Association of
British Columbia
Land Surveyors

# Professional Reference Manual

# Chapter 8

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Association of British Columbia Land Surveyors

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# Chapter 8 - Principles of Boundary Surveys

Land surveys are conducted for the purpose of establishing new boundaries or re-establishing existing boundaries. A survey that establishes a new boundary line is often called an original survey. In establishing a new boundary, a land surveyor locates the boundary on the ground, and creates both physical and documentary evidence of the boundary in accordance with appropriate statute, regulation and the Survey Rules.

In re-establishing a boundary, the land surveyor must locate and interpret both the physical and documentary evidence of the existing boundary in accordance with the hierarchy of evidence and use their professional judgement. The physical evidence found and placed and documentary evidence recorded of the re-establishment of the boundary, represents the land surveyor's opinion of the location of the true boundary as originally surveyed.

Where a land surveyor is laying out new boundaries in accordance with a description in a legally sanctioned document, such as a Gazette Notice, Aliquot parts description, Crown Grant, etc., and the land surveyor notices that the boundaries as described do not fit the ground in a significant manner, the land surveyor may question if the description is correct. If there is a concern that the description may not be correct, the land surveyor should point out the differences between the described boundaries and the lay of the land with the appropriate authorities. This communication is similarly critical with regard to private developments, where natural boundaries have moved, parcels not meeting minimum areas, etc.

If the decision of any such discussions result in surveyed boundaries that are not in accordance with the description, then it would be considered good practice that the reasons for the decision to vary the marking of the boundaries be recorded in some appropriate place, such as either in correspondence related to the survey plan, a note placed on the plan itself, a Survey Letter filed in the Land Title Register or the Crown Land Registry or some other appropriate place depending on the nature of the case. In this way, land surveyors who are dealing with these boundaries in the future will be alerted to the variation, the reason for it, and under whose authority the variation was made.

## Part 1 – Retracement Surveys

### 1) Basic Principles

Recent judicial decisions such as *McKellar vs. Fotsch* (see Chapter 8 - Part 3) and *Okanagan Radio vs. Dunlop* have clearly stated that it is a primary duty of a land surveyor to correctly ascertain the position of pre-existing boundaries prior to establishing new boundaries relative to those pre-existing boundaries. Section 1 of the *Land Survey Act* indicates that original boundary lines, being true and unalterable, are those that were "surveyed and run..." This suggests that if there is clear evidence that an original boundary line was not run in a straight line between the end points, that evidence might suggest that upon retracement, the boundary line is not necessarily a straight line between the original end points. In reaching a conclusion that an original or pre-existing boundary line is not a straight line between the end points but a crooked line by following the line as run, it is recommended that the land surveyor exercise caution in ensuring that there is conclusive evidence that the boundary

as run was not run in a straight line. Line trees are generally considered to be on the line run, but not blazed trees. The blazing of lines was practiced by other professions, such as foresters and miners. Ensure that the line being re-traced was not a trial line or traverse line, and that a trial line or traversed line was not blazed in error instead of the boundary line. For examples of trial lines and other blazed lines, see Specimen field notes in General Instructions to BCLS, May 1918. Land surveyors should also be aware that although the field notes of an original survey may indicate that all boundary lines were run, that was not necessarily done is some instances. See Circular Letter April 1904.

Since a land surveyor has no arbitrary powers to re-define the positions of pre-established boundaries, it is important to keep in mind that all evidentiary decisions are subject to judicial review. For this reason, all decisions taken by the surveyor in the course of a retracement survey must be made in the light of the statutory rules and judicial decisions which govern legal survey boundaries.

The order of importance of evidence, referred to as the hierarchy of evidence, is:

(1) evidence of natural boundaries;

(2) evidence of original monuments;

(3) evidence of possession that can reasonably be related back to the time of the original survey;

(4) measurements shown on the original plan and/or field notes.

Regarding (3) above, evidence of possession, courts have reasoned that the time frame to be considered is not strictly the time of the original survey. Evidence of possession should also be considered where it can be reasonably assumed that the original survey posts were in place when the fences, buildings or other evidence of possession were built. Courts have also reasoned that present day fences were replacements for earlier fences that were built with reference to the original survey posts. Where original survey posts are not found and there is evidence of possession, and the land surveyor concludes that the best evidence is measurements shown on the original plan or field notes, the onus is on the land surveyor to verify that the evidence of possession is not the best evidence.

As a result of several other recent judicial decisions such as *Richmond Hill Furriers vs. Clarissa Developments Inc.* (see Chapter 8, Page 8-6), acts of legislature referring to a plan or judicial decision, may take precedent over this order of importance.

An important principle which is also articulated in judicial decisions is that the retracement surveyor must make every effort to “walk in the footsteps of the original surveyor.” In other words, no difficult retracement should be attempted without a thorough understanding of the regulations under which the original survey was performed, the probable limits of accuracy, the monumentation likely to have been used and the order in which lines were run and monuments placed.

In commenting upon the “order of importance of evidence,” it is worth noting that, while the location of natural boundaries obviously cannot be disregarded, they are rarely of much help in practical problems of boundary retracement, being themselves often dynamic over time and often incapable of really accurate definition. The major point to keep in mind is the significance of evidence of possession, (or occupation) as being next in importance to original monuments and more important

than plan measurements. Board Advisory 2013-1 is a reminder to land surveyors that the hierarchy of evidence principles as well as *Land Survey Act* principles are to be followed when retracing a boundary.

## 2) Brief History

As there tend to be great differences in accuracy, completeness of plans, and monumentation between surveys performed at different times in B.C. history, it is useful to define three historical periods, being "early," "middle," and "modern". The early period commences with the first surveys on Vancouver Island, about 1851, and concludes when the First World War ended the great settlement and land boom, about 1915. Although there were a few very competent professionals working in surveying, this period is characterized by an absence of quality controls on the part of government, accompanied by the processing of a vast quantity of survey work conducted as a result of the land, timber and townsite booms in many parts of the province. Monumentation of surveys conducted during this period is usually poor, with that of subdivision and reference plans being often indeterminate, because of lack of any clear standards for land title plans. There are wild variations in accuracy, as between individual surveyors.

The middle period which covers the time between 1915 and a year or two after the end of the Second World War, was a very difficult time for the survey profession. For the most part, work was scarce and few new members entered the profession. Land prices, as related to survey costs, were very low. Most survey work continued to be done by individuals who were trained and commissioned during the great land boom early in the century, when practically all the work consisted of original surveys. As a result, some of them, even if competent in the running of lines and the making of measurements, had little understanding of survey evidence and the need for careful retracement of an original boundary before surveying a new parcel which abutted it.

It is convenient to define the modern period as commencing in 1947, because this is the year in which permanent metal monuments were made mandatory for the corners of parcels created under the *Land Act*. Prior to this, wooden posts were the standard. Iron pins had theoretically been required under the *Land Registry Act* since 1943 but this requirement was not really enforced until the end of the war. The modern period, also saw many advances in the training of land surveyors and the technology of measurement, as well as in the universal use of permanent monumentation.

## 3) Survey Systems

W. A. Taylor's booklet, *"Crown Lands: A History of Survey Systems*," (see Chapter 6-1-14-e), describes nine different systems of survey of at various time since 1851. In terms of fundamental differences which affect retracement, these systems can be consolidated to a total of six.

In order of time, the first survey system in the province was the **Hudson's Bay Company Sections**, all located in the vicinity of Victoria and surveyed between 1851 and 1858. These parcels are irregular in shape. There are no field notes of record and plans are undimensioned, with parcel sizes derived from attached metes and bounds descriptions.

The second system, introduced in 1858, is the **Vancouver Island sections and ranges system**, which is a standardized system of rectangular parcels, not square, each containing 100 to 160 acres. The boundaries usually, but not always, run in cardinal directions.

The third system, utilizing sections, ranges and blocks, was also introduced in 1858, but on the mainland, in the vicinity of New Westminster, then capital of the mainland colony. This was a copy of the U.S. Township system, but with the sections reduced from 640 to 160 acres and the townships called “Blocks”. This system was used from 1858 to 1861, and only on Sea and Lulu Islands.

The fourth system, the **District Lot System**, was introduced in 1859, with the survey of a number of parcels along the north shore of the Fraser River and the south shore of Burrard Inlet. Although parcels are irregular in size and shape, the surveyed boundaries usually run in cardinal directions. This system, which eventually extended through most of the province, passed through many evolutions. The typical standard district lot is approximately 1 mile square, contains 640 acres and is divided into 4 quarters. The four exterior quarter posts were usually posted in the course of the original survey, and, in many cases, the centre post was also set, often by means of an unclosed half mile of line from one of the exterior quarter posts. Size, shape, post density and boundary direction were subject to endless variation; therefore it is essential that a land surveyor conducting any boundary retracement have the original field notes in their possession before starting work.

The fifth system, the **Provincial Township System**, first used in 1873 in the New Westminster District, is a copy of the Dominion Township System, then in use in Manitoba and itself a derivative of the U. S. system. This system was used in extending legal surveys up the Fraser Valley in 1873 and 1874. An attempt was made, by amendment to the *Land Act* in 1879, to standardize the survey methodology and monumentation. The system was fairly widely used in some of the flatter parts of the Interior, where agricultural lands were surveyed in advance of settlement. Never well suited to the topographic conditions in British Columbia, its use, for new surveys, was terminated about 1914. A variation of this system is found on some of the larger islands, near Vancouver Island, where sections but no townships were created and the name of the island is substituted for a township number as an identifier.

The survey systems mentioned so far by number, i.e. the third system, the forth system etc., are Provincial survey systems. These are to be distinguished from the Dominion Township Survey Systems that are also referenced by number.

The **Dominion Township System**, was introduced into British Columbia as the result of a transfer, in 1883, from British Columbia to the Dominion Government, of a strip of land, (called the Railway Belt,) 40 miles wide, being twenty miles on each side of the Canadian Pacific Railway mainline from the eastern boundary of the province to the Pacific coast. To compensate for lands previously alienated within the Railway Belt, the Province later also transferred a 3.5 million acre block in the Peace River District, called the Peace River Block, to the Dominion. The survey of these large blocks became the responsibility of the Dominion Government and surveys, accordingly, were conducted by Dominion Land Surveyors, under the Dominion Township System.

Only the third, fourth and fifth Dominion Survey Systems were used In British Columbia. The third Dominion Survey System was used in the Peace River Block, the fourth Dominion Survey System was used in the Railway Belt. The fifth Dominion Survey System incorporates the third Provincial Survey System in the Lower Fraser Valley. A map showing the extent of the fifth Dominion Survey System in the Lower Fraser Valley can be found in CLSR field book 22359.

In general terms, surveys carried out under the Dominion system were completed under more rigorous standards than those which applied to the various provincial systems in the same time period. Survey standards, which may be reviewed by referring to the appropriate DLS Manual, were clear and usually adhered to by Dominion Land Surveyors. Bearings, in particular, are generally much more consistent than those found in Provincial surveys and monumentation is of a more permanent nature. In 1930, those parts of the Railway Belt and the Peace River Block which had not been alienated were transferred back to the Province.

Bulletin 38 (Office of SG Canada – Historical publications) explains changes to monumentation requirements for township surveys at difference times. See CLSR FB 30154.

## 4) Original Monumentation

As the original corner posts set in most surveys carried out between 1851 and the end of the Second World War were made of wood, it is not surprising that the recovery of direct evidence of these posts, in the modern period, is difficult and highly uncertain. Where there is sufficient topsoil for the post to have been set below the grassroots level, identifiable rotted wood may still be recovered after the lapse of many years, so careful digging may be well worth the effort in these conditions. Unfortunately, in hardpan conditions, original posts were often driven to fairly shallow depths and fell over when their points rotted off, leaving little evidence. Similarly, in heavily wooded areas, where the soil is composed of wood in various stages of decay, bits of rotted post can be very hard to distinguish.

Another incentive for careful digging, in searching for evidence of old posts where the ground is undisturbed is the fact that it appears to have been considered good practice, by some surveyors, to bury pottery shards or bits of broken bottles at the base of newly set wooden posts. This evidence may or may not be recorded in the original field notes. Stone mounds, often used where stones were readily available, usually survive unless destroyed by human activity.

In most parts of British Columbia, bearing trees are by far the most likely part of a corner monument to be found in place after a long time lapse. Under the *Land Act* of 1879, bearing trees, where available, were required at all section corners and most surveyors of that period and later, working in both the Provincial Township and District Lot systems, seem to have been reasonably diligent in making them.

Because some surveyors appear to have been a little careless in recording bearing trees in their field notes, it is necessary to treat field note bearings and distances with a certain amount of caution. Where there is conflict between recorded distances and those carved on the face of the tree, the carved distance is probably more reliable. Recorded bearings to bearing trees are often less reliable than recorded distances so distances should usually be given preference, where there is conflict. It is

also worth noting that bearing trees were sometimes carved but not recorded, so a search for unrecorded bearing trees at a corner where none are recorded in the field book can also be rewarding.

Where bearing trees have been destroyed by fire or have rotted off in the course of time, the stumps or roots will still provide conclusive evidence of the location of the corner, if they can be recovered and identified with certainty. This may be accomplished by trial and error in the field, by fitting a tentative corner location to a pattern of stumps, or, more conclusively, by tying all the nearby stumps to the control traverse, plotting them to a large scale and then making a trial and error fit to a plot of the original recorded bearing tree relationships, as derived from the field notes, plotted to the same scale on a separate piece of paper.

## 5) Evidence of Occupation

While hedgerows or edges of clearings can also provide useful evidence, fences, particularly in rural areas, and building corners, particularly in dense urban areas, are the classic source of occupational evidence for the retracement of boundaries. While it is important to be able to reasonably relate the timing of construction of the fence or building to a time period when the original survey evidence is likely to have been in place, absolute proof that the post was there when the building or fence was built is not ordinarily required. Since untreated wooden fence posts, for an example, may last only twenty years or so, it is unlikely that an individual fence corner post, viewed today, is the post that was set shortly after the survey was completed, a hundred years ago. Because it is known that farmers generally renew their fences on a continuing basis, replacing posts as they decay and keeping the same location, it is inferred (subject to any conflicting evidence) that the fence, as an object, is the same, though its component parts have been renewed.

> *"Although not conclusive, there is a strong presumption that long-standing fences accurately mark boundary lines despite the absence of an unbroken evidentiary chain."*
>
> *Phillips v. Keefe, 2010 BCSC 2005 (CanLII)*

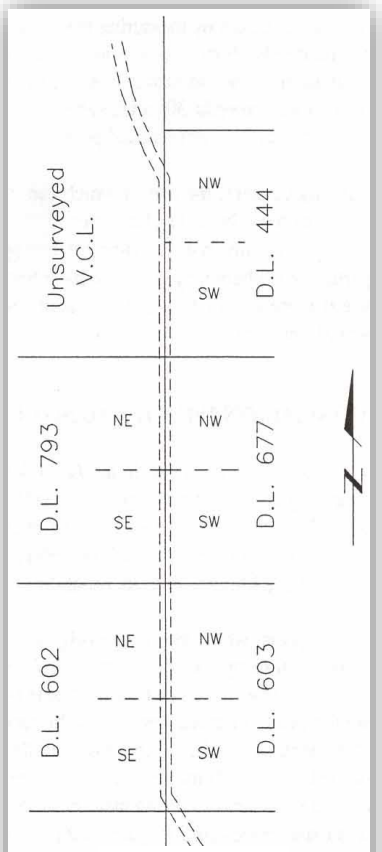


*FIGURE 1*

Fences or fence corners may be accepted as evidence where there is no certainty as to the date of first construction, if there is a pattern of fences and other evidence which are mutually supportive. In the following hypothetical example as shown in *Figure 1*, a land surveyor is required to retrace and repost the west boundaries of District Lots 603, 677 and 444, perhaps in connection with an R/W survey being carried out in the area. Original evidence is recovered at the southwest corner of D.L. 603 and at the northwest corner of D.L. 444, but all original evidence at the corners in between appears to be missing.

An old unsurveyed public road, depicted by broken lines on *Figure 1*, runs along these boundaries. Research indicates that all these district lots were surveyed separately between 1906 and 1909 and that the lots were Crown granted before 1914. The field notes show all these boundaries as "NORTH," or "SOUTH", with wooden posts at all the D.L. and quarter corners and all the distances as 40 chains, (804.67 metres). Ministry of Transportation & Infrastructure records indicate a public road on approximately this location at least since 1922.

Old fences are found running east and west from the district lot and quarter corners of District Lots 602, 603, 677 and 793. Fences on both sides of the old road in District Lots 602, 603, 677 and 793, are about 12.2 metres apart. No occupational evidence is found along the west boundary of D.L. 444.

Before commencing the control traverse, hubs are set centred between the road fences and on line with the fences running east and west. The hubs are coordinated as part of the control traverse. It is found that the overall distance from the SW corner of D.L. 603 to the NW corner of D.L. 444 is 4824.36 metres, a shortage of 3.66 metres, not an unusual result in surveys of that era.

If there is no occupational evidence, it may be reasonable to re-establish the missing corners by proration. However, by comparing the distances between the hubs set from the fences, it is found that there is a consistent shortage of 0.30 to 0.40 metres per quarter D.L. along the west boundaries of District lots 603 and 677, with the balance of the shortage, 2.26 metres, in the west boundary of District Lot 444. Bends in the order of two or three minutes of angle are found at each of the hubs set from the fences.

The solution adopted for this example is to accept the hubs at the district lot corners as true corners. The quarter corners on the west boundaries of District Lots 603 and 677 are set at the same northing as the fence lines, but on straight lines between the district lot corners, so that the bends occur at the district lot corners. As there is no occupational evidence of the quarter corner on the west boundary of D.L. 444, it is placed on a straight line between the corners of the district lot and proportionately halfway between. The plan will indicate "fence lines" as evidence in the appropriate locations. If the land surveyor feels that further explanation of their boundary resolution than is shown on their plan is required, they can prepare a letter and have the letter filed in land title office records (or Surveyor General records) when the plan is deposited.

While the legal authority for preference of evidence of occupation over plan measurements is the same for retracement of urban or suburban parcels as it is for large rural parcels, the practical procedures are different, in most cases. Particularly in the use of fence corners, the ability to relate the age of the fence to the time of the original survey may be useful. This is because of the relative ease with which untrained individuals can lay out fences by measuring from other fences, after the survey evidence has disappeared, where distances are relatively short. As a general rule, fence corner evidence in urban or suburban retracement surveys is most useful in the oldest subdivisions, where plan measurements are indefinite

**Note**

Relating a fence to the original survey posts was dealt with in 1 (1), basic principles.

and where a surplus or shortage in a block exceeds 30 centimetres. A pattern of fences may also provide useful corroboration of other evidence, such as unrecorded posts.

Building corners, the age of which can be reasonably related to the time when original survey evidence was likely to have been in place, are usually the most significant occupational evidence in urban retracement surveys. In any but the simplest urban retracement survey, it is very risky to disregard old buildings, particularly where they appear to have been built to line. At a minimum, the surveyor will coordinate them, see if there is a pattern of agreement between buildings and carefully consider any posting decision which would upset the established pattern.

**Consider Barry v. Desrosiers;**

In Barry v. Desrosiers, 1908, all the posts in the block were destroyed by fire 23 years prior to the trial. On being resurveyed, the block was found to be six inches short of the plan measurement. By proportioning the shortage over the entire block, Desrosiers' building was found to encroach 3/4 of an inch onto the adjoining lot. Held, on appeal, that the encroachment was not proven, as there was no certainty that the error in the original measurement was evenly distributed among the lots. (From presentation by Don Duffy at the 2005 BCLS AGM.)

## 6) Monuments Which Are Not Originals

The legal principle, found in the *Land Survey Act* and in many judicial decisions, that original monuments in their original positions are conclusive evidence of boundaries does not, of course, apply to survey monuments which have been set in the course of retracement surveys, or through any other procedure, unless they have been set or confirmed by judicial order. Before relying on any monument, except an original, the surveyor must satisfy himself as to its reliability.

Survey posts, which may not be originals, but which can be persuasive evidence of the location of true corners, come from many sources. Some, consisting of spikes, bars or angle irons, may have been placed by property owners or other individuals, in or beside rotting wooden posts, in the interest of preserving the corner. Many similar pieces of metal were placed by surveyors in the early and middle periods of provincial surveying, when there were no standard metal posts but the surveyors recognized that something more durable than wood was needed. Although many of the early repostings by surveyors were recorded in their own field books, there existed no means of placing them in the public record until 1962, when provision for the filing of posting plans was made in the *Land Registry Act* (now *Land Title Act*). For these reasons, there is much corner evidence, most of which is probably the best available, which is of uncertain validity but which cannot lightly be disregarded.

To add to the uncertainty, some surveyors and most land title offices have treated posts recorded on posting plans as inferior, in some way, to posts recorded on subdivision or reference plans. The examination of posting plans, in some land title offices has been perfunctory and there has been no review of the evidence on which the survey was based. Plans which show only posts set, with no indication of old evidence, have routinely been accepted.

An Ontario court case, *Richmond Hill Furriers vs. Clarissa Developments Inc.* (7RPR3d66), provides further guidance. In simple terms (the actual lot dimensions are more complicated) a subdivision plan

was prepared with five lots of 100 foot width and a 25 foot road allowance along the south edge (a total block length of 525 feet). This first plan was not registered, and subsequently the surveyor prepared a second subdivision plan creating five lots of 97 foot width with a 40 foot road allowance along the south edge (still a total block length of 525 feet). Unfortunately, the posts in the field from the first survey were not moved to the new plan locations, and remained at the 100 foot intervals. Over the years several additional surveys were done in the block and, not surprisingly, various solutions were used. In the 1950's, the problem was submitted to the Ontario Boundaries Act Tribunal, which decided that the posts as found should govern. However, upon appeal the court ruled that the posts in the field were not original posts set on the registered plan and therefore were not original posts in place. The lots were deemed to be 97 feet wide (more or less) but not defined by the location of the posts which were set on the first unregistered plan. The court further stated that the hierarchy of evidence can only apply when there is an ambiguity, and since the posts found were not set to represent the registered plan, and since the original field notes showing 100 foot lots were available, there is no ambiguity. In this case, the plan is the best evidence of the location of the boundaries.

All this means that there can be no fixed rules as to the acceptance or rejection, by the surveyor, of corner posts which are obviously not originals. If field notes or posting plans are available, (and assuming the posting plans show old evidence), the surveyor can review the evidential process by which the posts were set. If no such information is available, the surveyor can look for conflicts with occupation or plan measurements. The view taken by most experienced surveyors is that posts which are not originals should be accepted as found unless there is persuasive evidence that they are wrong. The decision as to how much checking is necessary before acceptance is, ultimately, the professional responsibility of the surveyor.

## 7) Coordinates As Evidence

The introduction and widespread promulgation of Integrated Survey Areas in the province has led to much discussion as to the present and future role of integrated survey coordinates in re-establishment of missing property corners. Section 14 of the *Land Survey Act*, states that “coordinates that may be derived from the plan for those original monuments are evidence of their positions and must be considered ……..”. In the absence of judicial decisions on the subject, it is probably safe to say that the hierarchy of evidence still applies in Integrated Survey Areas but that ISA coordinates must be considered where the original monument is missing. Had the Legislature intended Section 14 to abrogate the Common Law, as long established by judicial decisions, it would normally have indicated this by a clear statement of its intention. Until this happens, or until the courts provide further clarification, coordinates should only be used in the absence of better evidence.

## 8) Recording Result of Searches

It is a land surveyor’s duty to make clear on every plan the results of all searches made, whether successful or not, in order that another land surveyor can easily understand the methodology used to re-establish a boundary. With this in mind, it shall be considered good practice to place clarifying notes on plans in the following instances:

(1) where evidence has been searched for and nothing was found.

(2) where an original monument was found disturbed and has been restored or replaced.

(3) where a monument cannot be placed at a true corner.

(4) where occupational evidence such as fences or buildings is used.

(5) when the method used to re-establish boundaries may not be clear.

(6) where the origin of the evidence is unclear, the surveyor should state the source of the evidence on the plan. For example, a monument may have been set on an old posting plan, or may have been recorded in historical field notes, municipal records, etc. In the case where the evidentiary note is too large to place on the plan, the surveyor should consider filing a surveyor's letter with the Land Title and Survey Authority.

## Part 2 – Prorating & Reestablishment Of Boundaries

The guiding principle for boundary re-establishment is to use the best evidence available in each situation to attempt to replace the property corners, and the boundaries they are set to represent, in the same location as the original survey. Prorating is a tool that can be used to accomplish this after exhausting all other avenues.

In 1989 The Carswell Co. Ltd. published a book titled *Survey Law In Canada*. This book is a series of papers by respected land surveyors, some of whom are also lawyers, jointly prepared by The Canadian Institute of Surveying and Mapping (now known as The Canadian Institute of Geomatics) and the Canadian Council of Land Surveyors. Chapter 4 provides the following sections which are important principles to consider when commencing a survey to re-establish a previous survey.

***4.43*** At all times, the location of a boundary of a parcel is a question of fact to be based on evidence. The orders of reliability of evidence that are definitive of a boundary reflect those things which the courts have found least likely of error, namely, first preference to the natural boundaries of parcels; second preference to original monuments placed or recognized by survey; third preference to features of possessory evidence that can be related in time to the original survey (this is not adverse possession); and fourth preference to measurements.[1]

***4.44*** This placement of linear and angular measurements, as evidence, in a position of least weight is not a mark of discredit to the surveyor. Rather than that, it is the realization that there is more to fixing a boundary than using measured dimensions from other points which may be equally uncertain in position or deducing that a given line is straight simply because a single direction is recorded for it. Modern techniques can reproduce stated dimensions within very fine limits and lines can be run straight, but old lines and dimensions, set out and measured with quite different equipment such as Gunter's chain, with its actual links, for distances and the magnetic compass for directions, were almost invariably inaccurate and imprecise. Alternatively, the marks may be considered to be incorrectly placed and in error from the

[1] See Chapter 8, Part 2 for hierarchy of evidence

recorded dimensions; this may give grounds for resurvey, that is, for a new definition. Obviously, long-accepted features, to which property owners have lived quietly and to which they have acquiesced as their boundaries, cannot be lightly upset.

***4.46*** There are two possible situations that may emerge in examining a parcel on the ground and the title records of that same parcel: (1) that the fences or other occupational evidence may or may not be on the boundaries; and (2) that the stated dimensions of an original title plan may or may not be accurate (and the older the plan, the less accurate it will probably be as a reflection of the true dimensions). This points to the need for the surveyor to address these critical situations in his analysis of the evidence, and in his subsequent written report to his client in which he expresses his opinion.

***4.52*** The point must be made that once the original surveyed lines, faulty for distance and crooked from compass error as they may be, were recognized by the settlers and converted to physical features and once a lot line, not run in the original Crown survey, emerged as a physical feature, whether from a known survey of the lot line or not, then it would appear that the courts are reluctant to decide for any other line than that which comes from the long standing acceptance of the adjoining owners. This is entirely logical. The argument as to whether this is the lot line by the *Surveys Act* or some other type of lot line (e.g., lot line by occupation or established lot line) becomes nonsensical. There is inherent and common sense logic against changing the title records for each failure on the ground-based facts to conform to the theory of the system for corners and lines and numerical values as there are stated in records and intended to express the position of boundaries on the ground.

From section *4.43* it can be seen that measurements, under which prorating would be categorized, has a lower preference in the hierarchy of evidence and for the purposes of this paper when prorating is used it will be assumed that all evidence of a higher nature has been diligently and fully searched for but not found.

In general terms, prorating can be defined as the orderly proportionment of a difference between a plan distance and a measured distance. It is most commonly used to allow for the orderly adjustment of small differences between "undisputed corners" when intermediate boundaries lie between those undisputed corners. If a surveyor measures across the frontage of five city lots which each have a plan distance of 20.00 and finds a measured distance of 100.05, each lot would be given a measured frontage of 20.01 as shown in *Figure 2*. The standard formula that would be used in calculating

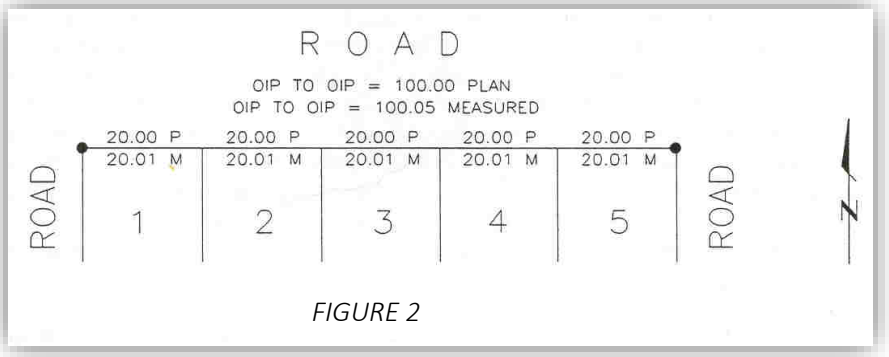


*FIGURE 2*

this measured frontage is: total measured distance divided by total plan distance times individual plan distance. In this example: 100.05 / 100.00 x 20.00 = 20.01.

There will come a point though, when the magnitude of the difference between the plan distance and the measured distance between undisputed corners becomes so large that a proration will not satisfy the guiding principle of boundary reconstruction. There is no specific magnitude of difference that will rule out a proration in all cases. Each case will have to be judged on an individual basis. Some factors that may come into play in determining the proration threshold may be, but are not limited to:

(1) The age of the original survey. A smaller difference would be expected against an original survey conducted in 1978 than an original survey conducted in 1878. Equipment and methods had improved significantly over a one hundred-year period.

(2) The reputation of the original surveyor. A magnitude of difference typical of comparison with one surveyor may not be typical of another surveyor.

(3) Difficulty of terrain. Steep terrain tends to magnify the discrepancies between older and newer equipment and methods.

(4) Conditions in the field at the time of the original survey. Although corrections should be applied to field measurements to correct for temperature and other factors, the reality of performing surveys at minus $40^0$ C in January or at $2^0$ C in a driving October rain make comparisons with a survey conducted on a pleasant $20^0$ C day in July difficult.

When the magnitude of difference with an original survey reaches the point where the proration threshold has been exceeded, the surveyor must use an alternate method to make sure the boundaries are correctly re-established. Some things to consider at that point may be:

(1) Is the magnitude of the difference with an original survey due to an error in the original survey? If so, errors are to be isolated and dealt with. Differences due to errors are not to be prorated into adjoining lots.

(2) Have the adjoining lots or blocks been explored to look for differences of similar magnitudes in opposite directions?

(3) Could adjoining road allowances have been posted at a different width than the original plan indicates?

(4) Ties to old fences and/or gaps between houses in a block may be required to see if they are evenly spaced.

(5) Subsequent surveys may have attempted to deal with the excess or shortage. Did the previous survey deal with the excess or shortage correctly? If the previous survey made an error in principle, there is no reason to repeat the error. (BCSC 4990/69, O'Connor v. Corra and Tolusso)

(6) Services, such as hydro poles or sidewalks, may have been constructed that could reasonably be traced back to the time of the original survey. Records of these services may be contained in municipal archives or the field books of other land surveyors.

The land surveyor must be aware of the basic principle of re-establishing boundaries. If a decision to prorate is deemed the best solution and the posting fits the occupation then the decision may well be the correct one, however, if the posting based on proration does not fit the occupation the greater likelihood is that proration is not the method that will put the boundaries back in their original position.

The argument that simply prorating a discrepancy between all owners affected is fair to everyone is not valid in law. The duties and responsibilities of the land surveyor with respect to both the survey structure and the individual owners are to replace the boundaries as close to their original positions as evidence may allow. Even newer fences may have been constructed to replace older fences that were constructed based on the original survey. This may give the fence line third preference in the hierarchy of evidence and place it above a mathematical solution involving proration.

There are instances where an original plan indicates the plan distance of a particular lot, usually at the end of a block of lots, as "more or less" by either using those words directly on the plan or attaching the "plus or minus" sign after the distance as shown in *Figure 3*. This can usually be taken to mean the original surveyor intended to set plan distances for the lots indicated without the plus or minus sign and put all difference in the block in the lot marked with the plus or minus sign. Re-establishing this block by doing just that may be the correct solution, however, the guiding principle of boundary reconstruction and all other evidence must be considered prior to adopting a mathematical solution.

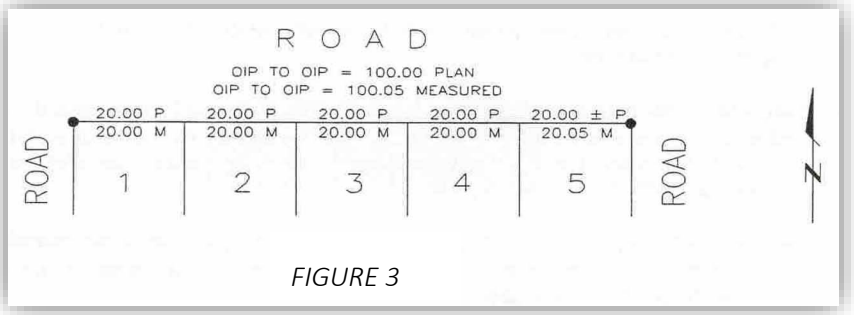


*FIGURE 3*

When determining the plan distances to prorate against, the land surveyor shall be careful not to double prorate. In *Figures 4 & 5*, lots 1 and 2 are subdivided into three lots: A, B & C.

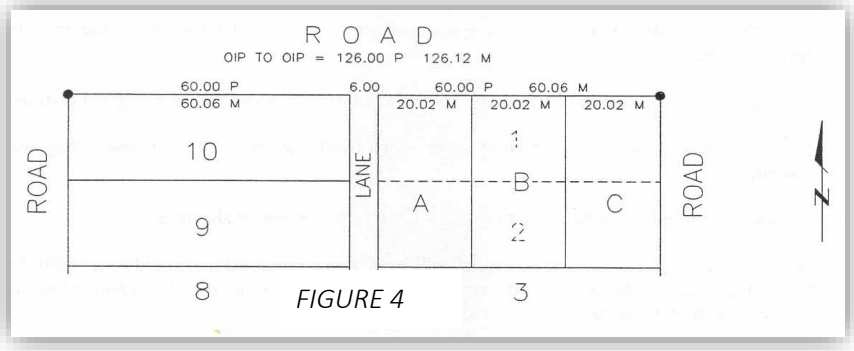


*FIGURE 4*

The plan distance across lot 1, 60.00, across the lane, 6.00, and across lot 10, 60.00, is 126.00. The measured distance between the old iron posts representing the two block corners is 126.12.

The calculation for determining the frontages of lots 1 and 10 would be as follows:

(126.12 - 6.00 = 120.12) / 120.00 x 60.00 = 60.06

With the lane being given plan width of 6.00, and the surplus prorated between lots 1 and 10. Lots A, B and C are then assigned equal frontages of: 60.06 / 3 = 20.02

In *Figure 5* another surveyor has been asked to replace the corners of lots A, B and C and measures the distance between the old iron posts as 126.06. In determining the overall plan distance between the two old iron posts, the original distance across former Lot 1, 60.00, shall be used, not the new plan distance across lots A, B and C of 60.06. If the new plan distance for lots A, B and C, 60.06, were used instead of the original plan distance across former lot 1, 60.00, the calculation for the measured distance across lot 10 would look like this: (126.06 - 6.00 = 120.06) / 120.06 x 60.00 = 60.00 and the calculation for the measured distance across lots A, B and C would look like this: (126.06 - 6.00 = 120.06) / 120.06 x 60.06 = 60.06

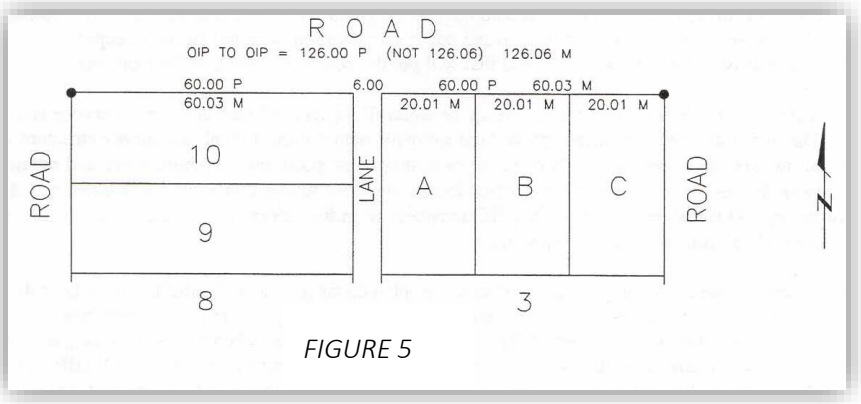


*FIGURE 5*

Although this calculation agrees nicely with the plan creating lots A, B and C, it leaves the two original lots 1 and 10 with different measured distances; 60.00 for lot 10 and 60.06 for lot 1. This is incorrect. The calculation for lot 10 and for former lot 1 should be: (126.06 - 6.00 = 120.06) / 120.00, original plan distances across lots 1 & 10, x 60.00 = 60.03

This correct solution keeps the distances across the original lots 1 and 10 in their correct proportions and avoids double proration. Lots A, B and C would then be given their prorated dimensions as: 60.03 / 60.06 x 20.02 = 20.01.

Re-establishing boundaries that are arcs of circular curves can be awkward due to the extra mathematical constraints involved in the geometry of curves as shown in *Figure 6*. The generally accepted basic principle involving re-establishment of curves is that the radius of the original curve be held.

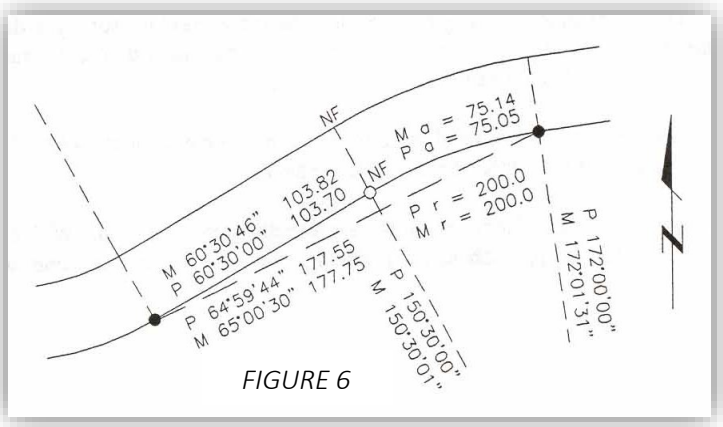


*FIGURE 6*

While this is usually the accepted procedure it must not override the guiding principle of re-establishing boundaries. This may involve changing the radius, making the curve non-tangential or adjusting the beginning and/or end of curve as the best evidence of the situation dictates.

## 1) Width of Roads

Section 5(3) of the *Land Survey Act* states:

> *(3) If a portion of the township, range or section line on which the corner, mound, post or monument was or should have been planted in the original survey is obliterated and lost, the surveyor must (a) run a line, similar to that shown on the original plan and field notes, between the 2 nearest points or places where the line can be clearly and satisfactorily ascertained, and (b) plant all intermediate posts or monuments as necessary in the line ascertained, giving the exact breadth to any allowance for a road or roads set out in the original survey.*

In accordance with section 5(3)(b) it has been accepted practice to make roads the width as stated on the plan that established the road when re-establishing corners through proration, unless there is evidence to the contrary, such as dimensions found in field notes of the original survey.

## 2) Summary on Proration

Section 5(2) of the *Land Survey Act* (formerly the *Official Surveys Act*) states that, under certain circumstances, roads must be given their full width when being re-established. This may have been implemented in order that any improvements placed on or in the road allowance remain within that allowance. However, Section 5 makes this statement with the following caveat; "*If it cannot be satisfactorily ascertained, then the surveyor shall measure the true distance between the nearest undisputed corners .... giving the exact breadth to any allowance for a road ....*". This clearly indicates that roads shall be given their full width only when there is no better evidence to the contrary.

Some general principles with respect to proration:

a) If the surplus or shortage is well beyond the limits of normal survey discrepancies caused by temperature, tension, sag or poorly calibrated chains or EDMs, look for a gross error. Gross errors are to be isolated and dealt with individually.

b) If a block consists of lots of equal dimension and a balance odd lot at one end or the other, it may be prudent to consider laying out the lots of equal dimension at plan distance, with all the surplus or shortage in the odd lot.

c) Consider the possibility that the road adjoining the block was not laid out at the plan width. This is distinctly possible and all the surplus or shortage may belong in the road, notwithstanding Section (5) 3 of the *Land Survey Act*.

d) Consider carefully the position of the road when one block is long and the adjoining block is short by a similar amount.

e) Research, research and more research is needed when you differ from the previous surveyor by large amounts. Every effort must be made to determine what the previous surveyor did by personally discussing the situation with the previous surveyor and by making a thorough examination of all legal survey and tenure records in the land title register and, if applicable, in the Crown land registry.

f) Use proration with extreme caution and remember it is last in the hierarchy of evidence and should only be used where there is no other better evidence available.

g) Consider alternatives to the solution that you are presently going to act on. With a little additional field work, or a different approach to the problem, you may be able to come up with a better solution.

## 3) Missing Diagonals

One of the problems encountered by land surveyors is when the diagonal corners of a parcel, for example a district lot, are the only original corners remaining as shown in *Figure 7*. If there are adjoining district lots then further searches can be made for other original monumentation so that consideration may be given to re-establishing the missing corners by producing adjoining lot lines the plan distance. In the case of an isolated single district lot, when the bearings have been properly reconciled and the length of the diagonal is in reasonable agreement with the original survey, the *Land Survey Act* would require a bearing-bearing solution based on the angles off the diagonal. This solution will also ensure that the ratio between the plan and measured distances for the four boundaries of the D.L. are in the same ratio as the plan and measured distances for the diagonal. It also has the advantage of retaining the correct angles at the four corners of the D.L. In all cases when a solution has been determined a further search for old evidence, based on that solution, should be carried out prior to posting.

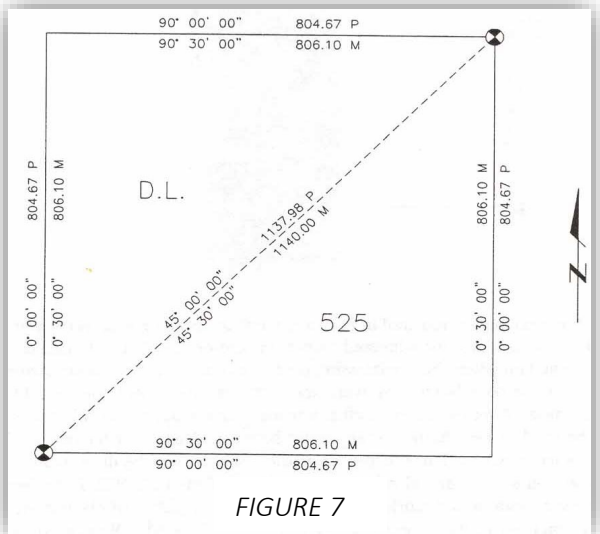

FIGURE 7

## 4) Witness Corners or Line Posts

There are several situations respecting witness corners and/or line posts. What situation presents itself to the land surveyor depends on the details on the plan and the rules in force at the time the survey was made.

a) The current Rules (SPR 2-10(1)(c ) & (d)) state that where a corner is unsuitable for posting, a single witness post is to be set but only if that location is within 20 m of the true corner. If a witness post can not be set within 20 m of the true corner, then posts of the type that would be required at the true corner must be set on each boundary radiating from the witnessed corner and, in this case, the posts set are line posts and must not be marked as witness posts.

b) Occasionally an original district lot survey will show one corner witnessed on both intersecting lines with two plan distances as shown in *Figure 8*.

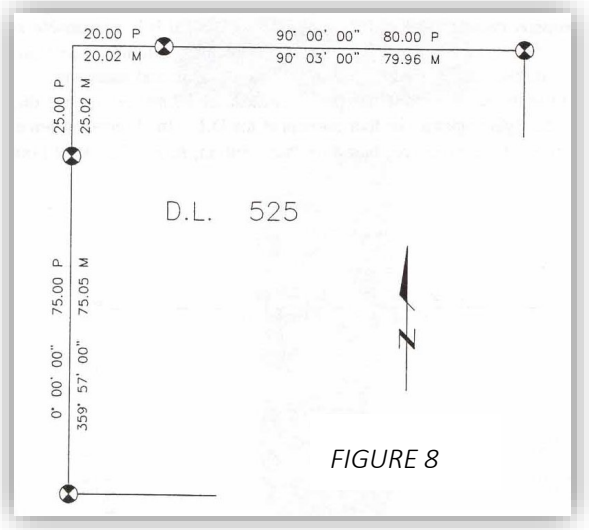

*FIGURE 8*

Both original posts were marked as witness posts and both had plan distances to the witnessed corner (not restricted to a maximum of 20 m) marked on the plan and often carved or stamped into the post itself. In a situation where both witnessing posts are found and have been deemed to be undisturbed and representative of the boundaries they were set to define, the general rule would be to produce both boundaries to intersection as if the posts were line posts. A measurement, such as a witness dimension, is fourth in the hierarchy of evidence and should only be used in the absence of any other better evidence of a boundary. In this case the two undisturbed posts are the better evidence of the boundaries than the witness dimensions. Rare circumstances may require an exception to this general rule where, in the opinion of the land surveyor, the best evidence available would indicate another location of the original boundaries. This practice of placing two witness posts at the same corner was amended in the General Survey Instructions Rules in 1991, and Section 9 (22) (2) of the GSIR. Also see GSIR Part 8, Division 2 regarding witness posts for Block Outline Surveys in the E and N Railway Grant lands.

c) Occasionally an original district lot survey will show one corner evidenced on both intersecting lines with two posts and two plan distances but without indicating that the posts are witness posts. The general rule would be to treat these posts as line posts.

## Part 3 – Gores & Overlaps

### 1) Background

In discussing gores and overlaps in the context of legal surveys, it is useful to refer to them as "apparent gores," and "apparent overlaps." This is because what appears, at first glance, to be an unintended gore between, or overlap of, adjacent surveyed parcels may often be found not to exist after the land surveyor has evaluated the application of common law and the *Land Survey Act* to the preliminary findings. What appears to be a gore or overlap usually results from an inaccurate or incomplete survey, where one or more of the parcels the surveyor created were intended to abut a pre-existing section or district lot boundary. Most of the apparent gores and overlaps which land surveyors have had to deal with during the modern (post 1947) period were created during the early (pre 1915) and middle (1915 to 1947) periods of B.C. surveying history, sometimes due to mistakes but mostly because, for reasons of economy, surveyors failed to adequately define pre-existing

section or district lot boundaries which were intended to form one limit of the new parcel. It was far cheaper simply to turn a 90 degree angle than to run out some distance to the previous corner, particularly in rough and wooded terrain.

There also appears to have been a failure, on the part of some land surveyors, who acquired their training and formative experience in the early period, when practically all surveys were original, to understand and appreciate the need to search for and evaluate old evidence.

During the early (land rush) period of Crown land surveying, numerous apparent gores and overlaps were created, between primary parcels, particularly in the district lot system, when surveyors, working from different points of commencement, failed to make appropriate ties to closely abutting surveys. Many of these were sorted out at the time but some have remained undetected into modern times. When a land surveyor discovers an apparent gore or overlap between district lots, where one or both parcels remain vested in the Crown, the first step is to advise the Surveyor General, who can sometimes provide a simple solution to the problem.

The relatively lax standards for preparation of plans under the *Land Registry Act* (now *Land Title Act*) during the early and middle periods add to the difficulties which face the modern surveyor in evaluating apparent gores or overlaps. Corner evidence which defines pre-existing corners is often not shown on the plan, or, if shown, may be nothing more than a hollow circle, with no indication as to whether this presumed post was found or set in the course of the survey. In the face of this, the presumption will usually be that the post is legitimate, but other contravening evidence, especially occupation, must also be evaluated if it exists.

There are several judicial decisions, in British Columbia and elsewhere, which demonstrate that, where the survey of a new parcel apparently overlaps a pre-existing parcel, that portion of the new parcel which overlaps the old is a nullity, that is, does not exist. The logic of this is simple. If the owner of the SW quarter of D.L. 123 engages a surveyor to survey a parcel which abuts their north boundary and the surveyor mistakenly overlaps the new parcel into the NW quarter, the owner cannot acquire ownership of the overlap because of the surveyor's mistake. Even if the mistake is not discovered until many years after it occurs, the north boundary will be where it always truly was - at the actual location of the quarter line. The subdivider could not convey land they did not own.

## 2) McKellar & Kelly vs Fotsch & Purden, 1988

Until 1988, the common law with respect to gores was much less clear. McKellar vs. Fotsch, (BC Supreme Court, New Westminster Registry, Jan., 1988) went a long way to clarify this.

See *Figure 9*. The facts of this case are as follows: In 1956, Sarah Anne Purden, the owner of the easterly 310 acres of District Lot 211, agreed to sell to J.W. Moore that part of her land lying between the Pemberton-Portage Road and the Lillooet River. She engaged the services of H.A. Cornwall, BCLS, to survey the parcel. In 1959, Cornwall's plan was deposited in the Land Registry Office as Plan 9479 and the title to Lot 1, Plan 9479, was conveyed to Moore. Cornwall's plan shows the east boundary of Lot 1 as being the east boundary of D.L. 211, with a bearing of north zero degrees twenty-six minutes east, both north and south of the road.

Some eight years after the deposit of the Cornwall plan, Alan Tolliday, BCLS, was engaged to survey and prepare a plan of subdivision of part of the adjacent District Lot 210, which plan was subsequently deposited as Plan 20157. As a first step in defining the boundary between the district lots, Tolliday quite logically produced a line through the three iron pins on the east boundary of Plan 9479 in a northerly direction to the vicinity of the NE corner of D.L. 211. When he found, by doing this, that he missed the original monument at the northeast corner by about 150 feet, he chose to disregard the Cornwall iron pins and to define the district lot boundary by running Astronomic South, by stellar observation, from the original monument to the river. Using this methodology, he found, as depicted on *Figure 1*, that Cornwall's posts were far to the west of the true boundary, that the Cornwall plan bearings were about three degrees off, and that there was an apparent gore containing 0.72 acre, between Lot 1 and the east boundary of D.L. 211.

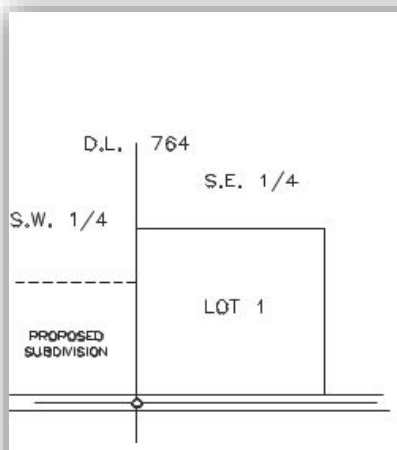


FIGURE 9

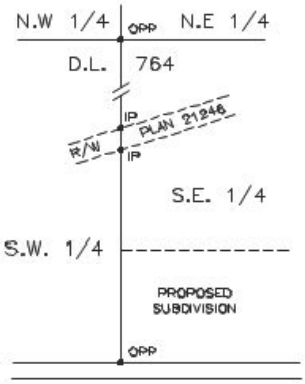


FIGURE 10

Although the specific method used by Tolliday in re-defining this boundary may be arguable, that was never an issue in the subsequent legal action and the district lot boundary defined by Tolliday was confirmed by the judge as the true boundary between District Lots 210 and 211. There was also some discussion of the fact that Cornwall's three posts were reset in concrete by the first owner of Lot 1, and may thereby have been shifted slightly, but this, too, was found irrelevant to the main issue.

By the time the matter reached the BC Supreme Court, there were three claimants to the apparent gore, McKellar, the owner of Lot 1, Fotsch, the owner of the Lot A, D.L. 210 and G.B. Purden, son of Sarah Anne and owner of the remainder of the parent title in D.L. 211. McKellar was plaintiff in the action, with Fotsch and Purden the defendants. Although some argument was advanced on behalf of Fotsch, on grounds of occupation, because he had occupied the "gore" by mistake due to the erroneous Cornwall survey, the principal argument advanced by the defence relied on Sections 1 and 2 of the *Land Survey Act*, which state that all corners of primary parcels, set "under the authority of the Province", are the true and unalterable corners. In determining that there was no gore and that the apparent gore is part of Lot 1, the judge decided that these two sections of the act apply to original surveys, but not to retracement surveys.

The logic of this is that the duty of the surveyor, Cornwall, had two components, the first being to re-establish an existing boundary, which was also a boundary of his new survey, and the second being to post the corners of the new parcel and record the posts by plan. The judge ruled that the fact that

Cornwall failed to correctly re-establish the boundary could not negate the clear intent, which was to make the east boundary of Lot 1 coincide with the east boundary of the district lot. In other words, the posts set by Cornwall govern the boundaries of Lot 1, except where they represent an incorrect location of a pre-existing boundary.

## 3) Practical Considerations

While *McKellar vs. Fotsch* is helpful in providing guidance in dealing with apparent gores, there is still some uncertainty as to the extent of its application. When dealing with an apparent gore or overlap, as with any evidential situation where there is legal uncertainty, the surveyor needs to keep their client informed as to any legal risks which may flow from decisions the surveyor has made.

There is also always the question of how much reliance can be placed on old posts which are purported to be on line when the modern surveyor is carrying out a survey, one or more boundaries of which abut pre-existing lines. A couple of hypothetical examples may be helpful. See *Figures 9 and 10.*A proposed subdivision of part of the SW 1/4 of D.L. 764 is being prepared as shown on *Figure 9*. It abuts Lot 1 which was surveyed out of the SE 1/4, which was created by a subdivision plan deposited in 1935. This plan shows no evidence, either found or set, except for an unlabelled hollow circle at the south quarter point of the district lot.

A search for evidence reveals old angle irons at the southwest and northwest corners of Lot 1, supported by old fences. It is decided to accept the old angle iron at the southwest corner as the true corner and also as a 33 foot witness to the quarter corner, but it is determined that, without further investigation, the old angle iron at the northwest corner of Lot 1 cannot be accepted as being on the true north-south quarter line, because there is nothing on the old plan to indicate that this line was run in the course of the subdivision survey. Accordingly, after further work, it is decided to place the northeast corner of the subdivision on a straight line between the SW corner of Lot 1 and the quarter point at the centre of the district lot as defined. The plan will show a tie to the old angle iron near the northwest corner of Lot 1, and, in accordance with the decision in *McKellar vs. Fotsch*, the plan will show Lot 1 extending to the quarter line if it is found that the old angle iron is easterly of the true quarter line. If it is found that Lot 1, as surveyed, overlaps into the SW 1/4, then that part which overlaps is a nullity, since the owner of the SE 1/4 could not have acquired and transferred the area of the overlay by means of an erroneous survey. The northwest corner of Lot 1 will be shown as being on the quarter line.

Referring to *Figure 10*, there is a similar situation, except that the old R/W plan clearly shows the evidence used to establish the quarter section boundary upon which it is based. It is always incumbent upon the land surveyor to ensure that pre-existing boundaries are correctly re-established, and it is therefore prudent to survey the full length of the quarter line. In *Figure 10*, provided that there is good agreement with measurements shown on Plan 21246 and that Plan 21246 appears to have correctly and accurately re-established the true quarter line, it may be acceptable to not go beyond the posts on the R/W plan in retracing the quarter line.

In dealing with apparent gores, overlaps and posts off line, it is always necessary for the land surveyor to keep to the tenets of the *Land Survey Act* and case law, and to use common sense in the evaluation of results.

It is also necessary to treat any survey which discloses major encroachment of long-standing improvements with a great deal of care and to ensure that the client is made aware of any legal uncertainties if potential encroachments are involved.

## Part 4 – Natural Boundary Determination Principles

During the course of conducting a survey, British Columbia land surveyors are regularly called upon to determine the location of natural boundaries. The purpose of this section is to provide some guidelines to land surveyors when determining the location of natural boundaries.

The location of natural boundaries can be difficult to determine without actually being on site. Natural boundary determination often requires considerable professional judgement and may create a situation where the land surveyor could be called upon to defend their professional judgement against challenges of various kinds.

Given, for example, the high property values of waterfront parcels, and the fact that there are often strict building setback requirements from natural boundaries, the land surveyor should exercise increased diligence in determining the location of natural boundaries, and if possible be in attendance when determining these locations.

The *Land Act* of British Columbia defines the natural boundary as: "The visible high water mark of any lake, river, stream, or other body of water where the presence and action of the water are so common and usual, and so long continued in all ordinary years, as to mark on the soil of the bed of the body of water a character distinct from that of its banks, in vegetation, as well as in the nature of the soil itself." This definition comes from the court case, *Howard et al vs. Ingersoll (1851), 13 How. 381.* While the case dealt with fresh water, the same principles can also be applied to tidal waters.

The *Manual of Instructions for the Survey of Canada Lands* defines the ordinary high water mark as: "The limit or edge of the bed of a body of water. In the case of non-tidal waters, it may be called the bank". In the same manual, the natural boundary is defined as "A boundary defined by a natural feature such as the bank of a body of water or the middle thread of a stream". Further, in the same manual, the bed is defined as "The bed of a body of water is the land covered so long by water as to wrest it from vegetation, or as to mark a distinct character upon the vegetation where it extends into the water or upon the soil itself".

Older survey plans used the term high water mark to define what we now call the natural boundary. The general public also uses the term high water mark and in the case of the ocean, they often see the flotsam and jetsam left by the previous high tide and they consider that as being the high water mark. It is little wonder there is confusion over the location of the natural boundary!

Older surveys were performed and plans were prepared using different technology and different standards than apply today. This has resulted in the location of natural boundaries shown crudely and inaccurately on many older plans. The inaccuracy of the depiction of the natural boundary can be corrected by following the procedures outlined in Circular Letter number 477A issued by the Surveyor

General of British Columbia. Matters dealing with erosion, avulsion, and accretion are also dealt with in various Circular Letters from the Surveyor General.

Natural boundaries that are external perimeter boundaries must be surveyed more accurately than other natural boundaries that are wholly inside surveyed parcels. Various sections in the Rules deal with the surveys of natural boundaries when preparing plans made pursuant to the *Land Act*, and the *Land Title Act*, the *Mineral Tenure Act*, and general rights of way, highway and railway surveys. In order to be consistent in terminology and so that present and future owners may know their legal position respecting a waterfront parcel, water boundaries must be clearly labelled on plans to indicate the situation at the time of the survey. The following terms should be used:

(1) where the present and original natural boundaries are in different positions, "Present Natural Boundary" and "Natural Boundary according to Plan _____."

(2) where the present and original natural boundaries are coincidental, "Present Natural Boundary and Natural Boundary according to Plan _____."

(3) where fill or excavation has occurred, the limits of the fill or excavation are to be labelled as "Limit of Fill" or "Limit of Excavation", as appropriate. The location of the limit of fill or limit of excavation ought to be where the present natural boundary would have been if the fill or excavation were to have been caused by natural means.

On natural boundaries of tidal waters, there are usually two situations that are applicable. There can either be solid rock or beach frontage. On solid rock, there is usually a "black line" above the sea growth that indicates the high water level. On vertical or near vertical solid rock the natural boundary is slightly higher than this black line. On solid rock that is gradually sloping, it is more difficult to determine the natural boundary. One must look for any evidence of where the tidal action meets the vegetation and that can often be only moss or lichen.

On ocean beach frontage, there is often a line at which the upland vegetation ceases to grow. The land surveyor should carefully examine the vegetation above this line to ensure that it is permanent (not seasonal growth) and that it is indicative of terrestrial vegetation. The land surveyor should observe the accumulation of driftwood and debris. Often there are large logs thrown up by storms that are lying at, or even above, the natural boundary. The location of the natural boundary is at the limit of permanent upland vegetation and where the soil types change so as to contain organic material. (In contrast, soils below the natural boundary are water washed enough so that organic materials cannot accumulate.)

Sometimes the natural boundary of tidal waters is nicely defined by both a change in vegetation type and in the natural of the soil, but not always: sometimes the natural boundary falls upon rock and there is no vegetation. On solid rock, sometimes a type of water tolerant lichen grows that appears as a "black belt" upon the rock. Although not definitive, land surveyors have been accepting the top of this belt as the natural boundary. The land surveyor must be as diligent in determining the location of a natural boundary as they would an artificial boundary and should seek corroborative evidence such as moss or lichen which only grows above the natural boundary.

Occasionally, the upland limit of a sandy beach may appear to be above the surrounding natural boundary. This may be caused by sand blown inland. The upland limit of the edge of vegetation in this

case is not caused by the action of water, but by the action of wind, and would therefore not be indicative of the natural boundary. In this case, a land surveyor should carefully inspect the limit of the natural boundary on either side of the wind blown sand, and may have to extrapolate where the natural would likely join the known locations of the natural boundary on either side of the beach.

On lakes, the natural boundary is generally well defined on the ground by the distinct line where the grass and vegetation cease to grow. Creek and river beds are most often similar to lake frontage in that there is usually a distinct line where the vegetation ceases to grow. On some small seasonal watercourses the vegetation grows right through them and therefore there is no natural boundary. It should be noted that on lakes, rivers, and streams, spring freshets typically over-flow the natural boundary.

## 1) Accretion

Accretion is the gradual and imperceptible natural deposition of land to an upland parcel. This may be a natural process or it could be caused by a natural process as a result of a structure placed on another property by another party. (See Occasional Paper No. 5, March 1995, Ministry of Environment, Lands and Parks, Land and Water Programs Branch.)

Under common law lawful accretion belongs to the owner of the upland parcel to which it attaches. To be considered as lawful accretion the new land must:

a) Build upon the existing natural boundary from the upland parcel,

b) The rate of accumulation must be slow and imperceptible, that is, the upland accumulation cannot be noticed hour by hour or day by day, but perhaps can be noticed month by month or year by year,

c) The new land must not be forming as a direct result of the upland owner, for their own benefit, intentionally causing the new land to form. However, if the new land is forming as a result of the placement of something up-stream or up-current such as a groyne, the new land may in certain circumstances be considered as lawful accretion.

## 2) Reliction

Reliction is defined in various texts as:

- *The "gradual change of water line on real property which gives the owner more dry land."*
- *"the gradual recession of water leaving land permanently uncovered."*
- *"Increase in the land area due to the gradual recession or shrinkage of a body of water such as a lake or sea, or change in the boundaries of a land due to a change of course by a river or stream".*

The process of Reliction is also referred to as Dereliction. Black's Law Dictionary defines Dereliction as: "*An increase of land caused by the receding of a sea, river, or stream from its usual watermark.*"

Under common law new land that has formed as the result of slow and natural reliction, and which has taken on upland characteristics, is considered to be lawful accretion. Like accretion, this new land can be brought into a certificate of title through an application to the Surveyor General pursuant to section 94(1)(c ) of the *Land Title Act*. (See Circular Letter 477A)

Land that has taken on upland characteristics downstream of a dam solely or primarily as a result of the dam's action on the flow of water in a river or stream is not considered to be lawful accretion. Rather this 'new land' remains owned by the owner of the river or stream (generally the Crown). The waterward boundary of properties along the river or stream remains in the location of the natural boundary as it was the moment before the dam began interfering with the natural flow of the water.

Conversely, upstream of dam the limit of ownership of a parcel having a natural boundary remains at the natural boundary the moment before the dam began impeding water. So, even though much of a parcel may be submerged, the land remains owned and the limit of ownership is at the natural boundary in its location just prior to flooding.

### 3) Erosion

Erosion is defined as the "*act or operation of wearing away*" and is a gradual and imperceptible change in the location of the natural boundary of an upland parcel due to the continued action of the water. As titled land slowly and naturally erodes ownership of the eroded land reverts to the owner of the water body (generally the provincial Crown) in accordance with common law.

### 4) Avulsion

Avulsion is defined as "*a fragment torn off*" and is the sudden and perceptible change in the location of a body of water due to cataclysmic events, such as, for example, a breakthrough of a new river channel, severe winter storms or a , landslide.

Where an avulsive event has occurred, the extent of ownership of a parcel of land remains unchanged. The new bed of the body of water continues to be owned by the party who owned the land prior to the avulsive event. The limit of ownership is to the natural boundary(s), where ever they were located prior to the avulsive event.

Recent avulsion is sometimes easily recognized in that there is often a cut bank immediately above the limit of the avulsion which may be distinct in its lack of vegetation. It is, however, possible that avulsion may have occurred many years earlier and, over time the upland has stabilized and vegetation has taken hold, such that it is not evident that the change occurred through a means other than erosion or accretion. Careful research may be necessary to determine which process resulted in the change of location of a water body.

A sudden change in the location of a stream bed, often referred to as avulsion or an avulsive event, does not result in the change of ownership of land. The new bed of the body of water continues to be owned by the party who owned the land prior to the avulsive event. The limit of ownership is to the natural boundaries, where ever they were located prior to the avulsive event.

### 5) Fill

Fill, with respect to land, refers to land artificially raised with piled rocks, gravel, or dirt, etc. Fill in relation to boundaries refers to piled rocks, gravel, dirt, etc. placed on the foreshore or below the natural boundary.

Fill is not accretion.

The difference between fill and lawfully accreted land is usually very obvious when viewed on site.

An accretion has a natural boundary, fill does not. The limit of fill is often defined by a human-made feature such as a retaining wall perhaps made of large blasted shot rock, logs, concrete blocks or sheet piling. The type of soil used as fill is often distinctly different from the surrounding native soil and the profile from the bed of the water body, through a fill area to the undisturbed ground landward of the body of water often appears un-natural.

Determination of the natural boundary when it has been obscured by fill can be difficult, even in cases where there is clear evidence of the natural boundary on both sides of the fill, as there may have been sinuosities in the location of the natural boundary beneath the area of fill. The location of the natural boundary, in these cases, must be determined from the best available evidence which may include, but not be limited to, the original or subsequent surveys of the boundary in question, old aerial or terrestrial photographs, trenching and the report of a soils expert or affidavits from present or previous owners.

If a parcel of land has only one natural boundary, and other limits, such as the natural boundary according to the plan upon which title is based, the limit of fill, or the limit of excavation, should not be interpreted as representing the true natural boundary, since the true natural boundary is where it was immediately prior to the filling or excavation having occurred as shown in *Figure 11*.

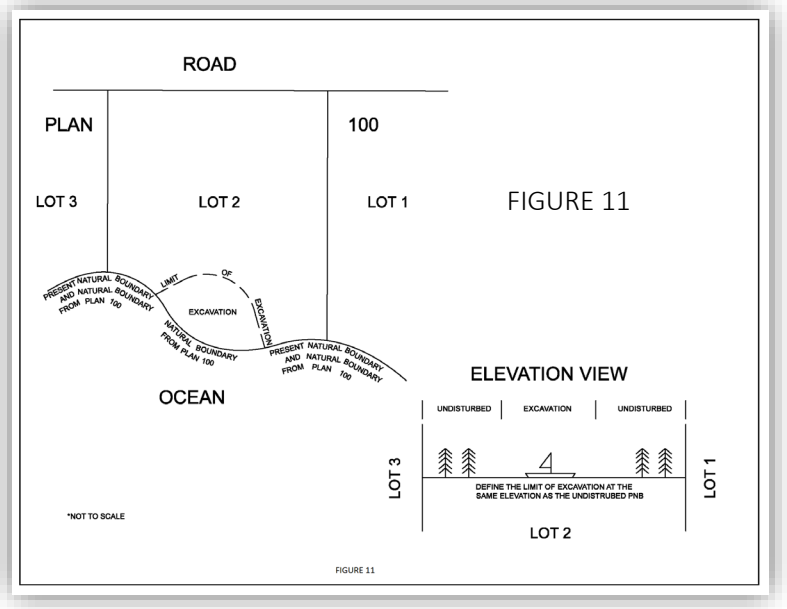

FIGURE 11

By their nature, natural boundaries are ambulatory and where erosion or accretion occurs, the limit of ownership moves with the natural boundary. Section 94 of the *Land Title Act* provides the administrative means to update the survey and plan upon which title is based to reflect the new location of the natural boundary of the parcel of land.

## Part 5 - Deferred Posting Using Section 69 *Land Title Act* (Block Outline Plans)

Section 69 of the *Land Title Act* provides a mechanism through which a subdivision plan may be prepared and registered with only control monuments set. Except where the corner might be coincident with a Control Monument, posts are not initially set at corners of the new parcels and roads, rather these corners are related mathematically to the control monuments.

Control monuments must be of a type 1 or 2, must be set in locations that are as safe as possible from disturbance, and if possible they should be intervisible.

Although section 69 (1)(a) of the Act specifies that the deferred method of monumentation can only be used for subdivisions, the Land Title and Survey Authority has interpreted this to include the subdivision plan and other plans required in conjunction with the subdivision, for example rights of way plans.

In order for a land surveyor to use the deferred method of posting pursuant to section 69 they must make application to the Surveyor General. See Surveyor General's Circular Letter No. 461B. If the application is approved, the land surveyor is generally given a period of one year after registration of the subdivision plan in which to complete the final posting of the new parcels and roads created by the plan, and of the angles and parcel intersections defined on any of the supporting plans. The reason for using the block outline method of deferred posting is to assist with the long term survivability of the monumentation. This is accomplished by setting the monuments after road and infrastructure construction and parcel grading has been completed. Should road and infrastructure construction not be completed within the time allowed in the Block Outline Order issued by the Surveyor General, the land surveyor should make a subsequent application for an extension of the time in which posting must be completed.

The land surveyor who signs the subdivision plan utilizing the block outline method of deferred posting is legally required, pursuant to s. 69, to complete final posting within the period specified by the Surveyor General, unless the Surveyor General determines otherwise.

**Note**

Of important note, a land surveyor who utilizes the block outline method of deferred posting remains legally responsible for completing final posting even if the client is unable or unwilling to pay for it.

Land surveyors should be aware of this potential risk before agreeing to use the block outline method.

To help mitigate the risk that a client won't pay for completion of final posting and the final posting plan, land surveyors who use the block outline method should consider obtaining some form of financial security from a client prior to undertaking the survey. For example, a land surveyor could request payment for final posting early, at the same time as payment is requested for preparation of the subdivision plan. Similarly, a land surveyor could request that the client enter into a surety bond, to ensure that the land surveyor will still be paid if the client defaults. A land surveyor who considers using some method to secure payment should seek legal advice where necessary.

Association of

**British Columbia Land Surveyors**