

Functional Requirements Specification for the Vote Count

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Distribution

Name(s)	Company
Ian Brightwell	NSW Electoral Commission
Sue Strudwick	NSW Electoral Commission
Terry Jessop	NSW Electoral Commission
Phil Binns	NSW Electoral Commission

Name(s)	Company

Approval

Name	Title / Organisation	Signature	Date
Ian Brightwell	Manager, Information Systems / NSW Electoral Commission		
Terry Jessop	Elections Branch, NSW Electoral Commission		

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1 Vote Count

1.1 Overview

The main purpose of the vote count module is to fully process a Legislative Council Election or Local Government Election Count in order to determine the candidates elected in accordance with the proportional representation counting method.

The Counting Algorithm presented below is required to process the Count and Preference Distribution from the keyed Ballot Paper details for both types of Elections. The process includes all the logic necessary for the distribution of preferences and random selection of papers to be set aside so that the required number of candidates is elected.

Essentially the process is the same for both Legislative Council and Local Government Election Counts; however at particular steps in the logic, different processing rules apply to each election type. These differences are explicitly identified in the process descriptions below.

The method of counting votes for a Legislative Council Elections is as directed by Reference 1.

The method of counting votes for Local Government Election is as directed by Reference 2.

Legislation clauses and subclauses quoted in this document are sourced from the above mentioned Legislation Schedule references.

1.2 References

- 1) Constitution Act 1902 No 32, Sixth Schedule Conduct of Legislative Council elections.
- 2) Local Government (General) Regulation 2005, Schedule 5 Counting of votes under proportional system.
- 3) Functional Requirements Overview and Technical Solution v1.2.doc, 07 April 2009, Kim Leung.
- 4) Logical Data Model v1.3.doc, 07 April 2009, Kim Leung.

1.3 Vote Count Flow Chart

The diagram below shows the high level steps of the vote counting method.

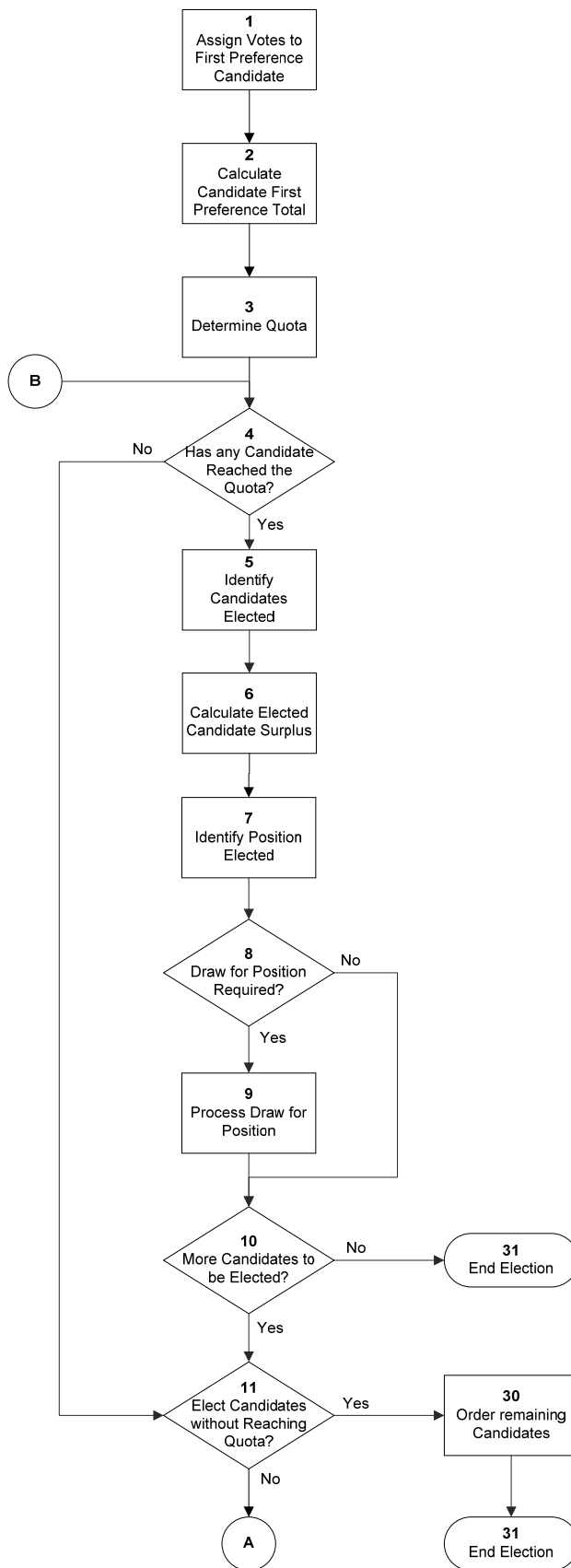


Figure 1.1 First Preference Count and Elected Logic

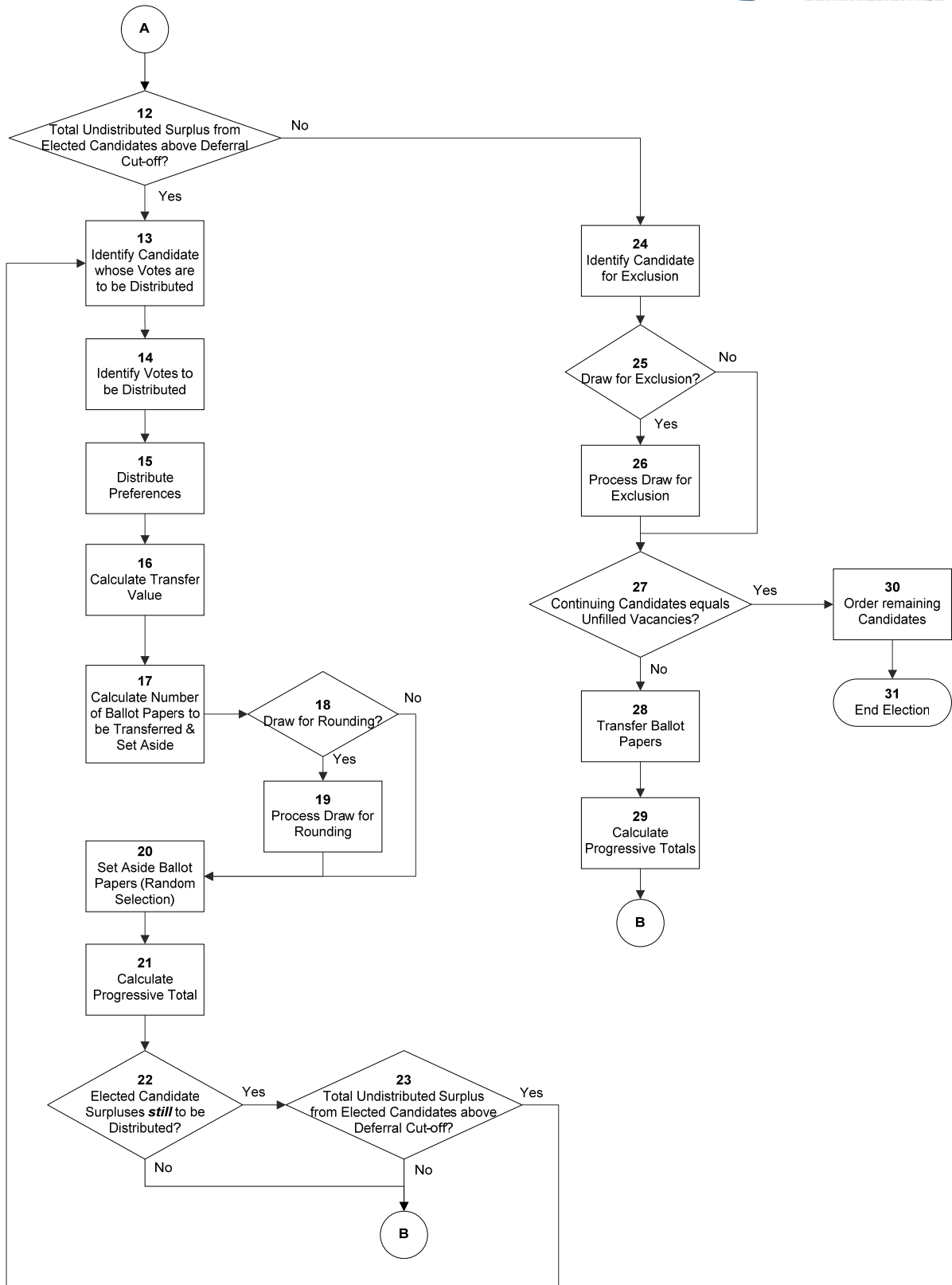


Figure 1.2 Main Process Loop and Exclusion Logic

1.4 Vote Counting Method

The Vote Count and Preference Distribution Algorithm is described below with reference to the Steps presented in the process flow charts in Figures 1.1 & 1.2.

The algorithm is initiated manually once all data entry and formality checking has been completed for an Election but all Steps described are automated as a single background process.

The process commences with the assignment of First Preference Votes (designated as Count 1) and continues with subsequent Preference Distributions (Subsequent Counts) until the required Number of Candidates has been elected.

The following data for each Election to be counted is required by the algorithm:

- a) Candidate details. At the beginning of the Count all Candidates are “Continuing”, unless they have been deemed “Ineligible” (e.g. if they have died after nomination but before election day or have been elected as a Local Government Mayor)
- b) Number of Candidates to be Elected
- c) Number of formal votes
- d) Number of informal votes
- e) Valid Preference details for each ATL paper, converted into BTL preferences
- f) Valid Preference details for each BTL paper.

1.4.1 Step 1 - Record First Preference Votes for each Candidate

1.4.1.1 Business Description

For each formal ballot paper, the vote is assigned to the Candidate indicated as the first preference (i.e. marked with a Number 1).

If this candidate is ineligible to receive votes the ballot paper is assigned to the Candidate marked with the next preference (i.e. with the Number 2) until an Eligible Candidate is determined.

1.4.1.2 Database Processing

#	Action	Table Reference
1	Indicate that the count process has started by setting Count_Executing_Flag = “Y”	ElectionArea
2	Create a count record with the following attribute values: ElectionEventID = election event ID for the contest ContestID = contest ID CountID = 1 CountType = “First Preference” VotesDistributed = 0 TransferValue = 0 ExhaustedVotes = 0 SetAsideVotes = 0 LeastVotesDifference = -1 FirstLowestCandidateID = 0 SecondLowestCandidateID = 0 CandidateID = 0 CountReportComplete = “N”	Count
3	Select all ballots that have a preference of 1.	BTL_Expanded_Preference
4	For each first preference selected, check the eligibility of the candidate prior to assigning the vote to the candidate. Get the eligibility status of the candidate.	Candidate
5	If the CandidateEligibilityFlag = “Y” then assign the first preference vote to that eligible candidate by creating a ballot paper movement record and assigning the following attribute values:	Ballot_Paper_Movement

	<p>ElectionEventID = election event ID for the contest ContestID = contest ID CountID = 1 VCBallotPaperID = ballot paper's unique ballot paper ID MovementType = "First Preference" FromCandidateID = 0 ToCandidateID = candidate ID marked with 1st preference.</p>	
6	<p>If the CandidateEligibilityFlag = "N" then assign the first preference vote to the eligible candidate next in the order of the voter's available preferences.</p> <p>a. Get the next available preference.</p> <pre>SELECT count (*) FROM BTLExpandedPreference, Candidate WHERE VCBallotPaperID = the retrieved ballot paper ID AND Preference = 1 + n AND CandidateEligibilityFlag = "Y"</pre> <p>Where n is 1 and incremented by 1 until SQL count returns 1 or until n = maximum preference on the vote.</p> <p>If SQL count = 1 then the next preference is valid (i.e. the next preference is for an eligible candidate).</p> <p>If SQL count = 0 then all next preferences have been ignored (i.e. the next preferences were for ineligible candidates) or there were no more preferences which means this is an exhausted vote.</p> <p>b. If a next eligible candidate was found from (a) then assign the first preference vote to that candidate by creating a ballot paper movement record and assigning the following attribute values:</p> <p>ElectionEventID = election event ID for the contest ContestID = contest ID CountID = 1 VCBallotPaperID = ballot paper's unique ballot paper ID MovementType = "First Preference" FromCandidateID = 0 ToCandidateID = candidate ID marked with next preference.</p> <p>c. If a next eligible candidate was not found from (a) then create a ballot paper movement record and mark this vote as an exhausted vote:</p> <p>ElectionEventID = election event ID for the contest ContestID = contest ID CountID = 1 VCBallotPaperID = ballot paper's unique ballot paper ID MovementType = "Exhausted" FromCandidateID = 0 ToCandidateID = 0</p>	<p>BTL_Expanded_Preference Candidate Ballot_Paper_Movement</p>

1.4.2 Step 2 – Calculate Candidate First Preference Total

1.4.2.1 Business Description

Each Candidate's Total of First Preferences (their Progressive Total) is calculated by summing all votes assigned to them.

1.4.2.2 Database Processing

#	Action	Table Reference
1	<p>Calculate each candidate's current progressive total.</p> <p>For each eligible candidate (i.e. CandidateEligibilityFlag = "Y"), get the total number of first preference votes by counting the number of ballots where the CountID is equal to 1 and FromCandidateID is equal to 0.</p> <p>If no records were returned for the eligible candidate (since they did not receive any votes then their Progressive Total = 0.</p>	<p>Candidate</p> <p>Ballot_Paper_Movement</p>
2	<p>Store each eligible candidate's progressive total by creating a candidate history record with the following attribute values:</p> <p>ElectionEventID = election event ID for the contest ContestID = contest ID CountID = 1 CandidateID = candidate ID VotesDistributed = 0 Votes Transferred = 0 ProgressiveTotal = progressive total derived from Action 1 CandidateStatus = "Continuing" SurplusMovement = " "</p>	<p>Candidate_History</p>

1.4.3 Step 3 - Determine Quota

1.4.3.1 Business Description

The quota represents the total number of votes sufficient to elect a candidate. The quota is calculated using the following formula:

$$\left(\frac{\text{Total Number of Formal Votes}}{\text{Number of Candidates to be Elected} + 1} \right) + 1 = \text{Quota}$$

Any resultant fraction is ignored to obtain an integer value.

1.4.3.2 Database Processing

#	Action	Table Reference
1	Total the number of first preference votes for all eligible candidates by counting the number of ballots where the CountID is equal to 1 and FromCandidateID is equal to 0 and MovementType = "First Preference".	Ballot_Paper_Movement
	Get the number of positions contested from the NumberOfPositionsContested field.	ElectionArea
	Using the values from Action 1 & 2, calculate the quota using the formula above (disregarding the remainder) and store the derived quota value in the Quota field.	ElectionArea

1.4.4 Step 4 – Has any Candidate reached the quota?

1.4.4.1 Business Description

Each Candidate's current Progressive Total is compared to the Quota.

[Note: This is done as a matter of course after the first count. While transfer counts are in progress, a check of the Continuing Candidates' current Progressive Totals against the Quota to see if any further Candidates are elected does not take place until the Distribution of the Surplus Votes of all

Candidates elected has been completed **OR** the Total Undistributed Surplus Votes of all Candidates elected is below the Deferral Cut-off.

For all counts after an Exclusion count, each Candidate's current Progressive Total is compared to the Quota. All Candidates whose current Progressive Total is greater or equal to the Quota are declared elected.]

If one or more Continuing Candidates have a Progressive Total greater than or equal to the Quota then continue at **Step 5**. Otherwise, continue at **Step 11**.

1.4.4.2 Database Processing

#	Action	Table Reference
1	Select each continuing candidate who has a progressive total which is greater or equal to the stored quota. Continuing candidates are candidates who, in their latest history record, have a CandidateStatus = "Continuing"	Candidate_History ElectionArea

1.4.5 Step 5 – Identify Candidates Elected

1.4.5.1 Business Description

All Candidates, whose current Progressive Total is greater than or equal to the Quota, are declared elected, and cannot receive further votes.

1.4.5.2 Database Processing

#	Action	Table Reference
1	Update the elected candidate's latest history with the following attribute value: CandidateStatus = "Elected"	Candidate_History

1.4.6 Step 6 – Calculate Elected Candidate Surplus

1.4.6.1 Business Description

The Surplus Votes available for subsequent distribution for each of these Elected Candidates is calculated by subtracting the Number of Votes needed for their Election (i.e. the Quota) from the Candidate's Progressive Total.

Surplus Votes for each Elected Candidate = Candidate's Progressive Total – Quota.

If there are Candidates elected by reaching the quota exactly then they do not have any surplus votes available for distribution and all their votes are to be set aside.

1.4.6.2 Database Processing

#	Action	Table Reference
1	Calculate and store the surplus votes for each elected candidate as follows: a. Get the progressive total of each elected candidate from Step 5 Action 1 b. For each elected candidate, calculate their surplus votes as follows: ProgressiveTotal – stored Quota c. Store the calculated number of their surplus votes by updating the elected candidate's record as follows: VCSurplusVotes = elected candidate's surplus votes	Candidate_History ElectionArea Candidate

1.4.7 Step 7 – Identify Position Elected

1.4.7.1 Business Description

The order or position in which each Candidate is elected affects the order of Distribution of the Surplus Votes.

In the case of the First Preference Count, the Elected Candidates are assigned positions in the sequence of their respective Surplus (i.e. the Candidate with the highest Surplus is deemed to be elected first and assigned Position 1, the next highest Surplus assigned Position 2) until all Elected Candidates are positioned.

For Subsequent Counts the Position Elected continues from the previous Count. If 2 or more Candidates are elected at the same Subsequent Count, the Candidates are also assigned Positions in the sequence of their current Surplus (i.e. the highest current Surplus is considered elected to the next position, the Candidate with the next highest current Surplus to the next position) until all Elected Candidates are positioned.

1.4.7.2 Database Processing

#	Action	Table Reference
1	Sort the candidates selected in Step 5 Action 1 by their surplus in descending order.	Candidate
2	If the current count is 1 then elect each candidate from Action 1 to the next available position in the sequence of their surplus, commencing at position 1.	Candidate
3	If the current count is greater than 1 then elect each candidate from Action 1 to the next available position in the sequence of their surplus, commencing at the last elected position + 1.	Candidate
4	Update the elected candidate's record to indicate the count at which they were elected and their order of position as follows: VCElectedOrExcludedAtCountID = current count VCOOrderOfElection = position elected	Candidate

1.4.8 Step 8 – Draw for Position Required?

1.4.8.1 Business Description

If the Election is a Legislative Council Election and there are 2 or more Candidates with equal Progressive Totals that exceed the Quota, then a draw must be conducted to determine the order of distributing surpluses for these Candidates.

If the election is a Local Government Election and there are 2 or more Candidates with equal Progressive Totals that exceed the Quota, then the Count process must be reviewed to go back and determine the previous Count at which the Progressive Totals for these 2 or more Candidates were last unequal and elect first the Candidate with the highest Progressive Total at that point.

If the 2 or more Candidates have had equal Progressive Totals at all preceding Counts (including Count 1), then a draw must be conducted to determine the order of distributing surpluses for these Candidates.

Otherwise, the process continues at **Step 10**.

1.4.8.2 Database Processing

#	Action	Table Reference
1.	In the case of LC Elections, if there are 2 or more continuing candidates who have an equal progressive total then continue to Step 9. In the case of LG Elections, if there are 2 or more continuing candidates who have an equal progressive total, the candidate who had the highest progressive total at a preceding count (starting from the last count) will be elected to the next available position, followed by the candidate with the next highest progressive total and so forth. a. Select the history records of the tied candidates where	Candidate_History Candidate

	<p>the Count ID = current count – 1</p> <p>b. If (a) above shows that 2 or more of these candidates had unequal progressive totals at the previous count then these candidates will be elected to the next available position in order of their progressive total</p> <p>Update the elected candidate's record to indicate the count at which they were elected and their order of position as follows:</p> <p style="padding-left: 40px;">VCElectedOrExcludedAtCountID = current count</p> <p style="padding-left: 40px;">VCOOrderOfElection = position elected</p> <p>c. However, if (a) above shows that 2 or more candidates were still tied at the previous count then continue through the preceding counts to determine the last count at which they had unequal progressive totals</p> <p>Update the elected candidate's record to indicate the count at which they were elected and their order of position as follows:</p> <p style="padding-left: 40px;">VCElectedOrExcludedAtCountID = current count</p> <p style="padding-left: 40px;">VCOOrderOfElection = position elected</p> <p>d. If (c) above shows that the tied candidates had equal progressive totals at <i>all</i> preceding counts or if this is the first count then the position these candidates are elected to is decided by draw. Continue to Step 9.</p>	
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1.4.9 Step 9 – Process Draw for Position

1.4.9.1 Business Description

The system must be capable of supporting Manual Draws and Automatic Draws.

If a manual draw is required then the Count process is “paused” and the system is required to present the details of the Candidates with equal Progressive Totals to allow the manual draw procedure to take place.

In the case of an automatic draw the system will use a random number generator to determine the outcome of the draw. Refer to Section [1.4.33 - Random Processing](#).

Once the result of the draw is provided, the Candidate drawn is deemed to have the larger surplus and is elected first, at which point any outstanding identification of the Position Elected is completed and processing automatically continues.

The draw details are required to be recorded within the database so reporting information is available.

1.4.9.2 Database Processing

#	Action	Table Reference
1	<p>For a manual draw pause the count process and:</p> <p>a. Display the tied candidates on the screen with a description of the type of draw</p> <p>b. For each displayed candidate, prompt for entry of manual lot decisions.</p> <p>c. Accept each manual entry as 1, 2, 3 etc.</p>	N/A
2	<p>The candidate with an entered value of “1” will be elected first and will therefore fill the next available position. The candidate with an entered value of “2” will be elected to the next available position and so on until all tied candidates have been assigned a position.</p> <p>Update the elected candidate's record to indicate the count</p>	Candidate_History

	CountID = current count Random_Number_History = system generated unique number ReasonType = "Draw" NumberGenerated = numbers generated delimited by a comma Range = number of tied candidates SeedUsed = the seed used	
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1.4.10 Step 10 – More Candidates to be Elected?

1.4.10.1 Business Description

After candidates who have reached the quota have been elected, a check is performed to determine if all vacancies have been filled.

If the Total Number of Candidates declared elected is equal to the Number of Candidates to be Elected, no further counting (processing) is required and the process is terminated at **Step 31**.

If there are unfilled vacancies then the counting process continues at **Step 11** to determine whether all vacancies can be filled by Continuing Candidates without having reached the quota.

1.4.10.2 Database Processing

#	Action	Table Reference
1	Get the number of positions contested from the NumberOfPositionsContested field.	ElectionArea
2	Get the number of filled positions by counting the number of elected candidates, i.e. where the VCOOrderOfElection field is not NULL.	Candidate
3	Calculate the number of unfilled vacancies by subtracting the number of elected candidates (Action 2) from the number of positions contested (Action 1).	N/A
4	If the calculated number of unfilled vacancies from Action 3 is 0 then go to Step 31. If the calculated number of unfilled vacancies from Action 3 is greater than 0 then continue to the next step.	N/A

1.4.11 Step 11 – Elect Candidates without Reaching Quota?

1.4.11.1 Business Description

Under certain conditions identified below, Continuing Candidates who have not reached the quota are elected to the remaining unfilled vacancies.

- a) If only one unfilled vacancy remains and a Continuing Candidate has a Progressive Total which is > than the total votes of all the other candidates remaining in the count + any un-transferred surplus then that Candidate will be **declared elected**, without further exclusions taking place.

This is determined as follows:

Progressive Total for a Continuing Candidate >

$$\text{Sum of the Progressive Total for all other Continuing Candidates} + \text{Surplus Votes not Transferred}$$

- b) For Local Government Elections, if there is more than 1 unfilled vacancy remaining then the Continuing Candidates are ordered in descending order of their Progressive Total and assigned to the unfilled vacancies in this order. If the votes of the Candidate assigned to the last vacancy is > than any un-transferred surplus + the votes of all other continuing candidates who have fewer votes than that candidate then that candidate and the candidates who have a progressive total > than this candidate's progressive total are **all declared elected** without further exclusions taking place.

This is determined as follows:

Progressive Total for the Candidate Assigned to the Last Vacancy >

$$\left(\begin{array}{l} \text{Sum of the Progressive Total for Continuing} \\ \text{Candidates with Votes less than the Candidate} \\ \text{Assigned to the Last Vacancy} \end{array} \right) + \begin{array}{l} \text{Surplus Votes} \\ \text{not Transferred} \end{array}$$

- c) If the Number of Candidates elected + Number of Continuing Candidates (who have not reached the quota) = Number of Candidates to be Elected, then **all remaining candidates are elected**.

If all vacancies have been filled then the counting process continues at **Step 30**. Otherwise, the process continues at **Step 12** to determine whether a distribution of surplus votes or exclusion is performed.

1.4.11.2 Database Processing

#	Action	Table Reference
1	<p>If the calculated number of unfilled vacancies from Step 10 Action 3 is 1 then determine if a Continuing Candidate has a majority of the votes remaining in the count:</p> <ol style="list-style-type: none"> Select all continuing candidate's latest history record and sort in descending order of progressive total Identify the continuing candidate with the largest progressive total from (a) and determine their progressive total If more than one continuing candidate shared equal largest progressive totals then go to Action 3 Otherwise, sum the progressive total for all continuing candidates from (a) who have a progressive total less than the candidate identified in (b) Sum any existing surplus votes not transferred <pre>SELECT SUM (VC_SurplusVotes) FROM Candidate, Candidate_History WHERE Candidate_History.CandidateID = Candidate.CandidateID AND CandidateStatus = "Elected" AND SurplusMovement <> "Transferred"</pre> <ol style="list-style-type: none"> If the progressive total of the candidate identified in (b) is greater than the sum of the progressive totals in (d) + the untransferred surplus in (e) then the candidate from (b) is declared elected. <p>Update the elected candidate's latest history with the following attribute values:</p> <p style="text-align: center;">CandidateStatus = "Elected"</p>	Candidate_History
2	<p>For Local Government Elections, if the calculated number of unfilled vacancies from Step 10 Action 3 is greater than 1 then determine if the Continuing Candidate to fill the last position (based on current progressive totals) has a majority of the remaining votes:</p> <ol style="list-style-type: none"> Select all continuing candidate's latest history record and sort in descending order of progressive total Identify the continuing candidate who would be elected to the last unfilled vacancy based on their progressive total If the candidate to fill the last vacancy cannot be determined because 2 or more candidates for this position have equal progressive totals then go to 	Candidate_History Candidate

	<p>Action 3</p> <p>d. Otherwise, sum any existing surplus votes not transferred</p> <pre>SELECT SUM (VC_SurplusVotes) FROM Candidate, Candidate_History WHERE Candidate_History.CandidateID = Candidate.CandidateID AND CandidateStatus = "Elected" AND SurplusMovement <> "Transferred"</pre> <p>e. Sum the progressive total for all continuing candidates from (a) who have a progressive total less than the candidate identified in (b)</p> <p>f. If the progressive total of the candidate identified in (b) is greater than the sum of (d) + (e) then this candidate and all candidate from (a) who have a progressive total greater than this candidate are declared elected</p> <p>Update the latest history record of these elected candidate's with the following attribute value:</p> <p style="text-align: center;">CandidateStatus = "Elected"</p>	
3	<p>Check if the unfilled vacancies can be filled by all remaining continuing candidates:</p> <p>a. Determine the number of continuing candidates by counting the latest candidate history records where CandidateStatus = 'Continuing'</p> <p>b. If the number of unfilled vacancies from Step 10 Action 3 equals the number of continuing candidates from (a) then all these continuing candidates are declared elected</p> <p>Update the latest history record of these elected candidate's with the following attribute value:</p> <p style="text-align: center;">CandidateStatus = "Elected"</p>	Candidate_History

1.4.12 Step 12 – Total Undistributed Surplus from Elected Candidates above Deferral Cut-off?

1.4.12.1 Business Description

If *no Surplus Votes* are available for Distribution (because no further Candidates have reached the Quota, or Candidate(s) were elected by having reached the Quota exactly) then the next Count must be an Exclusion of the Candidate with the lowest current Progressive Total and the Transfer of their Ballot Papers to the Continuing Candidates. The process continues to **Step 24**.

If Candidates have been elected *with Surplus Votes*, then these Surplus Votes will be distributed to the Continuing Candidates. However, under certain conditions identified below, this distribution is deferred until a Subsequent Count.

- a) For Legislative Council Elections, if the sum of all undistributed surplus votes from Elected Candidates is > or = to the difference between the Progressive Totals of the 2 Continuing Candidates with the lowest current Progressive Totals, then the next count is a Distribution of Surplus Votes. The process continues to **Step 13**.
- b) For Local Government Elections, if the sum of all undistributed surplus votes from Elected Candidates is > the difference between the Progressive Totals of the 2 Continuing Candidates with the lowest current Progressive Totals, then the next count is a Distribution of the Surplus Votes. The process continues to **Step 13**.
- c) Otherwise, the next count is an Exclusion and the distribution of any outstanding surplus' from elected candidates is deferred. The process continues to **Step 24**.

1.4.12.2 Database Processing

#	Action	Table Reference
1	Sum all the surplus votes from Step 6 for all elected	Candidate

	<p>candidates whose surplus votes are yet to be transferred.</p> <p>These are candidates who have a CandidateStatus of "Elected" and a SurplusMovement of not "Transferred".</p>	Candidate_History
2	If no records are returned or the sum of all surplus votes not transferred = 0 then the next count type will be an "Exclusion".	
3	<p>Otherwise, if the sum of all surplus votes not transferred is > 0 then determine whether the surplus is above the deferral cut-off:</p> <p>a. Get the 2 candidates with the fewest votes by selecting all continuing candidates from their latest history record and ordering them by their progressive total. The 2 candidates who have the lowest progressive totals are the candidates with the fewest votes</p> <p>b. Calculate the difference between the 2 lowest progressive totals</p> <p>c. In the case of LC elections:</p> <ul style="list-style-type: none"> • If the total surplus votes not transferred (derived from Action 1) is greater than or equal to the calculated difference (derived from Action 3 (b)) then the next count type will be a surplus "Transfer" • If the total surplus votes not transferred (derived from Action 1) is less than the calculated difference (derived from Action 3 (b)) then the next count type will be an "Exclusion". <p>d. In the case of LG elections:</p> <ul style="list-style-type: none"> • If the total surplus votes not transferred (derived from Action 1) is greater than the calculated difference (derived from Action 3 (b)) then the next count type will be a surplus "Transfer" • If the total surplus votes not transferred (derived from Action 1) is less than or equal to the calculated difference (derived from Action 3 (b)) then the next count type will be an "Exclusion". 	<p>Candidate_History</p> <p>Candidate</p>

1.4.13 Step 13 – Identify Candidate whose Votes are to be Distributed

1.4.13.1 Business Description

The next count will be a Distribution of the Surplus Votes of the Elected Candidate with the highest Position Elected whose Surplus Votes have not yet been distributed.

Note: Since there may be more than one Elected Candidate whose surplus votes need to be distributed the Candidate who was elected with the highest progressive total at that count will have their surplus votes transferred first, followed by the Candidate with the next highest progressive total and so forth.

If there are un-transferred surpluses from one or more previous counts then the surpluses from the earliest count are transferred first before those surpluses from subsequent counts. In other words the order in which votes are to be distributed is based on the Candidate Position Order.

1.4.13.2 Database Processing

#	Action	Table Reference
1	<p>Indicate that the data for the current count is now available for reporting by updating the current count record as follows:</p> <p>CountReportComplete = "Y"</p>	Count

	Increment the Count Number by 1, ready for the next count to be processed.	
2	<p>When the next count is a "Transfer" identify the candidate whose votes will be transferred</p> <p>a. Select the position order for all elected candidate whose votes have not been transferred:</p> <pre>SELECT VC_OrderOfElection FROM Candidate_History, Count WHERE CandidateStatus = "Elected" AND SurplusMovement is not "Transferred" AND VC_SurplusVotes > 0 ORDERBY VC_OrderOfElection Ascending</pre> <p>b. The first candidate from (a) will have their surplus transferred next.</p>	<p>Candidate_History</p> <p>Candidate</p>
3	<p>Create a "Transfer" count record with the following attribute values:</p> <p>ElectionEventID = election event ID for the contest</p> <p>ContestID = contest ID</p> <p>CountID = current count</p> <p>CountType = "Transfer"</p> <p>VotesDistributed = 0</p> <p>TransferValue = 0</p> <p>ExhaustedVotes = 0</p> <p>SetAsideVotes = 0</p> <p>LeastVotesDifference = calculated difference from Step 12</p> <p>FirstLowestCandidate = candidate ID with fewest votes from Step 12</p> <p>SecondLowestCandidateID = candidate ID with 2nd fewest votes from Step 12</p> <p>CandidateID = Candidate ID from Action 2 (b)</p> <p>CountReportComplete = "N"</p>	Count

1.4.14 Step 14 – Identify Votes to be Distributed

1.4.14.1 Business Description

When Distributing an Elected Candidate's votes only those votes that have been *transferred to a Candidate either from an elected or excluded candidate resulting in that Candidate attaining or exceeding the Quota* are taken into consideration.

These votes may come from more than one transfer of elected candidates if and only if more than one Candidate is elected at a previous Count and Votes from these distributions are transferred to the Candidate resulting in the Quota being attained or exceeded.

This means that, for a Candidate elected in the First Preference Count, all of that Candidate's first preference votes are to be Distributed. However, in Subsequent Counts only those Votes transferred to the Candidate and resulting in that Candidate being elected are to be Distributed. These votes are the "transferable" votes.

This is illustrated in the following 1995 Legislative Council example:

- a) after Count 1 GAY has 1403 votes
- b) in Count 2, Distribution of HANNAFORD's Surplus Votes results in 1,129,316 ^(a) Votes being transferred to GAY. Even though GAY now has enough votes to have exceeded the Quota he is not yet elected

- c) in Count 3, Distribution of EGAN's Surplus Votes results in 29^(b) further Votes being transferred to GAY. As a result of this GAY is elected with 1,130,748 votes, which provides a Surplus of 977,148 and his Surplus is to be distributed in Count 4
- d) thus at Count 4, there are only 1,129,345 votes available for Distribution (a + b), which are the votes transferred to GAY in Counts 2 and 3 respectively. The original 1403 votes at the end of Count 1 were never transferred to GAY and are therefore not to be Distributed.

1.4.14.2 Database Processing

#	Action	Table Reference
1	<p>For a candidate elected at the 1st count (VC_ElectedOrExcludedAtCount), select the first preference votes received by the candidate.</p> <p>a. Get the votes received by the elected candidate at count 1.</p> <pre>SELECT ballot records FROM Ballot_Paper_Movement WHERE ToCandidateID = elected candidate AND CountID = 1</pre>	<p>Candidate</p> <p>Ballot_Paper_Movement</p>
2	<p>For a candidate elected at a subsequent count, select the candidate's pile of "transferable" votes.</p> <p>a. Get the count at which the candidate was elected.</p> <pre>SELECT VCElectedOrExcludedAtCountID FROM Candidate WHERE CandidateID = elected candidate</pre> <p>b. Working back from this count, get the previous count at which candidate(s) were elected or excluded.</p> <pre>SELECT VCElectedOrExcludedAtCountID FROM Candidate WHERE VCElectedOrExcludedAtCountID = the count from (a) above - n</pre> <p>Where n is 1 and incremented by 1 until a record is return or until n = the count from (a) - 1</p> <p>If no records are returned then set the previous count at which candidates were elected to 0 for the purpose of performing (c)</p> <p>c. Get the elected candidate's transferrable votes which resulted in that candidate being elected</p> <pre>SELECT ballot records FROM Ballot_Paper_Movement WHERE Ballot_Paper_Movement.ToCandidateID = elected candidate AND Ballot_Paper_Movement.CountID > the VCElectedOrExcludedAtCountID value from (b) above AND Ballot_Paper_Movement.CountID <= the VCElectedOrExcludedAtCountID value from (a) above</pre>	

1.4.15 Step 15 – Distribute Preferences¹

1.4.15.1 Business Description

¹ In the LC legislation, the clause about the transfer of surplus votes (cl 10) first refers to 'arranging votes into separate parcels' for the continuing candidates. In the LG legislation the corresponding clause (cl 6 and 7) directs that the number of votes for each continuing candidate will be 'recorded'. In each case it is only after the transfer value and the numbers to be transferred are calculated, that the relevant clause provides for a transfer of ballot-papers to the continuing candidates to take place, and for the others being set aside as finally dealt with. Sections 1.4.15 to 1.4.20 describe the process in a different but equivalent way. The continuing votes are first notionally 'distributed' according to next preferences in Step 15, and after the calculation of transfer value and the number of votes to be transferred in Steps 17-19, the votes not to be permanently transferred are set aside in Step 20, and the rest remain transferred by default. This produces exactly the same result.

For **each** Vote to be Distributed the next preferred Candidate indicated on the relevant Ballot Paper is identified and if the Candidate so indicated is an Eligible Continuing Candidate (i.e. not yet elected or excluded), then the Ballot Paper is Distributed to that Candidate.

If this Candidate is Ineligible or not “Continuing” then the next preferred Candidate on the Ballot Paper is identified until the vote is distributed to an Eligible Continuing Candidate.

If there is no next preference for a Candidate on the Ballot Paper, then the Ballot Paper is **Exhausted**. If the next preference is duplicated or omitted as defined by Formality Rules then the ballot paper is also **Exhausted**.

1.4.15.2 Database Processing

#	Action	Table Reference
1	<p>For each vote retrieved in Step 14, get the votes that have next available preference marked for a continuing candidate.</p> <pre>SELECT record FROM BTL_Expanded_Preference, Candidate WHERE VCBallotPaperID = the retrieved ballot paper ID AND Preference = the elected candidate's preference + n AND VCElectedOrExcludedAtCountID = NULL AND CandidateEligibilityFlag = "Y"</pre> <p>Where n is 1 and incremented by 1 until a record is returned or until n = maximum preference on the vote.</p> <p>If a record was returned then the vote contains a valid next preference (i.e. the next preference is for a continuing candidate). Continue to Action 2.</p> <p>If no record was returned then all next preferences have been ignored (i.e. the next preferences were for an elected or excluded candidate) or there were no more preferences which means this is an exhausted vote. Continue to Action 3.</p>	BTL_Expanded_Preference Candidate
2	<p>For each vote that has a valid next preference from Action 1, assign them to the respective continuing candidate by creating a ballot paper movement record and assign the following attribute values:</p> <p>ElectionEventID = election event ID for the contest ContestID = contest ID CountID = current count VCBallotPaperID = ballot paper's unique ballot paper ID MovementType = "Transfer" FromCandidateID = elected candidate ToCandidateID = candidate ID marked with next preference.</p>	Ballot_Paper_Movement
3	<p>For each exhausted vote identified from Action 1, mark these votes accordingly by creating a ballot paper movement record with the following attributes:</p> <p>ElectionEventID = election event ID for the contest ContestID = contest ID CountID = current count VCBallotPaperID = ballot paper's unique ballot paper ID MovementType = "Exhausted" FromCandidateID = elected candidate ToCandidateID = 0</p>	Ballot_Paper_Movement

1.4.16 Step 16 – Calculate Transfer Value

1.4.16.1 Business Description

The Transfer Value is used to determine how many of the Elected Candidate's Surplus Votes are to be transferred to each continuing candidate based on next available preference. The Transfer Value is calculated using the following formula:

$$\text{Transfer Value} = \frac{\text{Surplus Votes}}{\text{Preferences Distributed} - \text{Exhausted Votes}}$$

For both Legislative Council and Local Government Elections, the Transfer Value is calculated to sixteen decimal places.

The values used in the formula above are specific to the Elected Candidate whose surplus is to be transferred, where:

- *Surplus Votes* refers to the elected candidate's total surplus votes
- *Preferences Distributed* is the transferable votes of the elected Candidate, whose Surplus Votes are to be distributed, as defined in **Steps 13 and 14**
- *Exhausted Votes* refers to the total number of ballots received by the elected candidate which do not bear a next preference for a continuing candidate, as defined in **Step 15**.

If the Exhausted Votes equals Preferences Distributed or if the Transfer Value calculated is > 1 then it is to be set to 1 (i.e. the surplus is > than the number of votes to be transferred) then it is to be set to 1 (since Exhausted Votes cannot be transferred).

1.4.16.2 Database Processing

#	Action	Table Reference
1	<p>Get the values required to calculate the Transfer Value as follows:</p> <ol style="list-style-type: none"> a. Get the number of surplus votes from the VCSurplusVotes field b. Count the total number of transferable votes retrieved from Step 14 c. Out of the total number of transferable votes, get the total number of exhausted votes by counting how many votes received by the elected candidate do not have a next available preference <pre>SELECT count(*) FROM Ballot_Paper_Movement WHERE CountID = the current count AND MovementType = "Exhausted" AND FromCandidateID = the elected candidate whose votes are being transferred</pre> <ol style="list-style-type: none"> d. Calculate the Transfer Value as: Surplus Votes from (a) / (Transferable Votes from (b) – Exhausted Votes from (c)) e. For both LC and LG Elections, if the resulting fraction of the calculated Transfer Value has more than 16 digits only the first 16 digits will be used f. If the calculated Transfer Value is greater than 1 or if the divisor in Action 1 (d) is 0 then the Transfer Value is to be set to 1 	Ballot_Paper_Movement
2	<p>Update the current count with the following information:</p> <p>VoteDistributed = Total number of "transferable" votes from Action 1(b)</p> <p>TransferValue = Transfer Value from Action 1 (d) – (g)</p> <p>ExhaustedVotes = Total number of exhausted votes from Action 1 (c)</p>	Count

1.4.17 Step 17 – Calculate Number of Ballot Papers to be Transferred and Set Aside

1.4.17.1 Business Description

The Votes to be Distributed to each Continuing Candidate is carried forward from the Distribution of Preferences performed in **Step 15**.

The sum of the Votes that are *actually* Transferred to all the Continuing Candidates = the Surplus Votes of the Candidate whose preferences are being Distributed, if enough votes show a next preference.

Thus the Transfer Value is required to proportion the Distributed Votes such that the Total of the Votes Transferred to the Continuing Candidates exactly sums to the Surplus and a sufficient number of votes are retained, in addition to the Exhausted Votes, to supply the votes needed for the Candidate's actual election that must be Set Aside (i.e. the Quota).

For each Continuing Candidate, the Number of Votes to be Transferred to that Candidate is determined as follows:

$$\text{Votes to be Transferred} = \text{Votes Distributed} \times \text{Transfer Value}$$

The Number of Votes to be Transferred is calculated to six decimal places.

Rounding Rules

In order to ensure that the sum of the Votes Transferred exactly totals the number of Surplus Votes, the following logic is required to round the calculated votes to be Transferred for each Candidate to full integer values representing votes:

- a) the integer parts of the Votes to be Transferred to all the Continuing Candidates are summed
- b) the Votes to be Transferred to the Continuing Candidates are ranked by the decimal fraction part in descending order and then by the integer part in descending order
- c) if the sum of the Integer parts is < the Surplus then calculate the difference between the two (i.e. Surplus – Sum of integer parts)
- d) the Votes to be Transferred are rounded up for that number of Candidates based on the order specified in (b)
- e) If there are 2 or more Candidates, whose Votes to be Transferred have the same decimal fraction part and not all of them can be rounded without the sum of the Votes to be Transferred exceeding the Surplus, then the Candidate(s) with the greatest Number of Votes to be Transferred is to be rounded up. If both the integer and fraction parts are equal then one or a greater number are chosen for rounding up by countback or random selection.
- f) the decimal parts of the Votes to be Transferred for all remaining Candidates are truncated (i.e. set to zero).

Votes Set Aside

For each Continuing Candidate, the Number of Votes to be Set Aside as a result of the Distribution is determined as follows:

$$\text{Votes Set Aside} = \text{Votes Distributed} - \text{Votes Transferred}$$

Note that if the calculated Transfer Value < or = 1 then:

$$\begin{aligned} \text{Quota} = & \text{The sum of the Ballot Papers to be Set Aside for each Continuing Candidate} \\ & + \text{Exhausted Votes for the Candidate being elected} \\ & + \text{Votes Set Aside from previous counts for the Candidate being elected} \\ & \text{(i.e. those votes not Eligible for Distribution as defined in Step 14)} \end{aligned}$$

If the calculated Transfer Value is > 1 then the Total Number of Ballot Papers to be Set Aside would exceed the Quota. The Quota is thus made up of any Ballot Papers set aside from previous counts + a sufficient number of Exhausted Votes to reach the Quota.

$$\begin{aligned} \text{Quota} = & \text{Votes Set Aside from previous counts for the Candidate being elected} \\ & \text{(i.e. those votes not Eligible for Distribution as defined in Step 14)} \\ & + \text{The Number of Exhausted Votes sufficient to make up the Quota.} \end{aligned}$$

The remaining balance of the Exhausted Votes is included in the Progressive Total of Exhausted Votes (since these votes cannot be distributed) so that the sum of all Progressive Totals always equals the Total Number of Ballot Papers in the Count.

1.4.17.2 Database Processing

#	Action	Table Reference
1	<p>For each continuing candidate count the number of votes assigned to them (i.e. not exhausted) from the “transferable” votes in Step 15 Action 2.</p> <p>a. Get all continuing candidates by selecting candidates that have CandidateEligibilityFlag = “Y” and VCElectedOrExcludedAtCountID = NULL</p> <p>b. For each continuing candidate from (a), determine how many votes were distributed to them.</p> <pre>SELECT count (records) FROM Ballot_Paper_Movement WHERE ToCandidateID = the continuing candidate AND CountID = the current count AND MovementType = “Transfer”</pre> <p>If no votes were assigned to them then set to 0.</p>	<p>Candidate</p> <p>Ballot_Paper_Movement</p>
2	Get the stored Transfer Value from Step 16	Count
3	<p>Calculate the number of votes to be transferred for each continuing candidate using the specified formula:</p> <p style="text-align: center;">Votes to be Transferred = Transferable Votes from Action 1 x Transfer Value from Action2.</p> <p>If the Transfer Value = 1 then go to Action 9.</p> <p>Otherwise, order the votes to be transferred by the decimal fraction part in descending order, and then by the integer part in descending order.</p> <p>For LG, the votes to be transferred are truncated to 4 decimal places.</p> <p>For LC, the votes to be transferred are truncated to 6 decimal places.</p>	
4	<p>Sum the integer parts of the votes to be transferred for all continuing candidates.</p> <p>The sum must be equal to the elected candidate’s stored surplus votes.</p>	Candidate
5	<p>If the sum of the integer parts is less than the surplus votes then</p> <p>a. Calculate the difference: Surplus Votes – Sum of the integer parts from Action 4</p>	
6	The Votes to be Transferred are rounded up for the first n Continuing Candidates, based on the sort order specified in Action 3, where n = the difference calculated in Action 5 (a)	
7	If the same number of votes to be transferred is shared by more than one candidate and at least one of them has a sort order position below n from Action 5 (a) then go to Step 18 to determine which of these candidates with the same number of votes to be transferred will have their integer value rounded.	
8	Any continuing candidates who did not have their integer part rounded will have the number of ballot papers to be transferred set to the integer part and the decimal value will be truncated.	
9	<p>The details of the surplus transfer are stored by creating a candidate history record for each continuing candidate.</p> <p>a. Get all continuing candidates by selecting candidates that have CandidateEligibilityFlag = “Y” and</p>	Candidate_History

	<p>VCElectedOrExcludedAtCountID = NULL</p> <p>b. For each continuing candidate from (a), create a history record with the following attributes:</p> <p>ElectionEventID = election event ID for the contest ContestID = contest ID CountID = current count CandidateID = the continuing candidate to whom the transferable votes have been assigned. VotesDistributed = total number of votes distributed to the continuing candidate (derived from Action 1). If no votes were distributed then set to 0. VotesTransferred = total number of votes to be transferred to this continuing candidate (determined at the conclusion of Action 7 when the Transfer Value < 1 or Step 17 Action 3, when the Transfer Value = 1). If no votes were distributed then set to 0. ProgressiveTotal = -1 CandidateStatus = "Continuing" SurplusMovement = " "</p>	
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1.4.18 Step 18 – Draw for Rounding?

1.4.18.1 Business Description

If the Number of Votes to be Transferred is equal then the Count process must be reviewed to go back and determine the previous Count at which the Progressive Totals for these 2 or more Candidates were last unequal and the fraction is credited to the Candidate with the highest Progressive Total at that point. If the 2 or more Candidates have had equal Progressive Totals at all preceding Counts (including Count 1), then a draw must be conducted to determine the allocation of the fraction for these Candidates.

Otherwise, the process continues at **Step 20** below in the Main Process Loop Logic.

1.4.18.2 Database Processing

#	Action	Table Reference
1	<p>When rounding the integer parts, the candidate or candidates with the highest progressive total at a preceding count will be rounded up first.</p> <p>a. Select the history records of the tied candidates where the CountID = current count – 1</p> <p>b. If (a) above shows that 2 or more tied candidates had unequal progressive totals at this count then the candidate, or n candidates who have the highest progressive total will be rounded up; where n is the number of tied candidates who have to be rounded up</p> <p>c. Repeat (a) and (b) working back through preceding counts</p> <p>d. If 2 or more tied candidates had equal progressive totals at all preceding counts then the candidate, or n candidates whose Votes to be Transferred is to be rounded up next will be decided by draw; where n is the number of tied candidates who have to be rounded up. Continue to Step 19.</p>	Candidate_History

1.4.19 Step 19 – Process Draw for Rounding

1.4.19.1 Business Description

	CountID = current count DrawID = system generated unique number DrawType = "Rounding" DrawTime = system date & time CandidateID = candidate ID DrawResult = "1" for candidate drawn first then increment by 1 for the next candidate and so on. ManualDrawFlag = "N"	Draw
5	Store the range and random numbers generated from Action 2 by creating a random number history record with the following attribute values: ElectionEventID = election event ID for the contest ContestID = contest ID CountID = current count Random_Number_History = system generated unique number ReasonType = "Draw" NumberGenerated = numbers generated delimited by a comma Range = number of tied candidates SeedUsed = the seed used	Random_Number_History

1.4.20 Step 20 – Set Aside Ballot Papers (Random Selection)

1.4.20.1 Business Description

The Number of Ballot Papers that are to be Set Aside from each Continuing Candidate (i.e. Removed from further election processing) has already been calculated in **Step 17** assisted by Step 18 and 19 where necessary.

The individual Ballot Papers that are to be Set Aside are to be selected randomly from the set of Votes Distributed using computerised random number generation logic. (Refer to Section [1.4.33 - Random Processing](#)). These papers are set aside as finally dealt with and the remaining papers from **Step 15** become the ballot papers transferred.

1.4.20.2 Database Processing

#	Action	Table Reference
1	If the Transfer Value is < than 1 then for each continuing candidate, get the unique Ballot Paper IDs of the transferable votes which have been assigned to this candidate (i.e. not exhausted) from the elected candidate who votes are being transferred: <pre> SELECT VCBallotPaperID FROM Ballot_Paper_Movement WHERE FromCandidateID = the elected candidate whose surplus is being transferred AND ToCandidateID = the continuing candidate assigned the next preference AND MovementType = "Transfer" </pre> Note: Step 20 is bypassed when the Transfer Value = 1 since there are no votes to be set aside.	Ballot_Paper_Movement
2	With the transferable votes from Action 1, randomly select votes totalling the Votes to be Transferred for each continuing candidate (calculated from Step 17 Action 8) as follows: <ol style="list-style-type: none"> Assign each vote from Action 1 with a consecutive number starting from 1 Using a seed, generate random numbers ranging from 1 to the Number of Votes to be Transferred. The votes 	

	<p>with the assigned consecutive number matching the number generated make up the votes to be transferred.</p> <p>If the random selection system parameter is configured to be fully random, then use a random seed.</p> <p>If the random selection system parameter is configured to be pseudo-random, then use the same seed.</p>	
3	<p>Store the range, random numbers generated from Action 2 and the seed used by creating a random number history record with the following attribute values:</p> <p>ElectionEventID = election event ID for the contest</p> <p>ContestID = contest ID</p> <p>CountID = current count</p> <p>Random_Number_History = system generated unique number</p> <p>ReasonType = "Transferred Votes"</p> <p>NumberGenerated = numbers generated delimited by a comma</p> <p>Range = Votes to be Transferred</p> <p>SeedUsed = the seed used</p>	Random_Number_History
4	<p>For each vote that was not randomly selected for transfer in Action 2 from the ballot papers in Action 1, set aside these by updating their ballot paper movement record as follows:</p> <p>MovementType = "Set Aside"</p> <p>ToCandidateID = 0</p>	Ballot_Paper_Movement
5	<p>Count the total number of votes set aside in this count from Action 4.</p> <pre>SELECT count (*) FROM Ballot_Paper_Movement WHERE CountID = current count AND MovementType = "Set Aside"</pre> <p>Store the total number of votes set aside.</p> <p>SetAsideVotes = count from Action 5.</p>	Ballot_Paper_Movement Count

1.4.21 Step 21 – Calculate Progressive Total

1.4.21.1 Business Description

Calculate each Continuing Candidate's new current Progressive Total.

Progressive Total = Progressive Total brought forward from previous count
+ Votes Transferred to Candidate

1.4.21.2 Database Processing

#	Action	Table Reference
1	<p>For each continuing candidate, add the votes transferred to the candidate in this count to the progressive total from the previous count.</p> <p>Progressive Total = VoteTransferred to the continuing candidate in the current count + Progressive Total from the current count - 1</p>	Candidate_History
2	<p>Select the elected candidate history record:</p> <pre>SELECT record FROM Candidate_History</pre>	Candidate_History

	<p>WHERE CandidateStatus = "Elected" AND CandidateID = the elected candidate whose votes are being transferred</p> <p>Update this record to show that the elected candidate's surplus has now been transferred.</p> <p>SurplusMovement = "Transferred"</p>	
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1.4.22 Step 22 – Elected Candidate Surpluses still to be Distributed?

1.4.22.1 Business Description

If the surplus of all elected Candidates has been transferred or if no surplus exists for the remaining elected candidates then further candidates can be elected before the next count is performed. The process continues at **Step 4**.

However if there are surpluses which remain to be distributed then the process continues at **Step 23**.

1.4.22.2 Database Processing

#	Action	Table Reference
1	<p>Check if the surplus votes of all elected candidates have been transferred:</p> <p>a. Check if all elected candidates have had their surplus votes transferred:</p> <pre>SELECT records FROM Candidate, Candidate_History WHERE Candidate.CandidateID = Candidate_History.CandidateID AND Candidate.VC_SurplusVotes > 0 AND Candidate_History.CandidateStatus = "Elected" AND Candidate_History.SurplusMovement <> "Transferred"</pre> <p>b. If no candidates were retrieved from (a), then all surplus votes have been transferred</p> <p>c. However, if candidates were retrieved from (a) then there are still surplus votes to be distributed.</p>	<p>Candidate</p> <p>Candidate_History</p>

1.4.23 Step 23 – Total Undistributed Surplus from Elected Candidates above the Deferral Cut-off?

1.4.23.1 Business Description

For Legislative Council Elections:

- a) if the sum of all undistributed surplus votes from Elected Candidates is > or = to the difference between the Progressive Totals of the 2 Continuing Candidates with the lowest current Progressive Totals, then the next count is another Distribution of Surplus Votes. The process continues at **Step 13**.
- b) if the sum of all undistributed surplus votes from Elected Candidates is < the difference between the Progressive Totals of the 2 Continuing Candidates with the lowest current Progressive Totals, then further candidates can be elected before the next count. The process continues at **Step 4**. The distribution of the outstanding surpluses from Elected Candidates is deferred.

For Local Government Elections:

- a) if the sum of all undistributed surplus votes from Elected Candidates is > the difference between the Progressive Totals of the 2 Continuing Candidates with the lowest current Progressive Totals, then the next count is another Distribution of the Surplus Votes. The process continues to **Step 13**.
- b) if the sum of all undistributed surplus votes from Elected Candidates is < or = to the difference between the Progressive Totals of the 2 Continuing Candidates with the lowest current Progressive Totals, then further candidates can be elected before the next count. The process continues at **Step 4**. The distribution of the outstanding surpluses from Elected Candidates is deferred.

1.4.23.2 Database Processing

#	Action	Table Reference
1	<p>Sum the surplus votes for all elected candidates whose surplus votes are yet to be transferred.</p> <pre>SELECT SUM (VCSurplusVotes) FROM Candidate WHERE CandidateID = the candidates with undistributed surpluses selected in Step 22 Action 1 (a)</pre>	<p>Candidate CandidateHistory</p>
2	<p>Check if the sum of all surplus votes not transferred is above the deferral cut-off.</p> <p>a. Get the 2 candidates with the fewest votes by selecting all continuing candidates from the current count history record and ordering them by their progressive total. The 2 candidates who have the lowest progressive totals are the candidates with the fewest votes</p> <p>b. Calculate the difference between the 2 lowest progressive totals</p> <p>c. In the case of LC elections:</p> <ul style="list-style-type: none"> If the total surplus votes not transferred (derived from Action 1) is greater than or equal to the calculated difference (derived from Action 2) then the next count type will be a surplus "Transfer" If the total surplus votes not transferred (derived from Action 1) is < than the calculated difference (derived from Action 2) then go to Step 4 <p>d. In the case of LG elections:</p> <ul style="list-style-type: none"> If the total surplus votes not transferred (derived from Action 1) is > than the calculated difference (derived from Action 2) then the next count type will be a surplus "Transfer" If the total surplus votes not transferred (derived from Action 1) is < than or = to the calculated difference (derived from Action 2) then go to Step 4 	<p>Candidate Candidate_History</p>

1.4.24 Exclusion Logic

1.4.25 Step 24 – Identify Candidate for Exclusion

1.4.25.1 Business Description

The Candidate for Exclusion will be the Continuing Candidate with the lowest current Progressive Total.

1.4.25.2 Database Processing

#	Action	Table Reference
1	<p>Indicate that the data for the current count is now available for reporting by updating the current count record as follows:</p> <pre>CountReportComplete = "Y"</pre> <p>Increment the Count Number by 1, ready for the next count to be processed.</p>	<p>Count</p>
2	<p>Get the candidate with the fewest votes by selecting all continuing candidates from the previous count history record and ordering them by their progressive total.</p> <p>The candidate who has the lowest progressive total from the rows returned below is the candidates to be excluded</p>	<p>Candidate_History</p>

	<p>in this count.</p> <pre>SELECT CandidateID FROM Candidate_History WHERE CountID = Current Count - 1 AND CandidateStatus = "Continuing" ORDER BY ProgressiveTotal Ascending</pre>	
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1.4.26 Step 25 – Draw for Exclusion?

If the Election is a Legislative Council Election and there are 2 or more Candidates with equal lowest current Progressive Totals, then a draw must be conducted to determine the Candidate to be Excluded.

If the Election is a Local Government Election and there are 2 or more Candidates with equal lowest current Progressive Totals, then the Count process must be reviewed to go back and determine the previous Count at which the Progressive Totals for these 2 or more Candidates were last unequal and Exclude the Candidate with the lowest Progressive Total at that point. If the 2 or more Candidates have had equal Progressive Totals at all preceding Counts (including Count 1), then a draw must be conducted to determine the Candidate to be Excluded.

Otherwise, the process continues at **Step 27** below in the Exclusion Logic.

1.4.26.1 Database Processing

#	Action	Table Reference
1	<p>In the case of LC Elections, if there are 2 or more continuing candidates who have an equal lowest progressive total the candidate to be excluded in this count is decided by the exclusion draw. Continue to Step 26.</p> <p>In the case of LG Elections, if there are 2 or more continuing candidates who have an equal lowest progressive total, the candidate who had the lowest progressive total at a preceding count will be excluded in this count.</p> <ol style="list-style-type: none"> Select the history records of the tied candidates where the Count ID = current count – 2 If (a) above shows that a single candidate had the lowest progressive total at the previous count then that candidate will be excluded in this count However, if (a) above shows that 2 or more candidates were still tied at the previous count then continue through the preceding counts to determine the count at which a single candidate had the lowest progressive total. If 2 or more candidates had equal lowest progressive totals at all preceding counts then the candidate to be excluded at this count will be decided by the exclusion draw. Continue to Step 26. 	Candidate_History
2	<p>If a draw is not required, create a count record with the following attribute values:</p> <p>ElectionEventID = election event ID for the contest</p> <p>ContestID = contest ID</p> <p>CountID = current count</p> <p>Count Type = "Exclusion"</p> <p>VotesDistributed = 0</p> <p>TransferValue = 0</p> <p>ExhaustedVotes = 0</p> <p>SetAsideVotes = 0</p>	Count

	LeastVotesDifference = -1 FirstLowestCandidateID = 0 SecondLowestCandidateID = 0 CandidateID = the excluded candidate ID CountReportComplete = "N"	
3	Update the excluded candidate's record to indicate the count at which they were excluded as follows: VCElectedOrExcludedAtCountID = current count	Candidate
4	Create a history record to indicate that the candidate has been excluded as follows: ElectionEventID = election event ID for the contest ContestID = contest ID CountID = current count CandidateID = the excluded candidate ID VotesDistributed = 0 VotesTransferred = 0 ProgressiveTotal = -1 CandidateStatus = "Excluded" SurplusMovement = " "	Candidate_History

1.4.27 Step 26 – Process Draw for Exclusion?

The system must be capable of supporting Manual Draws and Automatic Draws. If a manual draw is required then the Count process is "paused" and the system is required to present the details of the Candidates with equal lowest current Progressive Totals to allow the manual draw procedure to take place.

In the case of an automatic draw the system will use a random number generator to determine the outcome of the draw.

Once the result of the draw is provided, the Candidate drawn is deemed to have the lowest Progressive Total and is Excluded.

The draw details are required to be recorded within the database so reporting information is available.

1.4.27.1 Database Processing

#	Action	Table Reference
1	For a manual draw pause the count process and: <ol style="list-style-type: none"> Display the tied candidates on the screen with a description of the type of draw For each displayed candidate, prompt for entry of manual lot decisions. Accept each manual entry as a radio button to indicate "Excluded" or "Not excluded" 	N/A
2	The candidate marked with the "Excluded" radio button will be excluded. Create a count record with the following attribute values: ElectionEventID = election event ID for the contest ContestID = contest ID CountID = current count	Count

	<p>Count Type = "Exclusion"</p> <p>VotesDistributed = 0</p> <p>TransferValue = 0</p> <p>ExhaustedVotes = 0</p> <p>SetAsideVotes = 0</p> <p>LeastVotesDifference = 0</p> <p>FirstLowestCandidateID = 0</p> <p>SecondLowestCandidateID = 0</p> <p>CandidateID = the excluded candidate ID</p> <p>CountReportComplete = "N"</p> <p>Store the details and result of the draw by creating draw records for each tied candidate as follows:</p> <p>ElectionEventID = election event ID for the contest</p> <p>ContestID = contest ID</p> <p>CountID = current count</p> <p>DrawID = system generated unique number</p> <p>DrawType = "Exclusion"</p> <p>DrawTime = System date and time</p> <p>CandidateID = tied candidate ID</p> <p>DrawResult = "Excluded" for candidate selected for exclusion; "Not Excluded" for candidate(s) not selected for exclusion</p> <p>ManualDrawFlag = "Y"</p>	<p>Draw</p>
<p>3</p>	<p>For an automatic draw the system assigns each tied candidate with a consecutive number starting from 1.</p> <p>Using a seed, generate random numbers ranging from 1 to the number of tied candidates.</p> <p>If the random selection system parameter is configured to be fully random, then use a random seed.</p> <p>If the random selection system parameter is configured to be pseudo-random, then use the same seed.</p>	<p>N/A</p>
<p>4</p>	<p>The candidate with the assigned consecutive number matching the number generated will be excluded.</p> <p>Create a count record with the following attribute values:</p> <p>ElectionEventID = election event ID for the contest</p> <p>ContestID = contest ID</p> <p>CountID = current count</p> <p>Count Type = "Exclusion"</p> <p>VotesDistributed = 0</p> <p>TransferValue = 0</p> <p>ExhaustedVotes = 0</p> <p>SetAsideVotes = 0</p> <p>LeastVotesDifference = 0</p> <p>FirstLowestCandidateID = 0</p> <p>SecondLowestCandidateID = 0</p>	<p>Count</p>

	<p>CandidateID = the excluded candidate ID</p> <p>CountReportComplete = "N"</p> <p>Store the details and result of the draw by creating draw records for each tied candidates as follows:</p> <p>ElectionEventID = election event ID for the contest</p> <p>ContestID = contest ID</p> <p>CountID = current count</p> <p>DrawID = system generated unique number</p> <p>DrawType = "Exclusion"</p> <p>DrawTime = System date and time</p> <p>CandidateID = tied candidate ID</p> <p>DrawResult = "Excluded" for candidate selected for exclusion; "Not Excluded" for candidate(s) not selected for exclusion</p> <p>ManuaDrawFlag = "N"</p>	Draw
5	<p>Store the range and random numbers generated from Action 3 by creating a random number history record with the following attribute values:</p> <p>ElectionEventID = election event ID for the contest</p> <p>ContestID = contest ID</p> <p>CountID = current count</p> <p>Random_Number_History = system generated unique number</p> <p>ReasonType = "Draw"</p> <p>NumberGenerated = numbers generated delimited by a comma</p> <p>Range = number of tied candidates</p> <p>SeedUsed = the seed used</p>	Random_Number_History
6	<p>After the draw results (either manual or automatic) have been determined, update the excluded candidate's record to indicate the count at which they were excluded:</p> <p>VCElectedOrExcludedAtCountID = current count</p>	Candidate
7	<p>Create a history record to indicate that the candidate has been excluded as follows:</p> <p>ElectionEventID = election event ID for the contest</p> <p>ContestID = contest ID</p> <p>CountID = current count</p> <p>CandidateID = the excluded candidate ID</p> <p>VotesDistributed = 0</p> <p>VotesTransferred = 0</p> <p>ProgressiveTotal = -1</p> <p>CandidateStatus = "Excluded"</p> <p>SurplusMovement = " "</p>	Candidate_History

1.4.28 Step 27 – Continuing Candidates equals Unfilled Vacancies?

If the Number of Candidates elected + Number of Continuing Candidates (not including the Candidate just identified for exclusion) = Number of Candidates to be Elected, then ***all remaining***

candidates are elected (even if they have not reached the quota) and processing continues from **Step 30**. The actual Transfer of the Excluded Candidate's Ballot Papers is not necessary.

If more Candidates are required to be elected then processing continues from **Step 28** (to transfer the preferences of the Excluded Candidate).

1.4.28.1 Database Processing

#	Action	Table Reference
1	Get the number of elected candidates by counting the candidates that have CandidateEligibilityFlag = "Y" and VC_OrderOfElection = NOT NULL	Candidate
2	Get the number of continuing candidates by counting the candidates that have CandidateEligibilityFlag = "Y" and VCElectedOrExcludedAtCountID = NULL	Candidate
3	Get the number of Candidates to be Elected; NumberOfPositionsContested	ElectionArea
4	If the Number of Candidates Elected (from Action 1) + the Number of Continuing Candidates (from Action 2) = the Number of Candidates to be Elected (from Action 3) then all the remaining candidates are elected. Otherwise go to Step 28.	N/A
5	Sort the continuing candidates from Action 2 by their progressive total in descending order <pre>SELECT record FROM Candidate_History WHERE CandidateStatus = "Continuing" AND CountID = Current Count - 1 ORDERBY ProgressiveTotal, Descending</pre>	Candidate_History
6	Update the continuing candidate's previous count history record with the following attribute value: CandidateStatus = "Elected"	Candidate_History

1.4.29 Step 28 – Transfer Ballot Papers

The next preferences are examined for all votes assigned to the Candidate to be Excluded, and transferred to the next available Continuing Candidate as defined in the processing for **Step 15**.

When distributing preferences from Excluded Candidates, the Votes Distributed = Votes Transferred since there is no required Transfer Value to be applied.

1.4.29.1 Database Processing

#	Action	Table Reference
1	Get all the votes received by the excluded candidate. <pre>SELECT ballot paper ID FROM Ballot_Paper_Movement WHERE ToCandidateID = the excluded candidate</pre>	Ballot_Paper_Movement
2	For each vote retrieved from Action 1, get the next available preference marked for a continuing candidate <pre>SELECT next preference record FROM BTL_Expanded_Preference, Candidate WHERE VCBallotPaperID = the retrieved ballot paper ID AND Preference = the excluded candidates preference + n AND VCElectedOrExcludedAtCountID = NULL AND CandidateEligibilityFlag = "Y"</pre> Where n is 1 and incremented by 1 until a record is returned or until n = maximum preference on the vote. If a record was returned then the vote contains a valid next preference (i.e. the next preference is for a continuing candidate). Continue to Action 3.	BTL_Expanded_Preference

	<p>If no record was returned then all next preferences have been ignored (i.e. the next preferences were for an elected or excluded candidate) or there were no more preferences which means this is an exhausted vote. Continue to Action 4.</p>	
3	<p>For each vote that has a valid next preference from Action 1, assign them to the respective continuing candidate by creating a ballot paper movement record and assign the following attribute values:</p> <p>ElectionEventID = election event ID for the contest ContestID = contest ID CountID = current count VCBallotPaperID = unique ballot paper ID from Action 2 MovementType = "Transfer" FromCandidateID = excluded candidate ID ToCandidateID = candidate ID marked with next preference</p>	Ballot_Paper_Movement
4	<p>For each exhausted vote identified from Action 2, mark these votes accordingly by creating by a ballot paper movement record with the following attributes:</p> <p>ElectionEventID = election event ID for the contest ContestID = contest ID CountID = the current count VCBallotPaperID = unique ballot paper ID from Action 2 MovementType = "Exhausted" FromCandidateID = excluded Candidate ID ToCandidateID = 0</p>	Ballot_Paper_Movement
5	<p>Calculate the excluded candidate's transferable votes as follows:</p> <pre>SELECT count(*) FROM Ballot_Paper_Movement WHERE CountID = the current count AND FromCandidateID = the excluded Candidate ID</pre>	Ballot_Paper_Movement
6	<p>Calculate the excluded candidate's exhausted votes as follows:</p> <pre>SELECT count(*) FROM Ballot_Paper_Movement WHERE CountID = the current count AND FromCandidateID = the excluded Candidate ID AND MovementType = "Exhausted"</pre>	Ballot_Paper_Movement
7	<p>Update the count record with the number of transferred votes and exhausted votes as follows:</p> <p>VotesDistributed = Number of votes from Action 5 ExhaustedVotes = Number of votes from Action 6</p>	Count
8	<p>Store details to record the transfer of the excluded candidate's votes to continuing candidates:</p> <ol style="list-style-type: none"> Get all continuing candidates by selecting candidates that have CandidateEligibilityFlag = "Y" and VCElectedOrExcludedAtCountID = 0 For each continuing candidate from (a), create a history record with the following attribute values: ElectionEventID = election event ID for the contest 	Candidate Candidate_History

	ContestID = contest ID CountID = the current count CandidateID = continuing candidate ID to whom the transferable votes have been assigned VotesDistributed = the total number of votes transferred to this continuing candidate in Action 3. If no votes were transferred then set to 0 VotesTransferred = same value as Votes Distributed ProgressiveTotal = -1 CandidateStatus = "Continuing" SurplusMovement = " "	
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1.4.30 Step 29 – Calculate Progressive Total

Each Continuing Candidate's new current Progressive Total is calculated as follows:

Progressive Total = Progressive Total brought forward from previous Counts + Votes Transferred to Candidate

Processing continues from **Step 4** to determine whether any further Candidates can be elected.

1.4.30.1 Database Processing

#	Action	Table Reference
1	For each continuing candidate, add the votes transferred to the candidate in this count to the progressive total from the previous count. Progressive Total = VoteTransferred to the continuing candidate in the current count + Progressive Total from the current count - 1	Candidate_History

1.4.31 Step 30 – Order Remaining Candidates

The Candidate with the highest Progressive Total is **declared elected** to the next Position Elected and the Candidate with the next highest Progressive Total to the following position until all elected Candidates are positioned.

At the end of this process the required Number of Candidates for the Election are elected.

1.4.31.1 Database Processing

#	Action	Table Reference
1	For every candidate elected update the candidate's record to indicate: <ol style="list-style-type: none"> a. the count at which they were elected: VCElectedOrExcludedAtCountID = current count b. their order of position such that the candidate with the highest progressive total is elected to the next available position, and the candidate with the next highest progressive total is elected to the next available position and so forth: VCOOrderOfElection = next available position Note: if two or more candidates have the same progressive total then assign their order of position by Candidate ID. Go to Step 31.	Candidate

1.4.32 Step 31 – End Election

End Election Count Process.

Store all Election Results data on the database.

1.4.32.1 Database Processing

#	Action	Table Reference
1	Indicate that the data for the current count is now available for reporting by updating the current count record as follows: CountReportComplete = "Y"	Count
2	Indicate that the count process has completed by setting the following attributes: CountExecutingFlag = "N" CountRunByUserID = current UserID	ElectionArea

1.4.33 Random Processing

Using a Random Number Generator

A Random Number Generation Program from a reputable software provider is required for the purposes of performing random operations.

Random Selection of Candidates

The random selection of candidates for a Position Draw, Rounding Draw or an Exclusion Draw is as follows:

- If X candidates are in the draw, then they are all numbered from 1 to X
- The Random Number Generator is used to generate a number between 1 and X
- The candidate that matches the number generated is the one to be selected from the draw.

Random Selection of Votes Set Aside

The random selection of ballot papers to be set aside from the relevant ballot papers identified during the distribution process is as follows:

- If Y papers are to be set aside from the X papers distributed to a Continuing Candidate, then the distributed papers are numbered from 1 to X
- The Random Number Generator is used to generate Y numbers between 1 and X
- If a number is duplicated then another number must be generated
- The ballot papers that match the numbers generated are the ones to be set aside. These will be flagged within the computer system and will not be used in any further distributions.

This process will be followed distinctly for the ballot papers distributed to each Continuing Candidate.

2 Compliance Matrix

2.1 LC Legislation Compliance Matrix

The table below shows a compliance matrix of the steps described in Section 1 against the LC Legislation.

LC Legislation Clause	Step Ref.
6 At the close of the poll the Council returning officer shall ascertain the total number of first preference votes recorded for each candidate on all ballot-papers not rejected by him as informal and the total of all such votes.	Step 1 Step 2
7 The Council returning officer shall then determine a quota by dividing the total number of first preference votes for all candidates by 22 and by increasing the quotient so obtained (disregarding any remainder) by 1.	Step 3
8 Any candidate who has received a number of first preference votes equal to or greater than the quota so determined shall be elected.	Step 4-5
9 Where the number of first preference votes received by a candidate is equal to the quota, the whole of the ballot-papers containing those votes shall be set aside as finally dealt with.	Step 7 Step 8
10 Unless all vacancies have been filled, the surplus votes of each elected candidate shall be transferred to the continuing candidates, in proportion to the voters' preferences, as follows:	Step 10 Step 6 Step 13-20
(a) The Council returning officer shall divide the number of the elected candidate's surplus votes by the number of first preference votes (excluding any first preference votes indicated on ballot-papers which do not bear a next available preference for a continuing candidate) received by him and the resulting fraction shall, for the purposes of this clause, be the transfer value of that candidate's surplus votes.	Step 16
(b) The Council returning officer shall take all of the ballot-papers of the elected candidate on which a next available preference is indicated for a continuing candidate and arrange them in separate parcels for the continuing candidates according to the next available preference indicated on them.	Step 14 Step 15
(c) The Council returning officer shall ascertain, from the parcel referred to in paragraph (b) in respect of each continuing candidate, the total number of ballot-papers of the elected candidate which bear the next available preference for that continuing candidate and shall, by multiplying that total by the transfer value of the elected candidate's surplus votes, determine the number of votes to be transferred from the elected candidate to each continuing candidate.	Step 17
(d) If, as a result of the multiplication, any fraction results, so many of those fractions, taken in the order of their magnitude, beginning with the largest, as are necessary to ensure that the number of votes transferred equals the number of the elected candidate's surplus votes shall be reckoned as of the value of unity and the remaining fractions shall be ignored.	Step 17
(e) The Council returning officer shall then determine the number of ballot-papers to be transferred from the elected candidate to each continuing candidate.	Step 17
(f) The Council returning officer shall then, in respect of each continuing candidate, forthwith take at random, from the parcel referred to in paragraph (b) containing the ballot-papers of the elected candidate which bear the next available preference for that continuing candidate, the number of ballot-papers determined under paragraph (e) and transfer those ballot-papers to the continuing candidate.	Step 20
(g) The ballot-papers containing the first preference votes of the elected candidate which have not been transferred (that is, the ballot-papers containing the number of votes equal to the quota) shall be set aside as finally dealt with.	Step 20
11	
(1) When the surplus votes of all elected candidates have been transferred to the continuing candidates as provided by clause 10, any continuing candidate who has received a number of votes equal to or greater than the quota shall be elected.	Step 21 Step 22 Step 4-5
(2) Unless all the vacancies have been filled, the surplus votes of the elected candidate shall be transferred to the continuing candidates in accordance with the provisions of clause 10, but, in the application of those provisions, only those ballot-papers which have been transferred to the elected candidate from a candidate previously elected shall be taken into consideration.	Step 10 Step 14 Step 17-21
12	
(1) If, as a result of the transfer of the surplus votes of a candidate elected in pursuance of clause 11 or elected at a later stage of the scrutiny, a continuing candidate has received a number of votes equal to or greater than the quota, he shall be elected.	Step 21 Step 22 Step 23 Step 4-5
(2) Unless all the vacancies have been filled, the surplus votes of the elected candidate shall be transferred to the continuing candidates in accordance with the provisions of clause 10, but, in the application of those provisions, only those ballot-papers which have been transferred to the elected candidate from the	Step 10 Step 14

	candidate or candidates elected at the last preceding count shall be taken into consideration.	
13	The ballot-papers containing the first preference votes of a candidate who has been elected in pursuance of the provisions of clause 11 or 12, together with the ballot-papers transferred to him from a candidate previously elected or excluded which have not been further transferred, shall be set aside as finally dealt with.	Step 17 Step 20
14		
	(1) If, after the transfer of the surplus votes of the elected candidates, no candidate has, or less than the number of candidates required to be elected have, received a number of votes equal to the quota, the candidate who has the fewest votes shall be excluded and the whole of his ballot-papers shall be transferred to the continuing candidates next in order of the voters' available preferences.	Step 5 Step 10 Step 24-28
	(2) If thereupon, or as the result of the exclusion of a candidate at any subsequent stage of the scrutiny, a continuing candidate has received a number of votes equal to or greater than the quota, he shall be elected.	Step 29 Step 4-5
	(3) Unless all the vacancies have then been filled, the surplus votes of the elected candidate shall be transferred to the continuing candidates in accordance with the provisions of clause 10, but, in the application of those provisions, only those ballot-papers which have been transferred to the elected candidate from the candidate last excluded shall be taken into consideration.	Step 10 Step 14-21
	(4) The ballot-papers containing the first preference votes of the elected candidate, together with the ballot-papers transferred to him from a candidate previously elected or excluded which have not been further transferred, shall be set aside as finally dealt with.	Step 20
	(5) If no continuing candidate has then received a number of votes equal to the quota, the process of excluding the candidate with the fewest votes and the transferring of ballot-papers containing those votes to the continuing candidates shall be repeated until a continuing candidate has received a number of votes equal to the quota or, in respect of the last vacancy, a majority of the votes remaining in the count, but the process of excluding candidates shall not be repeated after the number of continuing candidates is equal to the number of unfilled vacancies.	Step 24-29 Step 10 Step 4 Step 11 Step 27 Step 30 Step 31
	(6) A ballot-paper that under this clause is, pursuant to the exclusion of a candidate, required to be transferred to a continuing candidate shall be set aside as finally dealt with if it does not indicate a next available preference for a continuing candidate.	Step 28
15	After all the candidates who have received a number of votes equal to the quota are elected: (a) where there is 1 remaining unfilled vacancy—the candidate who has received a majority of the votes remaining in the count, or (b) where the number of continuing candidates is equal to the number of remaining unfilled vacancies—those candidates, shall be elected.	Step 10 Step 11 Step 30 Step 27
16	Where, on the count of the first preference votes, or at the same time at any subsequent stage of the scrutiny, 2 or more candidates are elected by reason of their having received a number of votes equal to or greater than the quota, any transfer of the surplus votes of those candidates shall be carried out in the order, first of the candidate with the largest surplus, second of the candidate with the next largest surplus and so on.	Step 6 Step 7 Step 13
17		
	(1) Notwithstanding anything contained in this Part of this Schedule, a transfer of the surplus votes of an elected candidate shall be deferred (but without affecting the order of that transfer) so long as the total number of those surplus votes and any other surplus votes not transferred is less than the difference between the total votes of the 2 continuing candidates with the fewest votes.	Step 12 Step 23
	(2) In any such case, unless all vacancies have been filled, the candidate with the fewest votes shall be first excluded and the ballot-papers containing his votes shall be transferred to the continuing candidates as provided in clause 14 (1).	Step 10 Step 24-29
18		
	(1) If, on any count, 2 or more candidates have an equal number of votes, and 1 of them has to be excluded, the candidate whose name is on the slip drawn in accordance with subclause (4) of this clause shall be excluded.	Step 25 Step 26
	(2) If, at the time of their election, 2 or more candidates have an equal number of votes that is more than the quota, the candidate whose name is on the slip drawn in accordance with subclause (4) of this clause shall, for the purposes of clause 16, be deemed to have had the larger or largest surplus.	Step 8 Step 9
	(3) If, on the final count for filling the last vacancy, 2 candidates have an equal number of votes, 1 candidate shall be excluded in accordance with subclause (1) of this clause and the other shall be elected.	Step 25 Step 26
	(4) For the purposes of subclauses (1) and (2) of this clause, the names of the candidates who have an equal number of votes having been written on similar slips of paper by the Council returning officer and the slips having been folded by him so as to prevent the description being seen and having been mixed, 1 of those slips shall be drawn at random by him.	Step 9 Step 26

The table below is a compliance matrix showing the clauses in the LC Legislation which are satisfied by each step.

Step	6	7	8	9	10	10 (a)	10 (b)	10 (c)	10 (d)	10 (e)	10 (f)	10 (g)	11 (1)	11 (2)	12 (1)	12 (2)	13	14 (1)	14 (2)	14 (3)	14 (4)	14 (5)	14 (6)	15	16	17 (1)	17 (2)	18 (1)	18 (2)	18 (3)	18 (4)
1	✓																														
2	✓																														
3		✓																													
4			✓										✓		✓			✓	✓				✓								
5			✓										✓		✓				✓												
6				✓	✓																					✓					
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15					✓		✓				✓			✓		✓					✓										
16					✓	✓				✓				✓		✓					✓										
17					✓			✓	✓					✓		✓	✓				✓										
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19					✓									✓		✓					✓										
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21					✓								✓	✓	✓	✓					✓										
22													✓		✓																
23																											✓				

Step	6	7	8	9	10	10 (a)	10 (b)	10 (c)	10 (d)	10 (e)	10 (f)	10 (g)	11 (1)	11 (2)	12 (1)	12 (2)	13	14 (1)	14 (2)	14 (3)	14 (4)	14 (5)	14 (6)	15	16	17 (1)	17 (2)	18 (1)	18 (2)	18 (3)	18 (4)	
24																		✓				✓					✓					
25																			✓				✓				✓	✓			✓	
26																			✓				✓				✓	✓			✓	✓
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29																				✓								✓				
30																							✓		✓							
31																							✓		✓							

2.2 LG Legislation Compliancy Matrix

The table below shows a compliancy matrix of the steps described in Section 1 against the LG Legislation.

LG Legislation Clause	Step Ref.
3 Parcels of first preferences The ballot-papers are divided into parcels according to the names of the candidates for whom the first preferences on the ballot-papers are recorded	Step 1
4 Quota The aggregate number of first preferences is divided by one more than the number of candidates to be elected. The quotient (disregarding any remainder), increased by one, becomes the quota.	Step 3
5 Election on first preferences	
(1) A candidate who has, upon the first preferences being counted, a number of first preferences equal to or greater than the quota is elected.	Step 2 Step 4-5
(2) If the number of first preferences obtained by the candidate is equal to the quota, all the ballot-papers on which first preferences are recorded for that candidate are set aside as finally dealt with.	Step 7 Step 8
6 Surplus on first count	
(1) If the number of first preferences obtained by any candidate exceeds the quota, the surplus is transferred to the continuing candidates next in the order of voters' preferences, in accordance with the following directions:	Step 6 Step 13-20
(a) the ballot-papers on which first preferences are recorded for the elected candidate are re-examined, and the number of second preferences, or (in accordance with clause 12 of this Schedule) third or next consecutive preferences, recorded on them for each continuing candidate and the number of exhausted ballot-papers is counted,	Step 15
(b) the surplus is divided by the total number of first preferences recorded for such elected candidate (excluding any exhausted ballot-papers). The transfer value is equal to the resulting fraction or the first 4 digits of the resulting decimal fraction or (if the fraction exceeds 1) to 1,	Step 16
(c) the number of second or other preferences, ascertained in paragraph (a) as being recorded for each continuing candidate, is multiplied by the transfer value,	Step 17
(d) the resulting number for each continuing candidate is added to the number of votes obtained by the candidate on the counting of first preferences,	Step 21
(e) however, if as a result of the multiplication referred to in paragraph (c), any fraction results, so many of those fractions (taken in the order of their magnitude and beginning with the largest) as are necessary to ensure that the number of votes transferred equals the number of the elected candidate's surplus votes are treated as equal to 1, and the remaining fractions are ignored,	Step 17
(f) if, as a result of the multiplication referred to in paragraph (c), 2 or more fractions are equal and one of them is to be treated as equal to 1, the fraction arising from the largest number of second or other preferences referred to in paragraph (a) is treated as the largest, and if the numbers of those preferences are equal, the fraction credited to the candidate with the highest number of votes at the last count or transfer at which the candidates with the equal number of preferences had an unequal number of votes is treated as the largest, and if those candidates have had an equal number of votes at all preceding counts and transfers, the returning officer decides by lot which fraction is taken to be the largest,	Step 18 Step 19
(g) from the ballot-papers on which a second or other preference is recorded for any continuing candidate, a number of ballot-papers equal to the number of votes directed by paragraph (d) to be credited to the candidate are selected at random, and these are to be placed in a separate parcel and transferred to the candidate,	Step 20
(h) all ballot-papers of the elected candidate not transferred under paragraph (g) (including any exhausted ballot-papers) are set aside as finally dealt with, being the ballot-papers by which the candidate is elected,	Step 15 Step 20
(i) a transfer of votes under this clause is not made unless the surplus of the elected candidate, together with any other surpluses not transferred, exceeds the difference in numbers between the votes of the 2 continuing candidates lowest on the poll.	Step 12 Step 23
(2) However, this clause is subject to clause 11 of this Schedule, and if at any time there is one remaining vacancy which can be filled under that clause, no further transfer under this clause can be made.	Step 11
7 Surplus on transfer	
(1) If by a transfer of a surplus on the count of first preferences or of a surplus under this clause the number of votes obtained by a candidate equals or exceeds the quota, the candidate is elected.	Step 4-5
(2) In that case, despite the fact that the candidate has reached the quota, the transfer is to be completed, and all the votes to which the candidate is entitled from the transfer are to be transferred	Step 13-22

	to the candidate.	
(3)	If by a transfer the number of votes obtained by a candidate equals the quota, the whole of the ballot-papers on which those votes are recorded are set aside as finally dealt with, being the ballot-papers by which the candidate is elected.	Step 7 Step 8
(4)	If by a transfer the number of votes obtained by a candidate exceeds the quota, the surplus is transferred to the continuing candidates next in the order of the voters' respective preferences in the following manner:	Step 14-20
(a)	the ballot-papers transferred to the elected candidate in the last transfer are re-examined, and the number of next consecutive preferences recorded for each continuing candidate on the papers and the number of exhausted ballot-papers are counted,	Step 14-15
(b)	the surplus is divided by the total number of ballot-papers transferred to the elected candidate in the last transfer (excluding any exhausted ballot-papers). The transfer value is equal to the resulting fraction or the first 4 digits of the resulting decimal fraction or (if the fraction exceeds 1) to 1,	Step 16
(c)	the surplus is transferred and the papers dealt with in a manner similar to that prescribed by clause 6 of this Schedule for the transfer of a surplus arising at the first count,	Step 17-19
(d)	a transfer of votes under this subclause is not made unless the surplus of the elected candidate, together with any other surpluses not transferred, exceeds the difference in numbers between the votes of the 2 continuing candidates lowest on the poll.	Step 12 Step 23
(5)	However, this clause is subject to clause 11 of this Schedule, and if at any time there is one remaining vacancy which can be filled under that clause, no further transfer under this clause can be made.	Step 11
8 Transfer of surpluses		
(1)	If, on the counting of the first preferences or on any transfer, more than one candidate has a surplus, the largest of the surpluses is transferred, then the next largest, and so on.	Step 6 Step 7 Step 13
(2)	However, if there is an untransferred surplus obtained at a previous count or transfer, that surplus is transferred before those caused by subsequent transfers.	Step 6 Step 7 Step 13
(3)	If there are equal surpluses at the first count, the returning officer decides by lot which surplus is transferred first.	Step 8 Step 9
(4)	If there are equal surpluses at a later count or at a transfer, the surplus of the candidate who was the highest on the poll at the count or transfer at which the tied candidates last had an unequal number of votes is the first to be transferred. If those candidates have had an equal number of votes at all preceding counts or transfers, the returning officer decides by lot which candidate's surplus is the first to be transferred.	Step 8 Step 9
9 Exclusion of lowest candidates		
(1)	If, after the first preferences have been counted and transfers of surpluses have been made, fewer than the number of candidates required to be elected have obtained the quota, the candidate lowest on the poll is excluded.	Step 10 Step 24
(2)	All the unexhausted votes obtained by that candidate are transferred in one transfer to the continuing candidates who, on the ballot-papers on which such votes are recorded, are next in the order of the voters' respective preferences.	Step 28
(3)	Any exhausted ballot-papers are set aside as finally dealt with.	Step 28
(4)	The same process of exclusion and transfer is repeated until all the candidates, except the number required to be elected, have been excluded. At that point, the continuing candidates who have not already been elected are elected.	Step 27 Step 30
(5)	Whenever it becomes necessary to exclude a candidate and two or more candidates have the same number of votes and are lowest on the poll, the one who was lowest on the poll at the last count or transfer at which they had an unequal number of votes is first excluded.	Step 25
(6)	If those candidates have had equal numbers of votes at all preceding counts or transfers, or there has been no preceding count, the returning officer decides by lot which candidate is first excluded.	Step 25 Step 26
(7)	This clause is subject to clause 11 of this Schedule, and if at any time there is one remaining vacancy which can be filled under that clause, no further exclusion under this clause can be made.	Step 11
10 Effect of reaching quota while transfers are proceeding		
(1)	If by a transfer under clause 9 of this Schedule, the number of votes obtained by a candidate equals or exceeds the quota, the candidate is elected.	Step 4-5 Step 29
(2)	In that case, despite the fact that the candidate has reached the quota, the transfer is to be completed, and all the votes to which the candidate is entitled from the transfer are to be transferred to the candidate.	Step 13-22
(3)	If by a transfer under clause 9 of this Schedule, the number of votes obtained by a candidate equals	Step 7-8

	the quota, the whole of the ballot-papers on which those votes are recorded are set aside as finally dealt with, being the ballot-papers by which the candidate is elected.	
	(4) If by a transfer under clause 9 of this Schedule, the number of votes obtained by a candidate exceeds the quota, the surplus is transferred to the continuing candidates next in the order of the voters' respective preferences in the manner set out in clause 7 (4) of this Schedule.	Step 13-20
11 Election without reaching quota		
	(1) When the number of continuing candidates is reduced to the number of vacancies remaining unfilled the continuing candidates are elected, even if they have not reached the quota.	Step 27 Step 30
	(2) When only one vacancy remains unfilled and the votes of one continuing candidate exceed the total of all the votes of the other continuing candidates, together with any surplus not transferred, that candidate is elected.	Step 11
	(3) When more than one vacancy remains unfilled and the votes of the candidate who (if all the vacancies were filled by the successive election of the continuing candidates with the largest number of votes) would be the last to be elected exceed the total of any surplus not transferred plus the votes of all the continuing candidates with fewer votes than that candidate, that candidate and all the other continuing candidates who do not have fewer votes than that candidate are elected.	Step 11
	(4) When only one vacancy remains unfilled, and there are only 2 continuing candidates, and those 2 candidates each have the same number of votes, and no surplus votes remain capable of transfer, one candidate is excluded in accordance with clause 9 (5) and (6) of this Schedule and the other is elected.	Step 24 Step 25 Step 26
12 Determining order of preference		
	In determining which candidate is next in the order of the voter's preference, any candidates who have been declared elected or who have been excluded are not considered, and the order of the voter's preference is determined as if the names of those candidates had not been on the ballot-paper.	Step 15 Step 28
13 Deciding by lot		
	(1) For the purposes of excluding a candidate by lot under clause 9 or 11 of this Schedule, the names of the candidates who have equal numbers of votes are written on similar slips of paper by the returning officer, the slips are folded by the returning officer so as to prevent the names being seen, the slips are mixed and one is drawn at random by the returning officer and the candidate whose name is on the drawn slip is excluded.	Step 26
	(2) For the purpose of deciding by lot which candidate's surplus is first to be transferred under clause 8 of this Schedule, the names of the candidates who have equal surpluses are written on similar slips of paper by the returning officer, the slips are folded by the returning officer so as to prevent the names being seen, the slips are mixed, one of the slips is drawn at random by the returning officer and the candidate whose name is on the drawn slip is the one whose surplus is the first to be transferred.	Step 9
	(3) For the purposes of determining the largest fraction under clause 6 of this Schedule, the names of the candidates who have been credited with the equal fractions are written on similar slips of paper by the returning officer, the slips are folded by the returning officer so as to prevent the names being seen, the slips are mixed, one of the slips is drawn at random by the returning officer and the candidate whose name is on the drawn slip is taken to have been credited with the largest fraction.	Step 19

