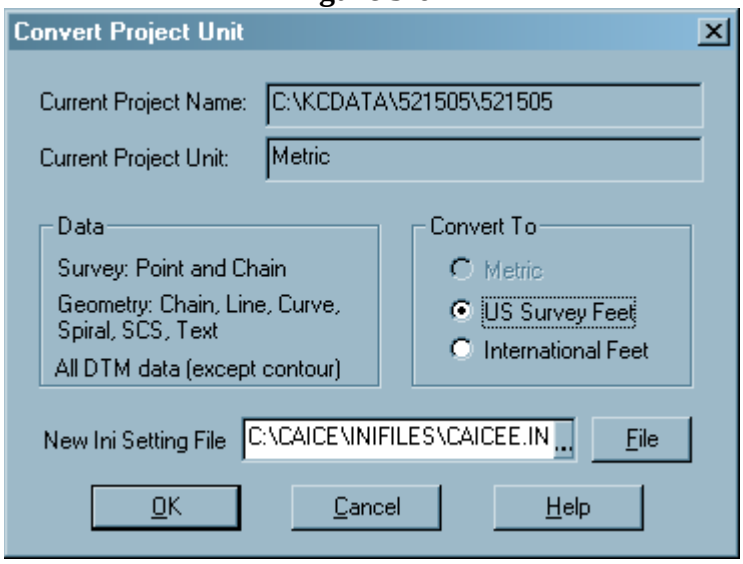
  This is done as a precaution if anything should go wrong in the conversion or storing of property data.

- **Transform the project to English units.**
  File*=>*Project Manager: Displays the *CAiCE Project Management System* dialog

  From *CAiCE Project Management System*
  Project*=>*Convert Project Units

  The *Convert Project Unit* dialog (see **Figure 3-6**) will appear.

Figure 3-6



No settings should need to be revised in this dialog.

NOTE: The correct units Feature Table and Cell File will need to be re-attached after conversion.

2. Chain the Property Data together using the following information

⇒ **Property Parcels** will be stored as geometry chains using the ***Geometry=>Geometry Chains=>Store/Edit*** command.

***** All prefixes will be the same as the current segment being processed (SVA, SVXO, SVXA, etc.).**

Table 3.2

OBJECT	TYPE	ZONE	PREFIX	FEATURE CODE	ATTRIBUTE
Points	Geometry	50	***	PCF, PPC, PPOL, POEL	F
Curves	Geometry	50	***	PAR	N/A
Chains	Geometry	50	***	PAR	N/A

***** NOTE: Use the Object Default Settings command for attributes!**

Table 3.3
Prefixes for original property points

Source of orig. survey data:	Stereoplotter	Field Survey
Segment for field file:	"XO" (Enhanced Original)	"A" (Orig. field file is the only field file)
Prefix to use to store property points :	SVXO (ie: SVXO1-1000)	SVA (ie: SVA1-1000)

If additional or enhanced property survey is needed, then the SDE will provide the surveyor with a point number to start with in gathering the additional/enhanced property survey data. The point number will be a number higher than the last number used in chaining together the original property (ie: 1100). The surveyor will gather the additional/enhanced data and then deliver it to the SDE to process in CAiCE.

Table 3.4
Prefixes for additional/enhanced property points

Source of orig. survey data:	Stereoplotter	Field Survey
Segment for field file:	"XA" (First Enhancement)	"XA" (First Enhancement)
Prefix to use to store property points :	SVXA (ie: SVXA1100-1200)	SVXA (ie: SVXA1100-1200)

This scenario of providing the starting number to the surveyor and then processing the additional/enhanced property survey using the prefix of the segment being processed would continue until all property is processed. By using these guidelines, all doubts about duplicating point numbers needing to go back to the data collector will be removed.

=> **Existing centerlines** will be stored as geometry chains using the ***Geometry=>Geometry Chains=>Store/Edit*** command or using the ***Geometry=>Geometry Chains=>Edit Horizontal Alignment*** command.

All prefixes will be the same as the current segment being processed (SVA, SVXO, SVXA, etc.).

Table 3.5

OBJECT	TYPE	ZONE	PREFIX	FEATURE CODE	ATTRIBUTE
Points	Geometry	50	***	ACL	F
Curves	Geometry	50	***	ACL	N/A
Chains	Geometry	50	***	ACL	N/A

***** NOTE: Use the** Object Default Settings command **for attributes!**

⇒ **Existing R/W chains** will also be stored as Geometry Chains and can be offset from the existing R/W centerline using the command ***Geometry=>Geometry Chains=>Store Offset Parallel Chains.*** Remember, any **curves** will also be offset with the same zone as the chain.

All prefixes will be the same as the current segment being processed (SVA, SVXO, SVXA, etc.).

Make sure that a Zone of 50 is specified when storing all offset chains.

Table 3.6

OBJECT	TYPE	ZONE	PREFIX	FEATURE CODE	ATTRIBUTE
Points	Geometry	50	***	RWE	F
Curves	Geometry	50	***	RWE	N/A
Chains	Geometry	50	***	RWE	N/A

***** NOTE: Use the** Object Default Settings command **for attributes!**

Locate the property points using the ***Geometry=>Points=>Locate Bearing/Distance from Point***, ***Geometry=>Points=>Locate Angle/Distance from Point***, ***Geometry=>Points=>Intersection***, and other commands using the English dimensions. **Make sure that a Zone of 50 is specified when storing all points.**

Chain the points together using the ***Geometry=>Geometry Chains=> Store/Edit*** command. **Make sure that a Zone of 50, the current segment prefix, and feature code *"PAR"* are used when storing all chains.** (See **Table 3.2**)

***** NOTE: Use the** Object Default Settings command **for attributes!**

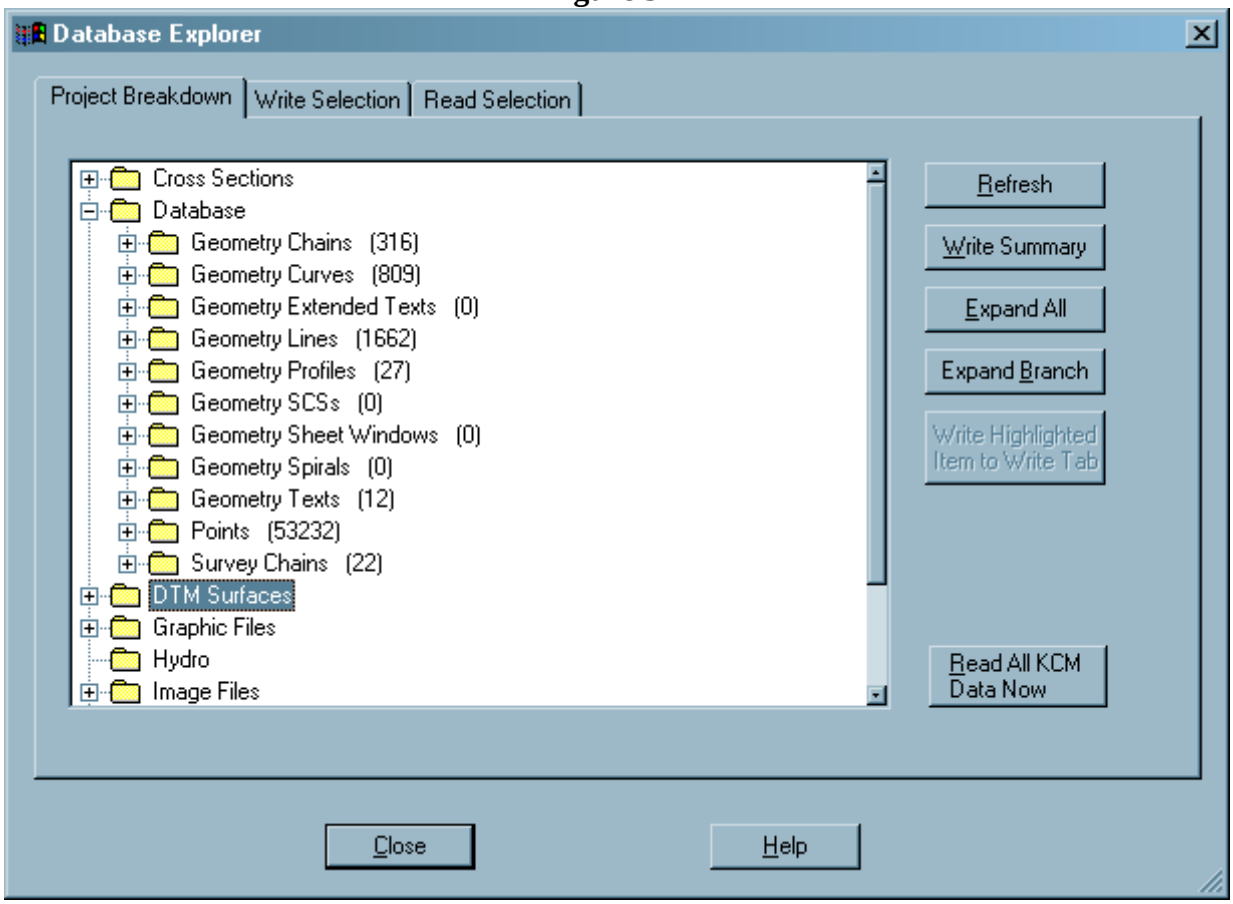
NOTE:
If English units plats or plans were used to store the property, then the project units will need to be converted back to Metric units by using the *Convert Project Units* command again from the *CAiCE Project Management System*. If no English plans or plats were used and no units conversion occurred, this step is not necessary.

NOTE: The correct units Feature Table and Cell File will need to be re-attached after conversion.

3. Write out the KCM files

The KCM file is produced through *Database Explorer*. The KCM file will contain the chains and all elements. The KCM file can also be used to export any type of geometry data out of CAiCE to send to another office. To produce the KCM files, use the ***Tools=>Database Explorer*** command. This command will open the *Database Explorer* dialog shown below (see **Figure 3-7**).

Figure 3-7

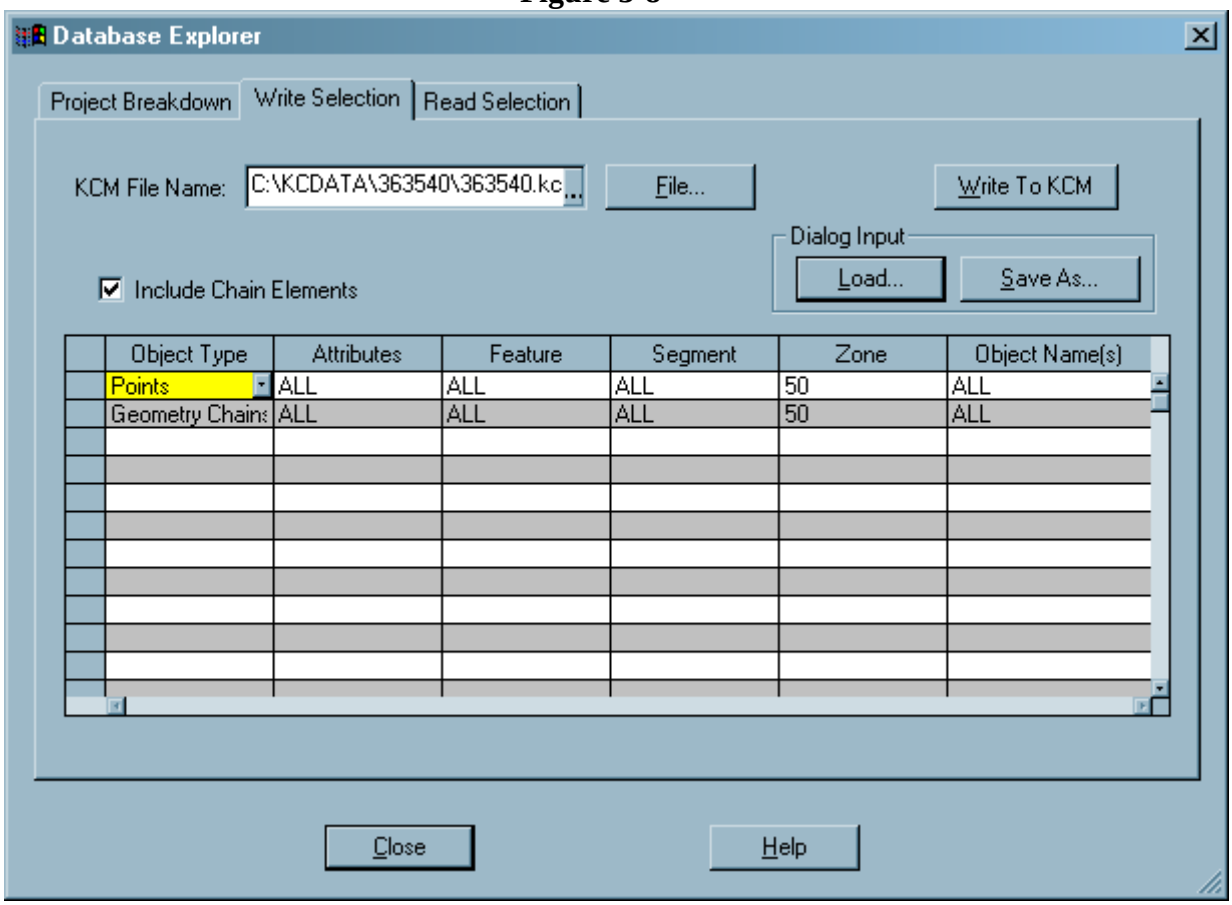


This command can be used to obtain detailed information about all files and objects associated with a project by using the **Project Breakdown** section and expanding the major categories shown above.

NOTE: For the following procedure to work as documented, all property must have been stored in CAiCE using the standard GDOT Property Zone of 50.

To write out the KCM file, click on the **Write Selection** tab to open the dialog shown below (see **Figure 3-8**).

Figure 3-8



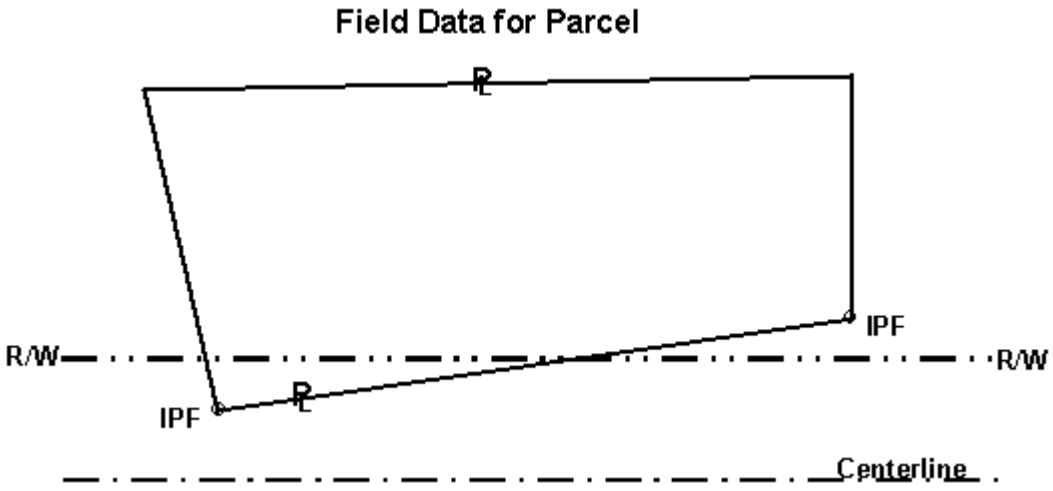
In the Write Selection dialog (See **Figure 3-8**), click on the **Load** button under **Dialog Input**, navigate to the *CAiCE* directory, select the file **WRITEPRP.TXT**, and click on the **Open** button. This will fill in the dialog with the selection criteria for all property data by Zone. The file **WRITEPRP.TXT** is part of the standard downloadable file **CAICEALL.EXE** from the GDOT CAiCE Homepage. Make sure the **Include Chain Elements** option is checked so that the chains and all their elements will be written out at one time. In the **KCM File Name** field, enter a name of *ProjectNamePR.KCM (ie: 123456PR.KCM).*

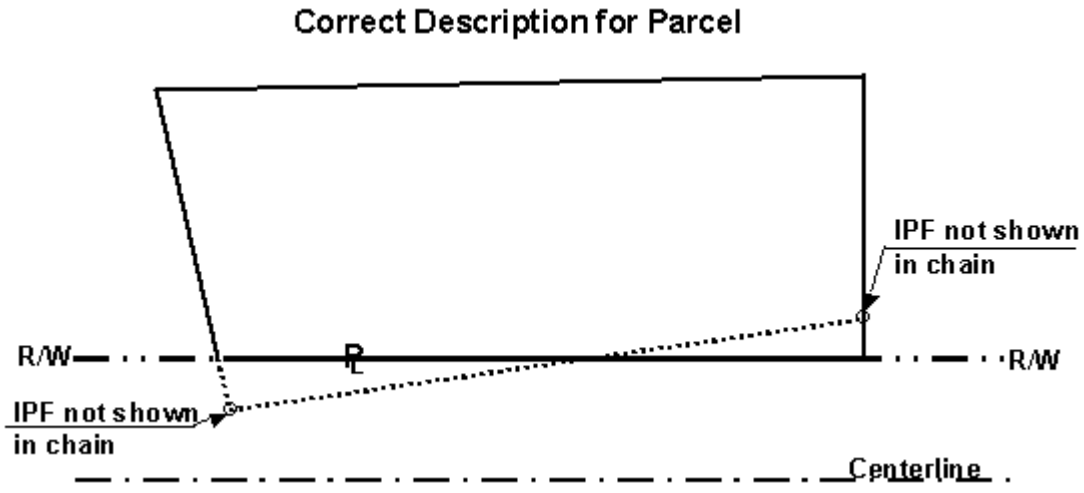
Next, click on the **Write to KCM** button to write the property data to the KCM file and click on the **Close** button to close the dialog. The resulting KCM file will reside in the project directory.

KCM File Naming Scheme:
PI# + PR.KCM (ie: *123456PR.KCM*)

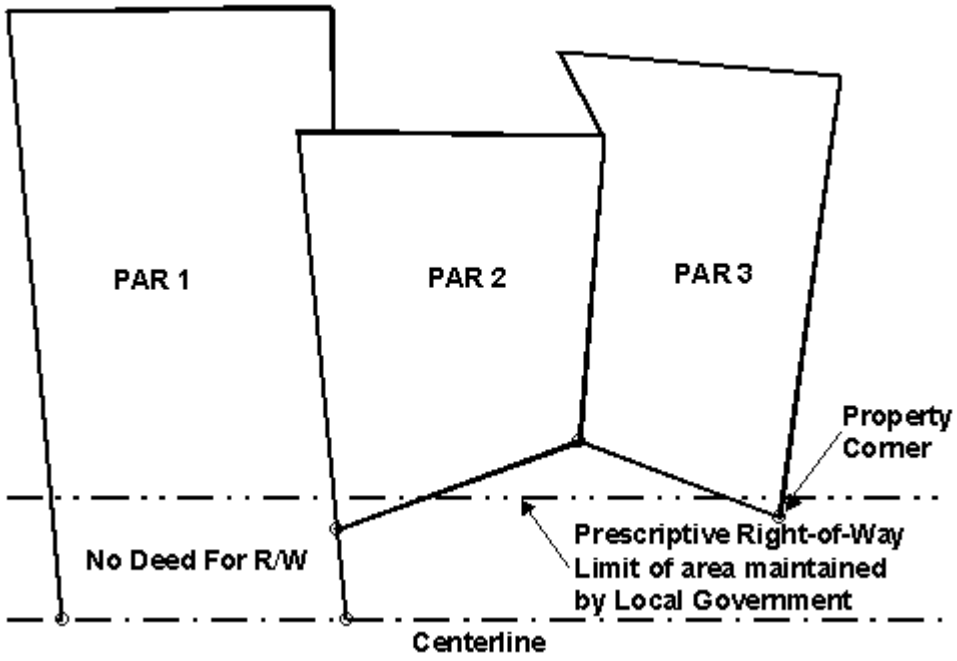
NOTE: The Surveyor is to submit the final and corrected **ASC file** and the property **KCM file** to the SDE.

Attachment "A"
October 1995
Road with Deeded Right-of-Way





Attachment "B"
October 1995
Road without a Deeded Right-of-Way



Revision Summary Page

Date	Description of Revision	Page
1/9/03	Changed the zone from 52 to 50 for the following standard survey feature codes: BCOL, BCTL, BLDL, BLLL, BSL	11
4/14/03	Changed the **Description** for the standard survey feature code RWE to "RIGHT-OF-WAY, EXISTING".	9
	Removed the **Chain Type** "F" and added the **Point Type** "F" for the following standard survey feature codes: RWU, RWE, POEL.	9
	Revised the **FEATURE CODE** column in **Table 3.6** for **Points**, **Curves**, and **Chains** to "RWE".	34
9/26/03	Updated document to correspond with CAiCE VT 10	N/A
3/15/06	Revised the location of the web-page link to download the GDOT Standard Files (CAiCEALL.exe).	14
	Revised the location of the web-page link to download the ASCSRV Installation Program.	17
12/01/12	Updated document to reflect changes in DTM files from LZH to ZIP format.	8