

**Republic of the Philippines**

**PHILIPPINES-AUSTRALIA LAND ADMINISTRATION**

**&**

**MANAGEMENT PROJECT**

**(PA-LAMP)**

**PROCEDURE MANUAL**

**for**

**URBAN and RURAL**

**CADASTRAL INDEX MAP PRODUCTION**

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8		Project Management Office
9		Supervisor CIM Production PIO1
10		Supervisor CIM Production PIO2
11		CIM Staff PIO1
12		CIM Staff PIO1
13		CIM Staff PIO1
14		CIM Staff PIO1
15		CIM Staff PIO2
16		CIM Staff PIO2
17		CIM Staff PIO2
18		CIM Staff PIO2

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# **1 Introduction**

The purpose of this work instruction is to give guidance to the cartographers and Managers in producing the Cadastral Index Map (CIM) according to the needs of the Land Administration Management Project (PA-LAMP).

## **1.1 Manual Revision and Use**

This manual is intended to be used by all PA-LAMP office personnel that are involved with the production of CIM. The intention of this manual is to support staff training and to provide procedural guidance to the cartographers during the preparation of any CIM.

A Procedure Manual should be distributed to all participating CIM staff. Periodical modifications to this manual will be made, which will require the approval of the Managers, who are responsible for circulating the modified manuals, and these will be forwarded to all registered holders. Any modification will be noted in the Document Verification/Document Approval section of the manual.

## **1.2 PA-LAMP Objectives**

The objectives of the PA-LAMP are to test alternative approaches to improve the protection of rights to land, eliminate fake titles, introduce an equitable system of land registration and valuation, formulate and propose policy and regulatory changes, and formulate the institutional arrangements needed to support implementation of the subsequent phase of the Program. The production of CIM is an important step in the PA-LAMP.

## **1.3 Cadastral Index Maps (CIM)**

The CIM is a map series that covers all cadastral related information. The CIM shows the cadastral information as spatial (graphical) index only, ie a working map. The CIM is not a legal identifier of land and does not replace the land records such as Certificate of Title and survey plans. It is used to manage and control the lands records process by providing a means of identifying individual land parcels and the associated land records ie titles and survey plans etc.

### **1.3.1 CIM Scale and Numbering**

All CIM will have a unique number, in this manner a CIM location and scale can be identified by the CIM number.

The base cadastral map within the Philippines is 1:4000 and depending on the location, ie Rural or Urban, the scale can be either one of the following:

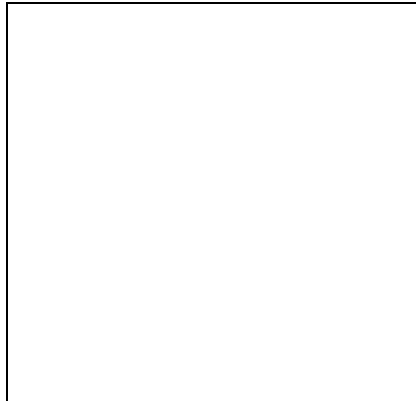
- 1:4000;
- 1:2000;
- 1:1000;

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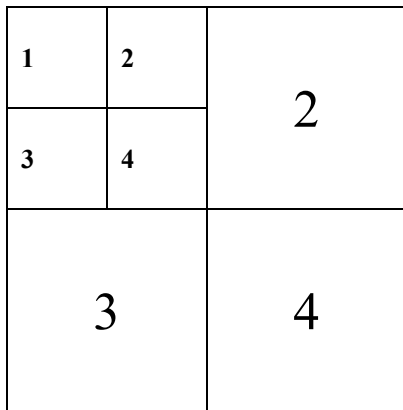
- 1:500.

Basically the CIM will be numbered by the geographical coordinates of the bottom left corner of the base 1:4000 map sheet and then broken down into 1:2000, 1:1000 and 1:500 sheet numbers.

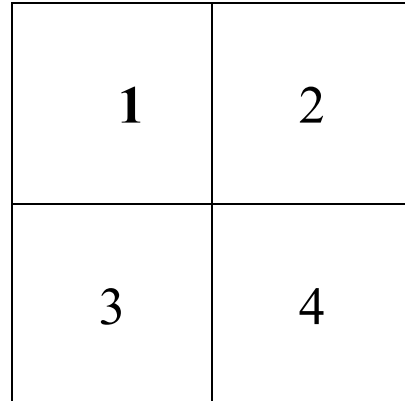
Below is a schematic drawing of a standard 1:4000 map



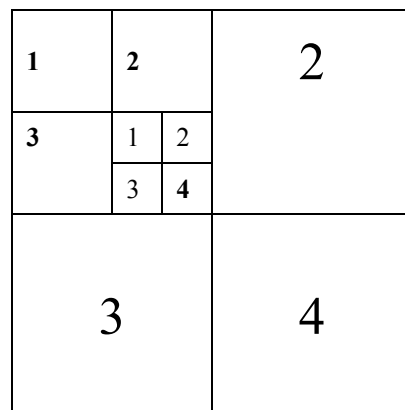
This can be broken down into 4 by 1:1000 map sheets



This can be broken down into 4 by 1:2000 map sheets



This can be broken down into 4 by 1:500 map sheets



14°30'

121°15'

The bottom left corner of the 1:4000 map sheet is defined by Latitude eg 14°30' and Longitude of 121°15'.

The CIM numbering can now be the degrees and minutes of that sheet corner. Considering that the Philippines longitude extends for only 5° the digit for 100 degrees longitude can be eliminated, leaving 4 significant numbers that can define the corner of the 1:4000 CIM, ie 14302115.

To enable the 1:2000 sheet numbering ie sheet 1 in this case an extra digit is required, 143021151 indicates this sheet. To enable the 1:1000 map sheet to be shown and extra digit is added ie 1430211514. To enable the 1:500 map sheet to be shown an extra digit is shown ie 14302115144.

Using the example shown above, if only the 1:4000 sheet is referred to then the CIM number would be 14302115000, if the 1:2000 sheet is referred to the CIM number would be 14302115100. If the 1:1000 sheet were referred to the CIM number would be 14302115140. If the 1:500 sheet were referred to the CIM number would be 14302115144.

This then becomes a unique CIM numbering system and by this number any sheet can be located geographically with ease.

Each CIM will be a specified size, ie the area shown within the CIM will depend on the scale of the CIM, being:

- 1:4000, the map sheet will be 1' (one minute) of arc of latitude and longitude.
- 1:2000, the map sheet will be 30" (thirty seconds) of arc of latitude and longitude.
- 1:1000, the map sheet will be 15" (fifteen seconds) of arc of latitude and longitude.
- 1:500, the map sheet will be 7.5" (seven and a half seconds) of arc of latitude and longitude.

### **1.3.2 CIM Parcel (Lot) Numbering**

Every parcel of land with or without a title will be shown on the CIM and given a Unique Parcel Identifier (UPI) ie a unique number that is not repeated within the CIM where that parcel occurs. A Cross Index Database (CrossIndex) will maintain an up to date reference of each parcel of land on any CIM, with respect to all the relevant information held by other participating agencies dealing with that parcel.

## **2 Agency Records Search**

### **2.1 Background**

An objective of the PA-LAMP is the rejuvenation of the land records system to include all information pertaining to all land parcels from the various agencies. This will allow cross checking of information to ensure the parcel hasn't been issued duplicate or fraudulent titles. It will also allow for the access of information and the updating of existing information in the one location by the various agencies when a transaction occurs on a parcel of land, ie in the One Stop Shop (OSS).

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The CIM will provide the mechanism through the CrossIndex database for the validation and maintenance of vital land records.

The process will:

- Ensure all land parcels are accounted for;
- Ensure that all existing records from all agencies are included in the process;
- Aid reconstitution of damaged or missing records;
- Identify conflicts or anomalies for future investigation;
- Provide a mechanism for maintenance of the records system.

### **2.1.1 Urban data Sources**

The records of ROD, LRA, DENR, LMB, BIR, and the Assessor's Office (LGU) will need to be searched.

#### **DATA SOURCES – Urban**

Listed below are the major items that are required, a more detailed list can be seen in Appendix 4 which deals with the database construction and fields.

Data Sources	Survey Plan Copy	Survey Plan No.	TCT Copy	TCT No.	Provisional Title	Owner's Name	Lot Area	Decree No.	Tax Declaration No./PVPIN	Tax Identification No.
LRA	X	X					X	X		
DENR	X	X					X			
LMB	X	X					X			
ASSESSOR		X		X		X	X		X	
ROD		X	X	X	X	X	X			
OWNER'S COPY		X	X	X	X	X	X		X	
BIR				X		X				X

### **2.1.2 Rural data Sources**

The records of ROD, LRA, DENR, CENRO, DAR and the Assessor's Office (LGU) will need to be searched.

#### **DATA SOURCES – Rural**

Listed below are the major items that are required, a more detailed list can be seen in Appendix 4 which deals with the database construction and fields.

Data Sources	Survey Plan Copy	Survey Plan No.	TCT Copy	TCT No.	Provisional Title	Owner's Name	Lot Area
LRA	X	X					X
DENR	X	X					X
ASSESSOR		X					X
ROD		X	X	X	X	X	X
DAR	X	X					
CENRO	X	X		X		X	X
Applicant		X	X	X	X	X	X

## **2.2 Transaction File Notification to ROD, DENR, LRA BIR, and LGU**

Prior to commencement of the records search, all agencies, from where records will be required will be provided with an explanation of the PA-LAMP CIM requirements.

The PA-LAMP Project Manager will provide each agency with a letter and diagram setting out the barangay to be searched.

From the beginning of the records search, each agency will need to maintain a file of all transactions occurring during the search period, so that any changes that occur can be identified and included in the final CIM. This file should be maintained and any further actions on the parcel should be noted so that the CIM and the CrossIndex can be updated within the OSS.

The Project CIM Manager/Supervisor will be required to regularly check that the transaction file is being maintained by all agencies, and to include all new transactions in the CIM work process.

## **2.3 Records Search Process and CrossIndex Database**

PA-LAMP has designed a database that will be suitable for the use in both urban and rural situations. There will be fields in the database that are not required by either location and these fields need not be filled in. Where possible all data from the various agencies needs to be collected, for this database will also be given to the agency concerned for their own use and maintenance of their records, where the agency concerned is still using a paper based system to maintain their records (Rural).

See **Appendix 4** for the layout of the CrossIndex Database or the various fields available.

It is essential that the data that is being collated from all the various agency records and entered into the database is verified, ie once all the data is entered for a particular day, or period of time, then that data should be printed so that the hard copy can be checked with the original data to ensure that the data integrity within the database is maintained (Rural). Remember that incorrect data will produce incorrect results when reports are made for the various field or office activities. Also incorrect data can make identification of duplicate or fraudulent title difficult, which is one of the main areas that PA-LAMP is looking into in urban areas.

### **2.3.1 Assessor's Office Tax Map Records**

The Tax Maps are to be ordered from the Assessor's Office. After the maps have been retrieved, the CIM Manager/Supervisors' file should be amended to indicate which maps have been retrieved. All maps should then be stored correctly for future use.

### **2.3.2 Search DENR, LRA and CENRO (Rural) Records**

The search should be on a barangay basis, these should be either scanned or a white print made. The following information should be obtained:

- Subdivision survey plans with Technical Descriptions (azimuth and distance annotation) either as a textual table or on an annotated plan drawing;
- Subdivision survey plans without Technical Descriptions, which may have individual lot description, either as textual table or annotated plan drawing;
- Consolidated plans of complex subdivision;
- Old survey plans from Land Management Bureau (LMB) that are not available from DENR;
- Plans of original surveys of old areas, which may have no other survey (eg Payatas and Piedad estates);
- Application No., Patent No., Contested/uncontested, (CENRO rural);
- Decree No. (LRA);
- All approved survey plans.

### **2.3.3 Search of ROD Records**

The search of ROD for the Certificate of Title (TCT) can be accessed as follows:

- Tax Maps show the TCT number of the original lot before subdivision;
- TCT's are stored in ROD by the book number and page within the book (not by barangay or district) this is found on the top right-hand corner of the TCT;
- The TCT contains reference to the TCT that it was created from. Where a TCT has been cancelled it will have the number of the TCT it creates endorsed on the back of the TCT;
- Provisional Titles over land with incomplete reconstituted titles;
- TCT show, survey plan number, lot number, owner, area and textual technical description;
- All the above should be available from the BOO records database (urban situations).
- Note: See Procedures Manual for Office Validation

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### **2.3.4 Survey Plan Collation (Urban)**

It is imperative that all plans that have been retrieved from the various agencies be used where they cancel an older survey. It is suggested that each survey plan be placed and attached to the plan that it superseded. Note the survey plan database should be should indicate this in the parent – child references.

If this is adhered to then there should be no plans that are missed out when compiling the CIM.

## **3 Storage of Plans and Records**

Copies of survey plans obtained from LRA, DENR, CENRO (rural), LMB, Assessor's Office and ROD need to be stored by barangay in the appropriate storage cabinet and numbered folders.

Safe and adequate storage should be provided for all records to ensure the records are not lost or damaged.

It is suggested that all plans and maps be stored either vertically or horizontally in plan storage cabinets and not folded or rolled. All survey records and lot data computation sheets collected in the rural situation should be kept in a safe storage unit.

## **4 Orthophoto Map**

An orthophoto map is compiled from rectified aerial photography, ie in displacement, distortion, scale and with this project on the PRS92 reference grid, thus producing a true-to-scaled image of the ground. Each orthophoto map has the same coverage area as a CIM, ie 1:4000 in Rural and 1:1000 in Urban areas. The Numbering system of the orthophoto maps is the same as the CIM numbering system.

The orthophoto maps therefore provide a means to locate the planimetric information on the CIM. The procedure to use the orthophoto maps is explained in the **Section 6 Appendix 2**.

## **5 Satellite Imagery**

## **6 CIM Survey Control**

Survey control may be available in many forms, ie existing traverses connected to PRS92, GPS established stations, or rectified orthophoto maps. All these may be used for control in the constraint and construction of CIM production.

Procedures for survey control use are explained in the **CIM Compilation Procedures Section 7**.

## **7 CIM Compilation Procedures**

### **7.1 Compilation of a CIM**

The CIM is ready to be compiled when the records of the DENR, LRA, LMB, ROD, CENRO, DAR, National Irrigation Authority (NIA), Public Works and Highways (DPWH) and Tax Maps have been searched and copies of plans available. Note not all of these agencies may be involved, it is dependent on whether the CIM is rural or urban.

Check if the orthophoto map has been completed and available. If available use the orthophoto as the base map for cadastral control.

In the early stages it is unlikely that orthophoto maps will be available. In this case compilation of lot data will depend upon LRA, DENR and LMB subdivision plans, National Irrigation Authority (NIA), Department of Public Works and Highways (DPWH) plans, and any identified cadastral surveys.

Note that all NIA plans for canals ie man made constructed waterways and DPWH plans should be collected for these may also depict changes in the cadastre that are not indicated on the original survey plans. These should be plotted and investigated where they overlap the cadastre that has already been captured.

The CIM Unit Manager should direct the cartographer to begin the CIM compilation. The Cartographic Supervisor will note CIM number, start date and cartographer name in CIM Control Register Database.

It is preferable that only one cartographer work on one CIM.

At the completion of every stage of the CIM production the CIM Control Register is required to be completed see **Appendix 8**, a blue/white print of the CIM will be required at every stage for QA purposes, see **Section 10** of this manual.

### **7.2 CIM Base Preparation.**

The CIM map graticule and grid can be produced using AutoCAD or MapInfo if these methods are available.

The map specifications are as follows:

- Coordinates: Philippines Transverse Mercator (PRS 92 reference system);
- See **Appendix 1** for the CIM sheet layout.

#### **7.2.1 Drafting Specification Standard**

Production of the CIM under the PA-LAMP will be according to the drafting specification standard set out below.

#### **7.2.2 Drafting Film**

The drafting film to be used for the CIM sheet shall be made of durable material being quality drafting film of a type and standard as below:

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- Type: single matt for electronically produced CIM and double matt for hand drafted produced CIM;
- Thickness: 0.03 mm.

### **7.2.3 Minimum Drafting Equipment**

The drafting equipment mentioned in the list below is the standard equipment to be used for construction of a CIM. The equipment listed below or of the same quality shall be used.





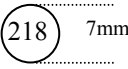
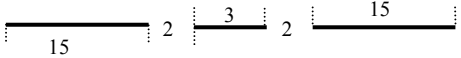
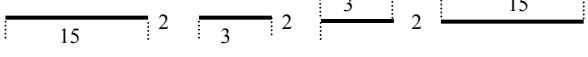
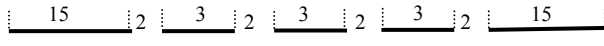
No	Basic Equipment Needed
1.	Technical pencil 0.5 (2H)
2.	Eraser (ink and pencil)
3.	Technical pen 0.2, 0.3 & 0.5
4.	Waterproof ink
5.	Set square 45° & 60°/30°
6.	Scale ruler (1:500, 1:1000,1:2000 & 1:4000)
7.	Scriber
8.	Leroy lettering set (CL 290, 240, 175, 140, 100, 80 & 60)
9.	Plastic or metal drafting ruler 1 metre
10.	Minimum of 2 Weights (lead encased in leather either pellet or solid)

### **7.2.4 Standard of Detail**

All detail on CIM must be in waterproof ink of a type recommended by the manufacturer of the drafting material. All detail lines, numbers, letters, symbols and decimal points must be legible and not defaced. Erasures must be made by a method that does not damage the surface of the drafting material.

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The following table shows the standard of detail to be assigned for the cadastral maps:

Items	Symbol	Pen Number			Stencil Size
		0.2	0.3	0.5	
Outer Edge of Cadastral Index Map Frame				✓	
Inner Edge of Cadastral Index Map Frame		✓			
Grid Line		✓			
Coordinates Values	1 622 000, 399 000, 14°	✓			
Boundary Line		✓			
Preliminary Land Parcel Number		✓			CL80
Final Land Parcel Number	1		✓		
Name of adjacent Road, River or Lake	Emerald Ave	✓			
Barangay Boundary (mm)				✓	
Municipality/District Boundary (mm)				✓	
Province Boundary (mm)				✓	

The following table shows the standard of detail to be assigned for the CIM. The preliminary and final cadastral index maps will also show the information as shown in the following table:

Item	Preliminary CIM compiled from:		Final CIM
	Orthophoto	Survey Plan	
1. Boundary mark Symbols	No	No	No
2. Boundary Mark Number	Yes	No	No
3. Length of each Boundary	Yes	No	No
4. Boundary Line	Yes	Yes	Yes
5. Original Parcel Number (Survey Plan)	Yes	Yes	No
6. Preliminary Land Parcel Number (UPI)	Yes	Yes	No
7. Final Land Parcel Number (UPI)	Yes	Yes	Yes
8. Name of village, town, road, river or lake	Yes	Yes	Yes
9. Barangay Boundary	Yes	Yes	Yes
10. Municipality/District Boundary	Yes	Yes	Yes
11. Province Boundary	Yes	Yes	Yes
12. Region Boundary	Yes	Yes	Yes
13. Titled	Yes	Yes	No
14. Not Titled	Yes	Yes	No
15. Land Classification	Yes	Yes	No
16. Land Use	Yes	Yes	No

**Note:** The preliminary and final CIM, when using an orthophoto map will consist of the orthophoto map and the overlay sheet.

By the use of the software “PA-LAMP CIM Sheet Corners” (see **Appendix 4**) the CIM sheet corners in both Geographic and Grid, plus the CIM sheet number and size will automatically be produced.

A sheet template can be modified in either MapInfo or AutoCAD. A grid in PTM can then be produced. The sheet corner coordinates in both systems, and the CIM sheet number can be added, along with the legend information.

The legend on a Final CIM will contain:

- CIM Map Sheet Number at both top and bottom of the legend box;
- Map Scale;
- Scale Bar;
- North Point;
- Projection;

- Datum;
- Index to Adjoining CIM diagram;
- Barangay boundaries;
- Municipality/District boundaries;
- Regional boundaries;
- Provincial boundaries;
- Administrative Areas Diagram (optional).

The Legend for a Preliminary CIM will contain:

- All the above as in the Final CIM and;
- Land Use codes;
- Land Classification codes;

Note: These processes may need to be performed using manual drafting if the AutoCAD and/or MapInfo process has not been developed.

The CIM supervisor should carry out Quality Assurance checks on the completed CIM base.

### **7.2.5 Urban:**

In urban areas the base scale used is 1:1000 and 1:500 is used where the area is too densely populated to allow the base scale to depict the lots and their annotations clearly.

- Scale: 1: 1000;
  - Coverage: 15 seconds of arc by 15 seconds of arc.
- or
- Scale: 1: 500;
  - Coverage: 7.5 seconds of arc by 7.5 seconds of arc.

### **7.2.6 Rural:**

In rural areas the base scale used is 1:4000 and the other scales are used only where the area is too densely populated to allow the base scale to depict the lots and their annotations clearly.

- Scale: 1: 4000;
- Coverage: 1 minute of arc by 1 minute of arc.

or

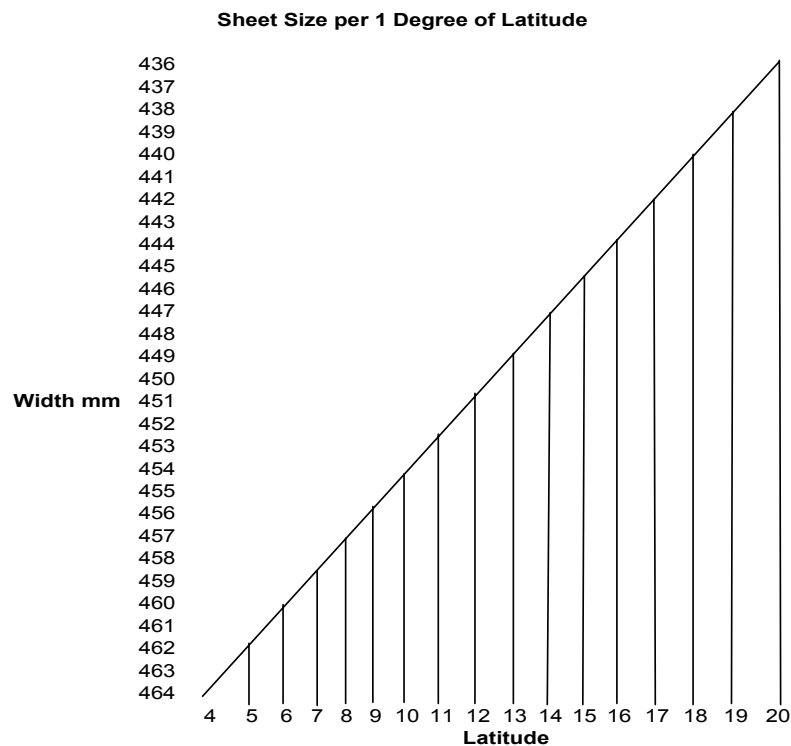
- Scale: 1: 2000;
- Coverage: 30 seconds of arc by x 30 seconds of arc.

or

- Scale: 1: 1000;
- Coverage: 15 seconds of arc by 15 seconds of arc in heavily populated areas.

**7.2.7 Shape and Size of CIM Sheet.**

The CIM sheet including preliminary and final map sheets will be between 676 and 704 mm wide (depending on geographical location) and 581 mm high. The CIM will be divided into grid intervals and this will be dependent on the scale of the CIM. The table below gives a representative idea of latitude verses graticule width. Also see the “PA-LAMP CIM SHEET CORNERS” software which will give correct graticule sizes. The sheet layout can be seen in **Appendix 1**.



- 1:4000 CIM will have a grid interval of 500 metres, ie 12.5 cm at map scale;
- 1:2000 CIM will have a grid interval of 200 metres ie 10cm at map scale;
- 1:1000 CIM will have a grid interval of 100 metres ie 10cm at map scale;

- 1:500 CIM will have a grid interval of 50 metres ie 10cm at map scale;

The grid starting position will be determined by PTM coordinates of the bottom left corner of the graticule. For instance if the coordinates of the graticule are North 1622133.713 and East 399465.524 then at the various scale the first grid in both North and East are:

- 1:4000, 366.287m towards the top of the CIM for North and 34.476m to the right for East;
- 1:2000, 66.287m towards the top of the CIM for North and 134.476m to the right for East;
- 1:1000, 66.287m towards the top of the CIM for North and 34.476m to the right for East;
- 1:500, 16.287m towards the top of the CIM for North and 34.476m to the right for East;

The Latitude and Longitude will only appear on the graticule. Grid coordinates will not appear on the graticule.

### **7.3 Survey Control**

Control is the most important requirement in the production of CIM. Without good control it is impossible to place the CIM on its absolute position upon the earth.

Control is required to establish position of all data that is held within any CIM, this can be done by a number of methods and is crucial in all aspects of CIM production from manual methods to the various automated methods.

#### **7.3.1 Existing Surveys**

Where existing surveys traverses exist on PRS92, these should be plotted in the CIM along with any connections made to cadastral corners, for hand drawn CIM only where the existing surveys plans are not on PRS92, eg Quezon City.

From these connections the survey plans can then be oriented and scaled to fit the control as plotted. See **Appendix 2 Procedure Manual for Urban and Rural CIM production (Manual Drafting) Section 5.**

#### **7.3.2 GPS Surveys**

In certain instances GPS maybe used to obtain control for the CIM orientation and population. In these circumstances identified cadastral corners are selected and position captured by GPS. These will be used to orientate and scale individual subdivisions. See **Appendix 2 Procedure Manual for Urban and Rural CIM production (Manual Drafting) Section 5.**

## **7.4 CIM Population**

There are many ways in which a CIM can be populated. The most expedient way would be by Orthophoto map (if available) or by automation. For automation, this would be done either in MapInfo or AutoCAD which needs to be available. The process of population also varies between urban and rural situations, these will be addressed separately, and also the various means of automated population in the various Appendices.

No matter what method is chosen, the results will not be excellent if there is no control available and this has been the case in the initial stages of urban studies such as Quezon City.

### **7.4.1 Manual Drafting**

Hand or manual drafting is the most basic way of the producing a CIM. In most instances this is how the first CIM will be produced, and unless some form of automation is introduced or orthophoto maps, then the manual method will be the main process of CIM production. **Appendix 2** shows the procedural steps in producing CIM by this method.

### **7.4.2 Digitising**

If there is control, AutoCAD and a digitising table available, or MapInfo, then a quick method of CIM production is available.

Note that AutoCAD uses a plane grid system while MapInfo can either use a plane or spherical system. A requirement is that all CIM be on the PRS92 ie PTM and if a seamless map is required then it is better to use a spherical method than a plane method. This has other advantages and that is it can be used as the base for a simple GIS.

The steps that need following are:

- Plot the external boundaries of the first major subdivisions using the technical descriptions found on the plans, (usually LRA) into AutoCAD or MapInfo using the control supplied. If BLLM connections are used, **use only one connection of a mother lot that closes and is approximately central to the whole project area** and then plot the other boundaries from their common points. This will alleviate any overlaps or gaps that are produced by the calculated connections;
- Digitise the minor subdivisions or surveyed parcels using the external plotted boundaries from above as control, ie AutoCAD only, this is done by using the calibration method, see **Appendix 3**;
- If there are scanned copies of the plans then “heads up” digitising (ie digitising within the computer environment using raster images) within MapInfo can be done, once again using the plotted surround boundary as control;

- If orthophoto maps are available, the digital image can be set as an additional layer in MapInfo and heads up digitising can be done.

### **7.4.3 Scanning, Vectorisation and Rubber Sheeting ie (transformation)**

If the scanned image and the software for vectorisation are available, then the raster or vector image can be rubber sheeted by least square adjustment to the control available. Note if the raster is used, then it will need to be vectorised prior to adding it to the MapInfo or AutoCAD file.

## **7.5 Edge Matching with Adjoining Map**

An edge match is required with adjoining sheets. The match is achieved using the graticule to align the CIM base and then tracing through in pencil the boundary of the adjoining lots extending beyond the sheet edge. Do not close the polygon as this may cause confusion in assigning UPI to the CIM.

A quality control check on the edge matching should be carried out prior to inking of the CIM.

If the adjoining map is being compiled simultaneously, work in cooperation with the other person to achieve acceptable edge matching.

Note: If the data is being collated within a computer environment the above is not required due to the software enabling a seamless map to be made.

## **8 CIM Parcel Numbering**

### **8.1 Adding the CIM Lot Number to the Map**

The last or highest UPI can be obtained from the database by using a simple query, or the last number will be indicated by pencil in the bottom right hand corner of the CIM.

#### **8.1.1 Urban**

Lots will be numbered starting from 1 consecutively from the top left of the CIM to the right and then in the reverse direction (ie a Z pattern). Lot numbering **will not** be duplicated within any one CIM. See **Appendix 6**

#### **8.1.2 Rural**

Lots will be numbered starting from 1 consecutively from the top left of the CIM to the right and then in the reverse direction (ie a Z pattern) where:

- Lots are within an existing survey plans;
- Lots are within a new survey plan.

See **Appendix 6**

### **8.1.3 Rules for assigning Unique Parcel Identifiers (UPI) within a CIM**

- Each lot is annotated only once;
- Each CIM starts with a new CIM Lot Number 1;
- Each lot is not numbered on more than one CIM, ie if a lot crosses the graticule into more than one CIM sheets place the UPI on the larger portion of the lot in only ONE of the CIM sheets;
- Parcels are numbered across the entire CIM. Do not stop at barangay or other administrative boundaries;

During CIM updating, any lot that is altered by either subdivision or consolidation will have the originally assigned UPI retired, (not deleted) and new UPI assigned following on from last UPI assigned on that CIM. The previous last number assigned to the CIM can be determined from the CrossIndex. The original UPI should not be removed from the database but will remain for historical purposes for a search for previous transactions.

## **8.2 Adding the CIM Lot Number (UPI) to the CrossIndex Database**

Once the CIM lot numbers (UPI) have been added to the CIM, they will need to be added to the CrossIndex database so that all the records pertaining to that lot are cross referenced.

In urban situations, use the survey plan, block and lot number as the reference to find the corresponding record in the CrossIndex database, add the CIM number and CIM lot number ie UPI to the database.

In rural situations, use the survey plan (cadastral map) and parcel number as the reference to find the corresponding record in the CrossIndex database, add the CIM number and CIM lot number ie UPI to the database.

Any parcels that cannot be found in the CrossIndex database should be flagged for further office investigation or field checks. This is done with in the database by adding to a table for checking ie one that indicates what is required to be followed up to ensure that the database and all records are referenced and verified (rural).

A check should be made in the database by running the report “Duplicate Titles” (this should be automated and done in the background on every piece of data entered). A search will be done in the CrossIndex database for any lots that have more than one title; or more than one owner, these should be flagged for further investigation (rural).

Any parcels that occur in the CrossIndex more than once such as repeated TCT’s and survey plan lot numbers should be marked for further office investigation or field checks. This may be due to duplicate entries or incorrect data having been entered.

See **Appendix 6 – CIM Numbering**.

## **9 Transactions Occurring During CIM Compilation**

At the commencement of the searching process, copies of the barangay boundaries should have been given to the DENR, LRA ROD, NIA and DPWH, with a request that copies of all new survey plans and titles that are approved flagged and copies forwarded. This will enable the CIM to be updated, and include all new transactions before handing the CIM over to the OSS.

## **10 Quality Assurance of CIM**

Checks should be undertaken to ensure the completeness, reliability and quality of the CIM. These checks should be on a regular basis, ie when particular achievements have been reached during the compilation of the CIM. The QA should be done by a supervising or experienced operator.

At the completion of every stage of the CIM production the CIM Control Register (see **Appendix 8**) is required to be completed, this will require a blue/white print of the CIM at every stage. **Appendix 7** shows the check sheets to be used and what is required at each QA check.

The approach will be by highlighting the checked data on the blue/white print. Any information which is found in error will be highlighted in a different colour. On completion of the QA, the person who performed the QA will sign the copy of the CIM and date it. The CIM Register will then be updated. This sheet will accompany the CIM until it is handed over to Office & Field Validation, and the handover to ROD.

If there are any corrections to be made from the QA process, the updating will be checked, ie all the corrections attended to will be rechecked.

The items that are required to be checked are:

- Completeness and accuracy of searching;
- Check that the grid, legend, graticule and CIM number is correct;
- Checks of control used, reference plans and indexes used;
- Plot checks for accuracy over parts of the CIM;
- Completeness and accuracy of lot numbering;
- Quality of drawing and lettering;
- Completion of edge joins, legends;
- Use of AutoCAD files and digital outputs.

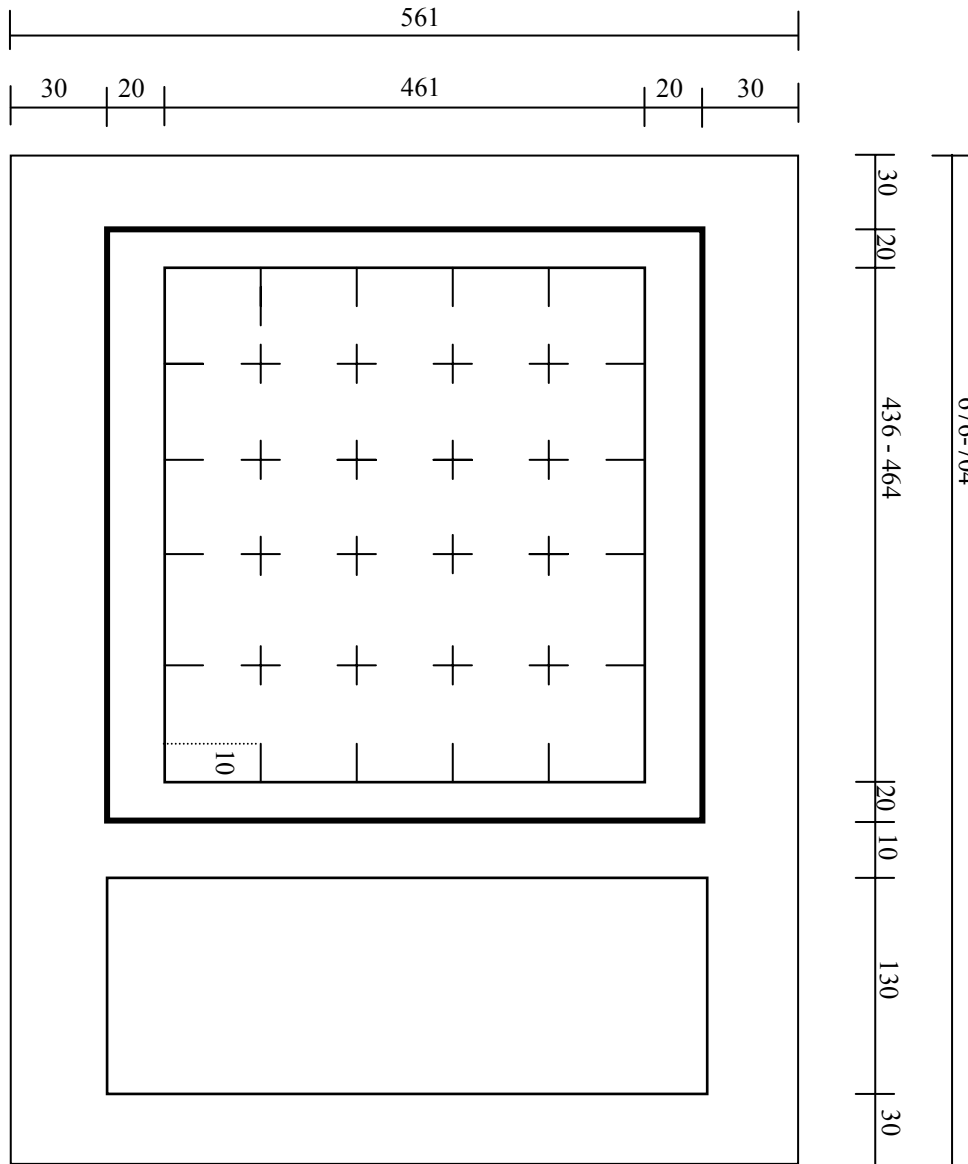
## **11 CIM Production Control**

The Manager and Supervising Cartographer will be responsible for managing the production flow process. This will include:

- Planning the CIM workflow programs consistent with resources, budgets and required output plans;
- Planning, reviewing and requesting additional control;
- Ordering, logging receipt and storage of orthophoto maps;
- Assigning staff to record searching in a timely manner;
- Monitoring records collection rates and quality assurance;
- Assigning staff to CIM compilation so that the CIM can be completed in a timely manner;
- Monitoring compilation rates and assuring quality;
- Planning, coordinating and implementing the hand over of the CIM into the OSS and or the office and field validation (urban).

# Appendix 1      Dimensions of Cadastral Index Map Sheet

Dimensions are in millimetres



## **Appendix 2**

### **Procedure Manual for Urban and Rural CIM Production by Manual Drafting**

## **Appendix 3**

### **Procedure Manual for Urban and Rural CIM Production by Digitising**

**Appendix 4**

**Database Procedures Manual**

## Appendix 5 PA-LAMP CIM Sheet Corners

**PA-LAMP CIM Sheet Corner Calculations**

1:4000 Sheet Corner Data

Latitude Degrees  Longitude Degrees  1:2000 1:1000 1:500  
Latitude Minutes  Longitude Minutes

USE EITHER OF THE TWO METHODS

Known Sheet Corner

Latitude  Deg  Min  Sec  Scale

Longitude

Sheet Layout

	E 717127.865		717354.360 E
1392745.622 N		12 35 15.0	N 1392747.345
461.2 mm	122 59 52.5		123 00 00.0
1392515.047 N		12 35 07.5	N 1392516.769
	E 717129.618	453.0 mm	717356.114 E

**CIM No**  
**12352259442**



**Appendix 7      QA Forms**

CIM Number
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**SHEET PREPARATION CHECK**

This particular QA checks the CIM after the sheet preparation stage. It is suggested that the CIM sheet corner calculations is redone unless a copy of the original has been printed and attached to the CIM folder. Listed below are the items to be checked:

- Is the search complete and have all the plans been identified?
- Have all the survey plans been collated and the latest plans identified?
- Is the CIM number correct?
- Is the grid plotted correctly?
- Are the grid values correct?
- Are the graticule values correct?
- Is the legend correct?
- Is the lettering and drafting neat?
- Has the CIM Register (database) been filled out?

Comments:

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Date:

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## PARCEL PLOTTING CHECK

CIM Number
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This particular QA checks the CIM after the plotting of parcels and inserting of their lot numbers. Listed below are the items to be checked:

- Have all the plans been plotted correctly?
- Have all the Road Lots been identified?
- Are the adjoining sheets matched?
- Are all the plan lot numbers correct?
- Are all the road lot numbers correct?
- Is the lettering and drafting neat?
- Has the CIM Register (database) been filled out?

Comments:

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Date:

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## UPI CHECK

CIM Number
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This particular QA checks the CIM after the allotting of the UPI. Listed below are the items to be checked:

- Is the numbering consecutive?
- Have all lots been numbered?
- Is the numbering correct at the sheet edges?
- Are there any lots numbered on other CIM?
- Are all the road lot numbers correct?
- Is the lettering and drafting neat?
- Is the UPI noted on the bottom right hand corner of the CIM in pencil?
- Has the CIM Register (database) been filled out?

Comments:

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Date:

## **PRELIMINARY CIM COMPLETED**

CIM Number

This particular QA check is performed when the preliminary CIM is completed.  
Listed below are the items to be checked:

- Are all street and roads named correct?
- Are all the creek and other water features naming correct?
- Is the CIM suitable for either forwarding to Office Validation or for the final CIM preparation?
- Is the lettering and drafting neat?
- Has the CIM Register (database) been filled out?

Comments:

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Date:

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## **UPDATE AFTER OFFICE VALIDATION**

CIM Number
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This particular QA checks the CIM after any updating has occurred after Office Validation. Listed below are the items to be checked:

- Have the new lots been drawn correctly?
- Have all lots been numbered correctly?
- Have the new UPI started from the last used UPI?
- Are all the road lot numbers correct?
- Is the lettering and drafting neat?
- Is the UPI noted on the bottom right hand corner of the CIM in pencil?
- Has the CIM Register (database) been filled out?

Comments:

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Date:

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## UPDATE AFTER FIELD VALIDATION

CIM Number

This particular QA checks the CIM after any updating has occurred after Office Validation. Listed below are the items to be checked:

- Have the new lots been drawn correctly?
- Have all lots been numbered correctly?
- Have the new UPI started from the last used UPI?
- Are all the road lot numbers correct?
- Is the lettering and drafting neat?
- Is the UPI noted on the bottom right hand corner of the CIM in pencil?
- Has the CIM Register (database) been filled out?

Comments:

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Date:

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## FINAL CIM COMPLETED

CIM Number
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This particular QA checks the CIM after the completion of the final CIM. Listed below are the items to be checked:

- Is the CIM number correct?
- Is the grid plotted correctly?
- Are the grid values correct?
- Are the graticule values correct?
- The legend correct?
- Have all the plans been plotted correctly?
- Have all the Road Lots been identified?
- Are the adjoining sheets matched?
- Are all the plan lot numbers correct?
- Are all the road lot numbers correct?
- Is the numbering consecutive?
- Have all lots been numbered?
- Is the numbering correct at the sheet edges?
- Are there any lots numbered on other CIM?
- Are all the road lot numbers correct?
- Are all street and roads named correct?
- Are all the creek and other water features naming correct?
- Is the CIM suitable for either forwarding to Office Validation or for the final CIM preparation?
- Is the lettering and drafting neat?
- Has the CIM Register (database) been filled out?
- Is the CIM suitable for forwarding to ROD?

Comments:

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Date: \_\_\_\_\_

## CIM UPI Numbers

1	87	173	259	345	431	517	603	689	775	861	947
2	88	174	260	346	432	518	604	690	776	862	948
3	89	175	261	347	433	519	605	691	777	863	949
4	90	176	262	348	434	520	606	692	778	864	950
5	91	177	263	349	435	521	607	693	779	865	951
6	92	178	264	350	436	522	608	694	780	866	952
7	93	179	265	351	437	523	609	695	781	867	953
8	94	180	266	352	438	524	610	696	782	868	954
9	95	181	267	353	439	525	611	697	783	869	955
10	96	182	268	354	440	526	612	698	784	870	956
11	97	183	269	355	441	527	613	699	785	871	957
12	98	184	270	356	442	528	614	700	786	872	958
13	99	185	271	357	443	529	615	701	787	873	959
14	100	186	272	358	444	530	616	702	788	874	960
15	101	187	273	359	445	531	617	703	789	875	961
16	102	188	274	360	446	532	618	704	790	876	962
17	103	189	275	361	447	533	619	705	791	877	963
18	104	190	276	362	448	534	620	706	792	878	964
19	105	191	277	363	449	535	621	707	793	879	965
20	106	192	278	364	450	536	622	708	794	880	966
21	107	193	279	365	451	537	623	709	795	881	967
22	108	194	280	366	452	538	624	710	796	882	968
23	109	195	281	367	453	539	625	711	797	883	969
24	110	196	282	368	454	540	626	712	798	884	970
25	111	197	283	369	455	541	627	713	799	885	971
26	112	198	284	370	456	542	628	714	800	886	972
27	113	199	285	371	457	543	629	715	801	887	973
28	114	200	286	372	458	544	630	716	802	888	974
29	115	201	287	373	459	545	631	717	803	889	975
30	116	202	288	374	460	546	632	718	804	890	976
31	117	203	289	375	461	547	633	719	805	891	977
32	118	204	290	376	462	548	634	720	806	892	978
33	119	205	291	377	463	549	635	721	807	893	979
34	120	206	292	378	464	550	636	722	808	894	980
35	121	207	293	379	465	551	637	723	809	895	981
36	122	208	294	380	466	552	638	724	810	896	982
37	123	209	295	381	467	553	639	725	811	897	983
38	124	210	296	382	468	554	640	726	812	898	984
39	125	211	297	383	469	555	641	727	813	899	985
40	126	212	298	384	470	556	642	728	814	900	986
41	127	213	299	385	471	557	643	729	815	901	987
42	128	214	300	386	472	558	644	730	816	902	988
43	129	215	301	387	473	559	645	731	817	903	989

## CIM UPI Numbers

44	130	216	302	388	474	560	646	732	818	904	990
45	131	217	303	389	475	561	647	733	819	905	991
46	132	218	304	390	476	562	648	734	820	906	992
47	133	219	305	391	477	563	649	735	821	907	993
48	134	220	306	392	478	564	650	736	822	908	994
49	135	221	307	393	479	565	651	737	823	909	995
50	136	222	308	394	480	566	652	738	824	910	996
51	137	223	309	395	481	567	653	739	825	911	997
52	138	224	310	396	482	568	654	740	826	912	998
53	139	225	311	397	483	569	655	741	827	913	999
54	140	226	312	398	484	570	656	742	828	914	
55	141	227	313	399	485	571	657	743	829	915	
56	142	228	314	400	486	572	658	744	830	916	
57	143	229	315	401	487	573	659	745	831	917	
58	144	230	316	402	488	574	660	746	832	918	
59	145	231	317	403	489	575	661	747	833	919	
60	146	232	318	404	490	576	662	748	834	920	
61	147	233	319	405	491	577	663	749	835	921	
62	148	234	320	406	492	578	664	750	836	922	
63	149	235	321	407	493	579	665	751	837	923	
64	150	236	322	408	494	580	666	752	838	924	
65	151	237	323	409	495	581	667	753	839	925	
66	152	238	324	410	496	582	668	754	840	926	
67	153	239	325	411	497	583	669	755	841	927	
68	154	240	326	412	498	584	670	756	842	928	
69	155	241	327	413	499	585	671	757	843	929	
70	156	242	328	414	500	586	672	758	844	930	
71	157	243	329	415	501	587	673	759	845	931	
72	158	244	330	416	502	588	674	760	846	932	
73	159	245	331	417	503	589	675	761	847	933	
74	160	246	332	418	504	590	676	762	848	934	
75	161	247	333	419	505	591	677	763	849	935	
76	162	248	334	420	506	592	678	764	850	936	
77	163	249	335	421	507	593	679	765	851	937	
78	164	250	336	422	508	594	680	766	852	938	
79	165	251	337	423	509	595	681	767	853	939	
80	166	252	338	424	510	596	682	768	854	940	
81	167	253	339	425	511	597	683	769	855	941	
82	168	254	340	426	512	598	684	770	856	942	
83	169	255	341	427	513	599	685	771	857	943	
84	170	256	342	428	514	600	686	772	858	944	
85	171	257	343	429	515	601	687	773	859	945	
86	172	258	344	430	516	602	688	774	860	946	

## Appendix 8 CIM CONTROL REGISTER

The CIM Control Register should be completed after each phase of CIM compilation:

The screenshot shows a software window titled "frmCIMRegister" with a standard Windows title bar. The main content area is titled "CIM CONTROL REGISTER" and contains a form with the following fields and sections:

- Header:** LAT | LONG | SHEET (DDMMDDMMSSS)
- Form Fields:** CIM Number (dropdown), Cartographer (text), Method (dropdown), Source (dropdown)
- Sheet Preparation:** Started (text), Completed (text), QA Name (text), Date (text)
- Parcel Drafting:** Started (text), Completed (text), QA Name (text), Date (text)
- UPI:** Started (text), Completed (text), QA Name (text), Date (text), Last UPI (checkbox)
- Preliminary CIM Completed:** Completed (text), QA Name (text), Date (text)
- Final CIM Preparation:** Started (text), Completed (text), QA Name (text), Date (text)
- Handover to Office Validation:** Date (text)
- Update CIM after Office Validation:** Started (text), Completed (text), QA Name (text), Date (text), Last UPI (checkbox)
- Handover to Field Validation:** Date (text)
- Update CIM after Field Validation:** Started (text), Completed (text), QA Name (text), Date (text), Last UPI (checkbox)
- Final CIM Completed:** Date (text)
- Handover to ROD:** Date (text)

At the bottom right, there are three buttons: "Find Record", "Save Record", and "Exit". At the bottom left, there is a record navigation bar showing "Record: 1 of 1" with navigation icons.