Automated Platting, LLC

Reference Documentation

Prologue

Automated Platting, LLC. would like to thank you for considering us for your residential platting needs. This documentation is presented as a means for you to become better acquainted with us and serves as a comprehensive reference tool which answers the most frequently asked questions regarding our files. Each base file we provide to our clients has similar basic characteristics. This documentation is designed to aid in the recognition and understanding of those items.

The plat information provided by Automated Platting, LLC. is presented in three files: the AutoCAD base file, a text report file and a traverse closure file. The AutoCAD base file contains verified boundary, centerline, right-of-way, lot and tract lines. All linework on these layers is checked for tangency errors, gaps and untrimmed entities, compared to each other for error of closure, and annotated at client specified scales. Additionally, zoning conditions are checked and product blocks placed. The text report file, created with an ".rpt" extension, provides boundary, right-of-way, lot and tract areas, area closure information, lists all non-normal / non-tangent entity intersections (located by the closest lot number) and validates minimum lot areas. The traverse closure file, created with a ".trv" extension, provides traverse closures for the boundary, right-of-way, lots and tracts, including coordinates and latitudes/departures for each course.

We realize that the amount of information presented here and in the files is extensive so we encourage anyone with questions this documentation does not address to contact us. We want to hear from you regarding comments or suggestions you may have regarding our product, the text file or this documentation. Input we receive from our clients strengthens the integrity of the services we provide.

Automated Platting, LLC. would like to thank you for considering our services for your platting needs and look forward to doing business with you.

Our Best Regards,
The Automated Platting Team

Statement of Intent

It is Automated Platting's goal to provide clients with accurate, reliable information and to generate a quality product for each project. Therefore, base files are created with the following in mind:

> ***Mission**: Automated Platting, LLC. strives to produce a base file which brings security for the needs and purposes of both the final plat and the design.*

AP makes a genuine attempt to discover a client's needs and requirements for every job. However it is the client's responsibility to make comments over and above the information requested by our forms. If the form items cannot accurately convey the clients' requests, we strongly urge them to include whatever information they deem necessary, in addition to the completed forms, for the most timely and correct generation of their final plat product.

Table of Contents

Section I : Company Contacts & Operations

Contact Information

Location: Automated Platting
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Fax: 602.231.0099

Web Site: www.automatedplatting.com

Operations

Drawing File Naming Conventions

At Automated Platting, LLC. (AP) each new project is assigned a project number. This number helps us keep track of which file is the most current project drawing, the client for which it was created, the specific parcel or phase, the type of product the file represents and the number of projects that have been completed in any year for a particular client. For example:

ABC010301_P1ACL1.dwg

Although the name appears complex, the parts, once explained, become quite logical and manageable. This sample file name contains the following sections (highlighted):

ABC010301_P1ACL1.dwg

Company name. Because some companies have more than one office, the **01** was incorporated into the job number. For example, company ABC has two offices that do business with AP. For identification purposes, the office with which AP first began doing business becomes ABC01, the second ABC02.

ABC01**0301**_P1ACL1.dwg

Project year and number of jobs completed in that year for that office. The year the project began is first, followed by the project number. In the example, this job is the first (**01**) project done in the year 2003 (**03**) for company ABC01.

ABC010301**_P1A**CL1.dwg

Phase or parcel number. In this example **P1A** denotes Phase 1, Parcel A.

ABC010301_P1A**CL1**.dwg

Plat drawing type and version number. The alpha characters designate the project type, i.e. linework validation (LV, LVP) or complete layout (CL). The numeric characters represent the base file version number. AP generates a new drawing each time a base file is revised. Doing this provides a progressive record of when changes were made, the revisions that were incorporated, and, most importantly, which drawing is the most current.

Operations *(continued)*

Service Contract

It is requested of all clients that they enter into a service agreement with Automated Platting, LLC. The contract primarily consists of an understanding of what is expected legally by both parties (client and Automated Platting, LLC.) and a delineation of the cost of services. Once a contract is signed, it remains in effect until terminated under the conditions stated in the contract. It is not necessary to complete a contract for each project; only one signed contract is required per company.

Project Submission

Project submission to AP requires three steps: selecting a product option, completing the appropriate forms, and providing AP with electronic data files.

Step 1: Selecting a Product Option (CL, LV, LVP)

The choices of product options are based on whether the client relies on AP to create the project layout.

CL – Complete Layout – the **CL** option is for clients who wish AP to generate the complete base layout from a planner's image or CAD file. Once AP commences work on a specified project, turnaround time averages approximately 100 lots per day for a finished job.

LV – Linework Validation – The **LV** option is for clients who submit their completed subdivision layout to AP for linework validation. This option includes validation of all lot areas. Turnaround time for the **LV** option averages 3-4 hours for a 200-400 lot subdivision once AP commences work on the file.

LVP – Linework Validation Plus – The **LVP** option is similar to **LV** with the added feature of providing validation for lot depths and widths according to the zoning criteria supplied to AP. Turnaround time for **LVP** averages 1-2 hours additional to the **LV** option.

Step 2: Completion of Proper Forms

For each product option, AP requires a set minimum amount of information to perform the desired service. To ensure all the necessary information is obtained, AP has created a series of forms specific for each product option. See the "Form Completion" section for details regarding this requirement. Current forms can be downloaded from our web site at automatedplatting.com.

Step 3: Electronic Files

Each project type requires the submission of an electronic file from the client. Products LV and LVP require a drawing file containing the project base file in AutoCAD* or dxf format. Product CL requires an AutoCAD* file containing the project boundary, as well as an image file (.tif, .jpg, etc.) of the desired layout. An example is a scanned image of the conceptual planning layout. If submitting a hardcopy in addition to the electronic files, it must be to scale.

**AP also accepts data via MicroStation V8 dgn format, but cannot convert the generated return base file into MicroStation.*

NOTE: AP does not accept submission of information via preliminary plat data or governmental subdivision design standards in lieu of completing AP product option forms.

Limits of Services

AP provides annotation, closure and geometric information for the boundary linework, and for all linework that lies within that boundary only. AP does not address any linework or monumentation that lies outside of the plat boundary. Furthermore, Automated Platting, LLC. does not research project information, either on or offsite, and relies exclusively on the client to provide all pertinent project data.

Form completion

Automated Platting, LLC. requires specific project information in order to serve our clients. The most efficient means of collection has been utilizing a series of forms. These forms need to be completed for each project prior to submitting to AP. Each product option has a complete set of forms that are required by AP which include the minimum criteria AP requires to complete each of the work options. Current forms can be downloaded from our web site at automatedplatting.com. A list of the forms for each type of project is given below. Please direct any questions regarding the completion of these forms to Automated Platting, LLC.

Form Name	Form Title
LV	Itemization of Client and Zoning Requirements
LVFD	Itemization of Final Draft Requirements
LVP	Itemization of Client and Zoning Requirements plus lot width/depth minimums
LVPFD	Itemization of Final Draft Requirements
CL1	Itemization of Client and Zoning Requirements
CL2	Lot Layout Specifications
CL3	Roadway, Tract, and Easement Layout Specifications
CL4	Graphical Itemization of Street Layout Requirements
CLFD	Itemization of Final Draft Requirements
CLRev	Complete Layout – Revision Itemization

Section II : Services & Costs

Services & Costs

Automated Platting, LLC. offers several levels of final plat production services, ranging from complete layout to final draft quality base files. Each of these services is covered in our client contract, but has been listed here for quick reference.

Product	Description	Cost	Minimum
CL	Complete Layout for Final Plat Base File	$20 / Lot	$500
LV	Linework Validation - Closures and Annotation using Client-provided linework	$10 / Lot	$250
LVP	LV Plus lot width and depth validation	$13 / Lot	$300
	Validate Parallel Sideyard Setbacks on LVP	$1 / Lot	
FD	Final Draft – AP validated linework only	$5 / Lot	$200
	Label building setback linework on FD	FD+$1.50 /Lot	- *n/a* -
	Label complex easements (NAOS, etc.) on FD	FD+$1-$2 /Lot	- *n/a* -
	Miscellaneous Consulting Services	$65 / hour	- *n/a* -

Expanded Descriptions

CL - Complete Layout for Final Plat Base File

$20.00 for each lot and tract, but not less than $500.00, to be performed pursuant to **Form Set CL.** Includes mathematically validated boundary, centerline, r/w and lotline linework, including annotation sets, but excluding Final Draft items.

LV – Linework Validation – Produce Final Plat Closures and Annotation using Client-Supplied Linework

$10.00 for each lot and tract, but not less than $250.00, to be performed pursuant to **Form Set LV**. Includes mathematically validated boundary, centerline, r/w and lotline linework, including annotation sets, but excluding Final Draft items.

LVP – LV Plus Lot Width and Depth Validation

$13.00 for each lot and tract, but not less than $300.00, to be performed pursuant to **Form Set LVP.** Includes mathematically validated boundary, centerline, r/w and lotline linework, including annotation sets, but excluding Final Draft items.

FD – Final Draft – AP Validated Linework Only

$5.00 for each lot and tract, but not less than $200.00, to be performed pursuant to **Form CLFD, LVFD or LVPFD.** Finalize Final Plat base file for sheet production. Includes sight visibility easements, P.U.E.'s, V.N.A.E.'s , tract and street dimensions, and 'polishing' the appearance of all final plat annotation. Additional fees for extensive or specific labeling requirements are included in the above table.

Miscellaneous Consulting Services

Miscellaneous consulting services and base file linework updates shall be at the time and materials rate of $65.00 per hour.

Additional Fees

Revisions Fees

Revisions to "CL1" files resulting from interpretive changes to the original concept are not charged as an extra fee, and are considered part of our commitment to producing a quality product. Once the file has been accepted as satisfactory by the client, subsequent revisions will be done on a time and materials (T&M) basis for minor changes. Examples of minor changes include adding and dropping lots, shortening or lengthening cul-de-sacs, adjusting tract widths, etc.

Changes which constitute a large conceptual change to a portion of the project will incur a fee of 50% of the initial layout fee on a per lot basis for the affected lots and tracts. Examples of conceptual changes are significant changes to the street patterns or a change in the lot zoning which affects lot depths and/or widths.

Automated Platting, LLC. understands that changes are inevitable and we strive to address them efficiently and error free. These revisions fees are intended to be fair and understandable. It is our intent not to bear a burden on our resources due to large changes, while not being punitive with our fees. We welcome feedback on this issue.

Expedited Work Fees

Automated Platting, LLC. strives to maintain a focus on the lives and wellbeing of its employees. AP is also aware that occasionally project requirements demand a constricted and accelerated production time that dictates the need for extra effort of all involved. Therefore, at the discretion of AP (regarding workload and being able to maintain a quality product), clients may request an expedited schedule. Expedited infers working the necessary hours, nights, and/or weekends for AP to complete the final plat product by the scheduled deadline.

Such accelerated timelines are available at a cost of twice the normal fees. For example, complete layout projects would be billed at $40/lot instead of $20. The acceptance of an expedited project is at the discretion of Automated Platting, LLC., and depends on the personnel needed to accomplish the job being available, and whether AP's existing in-house workload can be reorganized to accommodate the request. Although these restrictions may seem rigid, AP does not wish to jeopardize the quality or integrity of its final products for any client. AP prefers to be honest regarding its capabilities to complete an expedited task, rather than generating a substandard product.

Final Draft Option

The final draft service is optional for each project. Automated Platting, LLC. suggests that the final draft service be requested only when the design is underway and there are no changes remaining that will affect plat information. The reason for this is twofold:

Turnaround Times

First, unlike most of AP's services, the final draft is a manual drafting intensive procedure. Therefore, AP requires a five (5) day notice for completion of the final draft product. More advance notice is suggested for complex or large area jobs.

Regeneration of Plat Information

The second reason is AP's automation process. Changes to the design that alter the geometry in any way requires AP to rerun its annotation and validation software to maintain file integrity. This rerun erases and re-creates all existing annotation to ensure that the linework is properly labeled. This re-creation process eliminates all annotation that had been moved or rotated for aesthetic reasons, and requires AP to completely redo the final draft process.

Section III : Product Details

Final Plat Product File Features

- Closed Polylines for all significant figures created from parent/child entity types:

  - ✓ **Boundary Closures**
  - ✓ **Centerline Closures**
  - ✓ **Right-of-Way Closures**
  - ✓ **Block Closures**
  - ✓ **Lot Closures**
  - ✓ **Tract Closures**

- Automated Parent/Child (whole and broken) Entities provided for Design File usage

  - ✓ Parent Entities include all Boundary, ROW, Lot and Centerline entities
  - ✓ All parent entities are computer maximized for their greatest whole expression
  - ✓ All child entities are automatically replicated and generated from their parent entities as 'broken' entities for the logical expression of all subfigures such as lots and tracts within ROW boundaries.
  - ✓ The same combination of parent/child entities which create all polyline closures are used to generate all annotation for 'error-free' continuity.

- Product Validation according to Zoning Criteria

  - ✓ Graphic display of Zoning Window
  - ✓ Multiple Zoning definitions
  - ✓ Multiple Side yard setbacks shown within Zoning Window
  - ✓ Front and Rear setback lines provided in the drawing
  - ✓ Closed polylines generated from front and rear setbacks for each lot
  - ✓ All Lot Restrictions dimensioned
  - ✓ Corner lot definitions highlighted

- Automated Graphic and ASCII Drawing Validation for CAD Errors

  - ✓ End Point Gaps and Untrimmed/Unextended Entities
  - ✓ Non-tangent Arcs
  - ✓ Perpendicular and Radial Lines
  - ✓ Parallel and Concentric ROW Lines

- Annotation Features

  - ✓ Multiple scale options from the same parent/child entities within the same centralized file
  - ✓ All annotation groups formatted with multiple layer control options
  - ✓ Monumentation and tic marks grouped by scale to each annotation set
  - ✓ Sheet specific line and curve table recreation software provided with basefiles

- Automated ASCII Closure Report File

  - ✓ All subfigure areas tabulated and closed to their parent figure areas
  - ✓ All non-conforming geometrical conditions grouped according to figure headings

Layer Names

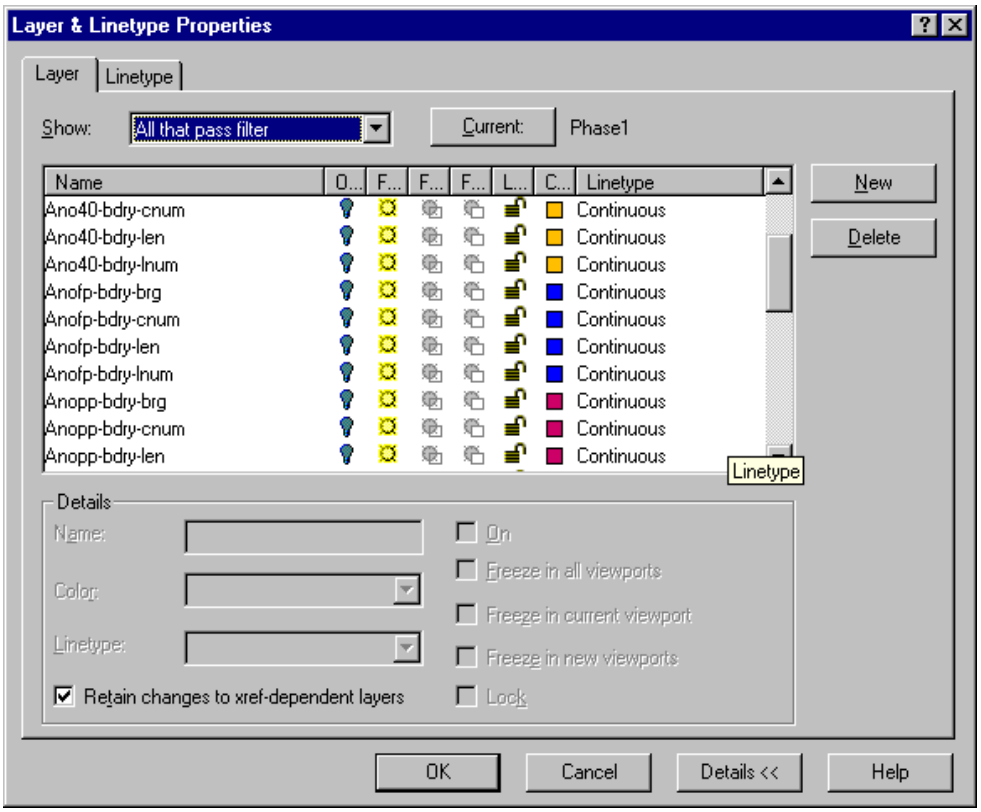
The primary linework layers are **BDRY**, **CL**, **ROW** and **LOTLINES**, or boundary, centerline, right-of-way, and lot lines, respectively, and will not be discussed further in this section. However, products returned to the client contain numerous layers, most of which are development layers for Automated Platting, LLC. Without dissecting the entire layer list, the following table should explain the layer names our clients will find most helpful. Some clients choose to block out all of Automated Platting's working layers in order to reduce the overall size of their project basefile. This can easily be done by using layer isolation via the "ap-*" wildcard statement.

LAYER NAME	DESCRIPTION
Ano*xx-xxxx*	All annotation is provided on layers beginning with the "Ano" prefix. They are separated by scale to enable quicker manipulation by the user (e.g. final plat annotation layers are "Ano**fp**-xxx", preliminary plat annotation layers are "Ano**pp**-xxx", and 40-scale annotation layers are "Ano**40**-xxx").
Ap-areabdry	Overall boundary area
Ap-areablk	Block areas – areas bounded by combinations of right-of-way and boundary linework, and which encompass the smaller lot and tract figures
Ap-areacl	Areas formed by closing the centerlines to the boundary
Ap-arearw	Areas of streets within limits of right-of-way lines
Ap-arealot	Lot area text in square feet and acres
Ap-comments	Automated Platting comments directed to the client – usually identification of problem areas or areas requiring client attention
Ap-geo	Simply put, these are the orange squares with a "T" or "N" in them. These blocks indicate non-normal (N) or non-tangent (T) activity at the endpoint of the line where they appear. They coincide with the non-normal/non-tangent itemization listed in the report file. This information can also be viewed by editing attributes for the orange blocks within AutoCAD.
Ap-no_fit	Linework generated comparing files that reflect changes to new files
Ap-polyblk	Block polyline formed by combinations of right-of-way and boundary linework, and which encompasses the smaller lot and tract figures
Ap-polyrw	Polyline forming interior right-of-way linework
Ap-polycl	Polyline forming closed centerline area
Ap-polybdry	Overall boundary polyline
Ap-polylot	Polyline from which the lot area was calculated. Tract polylines are also located here for use in such design applications as basin design.
Ap-polysetbk	Polyline for area bounded by building setback lines and side lot lines
Ap-prod*x*	Layer(s) for each specific product block. Each product block displays its zoning type and all minimum setbacks, widths, and depths that were used to generate it.
Ap-restrictions	Dimensions for locations where product blocks are restricted by lot, setback or easement lines.
Ap-rw_width	Displays ROW distance from centerline, and displays "*_* VARIES *_*" where ROW linework is not parallel or concentric with the centerline
Ap-xxx**-bkn**	AP child entities which have been automatically replicated and generated from their parent entities as "broken" at meaningful junctures
Ap-xxx**nam**	Applicable Automated Platting naming conventions for polyline figures such as blocks, centerlines, or streets
Ap-*xxxxx*	Automated Platting working layers. With the few exceptions listed here, most clients will have little used for these layers.

Annotation

Layer(s) involved: **Ano*xx-xxx***

All annotation in the base file is optionally generated using multiple scales depending on the client's needs. Annotation for preliminary plats, final plats and improvement plans each require separate scales, usually 100, 50, and 20 or 40 scales, respectively. The annotation is generated at the text height size based on each scale required, and placed on layers that can be isolated based on those scales. Preliminary plat annotation appears on layers designated as "Ano**pp**-*xxx*". Final plat annotation is placed on layers designated as "Ano**fp**-*xxx*". For improvement plans, the "fp" is replaced by "20" for 20-scale annotation, and "40" for 40-scale annotation. Therefore, annotation groupings can easily be isolated via the wildcard statements of *fp*, *pp*, or *40*, etc. An example of some of the annotation layers is shown in the image below.



The annotation is created with bearings and distances on separate layers, allowing the client the option of turning bearings on or off independently, without having to resort to the tedium of erasing all the bearings from drawings that require only distances. All annotation is generated in layered groupings, which afford the client multiple options with regard to controlling the annotation displayed. These options include combinations which are categorized by bearing, length, line number, curve number, leader arrows, overall vs. sub-data information, boundary, centerline, right-of-way, lots, and lot fronts. These annotation groupings are separate within each annotation scale or theme.

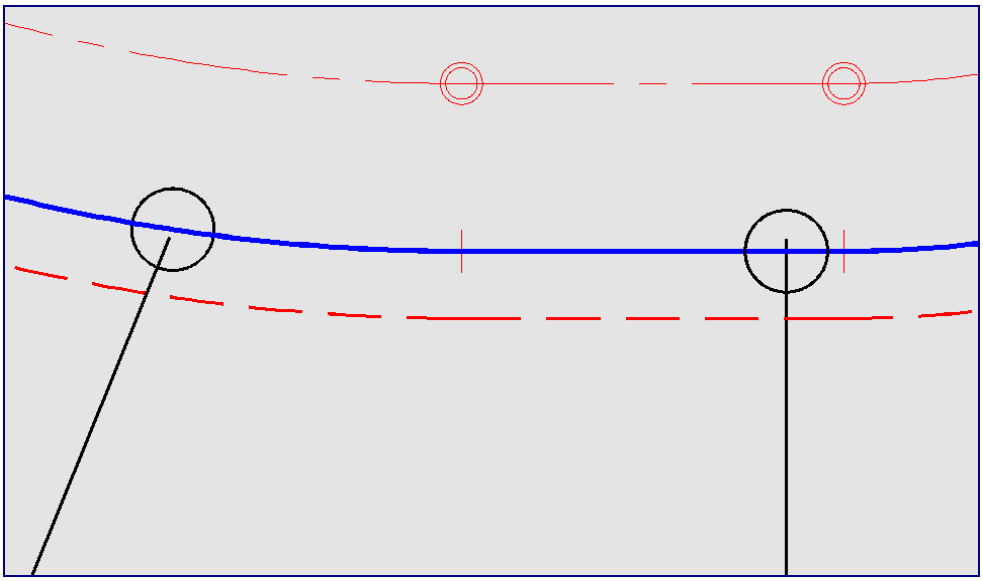
Linework Validation

Layer(s) involved: **bdry, cl, row, lotlines, ap-mark_gap**

When Automated Platting, LLC. is asked to validate client-supplied linework, AP computer-analyzes all linework for untrimmed and unextended entities, or endpoint gap errors, in order to facilitate necessary closed polyline figures. These are the only changes AP performs on client-supplied files as part of its validation service. These changes are documented to the client via the "ap-no_fit" layer.

When asked to perform full final plat linework layout and design, Automated Platting, LLC. provides the validation service as a procedural default when generating the linework.

AP's software analyzes the intersections and endpoints of all lines and arcs, searching for discrepancies based on in-house defined tolerances.



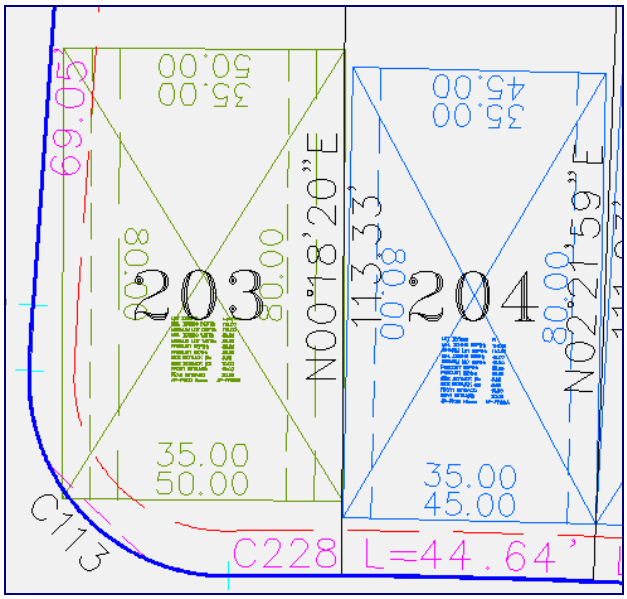
Unextended Entity **Untrimmed Entity**

Zoning Validation and Restrictions

Layer(s) involved: **ap-prod*x*, ap-restrictions**

Lotting performed by Automated Platting, LLC., is done using "smart product blocks", which are generated from information provided by the client in the CL or LVP Form Sets.

These blocks are created using the listed front, rear, and side yard setback requirements, lot depths and widths, and product depth and width considerations, as designated by the client per each type of zoning.



Product Blocks
Figure PB1

Each lot is created based on this zoning criteria. The product blocks (Fig. PB1) are then inserted into the drawing on layers "**ap-prod*x***", with each product block displaying the attributes used in its creation. Note also the different linetype sets in the product block for lot **203** in Figure **PB1**. Each matching pair of lines represents the side yard restrictions where the side yard requirements are not equal. For example, some corner lots are required to have an additional 5' bonus on width. This is reflected in both the graphic and text portions of the product block. See Figure **PB1** for the graphical representation and Figures **PB2a** and **PB2b** for text examples.

LOT ZONING:	r_corner
MIN. ZONING DEPTH:	110.00
MINIMUM LOT DEPTH:	110.00
MIN. ZONING WIDTH:	50.00
MINIMUM LOT WIDTH:	50.00
PRODUCT DEPTH:	80.00
PRODUCT WIDTH:	35.00
SIDE SETBACK #1:	5.00
SIDE SETBACK #2:	10.00
FRONT SETBACK:	10.00
REAR SETBACK:	20.00
AP-PROD Name:	AP-PRODB

Figure PB2a
Block with Different Size Side Setbacks

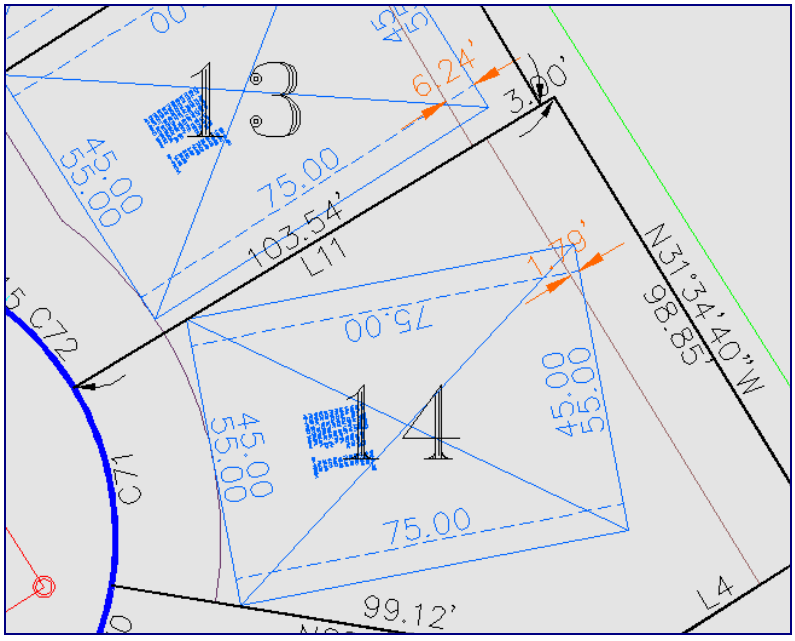
LOT ZONING:	R
MIN. ZONING DEPTH:	110.00
MINIMUM LOT DEPTH:	110.00
MIN. ZONING WIDTH:	45.00
MINIMUM LOT WIDTH:	45.00
PRODUCT DEPTH:	80.00
PRODUCT WIDTH:	35.00
SIDE SETBACK #1:	5.00
SIDE SETBACK #2:	5.00
FRONT SETBACK:	10.00
REAR SETBACK:	20.00
AP-PROD Name:	AP-PRODA

Figure PB2b
Block with Same Size Side Setbacks

Zoning Validation and Restrictions *(continued)*

Layer(s) involved: **ap-prodx, ap-restrictions**

Automated Platting, LLC. uses the product blocks to locate areas that may restrict the placement of a client product. These restrictions inform the client that, at minimum lot placement criteria, a particular product block encroaches either on a setback line, easement, etc., and requires special attention (Fig. Zone 3). In this particular example, the product block placement in lot 14, while set flush at the front setback line, encroaches on the rear setback line by 1.79', due to the right-of-way knuckle. This area is then dimensioned for client notification on the "ap-restrictions" layer.



Lot Restriction - Figure Zone 3

Restrictions are only dimensioned if the block they reference encroaches outside the limitations of the setback lines, denoted in the product block by the dashed lines. If the encroachment were to fall inside the setback lines, the lot is invalid and further design is required. Such encroachment usually occurs around knuckles or cul-de-sacs, where the front setback is pushed into the lot by the right-of-way bulge. Note lot 13 also shows a 6.24' restriction caused by the same knuckle.

Zoning Validation and Restrictions – Parallel Sideyard Setbacks

Layer(s) involved: **ap-prodx, ap-restrictions**

By default Automated Platting creates and validates lot widths based on minimum zoning criteria. In the following examples we are using a radial lot on a 50' cul-de-sac with a 10' front setback. This example was chosen to exaggerate the effect of parallel side yard setbacks on radial lots and uses lots on the convex side of a curve. Similar results are produced at the rear setback when lots are placed on the concave side of a curve. In Figure **PSB1** you can see that the lot has the 45' minimum width required by zoning. However, when the side yard setbacks are offset a 0.32' restriction is revealed in the front corners of the 35' building envelope. Ordinarily this is not a problem because builders seldom have a product utilizing full building envelope width at the minimum setbacks. A typical product example is illustrated below in Figure **PSB2**. In this example shifting the product to the right 0.34' enabled the elimination of any restrictions.

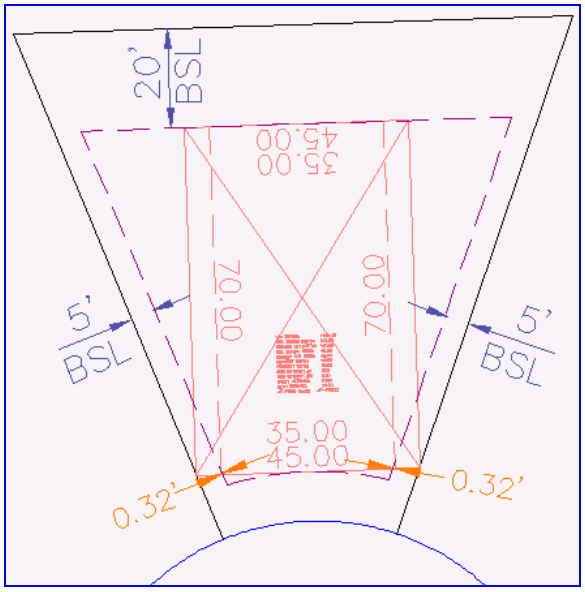


Figure PSB1
Parallel Sideyard Setbacks on Standard Radial Lot

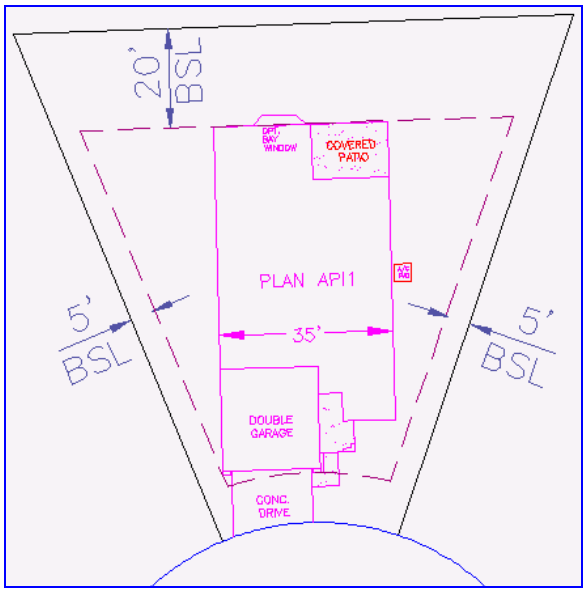


Figure PSB2
35' Product Unaffected by Side Yard Setbacks

Figure **PSB3** shows a product utilizing the full 35' building envelope at the minimum front setback line resulting in two 0.32' restrictions.

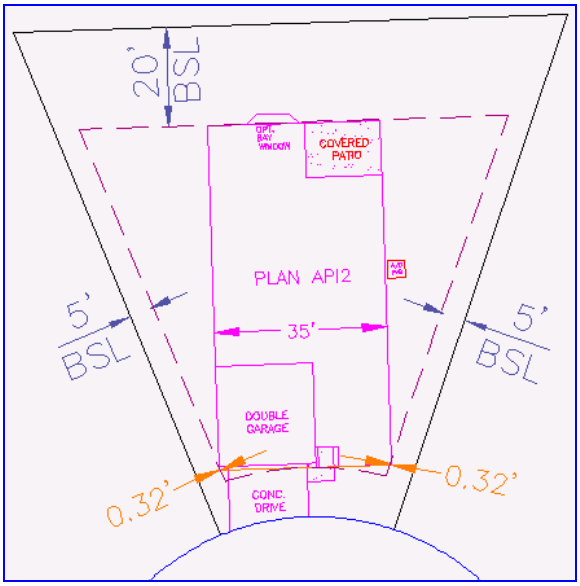


Figure PSB3
35' Product Affected by Side Yard Setbacks

Zoning Validation and Restrictions – Parallel Sideyard Setbacks

(continued)

Layer(s) involved: **ap-prod*x*, ap-restrictions**

In situations where it is known that a builder will be utilizing full width of the building envelope at the setback line, Automated Platting has the ability to automatically calculate the additional width necessary to eliminate parallel sideyard setback restrictions. This feature is applicable only to Complete Layout projects, Linework Validation Plus projects will require that sideyard setback linework be added, which can then be automatically validated by Automated Platting or manually checked against the product blocks by the client. Due to the extra effort involved in adding side yard setbacks to all lots in a LVP project there is an additional charge for this service (See Services and Costs index). Figure **PSB4** shows the product set into a lot that was calculated with the additional width required in order to eliminate parallel side yard restrictions at the minimum front setback. Figure **PSB5** shows the builder's product from Figure **PSB3** fit into the widened lot without any restrictions.

It is important to remember that the affect of this restriction is only at the minimum setback line and will vary by centerline radius and setback. The greater your centerline radius and setback the less a product will be affected. As an example, our sample 45' product on a 750' radius centerline and 20' front setback would have a 0.002' restriction at the front setback line on the convex side of the right-of-way or a 0.003' restriction at the rear setback when placed on the concave side of the right-of-way. When selecting parallel side yard setbacks on the CL2 or LVP form it is important to remain conscience about the increase in block lengths associated with parallel side yard setbacks and how that may effect lot yield.

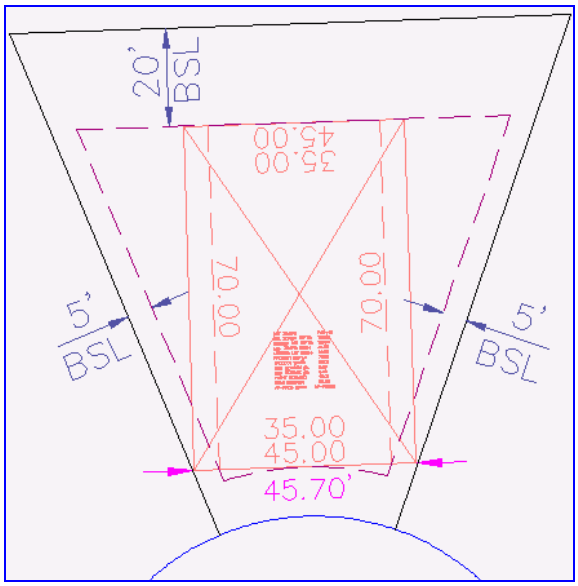


Figure PSB4
35' Product Using Parallel Side Yard Setbacks

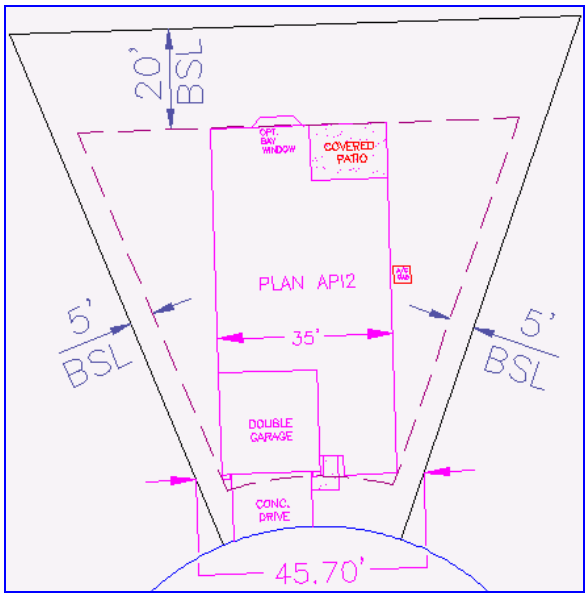


Figure PSB5
35' Product Using Parallel Side Yard Setbacks

Zoning Validation and Restrictions – Restricting Knuckle Lots

Layer(s) involved: **ap-prod*x*, ap-restrictions**

Ideally, the choice of whether or not to restrict lots located around knuckles should take place during the conceptual design in order to compensate for the extra block depth required when not restricting knuckle lots. If the planner has not accounted for the additional depth in the design, and you choose to not restrict knuckle lots, the potential is to lose lots if sufficient open space does not exist to absorb the additional depth. In Figure **KN1** you can see that lot 48 was created at the minimum depth of 115', leaving lot 49 with a 5' restriction in the rear and reducing the building envelope depth from 77' to 72'. By contrast, you will notice that in Figure **KN2** lot 48 has an addition 5' of depth in order to allow for full depth of lot 49, which is positioned on a knuckle. Complete Layout form CL4 allows you to select whether blocks containing knuckles are created with additional depth in order to not restrict lot rears around knuckles.

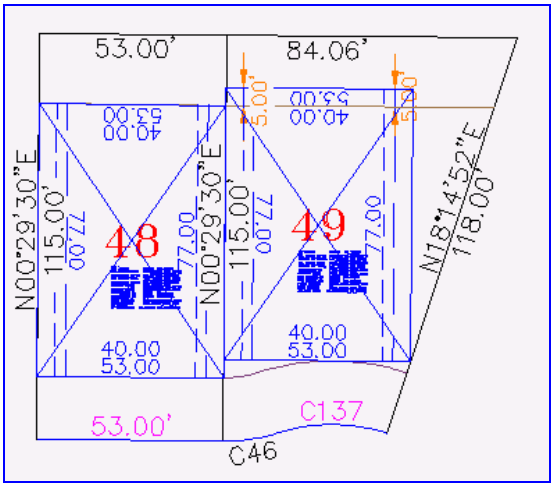


Figure KN1
Restricting Knuckle Lots

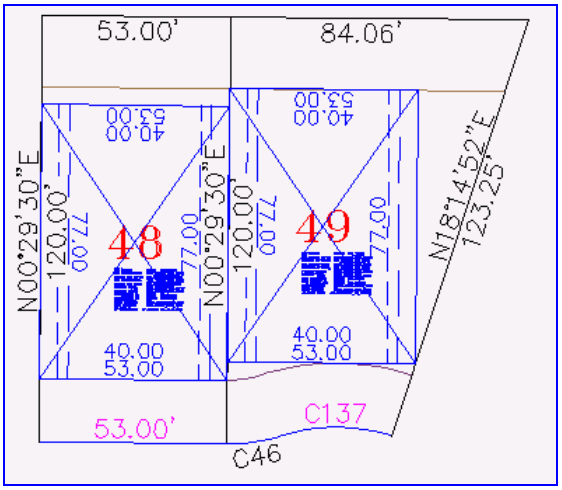
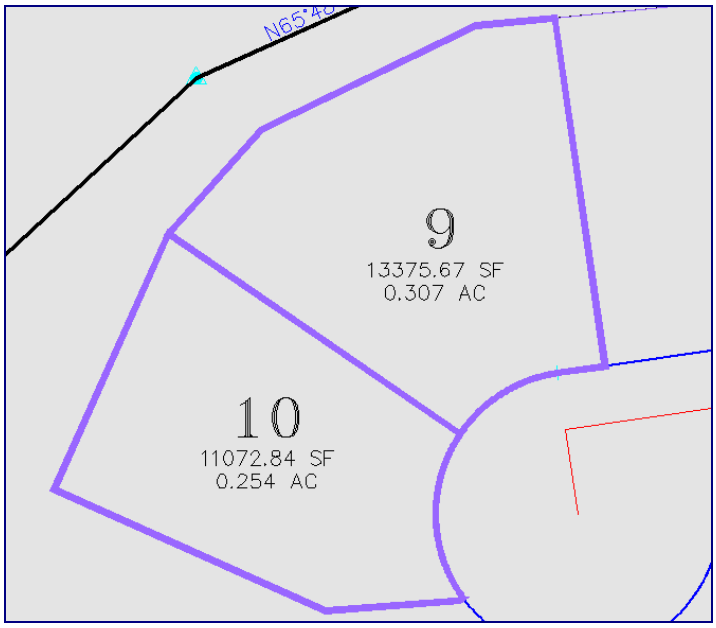


Figure KN2
Not Restricting Knuckle Lots

Lot Area Validation

Lot Area Generation and Tabulation

Layer(s) involved*: ap-area*xxx*, ap-poly*xxx



Lot areas are generated from polylines

During the annotation/verification process, a closed polyline is created for every lot, tract, block figure, right-of-way figure, centerline figure and the boundary. Each of these closed areas is then tabulated in a report format and given to the client in a text document. The areas are also placed in the drawing for verification and future use by the client. The area polylines are created on layers "ap-poly*xxx*", where the "xxx" designates the area type (lot, blk, rw, cl, bdry) while the area text is placed on layer "ap-area*xxx*".

In conjunction with this information, the areas are also used to validate overall boundary closure integrity, and are tabulated in the report file sent with every base file. An example of how the lot areas are displayed is shown in the figure at left.

In addition, tract areas are tabulated in the report file as part of the boundary verification system, and are listed in a similar fashion as the lots, totaled against the actual block area/polyline. The total lot area and the total block closure are then subtracted to achieve the area error of closure for that block. Below is an example of the lot and tract area listing from an actual report file.

```
LOT AREA TABULATION REPORT
            LOT AREA IN SQUARE FEET FOR BLOCK B
_____________________________________________________________
...

   LOT 55   ..... 6393.75
   LOT 56   ..... 6311.25
   LOT 57   ..... 6393.79
   LOT 58   ..... 6318.11
   LOT 59   ..... 8099.02
   TRACT B  ..... 7945.21

        ..... 94891.95  TOTAL LOT AREA

        ..... 94891.95  BLOCK CLOSURE AREA

..... .00  ERROR of CLOSURE
```

NOTE: Area tabulations are currently stored to a square foot precision of 0.01'. Therefore, typical errors of closure of 0.03 or –0.01 are round-off errors.

Lot Area Validation *(continued)*

Lot Area Deficiency Identification

Layer(s) involved: ap-area*xxx*, ap-poly*xxx*

As stated earlier, each lot is automatically bounded with a polyline to determine its area. During the annotation process, AP's software verifies all lot polyline areas against the minimum area required for each lot.

If a lot area falls short of the minimum required, AP's software generates a block indicating the actual area of the lot, along with the minimum area required for that lot. It encloses this information with a large red "stop sign" for quick location. (see **Figure LAV1**).

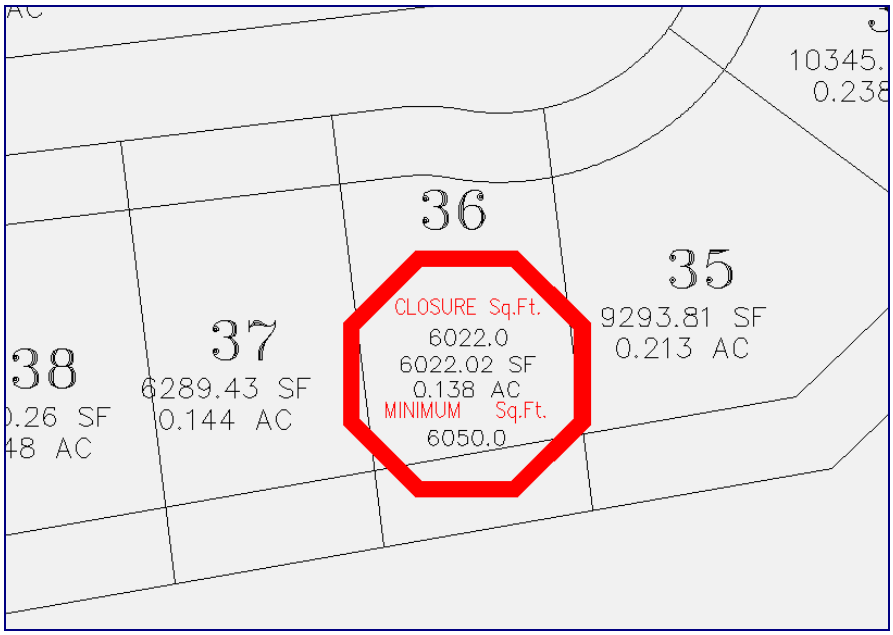


Figure LAV1

For the CL (complete layout) project selection, AP fixes all instances of these area deficiencies before continuing with the project. For the LV and LVP options, the file is returned to the client with the deficient area locators in the file. These areas are also identifiable in the report file. Below the section of the report listing lot areas, there is another section for lots with deficient area. The lot numbers that are tagged with the "stop sign" are listed in the report file under this section. The section below (**Figure LAV2**) is a portion of the report file for the project containing the lots in **Figure LAV1**. The report file shows the minimum area settings required for each lot, the total number of lots with that area requirement, and the lots in that group that are deficient in area.

```
…
MINIMUM AREA SETTINGS:

    LOT NUMBER GROUP     MINIMUM SQ. FT.

       1     THRU   117                  6050

LOTS WITH DEFICIENT AREA:

    LOT NUMBER    CLOSURE AREA     MINIMUM SQ. FT.

          36              6022.0              6050.0

          40              6037.5              6050.0
…
```

Figure LAV2

Geometric Discrepancies

(aka … the "Orange Squares")
Layer involved: **ap-geo**

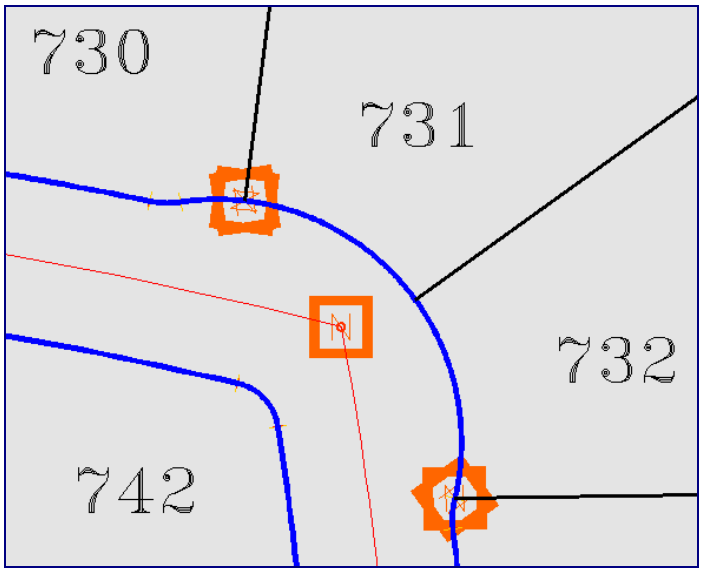


Figure GD1

In establishing closures and areas for lots, rights-of-way and tracts, AP also checks the geometric construction layout of all line work according to the following relationships: lot lines to rights-of-way, centerlines to centerlines and boundary lines, and rights-of-way to rights-of-way and boundary lines. The linework is checked for discrepancies that could give false closure information, non-tangent occurrences, and non-normal angular intersections. "Normal" is simply defined as radial or perpendicular intersections. These angular occurrences may or may not be appropriate to client intent or purposes, but AP identifies any non-tangent or non-normal occurrence in both the drawing and the report file as a procedural default. In the drawing, an orange square with either a "T" or an "N" inside is placed at the endpoint of the entities causing the anomaly (Fig. GD1). In the text file, it lists the angle in question, as well as identifying the nearest lot number for easy identification (Fig. GD2).

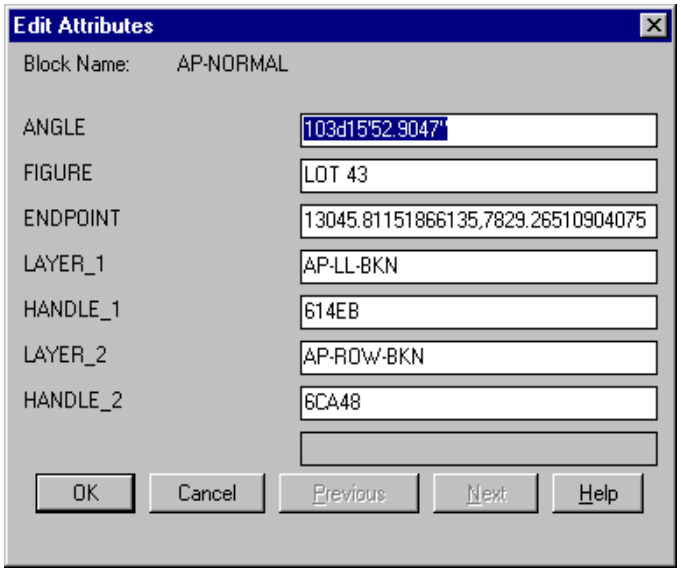
…
CENTERLINE NON-NORMAL GEOMETRICAL OCCURRENCES

ANGLE	NEAREST LOT #	FIGURE	COORDINATE
244d32'34.1997"	731	CL1	57666.92 , 7536.30

…

Figure GD2

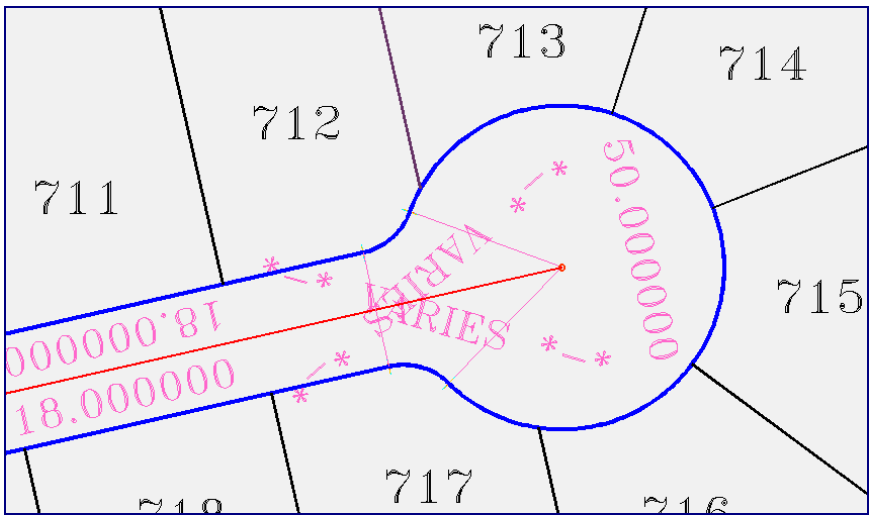
The orange squares also house attributes that match the information provided in the report file. This makes it easier for the client to view the angles in question without having to search in a report file for something being displayed in AutoCAD. The block attributes display a dialogue box, like the one shown below.



ROW Width Validation

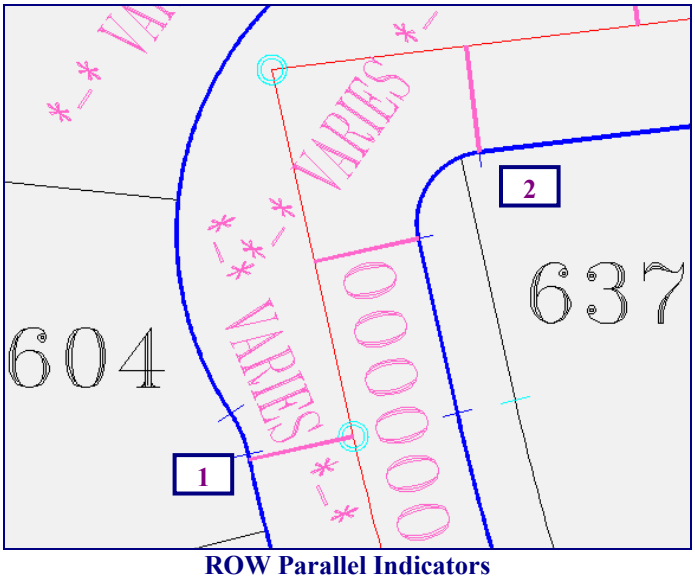
Layer involved: **ap-rw_width**

All right-of-way lines are compared to the centerline to ensure they are concentric or parallel. This comparison is documented in the drawing by displaying the actual right-of-way distance from centerline on layer **ap-rw_width** in large magenta letters. Any deviation from this requires additional annotation for the ROW, labeling the deviating bearing and distance, and a change in the ROW labeling that occurs throughout the project by AP. If a part of the right-of-way is non-parallel, the label changes to a "***_* VARIES *_***" text. These labels run parallel to the entities they are describing. See Fig. ROW1. These areas are usually returns, knuckles, or cul-de-sac bulbs, but can also occur elsewhere legitimately, such as tapers or turn lanes.



ROW Distance Labels
Figure ROW1

AP software analyzes all ROW lines for conditions on non-normal terminus with respect to the centerline terminus. If the ROW line extends beyond the centerline, AP draws a line from the centerline end point to a perpendicular or radial point along the ROW line (see Figure ROW2, item 1). For instances where the ROW line terminates before the end of the centerline, AP draws a line from the ROW end point to a perpendicular or radial point along the centerline (see Figure ROW2, item 2). These lines also allow for identifying questionable design layouts. Item 2 reflects situations that are typically valid. Item 1 indicates a condition that is invalid and reflects a need for linework correction. This software function does not consider ROW lines that are not parallel or concentric to centerlines.



ROW Parallel Indicators
Figure ROW2

ROW Width Validation *(continued)*

Layer involved: **ap-rw_width**

The ROW "***-* VARIES *-***" label is helpful in indicating problems in a street layout.

In figure RWV1, the ROW labeled L38 is not parallel with the centerline, and is not the required 25' width. AP software labels the ROW width as "***-* VARIES *-***", which could indicate a layout discrepancy.

AP corrects these errors on the complete layout (CL) option, but returns the drawing file "as is" to the client with these labels as shown for the LV and LVP options.

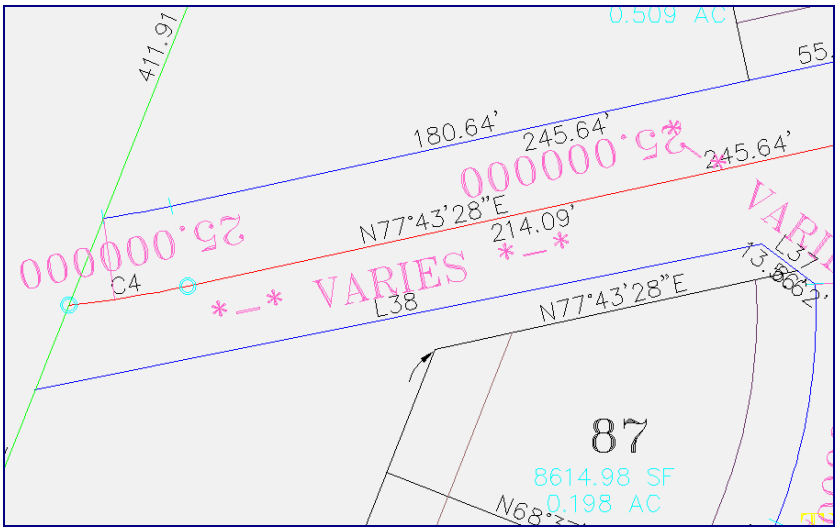


Figure RWV1

This error can be verified either by checking various points along the ROW and checking their perpendicularity with the centerline, or by checking the attributes of the line label L38 (see figure RWV2). From the attribute box, it is apparent that the bearings clearly do not match, further showing that the lines are not parallel. This "***-* VARIES *-***" label also reflects the fact that the curve in the centerline (label C4) is not reflected in the lower ROW line.

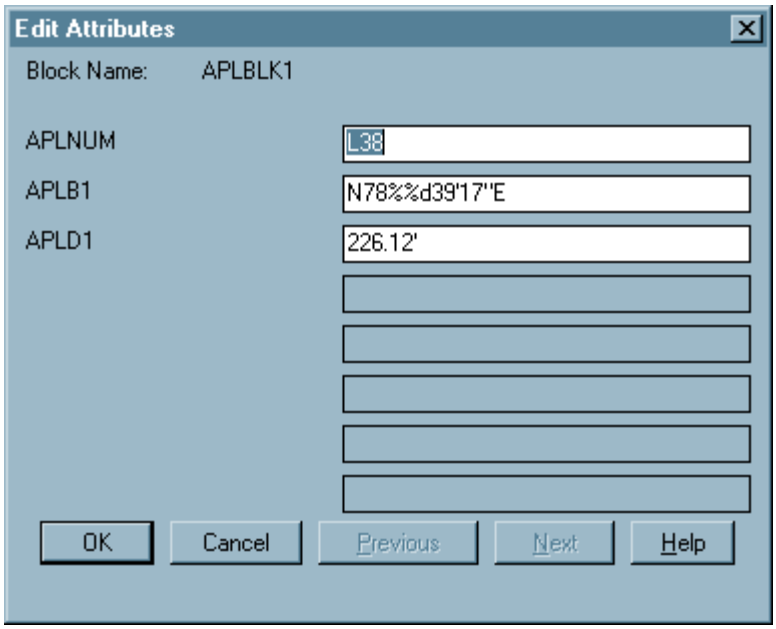


Figure RWV2

Radial Bearing Annotation

Layer(s) involved: **anofp-bdry-rb, anofp-cl-rb, anofp-row-rb, anofp-lf-rb, anofp-lots-rb**

Radial bearings are automatically annotated for all non-tangent arc end point conditions as well as all conditions of non-radial junctures with arcs. This feature is generated as a natural part of the Final Plat annotation and is not included within any of the design scale annotation sets or the Preliminary Plat annotation. Each arc condition that mathematically merits radial bearing notification is annotated according to a layer name classification which reflects the nature of the entities which produced the specific condition. The layer name classifications are: ANOFP-BDRY-RB (Boundary), ANOFP-CL-RB (Centerline), ANOFP-ROW-RB (Right-Of-Way), ANOFP-LF-RB (Lot Fronts), and ANOFP-LOTS-RB (Lot Lines). Radial bearing annotation consists of two entities, a line and a block. The line is always a 25.00' projection of the actual radial bearing outwardly from the top of the arc. The block contains attributes for the radial bearing and the distance, in feet, for the radius distance which correlates to the arc of that radial bearing (Figure RB2). The distance notification provides clarity when at a juncture of two non-tangent arcs such as is the case in the example at the southwest corner of Lot 1. The juncture for arcs C13 and C5 is non-tangent, and the resultant radial bearings are annotated as RB5 and RB4, respectively. Looking at the table, the radius for RB5 is 775.00' and the radius for RB4 is 227.77'. All radial bearing annotation is via an Automated Platting, LLC. line block. The Automated Platting, LLC. line table software gives you the option of an alpha prefix for making the table. Therefore, when making a table for radial bearings, you need to enter 'RB' when prompted for the alpha prefix. The standard for all bearing annotation by Automated Platting, LLC. is to reference all bearing quadrant information to the North – either NE or NW. The default placement of the line and block entities are the result of a standard mathematical expression.

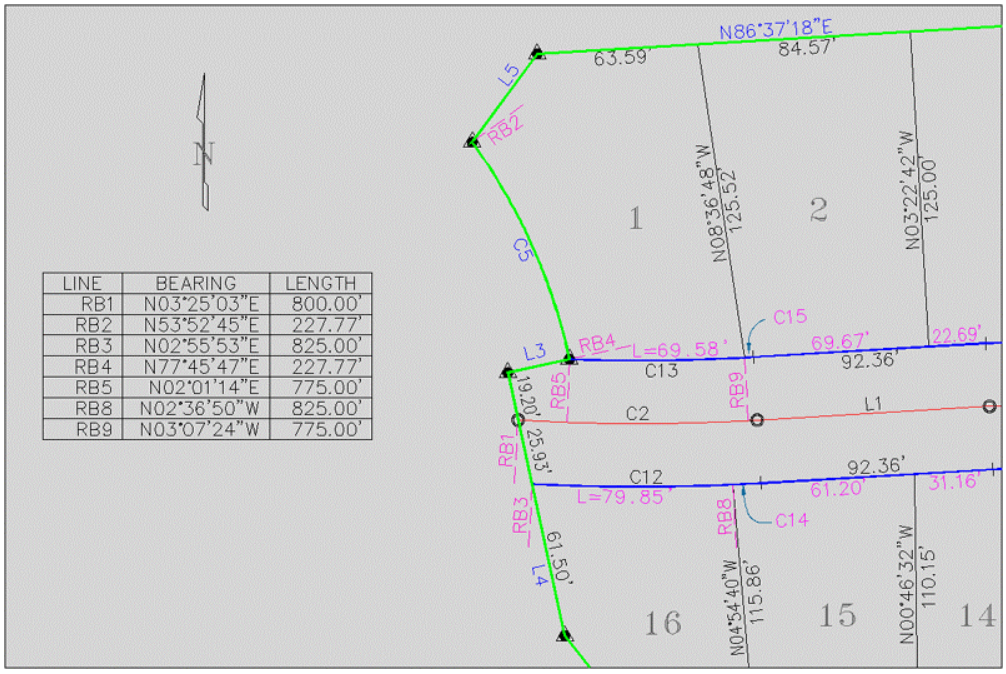


Figure RB1

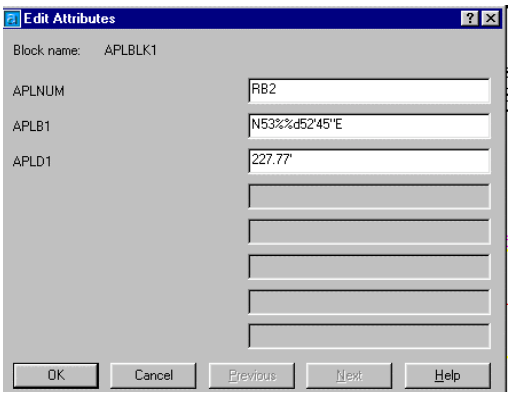
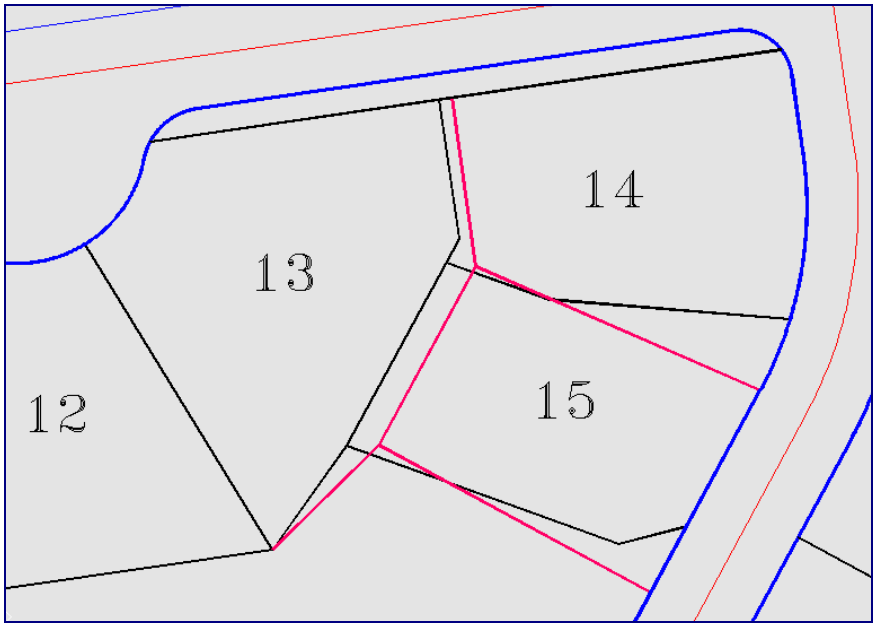


Figure RB2

File Comparison

Layer involved: **Ap-no_fit**



Lot Line Changes on Ap-no_fit Layer

It is understood that the design process itself often produces changes to the plat geometry. The proprietary software of Automated Platting allows for lots and streets to be added, deleted or moved, and provide a completely regenerated basefile within a minimum amount of time. Depending on existing workload commitments, turnaround will be within 48 hours, or usually the same day. For reference and checking purposes, AP runs a comparison between the new and old basefiles, and the result of that comparison is recorded on layer "**ap-no_fit**". This layer contains all line and arc entities that moved as a result of the design modification.

In addition, our software computer maximizes all sub-entities (or "child" entities) to their greatest mathematical whole expression ("parent" entities). Therefore, if a client basefile is submitted for validation and annotation, and contains, for example, a ROW line that is broken at lot corners (or randomly) then these sub-entities will also be depicted on the "**ap-no_fit"** layer.

This service is optional and must be requested for revisions to the CL product provided by AP. This service is standard procedure for the first returned file of the LV and LVP products. There is no additional fee for providing this service within our files.

Report File Information

Area Closures

Once the boundary linework is established, along with the correct layout of all centerlines, right-of-way and lot lines, this linework forms the natural figure areas for lots, tracts and streets. AP assigns block names to all figure areas bounded by streets and comprised of lots and tracts. AP then establishes overall area closures by adding block and street figure areas and comparing that sum to the overall boundary figure area. AP establishes lot and tract figure area closures similarly by comparing their sum with the respective block figure area. Centerline figure areas are totaled in comparison to the boundary area.

Figure Area Specifics

- Block names are located on layer "ap-blknam".
- Centerline figures are closed from radius points to other naturally occurring points via linework located on layer "ap-cl-add".
- Where necessary, roadway areas are made practical via linework on layer "ap-rw-add".
- ROW figure area names are located on layer "ap-rwnam".

ROW Note

Sometimes ROW figure names are alphanumeric for instances where private street areas are needed. In such cases, if a roadway is to be known as "Tract A," the ap-rwnam nomenclature would be A1, A2, … as necessary to obtain a practical definition of the figure area.

Sample.rpt

The "**Sample.rpt**" shown here is an extremely shortened version of the ASCII text report file generated by Automated Platting, LLC. It has been provided as an example of the various area listings that occur, and the comparisons that are made to ensure that the entire project closes based on the linework contained in the file.

Sample.rpt

```
                LOT AREA TABULATION REPORT
          LOT AREA IN SQUARE FEET FOR BLOCK A

LOT 588   ..... 8000.36
   ...
LOT 908   ..... 6217.52
TRACT F   ..... 13522.44

        ..... 996630.50  TOTAL LOT AREA

        ..... 996630.46  BLOCK CLOSURE AREA

        ..... -.04  ERROR of CLOSURE
```

```
                LOT AREA TABULATION REPORT
          LOT AREA IN SQUARE FEET FOR BLOCK G
...
LOT 779   ..... 5050.00
TRACT Q   ..... 38199.22

        ..... 298483.92  TOTAL LOT AREA

        ..... 298483.92  BLOCK CLOSURE AREA

        ..... .00  ERROR of CLOSURE
```

```
                LOT AREA TABULATION REPORT
          CL AREA TOTAL COMPARED TO BOUNDARY AREA

CL1       ..... 688207.05
   ...
CL11      ..... 104201.28

        ..... 3406759.69  TOTAL CL AREA

        ..... 3406759.68  BOUNDARY CLOSURE AREA

        ..... -.01  ERROR of CLOSURE
```

```
                LOT AREA TABULATION REPORT
          RW & BLOCK AREA TOTAL COMPARED TO BOUNDARY AREA

RW-A      ..... 203278.55
...
BLKD      ..... 298483.92

        ..... 3406759.69  TOTAL ROAD AREA

        ..... 3406759.68  BOUNDARY CLOSURE AREA

        ..... -.01  ERROR of CLOSURE
```

Report File Information *(continued)*

Traverse Closures

Automated Platting provides traverse closures for the boundary, lots, tracts, and rights-of-way. The traverse closures come in an ASCII text report file with the ".trv" extension. If a client wishes to generate their own traverse closures from third party software, AP provides them with the raw materials to be able to generate these types of closures. The layers **ap-polybdry**, **ap-polyrw,** and **ap-polylot** provide the client with the polylines required to quickly perform these operations. If entities are preferred instead of polylines, we recommend using the **ap-xxxbkn** layers for assembling such closures.

Automated Platting's format for traverse closures was chosen to directly replicate our automated polylines and reflect the accuracy that is consistent throughout all of our software. At a future date, we may also provide a traverse closure format that replicates the annotation to the nearest second for bearings and the nearest 0.01' for distances, thereby producing a "manufactured" error of closure.

```
PAGE 3                                                  02-07-03 11:19.21
Automated Platting, LLC.                                   AP_LVP1.DWG
                    LOT TRAVERSE CLOSURES
_____________________________________________________________________

TRAVERSE CLOSURE FOR LOT 1

          BEARING                DISTANCE       LATITUDE      DEPARTURE
                                                NORTHING      EASTING

Beginning Coordinate                          8668.8883     27788.9942

  South 12°16'32.28" East       114.3025      -111.6891        24.3024
                                              8557.1993     27813.2966
  South 77°43'27.72" West        55.0000       -11.6938       -53.7425
                                              8545.5055     27759.5542
  North 12°16'32.28" West       110.0000       107.4850       -23.3876
                                              8652.9904     27736.1665
  North 73°15'05.16" East        55.1680        15.8979        52.8277
                                              8668.8883     27788.9942
ERROR OF CLOSURE COURSE:
  North 90°00'00.00" East         0.0000         0.0000         0.0000
                                              8668.8883     27788.9942
Containing 6168.32 SF. or 0.142 AC.
_____________________________________________________________________

TRAVERSE CLOSURE FOR LOT 2

          BEARING                DISTANCE       LATITUDE      DEPARTURE
                                                NORTHING      EASTING

Beginning Coordinate                          8678.2040     27869.1831

  South 01°45'36.19" West       115.0142      -114.9600        -3.5325
                                              8563.2440     27865.6505
  South 01°45'36.19" West       175.0000      -174.9174        -5.3749
                                              8388.3266     27860.2756
        Delta = 014°02'08.47"    Chd Brg = South 84°44'31.95" West
        L=     42.8696'     Chd =     42.7625'     T=     21.5426'
  North 12°16'32.28" West       175.0000       170.9988       -37.2076
                                              8559.3254     27823.0680
  South 77°43'27.72" West        10.0000        -2.1261        -9.7714
                                              8557.1993     27813.2966
  North 12°16'32.28" West       114.3025       111.6891       -24.3024
                                              8668.8883     27788.9942
  North 73°15'05.16" East         2.6054         0.7508         2.4949
                                              8669.6391     27791.4891
  North 81°57'20.27" East        68.7354         9.6188        68.0590
                                              8679.2580     27859.5482
  South 83°45'26.25" East         9.6924        -1.0540         9.6349
                                              8678.2040     27869.1831
ERROR OF CLOSURE COURSE:
  North 90°00'00.00" East         0.0000         0.0000         0.0000
                                              8678.2040     27869.1831
Containing 7627.09 SF. or 0.175 AC.
```

Section IV : VLX & ARX Tools

VLX / ARX Index

Automated Platting, LLC. has several VLX routines that are available to clients using AutoCAD 2000-2004, which help expedite final plat sheet creation using the information generated by AP. ARX is available upon request for those clients using AutoCAD release 14. Below is a list of the VLX routines available, followed by an expanded description with instructions.

Lisp Name	Description
AUTOTBL4	Automatically regenerates line and curve tables
CTBL4	Creates curve table using blocks generated from CVLBL3x3
CVLBL3x3	Labels curves with C*xxx*
LNLBL3x3	Labels lines with L*xxx*
LTBL3x1	Creates line table using blocks generated from LNLBL3x3
PL-HILITE2	Highlights polyline selected for use with AUTOTBL3x1

Line and Curve Labeling and Tables

Label Generating Programs: **LNLBL3x3, CVLBL3x3**

The prompts give you control over the offset distance, text height and alpha prefix of the line or curve number. Furthermore, the software has an internal sorter and number generator that functions within the layer naming conventions of Automated Platting, LLC. Therefore, at the prompt:

Enter Scale: FP, 20 or 40 <FP>:

You have the option and responsibility of informing the program whether you are labeling for the purpose of Final Plat, 20-scale or 40-scale information. Once you have answered the prompt, the software will automatically inspect all layers within the drawing (according to the scale you have chosen) for available curve numbers that match the alpha prefix you have indicated. Therefore, if you have been doing design editing and have erased some curve or line numbers, the software will find the gaps in the numbering sequence for the indicated alpha prefix, and automatically fill in those gaps. Once there are no gaps in the sequence, the next successive highest number is used. Line and curve numbers are placed on the current layer.

Please note: all of Automated Platting's annotation layers have a naming convention of ANO**, wherein the ** is either FP (final plat), 20 (20-scale annotation), 40 (40-scale annotation), PP (preliminary plat annotation), or XX for some other scale requested by the client. Therefore, if you have renamed annotation layers, you will defeat the built-in labeling sorters.

The block drawings APCBLK1.dwg and APLBLK1.dwg need to exist in your drawing path in order for these labeling programs to function.

Line and Curve Labeling and Tables *(continued)*

Table Generating Programs: **LTBL3x1, CTBL4**

These programs produce line and curve tables. You are prompted for the desired text height for the table you wish to create. The table is created on the current layer, and is comprised of the line and curve numbers you have selected according to a prefix filter for which you are prompted. You can have as many different alpha prefix formats in a given drawing as you wish. Your selection set is automatically filtered for the table you are making according to the prefix you enter. However, you must turn off alternate scale layers, or you will probably end up with two or three number one and number two, etc. curve or line numbers in your table. For example, if you are making tables for the 20-scale annotation, you must turn off the 40-scale and FP annotation layers.

There are three selection-set methods: **AutoCAD, CP, WP** <AutoCAD>:

> **AutoCAD**: This option is the program default. You can select existing line or curve numbers through normal AutoCAD selection methods such as "window", selection, "crossing window", etc.

> **CP**: (Short for Crossing Polyline) You are prompted to select an EXISTING polyline. Line and curve numbers will then be selected according to the limits of that polyline using a "crossing" format.

> **WP**: (Short for Window Polyline) You are prompted to select an EXISTING polyline. Line and curve numbers will then be selected according to the limits of that polyline using a "window" format.

Last, you are prompted for the upper left-hand corner of the table you wish to create.

Please note: the "CP" and "WP" selection methods allow you to use your 'xclip' polylines that are in your basefile in order to create hassle-free, sheet-specific line and curve tables. You can create all your tables in your basefile, and then xref them to your sheets. This is extremely powerful due to the merits of **AUTOTBL4.vlx**.

"TBLDAT.dwg" must be in your drawing search path for this program to function properly. If it is not, needed information will not exist in order for **AUTOTBL4.vlx** to run properly.

Line and Curve Labels, Modification/Identification

Programs: **AUTOTBL4, PL-HILITE2**

The tabling routines **LTBL3x1** and **CTBL4** place an intelligent block at the upper left-hand corner of the table on a layer named "AP-TBLDAT". If you use the "CP" or "WP" selection method of using existing polylines within the drawing, then updating curve and line tables after changes is AUTOMATIC. Erase all line and curve tables without erasing the AP-TBLDAT blocks. Execute **AUTOTBL4** and all line and curve tables will automatically be recreated.

If you forget or get confused about which line or curve tables belong to which polyline, then turn on the AP-TBLDAT layer and run **PL-HILITE2**. It will prompt you to select the table of your choice. You can then window the upper left-hand corner of the table your want, and the software will highlight the polyline that serves as the selection set window for that table.