REPUBLIC OF THE PHILIPPINES

MANAOAG WATER DISTRICT

Aquino St., Poblacion, Manaoag, Pangasinan

Operations Manual

First Edition

August 2023

MANWAD

2023 Operations Manual

First Edition

August 2023

TABLE OF CONTENTS

I. GENERAL INFORMATION

INTRODUCTION

The Operation Manual of Manaoag Water District (MANWAD) is prepared to present the general information about the agency, its functions, mandates, operating procedures and organization. This manual provides readers with the knowledge about the district's functions, structures and practices.

This section presents the company profile, such as the brief history of MANWAD, mandates and functions, its vision and mission, pumping stations and areas of operation.

This manual assures that the MANWAD is operated in a consistent, safe, effective and efficient manner that satisfies all laws, rules, regulations and conditions needed to protect public safety and health.

PURPOSE OF THIS MANUAL

The purpose of this manual is to document the standard operating procedures that employees of MANWAD are expected to follow under normal operating condition. It also includes contingency plans that must be followed when the facility is not operating under normal conditions, as well as emergency procedures to be implemented in the event of an emergency situation.

This documented policies and procedures provide a consistent source of document from which to manage all the operations of MANWAD including a detailed system description (source, transmission and distribution), daily routine operation and maintenance procedures for the system, in addition to record keeping and emergency response procedures, implementation of projects, maintenance of facilities, service management, service delivery and staff management. This will ensure that there is consistent practice throughout the organization.

This manual of policies and procedures should be readily available to all people involved in the management of the organization. Policies and procedures shall be regularly reviewed and amended, if necessary, to comply with the latest laws, rules and regulations and to be responsive to the needs of the organization, the customers and employees.

WATER DISTRICT PROFILE AND GENERAL INFORMATION

In our town of Manaoag, water utility operation was under National Waterworks and Sewerage Authority (NAWASA) and was subsequently operated by the Municipality of Manaoag in 1969.

On May 26,1980, Sangguniang Bayan Resolution No. 34 was approved creating the Manaoag Water District based on the national policy, the P.D. 198 known as Provincial Water Utilities Act of 1973,*"Declaring a National Policy favouring local operation and control of water systems; authorizing the formation of local water districts and providing for the government and administration of such districts; chartering a national administration to facilitate improvement of local water utilities; granting said administration such powers that are necessary to optimize public service from water utility operations, and for other purposes"*. The Manaoag Water District was established and took over the operation of water utility in Manaoag.

Presently, the water supply of the Municipality of Manaoag is handled and managed by MANWAD which was initially created in 1980 On September 12, 1980 the Local Water Utilities Administration issued Conditional Certificate of Conformance No. 128 to MANWAD.

Currently, Manaoag Water District is the only water service provider in the Municipality of Manaoag. It is a non-profit oriented and receives no subsidy from the national and local government. The revenue raised is solely from the concessionaires' monthly payments of water bills and other installation costs. Local Water Districts were declared a Government Owned and/or Controlled Corporation (GOCC) by Supreme Court as of 1992.

The district is classified under Category C and currently managed by its General Manager, MS. FLORDELIZA N. TEJANO. It has four divisions namely: Administrative and General Services Division headed by MS. MARLENE CONSTANCIA F. MANAOIS, Finance and Commercial Division headed by MR. RUSTY MARK V. FLORES, Production and Water Quality Division headed by ENGR. CASIMERO G. CLAVERIA, Engineering and Construction Division headed by ENGR. AQUILEO F. MISAGAL.

Figure 1.0 General Information

Number of Employees	57	
Permanent	48	
Job Order	6	
Temporary	2	
Co-terminus	1	
Ratio of Connection per Employee	148	
Total Number of Active Service Connections	8,459	
Number of Domestic Connection	7,968	
Number of Commercial Connection	400	
Number of Government Connection	91	
Population Served (average)	42,295	
Sources of Supply		
Deep Wells	5	
Average Monthly Production	1,623,624.00	cu.m
Average Monthly Billed Water	1,318,460.60	cu.m
Unaccounted for Water	18.80	%
Average Monthly Consumption per Connection	10	cu.m
Average per Capita per Day Consumption	9,705	lpcm

VISION, MISSION AND CORE VALUES

Vision:

- To be Competitive Water Utility Comprising of Responsible Men and Women Committed to Service Par Excellence and Becoming a Partner in Improving the Quality of Life of the Manaoageños.

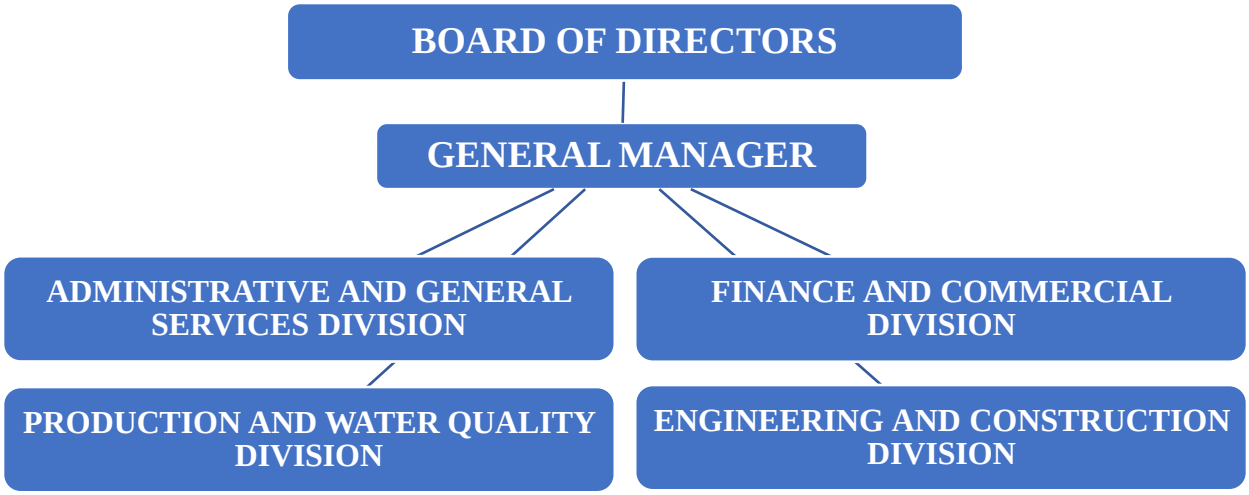
Mission:

- To provide safe and potable water and high-quality water service at fair price to meet the needs and expectations of our customer.
- To protect the environment to conserve our water resources for the future generation.
- To promote efficiency and productivity to enhance operational sustainability.
- To conduct ourselves in accordance with the highest ethical standards and moral values because our reason for being is to serve the public.

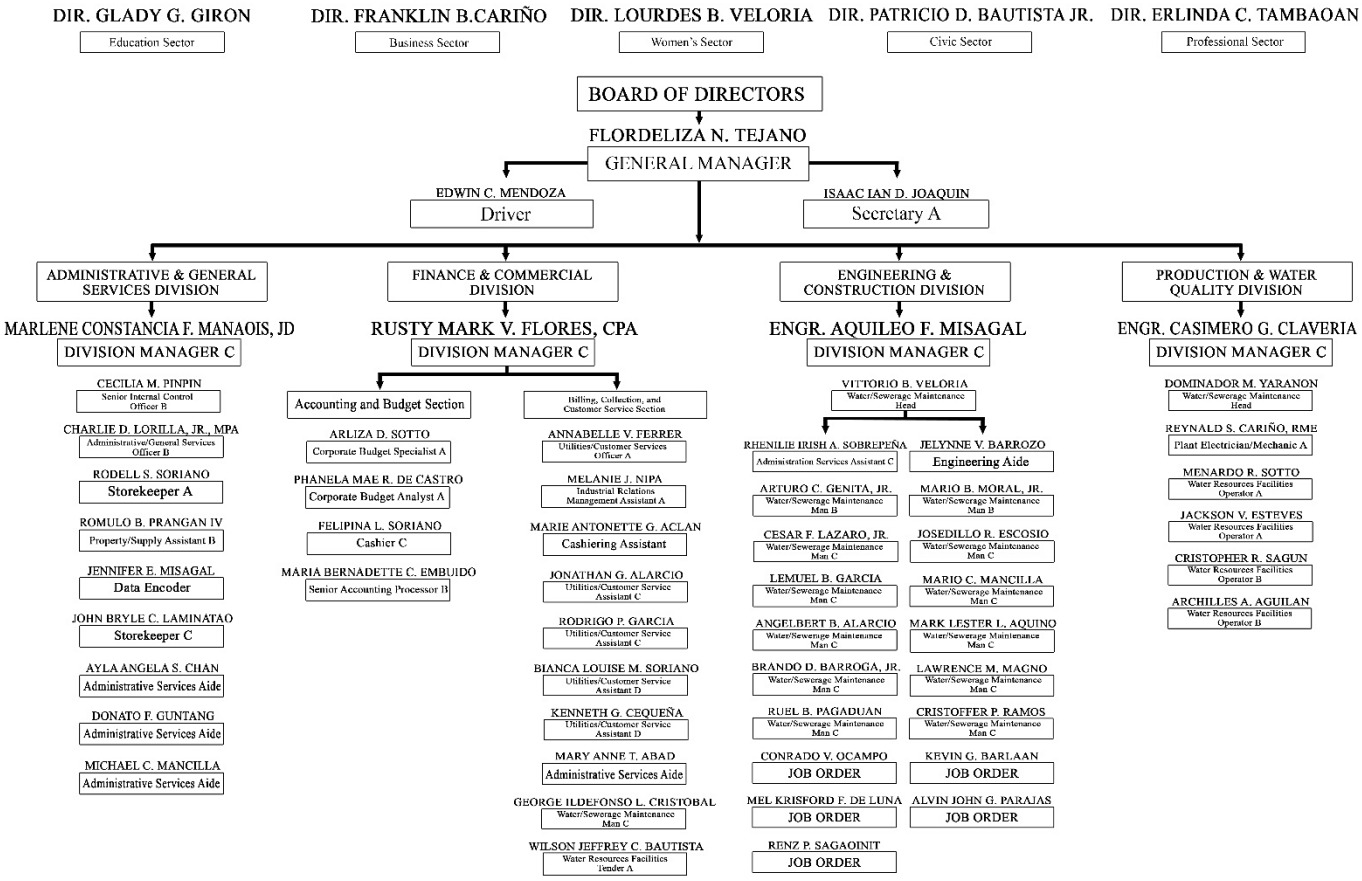
Core Values:

- **M** – Moral Ascendancy
- **A** – Accountability
- **N** – Non-stop Service
- **W** – Wilfulness
- **A** – Action-oriented
- **D** – Disciplined

ORGANIZATIONAL STRUCTURE

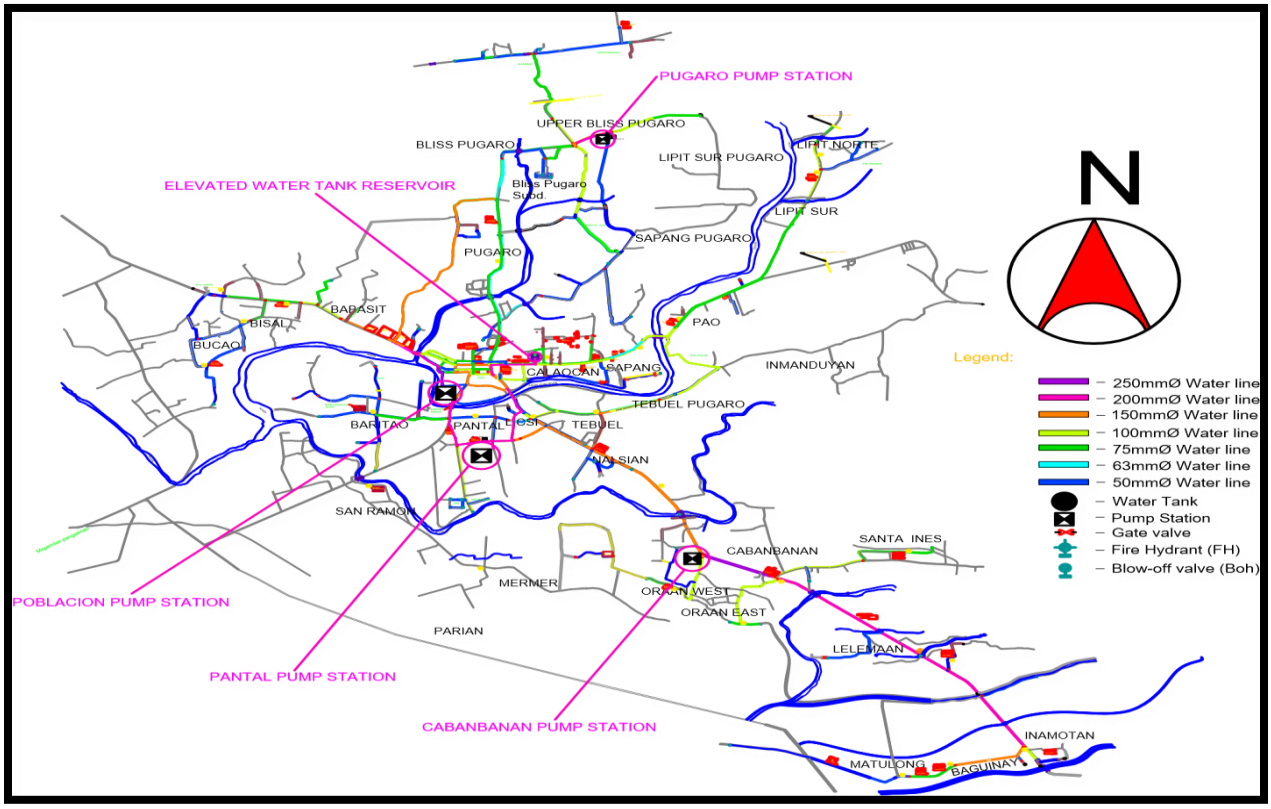


ORGANIZATIONAL CHART



SERVICE COVERAGE

DISTRIBUTION LINE



Transmission and Distribution Line

The interconnected transmission pipelines originating from the five water sources namely, from Barangays of Baritao, Cabanbanan, Pantal, Poblacion and Pugaro. 250mm, 200mm, 150mm, 100mm, transmission pipelines are interconnected to each other also to the Elevated Steel Tank at Brgy. Calaocan and Glass Fused Reservoir at Brgy. Pugaro. The existing transmission line have a carrying capacity of about 10-120 liters per second (lps). This was based on the hydraulic analysis of the transmission pipelines and actual recorded production.

Length of the following Transmission and Distribution Lines:

PIPE DIAMETER	TYPES OF PIPES	LENGTH
250 mm	PVC	4.178 km
200 mm	PVC/Fiberglass	0.591 km
150 mm	PVC, GI	27.859 km
100 mm	PVC, GI	0.123 km
75 mm	PVC, GI	0.123 km
63 mm	PVC	0.035 km
50 mm	PVC	3.2677 km
25 mm	PVC	0.035 km
	Total Length:	**36.2117 km**

Consumers of MANWAD are classified into six types, namely, Residential, Government, Commercial/Industrial, Semi-Commercial A, Semi-Commercial B, and Semi-Commercial C.

Service Area

The Municipality of Manaoag is composed of twenty-six (26) barangays. Manaoag Water District is currently serving Eight thousand four hundred fifty-nine (8,459) active connections within the municipality as of July 2023. The farthest delivery to the South is Brgy. Matulong, which is about ten (10) kilometers from Brgy. Poblacion. Farthest Northern delivery point is Brgy. Pugaro, around seven (7) kilometres away from Brgy. Poblacion.

Manaoag Water District currently serves twenty-five (25) out of twenty-six (26) barangays of Manaoag. MANWAD also serves seven (7) barangays outside of Manaoag, namely, Brgy. Inmanduyan from Municipality of Laoac, Brgy. Sta. Maria of Municipality of San Jacinto, Brgy. Nantangalan and Maambal of Municipality of Pozorrubio, and Brgys. San Jose Leet, Sitio Isla Pinmaludpod and Catablan of Urdaneta City.

Number of service connection per barangay.

Babasit	787	Matulong	140	Sta. Ines	110
Baguinay	238	Mermer	24	Tebuel	459
Baritao	709	Nalsian	274	Inmanduyan, Laoac	2
Bisal	228	Oraan East	59	Sta. Maria, San Jacinto	10
Bucao	179	Oraan West	116	Maambal, Pozorrubio	167
Cabanbanan	302	Pantal	455	Nantangalan, Pozorrubio	123
Inamotan	240	Pao	544	Catablan, Urdaneta City	1
Lelemaan	160	Poblacion	1,603	San Jose Leet, Urdaneta City	84
Licsi	320	Pugaro	1,132	Sitio Isla Pinmaludpod, Urdaneta City	48
Lipit Norte	149	San Ramon	371		
Lipit Sur	248	Sapang	110		

SUPPLY SOURCE, TRANSMISSION, DISTRIBUTION AND RESERVOIR

The District currently has five water sources, namely, Baritao, Cabanbanan, Pantal, Poblacion and Pugaro. Elevated Steel Tank at Brgy. Calaocan and a Glass Fused Reservoir at Brgy. Pugaro.

Baritao Pumping Station

The Pumping Station is Located at Barangay Baritao Manaoag, Pangasinan or Latitude of 16°02'19.8" and Longitude 120°28'0.72".

Year constructed: **2022**
Discharge Capacity: **35 LPS** (90,720 m^3)

Cabanbanan Pumping Station

The Pumping Station is Located at Barangay Cabanbanan Manaoag, Pangasinan or Latitude of 16°01'44" and Longitude 120°30'09".

Year constructed: **2004**
Discharge Capacity: **20 LPS** (51,840 m^3)

Pantal Pumping Station

The Pumping Station is located Barangay Pantal Manaoag, Pangasinan or Latitude of 16°02’20” and Longitude of 120°28’58”.

Year constructed: **1994**
Discharge Capacity: **30 LPS** (77,760 m^3)

Poblacion Pumping Station

The Pumping Station is located at Aquino Street Barangay Poblacion Manaoag, Pangasinan or Latitude of 16°02’28” and Longitude of 120°29’08”.

Year constructed: **2017**
Discharge Capacity: **30 LPS** (77,760 m^3)

Pugaro Pumping Station

The Pumping Station is Located at Barangay Pugaro Manaoag, Pangasinan or Laltitude of 16°04’25.8” and Longitude 120°29’55.1”.

Year constructed: **2017**
Discharge Capacity: **30 LPS** (77,760 m^3)

Elevated Steel Water Reservoir

This Reservoir is located at Barangay Calaocan Manaoag, Pangasinan or Latitude 16°2’44” and Longitude 120°29’28”.

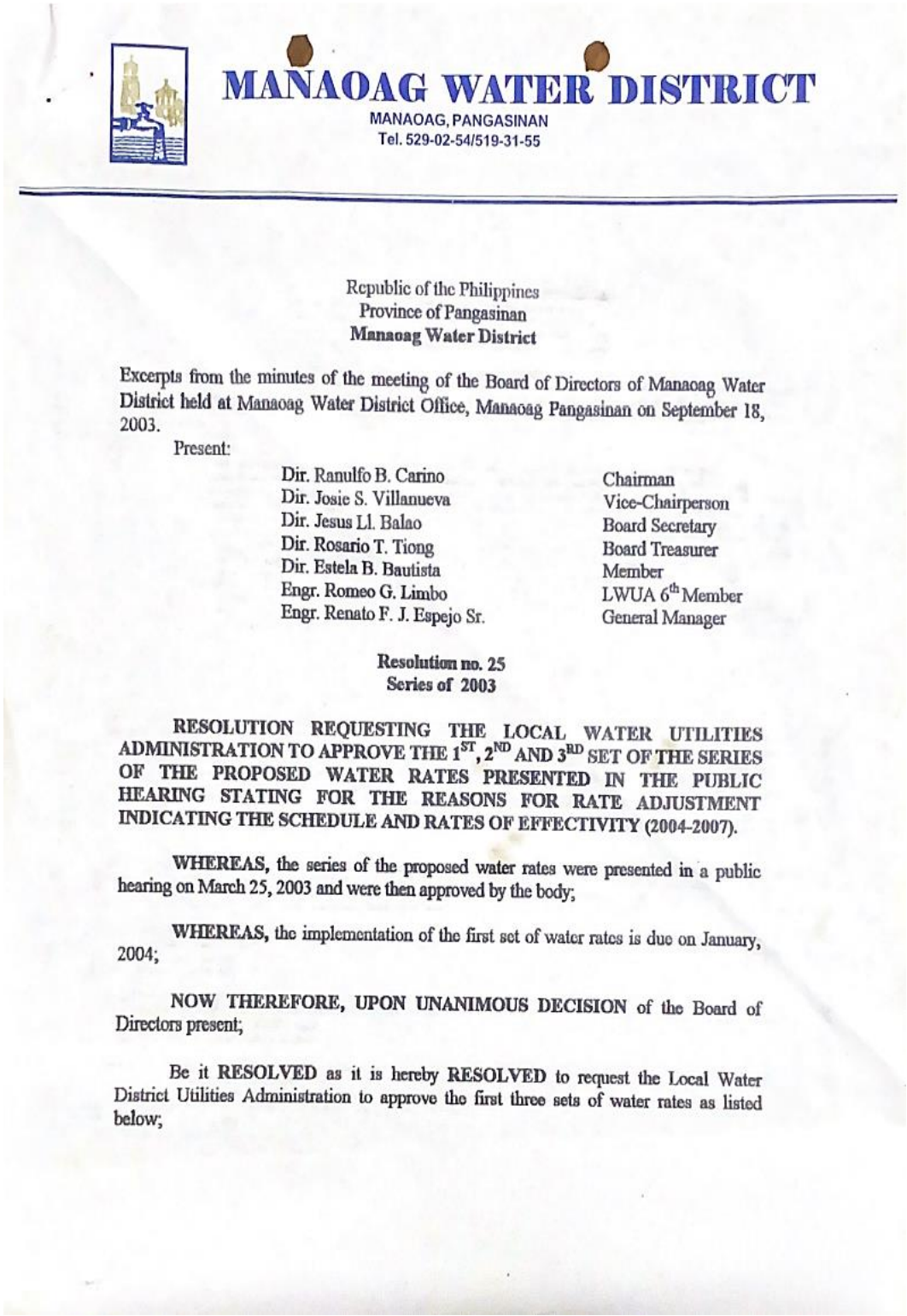
Year constructed: **1994**
Capacity: **380 cubic meter**

Glass Fused Reservoir with Booster Pump

The Reservoir is Located at Barangay Pugaro Manaoag, Pangasinan or Laltitude of 16°04’25.8” and Longitude 120°29’55.1”.

Year constructed: **2023**
Capacity: **360 cubic meter**

WATER RATES



MANAOAG WATER DISTRICT
MANAOAG, PANGASINAN
Tel. 529-02-54/519-31-55

Republic of the Philippines
Province of Pangasinan
Manaoag Water District

Excerpts from the minutes of the meeting of the Board of Directors of Manaoag Water District held at Manaoag Water District Office, Manaoag Pangasinan on September 18, 2003.

Present:

Dir. Ranulfo B. Carino	Chairman
Dir. Josie S. Villanueva	Vice-Chairperson
Dir. Jesus Ll. Balao	Board Secretary
Dir. Rosario T. Tiong	Board Treasurer
Dir. Estela B. Bautista	Member
Engr. Romeo G. Limbo	LWUA 6th Member
Engr. Renato F. J. Espejo Sr.	General Manager

Resolution no. 25
Series of 2003

RESOLUTION REQUESTING THE LOCAL WATER UTILITIES ADMINISTRATION TO APPROVE THE 1ST, 2ND AND 3RD SET OF THE SERIES OF THE PROPOSED WATER RATES PRESENTED IN THE PUBLIC HEARING STATING FOR THE REASONS FOR RATE ADJUSTMENT INDICATING THE SCHEDULE AND RATES OF EFFECTIVITY (2004-2007).

WHEREAS, the series of the proposed water rates were presented in a public hearing on March 25, 2003 and were then approved by the body;

WHEREAS, the implementation of the first set of water rates is due on January, 2004;

NOW THEREFORE, UPON UNANIMOUS DECISION of the Board of Directors present;

Be it **RESOLVED** as it is hereby **RESOLVED** to request the Local Water District Utilities Administration to approve the first three sets of water rates as listed below;

MANAOAG WATER DISTRICT

MANAOAG, PANGASINAN
Tel. 529-02-54/519-31-55

Water Rates Schedule	2004	2005	2006	2007	2008	2009	2010
Minimum Charge	150.00	150.00	180.00	180.00	220.00	220.00	260.00
11-20 cu. m.	16.00	16.00	19.00	19.00	23.00	23.00	27.00
21-30 cu. m	17.50	17.50	20.50	20.50	24.50	24.50	28.50
31-40 cu. m.	19.50	19.50	22.50	22.50	26.50	26.50	30.50
Over 40 cu.m.	22.00	22.00	25.00	25.00	28.50	28.50	33.00

RESOLVED finally to furnish copies of this resolution to Hon. Lorenzo H. Jamora, Administrator, Local Water Utilities Administration for his information and appropriate action

APPROVED UNANIMOUSLY.

CARRIED:

I hereby certify to the correctness of the above resolution.

DIR. JESUS LI. BALAO
Secretary

ATTESTED:

DIR. RANULFO B. CARINO
Chairman

DIR. JOSIE S. VILLANUEVA
Vice Chairperson

DIR. ROSARIO T. TIONG
Treasurer

DIR. ESTELA B. BAUTISTA
Member

ENGR. ROMEO G. LIMBO
LWUA, Sixth Member

Below are the current water rates of Manaoag Water District.

MANWAD WATER RATES

Classification	Size	Minimum Charge	Commodity Charge			
		0-10	11-20	21-30	31-40	41-up
		(Peso/Cu.M)				
Residential / Government	1/2"	220.00	23.00	24.50	26.50	28.50
	1"	704.00	23.00	24.50	26.50	28.50
	2"	4400.00	23.00	24.50	26.50	28.50
Commercial / Industrial	1/2"	440.00	46.00	49.00	53.00	57.00
	1"	1408.00	46.00	49.00	53.00	57.00
Commercial "A"	1/2"	385.00	40.25	42.85	46.35	49.85
	1"	1232.00	40.25	42.85	46.35	49.85
Commercial "B"	1/2"	330.00	34.50	36.75	39.75	42.75
	1"	1056.00	34.50	36.75	39.75	42.75
Commercial "C"	1/2"	275.00	28.75	30.60	33.10	35.60
	1"	880.00	28.75	30.60	33.10	35.60
Bulk / Wholesale	1/2"	660.00	69.00	73.50	79.50	85.50
	1"	2112.00	69.00	73.50	79.50	85.50

II. DUTIES AND RESPONSIBILITIES

II.A OFFICE OF THE GENERAL MANAGER

A.1 BOARD OF DIRECTORS

The Board of Directors of Manaoag Water District (MANWAD) is composed of five Filipino citizens representing the following sectors: Business, Professional, Civic, Education, and Women. The members of the Board are appointed by the Local Chief Executive in accordance with PD 198 as amended with a regular term of office for six (6) years, however it does not engage in the detailed management of the Water District.

As a policy-making body, it would have full policy control on the district. Part of its functions is to hire the General Manager and other personnel particularly in the supervisory level which shall be subject to approval by the Board. The executive administrative or ministerial power is delegated to the General Manager and to the officers of the district.

A.2 OFFICE OF THE GENERAL MANAGER

The General Manager shall have full supervision and control of the maintenance and operation of water district facilities, with power and authority to appoint all personnel of the district. Provided, that the appointment of personnel in the supervisory level shall be subject to approval by the Board. (Sec. 24 of PD 198 as amended).

Duties and responsibilities being performed by the General Manager are herein stated, to wit:

- Propose Policies, Rules, Regulations and Budgets for Board action and carries out Board Policies;
- Prepares basic plan to carry achieving utility objective, directs and controls utility activities toward that end;
- Full supervision and control of the maintenance and support of Manaoag Water District facilities;
- Improves and maintains existing water facilities and resources;

- Direct and manage the day-to-day affairs and business of Manaoag Water District;
- Informs all the Division Heads for the Plans, Policies and other concerns coming from the Board of Directors for implementation and dissemination;
- With the approval of the Board of Directors, determine the staffing pattern and the number of personnel of Manaoag Water District and define their duties and responsibilities;
- To appoint, remove, suspend or otherwise discipline for cause any employee of Manaoag Water District;
- Coordinates with regulatory agencies such as Local Water Utilities Administration (LWUA), Department of Budget and Management (DBM), Commission on Audit (COA), Civil Service Commission (CSC), Government Owned and/or Controlled Corporation (GOCC) and Local Government Unit (LGU) concerning the operation of the district;
- Received monthly reports and related data from Division Heads;
- Renders reports directly to Board of Directors;
- Prepares agenda for meetings of the Board of Directors and keep the Board informed as to utility status;
- Represents the district in Inter-Agency functions and conventions relative to the operations of the district;
- Manages and oversees the performance of employees as well as the overall condition of the workplace;
- Perform such other duties as may be necessary, implied and incidental to its responsibilities as well as may be delegated or assigned by the Board of Directors from time to time; and
- Overall responsible to the district's operation.

II.B ADMINISTRATIVE AND GENERAL SERVICES DIVISION

B.1 RESPONSIBILITIES OF THE DIVISION MANAGER

- Implement procedures on procurement of adequate supply of materials, equipment and services;
- Implement procedures on warehousing and maintenance of materials, supplies, vehicles and equipment in accordance with the regulations, policies and pertinent provisions governing such matters as required by the Commission on Audit (COA);

- Formulate, recommend for approval and implement policies related to security measures of building, grounds and people in the organization;
- Formulate and implement human resource programs, policies and procedures pursuant to Civil Service laws and rules;
- Formulate programs to assess and improve employee competencies;
- Perform other related functions as may be assigned.

B.2 FUNCTION OF THE DIVISION

The division is responsible in the formulation and implementation of policies concerning administrative matters; proposes and undertakes activities related to human resource management. It is also responsible for the enforcement and enhancement of plans, policies, methods and procedures relating to property and supply management which includes but shall not limited to building, grounds and facilities, transport operation and maintenance.

In addition, one main function of this division is to facilitate the procurement process in accordance to the Implementing Rules and Guidelines of Republic Act 9184. This division holds wide array of activities necessary for the operation of the district.

This division has three (3) units, namely: Human Resource Management; Procurement; and Property & Supply Management.

B.3 HUMAN RESOURCE MANAGEMENT UNIT

It is responsible for managing the employee's life cycle such as recruitment and placement, hiring, training, administering employee benefits. Human Resource Management is involved in disseminating information on employee benefits, assistance, programs and leave of absence. It is usually responsible for creating, putting into effect and overseeing policies governing workers and the relationship of the institution and its employees.

One of the vital roles of Human Resource Management is to manage the people within the workplace to achieve the agency's vision and mission and reinforce the best practices at all times. There are four (4) areas of human resource management, namely: Recruitment, Selection and Placement (RSP), Learning and Development (L&D), Performance Management (PM), and Rewards and Recognition (R&R).

It also implements Manaoag Water District's (MANWAD) policies on wages and salaries including leave administration and other Civil Service Commission (CSC) policies on employees' benefits and separation pay/terminal leave benefits. Responsible for payroll preparation, payroll deductions and maintenance of records of salaries and wages including 201 file of MANWAD employees. Assists management in handling labour relations problems in accordance with the 2017 Rules on Administrative Cases in the Civil Service (RACCS). Oversees the over-all development of the employees in terms of learning and development, knowledge, skills, attitude development and enhancement.

B.4 PROCUREMENT UNIT

This unit shall have the responsibility to provide guidance, oversee the procurement function and procedure, monitor the procurement activity as applicable within the district to ensure compliance with the existing applicable laws, rules and guidelines under Republic Act 9184 (R.A. 9184), otherwise known as the Government Procurement Reform Act. Procurement defines under Article 1 of R.A.9184 as "the acquisition of Goods, Consulting Services, and the contracting for Infrastructure Projects by the Procuring Entity. Procurement shall also include the lease of goods and real estate. With respect to real property, its procurement shall be governed by the provisions of Republic Act 8974, entitled "An Act to Facilitate the Acquisition of Right-of-Way Site or Location for National Government Infrastructure Projects and for Other Purposes".

It manages the entire procurement process, from taking of requisitions, canvassing, purchasing of all requested supplies and materials needed by the district and its personnel. Bids and Awards (BAC) activities such as posting, canvassing and preparation of bidding documents. Government procurement aims to direct the procuring entity to the supplier/contractor that could deliver the products or services most economical and most advantageous to MANWAD. There are important factors to be considered such as right quality, right quantity, right price, right time and right source.

B.5 PROPERTY AND SUPPLY MANAGEMENT UNIT

This unit is responsible for the receipt, inspection, acceptance, documentation, storage, issuance, maintenance, transfer and disposition of all inventory items, properties and equipment of the district. Ensures the administration, safeguarding

and monitoring of the periodic physical inventories of materials and supplies, fixed assets, and other district properties.

Manages the security and orderliness of the storeroom/stockroom and maintains adequate operational and functional requirements.

One of the core functions of this unit is to ensure the district's facilities are well-maintained and in good working condition which includes but not limited to routine maintenance, repairs and upgrades to extends the lifespan of infrastructure and equipment. It is also responsible for general maintenance tasks of office buildings including all electrical, communication, telephone connections, internet and CCTV connections, maintenance of grounds and facilities using cleaning tools and equipment to keep the same in presentable and secure condition.

The Property and Supply Management Unit is also responsible in the acquisition, dispatch, preventive maintenance, repairs, disposition and over-all operation of all transportation units and miscellaneous mechanical tools and equipment of the district. Proper documentation related to property ownership, leases, maintenance schedules, warranties and other important documents should be maintained.

II.C FINANCE AND COMMERCIAL DIVISION

C.1 Responsibilities of the Division Manager

- Coordinates the effort of all those directly engage in the preparation of the annual corporate operating budget, monitors budget utilization and recommends for budget supplemental and its revision;
- Reviews periodic financial reports and ensures compliance to existing accounting rules and regulations issued by regulatory agencies such as Commission on Audit (COA) & Department of Budget and Management (DBM).
- Recommends policies/procedures that will improve customer satisfaction and collection efficiency of the district.
- Enforces utility rules and regulations as to billings, delinquencies and adjustments;
- Ensures the reliability and integrity of financial reporting, carry out activities and best practices at all times that will promote sound internal control system.
- Performs other related functions as may be assigned.

C.2 Function of the Division

The division is a vital component of the district, ensuring financial stability, transparency, customer relations and compliance to existing rules and regulations. Its function directly impacts decision-making, financial planning, and the overall success of the district.

The division currently has two (2) sections, namely: Accounting & Budget Section; and Billing, Collection & Customer Services Section.

C.3 The **Accounting & Budget Section** is responsible for the preparation and safekeeping of all Book of Accounts, financial records and other financial instruments. It ensures the reliability and integrity of financial reporting, compliance with relevant accounting and auditing standards and tax regulations. It also carries out activities and best practices at all times that will promote sound internal control system of the district.

C.3.1 ***Accounting Unit*** involves in maintaining all the financial records of the district, including journals, ledgers and other accounting books. The accurate and up-to-date recording of financial transactions is imperative for generating reliable financial statements and reports.

The unit is also responsible for designing, implementing and maintaining an effective internal control system. Internal controls are measures put in place to safeguard assets, prevent fraud and ensure compliance with financial rules, regulations and policies.

C.3.2 ***Budget Unit*** is responsible in the preparation and presentation of budget report for the district, this involves estimating revenues, projecting expenses, and setting financial targets. It reviews budget proposals submitted by different divisions to ensure they are comprehensive, realistic and aligned with the district's strategic priorities. It also conducts financial analysis and cost-benefit assessments to evaluate the impact of proposed budgets.

Throughout the calendar year, the Budget Unit monitors actual financial performance against the budget. This helps in identifying variances and making necessary corrective actions to achieve financial goals.

C.4 The **Billing, Collection & Customer Services Section** is responsible for managing various aspects of billing, collections and customer care support. This section plays a pivotal role in maintaining smooth financial operations and ensuring positive customer relations. It serves as a critical link between the district and its customers, ensuring the accurate billing of water services, timely collection of payments and responsive customer assistance to maintain customer satisfaction and financial stability.

C.4.1 The ***Billing Unit*** is responsible for correct meter reading consumed by each customer of the district; these readings are used to calculate the amount due from them for the water services used during a specific billing period.

It generates monthly billing notices and distribute the same to respective customers. It actively follows up all delinquent accounts by way of sending out demand letters which serve as formal notices obliging the customers to settle their outstanding water bills promptly. It also enforces utility rules and regulations as to billings, delinquencies, adjustments and maintains an up-to-date customer ledger.

Furthermore, to execute tasks in the field, this unit is in charge of the **Meter Readers Team.**

C.4.2 The ***Collection Unit*** handles collection of payment from customers for the services rendered. It receives and processes payments from customers through various channels, such as over the counter payments at the district office in cash or checks and bank transfers for selected customer accounts. The unit also ensures the collection efficiency of the district.

C.4.3 ***Customer Services Unit*** receives and processes different service applications. It provides assistance to customers regarding their account inquiries, requests and other related concerns. This includes addressing customer complaints, resolving billing discrepancies and guiding customers through the payment or application process.

It enforces disconnection of delinquent accounts and oversees the reconnection process once the outstanding bills are settled. The unit maintains an open and effective communication with customers through various channels, such as phone messages/calls, electronic mails and written correspondence. It provides important updates, reminders and advisories related to billing and payment matters. It also creates organized

scheme on customer relations and recommends procedures that will improve customer satisfaction.

Furthermore, to execute tasks in the field, this unit is in charge of two teams, namely: **Disconnection Team** and **Investigation Team.**

II.D PRODUCTION AND WATER QUALITY DIVISION

D.1 Responsibilities of the Division Manager

- Responsible for water production requirements and ensure the steady supply of water to the service area;
- Monitors water pumps and water resources facilities;
- Monitors water system pressure, pumping water level and water quality in accordance with the standards set by the NSDW and WHO;
- Conducts preventive maintenance and repairs of equipment and facilities, pump testing for newly purchase and repairs unites of pumps and motors for quality control acceptance and efficiency rating check-up;
- Monitors water quality by conducting regular chlorine residual test, collect water samples for water analysis, bacteriological for potability and for physical and chemical tests. Results to water analysis are set to meet the standards of PNSDW making sure that water delivered to every household is safe and potable.
- Performs other related functions as may be assigned.

D.2 Function of the Division

This Division is responsible for water resources management; water supply production, treatment and distribution; non-revenue water management; and planning and design of various infrastructure and waterworks projects. Specifically, the Division is in charge of monitoring pump operation data, maintenance of pump stations and water production equipment, facilities and other appurtenances. The division shall exercise operational control over the following duties:

- Submission of chemical and physical testing of water samples from all pumping stations;
- Submission Summary Report on Microbiological Test of water samples to LWUA; Conducting tests and inspections; preparing reports and calculations

- Operation & monitoring of Pumping Equipment
- Disinfection of Water Supply
- Water Quality Testing and Monitoring
- Housekeeping and maintenance of pump house, ground and surrounding, equipment and other related production facilities.
- Delivery of chlorine to pumping stations.

II.E ENGINEERING AND CONSTRUCTION DIVISION

E.1 Responsibilities of the Division Manager

- Direct, oversee and participate in the development of the Division's work plan; assign work activities, projects and programs; monitor workflow; review and evaluate work products, methods and procedures;
- Research and prepare technical and administrative reports and studies; prepare written correspondence as necessary;
- Ensure District safety practices are implemented throughout division to ensure a safe and healthy work environment;
- Responsible for planning and development of program related to water distribution system and network by using commercial and in-house computer-aided engineering software;
- Responsible for establishing and adopting of optimum design, preparation of technical specifications, estimate and program of work;
- Responsible for establishing technical standard and in-house construction software development that may be applicable/adaptable to the needs of the agency;
- Responsible for the preparation, generation of all plans, records and documentation relative to the water distribution network system;
- Conducts weekly coordination meeting to monitor personnel accomplishment and distribution of employees work assignments;
- Prepares and evaluates system improvement schemes/design and conduct cost benefit analysis. Submit recommendation;
- Reviews/evaluates operation of system electro-mechanical equipment. Submit findings and recommendations;
- Evaluates hydraulics of distribution system and submit recommendation to improve system operating efficiency;
- Prepares cost estimate for the construction and operation of available scheme for Manwad's future additional water supply source.

E.2 Function of the Division

The Engineering Division plans and designs mainline extensions, performs mainline improvement of the system and other plumbing facilities, and implements Program of Work (POW) for extension, expansion and improvement of the water supply system.

The division also undertakes repair and maintenance of transmission and distribution pipelines including its appurtenances, installs service connections and undertakes repair and maintenance of the same, and coordinates for the plan, design and implementation of program of work for extension and improvement of office structures and other facilities.

- Predictive and preventive maintenance including immediate repair of transmission, distributions, service lateral and water service connection pipelines and appurtenances such as hydrants, blow-off valves, gate valves, air release valves, etc.;
- Restored grounds and other affected structures during construction, repair and maintenance works;
- Upgrading of deteriorated and undersized pipelines;
- Installation of water service laterals;
- Keeping record and maintenance of installed water meters of concessionaries;
- Maintenance of a sound and leak-free pipeline and on time repair of all leaks or pipe bursts to prevent water loss;
- Detection and pinpointing of exact location of underground leakages.

E.2.1 Maintenance Job Order / Service Request

1. Installation of New Water Service Connections
2. Reconnection and Re-application
3. Mainline and Service Line leaks, broken pipes
4. Meter Stand Leak
5. Change Meter
6. Relocation of Water Meter
7. Gate Valve Repair/Replacement
8. Water Quality
9. Mainline Disconnection
10. Additional Meter Riser
11. Apprehension of Illegal Connection
12. Relocation of Mainline/Service Line
13. Blow-off leak/Rehabilitation
14. Restorations

III. OPERATION AND MAINTENANCE CONCEPT

III.A ADMINISTRATIVE AND GENERAL SERVICES DIVISION

A.1 HUMAN RESOURCE MANAGEMENT UNIT

A.1.1 PROCEDURE FOR REQUEST ON CREATION OF POSITIONS/RECLASSIFICATION/RECATEGORIZATION/CONVERSION/ABOLITION/RETENTION AND MODIFICATION OF ORGANIZATION STRUCTURE AND STAFFING PATTERN

(See Illustration No. 1 on page 54)

- The General Manager recommends to the Members of the Board of Directors to enact a resolution approving and indicating the positions for creation/reclassification/abolition/retention/conversion or modification of Organizational Structure and Staffing Pattern as the case maybe;
- Letter duly signed by the General Manager requesting the same;
- The Human Resource Management Unit (HRMU) prepares Existing and Proposed Organizational Structure and Staffing Pattern (EOSSP/POSSP) and Position Description Forms (PDF/s) of the positions to be created/re-classed/converted;
- Certification from the General Manager indicating that the funding requirements as a result of the staffing modification are included or to be included in the annual budget of the district, that the district will not incur net loss as a result of the staffing modification; and total number of active service connections;
- The Human Resource Management Unit (HRMU) requests the Finance and Commercial Division (FCD) to furnish copy of Financial Statements/COA Audited Financial Statements for the last two (2) years and Monthly Data Sheet;
- The Human Resource Management Unit (HRMU) prepares Position Allocation List (PAL) and Proposed Plantilla of Personnel (PPP);
- The General Manager requests the Local Water Utilities Administration (LWUA) a certification stating the current category of the district duly signed by the LWUA Administrator and a

certification that the district is up-to-date in paying its debt obligation;

- The General Manager secures a certification from the Commission on Audit (COA) Auditors that the district did not incur any loss for the immediate past two (2) years;
- All consolidated documents duly signed by the Head of Agency will be submitted to the Department of Budget and Management (DBM) for evaluation and approval.

A.1.2 RECRUITMENT, SELECTION AND PLACEMENT – PROCEDURE ON HIRING

(See Illustration No. 2 on page 55)

It is a major part of an institution or organization overall resourcing strategies which identify and secure people needed for the institution to achieve the main goal and objective based on agency's vision, mission and its mandate.

- The Human Resource Management Unit (HRMU) receives request for filling-up the vacant position (personnel requirement) from the requesting office or division;
- Forwards the request for filling-up of vacant position (personnel requirement) to the Head of the Agency for approval;
- Upon approval of the request by the Head of Agency, the Human Resource Management Unit (HRMU) prepares request for the duly signed Publication of Vacant Position by the Administrative and General Services Division Manager and submit the same to the Civil Service Commission Bulletin of Vacant Positions to the CSC Field Office;
- Collates all application letters, listing of applicants and conduct preliminary evaluation;
- Prepares Comparative Assessment Report of qualified applicants;
- The Personnel Selection Board (PSB) conducts systematic assessment of the competence and qualifications of applicants, prepares the PSB reports and submits shortlist of qualified applicants

recommended for appointment to the Head of the Agency. The Head of Agency shall choose the applicant to be appointed;

- Upon approval by the Head of Agency, the Human Resource Management Unit (HRMU) prepares the appointment papers to be submitted to the Civil Service Commission (CSC) for attestation. The Human Resource Management Unit (HRMU) posts the notice of appointment of an employee after the issuance of an appointment.

A.1.3 LEAVE ADMINISTRATION

(See illustration No. 3 on page 56)

It is a process of managing time-off requests which includes but not limited to mandatory vacation, sick, maternity, paternity, special privilege leave, solo parent leave, study leave, 10-day VAWC leave, rehabilitation privilege, special leave benefits for women, special emergency (calamity) leave and adoption leave provided however, that all leave applications are in accordance with the Omnibus Rules on Leave (Rule XVI of the Omnibus Rules Implementing Book V of E.O 292).

A.1.3.a PROCESSING OF LEAVE APPLICATION

- The Human Resource Management Unit (HRMU) discusses with the employee the type of leave applicable;
- The Human Resource Management Unit (HRMU) receives the accomplished leave application and checks the completeness and accuracy of data prior to certification of leave credits;
- Upon certifying the leave credits, the Human Resource Management Unit (HRMU) checks and deducts leave credits on the leave card;

  (Note: In case of Leave Without Pay, it will be recorded to the logbook for payroll deduction.)
- The leave application will then be forwarded to the Division concerned for the required signature/recommending approval by the Division Manager concerned;
- The Human Resource Management Unit (HRMU) prepare routing slip and routes the leave application to the Office of the General Manager for signature and approval;

- Upon approval of the leave application, it will be routed again to the Human Resource Management Unit (HRMU);
- The Human Resource Management Unit (HRMU) will then inform the concerned employee of the approval of the leave application. In case of disapproval/amendments, inform concerned employee of the changes;
- The Human Resource Management Unit (HRMU) files the approved/disapproved leave application to the individual folder, one (1) copy to be returned to the employee concerned;
- The Human Resource Management Unit (HRMU) generates/prepares the monthly reports on Summary of Employees' Scheduled Leave and Summary of Employees' Accumulated Leave Credits signed by the Administrative and General Services Division Manager duly approved by the General Manager

A.1.4 APPLICATION FOR OVERTIME AUTHORIZATION

(See illustration No. 4 on page 57)

- The Human Resource Management Unit (HRMU) receives duly accomplished Overtime Authorization (OA) form;
- Checks the completeness and accuracy of data that contains the date of filing, name of employee, ID number, position and its respective division. It also includes the date covered, number of hours/requests for approval and the purpose to render overtime;
- The Human Resource Management Unit assures that the Overtime Authorization (OA) signed by the employee and his Division Heads/Immediate Supervisor. Upon checking and verification, said OA form will be forwarded to the Office of the General Manager for Approval before recording and considered as Compensatory Overtime Credits (COC);
- The Human Resource Management Unit (HRMU) files the approved Overtime Authorization (OA) to the individual folder, one (1) copy to be returned to the concerned employee;
- The Human Resource Management Unit (HRMU) generates/prepares reports on Summary of Earned Compensatory

Overtime Credits (COC) and Status Reports of Overtime Credits Available for Utilization signed by the Division Manager of Administrative and General Services and duly approved by the General Manager.

A.1.5 PROCESSING OF COMPENSATORY TIME-OFF APPLICATION

(See Illustration No. 5 on page 58)

- The Human Resource Management Unit (HRMU) discuss with the employee the balance of Compensatory Time-Off (CTO);
- The Human Resource Management Unit (HRMU) requires the accomplished Compensatory Time-Off (CTO) authorization application with required signature from the Division Heads/Immediate Supervisor;
- The Human Resource Management Unit (HRMU) checks the Compensatory Time-Off (CTO) application as to the completeness and accuracy of data which contains the date of filing, name of employee, position, ID number and its respective division. It also includes for availment dates of CTO; Date of COC; No. of hours for availment CTO and remaining COC's.
- The Human Resource Management Unit (HRMU) records and deducts the number of hours availed to COC credits with attached overtime ledger card and signed by the Administrative and General Services Office (AGSO) and Division Manager from Administrative and General Services;
- Upon approval of the CTO applications, it will be routed again to the Human Resource Management Unit;
- The Human Resource Management Unit (HRMU) will then inform the concerned employee of the approval of CTO application. In case of disapproval/amendments, inform concerned employee of the changes;
- The Human Resource Management Unit (HRMU) files the CTO application to the individual folder, one (1) copy to be returned to the concerned employee.

A.1.6 PAYROLL PREPARATION

(See Illustration No. 6 on page 59)

- The Human Resource Management Unit (HRMU) prepares the general payroll three (3) working days before the ensuing month. Ensures the corrections and accuracy of data including statutory deductions, salary and adjustment and others;
- The Human Resource Management Unit (HRMU) prints out the prepared payroll in a weekly basis with the attached Daily Time Record (DTR) print-out from the Biometrics;
- The checked and verified attached Daily Time Record (DTR) will then be routed to the Finance and Commercial Division (FCD) for checking as to the completeness and accuracy of data indicated in the prepared general payroll together with the attached documents;
- After checking, the general payroll will be ready for voucher and checks preparation from Finance and Commercial Division (FCD) and will then be forwarded to the Office of the General Manager (OGM) for approval;
- The Human Resource Management Unit (HRMU) prepares the salary for job order employees every Friday of the week;
- The Job Order Employee's Daily Time Record (DTR) will be downloaded from the Biometric Attendance System then will be uploaded by the Human Resource Management Unit (HRMU) to check the corrections of hours rendered by the employee;
- After checking, the Human Resource Management Unit (HRMU) prepares Job Order Payroll for the applicable week and will be routed to the Finance and Commercial Division (FCD) for checking with the attached documents;
- The Job Order Payroll together with all the attached documents will be forwarded to the Office of the General Manager (OGM) for signature and final approval.

A.1.7 LOAN APPLICATIONS

(See Illustration No. 7 on page 60)

A.1.7.a GOVERNMENT SERVICE INSURANCE SYSTEM (GSIS) LOAN

- The Human Resource Management Unit (HRMU) shall be apprised by member/employee for the loan application;
- The qualified member/employee must have his loan application using kiosk machine of the Government Service Insurance System (GSIS) or the GSIS Touch;
- Upon application of loan by the member/employee, the Human Resource Management Unit (HRMU) requests the Finance and Commercial Division (FCD) to issue net take home pay;
- Upon checking the eligibility of a member or employee to apply for a loan and that the net take home pay is within the limit, only then the Agency Authorized Officer will confirm the loan application through the GSIS Wireless Automated Processing System.

A.1.7.b HOME DEVELOPMENT MUTUAL FUND (PAGIBIG) LOAN

- The Human Resource Management Unit (HRMU) shall be apprised by member/employee for the loan application;
- The qualified member or employee must create a Virtual Pag-ibig account where loan application could be processed;
- Upon application of loan by the member/employee, the Human Resource Management Unit (HRMU) requests the Finance and Commercial Division (FCD) to issue net take home pay;
- Upon checking the eligibility of a member or employee to apply for a loan and that the net take home pay is within the limit, only then the Agency Authorized Officer will approve the loan application through Virtual Pag-ibig Platform.

A.1.7.c LAND BANK OF THE PHILIPPINES LOAN

- The Human Resource Management Unit (HRMU) shall be apprised by member/employee for the loan application;
- Upon application of loan by the member/employee, the Human Resource Management Unit (HRMU) requests the Finance and Commercial Division (FCD) to issue net take home pay;
- Upon checking the eligibility of a member or employee to apply for a loan and that the net take home pay is within the limit, the cashier will process the loan application through Electronic Salary Loan Module;
- The Agency Authorized Officer (AAO) will approve the loan application pursuant to the existing Memorandum of Agreement (MOA) between the district and the Land Bank of the Philippines.

A.1.8 EXPEDITION AND SUBMISSION OF STATEMENT OF ASSETS, LIABILITIES AND NET WORTH (SALN)

(See Illustration No. 8 on page 61)

- The Office of the General Manager (OGM) issues an Office Order on the accomplishment and deadline of submission of the Statement of Assets, Liabilities and Net Worth (SALN).
- The Human Resource Management Unit (HRMU) disseminates the forms either on soft or hard copy to every division.
- The Human Resource Management Unit (HRMU) receives and checks all accomplished forms as to the accuracy and completeness of data. All SALN forms with correction and alterations will be sent back to the division or employee concerned;
- After the SALN forms are all submitted by the different divisions not later than April 30 of every year. Upon checking, it will then be forwarded to the Office of the General Manager (OGM) for signature to be sworn to and subscribed. However, the General Manager's accomplished SALN will be signed, sworn and subscribed to by the Chairman of the Board of Directors;

- After all the SALN forms are signed, sworn in to and subscribed, it will be finally submitted to the Office of the Ombudsman not later than June 30 of every year.

A.1.3 PREPARATION AND SUBMISSION OF OFFICE PERFORMANCE COMMITMENT AND REVIEW (OPCR) AND INDIVIDUAL PERFORMANCE COMMITMENT AND REVIEW(IPCR)

(See Illustration No. 9 on page 62)

A.1.9.a PERFORMANCE PLANNING AND COMMITMENT

- The Human Resource Management Unit (HRMU) is normally conducting orientation on Strategic Performance Management System (SPMS) every second week of January of the current year, and at the same time discussion as regards to the Performance Targets/Goal Settings to be enumerated in the OPCR;
- Submission of OPCR to the Performance Management Team (PMT)-HRM Unit will be on the 25th day of October for every year;
- Release of approved OPCRs to the concerned offices will be on the 29th day of November for every year;
- Submission of IPCR to the PMT-HRM Unit will be on the 15th day of December covering the period of January to June performance targets. Whereas, the period of July to December performance targets will be submitted on the 15th of June for every year.

A.1.9.b PERFORMANCE MONITORING AND COACHING

- Performance monitoring and coaching of OPCR by the PMT will be conducted annually;
- The IPCR will be monitored by the HRM Unit semi-annually;
- Performance monitoring and coaching of individual staff will be conducted by the Division Managers concerned on a regular basis;

- Performance monitoring and coaching forms must be submitted to PMT-HRM Unit after end of every quarter for filing;
- Employees with rating of satisfactory and below will be discussed by the Division Managers to his staff, the performance against agreed work, goals and targets every mid and end of the year. Feedback should be submitted to the PMT.

A.1.9.c PERFORMANCE REVIEW AND FEEDBACK

- The PMT shall review, evaluate and validate OPCR against targets and return validated OPCR to divisions and offices concerned;
- The HRM Unit collates the assessed OPCRs and shall be submitted to the PMT;
- PMT to facilitate performance review by the agency (Annual Performance Review);
- Submission of IPCRs with actual accomplishments to the PMT-HRM Unit will be on the 25th of July every year covering the period of January to June accomplishments and every 25th of January of every year covering the period July to December accomplishments;
- Evaluation and validation of IPCRs by the PMT will be on the 25th of February and 25th of August of every year.

A.1.9.d PERFORMANCE REWARDING AND DEVELOPMENT PLANNING

- Submission of Top Performers List to the Program on Awards and Incentives for Service Excellence (PRAISE) will be every 15th day of March of every year;
- Submission of Office Performance Assessment Report to the PMT or to the Head of the Agency will be on the 15th day of March of every year;

- Performance Development Planning should be conducted second week of June of every year.

A.1.10 PROCEDURE ON DISCIPLINARY CASES/ ADMINISTRATIVE PROCEEDINGS

(See Illustration No. 10 on page 63)

Administrative cases shall be non-litigious in nature. The technicalities of law, procedure and evidence shall not strictly apply but subject to the requirements of due process in administrative cases. Any action that can be taken on the completion or during the investigation proceedings including but not limited to a warning, reprimand, suspension from official duties and dismissal from service or any such action as is deemed to be fit considering the gravity of the matter.

A.1.10.a COMPLAINT

- The Human Resource Management Unit receives the complaint in writing, subscribed and sworn to by the complainant;
- No complaint against an official or employee shall be given due course unless the same is in writing, subscribed and sworn to by the complainant. In case initiated by the proper disciplining authority or an authorized representative, a show because order is sufficient. (Rule 3 Sec. 11 of 2017 Rules on Administrative Cases in the Civil Service);
- Complaint shall contain the full name and address of the complainant; full name and address of the person complained of, its position and office employment; a narration of the relevant and material facts which shows the acts or omissions allegedly committed; certified true copies of documentary evidence and affidavits of his witness; if any; and certification or statement of non-forum shopping;

  (Note: Complaint can be dismissed in the absence of any of the aforementioned requirements.)
- The complained party/employee submits counter-affidavit/comment under oath within three (3) days from receipt.

A.1.10.b PRELIMINARY INVESTIGATION

- A Preliminary Investigation is a mandatory proceeding under taken to determine whether a prima facie case exists to warrant the issuance of a formal charge/notice of charge. (Rule 4 Sec. 18 of 2017 Rules on Administrative Cases in the Civil Service);

- The Human Resource Management Unit conducts preliminary investigation/fact-finding investigation to commence not later than five (5) days from receipt of complaint and terminated within thirty (30) days thereafter.

  (Note: In the absence of a prima facie case, complaint shall be dismissed.)

A.1.10.c FORMAL CHARGE

- After finding a prima facie case, a formal charge will then be issued to the person complained of who shall now be called as defendant. A formal charge shall contain a specification of charge and all the material and relevant facts of the case.

A.1.10.d ANSWER

- After the formal charge has been issued, the complained party/person submits his answer in writing and under oath shall be specific and shall contain material facts and applicable laws, if any;
- When the disciplining authority or a representative determines that the answer is satisfactory, the case shall be dismissed. Otherwise, the investigation shall proceed;

- Failure to file an answer waived right thereto and may issue preventive suspension or reassignment as the case maybe.

A.1.10.e FORMAL INVESTIGATION

- The Human Resource Management Unit or a special committee shall conduct formal investigation;

- A formal investigation shall not be held earlier than five (5) days not later than ten (10) days from receipt of the respondent's answer or upon the expiration of the period to answer;

- Investigation shall be finished or completed within thirty (30) days from the issuance of the Formal Charge or receipt of the answer;

- The result of the formal investigation will then be submitted to the Appointing Authority within fifteen (15) days after the conclusion of the formal investigation.

A.1.10.f DECISION

- After the submission of the result of the formal investigation, the Appointing Authority shall decide the case within thirty (30) days from receipt of the Formal Investigation Report;

- A decision rendered by the Appointing Authority will be final and executory when a penalty of reprimand or suspension for not more than thirty (30) days or a fine if an amount not exceeding thirty (30) days' salary is being imposed. It shall be final and executory unless a motion for reconsideration is reasonably filed. However, the respondent may file an appeal or petition for review which the issue raised is violation of due process;

- Decision shall also be final and executory if the penalty imposed is suspension exceeding thirty (30) days, or fine in an amount exceeding thirty (30) days salary, after the lapse of the reglementary period for filing a motion for reconsideration or an appeal and no such pleading has been filed.

A.1.10.g MOTION FOR RECONSIDERATION

- A motion for reconsideration may be filed to the Appointing Authority within fifteen (15) days from receipt of the decision;

- After the motion for reconsideration has been filed, the Appointing Authority will then issue his decision on the filed motion for reconsideration.

A.1.10.h APPEAL

- Subject to Section 49 of 2017 Rules on Administrative Cases in the Civil Service, decisions of Appointing Authority imposing a penalty exceeding thirty (30) days suspension or fine in an amount exceeding thirty (30) days, may be appealed to the Commission within a period of fifteen (15) days from receipt thereof;

- Submission of an appeal may be submitted to the agency; Civil Service Commission (CSC) Regional Office; CSC Central Office; Court of Appeals; and Supreme Court.

A.2 BASIC PROCEDURES ON PROCUREMENT

(See Illustration No. 11.1 and 11.2 on pages 64-65)

- Procurement Planning and the Preparation of the Project Procurement Management Plan (PPMP), Annual Procurement Plan - Common-Use Supplies and Equipment (APP-CSE) and Annual Procurement Plan (APP);

- Process Purchase Request Slip (PRS) with estimate unit cost indicated therein. As to Alternative Method of Procurement (e.g., Shopping, Small Value Procurement), the threshold is below Php 1,000,000.00 while for above Php 1,000,000.00 shall fall on Public Bidding;

- Receives approved Purchase Requisition Slip (PRS) based on approved APP/PPMP and Approved Budget for the Contract (ABC) from various division/end-user;

- Conducts Request for Quotation for materials and supplies under Alternative Method of Procurement. (Shopping and Negotiated Procurement);

- Post Request for Quotation (RFQ) thru Philippine Government Electronic Procurement System (PhilGEPS). (Alternative Method of Procurement);

- Publish Invitation to Bid (ITB) thru PhilGEPS. (Public Bidding);
- Preparation of Bidding documents;
- Facilitate bidding procedures;
- Preparation of Schedule of Activities for each project to be bid, Minutes of the Meetings, BAC Resolution, Notice of Award, Contract of Agreement, and Notice to Proceed for the approval of BAC Chairman/members and Head of the Agency;
- Posting Notice of Award thru PhilGEPS;
- Prepares Abstract of Quotation and forward to Bids and Awards Committee (BAC) for approval;
- Prepares Purchase Order (PO) and forward to Finance and Commercial Division Manager and to the Head of Agency;
- Sends Purchase Order to the supplier through email;
- Confirms receipt of Purchase Order to the supplier and negotiate for the schedule of delivery;
- Ascertain Delivery, Inspection and Acceptance of the items;
- Attach necessary documents to Purchase Order and forward to Finance and Commercial Division for BUR issuance and voucher preparation for approval of Finance and Commercial Division Manager and the Head of Agency;
- Forward voucher to Cashier for check preparation and issuance with complete attached documents;
- Release check payment for the items delivered to the Supplier either thru deposit or pick-up;
- Prepare Procurement Monitoring Report (PMR) to be approved by the General Manager and to be submitted to Government Procurement Policy Board (GPPB) within fourteen (14) calendar days after the end of each semester.

A.3 PROPERTY AND SUPPLY MANAGEMENT UNIT

A.3.1 PROCEDURES IN RECEIVING OF DELIVERIES (MATERIALS, SUPPLIES AND EQUIPMENT)

(See Illustration No. 12.1 and 12.2 on pages 66-67)

- Unloading/Pick-up of deliveries;
- Secure copies from the procurement unit a copy of the purchase request and from the delivering party a copy of the delivery receipt or a sales invoice. If a third party made the delivery, secure a copy of the bill of lading;
- Inspect the deliveries with the representative from the accounting unit and with the end-user as witness for the delivery;
- Ascertain that the description and quantity from the copy of purchase order and the details in the delivery receipt and the item delivered is correct as with its order and condition;
- Consider to inspect the delivery thoroughly its size, quantity, make or brand and physical condition if necessary (take note of the condition of the packaging and the items enclosed therein). If there are any defects or discrepancies noted in the delivery, promptly inform the accounting unit and the procurement unit for the negotiation with the supplier;
- Issuance of the Certificate of Acceptance is made if the delivery was made in full satisfaction of the inspecting party (assigned property custodian, accounting unit and the end-user). The Certificate of Acceptance shall contain the Name of the supplier, its address, Purchase Order no., Purchase Requisition Slip no., Delivery Receipt and Sales invoice number. Description, unit Cost, Quantity of the Delivery and the Total amount of delivery condition and date of the delivery. If an equipment is delivered, full description of the item shall be stated in the Certificate of Acceptance. The Certificate shall be prepared and signed by the assigned property custodian, representative of the accounting unit,

the Head of the Administrative Division and the General Manager;

- Encoding, filing and image scanning of Purchase Order, Purchase Requisition Slip, Delivery and Sales Invoice and other pertinent documents related to the delivery for future reference;
- Proper sorting and storage of the items shall be made;
- Equipment shall be assigned property numbers and properly tagged for proper identification prior to release.

A.3.2 PROCEDURES FOR THE RELEASE OF MATERIALS FOR NEW CONNECTIONS, REPAIRS AND MAINTENANCE

(See Illustration No. 13 on page 68)

- The Requesting employee prepares the Materials Requisition and Issue Slip (MRIS) based upon the works to be done or to be accomplished;
- The Materials Requisition and Issue Slip (MRIS) will be verified by the supervisor or chief of the Engineering and Construction Division and to be approved by the Head of the Administrative Division for release;
- The Storekeeper checks for the availability of the items to be released. If the item is not available, the storekeeper notifies the Requesting employee and the purchasing unit for the preparation of the Purchase Requisition Slip;
- Before releasing the requested items or materials, the Storekeeper affixes or assigns MRIS number, date of release, water meter serial number (for new connections and change meters) to the presented documents such as the SACO, MJO and drawings for future reference;
- Upon the release of the items enumerated in the MRIS, the requesting employee shall check for the quality and quantity of the materials as per stated in his MRIS;

- The Storekeeper then returns to the requesting employee his copy of the Maintenance Job Order (MJO), survey form and drawings;
- A duplicate copy of the MRIS and the SACO will be furnished to the Accounting Unit and to the Customer Service Assistant respectively;
- For returns and change items, the requesting employee shall notify the heads of Engineering and Administrative Division for appropriate revision;
- Compiling and posting of MRIS to Bin Cards and MRIS database.

A.3.3 PROCEDURES FOR THE RELEASE OF EQUIPMENT

(See Illustration No. 14 on page 69)

- The Storekeeper checks for the availability of the Equipment on Stock;
- For equipment with an amount lesser than P50, 000.00, an Inventory Custodian Slip (ICS) shall be issued and equipment with an amount equal or greater than P50,000.00, a Property Accountability Receipt (PAR) shall be issued to document the accountability for the equipment. Copies of which is to be furnished to the accounting unit, procurement unit and the end-user;
- Counter check the items listed in the PAR or ICS before the release;
- The end-user checks the equipment and acknowledges the receipt of the equipment thru signing of the ICS or the PAR;
- Copies of the ICS and PAR is submitted to the accounting unit and the End-user;
- Posting of Release on file and records;

A.3.4 PROCEDURES FOR THE RELEASE OF WATER METERS FOR RECONNECTIONS

(See Illustration No. 15 on page 70)

- The plumber presents the approved Maintenance Job Order (MJO) for the Reconnection;
- The storekeeper then refers to the record on file for the stored water meter that was disconnected then proceeds to locate the water meter;
- The storekeeper and the plumber verify if the water meter is the same as the one provided or listed in the maintenance job order. The serial number, brand, name of the concessionaire and the last reading should be considered during verification;
- Releases additional materials for the reconnection, assigns MRIS no, date of release and posts the release of new materials in the Bin Cards;
- Fills-up necessary documents such as the MJO and the plumber acknowledges the receipt of the water meter on the Reconnection logbook;
- The storekeeper then updates his record of disconnected water meter.

A.3.5 PROCEDURES FOR THE STORAGE OF DISCONNECTED WATER METERS

(See Illustration No. 16 on page 71)

- The disconnection team or employee assigned for the disconnection shall accomplish the copy or forms for the disconnection such as the MJO- for requested disconnections/massive disconnection report;

  (Indicate the last name of the concessionaire, brand and size of the water meter, last reading and the materials included during the disconnection of the water meter).

- The storekeeper inspects the water meters as per details and descriptions in the accomplished Massive Disconnection Report or the Maintenance Job Order;
- Labelling and identifying marks will be written in the water meter by the use of paint/permanent marker prior to storage to assigned plastic bins to ease recovery from storage;
- The storekeeper receives the water meter for storage and his copy of the Massive Disconnection report for filing, encoding for future reference.

A.3.6 PROCEDURES FOR INVENTORY TAKING

(See Illustration No. 17 on page 72)

- The Storekeeper prepares the Inventory report semi-annually. The inventory report shall contain the date of inventory, description, unit of measure and count for each item of materials and supplies and for the inventory of equipment, description, assigned property no. and acquisition cost shall be included;
- Submits the same to the Inventory Committee prior to inventory taking;
- The Inventory Committee verifies for the existence of the items thru manual counting;
- Promptly trace and reconcile discrepancies between the physical count and book inventories;
- Submission of the final copy of the inventory report for approval of the inventory committee, Head of divisions and Agency;
- Adjustment of entries as per approval of the accounting unit.

A.3.7 PROCEDURES FOR THE DISPOSAL OF UNSERVICEABLE EQUIPMENT AND WASTE MATERIALS

(See Illustration No. 18 on page 73)

- Unserviceable Equipment and materials should be kept and well accounted for prior to the preparation of Inventory and Inspection Report of Unserviceable Properties (IRRUP) or waste materials report;
- Provide in the IRRUP description of the Equipment, quantity, unit of measure, carrying value (to be provided by the accounting unit);
- The Disposal Committee shall conduct actual physical count and assessment of the items presented for the appraised value;
- The Disposal Committee then recommends to the Head of the Agency the mode of disposal of unserviceable materials and equipment;
- After the Head of Agency approves the Disposal of the Unserviceable materials and equipment, the accounting unit submits to COA a copy of the IRRUP for evaluation and inspection;
- Conduct of bidding procedures;
- Payment of the value of the disposed equipment and materials;
- Hauling of Materials to be witnessed by the disposal committee;
- Closing and adjustment from ledgers and book of accounts.

A.3.8 PROCEDURES IN THE PROCESSING OF REQUISITION OF VEHICLES

(See Illustration No. 19 on page 74)

- Receipt of notice to process requirements for requisition of vehicles;

- Advice requesting Division for details of the request;
- Verifies information and details received from the requesting Division;
- Requests attachments from different units;
- Requests for approved Board Resolution;
- Prepares letter request to Local Water Utilities Administration;
- Approval of the letter request by the Head of the Agency;
- Submission of letter request and necessary attachments to LWUA
- Receipt of Authority to Purchase Vehicles form DBM/LWUA/DPWH;
- Purchase of the vehicles.

A.3.9 PROCEDURES FOR THE REGISTRATION OF MOTOR VEHICLE

(See Illustration No. 20 on page 75)

- Preparation of documents of the said motor vehicle;
- The GSIS insurance of the said vehicle should be updated;
- The vehicle should pass and comply with the requirements of the LTO such as the Smoke Emission Test as mandated by Law;
- The vehicle will be subject for further inspection at Land Transportation Office for ocular inspection such as stencils and vehicle safety evaluation;
- Proceed to LTO PACD;
- Submit necessary documents such as the Copies of Insurance Policy, Latest LTO Official Receipt and Certificate of Registration, Smoke emission Result at evaluation desk for assessment and computation;

- Wait for your number to be called at the cashier for payment and the release of the updated Official Receipt of registration and current sticker;
- Furnish copy of the latest Official Receipt and Certificate of Registration to the end user.

A.3.10 PROCEDURES FOR THE REPAIR OF EQUIPMENT AND SERVICE VEHICLE

(See Illustration No. 21 on page 76)

- End-user requests for repair of equipment;
- Equipment subjected for testing and ocular assessment by the storekeeper;
- Proper identification of defects is done and recommendations for the repair are given;
- Accomplish repair inspection report and details of the equipment is stated;
- If the equipment is rendered irreparable, the concerned shall be notified for proper disposal and action;
- Upon accomplishment of the repair inspection report (RIR), the end-user submits the RIR to the Head of Administrative and Head of the concerned end-user for verification and approval;
- Repair and replacement of parts are undertaken if necessary;
- Testing of equipment if the defect is properly resolved;
- Documents are prepared to be submitted to the accounting unit for payment of parts or services rendered.

A.3.11 PROCEDURES FOR PROCESSING OF DOCUMENTS IN CASE OF VEHICULAR ACCIDENT

(See Illustration No. 22 on page 77)

- In case of vehicular accident, coordinate with the Police Station/Barangay Officials where the accident transpired for recording of the incident;
- Take photo of the damaged vehicles in all angles including bodily injury;
- Secure the necessary information and documents;
- Submit all documents to GSIS for processing of claims;
- Request presence of Adjuster from the insurance company for inspection of the vehicles;
- Receipt of notice for preparation of estimate to accredited/non-accredited shop;
- Receipt of cost estimate for materials and labour fee to be incurred in connection with the minor or major repair;
- Submit cost estimate to GSIS/GSIS accredited insurance company;
- Receipt of Motor Car Claim Unit Evaluation Sheet;
- Upon concurrence, receipt of letter of authority;
- Receipt of check from GSIS for payment of the repair to the accredited shop.

A.3.12 PROCEDURES FOR PROCESSING OF PAYMENT OF REAL PROPERTY TAX

(See Illustration No. 23 on page 78)

- Secure validation from the Municipal Assessor based on submitted listing of properties;
- In case of updates in the Tax Declaration, request copy of new Tax Declaration;

- Prepare Summary of Properties and necessary attachments;
- Submission of records to Municipal Treasury for verification of the amount;
- Payment of fees at the Municipal Treasury;
- Issuance of Official Receipts.

A.3.13 PROCEDURES FOR TRANSFER OF TAX DECLARATION FOR TITLED PROPERTIES

(See Illustration No. 24 on page 79)

- Prepare Purchase Request for Lot Survey;
- Ocular inspection and survey of the request lot;
- Receipt of the Technical Description and Approved Plan;
- Verify records at the Municipal Assessor;
- Payment of Tax Clearance at the Municipal Treasury, if required;
- Request Certificate Authorizing registration with BIR and needed attachments;
- Payment of Transfer Tax at the Provincial Treasurer;
- Submit all necessary documents and attachments to the Provincial Assessor's Office;
- Payment of necessary fees;
- Release of new Tax Declaration.

Illustration No. 1. ***PROCEDURE FOR REQUEST ON CREATION OF POSITIONS/RECLASSIFICATION/RECATEGORIZATION/CONVERSION/ABOLITION/ RETENTION AND MODIFICATION OF ORGANIZATION STRUCTURE AND STAFFING PATTERN***

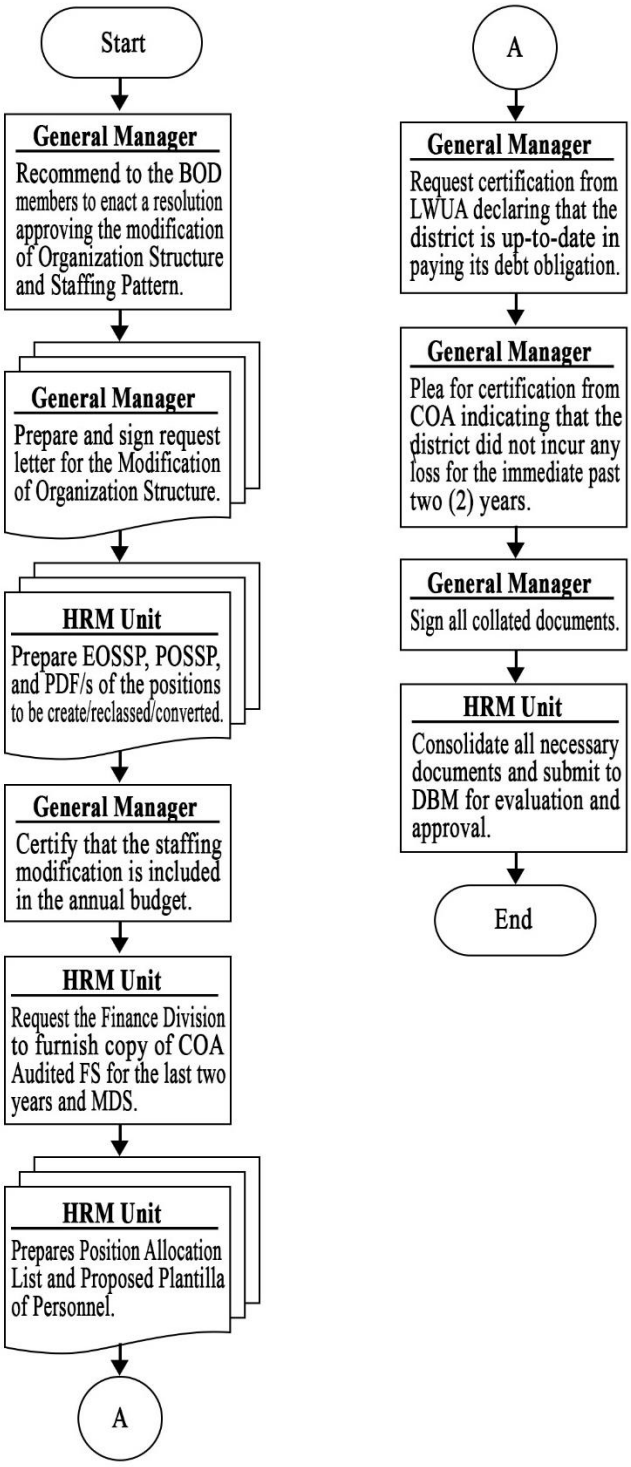


Illustration No. 2. ***PROCEDURE ON HIRING – RECRUITMENT, SELECTION AND PLACEMENT***

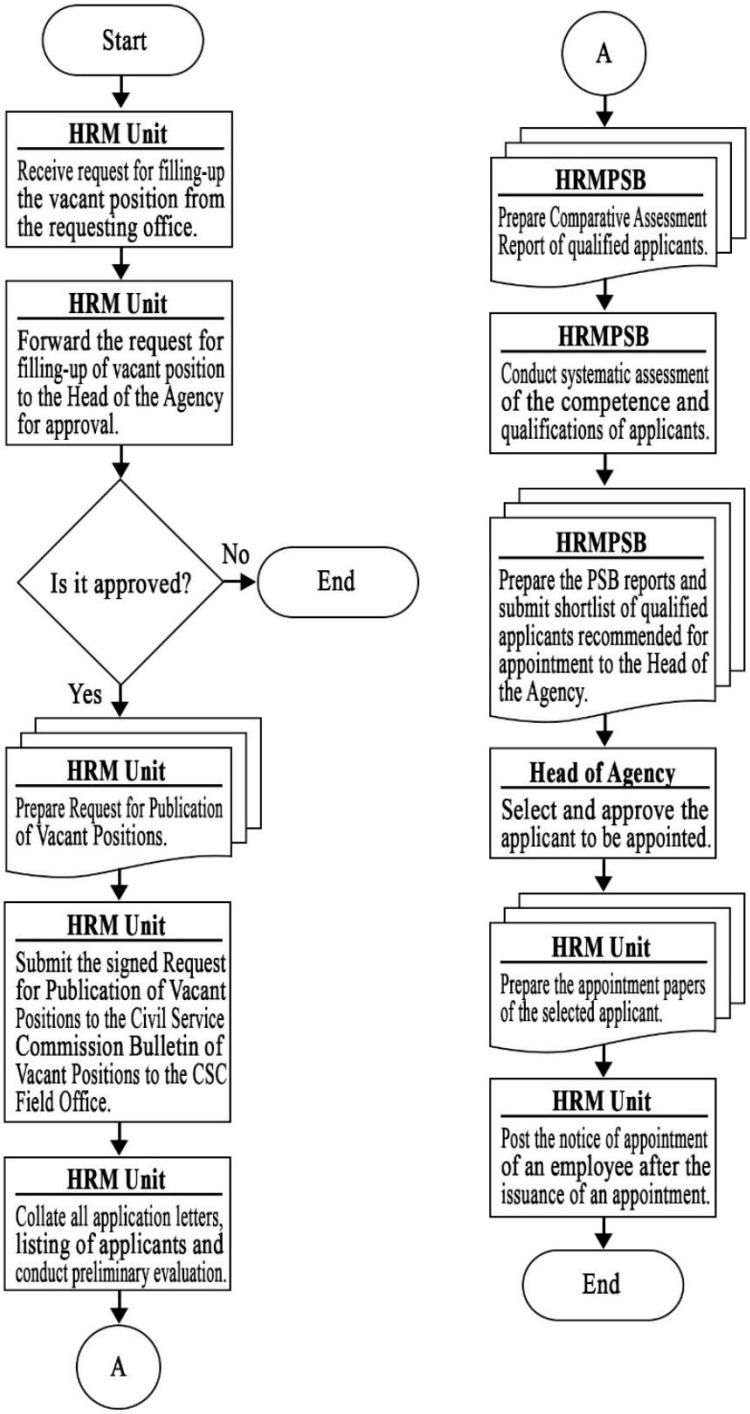


Illustration No. 3. ***LEAVE ADMINISTRATION***

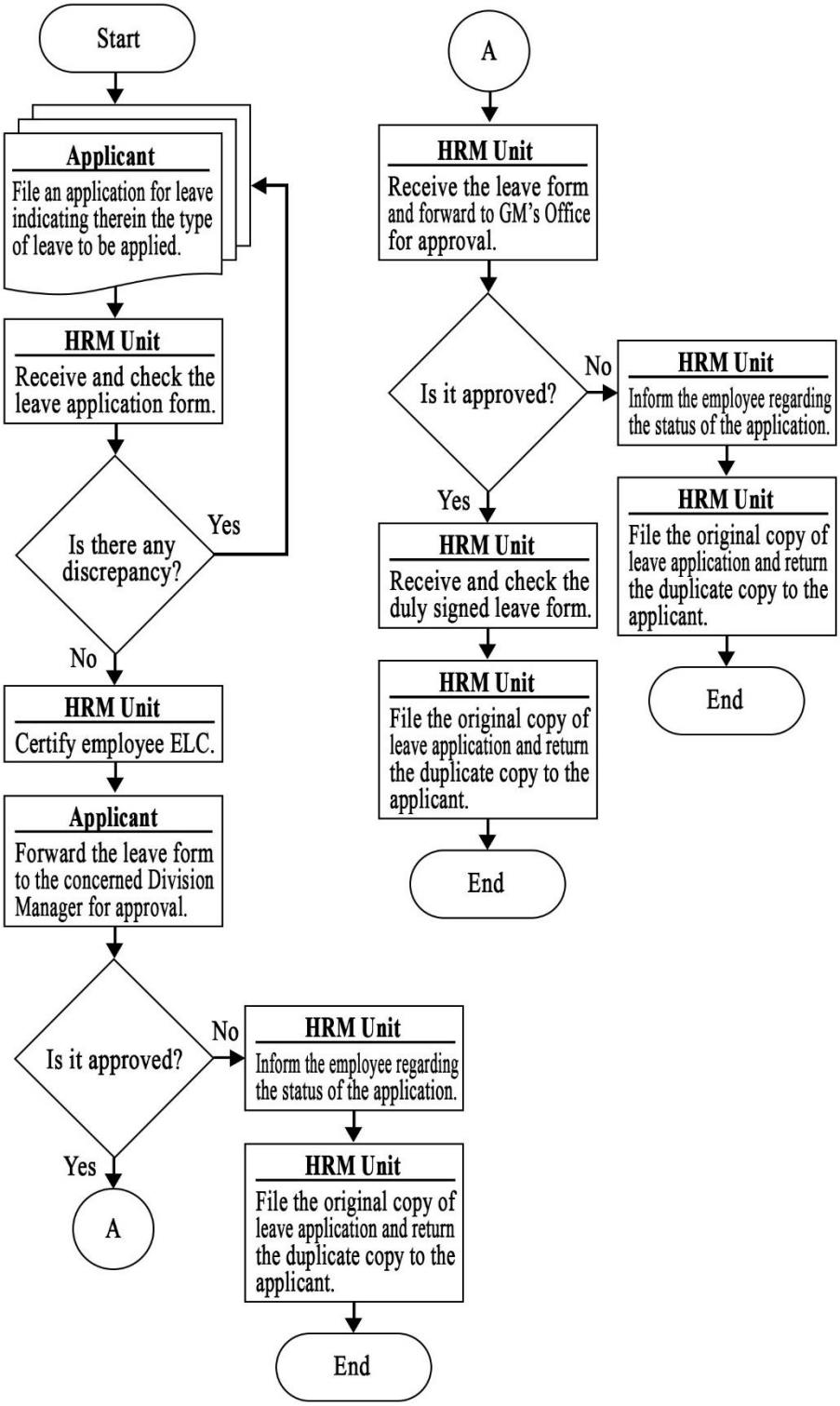


Illustration No. 4. ***APPLICATION FOR OVERTIME AUTHORIZATION***

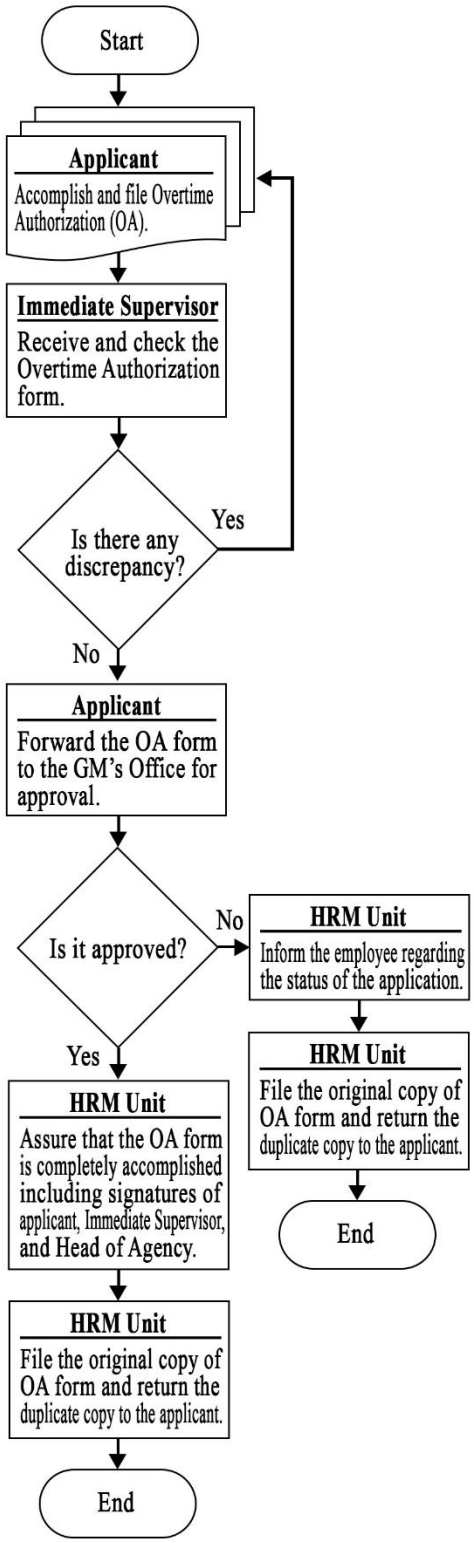


Illustration No. 5. ***PROCESSING OF COMPENSATORY TIME-OFF APPLICATION***

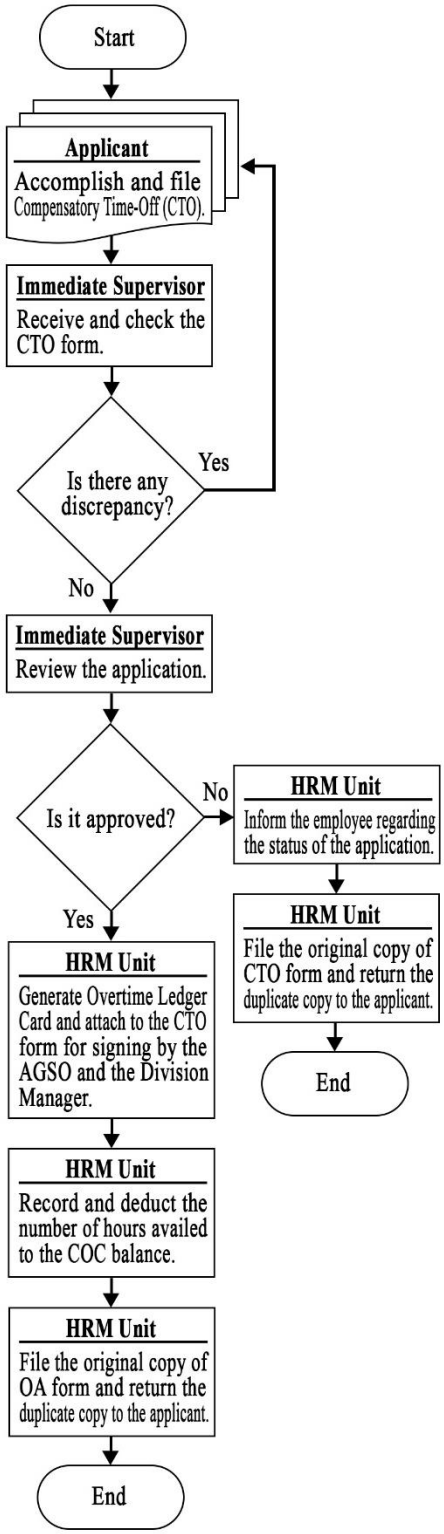


Illustration No. 6. ***PAYROLL PREPARATION***

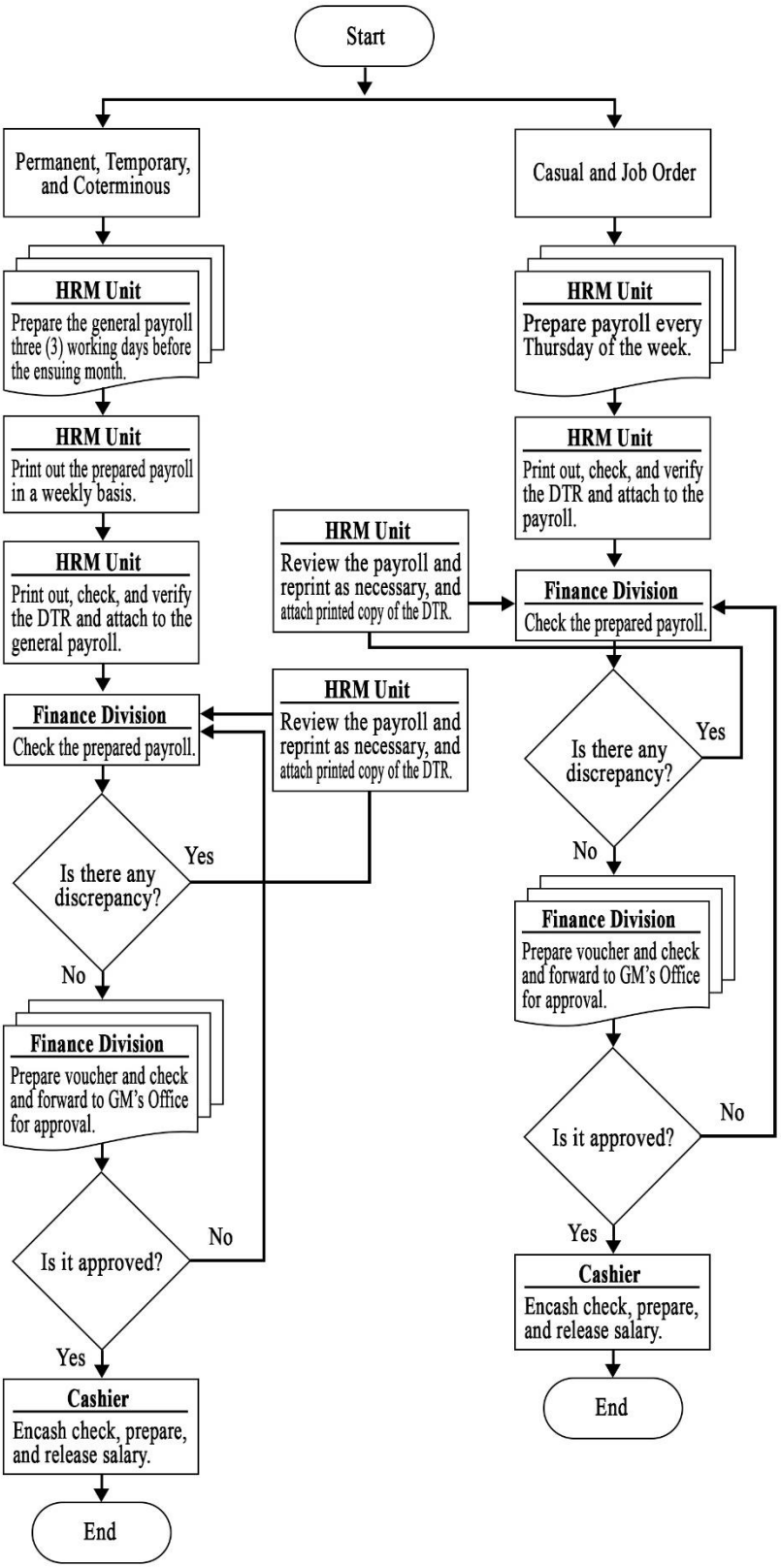


Illustration No. 7. ***LOAN APPLICATIONS***

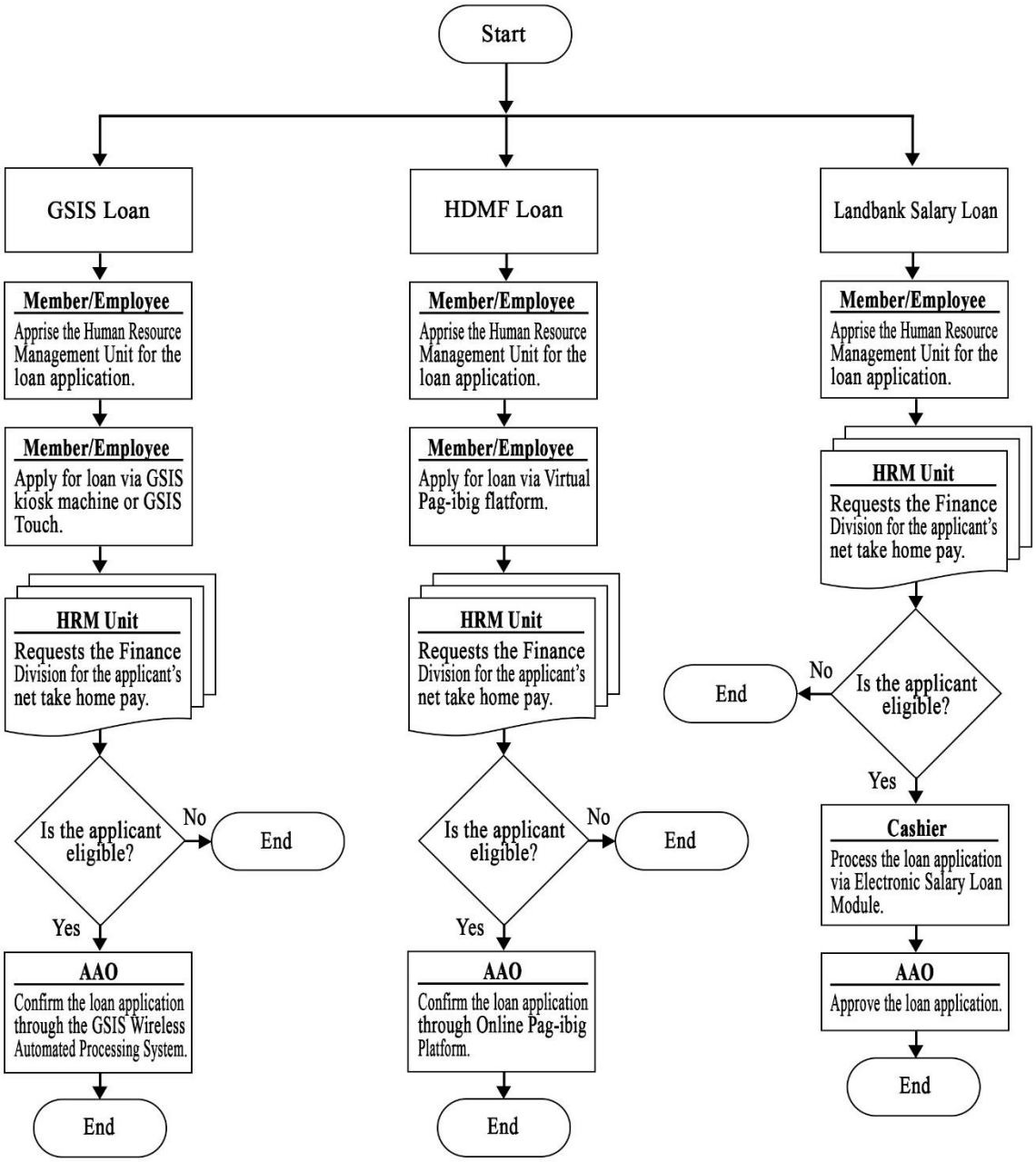


Illustration No. 8. ***EXPEDITION AND SUBMISSION OF STATEMENT OF ASSETS, LIABILITIES AND NET WORTH***

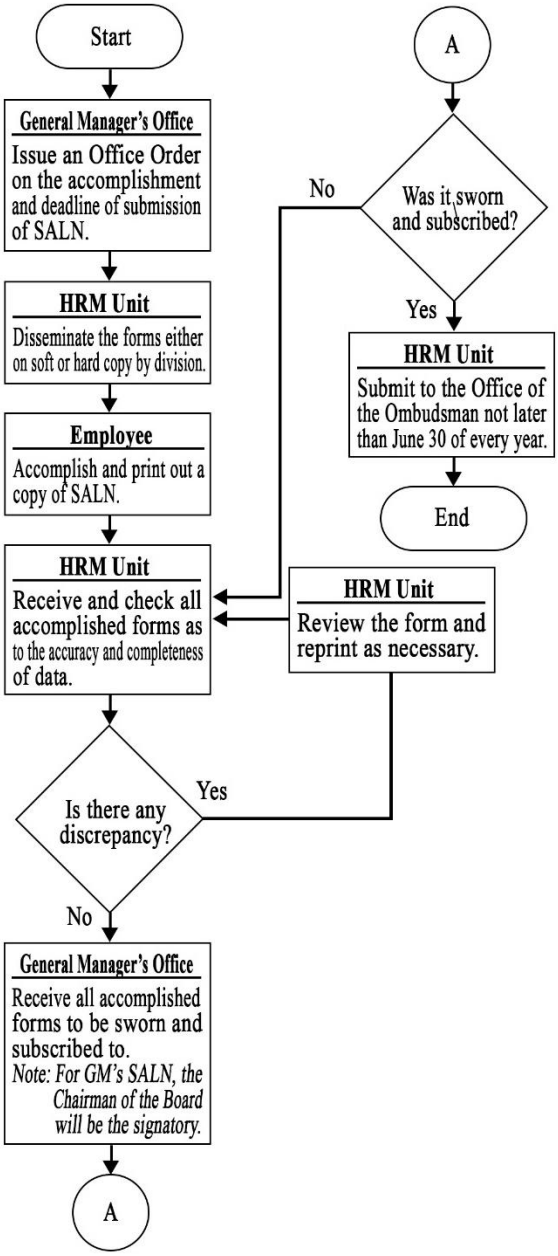


Illustration No. 9. ***PREPARATION AND SUBMISSION OF OFFICE PERFORMANCE COMMITMENT AND REVIEW (OPCR) AND INDIVIDUAL PERFORMANCE COMMITMENT AND REVIEW (IPCR)***

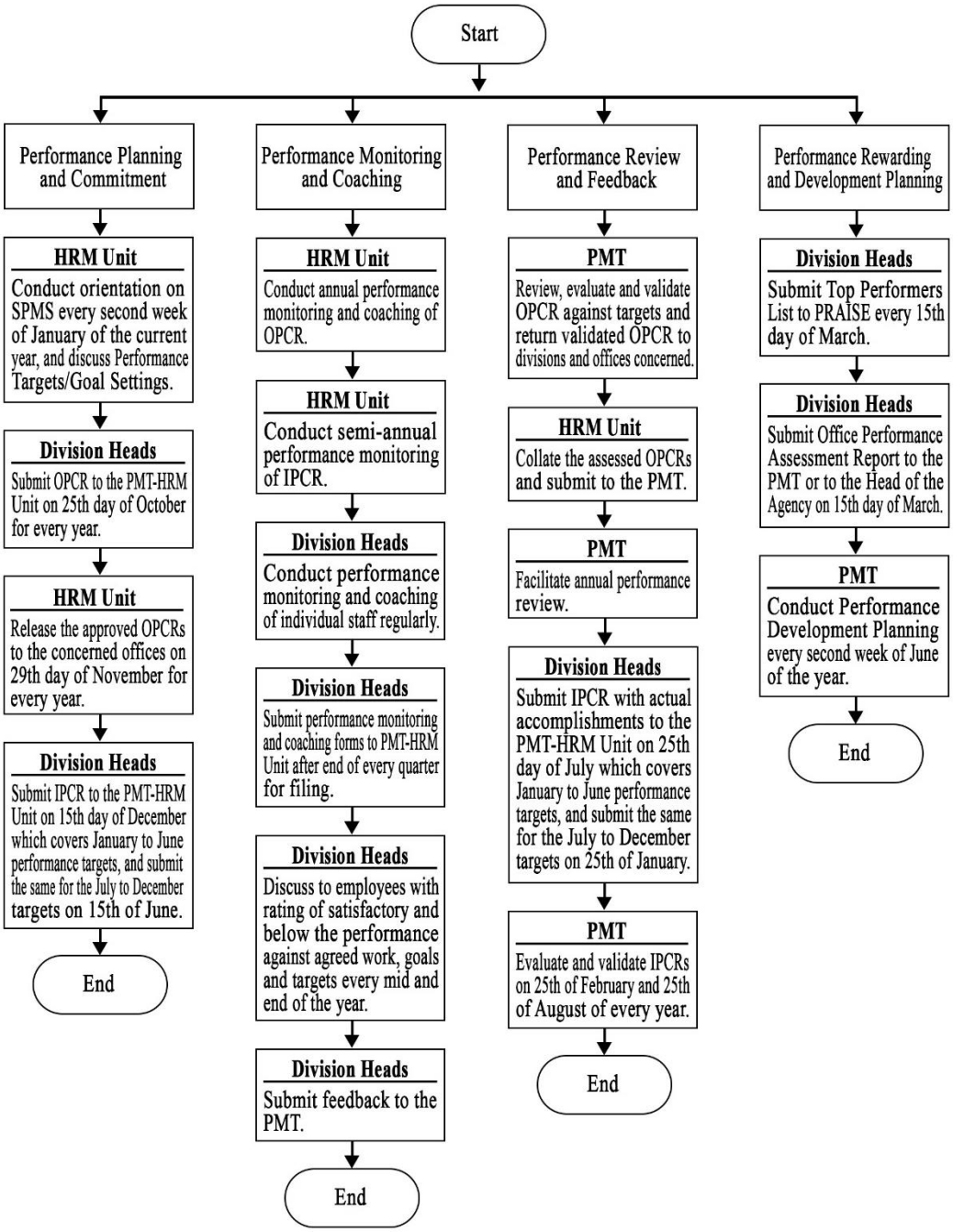


Illustration No. 10. ***PROCEDURES ON DISCIPLINARY CASES/ADMINISTRATIVE PROCEEDINGS***

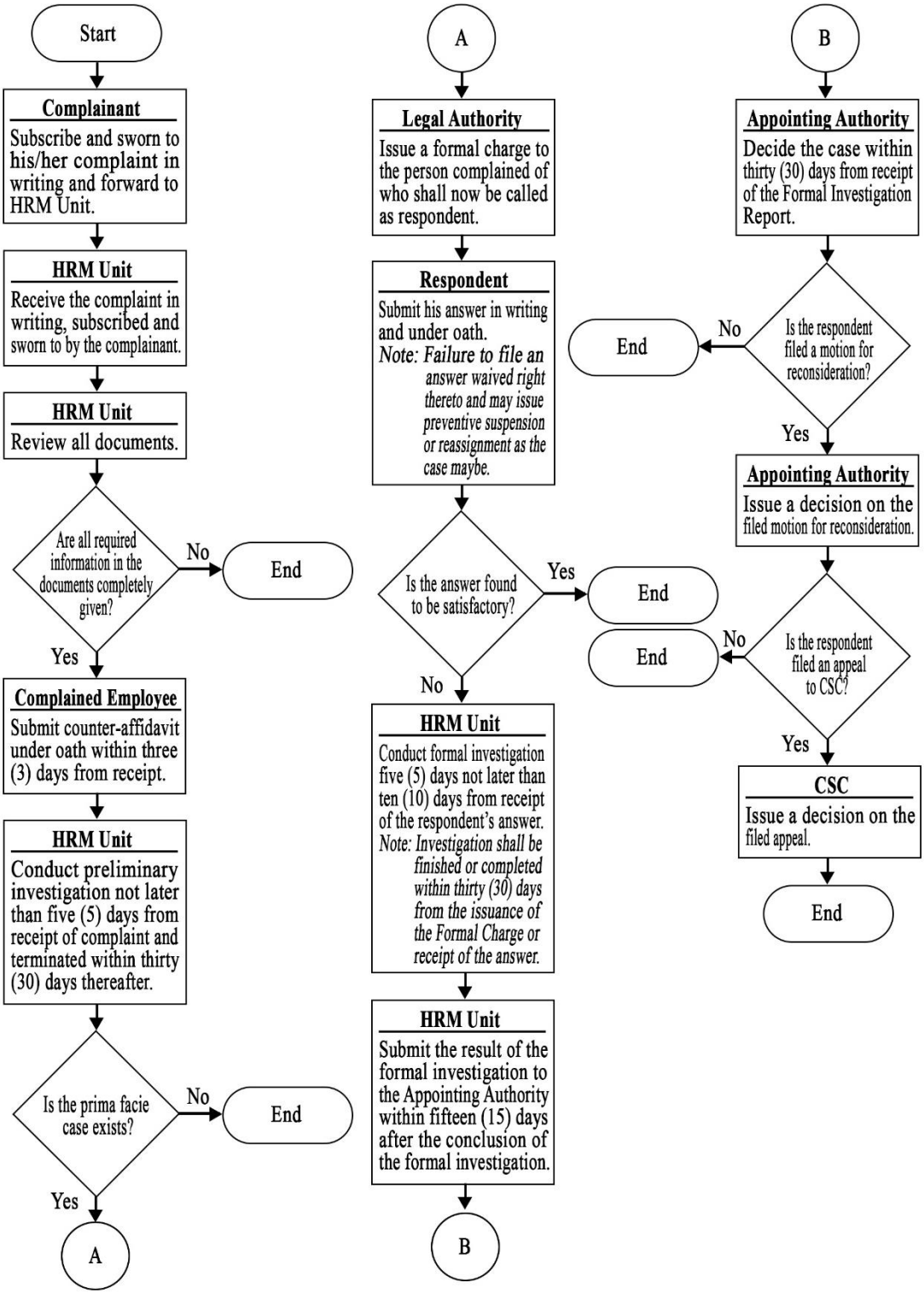


Illustration No. 11.1. ***BASIC PROCEDURES ON PROCUREMENT***

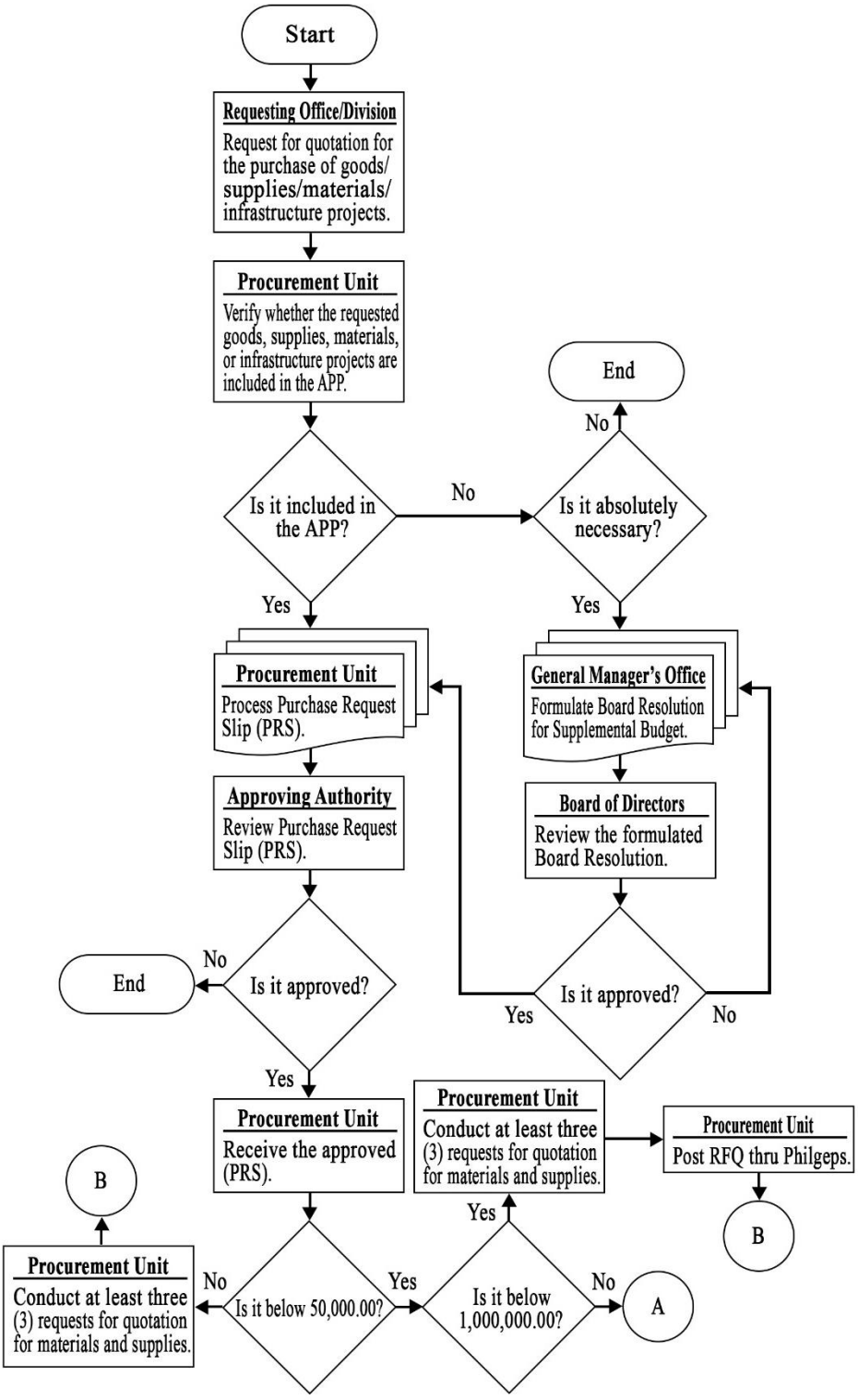


Illustration No. 11.2. ***BASIC PROCEDURES ON PROCUREMENT***

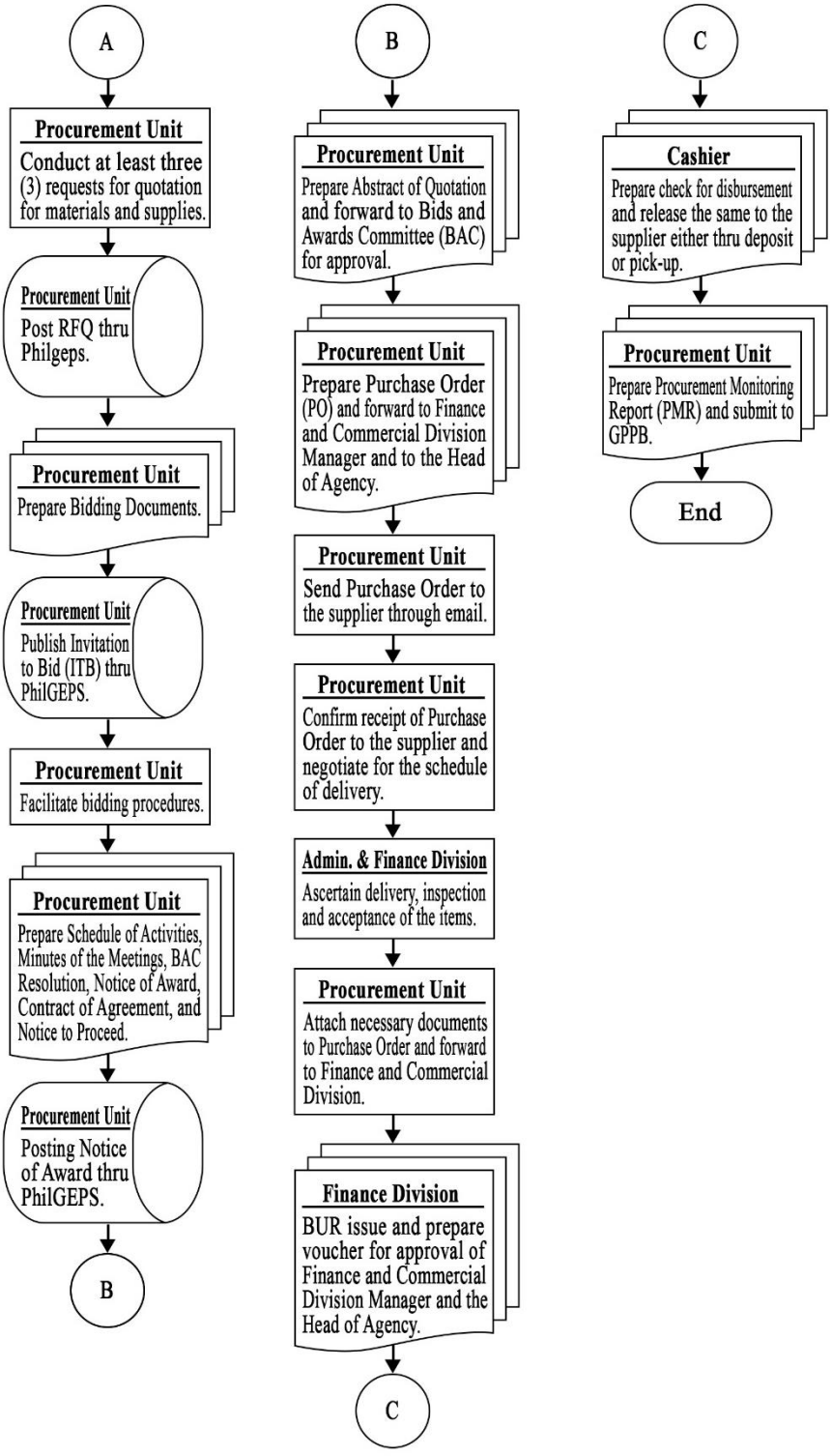


Illustration No. 12.1. ***PROCEDURES IN RECEIVING OF DELIVERIES (MATERIALS, SUPPLIES AND EQUIPMENT)***

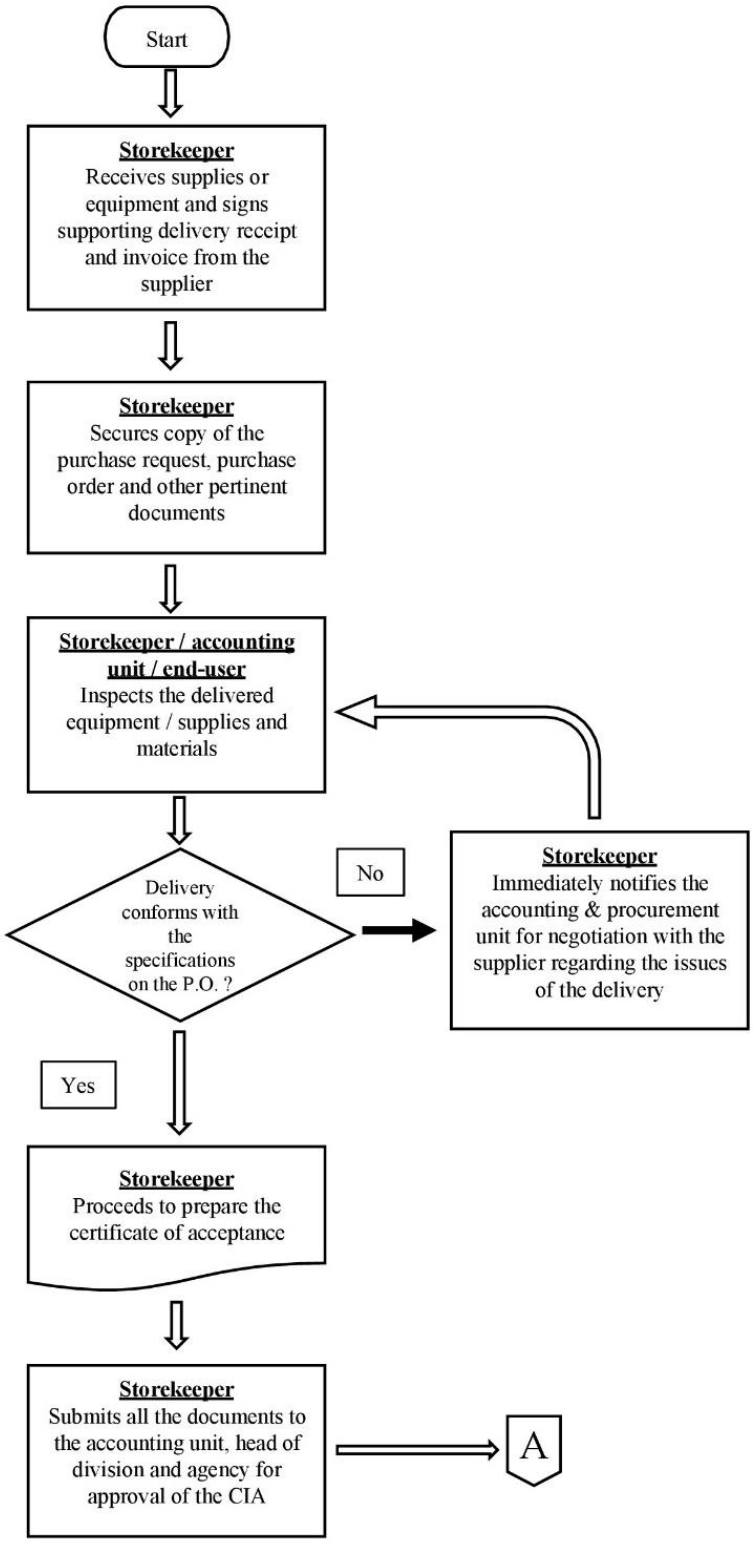


Illustration No. 12.2. ***PROCEDURES IN RECEIVING OF DELIVERIES (MATERIALS, SUPPLIES AND EQUIPMENT)***

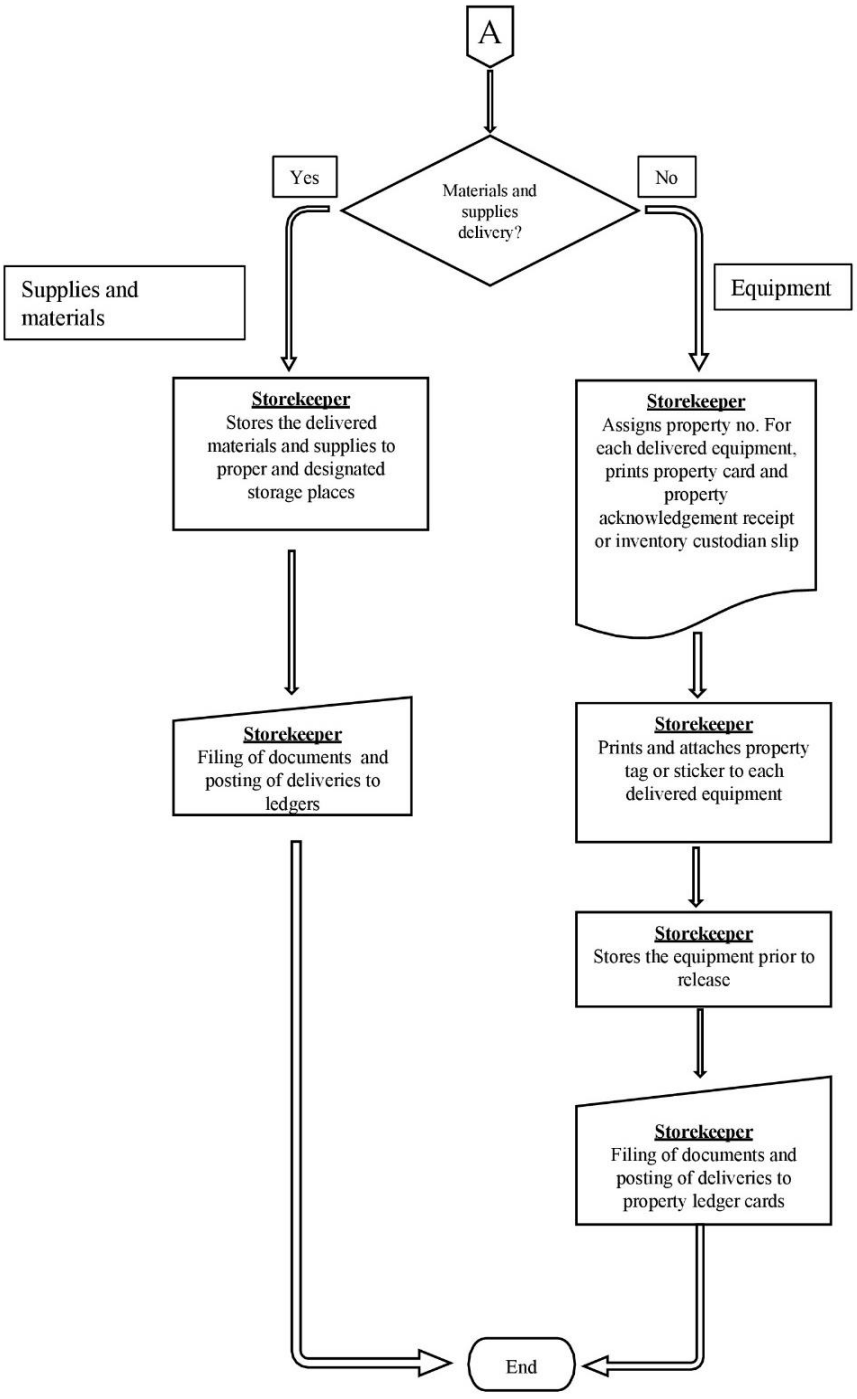


Illustration No. 13. ***PROCEDURES FOR THE RELEASE OF MATERIALS FOR NEW CONNECTIONS, REPAIRS AND MAINTENANCE***

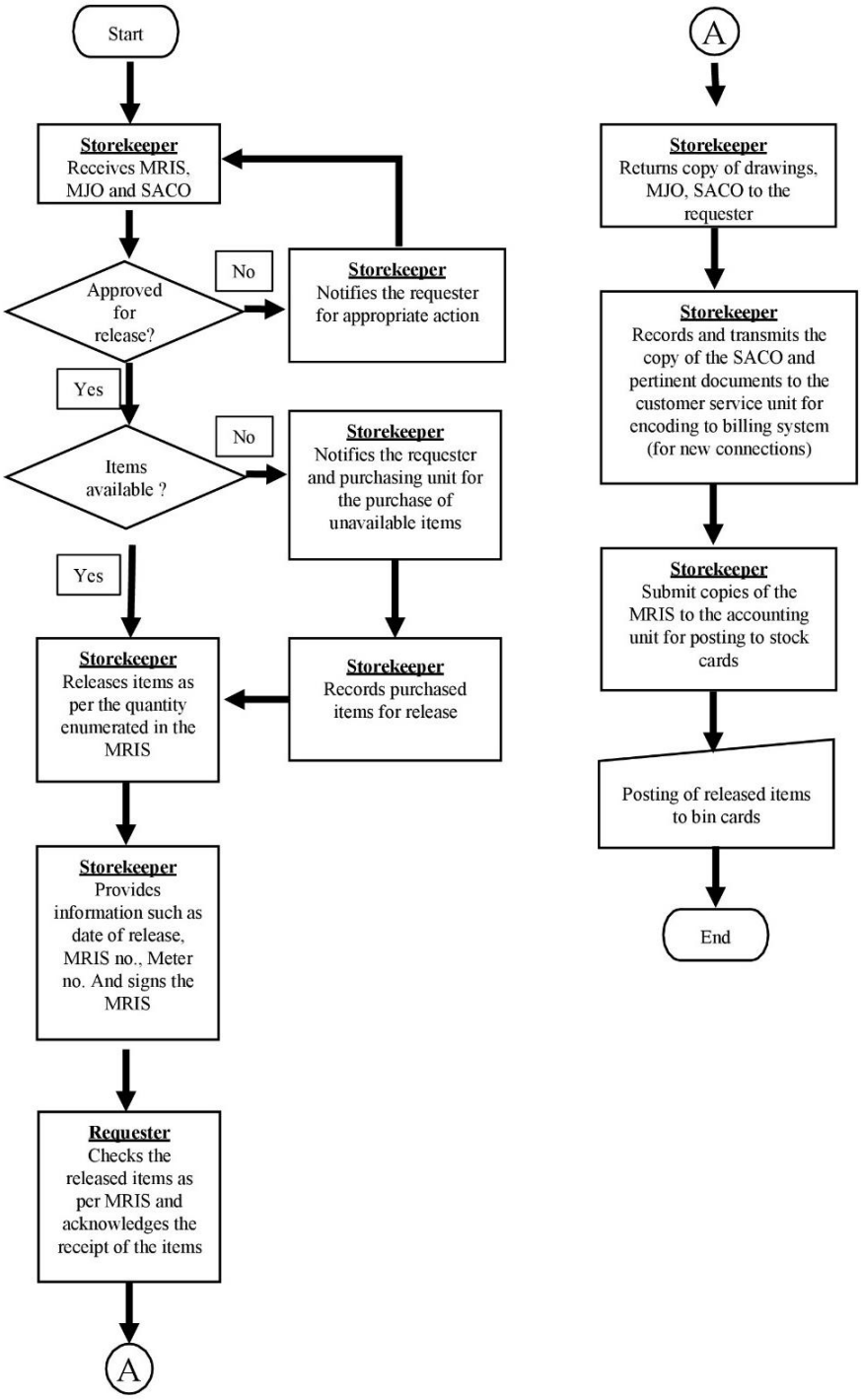


Illustration No. 14. ***PROCEDURES FOR THE RELEASE OF EQUIPMENT***

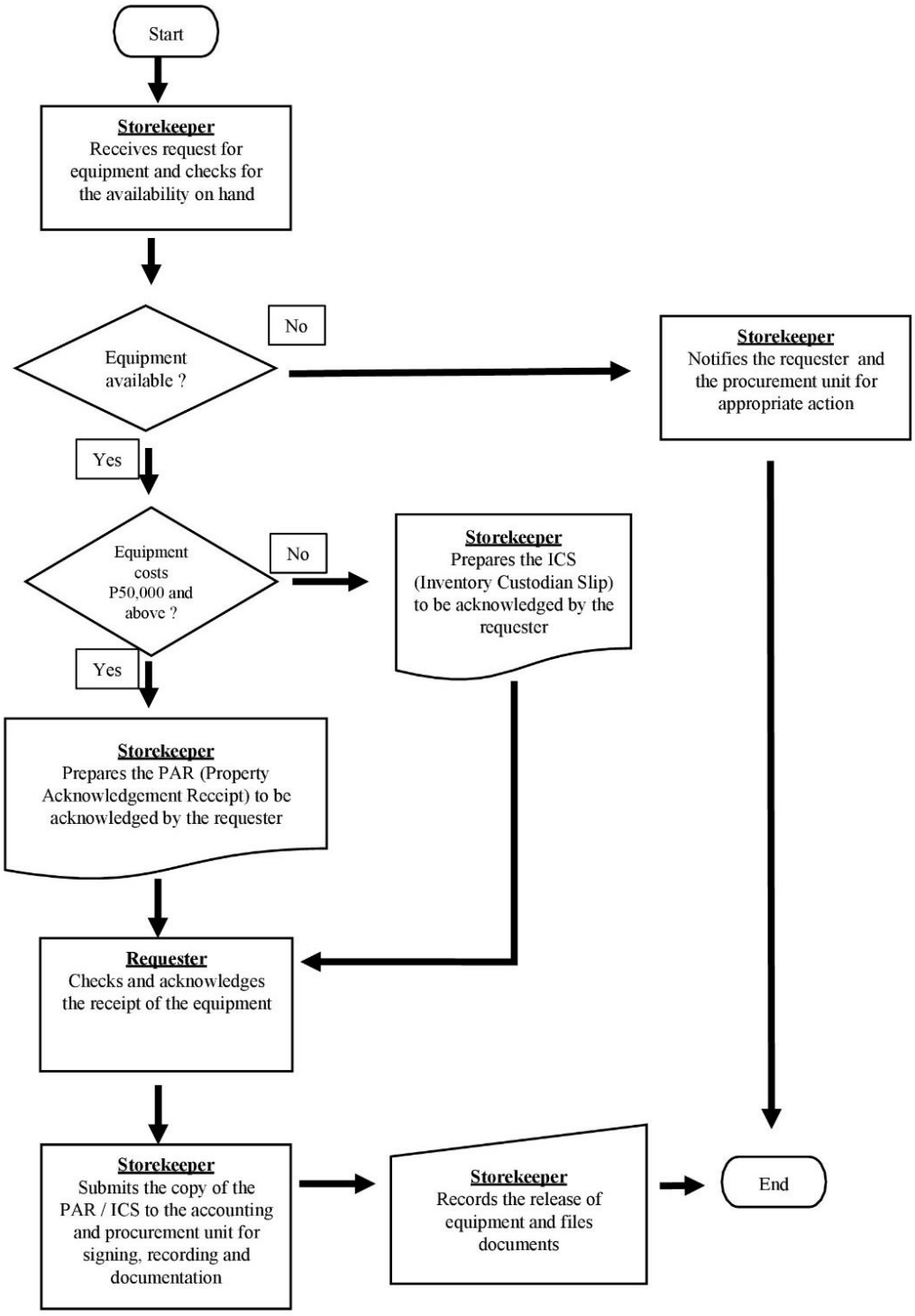


Illustration No. 15. ***PROCEDURES FOR THE RELEASE OF WATER METERS FOR RECONNECTIONS***

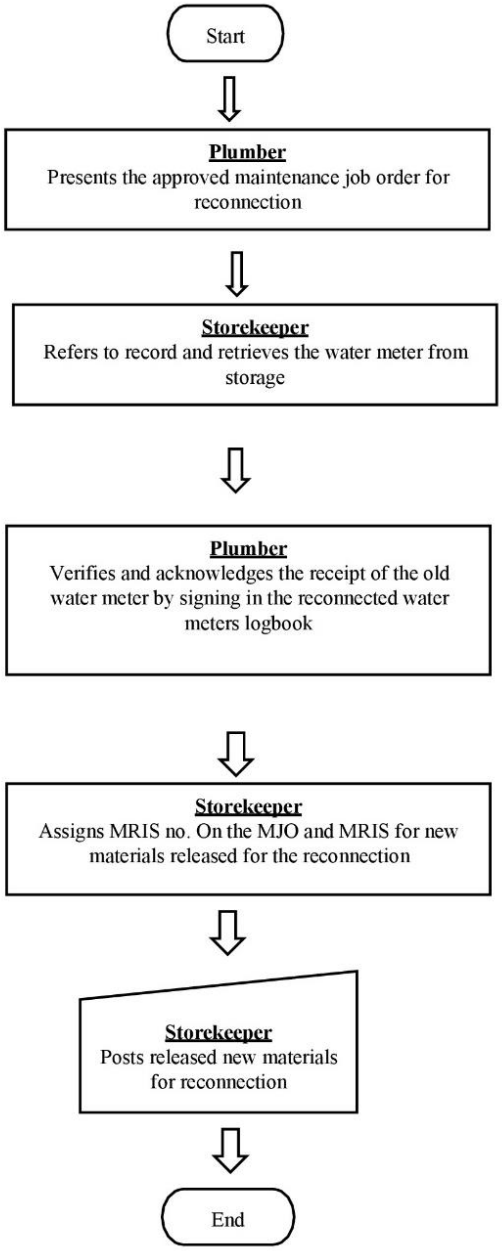


Illustration No. 16. ***PROCEDURES FOR THE STORAGE OF DISCONNECTED WATER METERS***

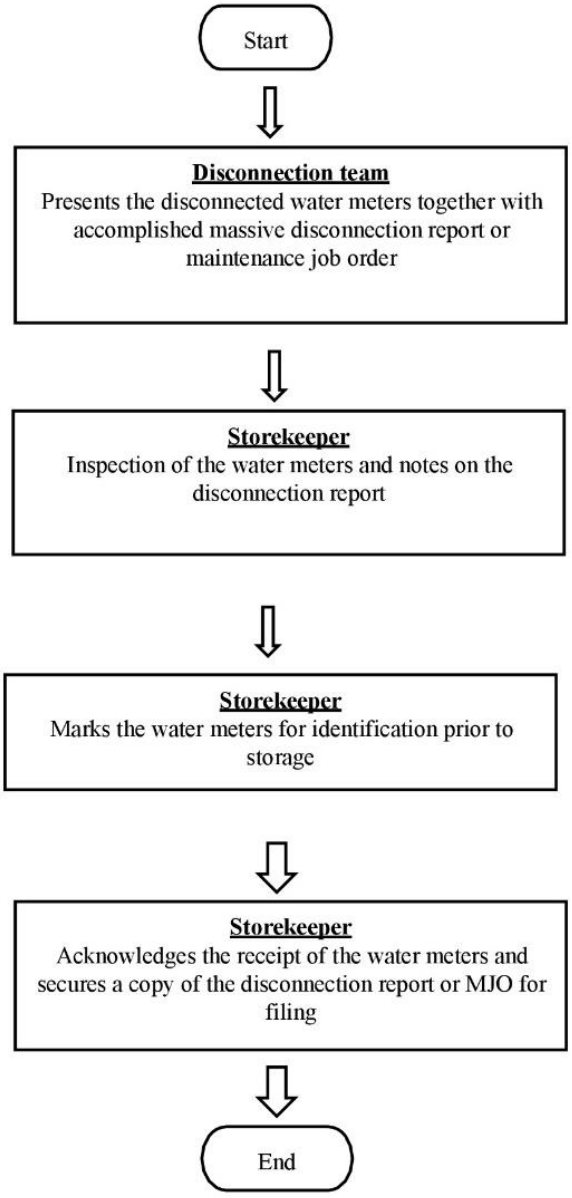


Illustration No. 17. ***PROCEDURES FOR INVENTORY TAKING***

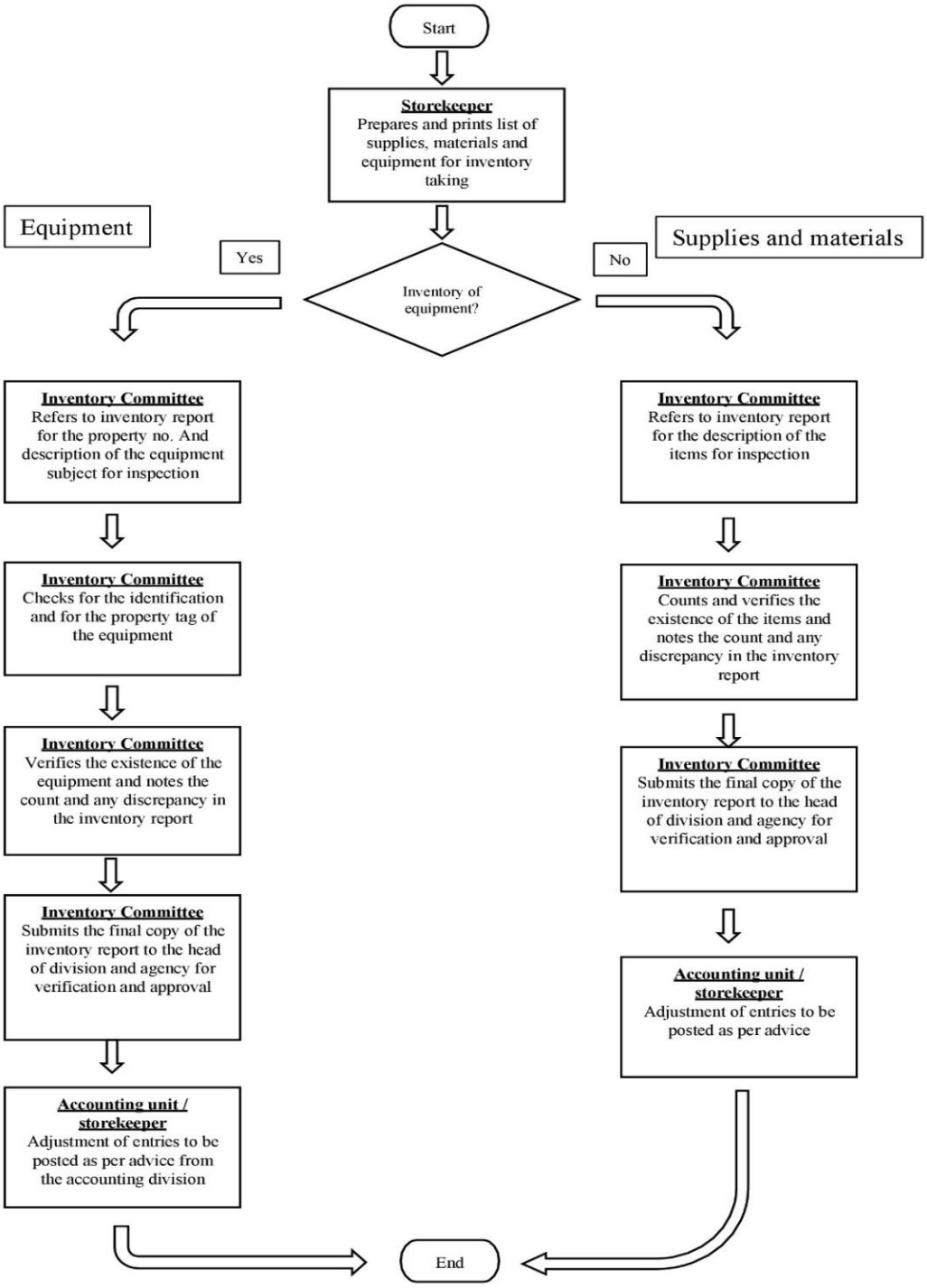


Illustration No. 18. ***PROCEDURES FOR THE DISPOSAL OF UNSERVICEABLE EQUIPMENT AND WASTE MATERIALS***

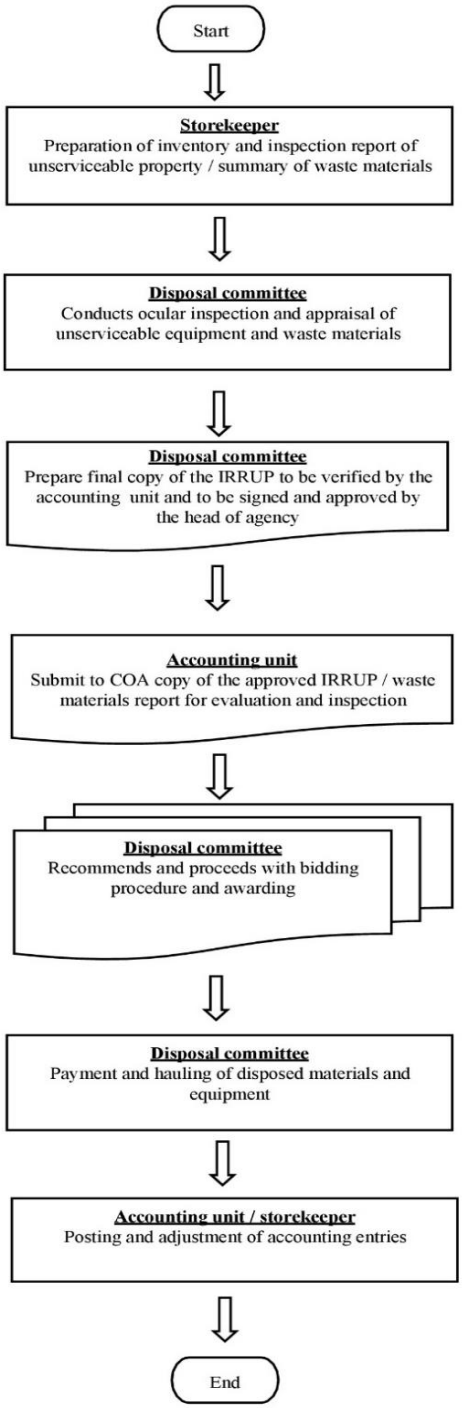


Illustration No. 19. ***PROCEDURES IN THE PROCESSING OF REQUISITION OF VEHICLES***

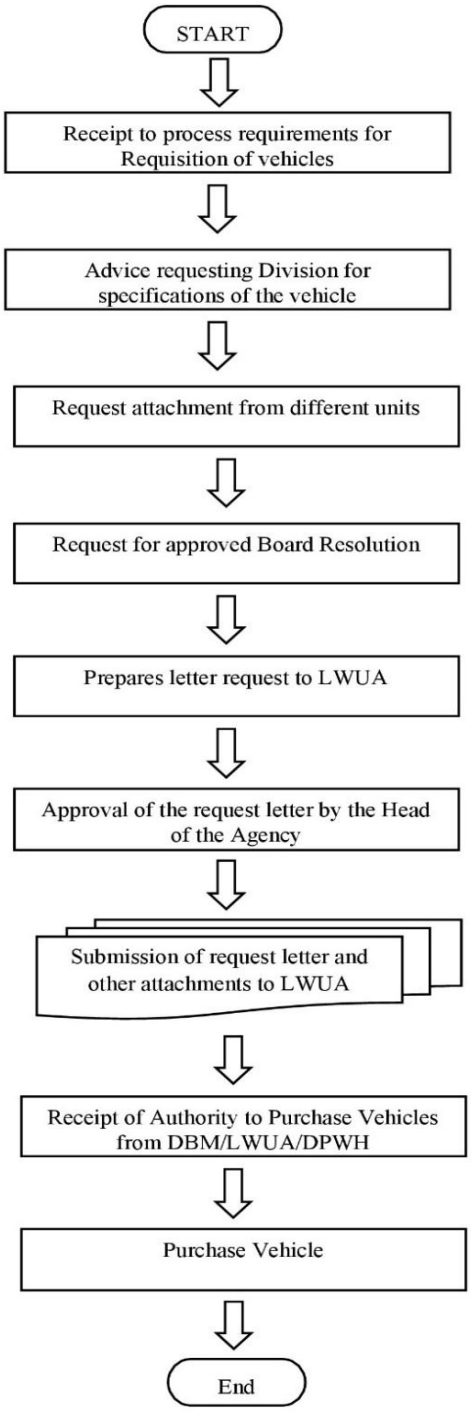


Illustration No. 20. ***PROCEDURES FOR THE REGISTRATION OF MOTOR VEHICLE***

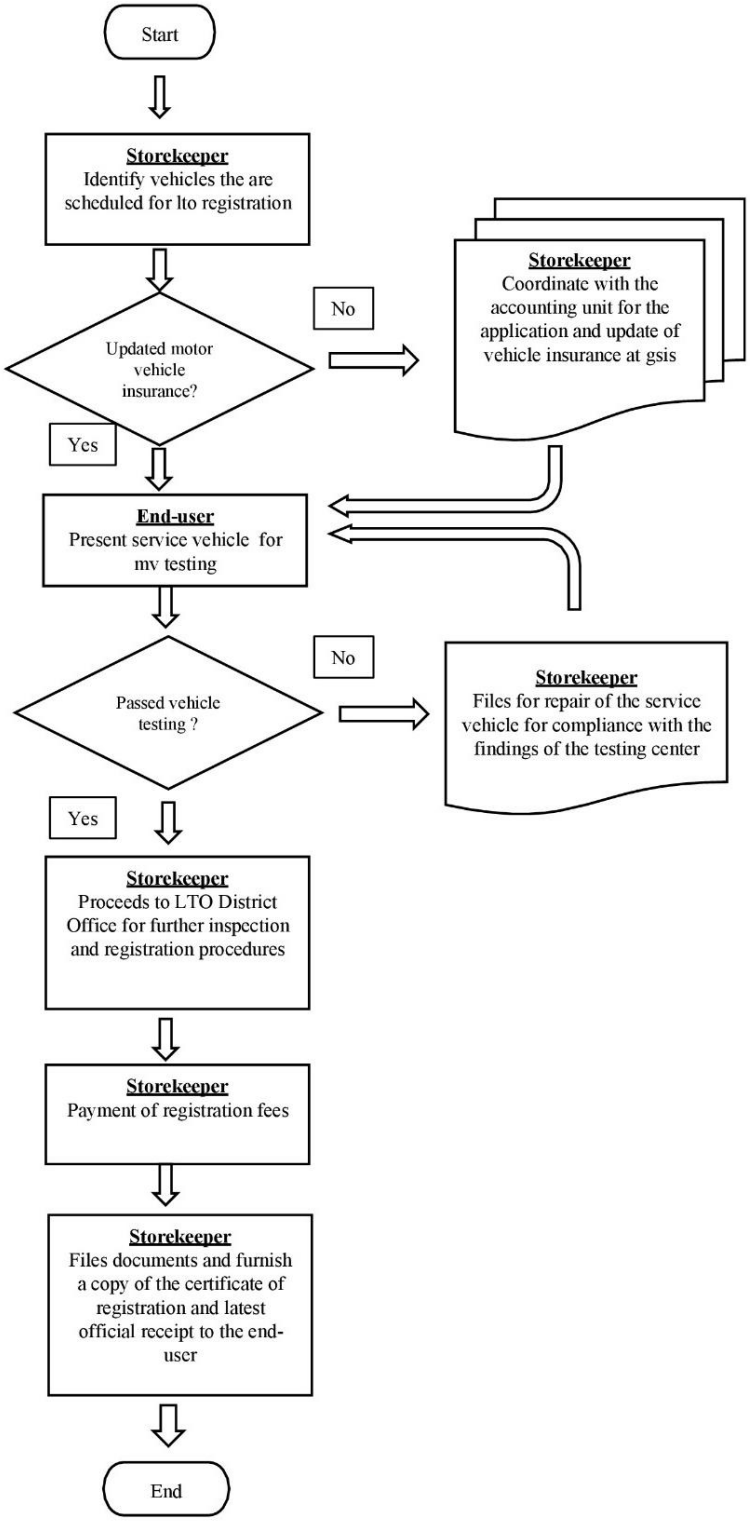


Illustration No. 21. ***PROCEDURES FOR THE REPAIR OF EQUIPMENT AND SERVICE VEHICLE***

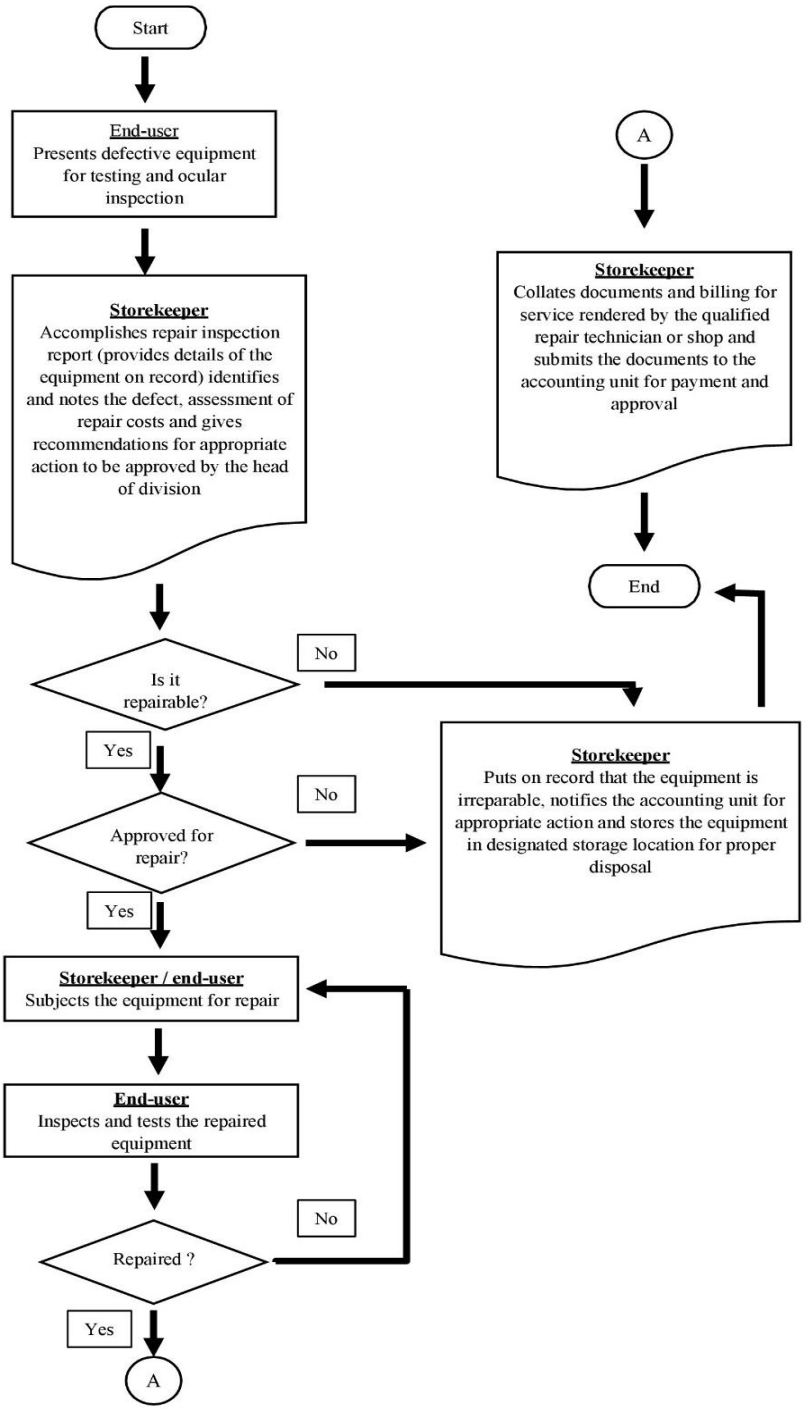


Illustration No. 22. ***PROCEDURES FOR PROCESSING OF DOCUMENTS IN CASE OF VEHICULAR ACCIDENT***

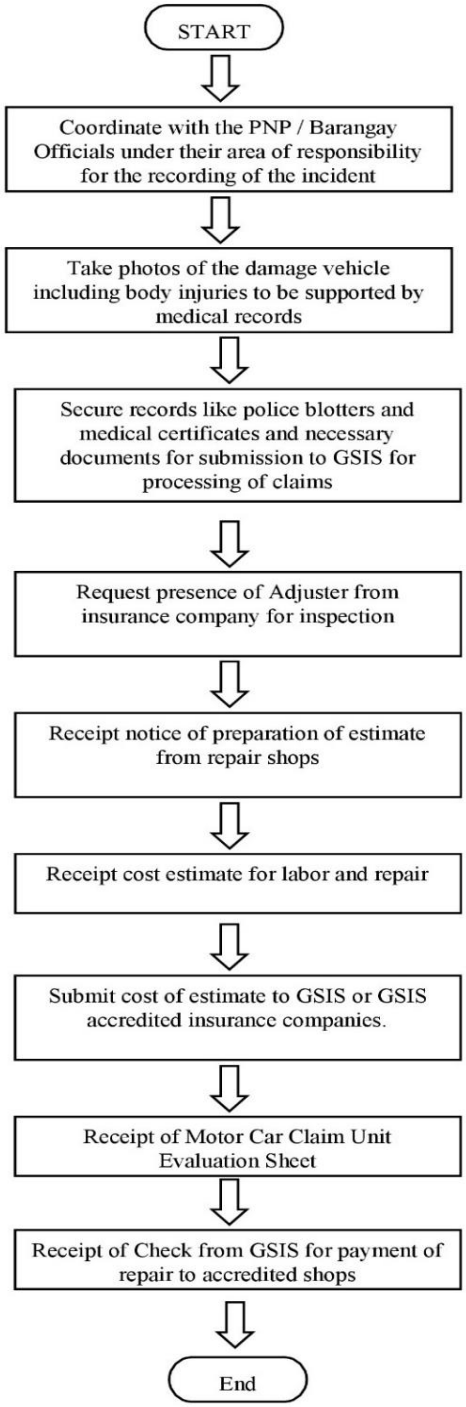


Illustration No. 23. ***PROCEDURES FOR PROCESSING OF PAYMENT OF REAL PROPERTY TAX***

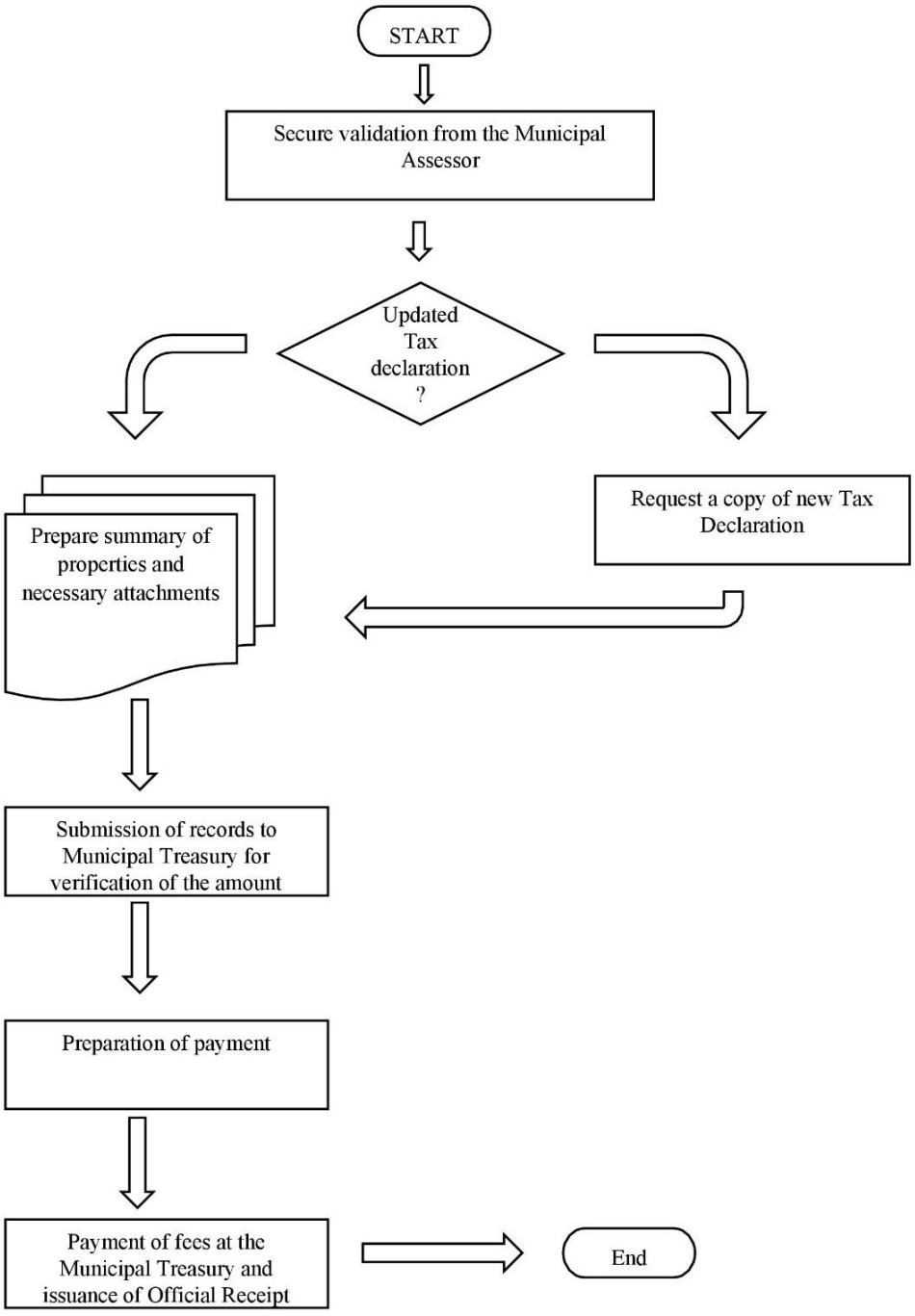
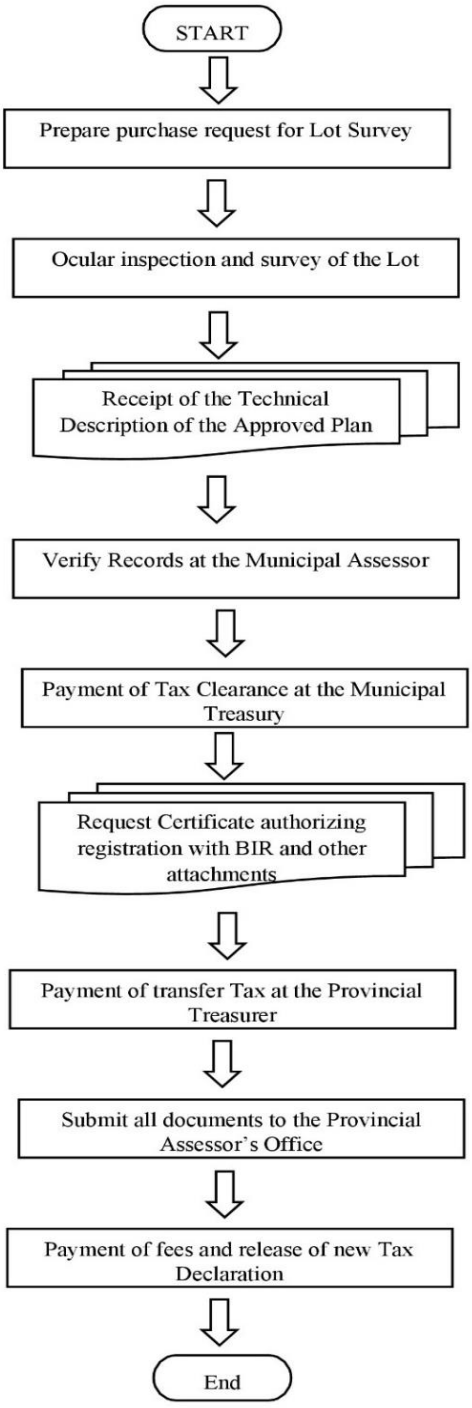


Illustration No. 24. ***PROCEDURES FOR TRANSFER OF TAX DECLARATION FOR TITLED PROPER***



III.B FINANCIAL AND COMMERCIAL DIVISION

B.1 FINANCE OPERATIONS

Finance operations involve the comprehensive range of activities and processes within the district that are associated with managing its financial resources, transactions, and strategies. These operations contain various tasks such as budgeting, financial planning, accounting, financial reporting, risk management, cash flow management, investment decisions, and ensuring compliance with financial rules, regulations and standards.

B.1.1 Performance Parameters

Through a series of memorandum circulars, the Department of Budget and Management (DBM) and the Local Water Utilities Administration (LWUA) have collaboratively instituted a comprehensive framework. This framework outlines a standardized set of Major Final Outputs (MFOs) and Performance Indicators (PIs) that are to be seamlessly integrated into the operational fabric of Local Water Districts (LWDs), as part of its mandated obligations. These are the following:

B.1.1.a MFO 1 - Water Facility Service Management

PI 1 (Quantity) – Access to Potable Water	Percentage of barangay with access to potable water against the total number of barangays within the coverage of the LWD.
PI 2 (Quality) – Reliability of Service	Percentage of household connections receiving 24/7 supply of water.
PI 3 (Timeliness) – Adequacy	Source capacity of LWD to meet demands for 24/7 supply of water.

B.1.1.b MFO 2 - Water Distribution Service Management

PI 1 (Quantity) – Non-Revenue Water	Percentage of unbilled water to water production.
PI 2 (Quality) – Potability	Average deviation from the Philippine National Standards for Drinking Water (PNSDW) - chlorine residual requirements from January 1 to December 31.
PI 3 (Timeliness) – Adequacy/Reliability of Service	Average response time to restore service when there are interruptions based on the Citizen's Charter of LWD proposed for approval by the Civil Service Commission (CSC).

B.1.1.c MFO 3 - Support to Operation

PI 1 – Staff Productivity Index	The Staff Productivity Index of one (1) position for every one hundred (100) service connections for Category D, and one hundred twenty (120) service connections for Categories A to C, shall be strictly observed in the determination of the total number of positions in an LWD.
PI 2 – Affordability	Reasonableness/Affordability of water rates to consumers with access connections. Water rate for the 1st cubic meter must not exceed 5% of the average income of Low-Income Group (LIG).
PI 3 – Customer Satisfaction	Percentage of Customer Complaints acted upon against received complaints.

B.1.1.d MFO 4 – General Administration and Support Services

PI 1	Financial viability & sustainability of LWD operations. a. Collection Ratio b. Operating Ratio c. Current Ratio
PI 2	Compliance with Commission on Audit (COA) reporting requirements in accordance with content and period of submission. a. Statement of Financial Position b. Statement of Financial Performance c. Statement of Cash Flows d. Statement of Changes in Equity e. Notes to Financial Statements f. Quarterly Reports
PI 3	Compliance with LWUA reporting requirements in accordance to content and period of submission. a. Monthly Data Sheet b. Statement of Financial Position c. Statement of Financial Performance d. Statement of Cash Flows e. Microbiological, Physical, Chemical, Chlorine Residual Report f. Approved Corporate Operating Budget (COB) with Annual Procurement Plan (APP) g. Annual Reports

B.1.2 Business Planning

Business planning for MANWAD refers to the strategic process of formulating a comprehensive 10-year projection plan for the efficient and sustainable management of water-related services and operations.

This planning involves assessing the district's current state, identifying its goals and objectives, and devising strategies and action plans to achieve those goals.

It typically encompasses various aspects including:

- Financial Management
- Infrastructure Development
- Resource Allocation
- Customer Service Satisfaction
- Regulatory Compliance and
- Long-term Sustainability.

The aim of the plan is to create a well-defined and adaptable framework that guides the water district's activities, ensuring the provision of high-quality and reliable water services to its consumers while considering factors such as environmental impact, financial viability, and operational efficiency.

The basic procedures of Business Planning are:
(See Process Flow Diagram #1 on page 117)

B.1.2.a Recognize the Major Final Outputs (MFOs) and Performance Indicators (PIs) established by regulatory bodies, specifically DBM and LWUA, and implement them within the district's operational framework;

B.1.2.b The General Manager, in collaboration with key division personnel, defines the Key Result Areas (KRAs) corresponding to each MFO and PI;

B.1.2.c Evaluate the performance of the preceding year before establishing objectives to fulfill each KRA.;

B.1.2.d Identify and analyze internal and external environmental factors to determine organizational resources and conduct a SWOT analysis to assess the district's strengths, weaknesses, opportunities, and threats;

B.1.2.e After assessing the district's internal and external capabilities, a framework of strategies, programs, and initiatives is crafted to effectively tackle the established objectives aimed at fulfilling the Key Result Areas (KRAs) associated with each Major Final Output (MFO) and Performance Indicator (PI);

B.1.2.f Consolidate programs and initiatives, including targets, vital responsibilities, timelines, and budgets, to formulate the Annual Procurement Plan (APP);

B.1.2.g Present the APP to the Board of Directors (BOD), led by the General Manager;

B.1.2.h Review and, if necessary, amend the APP within the BOD, granting approval for the plan.

B.1.3 Preparation of Corporate Operating Budget (COB)

Manaoag Water District's Corporate Operating Budget is a formal and structured financial plan that outlines the estimated revenues and expenditures for a specific period, typically a calendar year.

It serves as a detailed projection that helps the district manage its financial resources to support the implementation of its various programs and projects and make informed decisions about how to allocate and utilize funds.

The initial budget formulation takes place within each division at the beginning of the fourth quarter of the year. The consolidated budget called the APP is then prepared and reviewed by managers of each division together with the General Manager. The APP shall be presented to the BOD for approval and subsequently submitted to regulatory bodies such as COA and LWUA, signifying its alignment with established financial rules and regulations.

The fundamental elements of COB are:

- Annual Procurement Plan - Non-Common Use Supplies and Equipment (APP-non CSE)
- Project Procurement Management Plan (PPMP)
- Annual Procurement Plan; and
- Financial Statements, including the Statements of Financial Performance and Statement of Cash Flows.

The basic procedures of Budget Preparation are:
(See Process Flow Diagram #2 on page 118)

B.1.3.a At the beginning of the 4th quarter, budget proposal called the PPMP for the following year is prepared by each division.

B1.3.b The Budget Officer prepares the Estimated Operating Expenses relative to the Annual Procurement Plan submitted by the different divisions.

B.1.3.c Estimated water revenues and other service income are projected based on the targeted number of service connections for the budgeted year.

B.1.3.d The Budget Officer consolidates the estimates into a projected Income and Expense Budget.

B.1.3.e The Capital Expenditures Budget is also formulated, requiring substantiation through a roster of justifications such as price hikes, inflation impacts, production enhancements, and associated documentation.

B.1.3.f Budget deliberation is carried out to address matters and considerations concerning the budget proposal aiming to formulate the Annual Procurement Plan for the budgeted year.

B.1.3.g The General Manager formally presents the Annual Procurement Plan to the Board of Directors, providing a comprehensive overview of the plan's details and strategic significance.

B.1.3.h The Board of Directors examines and reviews the intricacies of the Annual Procurement Plan. Should the need arise, they enact revisions to ensure its accuracy and alignment with the district's goals. Following this evaluation process, the Board provides their official endorsement, granting their approval to the finalized plan.

B.1.4 Disbursements

Disbursement of funds refers to the controlled and regulated release or allocation of financial resources by the district for various programs, projects, services, and operational needs.

This process is guided by budgetary allocations, legal regulations, and financial accountability measures. The disbursement of funds involves ensuring that public money is spent efficiently, transparently, and in alignment with the priorities and objectives set by the district. It encompasses a range of activities, from paying salaries to employees and funding infrastructure projects to delivering essential public services to the consumers.

As stipulated by the framework of the New Government Accounting System (NGAS) for Government-Owned and/or Controlled Corporations (GOCCs), government expenditures undergo a classification process that segregates them into the subsequent categories:

- Personnel Services
- Maintenance and Other Operating Expenses
  (e.g., Electricity and Fuel Expenses)
- Financial Expenses
- Capital Outlays

The district's financial operations, transactions, and disbursements are guided by the core principles outlined in Section 4 of PD 1445, recognized as the "Government Auditing Code of the Philippines":

- No money shall be paid out of any district treasury or depository except in pursuance of an appropriation, law or other specific statutory authority;
- District funds or property shall be spent or used solely for public purpose;

- Trust funds shall be available and may be spent only for the specific purpose for which the trust was created or the funds received;

- Fiscal responsibility shall, to the greatest extent, be shared by all those exercising authority over the financial affairs, transactions, and operations of the district;

- Disbursement or disposition of district funds or property shall invariably bear the approval of the proper officials;

- Claims against district funds shall be supported with complete documentation;

- All laws and regulations applicable to financial transactions shall be faithfully adhered to; and

- Generally accepted principles and practices of accounting as well as of sound management and district administration shall be observed, provided that they do not contravene existing laws and regulations.

Furthermore, NGAS for GOCCs, outlines the basic requirements for disbursements as follows:

- Existence of a lawful and sufficient allotment certified as available by the Budget Officer;

- Existence of a valid obligation certified by the Chief Accountant/Head of Accounting Unit;

- Legality of transactions and conformity with laws, rules and regulations;

- Approval of the expense by the Chief of Office or by his duly authorized representative; and

- Submission of proper evidence to establish the claim.

The water district has established sound disbursement procedures that serves as mechanism for monitoring expenditures and upholding the highest standards of accountability. Various disbursement objectives exist, and the water district ensures that its procedures encompass the following purposes:

- Payroll;
- Operational expenses like chemicals, fuel, repairs;
- Capital Expenditures;
- Debt Service;
- New service connections;
- Maintenance expenditures; and
- Emergency procurement

The basic procedures of Disbursement of Funds are the following:
(See Process Flow Diagram #3 on page. 119)

B.1.4.a Supporting documents are forwarded to Accounting & Budget Section (ABS) for budget monitoring and preparation of Disbursement Voucher (DV). Documentary requirements for common government transactions are to be provided in accordance with COA Circular 2023-004 dated June 14, 2023;

B.1.4.b The ABS ensures the supporting documents are complete and confirms budget allocation before initiating the DV preparation;

B.1.4.c The ABS prepares DV, Journal Entry Voucher (JEV) and Budget Utilization Request (BUR) to record the transaction;

B.1.4.d The Division Manager of Finance and Commercial Division (FCD-DM) reviews the accuracy, verify the legality of the transaction and affix his signature in the DV, JEV, BUR. Subsequently, the DV, along with the accompanying attachments, is sent to the Cashier to facilitate the issuance of a check;

B.1.4.e The Cashier prepares the check and updates the Daily Cash Position Report (DCPR) to monitor the daily cash balances;

B.1.4.f Once the disbursement is ready for payment, the Cashier forwards the DV and supporting documents together with its corresponding check to the ABS;

B.1.4.g The FCD-DM forwards the DV to the General Manager for approval and returns the approved disbursement to the Cashier for releasing;

B.1.4.h The Cashier releases the check and have the DV acknowledged by the payee, affixing payee's name, signature and date of receipt of check;

B.1.4.i The Cashier then stamps "PAID" to the released disbursements, retrieves the duplicate copy of the DV and forwards the duly acknowledged disbursements to the ABS;

B.1.4.j The ABS files the duly acknowledged DVs with its supporting documents in chronological order in preparation for COA audit.

B.1.4.k The ABS updates the General Ledger (GL) and respective Subsidiary Ledger (SL) in preparation for Trial Balance and Financial Statements.

B.1.5 Receipts

Receipts specifically pertain to all forms of cash inflows and funds collected by the district from various sources related to its water supply and services such as waterworks system fees, connection fees, fines and penalties and other service-related fees.

The district has the authority to market water that falls under its jurisdiction, following established rate schedules and fees as determined by LWUA. These schedules may incorporate varying rates based on different usage categories and quantities. The district is tasked with reasonably setting these rates and fees to attain the following financial objectives:

- Recover costs for the installation of new services and meters by collecting reimbursement from newly acquired water customers;

- Generate income from all activities involving water deliveries and services conducted by the district;

- Cover the operational costs incurred by the district;

- Allocate funds for the ongoing repairs and maintenance of the district;

- Create a suitable surplus or savings to finance future replacements, expansions and enhancements of facilities;

- Manage the payment of interest and principal on district debts, establishing a sinking fund for timely debt payments, and establishing reserves for unforeseen contingencies.

The basic procedures of Collection of Payments are the following:
(See Process Flow Diagram #4 on page 120)

B.1.5.a Customers get a queuing number card from the service counter and wait for their turn to be called. A designated lane is provided for senior citizens, persons with disability and pregnant women wherein they can pay directly to the teller with separate queuing;

B.1.5.b The teller accepts payment from the customers;

B.1.5.c The teller issues official receipts upon receipt of payment and inputs the collection to the Billing and Collection System to update the customers' records. The teller shall then undertake to verify the following:

- If the customer has an outstanding bill to the district, any payments received are to be applied initially to the most overdue billings and the remaining balances will be credited to the current billings provided that said balances shall cover the whole amount equivalent to one (1) month of billing;

- If the customer qualifies as a senior citizen, senior citizen discount is computed automatically from the Billing and Collection System;

- In situations where payment adjustment is necessary due to customers' account with on-going investigation and other similar transactions, verify the computation and seek approval for payment override from the billing or supervising officer.

B.1.5.d The cashier then prepares deposit slips for all the collections made during the day, update the Cash Book and prepares the Daily Cashier's Collection Summary (DCCS).

B.1.5.e Collections made during the day are deposited in the morning of the next banking day.

B.1.5.f The Cashier reviews the accuracy and completeness of the collection reports and updates the Daily Cash Position Report (DCPR) to monitor the daily cash balances.

B.1.5.g Once reviewed by the FCD-DM, the ABS receives the forwarded DCCS and DCPR.

B.1.5.h The ABS prepares and verifies the JEV for the DCCS, which is then approved by the FCD-DM, and files it in chronological order in preparation for COA audit.

B.1.6 Financial Reporting System

The Financial Reporting System of the district refers to a structured and organized framework, comprising processes, procedures and technological tools, that facilitates the collection, processing, analysis and presentation of financial information in a standardized manner. This system enables the district to record, compile and communicate its financial activities, transactions and performance to stakeholders, regulatory bodies and the public.

It includes the arrangement and submission of trial balances, financial statements and other financial reports necessary for compliance with regulatory agencies. The components encompass (1) preparation and submission of trial balance and other reports and (2) preparation and submission of financial statements.

A **Trial Balance** is a listing of the ledger accounts and their debit and credit balance to determine that the debits equal the credits in the recording process. It is usually prepared before the preparation of the financial statements. The steps in the preparation of the trial balance are the following: *(Reference: NGAS for GOCCs)*

1. Complete the heading
2. List the accounts with balances
3. Show the total of the debit and credit columns
4. Sign the certification

Under the NGAS, and in view of the preparation of Financial Statement of Performance there is a need for a proper matching of revenues and expenses.

Under matching principle, adjustments should be made for economic activities that have taken place but are not yet recorded at the time when the financial statements are prepared.
The implementation of adjusting journal entries serves a fundamental purpose: to establish a precise alignment between the recognition of revenues and the allocation of expenses with the specific period in which they are legitimately earned or incurred.

This process of adjustment delves into the intricate terrain of financial accuracy, ensuring that the financial statements faithfully reflect the economic reality of the district operations. Adjustments are of two main types:

- Adjustment for Accrued Item – It is an adjusting entry for an economic activity already undertaken but not yet recorded as an asset and revenue accounts or a liability and expense accounts.

- Adjustment for Deferred Item – It is an adjusting entry transferring data previously recorded in an asset account to an expense account, or data previously recorded in a liability account to a revenue account.

Financial Statements are comprehensive, organized records that provide a momentary glimpse of the district's financial position and performance over a specific period. These statements present a well-structured and coherent summary of the financial activities, transactions and state of affairs of the district. These enable the users of the FS to gauge the district's financial well-being and facilitate prudent decision-making.

The elements of financial statements and other similar reports generally prepared in the district are:

- **Statement of Financial Position** - also known as the Balance Sheet, is a formal financial report that provides a comprehensive snapshot of the district's financial status at a specific period. It offers a detailed representation of the district's assets, liabilities and equity.

- **Statement of Financial Performance** - also known as the Income Statement or Profit and Loss Statement, is a formal financial report that presents a comprehensive overview of the district's financial performance over a specific period. It provides a detailed account of the entity's revenues, expenses and resulting net income or net loss, highlighting the financial outcomes generated by its operational activities.

- **Statement of Cash Flows** - is a formal financial report that provides a comprehensive summary of the district's cash inflows and outflows during a specific period. It offers insights into the district's ability to generate and manage cash, showcasing the sources and uses of cash across three main categories of activities: operating, investing and financing.

- **Statement of Changes in Equity** - is a formal financial report that outlines the variations in the district's equity over a specific period. It elucidates the factors contributing to changes in equity, such as transactions with the district (e.g., contributed capital, retained earnings, prior period adjustments and other comprehensive income)

- **Notes to Financial Statement** - often referred to as footnotes, are integral components of financial reporting that provide essential contextual information, clarifications and supplementary details to enhance the understanding of the figures and disclosures presented in the first four (4) or the primary financial statements. These notes offer insights into the methodologies used, accounting policies applied and additional information that might not be fully covered in the primary statements.

- **Monthly Data Sheet** - Illustrates the district's functionality and accomplishments through performance indicators encompassing service connection data, prevailing water rates, billing and collection information, financial statistics, production records, administrative information and the state of institutional progress.

The management of the district is responsible for ensuring fair presentation and reliability of financial statements. This responsibility fulfilled by applying generally accepted accounting principles that are appropriate to the district's financial conditions, establishing a sound internal control system and adhering to the chart of accounts prescribed by COA.

The basic procedures of Financial Reporting System are the following:
(See Process Flow Diagram #5-8 on pages 121-124)

B.1.6.a The ABS receives and reviews the supporting documents which contain different financial transactions.

B.1.6.b The ABS prepares the JEV for all transactions and subsequently transfer the recording of transactions details from the accompanying supporting documents to the following journals:

Special Journals:

- Disbursements - Cash Disbursements Journal (CDJ)
- Receipts - Cash Receipt and Deposits Journal (CRDJ)

General Journal:

- Other Cash and Non-Cash Transactions Journal

B.1.6.c At the end of each month, following a thorough verification of the completeness and accuracy of all received and recorded documents, the ABS proceeds to post the amounts in the JEV to the general ledgers and subsidiary ledgers.

B.1.6.d Summarizes the ledger and retrieves balances for both the net monthly transactions and year-to-date figures. Additionally, examines exceptional balances for further review.

B.1.6.e The ABS head extracts the balances of the General Ledger (GL) accounts and prepares Trial Balance (TB) on a monthly basis.

B.1.6.f Transfers figures from the trial balance to the Statement of Financial Position and Statement of Financial Performance columns. Ensures accurate alignment of account balances with their respective columns in the statements.

B.1.6.g Prepares Statement of Cash Flows using the special and general journals, Statement of Changes in Equity and Notes to Financial Statements.

B.1.6.h The ABS receives other information from different divisions for the preparation of Monthly Data Sheet as follows:
Billing, Collection & Customer Services Section:

- *Service Connection Data;*
- *Existing Water Rates; and*
- *Billing and Collection Data.*

Administrative and General Services Division

- *Number of Employees; and*
- *Employee's Average Monthly Salaries.*

Production and Water Quality Division

- *Water Production Data*

Office of the General Manager and Board of Directors

- *Board Resolutions Passed; and*
- *Attendance of the Board of Directors.*

B.1.6.i The Financial Statements, along with the Notes to Financial Statements and Monthly Data Sheet, undergo a review process by the Finance and Commercial Division Manager, and subsequently, they are presented for approval to the General Manager.

B.1.6.j The reports are presented before the Board of Directors and subsequently submitted to Commission on Audit, Local Water Utilities Administration and other regulatory agencies.

B.2 COMMERCIAL OPERATIONS

Commercial Operations pertain to the array of systems and strategies involved in interacting with customers and managing their billing processes. These operational protocols extend across various facets of the water district's operational framework, encompassing:

B.2.1 New Service Connection Applications

The MANWAD provides the water directly to each customer through a metered service connection, and bills them on a monthly basis. The act of providing a service connection and water supply constitutes a contractual agreement between two parties. Consequently, all potential customers are required to formalize this arrangement by signing a Service Application and Construction Order (SACO) with the district, thereby securing their access to the water connection.

The SACO establishes binding contractual obligations between MANWAD and the customer, enabling either party to pursue legal remedies in the event of any breach of contract.

Water service connections are categorized into five (5) basic customer types, namely: Residential/Government, Commercial/Industrial, Commercial A, Commercial B and Commercial C. Using these classifications, the new service connection is assigned its type of classification prior to being installed.

In the duration of using the service connections some customers change the nature of using the service. Hence, re-classification of the service connections is deemed necessary.

The basic procedures of New Service Connection Applications are
(See Process Flow #9-A on page 125-127)

B.2.1.a Applicant gets a queuing number card from the service counter and waits for his/her turn to be called;

B.2.1.b Customer Service Assistant calls the number next in line and handles the request for new service connection from the applicant;

B.2.1.c Records the applicant's name, contact and address, cross-referencing against existing records to determine if there are any outstanding accounts associated with the district. Based on the applicant's address, assigned Water Sewerage/Maintenance Man (plumber) conducts a field survey for the availability of water source, if necessary;

B.2.1.d Applicant fills out the SACO in two (2) copies. Generally, if the applicant is not the owner of the lot or building, written consent from the property owner is required, granting authorization for the district to install the service connection on the premises. Additionally, the property owner commits to settling any unpaid water bills if the applicant fails to fulfill payment obligations;

B.2.1.e A new applicant for water service connection should submit the following basic requirements *(for residential type)*:

- 1 - Copy of recent 1"x 1" or 2"x 2" picture
- 1 - Photocopy of valid ID/s (front and back)
- 1 - Photocopy (all pages) of proof of ownership of House & Lot (tax declaration or land title or notarized deed of absolute sale)

  In the absence of Proof of Ownership of House and Lot (Special Case):

  - Barangay Certificate of Residency
    (*Indicate number of years)*

  - Affidavit of Undertaking:
    ** Specify owner/s of the House & Lot*

** If problems/complaints arise from the said House & Lot, applicant has no objection if water connection needs to be disconnected*

If by Representative:

- Authorization Letter
- 1 - Photocopy of valid ID/s (Front and back) of the representative

B.2.1.f Billing, Collection & Customer Services Section (BCCSS) endorses the SACO to Engineering and Construction Division (ECD), assigned plumber will conduct a field survey and fill out the survey form for:

- Inspection and estimation of materials needed for the water service installation using the Materials and Requisition Issue Slip (MRIS) form;
- the availability of applicant's indoor plumbing installation that will be necessary for tapping of connection to the district's water system

B.2.1.g Advises the applicant to settle the cost of materials to the MANWAD office;

B.2.1.h The assigned plumber then returns the SACO along with the survey form, reviewed and signed by the Division Manager of ECD, to the BCCSS after indicating findings thereon;

B.2.1.i Customer Service Assistant indicates cost of billed materials in the MRIS form;

B.2.1.j Advises the applicant to: submit all the requirements needed for New Service Connection application; pay registration fee, guaranty deposit, cost of materials and other fees needed for installation of water service connection; wait for seven (7) to ten (10) working days after payment for installation;

GUARANTY DEPOSIT *Registration fee for all types of classification: Php 300.00*		
TYPE *Under Sections 3 & 4 of MANWAD's Utility Rules and Regulations*	**SIZE/ CONSUMPTION**	**AMOUNT** *Under Sections 7 & 14 of MANWAD's Utility Rules and Regulations*
Residential/Government	½ "	Php 660.00
	1"	Php 2,112.00
	2"	Php 13,200.00
Special Residential	½"	Php 1,452.00
Commercial/Industrial	½"	Php 1,320.00
	1"	Php 4,224.00
Commercial A	½"	Php 1,155.00
	1"	Php 3,696.00
Commercial B	½"	Php 990.00
	1"	Php 3,168.00
Commercial C	½"	Php 825.00
	1"	Php 2,640.00
Bulk/Wholesale	½"	Php 1,980.00
	1"	Php 6,336.00
Bungalow-type residential house	100 cu.m	Php 1,000.00
Two-storey residential building	200 cu.m	Php 2,000.00
Commercial building up to four (4) storeys	~	Php 10,000.00
Commercial building of more than four (4) storeys	~	Php 20,000.00

Note: Subsequent updating of guaranty deposits is necessary based on the customers' actual consumptions.

B.2.1.k Billing officer registers customer's account number, posts the same in the SACO; and facilitate orientation for new service connection;

B.2.1.l Forwards the SACO and MRIS with accompanying attachments to the FCD-DM and ADMIN-DM for approval of the same

respectively, reviews and approves SACO and MRIS; returns both documents to the BCCSS;

B.2.1.m BCCSS endorses the SACO to the ECD; ECD assigns plumber for the new connection installation; The assigned plumber gives the copy of SACO and MRIS to the Storekeeper for the release of the materials;

B.2.1.n Assigned plumber goes to the customer's address and install the water service connection;

B.2.1.o The customer will be present during the installation and signify acknowledgement on inspection report;

B.2.1.p After installation of water service connection, inspection of the said installation shall be conducted; ECD forwards the inspection report, duly signed and inspected, to the BCCSS;

B.2.1.q BCCSS receives the SACO, MRIS and inspection report from the Storekeeper and ECD, respectively; encodes the newly installed water service connection to the Billing and Collection System to be included in the Master List of Service connections;

B.2.1.r BCCSS will prepare the SACO to be notarized by the district's legal counsel and sends the copy of the notarized SACO to the customer.

The basic procedures of Re-classification of Service Connection are:
(See Process Flow Diagram #9-B on page 128)

B.2.1.s Meter readers create a compilation of identified accounts that meet the conditions for potential re-classification;

B.2.1.t Forwards the list of identified accounts to the Section Head of BCCSS.

B.2.1.u The Section head receives and reviews the list of accounts for re-classification and instructs Customer Service Assistant to prepare Service Request (SR) and Maintenance Job Order (MJO);

B.2.1.v Forwards the SR and MJO to the Investigation Team for inspection;

B.2.1.w Visits and inspects the service connections of the accounts listed;

B.2.1.x Communicates the result of the investigation to the Section head of BCCSS;

B.2.1.y Section head verifies the classification of the service connection in accordance with Sections 3 & 4 of the Manwad's Utility Rules and Regulations; and

B.2.1.z Sends a communication letter, duly signed by the FCD-DM, to the customer informing them that a re-classification is required for their service connection.

B.2.2 Application for Senior Citizen Discount

Republic Act No. 9994 also known as the "Expanded Senior Citizens Act of 2010," granting additional benefits and privileges to senior citizens, further amending Republic Act No. 7432 of 1992 as amended by Republic Act No. 9257 of 2003.The said Act defines senior citizen or elderly as any resident citizen of the Philippines at least 60 years old. Moreover, the law also provides grant of a minimum of **5% discount on water** and electric bills registered in the name of the senior citizen residing therein, and provided that the monthly consumption does not exceed 100 kilowatt hours of electricity and **30 cubic meters of water**.

The privilege is granted to a qualified senior citizen who meets the following mandatory criteria, namely:

- The senior must be a resident of the household;
- Water connection classification must be residential;
- The consumption should not exceed 30 cubic meters;
- The discount is granted per household, regardless of the number of senior citizens living therein;
- The account should be in the name of the senior citizen for a period of one (1) year
- There must be renewal of application of senior citizen discount every year;
- A senior citizen can only avail of one connection discount;

- For change of name, the discount will be availed one (1) year after filing of the application;
- A valid senior citizen ID must be presented upon payment of water bills

Further, the requirements for availment are as follows:

- For new application:

  If applied by the Senior Citizen (SC):

  - 1 pc. - Photocopy (front and back) of valid Senior Citizen ID Card. (Present the original ID at the office)
  - 2 pcs. - Recent picture (2"x2")
  - Barangay Certification of Residency (Proof of residency)

  If applied through Senior Citizen's Representative:

  - 1 pc. - Photocopy (front and back) of valid Senior Citizen ID Card. (Present the original ID at the office)
  - 2 pcs. - Recent picture of SC applicant (2"x2")
  - Barangay Certification of Residency. (Proof of residency of the SC applicant)
  - Authorization Letter by the SC applicant. (Authorizing a Representative)
  - 1 pc. - Photocopy (front and back) of valid ID of the Representative
  - 1 pc. - 5R size of the SC applicant holding the latest newspaper

- For renewal of application:

  If applied by the Senior Citizen:

  - Personal Appearance of the Senior Citizen

  If applied through Senior Citizen's Representative:

  - 1 pc. - Photocopy (front and back) of valid Senior Citizen ID Card. (Present the original ID at the office)
  - Authorization Letter by the SC applicant. (Authorizing a Representative)
  - 1 pc. - Photocopy (front and back) of valid ID of the Representative
  - 1 pc. - 5R size of the SC applicant holding the latest newspaper

The basic procedures of Application for Senior Citizen Discount are:
(See Process Flow Diagram #10 on page 129)

B.2.2.a Applicant gets a priority queuing number card from the service counter and waits for his/her turn to be called;

B.2.2.b Customer Service Assistant calls the priority number next in line and handles the request for application for senior citizen discount from the applicant;

B.2.2.c Records the applicant's name, contact and address, cross-referencing against existing records to determine if there are any outstanding accounts associated with the district; provides the Application Form for senior citizen discount availment.

B.2.2.d Applicant fills out the Application Form; submits duly signed application along with the requirements as stated above;

B.2.2.e CSA verifies the application form and confirms that all required documents are included; forwards the same to the FCD-DM for review and approval.

B.2.3 Meter Reading and Posting of Billing Information

Water Meter Reading refers to the process of recording the consumption from water meters installed at customers' locations. These meters measure the amount of water consumed by a customer over a specific period. The readings are typically taken manually by a meter reader through read and bill system. The billing information is then posted to the customers' account ledger.

The basic procedures of Meter Reading and Posting of Billing Information are:
(See Process Flow Diagram #11 on page 130)

- **Meter Reading**

B.2.3.a Meter Reader (MR) downloads billing data per zone based on the billing date from the billing and collection system to the meter reading device;

B.2.3.b MR goes to the billing zone and reads water meter, encodes the reading to the meter reading device; prints the billing notice using the portable printer and serves the notice to the customer, if the customer is unavailable, the notice is placed in a mailbox;

B.2.3.c Customer receives the billing notice and acknowledge the same;

B.2.3.d While out on the fieldwork, MR, at all times, observes the condition of the service connections and remains vigilant for any potential service issues; ensures that district policies are not violated;

B.2.3.e Receives complaints from customers on issues of the service connection and perform initial investigations. If the issues need additional corrections, logs the issues in the field findings logbook. The issues identified by the BCCSS are then address, and if necessary, the Billing officer will request for Maintenance Job Order (MJO) for further repairs and maintenance;

B.2.3.f Upon completion of reading, MR uploads the readings from the meter reading device to the system, the system will assign a distinct sequence number for each billing zone.

- **Posting of Billing Information**

B.2.3.g After uploading of readings by the MR, Billing Officer commits the water bill number sequence and post the billing information to the ledger of each customer;

B.2.3.h The billing officer generates Daily Billing Summary for each zone, providing an overview of the issued billing notices. This summary will contain a detailed breakdown of metered consumption, displaying the overall cubic meter consumption, water bill amounts, and the number of customers in each zone;

B.2.3.i Upon receiving customer complaints or identifying the need for billing adjustments, prepares Billing Adjustment Memo (BAM) in two (2) copies. Forwards to the FCD-DM for review and approval;

B.2.3.j Receives from the FCD-DM the approved copies of Billing Adjustment Memo and subsequently prepares Monthly Billing Adjustments Summary at the end of the month;

B.2.3.k Forwards to the FCD-DM and General Manager the Monthly Billing Adjustments Summary for review and approval. Sends the copy of the same with accompanying BAM to ABS for JEV preparation;

B.2.3.l Generates Monthly Billing Summary every first week of the ensuing month and forwards the same to ABS for recording purposes.

B.2.4 Handling Customer Requests and Complaints

It's important to promptly address every customer complaint as a standard practice. There are various channels through which the district can collect complaints from its customers. These complaints should be documented, categorized based on their type and when they were received, and then resolved or addressed accordingly.

The objective of attending to customer complaints is to maintain customer loyalty, elevate the district's image in the eyes of customers, and improve overall customer satisfaction. Additionally, this process allows the district to identify areas that need improvement and make necessary actions to prevent similar issues in the future.

The basic procedures in Handling Customer Complaints are:
(See Process Flow Diagram #12 on page 131)

B.2.4.a Customer Service Assistant (CSA) records all complaints received from customers via phone calls, messages, field through.

Meter Readers or from any employees or personal visit of the customer to the office; the logbook must contain details such as, the customer’s name, address, type of complaints, date when Service Request (SR) and Maintenance Job Order (MJO) was prepared, date of endorsement to Engineering and Construction Division, name of plumber assigned on the job and date when it was accomplished;

B.2.4.b Based on the logbook, the CSA generates the SR and MJO outlining the complaint's specifics as reported; advises customer to settle fees, if necessary; signs and endorses the SR and MJO to the ECD for further actions;

B.2.4.c Regular follow-ups, with the plumber, of SR for instances that remain unresolved for more than two (2) working days, as indicated in the logbook. Any undue delays are escalated to the Section Head of Engineering & Construction Division for attention;

B.2.4.d Receives from the plumber the accomplished copies of SRs and MJOs; assess the actions taken; notifies customers that their issues have been attended to, and if the customer remains unsatisfied, investigates cause of dissatisfaction and refers the issue to the ECD. Indicates in the logbook the date when the complaint was resolved or acted upon; logs the accomplishments to the system; the SRs and MJOs are filed accordingly.

B.2.5 Request for Change of Account Name/Transfer of Ownership

This process refers to the request for the alteration of the customer's account name or the transfer of ownership of the water meter. This typically occurs when the ownership changes hands or when there is a need to update the customer's account details where the existing account name is no longer practical to be used. The request involves providing relevant documentation to the district to ensure accurate billing and account information based on the correct ownership details.

Requirement needed for the request are as follows:

- Notarized waiver from the present owner
- Photocopy of the present owner's valid ID (front and back)
- 1 pc. - 1"x1" picture of the successor owner
- 1 copy of a valid ID (front and back) of the successor owner
- Death Certificate of the former owner, if deceased.

The basic procedures in Request for Change of Account Name/Transfer of Ownership are:
(See Process Flow Diagram #13 on page 132)

B.2.5.a Customer gets a queuing number card from the service counter and waits for his/her turn to be called;

B.2.5.b Customer Service Assistant calls the number next in line and handles the request for change of account name/transfer of ownership from the customer;

B.2.5.c Records the customer's name, contact and address, cross-referencing against existing records to determine if there are any outstanding accounts associated with the district; provides the Request Form for transfer of ownership.

B.2.5.d Customer fills out the Request Form; submits duly signed form along with the requirements as stated above;

B.2.5.e Applicant fills out the Application Form; submits duly signed application along with the requirements as stated above; pays notarial fees and guaranty deposits, if necessary;

B.2.5.f Teller accepts payment and issues Official Receipt to the customer.

B.2.5.g CSA verifies the request form and determine that all required documents are complete; forwards the same to the FCD-DM for review and approval.

B.2.6 Filing of Promissory Note

A promissory note is a legal financial instrument that outlines a written promise made by the customer to repay the water bill to MANWAD. This written document serves as a formal agreement between the parties involved which includes the terms and conditions of the water bill to be paid, penalties (if applicable), the repayment schedule and associated consequences for any nonfulfillment therewith.

The basic procedures in Filing Promissory Note are:
(See Process Flow Diagram #14 on page 133)

B.2.6.a Customer gets a queuing number card from the service counter and waits for his/her turn to be called;

B.2.6.b Customer Service Assistant calls the number next in line and handles the customer’s request for promissory;

B.2.6.c Gets customer’s details and verifies customer’s records from the system, if the customer is eligible to file promissory note; provides the form for Promissory Note (PN);

B.2.6.d Customer writes request letter for repayment schedule of water bill and fills out the PN Form; signs and receives the original copy of the PN.

B.2.7.e CSA verifies and acknowledges the PN; forwards the same to FCD-DM and OGM for review and approval, respectively; files the duplicate copy and gives the original copy to the customer.

B.2.7 Disconnection of Water Service Line

Accounts resulting from non-payment of water bills shall be considered delinquent sixteen (16) days from the date of billing. A penalty charge of ten percent (10%) of the delinquent billings shall be added to the overdue water bill. A grace period of thirty (30) calendar days after the due date shall be granted before disconnection of service.

Service may be discontinued without further notice if payment of all charges is not made on or before the expiration date of the grace period. Provided, however that Notice of Disconnection is served upon the delinquent customer at least two (2) days before actual disconnection.

Failure to receive a billing notice does not relieve a customer from liability. Any amount due shall be deemed a debt to the district and any person, firm or corporation failing, neglecting or refusing to pay said indebtedness shall be liable to a civil action in the name of the district, in any court of competent jurisdiction for the amount thereof.

Voluntary and temporary disconnection of water service lines shall be supported by a written request by the customer and shall be charged of one hundred pesos (Php100.00).

The basic procedures in Disconnection of Water Service Line are:
(See Process Flow Diagram #15 on page 134)

B.2.7.a Disconnection Team generates and prints List of Delinquent Accounts Report and Notices of Disconnection; distributes the same to delinquent customers;

B.2.7.b Customer shall acknowledge the receipt of Notice of Disconnection;

B.2.7.c At least two (2) days from date of distribution, disconnection team generates and prints List of Delinquent Accounts Report again to verify if payment was made or PN was executed prior to disconnection order;

B.2.7.d Implements disconnection service of water meter of delinquent accounts; records the last meter reading, meter serial number and date of disconnection; takes photos of actual disconnection, if necessary;

B.2.7.e Prepares and forwards the Daily Report of Disconnected Accounts to the Billing Officer; hands over the disconnected water meters to the Storekeeper;

B.2.7.f Billing Officer updates the Customer's Ledger; posts the last reading for billing purposes; prepares list of disconnected accounts to offset the amount due against the guaranty deposits balances at the end of the month; Storekeeper receives and stores the disconnected water meters.

B.2.8 Write-off of Dormant Receivable Accounts

Write-off of Dormant Receivable Accounts is the process of derecognizing the customer's accounts receivable and the corresponding allowance for impairment from the books of accounts. Dormant receivable accounts are which balances remained inactive or non-moving in the books of accounts for ten (10) years or more and where settlement/collectability could no longer be ascertained. *(Reference: COA Circular No. 2016-005).*

The basic procedures in Write-off of Dormant Receivable Accounts are:
(See Process Flow Diagram #16 on page. 135)

B.2.8.a At the beginning of the year, Billing Unit conducts verification, analysis, and validation of the existence of the receivables; identifies and generates ledger of dormant or non-moving accounts for ten (10) years or more based on the Aging of Accounts Receivable;

B.2.8.b Sends three (3) consecutive demand letters to the dormant customers through registered mail; files the registry return receipt as proof of delivery;

B.2.8.c Secures barangay certification as to the whereabouts of the dormant customers, authenticated with the signatures of both the barangay secretary and barangay chairman.

B.2.8.d Prepares aging of dormant receivables, to support the request for write-off, and indicate in the remark's column the existence of the applicable conditions, as follows:

- Absence of records or documents to validate/support the claim and/or unreconciled reciprocal accounts;
- Death of the accountable debtor;
- Unknown whereabouts of the accountable debtor, and that he/she could not be located despite diligent efforts to find him/her;
- Incapacity to pay or insolvency;
- Exhaustion of all possible remedies by the Management to collect the receivables

B.2.8.e Submits request to the Board of Directors for the creation of Board Resolution approving the write-off of uncollectible Accounts Receivable.

B.2.8.f Certification from the Division Manager of Finance and Commercial Division shall be provided, stating that the dormant accounts which were requested for write-off were included in the Aging of Accounts Receivable as of the date when the request is made.

B.2.8.g The General Manager of the district shall file the request for authority to write-off dormant receivable accounts to the COA Audit Team Leader (ATL) and/or Supervising Auditor (SA).

The request shall be supported by the following documents:

a. Schedule of dormant accounts, certified by the accountant and approved by the General Manager of the district;
b. Certified relevant documents validating the existence of the conditions, as applicable, such as:
    - Death Certificate issued by Philippine Statistics Authority;
    - Proof of Insolvency;
    - Certification from the Department of Trade and Industry that the debtor has no registered business;
    - Certification from the Securities and Exchange Commission that the Corporation is no longer active;
    - Certificate of no residence in the barangay of the municipality/city of last known address;
    - Proof of exhaustion of all remedies to collect the receivables, such as but not limited to copies of served or returned demand letters;

B.2.8.h Accounting Unit prepares the JEV within 15 working days upon receipt of the decision granting the authority to write-off and effect the adjusting entries in the books.

B.2.8.i Billing officer generates billing adjustment memo; writes-off receivables of the dormant accounts from the Billing and Collection System.

B.2.9 Request for Reconnection of Water Service Line

This request refers to the formal process by which customers apply to have their water service line reconnected after it has been disconnected for a certain period. This request involves submitting necessary documentation, paying any outstanding dues or reconnection fees and following the district's procedures for reconnection.

When service has been discontinued on account of non-payment of water bills, or for any other infraction of the rules, a charge of three hundred pesos (Php300.00) will be required by the district to reconnect the service. No reconnection charges, however, shall be required for the turning on of service within twenty-four (24) hours after disconnection.

The basic procedures in Request for Reconnection of Water Service Line are:
(See Process Flow Diagram #17 on page 136)

B.2.9.a Customer gets a queuing number card from the service counter and waits for his/her turn to be called;

B.2.9.b Customer Service Assistant calls the number next in line and handles the customer's request for reconnection of water service line;

B.2.9.c Gets customer's details and verifies customer's records from the system; advises customer to settle all outstanding water bills, update guaranty deposits and pay reconnection fees;

B.2.9.d Customer pays outstanding bill and all other fees.

B.2.9.e Teller accepts payment and issues Official Receipt to the customer.

B.2.9.f CSA confirms customer's payments; logs the request in the log book; re-activates the customer's account in the Billing and Collection System; generates SR and MJO for reconnection; endorses the same to the Engineering and Construction Division.

B.2.9.g Regular follow-ups, with the plumber, of SR for instances that remain unresolved for more than two (2) working days, as indicated in the logbook. Any undue delays are escalated to the Section Head of Engineering & Construction Division for attention;

B.2.9.h Receives from the plumber the accomplished copies of SRs and MJOs; logs the accomplishments to the system; the SRs and MJOs are filed accordingly.

B.2.10 Request for Relocation of Water Service Line

This request refers to the formal process by which customers apply to have their water service line relocated. This request involves submitting necessary documentation, paying any outstanding dues or relocation fees (Php100.00) and following the district's procedures for relocation.

The basic procedures in Request for Relocation of Water Service Line are:
(See Process Flow Digram #18 on page 137)

B.2.10.a Customer gets a queuing number card from the service counter and waits for his/her turn to be called;

B.2.10.b Customer Service Assistant calls the number next in line and handles the customer's request for relocation of water service line;

B.2.10.c Gets customer's details and verifies customer's records from the system; advises customer to settle relocation fees and costs of the needed materials;

B.2.10.d Customer pays relocation and other fees.

B.2.10.e Teller accepts payment and issues Official Receipt to the customer.

B.2.10.f CSA confirms customer's payments; logs the request in the log book; generates SR and MJO for relocation; endorses the same to the Engineering and Construction Division.

B.2.10.g Regular follow-ups, with the plumber, of SR for instances that remain unresolved for more than two (2) working days, as indicated in the logbook. Any undue delays are escalated to the Section Head of Engineering & Construction Division for attention;

B.2.10.h Receives from the plumber the accomplished copies of SRs and MJOs; logs the accomplishments to the system; the SRs and MJOs are filed accordingly.

B.2.11 Other Commercial Activities, Programs and Policies

Manwad offers additional frontline services to further enhance the operations and provide customer satisfaction. These services encompass a variety of commercial-related endeavors, strategies, and rules that fall outside of the previously discussed areas but are still relevant to the context being outlined.

B.2.11.a Policy on Illegal Connections

Pursuant to Board of Directors' Resolution No. 05 s. 2007, this policy shall be the governing guideline in determining, apprehending and penalizing violators involved in illegal connections, water meter tampering, intentional destruction of water pipelines, illegal withdrawal of water from hydrants and other water pilferage acts.

Definition of Terms:

- Illegal Connections – water connections which are not duly registered with the Water District, unauthorized connections made to previously disconnected service lines, connection with faucet or by-pass line installed between the district mainline and the water meter.
- Water Meter Tampering – unauthorized manipulation of the water meter for the purpose of stealing water. This offense also includes placing strong magnets, placing foreign objects inside the meter, inverting the position of the meter, breaking water meters. All for the purpose of slowing down the meter registry and eventually lessen water consumption.
- Illegal Withdrawal of Water from Water Hydrants – unauthorized withdrawal of water from fire hydrants, willful destruction of water hydrants and/or manipulation to cause unnecessary spillage or water.
- Other Water Pilferage – are other illegal acts to cause spillage or pilferage of water.
- Penalties/Fines – the amount slapped on offenders involving actions defined above.

Determination of Offenses:

- Any person who has a connection with the Manwad water system but is not registered as a customer shall be considered as an illegal connector. This also includes those with unauthorized connections made to previously disconnected

service lines, with faucet or faucets or by-pass lines installed between the tapping point and the water meter.

- Any customer with registered connection, who is found out to have manipulated his water meter, inverted its position thereby reversing the reading, placing magnets or foreign objects inside or outside the water meter to slow down or stop the registering of water flow shall be charged with tampering of water meter.

- Any person who withdraws water from fire hydrants, destroys or manipulates the same or intentionally destroys water transmission lines so as to cause unnecessary spillage of water.

Penalties/Fines:

- Pursuant to P.D. 198, offenders shall be meted a punishment of six (6) months to six (6) years imprisonment or a fine of six thousand pesos (Php 6,000.00) or both, upon conviction.

- Additional charges for water loss shall be computed as follows:
    a) Customer-Offenders – average monthly consumption in six (6) months prior to the date of the committal of the offense time multiplier of 2.5 times the number of months the offense was done, times the prevailing water rate. The 2.5 multiplier factor is based on statistics that illegal connectors consume two and a half times more than the metered consumption.

    b) Non-Customer-Offenders – prevailing per capita consumption times multiplier of 2.5 times a minimum of six (6) months or the number of months during which the offenses was done if it can be reasonably estimated, times the prevailing water rates.

- Other charges ascertained to be necessary to restore legal water connections shall be borne by offenders.

Employees of Manwad who are caught to have conspired with the offenders in installing the illegal connection will be dealt with to the fullest extent of the law.

After thorough investigation, offenders' water connection will be immediately disconnected. Offenders shall be given fifteen (15) calendar days after notification to make a settlement of the offense in the Manwad Office. After this period, the matter will be referred to the Water District Legal Counsel for legal action.

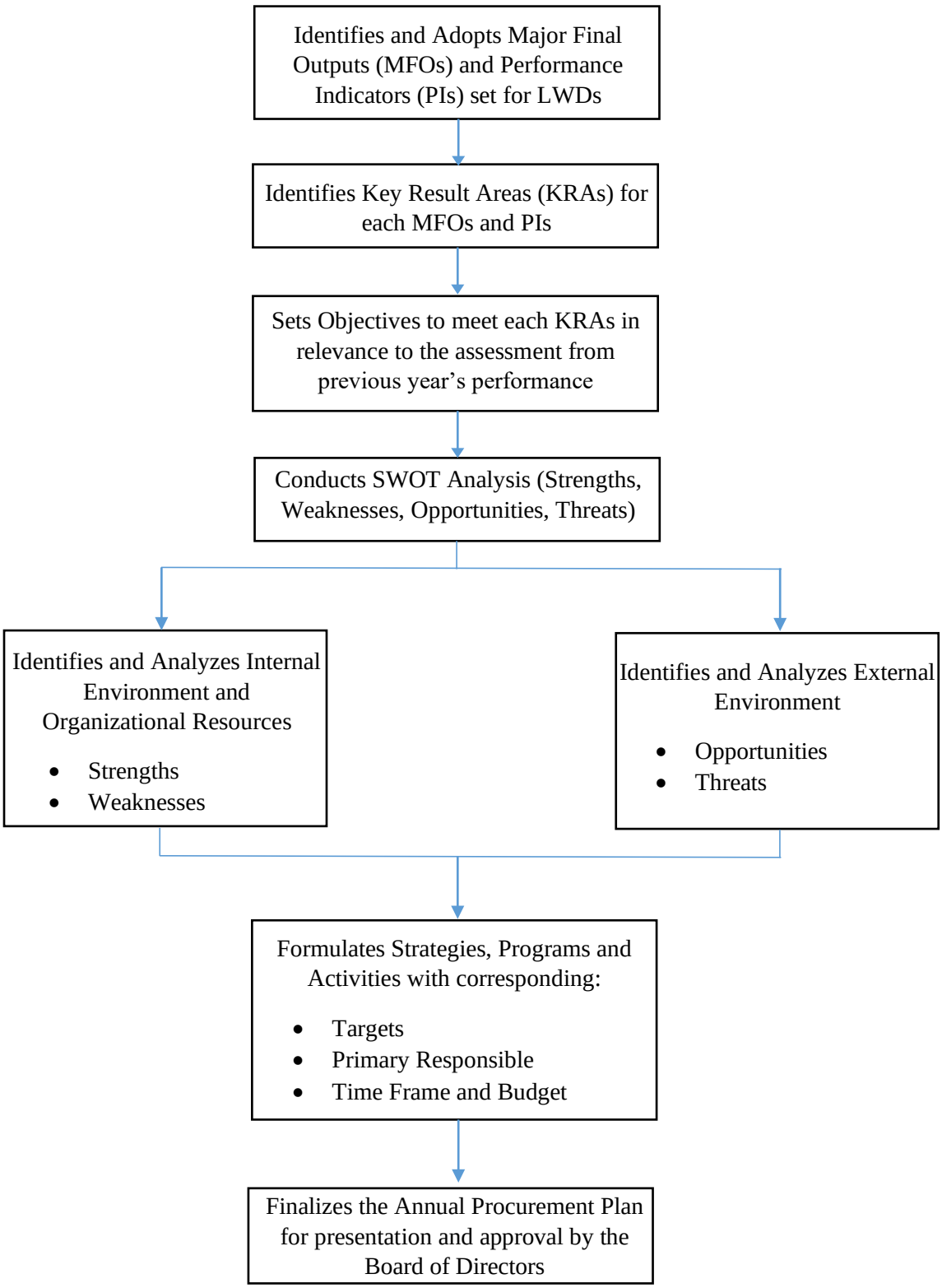
B.2.11.b House-to-House Marketing/Survey

This activity refers to the method of collecting data and promoting water services by directly visiting individual residences on a specific service area. This approach involves personnel from finance and commercial and other personnel from different divisions going from one house to another to engage with residents and gather information. It's a strategy commonly used to understand customer preferences, conduct market research, encouraging potential customers to avail services and raise awareness about new water services or pipelines within a specific zone or barangay.

The survey includes:

- Identification of zone or barangay to be surveyed;
- Discerning probable customers within target areas for expansion and individuals residing within the district's service area who are yet to be connected to the service;
- Execution of surveys and effectively communicating the services provided by the district to potential customers;
- Compilation of the duly accomplished survey forms and endorsement of the same to the Section Head of BCCSS; and
- Analyzation of the survey result and preparation of recommendations based on the said result.

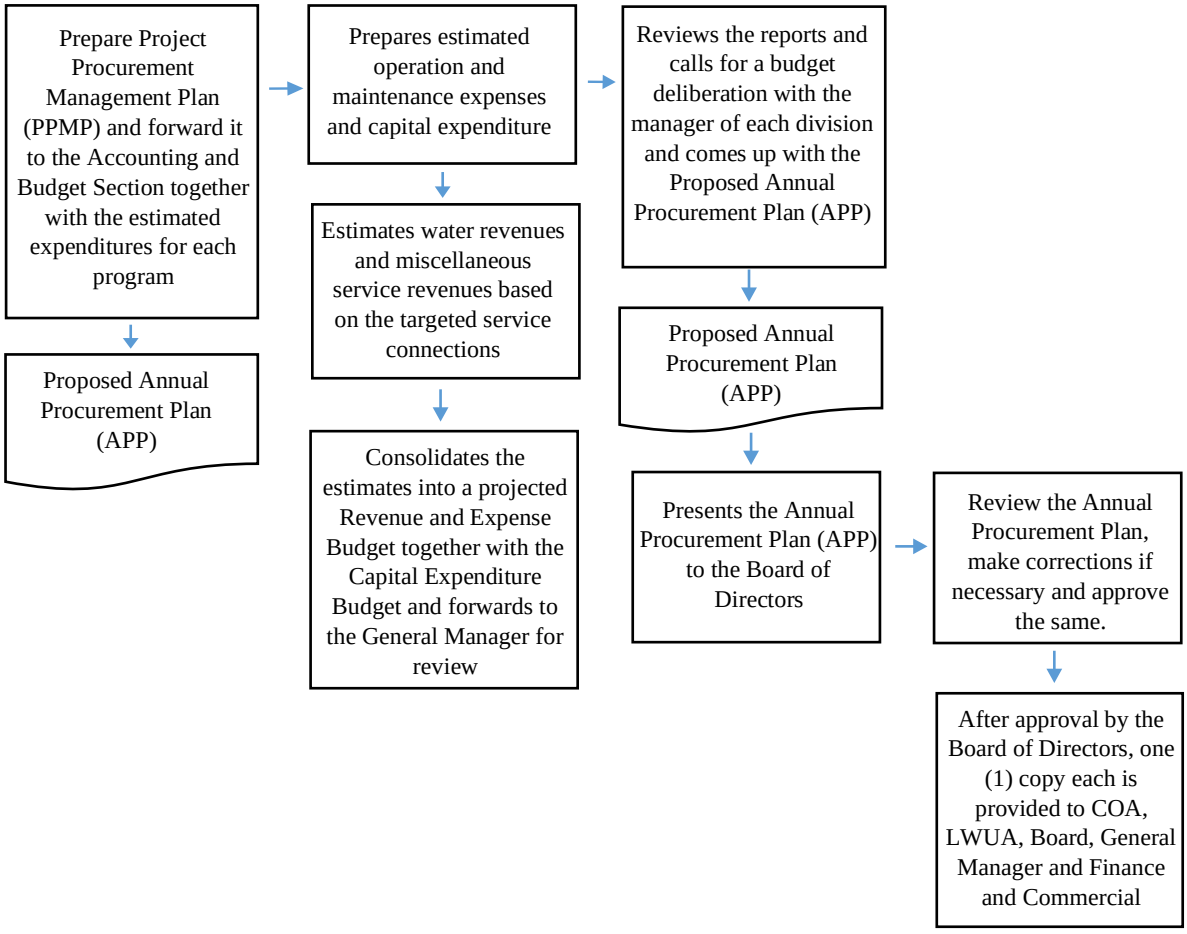
Process Flow Diagram #1: Business Planning



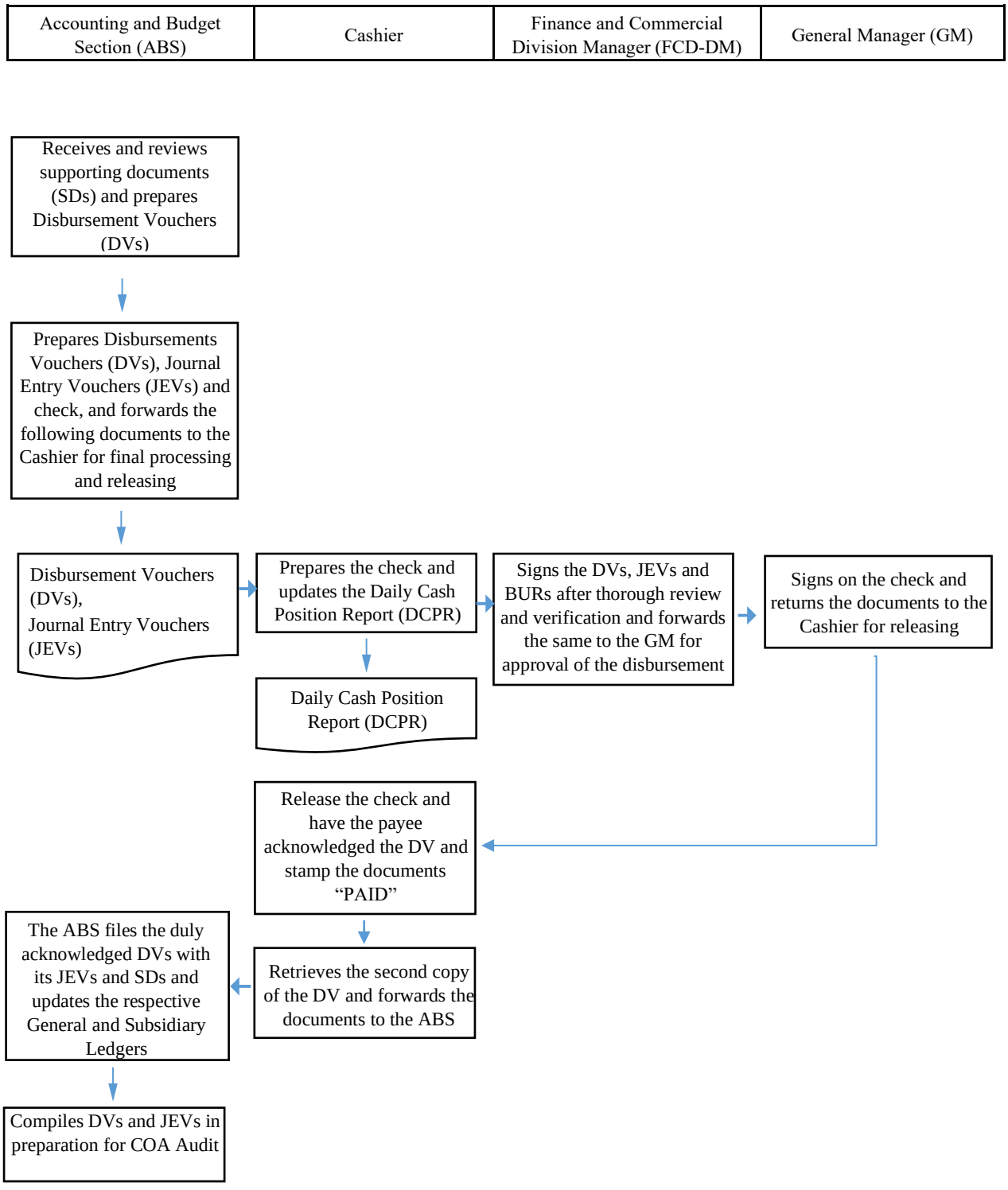
Process Flow Diagram #2: Budget Preparation

Divisions	Accounting and Budget Section	General Manager	Board of Directors

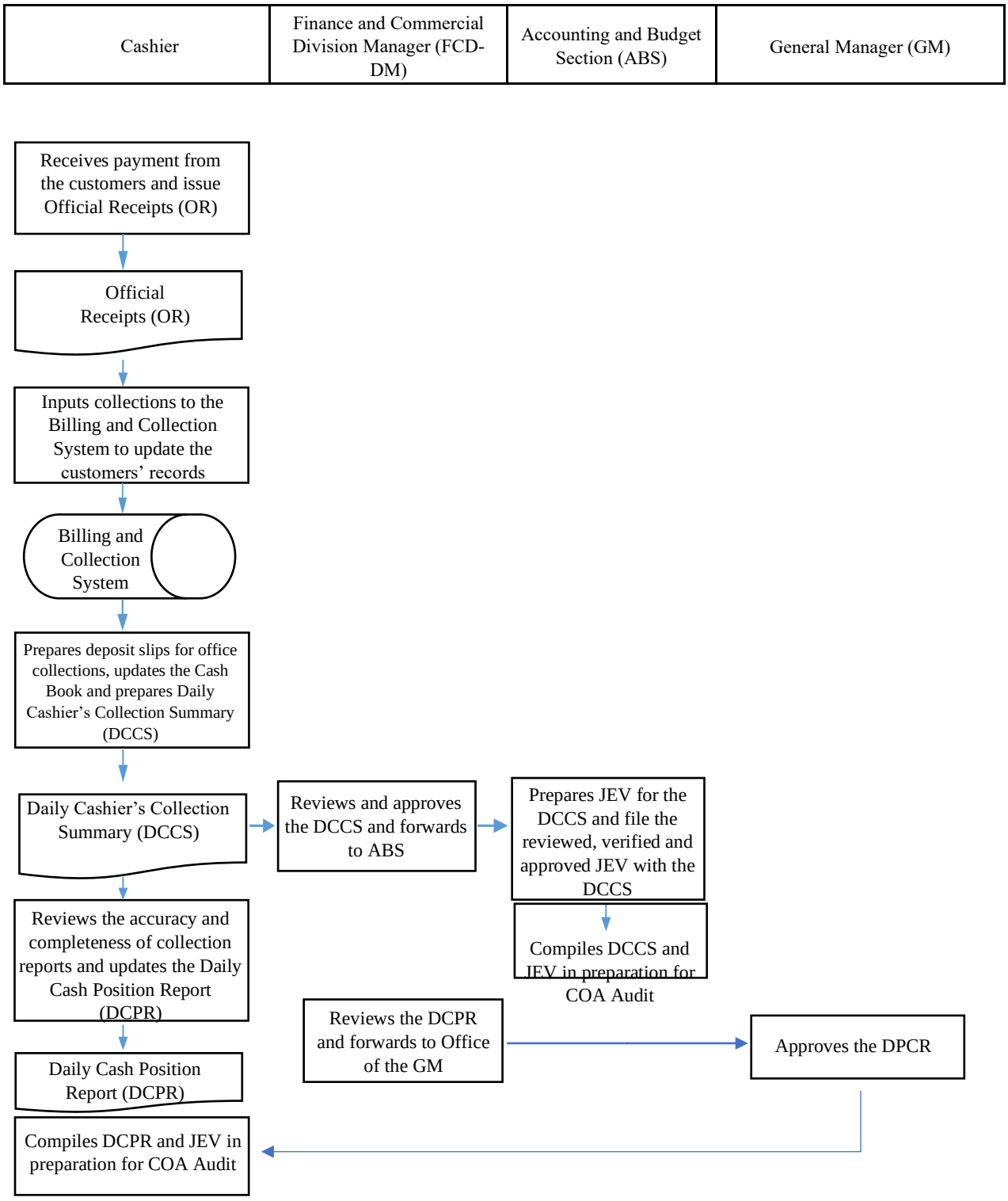
- At the beginning of the 4th quarter, budget for the following year is prepared:



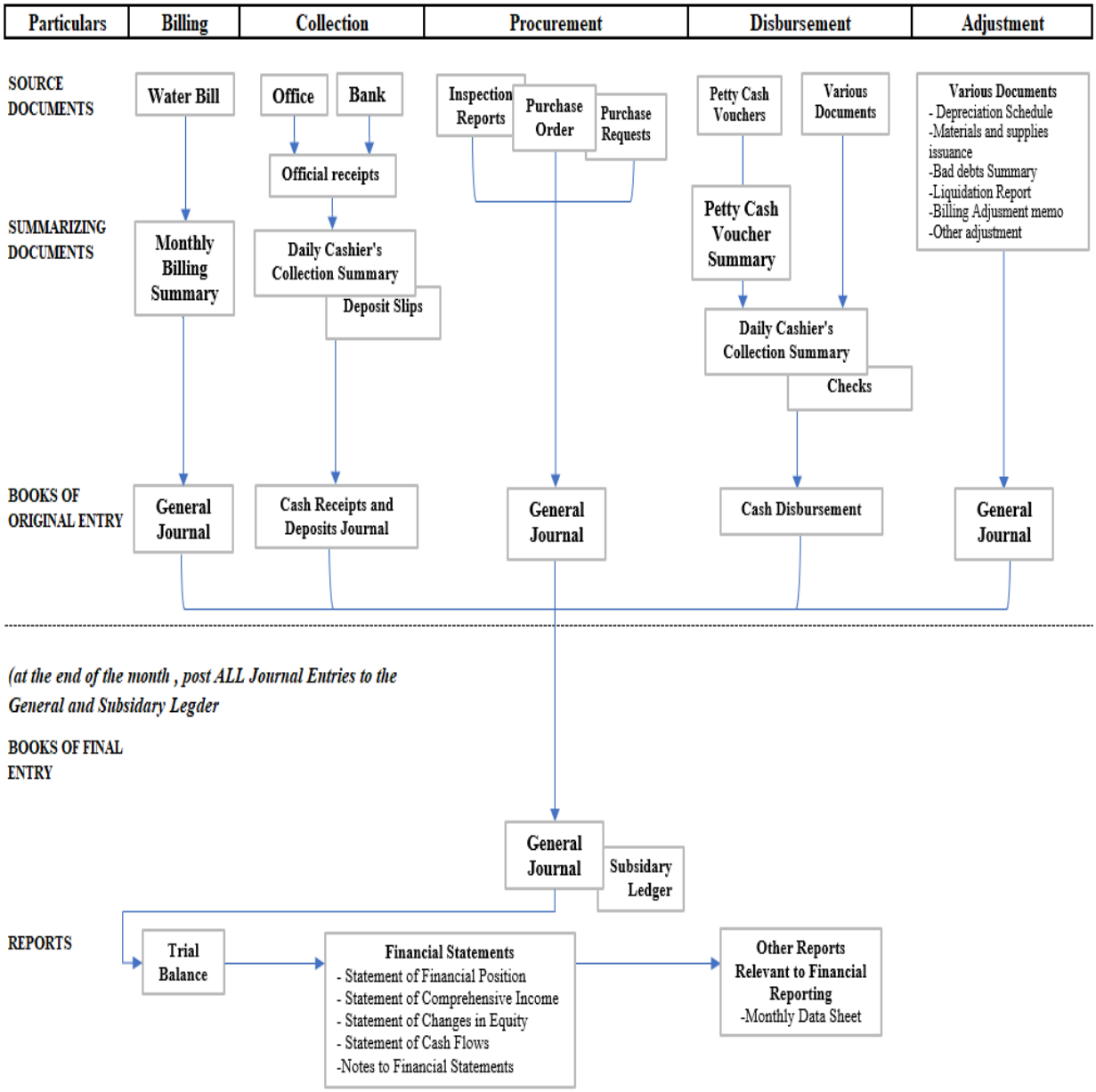
Process Flow Diagram #3: Disbursement of Funds



Process Flow Diagram #4: Collection of Payments



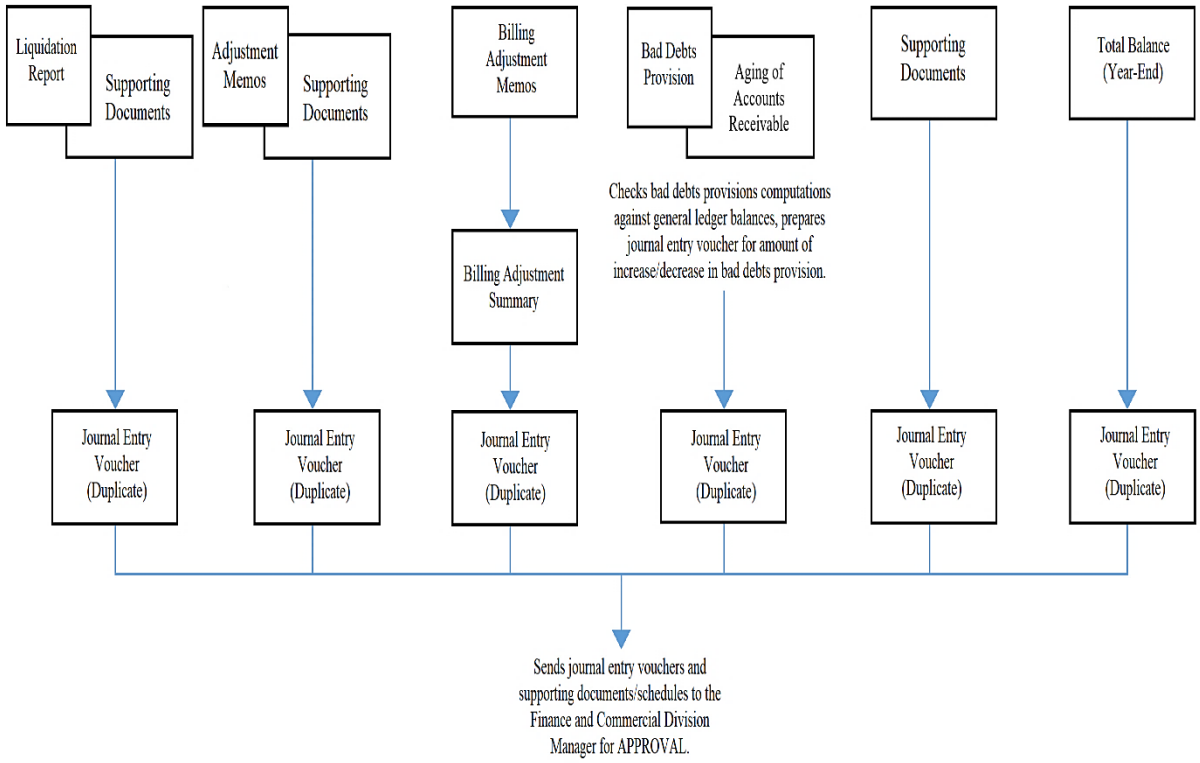
Process Flow Diagram #5: Financial Reporting System — General Accounting System



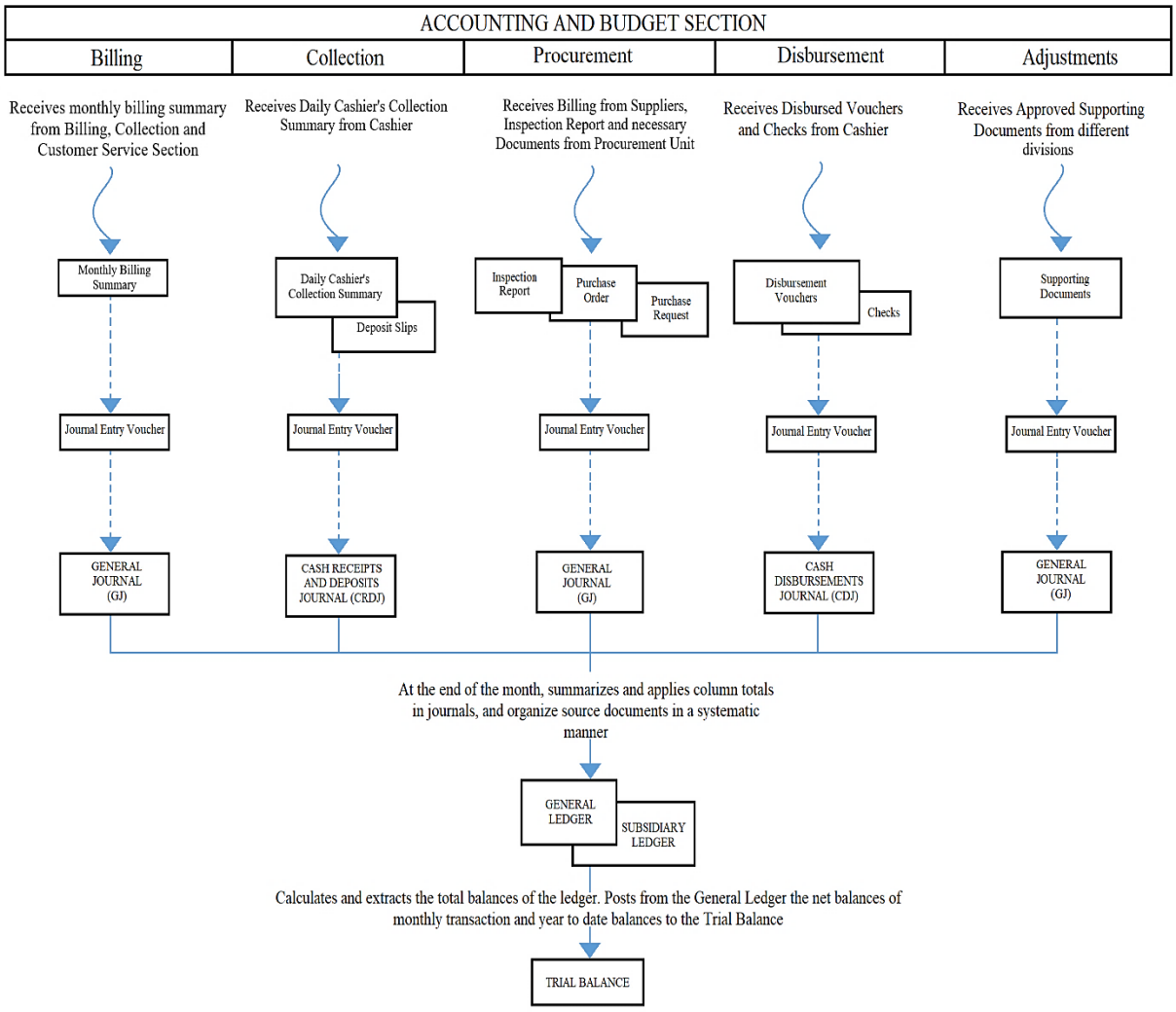
Process Flow Diagram #6: Financial Reporting System — General Journal (Adjustments)

ACCOUNTING AND BUDGET SECTION					
Liquidation of Cash Advances	Debit/Credit Memos	Billing Adjustments	Bad Debts Provision	Other Transactions	Year-End Closing Entries

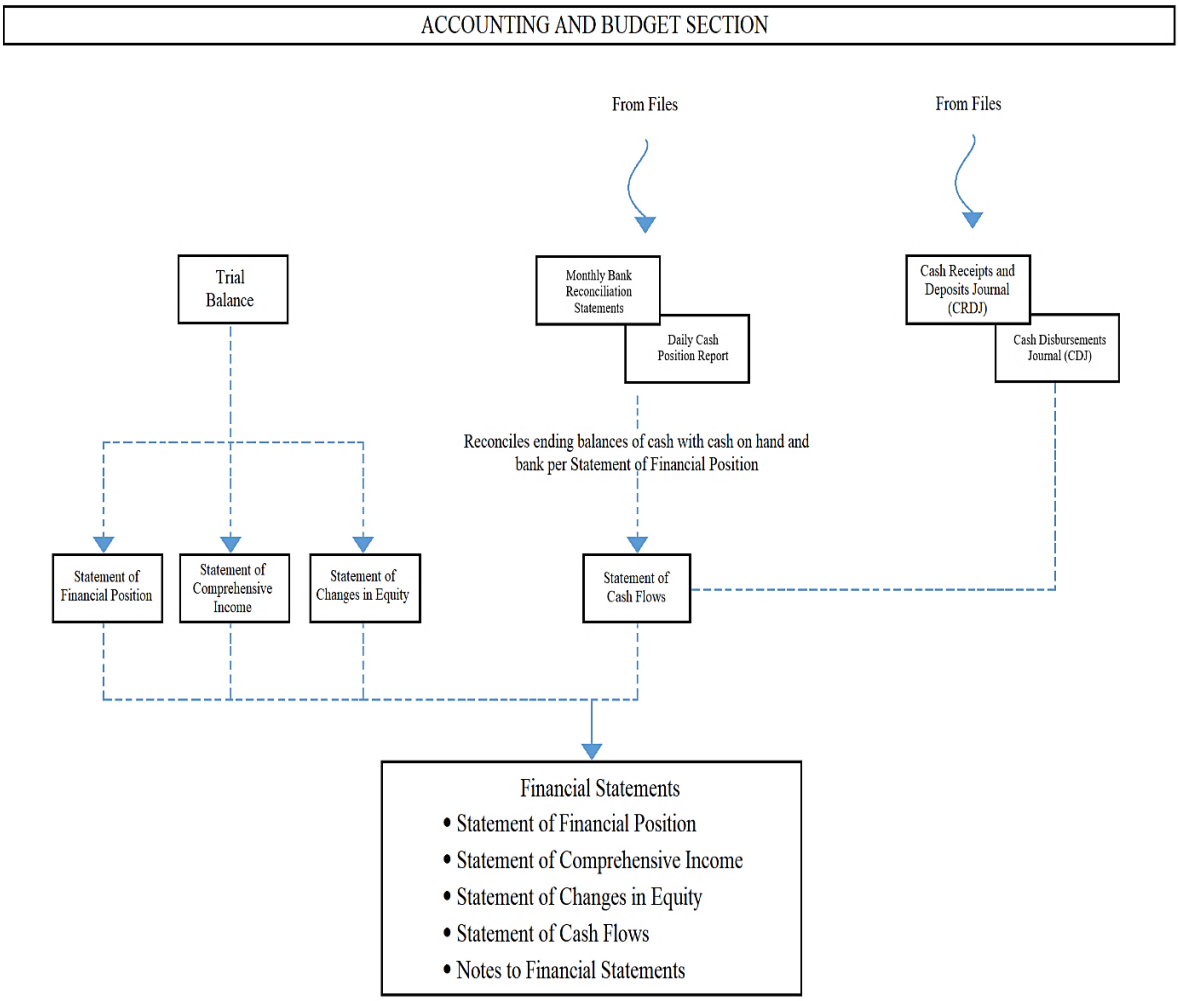
- All supporting documents are to be verified and approved by the Finance and Commercial Division Manager before processing and posting the adjustments.



Process Flow Diagram #7: Financial Reporting System — Preparation of Trial Balance

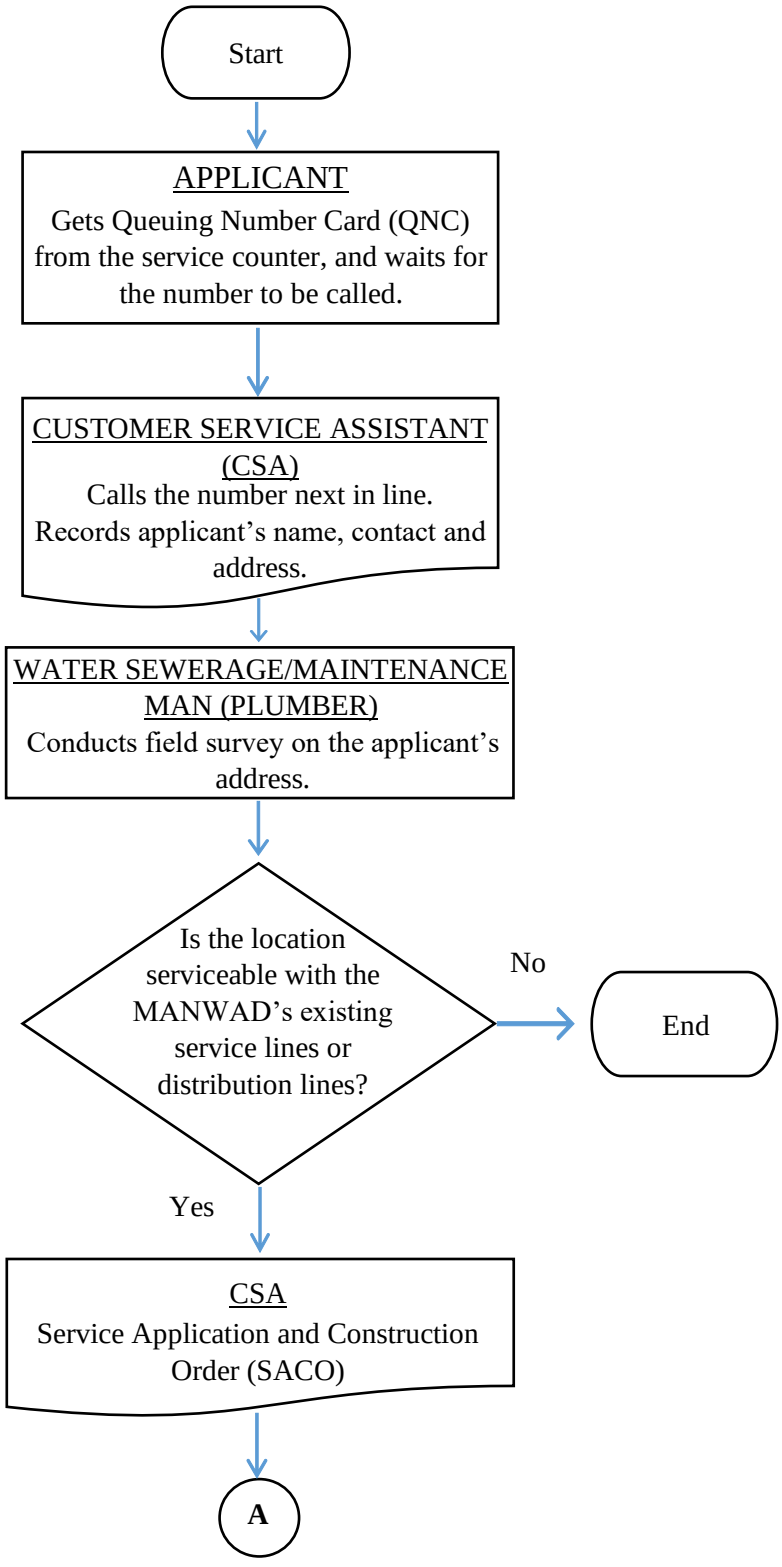


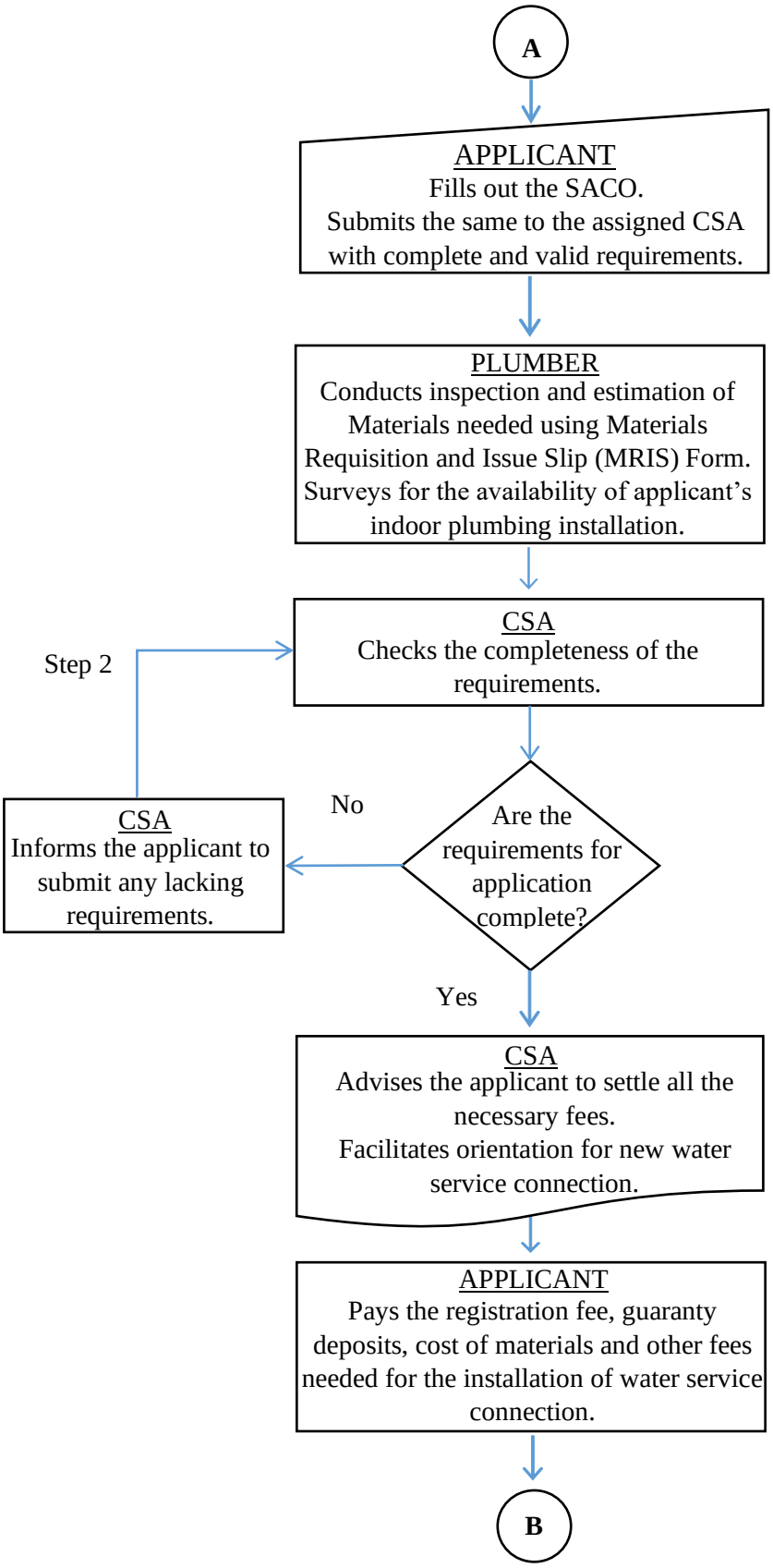
Process Flow Diagram #8: Financial Reporting System — Preparation of Financial Reports



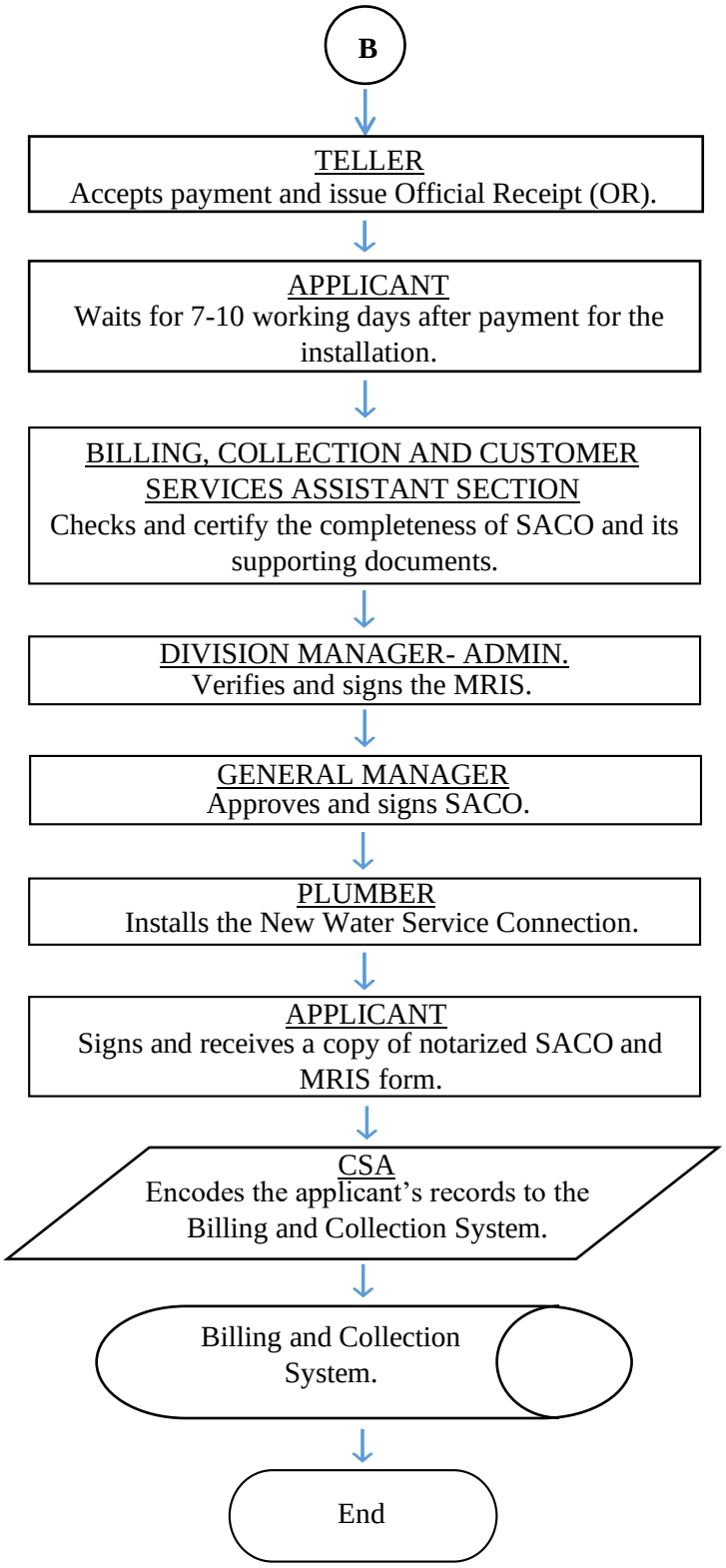
Process Flow Diagram #9-A: New Service Connection Application

Step 1

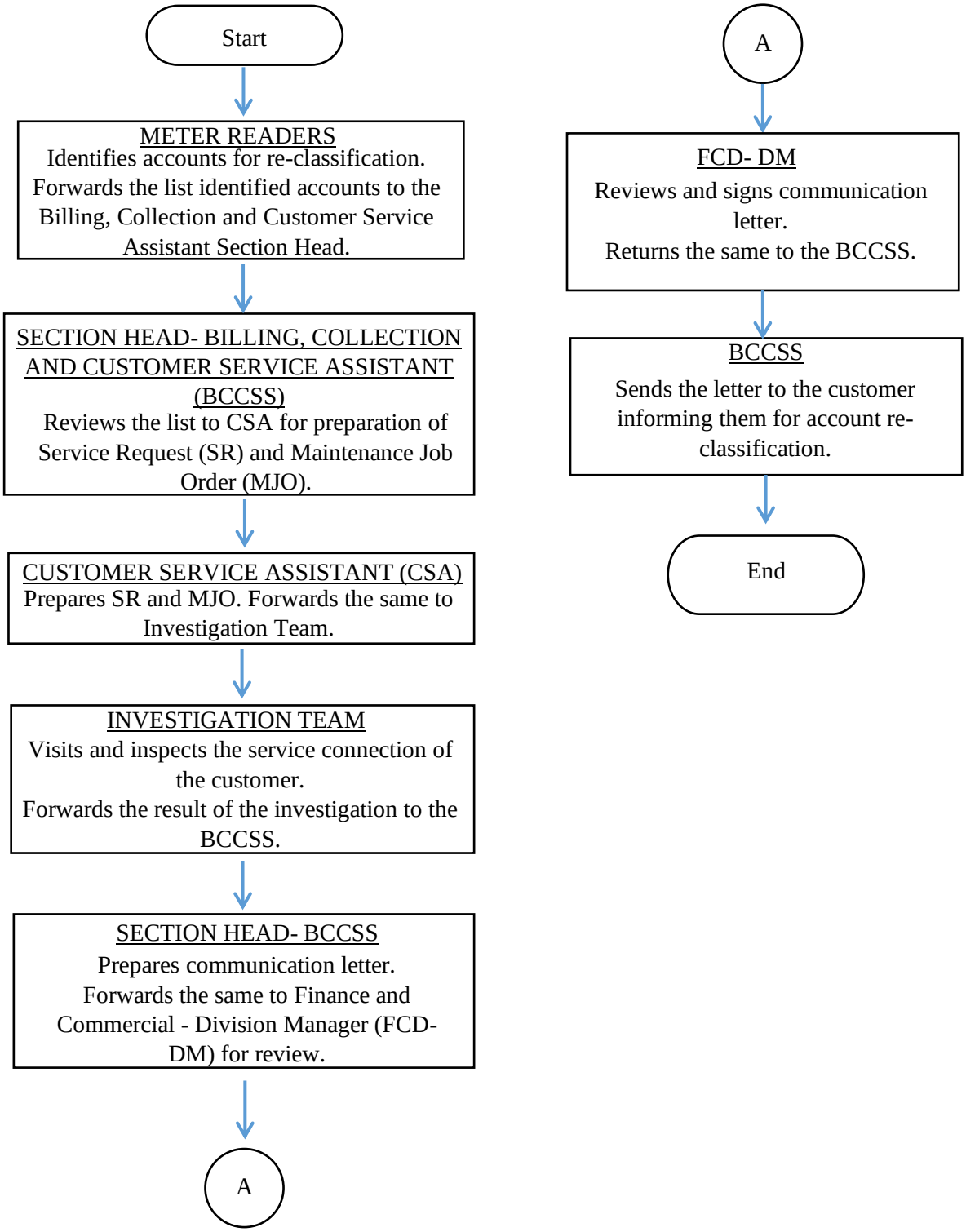



A
APPLICANT
Fills out the SACO.
Submits the same to the assigned CSA with complete and valid requirements.
PLUMBER
Conducts inspection and estimation of Materials needed using Materials Requisition and Issue Slip (MRIS) Form.
Surveys for the availability of applicant's indoor plumbing installation.
CSA
Checks the completeness of the requirements.
Step 2
Are the requirements for application complete?
No
CSA
Informs the applicant to submit any lacking requirements.
Yes
CSA
Advises the applicant to settle all the necessary fees.
Facilitates orientation for new water service connection.
APPLICANT
Pays the registration fee, guaranty deposits, cost of materials and other fees needed for the installation of water service connection.
B

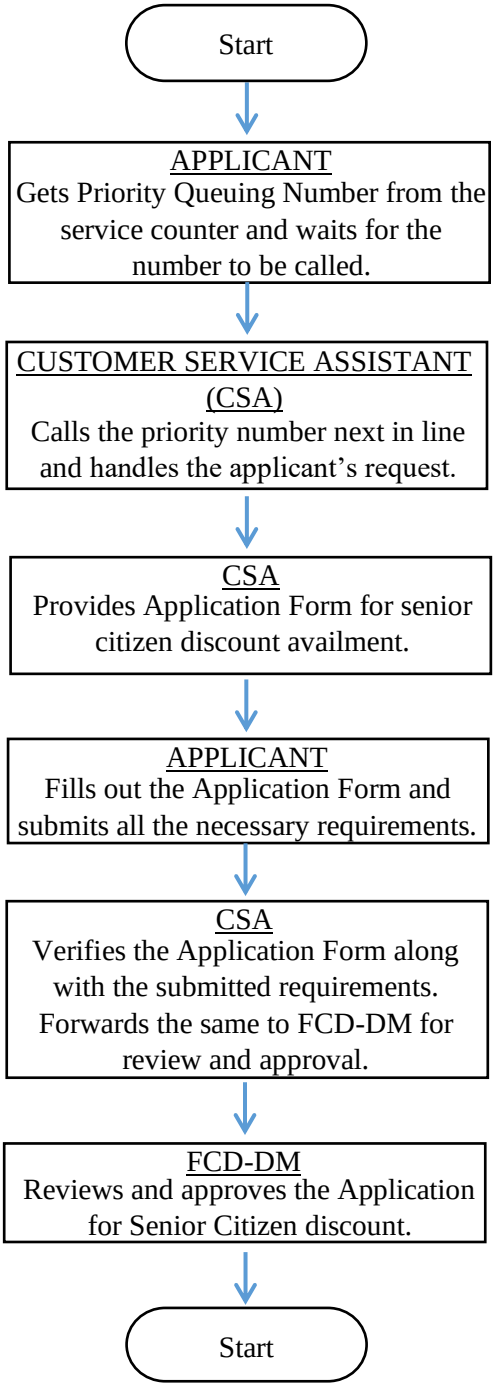
Step 3


B
TELLER
Accepts payment and issue Official Receipt (OR).
APPLICANT
Waits for 7-10 working days after payment for the installation.
BILLING, COLLECTION AND CUSTOMER SERVICES ASSISTANT SECTION
Checks and certify the completeness of SACO and its supporting documents.
DIVISION MANAGER- ADMIN.
Verifies and signs the MRIS.
GENERAL MANAGER
Approves and signs SACO.
PLUMBER
Installs the New Water Service Connection.
APPLICANT
Signs and receives a copy of notarized SACO and MRIS form.
CSA
Encodes the applicant's records to the Billing and Collection System.
Billing and Collection System.
End

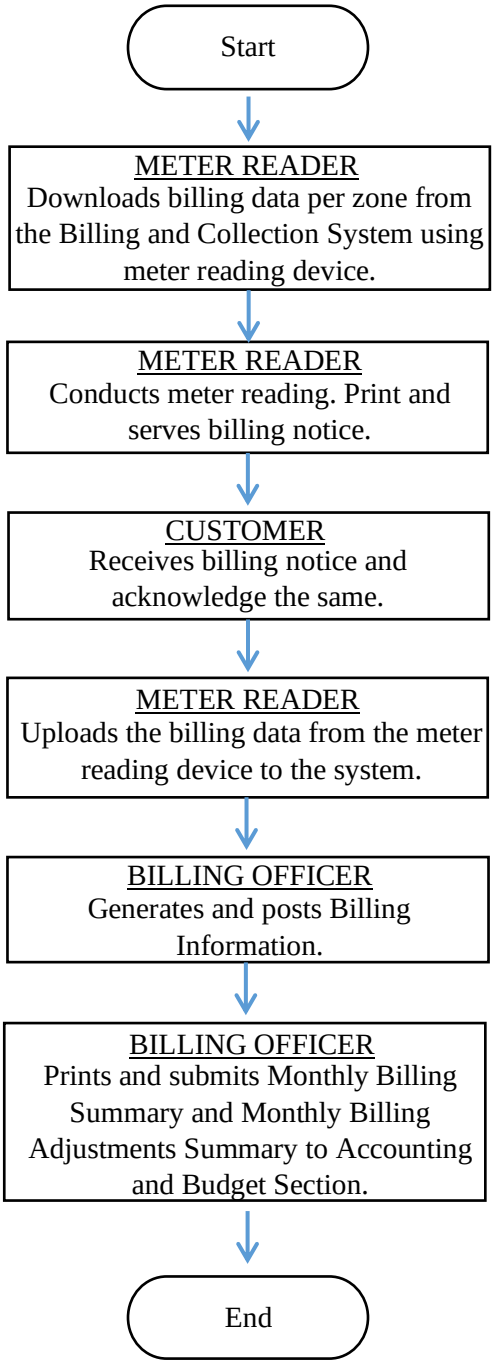
Process Flow Diagram #9-B: Re-classification of Service Connection



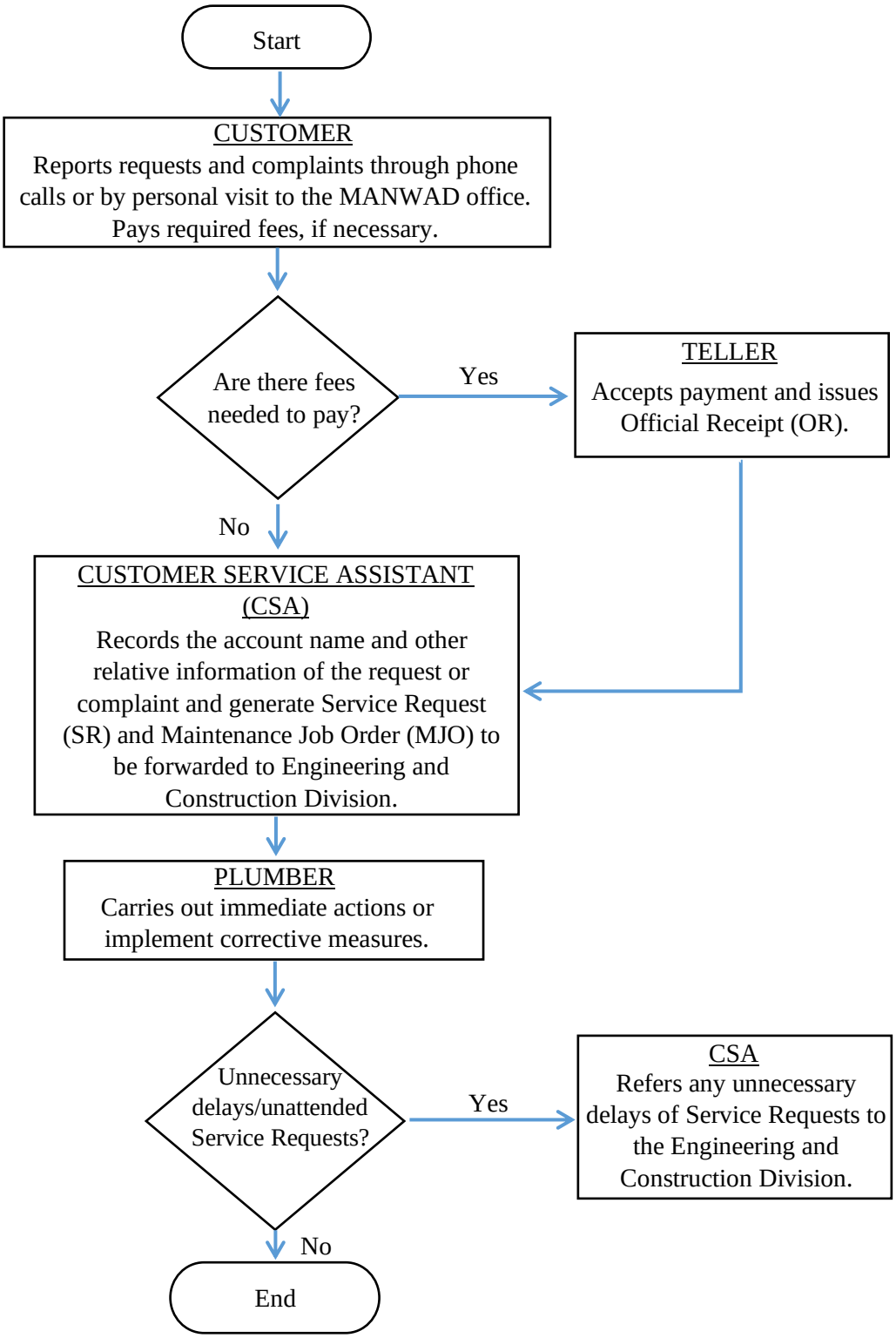
Process Flow Diagram #10: Application for Senior Citizen Discount



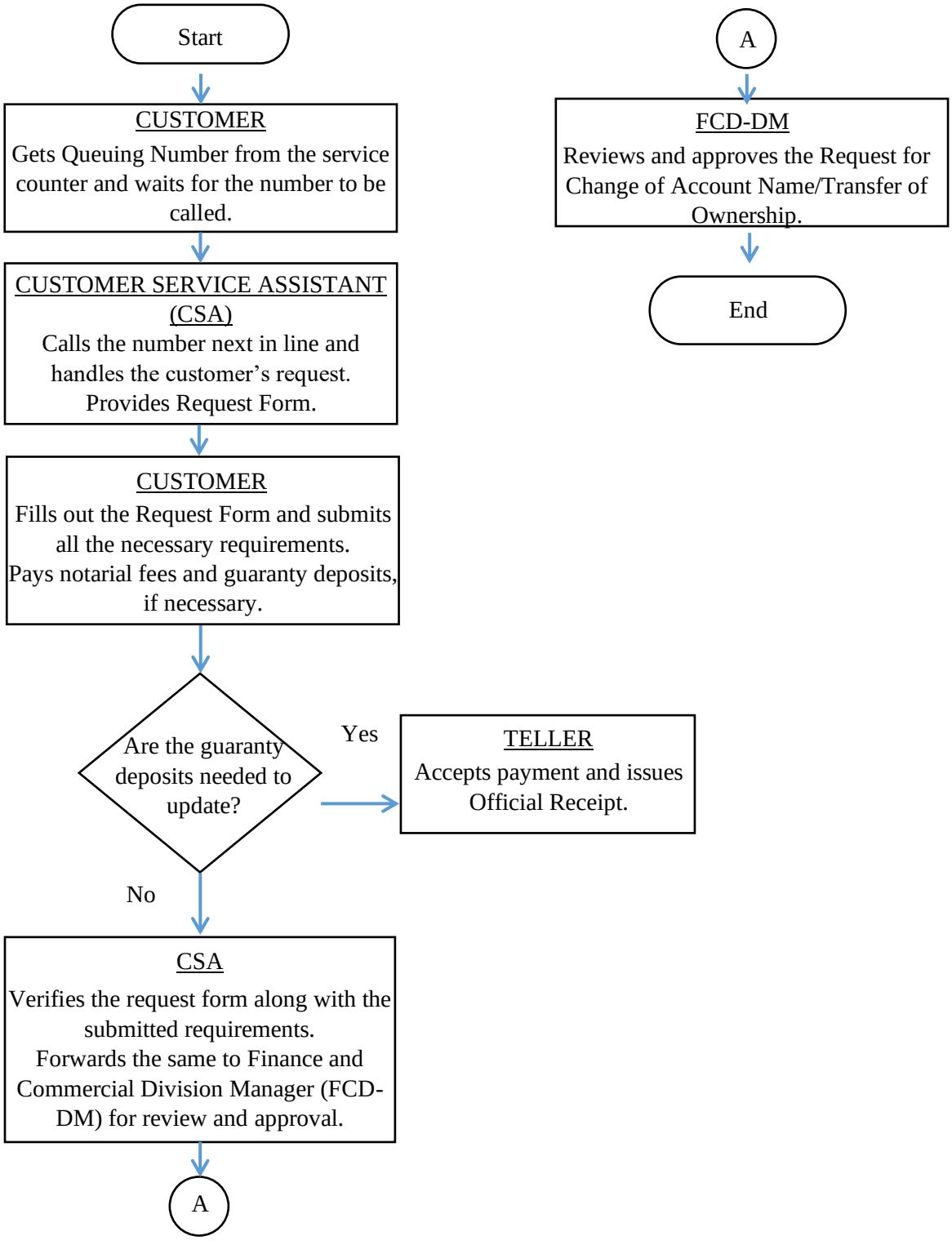
Process Flow Diagram #11: Meter Reading and Posting of Billing Information



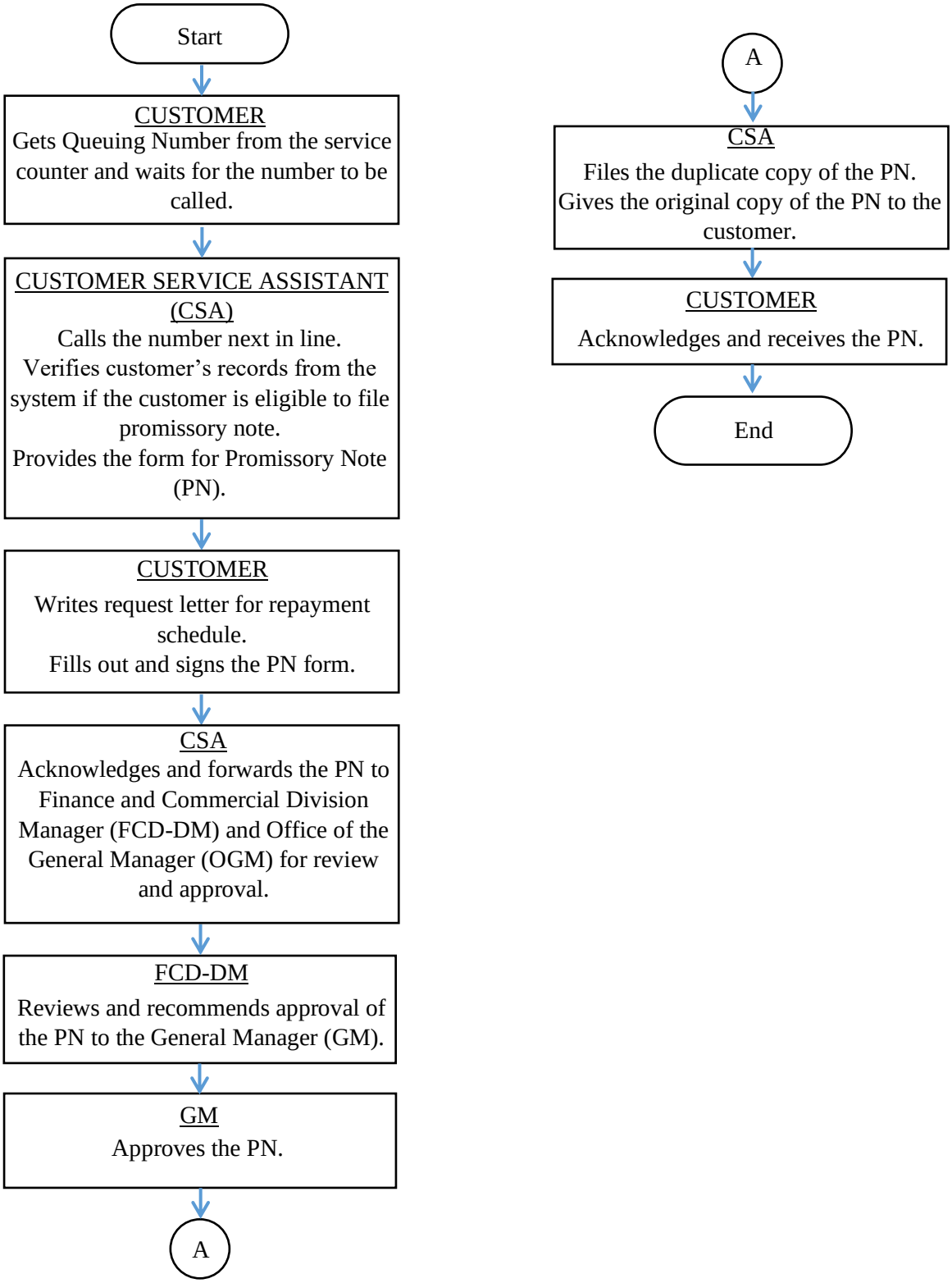
Process Flow Diagram #12: Handling Customer Requests and Complaints



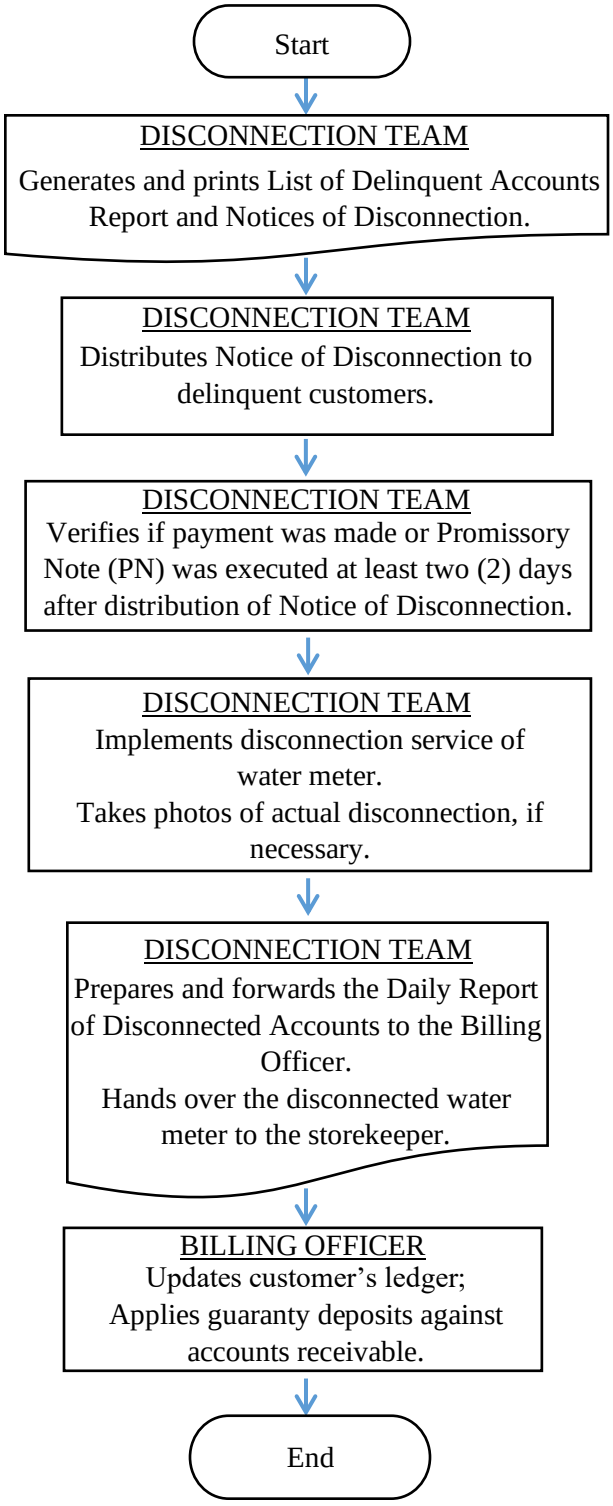
Process Flow Diagram #13: Request for Change of Account Name/Transfer of Ownership



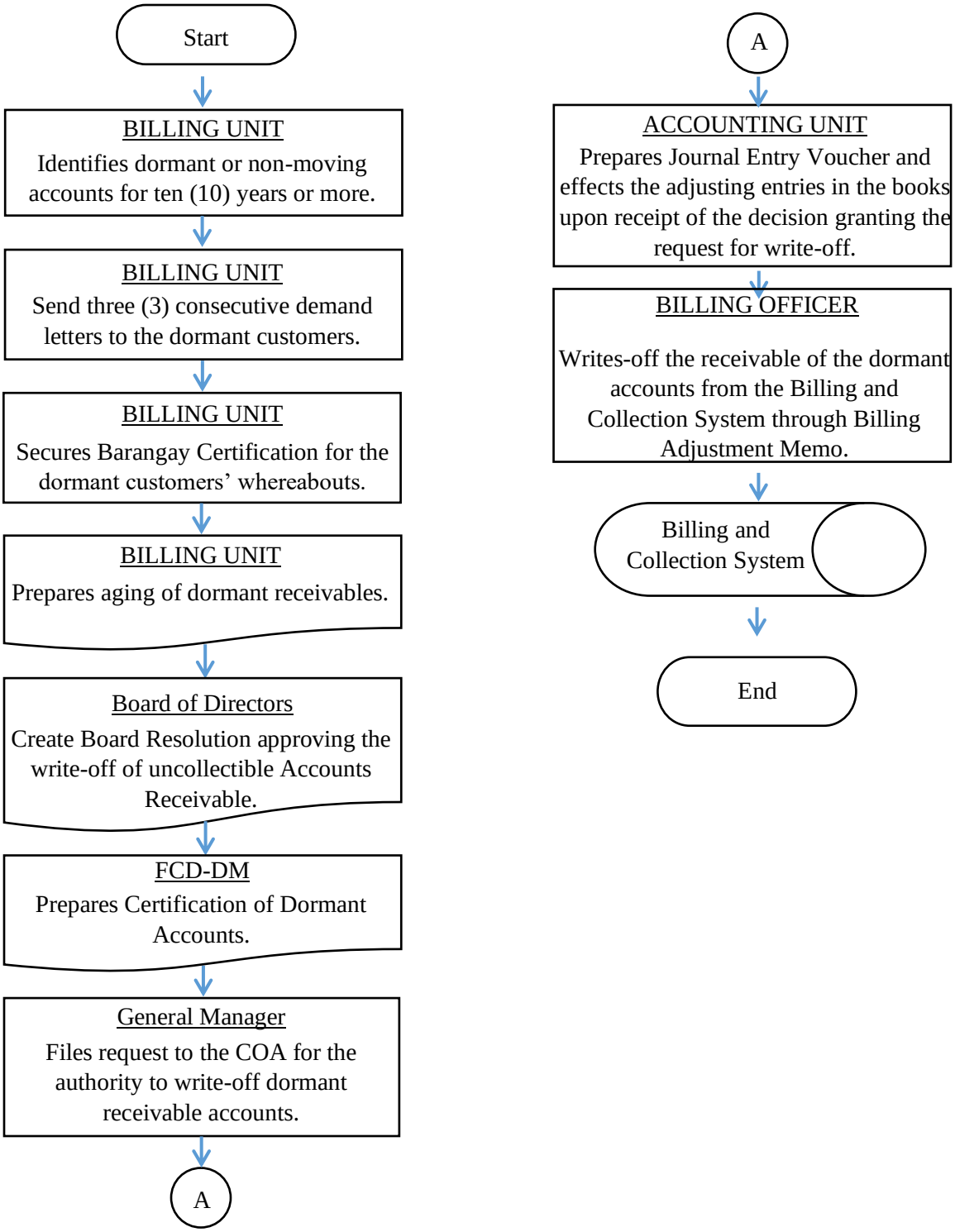
Process Flow Diagram #14: Filing of Promissory Note



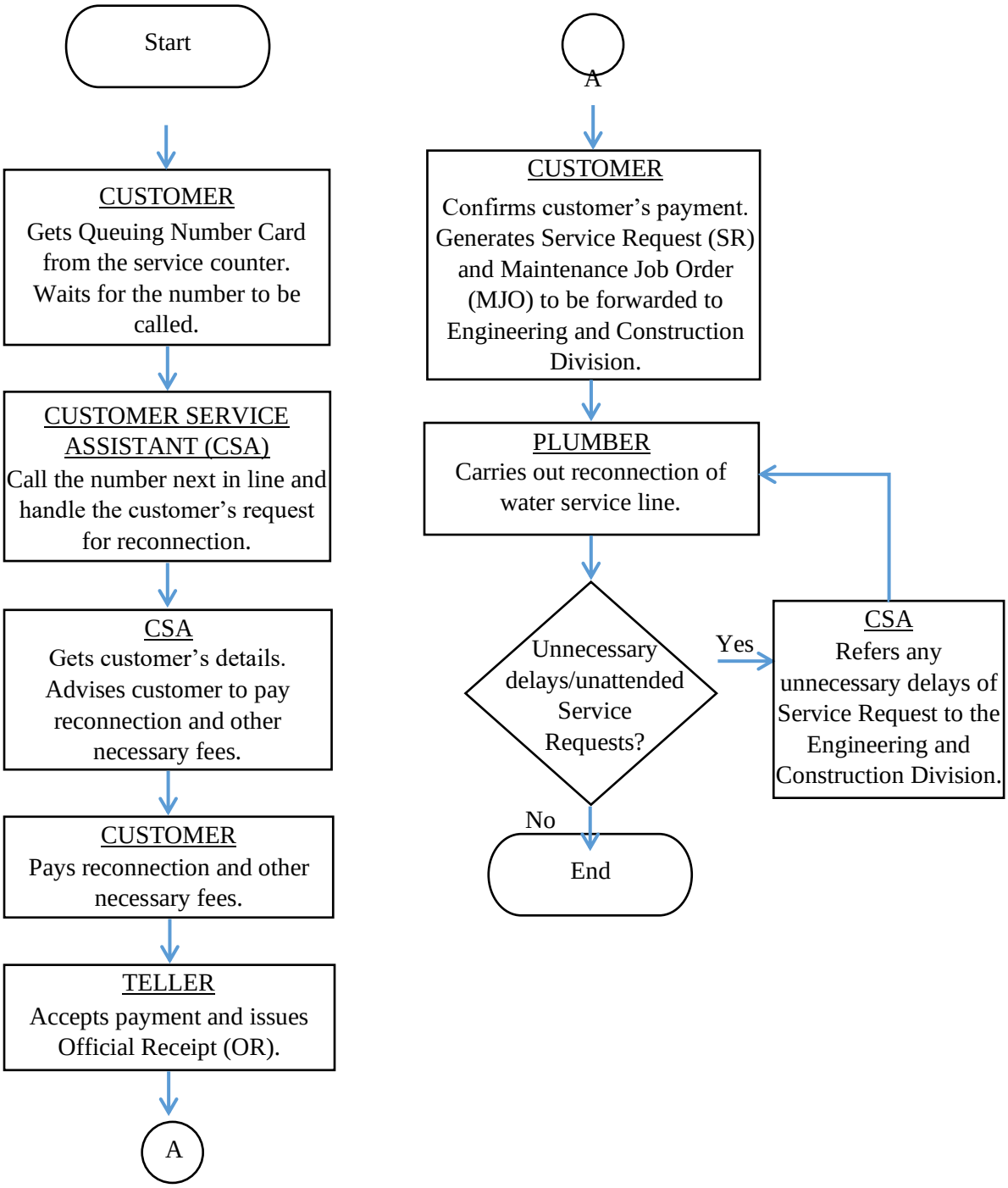
Process Flow Diagram #15: Disconnection of Water Service Line



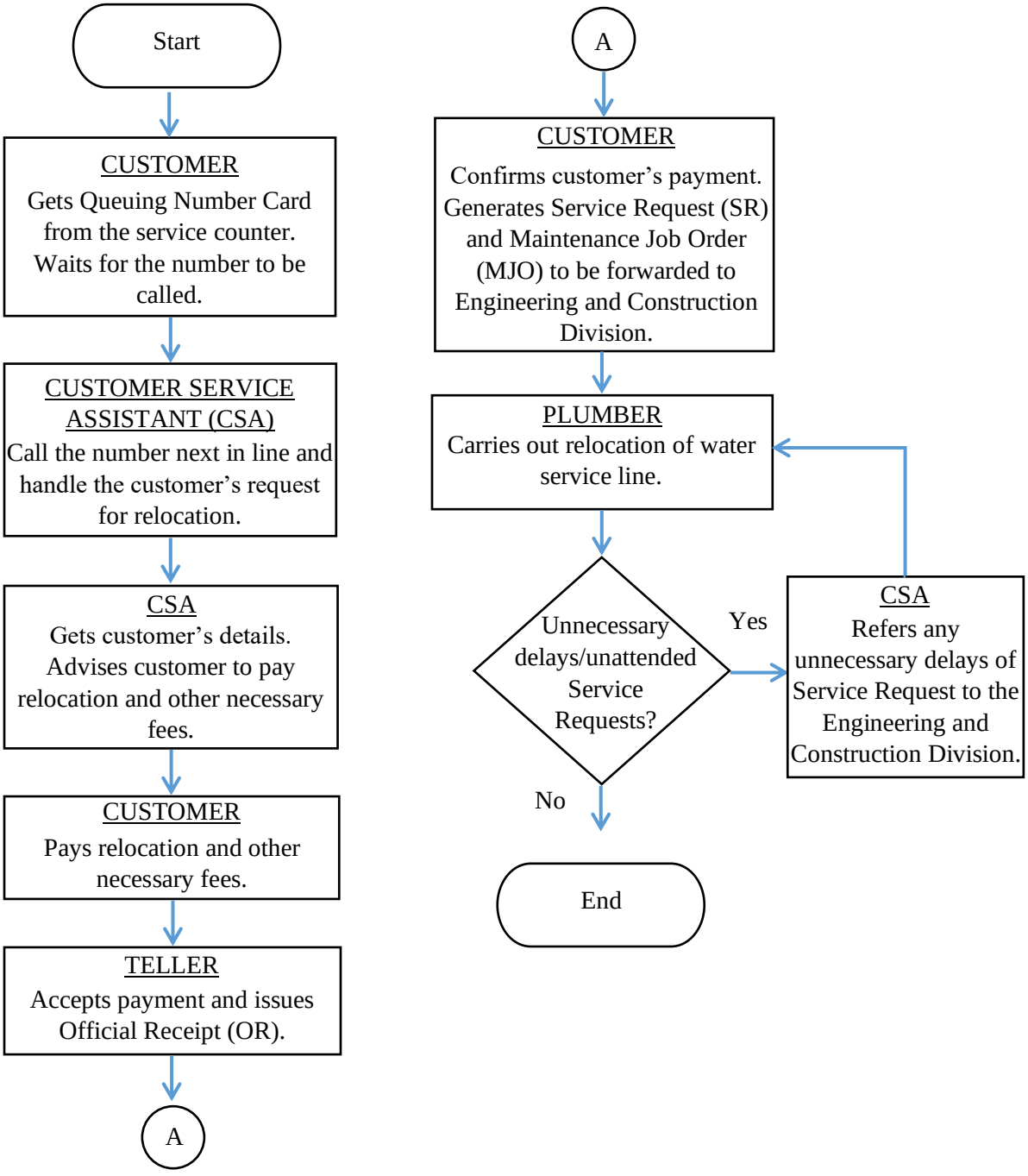
Process Flow Diagram #16: Write-Off of Dormant Receivable Accounts



Process Flow Diagram #17: Request for Reconnection of Water Service Line



Process Flow Diagram #18: **Request for Relocation of Water Service Line**



II.C PRODUCTION AND WATER QUALITY DIVISION

C.1 Water Resources Operations and Maintenance

C.1.1 Deep Wells

A properly designed and constructed well can give many years of trouble-free service. Good operations and maintenance seek to avert well failures, which are usually indicated by reduced (if not complete loss of) pump discharge, or deterioration on the quality of the water.

The following information will be a guide in the operation and maintenance of wells:

- Safe pumping level
- Pump curves
- Well design
- Location of discharge line shut-off valve and pressure gauge

C.1.2 Pumping Tests

Pumping tests are carried out to determine the safe pumping yield, which establishes how much groundwater can be taken from a well, and what effects pumping will have on the aquifer and neighbouring well supplies. It is one of the parameters for selecting the pump to be used.

Once the safe pumping level is established, it should be compared with the design pump curves of the equipment to be used. This will guide the operational parameters for pumping water from the well.

24-Hour Constant Rate Pumping Test Procedure

A pump test consists of pumping a well at a certain rate and recording the drawdown (decline) of water level in the pumping well and in nearby observation wells over a certain time period. The responses of the water levels at the pumping well reflect the aquifer's ability to transmit water to the well. The response allows hydro geologists to determine the aquifer's characteristics. Water levels will drop less in more permeable aquifers than

in aquifers of lower permeability. Ideally, water levels should be measured at predetermined time intervals at the pumping well and nearby observation wells.

A. Required Tools and Equipment

a. Pump and motor (submersible pump with a capacity greater than the yield requirement by at least 20%)
b. Water level indicator
c. Stopwatch
d. Containers for volumetric measurement of discharge

B. Terminologies

a. *Static Water level* – The vertical distance from ground level (or known measuring point) to the water surface in the well when there is no pumping.
b. *Pumping Water Level* – The vertical distance from ground level (or known measuring point) to the water surface in the well during pumping.
c. *Drawdown* – The difference between the pumping water level and the static water level.
d. *Well Yield* – The volume of water per unit time that could be pumped from the well as determined by the pumping test.

C. Discharge Measurements

Discharge measurements are usually measured by a flow meter. If there is no device to measure the flow, then volumetric measurements will be resorted to. The volumetric method consists of noting down the time required to fill a container (bucket or a drum). Better results are obtained with a larger container. For more accurate results, several trial measurements should be done and the average of these trials taken.

D. Procedure

a. Prior to starting the pump, measure and record the static water level.
b. After starting the pump, measure the corresponding water levels. Discharge should be greater than the required yield and should be maintained at a constant rate during the entire duration of the test for 24 hours.
   Measurement intervals should be as follows:

Time from start of pumping	Time intervals between measurements
(min)	(min)
0 - 10	0.5 - 1
10 - 15	1
15 - 60	5
60 - 300	30
300 - end of test	60

c. Simultaneous with the water level measurements, take measurements of discharge.
d. Monitor nearby wells to determine effects during pumping.
e. Right after the end of the pumping test, measure the water level recovery.
f. Plot data obtained from the test on a semi-logarithmic paper showing the time in the abscissa (x axis) and the drawdown in the ordinate axis (y axis).

C.1.3 Major Causes of Deteriorating Well Performance

At the outset, in designing and constructing a well, care should be taken to prevent the major causes of eventual well deterioration. Following are five of the main causes of deterioration in well performance. Consider that the first four of these major causes of well deterioration are greatly influenced by the care taken in constructing the well.

a. Well yield reduction due to incrustation and growth of iron bacteria;
b. Plugging of well screen due to build-up of fine particles;
c. Sand Pumping;
d. Structural collapse of the well casing and screen; and
e. Condition of pump.

C.1.4 Pumping Stations Operation and Maintenance

C.1.4.a Pumps

Pump manufacturers always provide a manual for the operation and maintenance of their pumps. The instructions in these manuals, including the recommended maintenance schedule, should be followed. The instructions include greasing, oil inspection, checking of voltage at power source, adjustments and repairs.

If during inspection a defect is found, it should be repaired immediately. The operator should pay attention even to small defects, and not wait for them to worsen, as these could cause other parts or units to fail, resulting in larger damage and costlier repairs.

C.1.4.b Pump Log

A pump log should be maintained to record the daily pressure and flow readings of the pump. The time of the day when these readings are made should also be reflected.

The schedule for operating and stopping the well pumps should relate the pump capacity to the data on daily water demand and the water levels of the reservoirs.

C.1.4.c Pump Operations

The specified operation and maintenance procedure and schedule as provided by the manufacturers of pump shall always be followed. However, the following points shall be observed in the operation of the pumping equipment:

1. Avoid dry running of pumps
2. Centrifugal Pumps must be primed
3. Pumps should be operated only within the recommended range of head-discharge. If a pump is operated at a point away from the duty point, the pump efficiency reduces. Likewise, operation near the shut-off point causes substantial recirculation within the pump resulting to overheating.
4. Voltage during operation should be within +10% of rated voltage. Similarly, current should be below the rated current of the motor.

C.1.4.e Steps for Starting the Motor ON

Perform the following before starting the Pump:

1. Make sure that you are properly oriented and knowledgeable to the location,functions and how to operate/manipulate the following:
   - Circuit breaker, switches, fuses, relays, reset button, and variable frequency drive (VFD) of the motor control panel (MCC).
   - Metering devices and gauges like voltmeter, ammeter, pressure gauge and flow meter.
   - Discharge valve, blow off valve, check valve and pressure transmitter.

2. Open the MCC with the circuit breaker OFF and check visually for its physical condition, signs of overheating, loosed or detached wires, burnt components particularly in the power circuit and ensure that they are in good condition. Report signs of deterioration to the Water Sewerage Maintenance Head and Plant Electrician.

3. Always make it a point to go over the operation log book before powering up the motor and find out the important events that has transpired before your shift of duty.

4. Know the operating current and voltage of the submersible motor. Refer to the data on the logbook. Set the auto selector switch to OFF and then turn ON the main circuit breaker of the MCC.

5. Check if the supply line to line voltages is in accordance with the specified values or within safe operating range of the motor such as the supply line voltages should not exceed ± 10 % of the rated voltage of the motor.

   Example:

   Allowable voltage range:
   For a 220 volts motor: 198 – 242 volts
   For a 440 volts motor: 396 – 482 volts

6. Using a voltmeter, check for availability of three phase power supply. Never attempt to start the pump with single phase electrical power supply. Some MCC however, areautomatically inhibited from starting with abnormal power supply condition.

C.1.4.f Steps for Starting the Pump ON

1. Fully close the discharge valve, open the blow off valve at 1/3 opening and set the switch to manual position.
2. After satisfying the above requirements, start the submersible pump by setting the selector switch to manual mode, then press the start button. Should you want to operate in automatic mode, set the selector switch to automatic mode and no need to press the start button.
3. Once the MCC has commenced starting sequence, observe its operation. If the motor control is a variable frequency drive (VFD), the output frequency will increase gradually until the set frequency is obtained. This time, fully open the blow off valve, monitor the condition of water coming out of the blow off header and also monitor the line current readings.
4. If in starting you have encountered trouble, determine the cause. If it is a minor one, fix it. If it is a major one and you cannot repair it, shutoff the motor by pressing the stop button, switch off the main circuit breaker and report immediately to thepreventive maintenance unit.
5. Divert water output into the distribution pipe when the water coming out of the blow off header is already clear or at least 10-minutes flowing. After this, open the distribution valve while gradually closing fully the blow off valve.
6. Turn On the chlorine dosing pump and make sure that it is working properly.

C.1.4.g Steps for Starting the Pump ON

1. Stop the operation accordingly.
2. Throttle the discharge valve at 1/3 opening, then press the stop button.
3. Fully close the discharge valve.
4. Record the time, meter reading, flow totalizer reading and the kilowatt-hour reading the pump is stopped.
5. Turn off the main circuit breaker at the MCC.

C.1.4.e Pump Trouble Checklist

The manufacturer or supplier of the pump always provides the pump design curve which is the basic reference for evaluating actual performance. In addition to the comparison of actual performance against the design curve, the operator should be alert to the following indications of pump problems:

1. Excessive heating of the motor;
2. Change in the bearing noise level;
3. Change in the pattern of oil consumption of the motor;
4. Excessive vibration;
5. Change in amperage or voltage load;
6. Cavitation noise or other unusual noise; and
7. Presence of cracks or uneven settlement of the pad or ground around the pump.

C.1.5 Submersible Pumps

C.1.5.a Operation

Submersible pumps may be operated manually with a switch located above ground level or automatically with a pressure switch, electrodes or float control device.

Submersible pumps should always be operated below the water level. The pump should be installed higher than the well screen to prevent pump break suction which will lead to a burned pump motor.

C.1.5.b Repair & Maintenance

To begin a maintenance job analysis, the assigned person needs the following information:

1. Pump motor unit size and type;
2. Static and pumping water level of the well;
3. Size of drop pipe;
4. Pump setting;
5. Discharge pressure required;
6. Capacity pumped;
7. Line voltage; and
8. Operating Manual

C.1.5.c Common Troubles in Operating Submersible Pumps and their Remedies

TROUBLES	LIKELY CAUSES	REMEDIES
1. Pump motor fails to start	Motor Overload	Overloaded contacts close automatically. Check cause of overload.
	Low voltage	Check voltage
	Blown fuse, broken or loose connections	Check fuses, relays, electric condensers and all electrical connections.
	Motor control box not in proper position	Ensure box and repair the damaged cable.
	Damaged cable installation	Locate and repair the damaged cable.
	Cable, splice or motor windings may be grounded or wet.	Check the ground by using an ohmmeter. If grounded, pull out the unit and inspect cable and splice. Cut the unit loose from the cable and check each part separately using an ohmmeter.
	Pump stuck by corrosion or abrasive	Pull out pump, examine and remove foreign matter.
2. Pump runs but delivers little or no water	Pump not submerged	Lower the unit into the well or replace by a smaller capacity pump
	Discharge pipe may be leaking	Examine discharge line by pulling out one joint at a time.
	Check valve may be clogged or corroded	Pull out pump and clean or replace check valve
	Pump badly worn out by sand or abrasive	Replace pump. Clean well thoroughly of abrasive before putting the new unit in.
	Strainers or impellers clogged with sand or scale	Pull out pump unit and remove the scale/sand
	Scaled or corroded discharge pipe	Replace pipe
3. Pressure valve fails to shut	Switch may be defective or out of adjustment	Adjust or replace pressure switch
	Discharge pipe may be leaking	Raise unit one pipe joint at a time until leak is found. Repair leaks.

C.1.6 Centrifugal Pumps

C.1.6.a Operation

To operate a centrifugal pump, certain procedures need to be followed, which are found in the manual supplied by the manufacturer.

C.1.6.b Steps in Operating Centrifugal Pumps

a. Before starting the motor, make sure that the discharge gate valve is Closed.

b. If the pump is not self-priming or has defective suction line or foot valve, add priming water. Priming displaces the air in the suction line or drop pipe of the pump with water.

c. Allow the pressure to build up, and then slowly open the discharge valve. Doing this slowly avoid water hammer, which could destroy the pipes and valves.

d. Start the pump motor.

e. After the pressure has built up, slowly open the discharge gate valve. In case the pump has been primed with water, waste the water pumped during the first 1-2 minutes by opening the drain valve.

f. Make a routine check for faults in the operation of the system (abnormal noise, vibration, heat and odor)

C.1.6.c Repairs and Maintenance

Bearings, gears and other pump moving parts should be lubricated on the regular schedules, using the lubricants recommended by the supplier. The following are specific actions to remedy centrifugal pump problems.

a. Low pump efficiency

If the pump performance tests reveal that the pump is operating at significantly lowered efficiencies, the pump should be pulled out, inspected and repaired or reconditioned. This work is best referred for servicing to the manufacturer or a pump repair specialist.

b. Packing adjustment

The water flowing through the stuffing box should be maintained at a level just enough to prevent overheating. The gland nuts should be loosened or tightened one-quarter turn only to allow the packing to equalize against the pressure.

c. Checking and adjusting Misaligned Head shaft

Pump vibrations could indicate a misalignment of the head shaft.

This can be checked by the following procedure:

1. Remove the motor dust cover, motor head nut and key, and take out the motor drive flange.
2. Check if the head shaft is concentric with the motor hollow shaft bone.
3. If needed, adjust by using shims.

C.1.6.d Other Common problems and their remedies

TROUBLES	LIKELY CAUSES	REMEDIES
1. Pump motor fails to start	Blown fuse or open circuit breaker	Replace fuse or reset circuit breaker
	Motor or starting switch out of order.	Inspect/repair. Refer to equipment supplier or experienced mechanic or electrician.
	Break in wiring.	Repair circuit wires.
	Stuffing box may be binding or tightly packed	Check packing by manually rotating shaft. Loosen packing nut just enough to allow a slow seepage of water and free the shaft.
	Scale or sand in the impeller.	Open pump and remove scale by acid treatment and/or sand.
Pump runs but delivers no water	Pump lost first priming.	Repeat priming. Follow manufacturer's priming instructions.

	Pump repeatedly loses priming due to leaky drop pipe or suction pipe.	Pull out drop pipe and seal the leaks
	No water at source due to over pumping	Reduce pumping rate or deepen the well.
Pump runs but delivers only a small amount of water	Well not yielding enough water.	Do pumping test or deepen the well.
	Air leaks in suction pipe.	Pull the drop pipe from the well & seal leak/s.
	Impeller is worn out or lugged with scale or trash.	Open the pump and clean/replace impellers.
	Foot valve may be obstructed.	Clean foot valve.
Noisy Pump	Bearing or other working parts of pumps are loose or need to be replaced	Tighten or replace defective parts.
	Pump motor is loosely mounted.	Tighten mounting
	Low water level in well	Reduce pumping rate
	Presence of air in suction line	Repair air leaks

C.1.7 Other Causes of Pump Failures

1. Over pumping

- More water is pumped than the capacity of the well. It will lower the water level in the well, consequently reducing the discharge, and in the case of submersible pumps, damage the pump motors. It will also result in sand clogging the well screen.
- It can be avoided by reducing the pump discharge or increasing the well capacity (rehabilitating or deepening the well). The safe pumping level should first be determined from the well driller or from the well drilling records.

2. Corroded Well Casing

    - Well casing is used to prevent the collapse of the hole and entrance of undesirable water into the well. Corrosion is caused by the direct reaction between the water and casing material.
    - The problem of corroded well casing can only be solved by drilling a new well or inserting a smaller diameter casing inside the corroded one. In such a case, it is necessary to consult with an experienced driller.

3. Incrustation or clogging of Well Screens

    - It may be caused by direct deposition of suspended fine sand, formation and deposition of calcium carbonate, and deposition of slimy matter resulting from the biological activity of bacteria.
    - Incrustations caused by the deposition of suspended matter and/or scale can be corrected by surging or by muriatic acid treatment. Clogging due to bacteria can be corrected by chlorination. This procedure must be referred to an experienced driller.

4. Cavitation

    - It is one of the most serious operational problems with centrifugal pumps. When it happens, cavities or bubbles of vapor form in the liquid. The bubbles collapse against the impeller, making a sound as though there were rocks in the pump. If left uncorrected, cavitation will seriously damage the pump. Cavitation develops when normal pump operating conditions are exceeded. The results are noise, vibration, impeller erosion, and reduction in total head and efficiency.

      Typical Causes of Cavitation

        a. The pump is operating with too great a suction lift.
        b. A suction inlet is not sufficiently submerged.
        c. The impeller vane is traveling at higher revolutions per minutes (rpm) than the liquid.
        d. Suction is restricted
           (Note: Do not throttle the suction of a centrifugal pump)
        e. The specific pump speed is too high for the operating conditions.
        f. The liquid temperature is too high for the suction conditions.

C.1.8 Pump-Set Performance Testing

Pumps are always supplied with pump curves data when newly purchased. The pump curve shows the pump efficiency at its operating conditions. Note that the head curve for a radial flow pump is relatively flat and that the head decreases gradually as the flow increases. Note also that the brake horsepower increases gradually over the flow range with the maximum normally at the point of maximum flow.

The three pump characteristics shown in the graph are:

1. Head Capacity
2. Power Capacity
3. Efficiency Capacity

As the pump ages or is affected by operating problems, its efficiency will drop causing reduced pump capacity and higher operating cost. This loss of pump capacity can be determined by a pump set performance testing.

Periodic checking of the pump set (pump and motor) will disclose deterioration of operation before any serious problems develop. A performance check should be carried out every year or as often as required, especially when the pump is subjected to severe conditions such as corrosion, sand pumping, abrasion or cavitation.

C.1.9 Guidelines for Performance Test

1. The test should be carried out at the pump's normal operating conditions and at 2 points above and below this condition.
2. Shut-off and fully-open discharge valve positions should also be checked (do with the previously obtained ratings or original pump curve points not exceed 3 seconds for shut off).
3. Test data are recorded and compared.

   The pump station normally has 2 devices for measuring flow measurement: one uses the orifice equipped by-pass and table values; and the other uses the flow meter which is read directly. If there is no flow meter or orifice device in the by-pass pipe, flow measurements can still be made using volumetric measurements or horizontal flow measurements.

1. Test Procedure Using an Electric Motor as Prime Mover

a. Close the distribution discharge valve and half open the by-pass valve;
b. Start operating the pump set and let it run for about 5 minutes for water level to stabilize;
c. Manipulate the discharge valve to the following settings while taking pressure and flow measurements:
    - Operating pressure
    - Operating pressure less 10 psi
    - Operating pressure plus 10 psi
    - Operating pressure plus 20 psi;
d. Shut off pressure (do not exceed 3 seconds for this setting).

2. Analysis of Pump set testing Results

a. Reduced Head Curve, Pump Efficiency and Brake Horse Power (BHP)
    - Reduction on all 3 curves is brought about by worn impellers.
    - Ample clearance should be provided to prevent impeller abrasion by sand.
    - Impeller abrasions will result in reduced water yield. In such a case, the pump should be pulled out and repaired.

C.1.10 Maintenance of Pump Station and Surroundings

The operator should at all times maintain the cleanliness of the pump station and its surroundings not only for aesthetic reasons but also for sanitary reasons. Water users usually associate the quality of the water with the condition and cleanliness of the facilities. If these are in poor condition, the water quality will be subject to doubt. The pump station and the surroundings should be periodically cleaned. Rubbish should be disposed of, the dust swept out. The pump house should be kept in good repair and, when needed, painted. Ideally, trees and plants should be planted in the premises.

C.1.11 Electric Motor Routine Maintenance

The most important items for good maintenance of an electric motor, aside from checking for bearing wear, are regular use, and keeping it warm (from operation), clean, and dry. Moisture is an enemy of insulation along with oil and dust. Every motor should be operated for 5-6 hours at least every week. The longest useful life of a motor is obtained from a unit which is never shut down and cooled off, especially in a humid climate.

Listed below are some maintenance tips:

A. Every Day:

1. Check temperature of motor housing with hand.
2. Check lubrication reservoir level.
3. Check air vents for blockage.
4. Check external wiring for frayed insulation or loose connections.
5. Check voltage and current at each leg of the three phases.

B. Every Month:

1. Check motor housing temperature.
2. Check shaft alignment.
3. Check input horsepower under load.

C. Every Year:

1. Vacuum all dust out of windings and motor case.
2. Drain lubricant, flush out oil reservoir with kerosene, and replace with factory- approved lubricant.

D. Every Three Years:

1. Examine winding insulation for damage.
2. Clean oil connectors and contact points with fine emery cloth.
3. Inspect shaft and bearings for scour, wear or damage.
4. Check input horsepower under load.

C.1.12 Chlorinator Operation and Routine Maintenance

Hypochlorinator / Dosing Pump

1. Read the Instructions provided in the manufacturer's Manual.
2. For maintenance purposes, it is essential to clean the strainers and tubings as often as necessary or at least twice monthly. If the tubings are not cleaned, the chlorine granules can re-solidify and cause blockages.

C.2 Distribution System Flushing

The distribution system should be flushed to maintain water quality, remove sediments, maximize hydraulic capacity, and remove stagnant water at dead-ends. Water mains may also be flushed periodically throughout the year in response to customer complaints as well as non-compliant samples, and by direction from the local officials. Uni-directional flushing is recommended as it is typically the most effective method of flushing a water distribution system as it starts at the source and progresses from the largest to the smallest mains in a systematic manner. A flushing program should also incorporate hydrant maintenance and valve exercising.

Prior to Flushing Checklist

- Pre-plan the flushing sequence using system maps. Select the flush-out locations and consider installing new ones where necessary.
- Review drainage of flushing points.
- Notify customers in advance of possible impacts and duration.
- Ensure reservoirs are full to provide adequate amount of flushing water.

While Flushing Checklist

- Flushing velocity should be at minimum 0.75 m/sec (2.5 ft/s), but 1.5 m/sec (5.0 ft/sec) is preferred in order to achieve suitable biofilm removal.
- Open hydrant for a period long enough (5-10 minutes) to stir up deposits inside the watermain. Flush until the water is clear.
- Assure that system pressures in other parts of the distribution system do not drop below 140 kPa (20 psi).

- If discharging into a drainage course, check chlorine residual concentrations to ensure that chlorine has dissipated by the time the water reaches fishery habitat, or use a de-chlorinating agent to consume the chlorine.
- Collect two water samples from a flowing hydrant; the first after 2 or 3 minutes of flushing and the second just prior to closing the hydrant. Sample for chlorine residual, turbidity, and iron (where applicable).
- Document results and update records. See sample Flushing Logs.
- Open the control valve to allow water to flow and observe for leaks;
- Backfill and restore surface to its former condition.

C.3 Reservoir

C.3.1 Operation

Water for distribution is pumped from the water source to the system's water tank or reservoir, from which it is delivered to the consumers through the pipelines. The reservoir is designed, based on the requirements of the system, to distribute the water by booster pump.

C.3.2 Cleaning

The quality of water coming from the reservoir must be maintained within the standards for potable water. To ensure the quality of the water supply, the reservoir must be cleaned and disinfected periodically. Failure to apply this routine will result in the accumulation of solids and proliferation of bacteria in the tank, making the water unsafe for drinking. Cleaning is usually done once a year, but it always must be done whenever the water in the reservoir contains an appreciable amount of dirt.

Important Safety Precautions

When cleaning reservoirs, workers must work in pairs – one to go down and the other to keep watch over the one inside the reservoir. Proper ventilation must be ensured at all times during the cleaning or repair operations.

a. Checking Sediment Levels

1. Reduce the water level down to 15-20 cm above the bottom of the tank;
2. Stir up the water;

3. If the bottom appears to be clean and sediments are either minimal or not present, cleaning is not needed.

b. Cleaning

1. When the check confirms that an appreciable number of sediments has accumulated in the reservoir, cleaning should proceed;

2. Brush the walls, column, ladders, and other parts of the reservoir to remove adhering dirt particles and algae, if any;

3. Open the drain valve to drain the remaining water to waste. While draining, agitate the water to keep the dirt particles from settling, and sweep the sediments in the water towards the outlet;

4. Disinfect the tank by any of the following methods:
   - Fill the tank with 50-mg/l chlorine solutions and allow the solution to stand for 24 hours before draining it to waste;
   - Alternatively, mix bleaching powder and water in a pail or bucket to form a thin paste. Using a brush, apply the thin paste forcefully on the interior surfaces of the reservoir. Allow one hour to pass before rinsing the tank with clean water;

5. Put the tank back into operation after rinsing it with clean water.

Important Precaution on Chlorine

During disinfection work (which includes the task of rinsing of the reservoir to remove the bleach), the working men must be wear breathing apparatus and full protective clothing.

In case the bleaching powder solution accidentally gets into contact with the eyes, immediately wash eyes with copious amounts of clean water. After the disinfection job, all men involved in the work must shower or wash their entire bodies thoroughly.

C.3.3 General Precautions

1. All fence gates, access hatches and manholes of reservoirs should be locked. Storage facilities tend to attract children who like to play around the facilities, climb the ladders and play on top of concrete roof. Never leave a storage facility without locking all access openings.
2. Vandals are known to intentionally damage storage facilities. If a covered storage facility is found to have been forced open, it must be assumed that the water has been contaminated. Therefore, the reservoir should be drained to waste and disinfected before being refilled with new water. All fences should be maintained in good condition.
3. Keep reservoir roof ladders and walkways free of dirt, debris and grease to prevent slipping and contamination.
4. Never enter a closed reservoir alone without someone standing by to help if you get in trouble.
5. Keep alert for cracks/leaks in the reservoir and repair these at once.
6. Never store unchlorinated water in a reservoir for more than 72 hours.

C.4 Leak Detection

C.4.1 Water Audit

Water Audit can be defined as the assessment of the capacity of total water produced and the actual quantity of water distributed throughout the service area leading to an estimation of the losses otherwise known as non-revenue water (NRW). Non-revenue water is the volume difference of the water produced and the water billed.

The Water Audit Method takes the approach that all water is accounted for and quantified as either a component of beneficial consumption or a wasteful loss. By measuring (metering) or estimating water quantities under this approach, no water is unaccounted for.

This methodology not only assists the water district in identifying where their losses are occurring, but also expresses by volume how much is lost and associates a cost to those losses. It also standardizes the water audit reporting process for water utilities.

C.4.1.a Non-Revenue Water

Non-revenue water (NRW) is water that has been produced but does not result in revenues for the water district. NRW is typically measured as the volume of water "lost" as a share of net water produced.

1. Analyzing NRW Water:

The percentage NRW can be determined by the formula:

NRW(%) = ((Water Produced - Water Billed) / Water Produced)* 100

To accurately determine NRW, reliable and functional meters must be installed at all sources and service connections.

2. Benefits of NRW Reduction

- Financial gains from increased water sales or reduced water production, including possibly the delay of costly capacity expansion;
- Reduced operational cost which will result in a lower tariff;
- Increased firefighting capability due to increased pressure;
- More consumers can be served, or longer operational hours;
- Easier to sell increased tariffs; and
- Reduced risk of contamination.

The water district should bring the NRW down to 20% or below. However, the cost of the efforts to reduce NRW should be guided by the principle of "not spending ₱2 in order to earn ₱1".

3. Sources of NRW

NRW can be analyzed on whether they are physical losses or losses due to commercial policies or deficiencies.

a. Physical Losses
   - Leaks/breaks
   - Illegal connections
   - Water usage by utility (flushing, etc.)

b. Commercial Losses
   - Non-metered connections
   - Under-registration of meters
   - Poor collection performance

4. NRW Reduction Approaches

A number of approaches have been used successfully by some of the major water utility companies.

a. Isolation of zones and the continuous measurement and analysis of inflows to determine areas with high NRW.
b. Programs to improve the reliability of customer metering and reading.
c. Hydraulic analysis of the distribution system to determine calculated versus actual pressures. (This requires updated system maps.)
d. Analysis of maintenance records to determine what repairs have been done, where, and their frequency. This may lead to decisions to replace rather than repair some pipelines. (For this reason, it is important to inculcate among field personnel the value of clear, reliable reports, and to have a good user-friendly repository of records.)
e. Leak detection programs. While there should be a continuing program of leak detection, periodic high-visibility campaigns involving the public have also been found to be effective.
f. Modulation of pressure in the pipelines. Higher pressures will naturally increase the rate of leakages.
g. Strengthening the procurement and stock management of critical and often used repair and maintenance materials, so that these will always be available when needed. While many repairs can be done with readily available substitute materials, temporary stop-gap solutions cannot be relied upon to fix long term and recurring problems.
h. Continuous management attention: The reduction of NRW should be considered by management and the board as a continuing oversight concern.

5. NRW Survey

When NRW is analyzed to have increased, due likely to pipeline leaks, an NRW survey should be carried out to pinpoint the problem.

The steps are as follows:

1. Divide the entire distribution system into zones;
2. Isolate the different zones by closing or installing appropriate control valves. Observe the water consumption rate in each zone and compare with billed consumption. Determine the zones with abnormally high NRW;
3. Divide the pinpointed zones, which consume a large quantity of water into sub-zones. The water inflow can be measured using zone and sub-zone meters;
4. Isolate these different sub-zones and study their respective NRW;
5. Select the sub-zones(s) with unusually high-water consumption rates. Subdivide further and measure their water consumption rate;
6. Repeat the above process until the locations of leak(s) are pinpointed.

C.5 Chlorination

There are a lot of methods of water disinfection but chlorination is commonly used and the method being adopted by Manaoag Water District. Drinking water is chlorinated to kill bacteria, viruses and parasites, which may exist in water and may cause illness and disease.
The requirement is to maintain a minimum of 0.3 mg/l residual chlorine in potable water at consumer tap end.

Generally, chlorination without filtration or other treatment process is effective and adequate to the water of Manaoag as the degree of its bacteriological pollution is moderate.

C.5.1 Hypochlorinator / Dosing Pump

The Manaoag Water District is using hyphochlorinator in chlorination. It is most commonly used equipment for chlorination.

The hypochlorinator is a pump used to add hypochlorite solutions to water at a manually adjustable feeding rate. The hypochlorite solution is pumped from a container into a water pipeline. Due to the corrosiveness of the hyphochlorite

solutions, the critical parts of the pump are made of chemically resistant plastic and synthetic rubber.

Hypochlorinators are kept in a separate room away from other equipment, tools, controls and the like because of the corrosiveness of the solution.

C.5.2 Chlorine Demand and Dosage

Water and the substances that are in it consumes chlorine. The water chlorine demand plus a certain residual or remaining chlorine shall be the required dosage of the chlorine solution. The amount of chlorine to be used in a day (dosage rate) must be established to answer for the chlorine demand and the residual.

The required chlorine residual range is from 0.2 to 0.5 mg/l taken at the consumer's faucet.

The water chlorine demand must be determined daily. Even if the chlorine demand of a particular source does not change much over the years, it is still good to measure the chlorine demand and residual every day to determine the accurate chlorine dosage to be used.

There are two ways of determining the chlorine dosage. Method 1:

1. Dose the water supply with an arbitrary amount, say 1mg/l;
2. Wait for 30 minutes and measure the chlorine residual.
3. If residual is zero or less than 0.2 mg/l, increase the dosage until the right residual is obtained.
4. If residual is more than 0.5 mg/l, then the dosage can be reduced.

Method 2:

Use a 1% chlorine solution to conduct the following procedures:

1. Prepare a 1% chlorine solution
2. Take 4 non-metallic containers of known volume (e.g., 20-liter buckets);
3. Fill the containers with some of the water to be treated and check the pH of the water;
4. Add to each bucket a progressively greater dose of 1% solution with a measuring device:
    - 1st container: 1 ml
    - 2nd container: 1.5 ml
    - 3rd container: 2 ml
    - 4th container: 2.5 ml

5. Wait 30 minutes. (This is essential as this is the minimum contact time for the chlorine to react. If the pH of the water is high, this minimum time will increase);
6. Measure the free chlorine residual in each bucket;
7. Choose the sample which shows a free residual chlorine level between 0.2 mg/l and 0.5mg/l;
8. Extrapolate the 1% dose to the volume of water to be treated;
9. Check chlorine demand at several water distribution points and adjust if required.

C.5.3 Measuring Chlorine Residual

When chlorine cannot be detected within the distribution system, it means that it has reacted more or less completely with the water and the impurities in the water. At this point, there is no freer chlorine to act effectively as a disinfectant.

Three types of chlorine residuals can be measured:

- Free chlorine: which kills microorganisms most effectively;
- Combined chlorine: formed when free chlorine reacts with other chemicals in water, forming other types of chlorine-based compounds;
- Total chlorine: the sum of free and combined chlorine.

Free chlorine is very unstable and is prone to be reduced quickly. Sunlight and the stirring of the water will cause free chlorine to react with the water and other matter, and thus disappear more quickly. For this reason, chlorine should be tested on site.

The comparator uses a reagent which reacts with the chlorine to give the water a reddish color. A color chart is then used to compare the color of the mixture to different colors with given pH values. The general procedures in measuring the free chlorine residual using a comparator is as follows:

1. Fill a viewing tube with 5 ml sample water and place this tube in the top left opening of the comparator;
2. Fill a second viewing tube with 5-ml sample water;
3. Add the contents of one DPD Free Chlorine Reagent sachet to the second tube and swirl to mix;

4. Place the second tube in the top right opening of the comparator;
5. Hold comparator up to a light source (sky, window or lamp) and look through the opening in front;
6. Rotate the color disc until the colors in the 2 openings match;
7. Read the mg/l free chlorine in the scale window. (This reading must be done within one minute after adding the powder reagent);
8. If the free chlorine residual is lower than 0.1 mg/l, proceed with the total chlorine residual test using the same procedures as above but with the Total Chlorine Reagent sachet;
9. If the total chlorine level is higher than free chlorine, it is obvious that combined chlorine is present. In that case you need to add more chlorine or increase dosage.

Chlorine residuals in water of greater than 0.7 mg/l can already be tasted. Unless otherwise indicated for health reasons, it is best to keep residuals below this level to avoid taste issues and to reduce chemical costs.

C.5.4 Chlorine Dosages

The commonly used dosages for various disinfection requirements are as follows:

1. For disinfection of water supplies:
   - Dosage: 0.5 – 2.0 mg/l
   - Contact Time: 20 – 30 minutes

2. For disinfection of newly constructed/repaired wells, storage tanks, pipelines, spring box, etc.:
   - Dosage: 50 mg/l
   - Contact Time: 24 hours or
   - Dosage: 300 mg/l
   - Contact Time: 1 hour

Example of Dosage Calculation

Given:

Water Production: 80 lps

Required Residual: 0.2 mg/l

Chlorine Demand of Water: 0.5 mg/l

Required:

Dosage and Dosage Rate

Dosage = Demand + Residual
= 0.5 + 0.2
= 0.7 mg/l

Dosage Rate using Calcium Hypochlorite:
Calcium Hypochlorite has 70% available
Chlorine Water Production = 80 lps*3600sec/hr * 24hrs/day
= 6,912,000 lpd

Dosage Rate = 0.7 mg/l / 0.7 * 6,912,000 lpd
= 6,912,000 mg
= 6.92 kg per day

Preparation of Solution

1. The concentrated hypochlorite solution is prepared in a tank with capacity suitable for 24 hours requirement.
2. The powder is first put in the tank and water is sprinkled on the powder.
3. The solution is mixed thoroughly by hand or by a motor driven stirrer.
4. The solution is then ready for feeding in the system by hypochlorinator.

The solution should have a contact period of at least 20 minutes between the point of injection and the first service connection.

C.5.5 Hypochlorinator Operation and Maintenance

1. Read the Instructions provided in the manufacturer's Manual.
2. For maintenance purposes, it is essential to clean the strainers and tubing as often as necessary or at least twice monthly. If the tubing is not cleaned, the chlorine granules can re-solidify and cause blockages.

C.5.6 Chlorine Residual Monitoring and Report

Generally, chlorine residual measurement is taken daily at pipeline extremities and these points correspond with the sampling points for Bacte-Test.

The daily measured chlorine residual should be recorded and summarized in the chlorine residual log. Any abrupt change in chlorine residual should be reported immediately and an investigation should be initiated to find the cause.

C.6 Water Quality Monitoring

C.6.1 General

The Department of Health as part of their mandate, has formulated standards for drinking water which establishes limits for different impurities found in drinking water. The Philippine National Standards for Drinking Water (PNSWD) was instituted to achieve more comprehensive parameters to address issues on water quality. It also advocates for an efficient water quality monitoring system by prioritizing the parameters that need to be monitored.

Some benefits of implementing a thorough monitoring program include:

- Reducing risk to public health by early detection and mitigation of declining or unacceptable water quality;
- Supporting due diligence and increasing public trust;
- Maximizing the efficiency of treatment processes at the treatment facility; and
- Guiding operation and maintenance activities to address water quality in the distribution system.

C.6.2 Requirements

The water produced by the Water District must undergo laboratory examination to determine fecal contamination of water or microbiological quality. Because of high probability of microbial contamination, the examination is conducted frequently. The PNSDW recommends a minimum of 1 sample per month for every 5000-population served.

The Water District is also required to conduct at least once a year, the physical and chemical quality analysis of the existing sources of the water system.

The results of the microbiological monitoring and the physical and chemical quality analysis of water must be submitted to the Local Water Utilities Administration and to the City Health Office.

C.6.3 Microbiological Quality

Drinking-water supplies should be free from contamination by human and animal excreta, which can contain a variety of microbial contaminants. Practically, all pathogenic organisms that can be carried by water originate from the intestinal tract of warm-blooded animals.

Water intended for human consumption should contain no indicator organisms. Frequent examinations for fecal indicator organisms remain as the most sensitive and specific way of assessing the hygienic quality of water.

To determine the safety and acceptability of drinking-water supply, appropriate laboratory examinations should be conducted on representative samples of water taken at all critical stages in the production and consumption of water supply.
These stages include, and not limited to: the water sources, in the course of and after the treatment process, and from a reasonable number of points in the distribution network.

The sampling points of Manaoag Water District for microbiological testing is indicated in the Table below. Test are conducted by DOH accredited laboratories in Pangasinan.

Standard Method of Detection and the Values for Microbiological Quality.

Parameters	Method of Determination	Value	Unit
Total Coliform	Multiple Tube Fermentation Technique (MTFT)	< 1.1	MPN/100ml
	Membrane Filter (MF) Technique	< 1	Total Coliform Colonies/100ml
	Chromogenic Substrate Test	< 1.1	MPN/100ml
Fecal Coliform	Multiple Tube Fermentation Technique (MTFT)	< 1.1	MPN/100ml
	Membrane Filter (MF) Technique	< 1	Total Coliform Colonies/100ml
	Chromogenic Substrate Test	< 1.1	MPN/100ml
Heterotrophic Plate Count	Pour Plate	< 500	CFU/ml
	Spread Plate		
	Membrate Filter Technique		

The volume of sample should preferably not less than 100 ml. The sampling bottles, normally 120 ml capacity are provided by the laboratory which are already cleaned, sterilized and capped properly.

C.6.4 Sample Collection, Handling and Storage

The sample should be representative of the water under examination. Contamination during collection and before examination should be avoided.

The tap should be cleaned and free from attachments and fully opened with water allowed to waste for a sufficient time to permit the flushing/clearing of the service lines. Flaming is not necessary. Taps with a history of previous contamination may be disinfected with hypochlorite solution (NaOCl 100 mg/L). No samples shall be taken from leaking taps.

The sampling bottle should be kept unopened until it is ready for filling. Remove stopper or cap as a unit; do not contaminate inner surface of stopper or cap and neck of bottle. Fill container without rinsing, it should be filled without rinsing and ample space (at least 2.5 cm) must be left to facilitate mixing by shaking. Replace stopper or cap immediately.

Water samples should be processed promptly or within six (6) hours after collection or if not possible the use of ice coolers for storage of water samples during transport to the laboratory is recommended. The time elapsed between collections and processing should in no case exceed 24 hours.

Sample bottles must be tagged for identification.

C.6.5 Chemical and Physical Quality

C.6.5.a Chemical Contaminants

Various forms of chemicals, which occur naturally in the environment and in raw water may be found in drinking water supplies. There are few chemical constituents of water that can lead to acute health problems. Inorganic constituents suspected as carcinogenic includes arsenic, lead, chromium and cadmium among others. Organic constituents in water comes from decomposition of organic debris and from agricultural and industrial activities.

C.6.5.b Acceptability Aspects

The chemical and physical quality of water may affect its acceptability by consumers. Although acceptability aspects of drinking water quality i.e., taste, odor, color do not have adverse health implications, standards are set to satisfy the need of consumers for a colorless, odorless and tasteless drinking water.

LWUA has required annual submission of physical and chemical quality analysis of the water sources of the water districts. The standard values for physical and chemical quality requirements of drinking water supply based on priority parameters set by LWUA and the local health office is shown in the following table.

Standard Values for Physical and Chemical Quality
on Priority Parameters

Constituents	Maximum Level	Unit
A. Inorganic Constituents		
Arsenic	0.05	mg/l
Cadmium	0.003	mg/l
Lead	0.01	mg/l
Nitrite	3	mg/l
B. Organic Constituents		
Benzene	0.01	mg/l
C. Aesthetic Quality		
Color	5	True Color Units
Turbidity	5	NTU
Chloride	250	mg/l
Iron	1	mg/l
Manganese	0.4	mg/l
pH	6.5-8.5	number
Sulfate	250	mg/l
Total Dissolved Solid (TDS)	500	mg/l

C.6.6.c Water Sampling for Chemical and Physical Analysis

Water samples for chemical and physical analysis shall be taken at all water sources of the Water District at least once a year.

Volume of Sample

Three (3) liters of sample should suffice for physical and chemical analyses.

C.6.6.d Container

Sample containers must be carefully cleaned to remove all extraneous surface dirt, thoroughly rinsed with distilled water, and drained before use. Suitable containers may be of a chemically resistant glass, polyethylene plastic or hard rubber.

Cork stoppers wrapped with relatively inert metal foil are suitable for many samples or caps of polytetrafluoroethylene (PTFE).

When filled with water sample, leave a space about 1% of the capacity to make room for liquid expansion.

Sample containers must be properly labeled with the following information:

Date and time of sampling
Source of sample
Point of sampling *(In sufficient detail to enable anyone to collect a second sample from the identical spot from which the first sample was taken)*
Temperature of the sample
Sampled by: *(name of collector)*

C.6.6.e Sampling Collection

Collect samples from wells only after the well has been pumped sufficiently. New wells will require sufficient extraction before sampling.

Before samples are collected from distribution systems, flush the lines sufficiently to ensure that the sample is representative of the supply.

C.6.6.f Container

Sample containers must be carefully cleaned to remove all extraneous surface dirt, thoroughly rinsed with distilled.

C.6.6.g Sample Handling and Storage

In general, the shorter the time lapse between collection of a sample and its analysis, the more reliable will the analytical results be.

For certain constituents and physical values, immediate analysis in the field is required in order to obtain dependable results, because the composition of the sample may change before it arrives at the laboratory.

Changes caused by the growth of organisms may be greatly retarded by keeping the sample in the dark and at a low temperature until it can be analyzed.

It is necessary to keep the samples cool or refrigerated. Storage at a low temperature (4oC) is the best way to preserve most samples.

III.D ENGINEERING AND CONSTRUCTION DIVISION

D.1 Transmission Pipelines

D.1.1 General Objective of Transmission System

The overall objective of a transmission system is to deliver water from the source to the storage reservoirs or directly to the distribution networks.

The objective of operations and maintenance of transmission system is to achieve optimum utilization of the installed transmission capacity. Over the years, the Water District has developed operation procedures on the transmission lines to ensure that the system can operate satisfactorily and f unction efficiently and continuously.

The water system of MANWAD has pressurized transmission lines that deliver water from pumping stations or booster stations.

D.1.1a Problems in Transmission Pipelines of Pumping Stations

The source and the distribution system are connected by the transmission mains. Any failure in the transmission line is a failure of the whole system. Normal problems with the transmission line of a spring source are caused by heavy rains, improper operation and lack of understanding or information on the transmission system.

D.1.1.aa Turbid Water

It is of utmost concern of the water district not to allow turbid water to enter the transmission line. Turbid water will make the supply not potable and will introduce sediments to the pipelines. Sediments that accumulated at low points of the transmission line will require thorough flushing. The blow-off valves are provided on the lowest point of the transmission line for flushing purposes. These points should be regularly flushed.

D.1.1.ab Improper Valve Operation

Improper operation of on-line valves may result to pipe damage, reduced capacity, or water contamination. For a gravity transmission line, if a downstream valve is shut off, high static pressure may occur that can damage mechanical joints or the valve itself. On the other hand, if an upstream valve is turned off, vacuum may be created inside the pipe due to suction that may result to pipe damage or distortion. It may also allow entry of contaminants through the leaks on the pipelines.

D.1.1.ac Air Entrapment

Air may also be entrapped inside the pipe that can cause reduced discharge and high head loss. Air collects at the high points of the transmission mains. The air release valves on these points should be regularly checked for proper functioning.

D.1.1.ad Water Hammer

Closing a valve abruptly will create water hammer that can damage pipe. The magnitude of the water pressure created by water hammer and its oscillating effect may be sufficient to rupture the pipeline. Care should be taken in opening and closing of valves in the transmission line.

D.1.1.ae Leakages

Leak in transmission lines is not always visible. Invisible leaks are hard to locate. Most common leaks are through the welded joints of the steel pipes. Leaks also occur through flexible joints where the bolts have become loose and gland packing is not in position.

Leaks through air valves occur due to improperly seated ball either due to the damage of the gasket or due to abrasion of the ball, through the gland of the isolating sluice valve or through the small orifice.

Review of flow meter data will indicate possible leakages. Any abrupt increase in flow is an indication of major leak on the transmission line. Changes in pressure readings may also suggest a leak.

Soft water ph level:	7 below
Normal water ph level:	7 – 7.3
Hard water ph level:	7.4 above

D.1.2 Problems in Transmission Pipelines of Pumping Stations

Transmission line of pumping stations have minimal problems on contamination, turbidity, and air entrapment. The only major problem is the backflow and the water hammer it creates when the pump is suddenly turned off. The volume of water initially being pumped in the transmission pipe will backflow to the pumping station when the pump is shut off or when power failure occurs. The backflow may be so severe that can damage the pump or the discharge line appurtenances or the transmission pipe itself.

D.1.3 Operation and Maintenance Activities

D.1.3.a Mapping and Inventory of pipes and fittings

An updated transmission system map with location valves, flow meters and pressure gauges, air release valves, blow-off valves, river crossing and other pipeline fittings is the foremost necessity for a good operation.

The valves indicated in the map should contain direction and number of turns to open, record the number of turns, location and the date completed.

D.1.3.b System Pressure and Flow Rate

It is essential to maintain a continuous positive pressure in the transmission main. Pressure gauges should be read and recorded daily. Low pressure incidence should be investigated immediately.

Flow measurement should be taken and recorded daily. Any abrupt change in flow rate should be investigated.

D.1.3.c Inspection

Regular inspection of the transmission line route should be conducted to detect and correct the following:

- Any sign of deterioration of the transmission system.
- Any encroachment to the transmission system
- Unauthorized tapping or connection
- Any act of vandalism.

D.1.4 Maintenance of Pipelines

Pipeline bursts/main breaks can occur at any time and the Engineering and Construction Division shall have a plan for attending to such events. This plan must be written down, disseminated to all concerned and the division must always be in readiness to implement the plan immediately after the pipe breaks reported. After a pipe break is located, determine which valve is to be closed to isolate the section where the break has occurred. Some important consumers may be on the transmission system and having an industrial process dependent on water supply which cannot be shut down as fast as the water supply lines are cut off and should be notified about the break down. These consumers have to be informed about the probable interruption in water supply and also the estimated time of resumption of water supply.

After the closure of the valve the dewatering/mud pumps are used to drain the pipe breakpoints. The sides of trenches have to be properly protected before the workers enter the pit. The damaged pipe is removed, and the accumulated silt is removed from inside the pipe and the damaged pipe is replaced and the line is disinfected before bringing into use. A report shall be prepared following every pipe break about the cause of such break, the resource required.

D.1.4.a Scouring of Pipelines

It is done to clean the transmission lines by removing the impurities or sediment that may be present in the pipe. This is particularly essential in the case of transmission lines carrying raw water.

D.1.4.b Leakage Control

Visible leaks: The plumbers can report visible leaks found by him to his superiors. Critical areas where leaks often occur have to be identified and appropriate correct measures have to be implemented.

D.1.4.c Chlorine Residual Testing

A minimum free chorine residual of 0.2 mg/lit at the receiving reservoir of a transmission system is needed to be maintained. Absence of residual chlorine could indicate potential presence of contamination in transmission system.

The following steps which are required to be taken are:

- Testing of residual chlorine
- Checking the chlorination equipment at the start of the transmission system.
- Searching for source of contamination along the transmission system which has caused the increase in chlorine demands.
- Immediate rectification of the source of contamination

D.2 Distribution System Operations and Maintenance

The operation and maintenance of a water distribution system has the following general objectives:

- To ensure adequate pressure in the system 24 hours;
- To minimize non-revenue water (NRW);
- To ensure that the water delivered is potable.

The distribution system consists of the following components:

1. Distribution pipelines
2. Storage tanks or reservoirs
3. Service connections or standpipes
4. Valves and other appurtenances

D.2.1 Distribution Pipelines

Distribution pipelines must be able to convey quality water reliably and efficiently to the consumers and keep it from being contaminated along the way.

D.2.1.a Sound Operation Practices

Properly constructed, pipelines can provide years of trouble-free operations. However, sound operation practices need to be observed, both to ensure water quality and to prevent the deterioration of pipeline efficiency. Sound operation practice can be summarized as follows:

- Always maintain positive pressure in the pipeline. Negative pressure could result in backflow that may contaminate the system.
- Open and shut off the valves gradually. Abruptly opening or shutting might produce water hammer that could damage the valves and weaken the pipe joints.
- Implement an appropriate flushing program to clear sediments from the system. Dead-end points and low-level sections of pipelines are prone to sediment

accumulation. Regular flushing of these sections should be implemented and if necessary permanent blow-offs must be provided.

D.2.1.b Preparation for Repairs

Pipeline leaks and breakages can and will happen. Water main breaks need to be repaired with as little delay as possible. Personnel should be trained to work with minimal delay so as not to prolong inconvenience to the public.

The following tasks should be done in advance in order to eliminate delays in getting the needed repair work started:

- List of key personnel for repair works and their contact numbers should be readily available.
- Keep the following tools available and ready for use at all times; valve keys, hand tools, digging tools, pavement breakers, dewatering pump, floodlights, etc.
- Keep a stock of sleeve type coupling or mechanical-joint repair fittings in different pipe sizes.

D.2.1.c Location of Water Mains

The exact location of pipes should be indicated in the as-built drawings of the distribution system. The drawing should also indicate the size, material, and location of valves, fittings and appurtenances. This drawing should be readily available for use by leak repair team and service connection installation team. It has to be updated whenever additional appurtenances are installed in the system.

D.2.1.d Cleaning Pipelines

When water velocity is low, sediments tend to get deposited and build up inside the pipes. The built-up deposits decrease the carrying capacity of the pipes and increase internal friction, making the pipelines less efficient. The effects are complicated when magnesium and calcium salts are present in the water (hard water), as their precipitates result in scaling inside the pipes.

The method for removing solids which are not cemented to the inside surface of pipes is to flush with water at high velocity. Annual flushing is generally sufficient to maintain the pipelines clean. Dead end pipes should be flushed and disinfected at least twice a year.

The flushing procedure is as follows:

a. Isolate the water mains to be cleaned by closing the appropriate control valves;
b. Empty the water mains by opening the blow-off valve or other temporary outlet at the lower end of the pipeline.
c. Inject water at high-induced velocity (1.0 meter per second or higher) until the objectionable materials are expelled;
d. As needed, disinfect the pipelines.
e. Put pipelines back to operation.

D.2.1.e Repairing Pipe Leaks

Contamination can occur during repair works of watermain. To minimize the potential for contamination, ensure the following actions are taken:

- Keep sections of new pipe sealed at both ends to prevent dirt and foreign matter from entering. Plug existing open watermain ends until tie-in or repair is to be made.
- Properly excavate around pipe to mitigate against soil intrusion into opened pipe section. Use dewatering pump when necessary.
- Ensure that tools, equipment and any other items that come into contact with the watermain are properly cleaned and disinfected.
- Ensure proper disinfection of all piping, fittings and appurtenances.
- Ensure the repair is tight and not leaking.
- Investigate possible sources of cross connections after installation or repair (ex: leaking valve, backflow through distribution).
- Implement disinfection and flushing.

Leaks in water mains should be fixed as soon as they are detected. Once the leak is pinpointed, the water in the isolated main must be removed. The repair job then consists of sealing the leaks and/or replacing the defective pipe section. The preferred method of fixing leaks is to provide sleeve coupling or repair clamp around the leak opening.

D.2.1.f Replacing Damaged Sections of Pipelines

When the damage in a certain section of a water main is extensive, repair may involve cutting off and replacing the damaged section.

The procedures for repairs are as follows:

a. For Galvanized Iron (G.I.) Pipes
    1. After isolating the section by closing valves, excavate the exact location of the damage.
    2. Cut the defective section and thread both ends of the cut pipes.
    3. Use coupling and union to join the repair piece.
    4. Open valves to verify leak-proof connections.
    5. Backfill and restore surface to its original condition.

b. For Polyvinyl Chloride (PVC) Pipes
    1. After isolating the section by closing valves, excavate the exact location of the leak.
    2. Measure and cut the defective portion of the pipeline.
    3. Install a PVC socket on one cut end and a sleeve type coupling on the other end to connect the repair piece.
    4. Open the control valve to allow water to flow into the repaired section and observe for connection leaks;
    5. If there is no more leak, backfill the excavation and restore the surface to its former condition.

c. For Polyethylene (PE) Tubing

1. After isolating the section by closing valves, excavate the exact location of the leak.
2. Cut the defective portion of the water main;
3. Use replacement piece for repair of PE tubing. Use compression type brass coupling for PE tubing.
4. For bigger diameter PE tubing, use butt-welding method to the repair joints.
5. Open the control valve to allow water to flow and observe for leaks;
6. Backfill and restore surface to its former condition;

D.3 Tamks and Reservoir

D.3.1 Detecting and Repairing Leaks in Steel Tanks

Reservoirs made of steel are usually installed above ground, making it possible to visually detect any leaks.

Leaks in steel tanks can be repaired as follows:

1. Small leaks may be sealed with epoxy or by welding.
2. Larger leaks may require covering the damaged section with a steel plate larger than the hole, and welding it to the tank to seal the leak.

D.3.1.a Maintenance of Reservoir Appurtenances

a. Monthly Maintenance Tasks

1. Lubricate float control pulleys.
2. Inspect float for leaks.
3. Check level indicator for free operation.
4. Sweep roof, catwalks and ladder landings.

b. Manholes

Manholes should always be covered and locked to keep out foreign materials that could contaminate the water supply and also to prevent accidents.

c. Overflow Pipe and Air Vents

- Covered reservoirs or tanks should be vented to allow the passage of air to and from the reservoir as the water level changes. Use fine screens on the vents to prevent the entrance of animals and insects, and keep the screens in good condition.
- Keep access manhole covers in place to prevent accidents and contamination.
- Slope the ground away from the reservoir in all directions to prevent surface water from flowing towards it.
- Leaks in the walls that allow surface water or shallow groundwater to seep in are dangerous. Repair leaks at once.

D.3.1.b Painting of Reservoir

Painting is necessary to prevent corrosion and to prolong the life of steel tanks used as water reservoirs. Painting is recommended at least once every five years, after the annual cleaning and inspection of the reservoir.

The procedure is as follows:

1. Dry, clean and smooth all surfaces to be painted. Remove all dirt, scale and rust by scraping or fine brushing. Remove oil/grease by using an appropriate solvent;
2. Paint the surfaces of the reservoir with a lead-free, food-grade coating material. Usually this is a polyurethane elastomeric paint or a high gloss epoxy coating;
3. Make sure that the paint to be used is free from any substance harmful to human health, and that it will not impart taste or odor to the water;
4. After the paint has cured, disinfect the reservoir;
5. Put the reservoir back to operation.

D.4 Service Connections

In general, domestic meters should be taken out of service every 5 to 7 years and completely overhauled. The systematic inspection and replacement of consumption meters is an important aspect of routine maintenance. Records should be kept on the condition of meters to guide future procurement and enable the Utility to take measures against water loss.

Representative pothole checking of service connections within 5 years of service (avoid leaks due to deterioration) should also be done.

D.4.1 Inspection of Water Meters

1. Clean all water meter parts thoroughly;
2. Make sure the gear train runs freely;
3. Check the action of the disc in the chamber;
4. Remember that friction is just as detrimental to correct registration (reading) as slippage;
5. Store meters away from heat;
6. Use a calibrated meter as a standard of comparison for tolerances and clearances;
7. After every repair, retest the meter for accuracy;
8. If necessary, call the manufacturer for advice.

D.5 Valves

The valves useful life depends largely on the manner they are operated and maintained.

D.5.1 Valve Operation

1. Valves operated manually should be opened all the way, then closed one-quarter turn of the hand wheel to prevent the valve from sticking in the open position;
2. Valves should be opened and closed slowly at an even rate to reduce the risk of water hammer.

D.5.2 Common Causes of Valve Failure and their Remedies

D.5.2.a Corrosion

Corrosion will render the valve inoperable. If valves are not operated or lubricated for a long time, they may become inoperable due to corrosion damage is not extensive, the valve may be made operable again by WD-40 or dilute lubricating oil down the valve key to lubricate the joint between the stem and packing. However, if the valve is still inoperable after this procedure, it should be replaced.

D.5.2.b Closing the Valve Too Tightly

Closing the valve too tightly may damage the valve washer, the valve seat, or the threads of the valve stem, causing the water to leak. To solve this problem, it is suggested to put markers showing the direction of opening and closing and to close the valve just tight enough to stop the flow of water.

D.5.2.c Worn-Out Washer or Loose Packing

Worn-out washers or loose packing should be replaced to prevent the loss of water.

D.5.2.d Cavitation

Cavitation results when a valve is left partially closed or open for a long period. Leaving a valve partially closed or open will cause a partial vacuum or void in the downstream side that may eventually be filled with low-pressure vapors from water. When these vapor pockets collapse, a mechanical shock (cavitation) is created, this may produce cavities. After some time, the valve will be destroyed and even the pipelines may be affected. Cavitation can be avoided by keeping the valves fully closed or fully opened at all times.

D.5.2.d Water Hammer

Water hammer is caused by sudden closing of valves. When the flow of water is suddenly stopped, enormous pressure is created

which may damage the pipe or valves. This problem can be prevented by closing the valve slowly.

D.5.3 Valve Maintenance

All valves in the distribution system must be exercised at least twice a year. It should be inspected for defects and any repair undertaken should be properly documented.

Valve maintenance extends valve life and will assure proper operation. This is true with isolation valves, air release valves, and blow-off valves.

D.5.4 Components of a Valve Maintenance Program

Valve maintenance program includes the following:

- A valving system map indicating location and identification number of valves.
- Valve card showing type, size, location, number of turns to open and close, direction of opening, and maintenance record.
- A schedule for regular exercise and routine maintenance.

D.5.5 Components of a Routine Valve Inspection

- Verify the accuracy of the location of the valve boxes on the system map and update map where necessary.
- Remove valve box cover and inspect stem and nut for damage or obvious leakage.

- Close the valve fully and record the number of turns to the fully closed position (always close the valve slowly to prevent water hammer).
- Record whether the valve is right hand or left-hand closing.
- To determine if a valve is closed, simply use a key valve.
- Record condition of valve and any maintenance that is required. Any valve that does not completely open or close should be replaced.
- Clean the valve box cover seat.
- Replace any missing valve box covers.

Note: *When inspection is complete, place the valve in its operating position (open or closed)*

Automatic air release, vacuum breaker, or pressure-reducing valves should be inspected at least every six months. These valves will usually have an O&M manual, which describes how they are to be inspected and maintained. Manual air releases should be opened and flushed to remove accumulated air, at least twice a year.

D.6 Hydrant Maintenance

Regular maintenance of hydrants will give assurance that they are functional when needed. It should be inspected and tested once a year.

Hydrant maintenance should include:

- Location map of the hydrants with identification number.
- A routine maintenance schedule and flow testing.
- Hydrant card indicating type, date installed, and maintenance record.

D.6.1 General Inspection and Maintenance Procedures

a. Check for leakage (use listening device to detect non-visible leaks).
b. Remove all nozzle caps and inspect threads; replace any missing caps and chains. Clean and lubricate nozzle threads.
c. Replace any missing or damaged nuts.
d. Open and close hydrants fully a few times and check for ease of operation the hydrant during an emergency.
e. While hydrant is flowing, test isolation valve by closing it.
f. Check for any exterior obstruction that could interfere with operation of the hydrant during an emergency.
g. If a hydrant is inoperable, tag it with a clearly visible marking and immediately report its condition and schedule it for repair.
h. Prepare record of inspection and maintenance operations and any repair work.

D.7 Illegal Connections

Illegal connections can be detected by any of the following methods:

a. Block Inspection

Key in the information to be obtained in a block census is where those

who are not connected to the system are getting their water. If their source cannot be determined, the dwelling unit is considered suspect.

b. Reward system

Offering rewards to those who can pinpoint illegal connections has been known to be effective. The reward can be a portion of the collectibles.

Reward = 1,500.00 pesos

c. Monitoring Consumption

A high NRW within a sub-zone without any leaks indicates the presence of illegal connections. Any customer whose consumption drops to a small percentage of his average consumption without any adequate cause should be suspect.

The Board should come up with a policy on penalties for those caught with illegal connections, which would be the basis of management action.

d. Optimum Meter Replacement Cycle

Every utility must have a meter replacement program. Depending on the classification and type of meters used.

D.8 Locating Leaks by Direct Observation

This method is the simplest and most applicable leak detection technique for use in small water supply systems.

This requires being alert to the following signs of leaks:

1. Appearance of wet spots at early dawn during dry season;
2. Greening of patches of ground in areas where plants generally could hardly grow;
3. Abnormal drops in pressure

ANNEXES

OPERATIONAL MATHEMATICS

This Section provides a reference and guide to the basic mathematics needed for operational purposes of the water district.

Introduction

The two main systems of measurement are the metric and the English systems. The metric system is also called the International Standard (SI) system. It has been accepted officially by practically all countries (a notable exception is the United States) and is used by all international scientific institutions and the United Nations. However, not all countries who have accepted it have been able to take the steps needed to fully convert from their previous system to the metric.

This Manual will use the metric system primarily. It must be considered, however, that much of the calibration of equipment in use in the water industry, as well as references, information, and standards (of which the US is a leading source) use measurements based on the English system. Thus, it is important to know both systems, and to be able to convert the measurements of one system to the other.

The metric system is a decimal system based on 10, in which the higher- or lower-value units of measure are scaled by raising or reducing by a factor of 10. The basic measures of time, expressed in seconds, minutes, hours, days, months, and years, are common to both systems. However, decades (10 years), centuries (100 years), and millennia (1000) are graduated values that use the decimal or metric scale.

This Section introduces the important units of measure that are frequently used in the establishment and operation of water district facilities. It also presents conversion tables and gives samples of how to convert from the English to the metric system.

Measures of Length

Length is a measurement of the distance from one point to another, and is the basis also for measuring area and dimension.

Metric Units of Length

In the metric system, the basic unit is the Meter. Graduated multiples or fractions of the meter are designated by prefixes as shown in Table 1.0 below.

The higher values are on the left, and the lower values are on the right:

Table 1.0 Metric Units of Length

SI prefix	**kilo**	**hecto**	**deka**		**deci**	**centi**	**milli**
Unit	Kilometer	Hectometer	Dekameter	**meter**	Decimeter	Centimeter	Millimeter
Multiplier	1,000	100	10	1	0.1	0.01	0.001
Symbol	**km**	**hm**	**Dam**	**m**	**dm**	**cm**	**mm**

English Units of Length

In the English system, length is expressed in inches, feet, yards and miles.

The useful common units and their relationships are as follows:

Table 1.1 Metric Units of Length

	inch (in)	**foot (ft)**	**yard (yd)**	**mile (mi)**
1 foot	12 in	1 foot		
1 yard	36 in	3 ft	1 yard	
1 mile		5,280 ft	1,760 yd	1 mile

Converting Between Metric and English Units of Length

The conversion chart that follows gives the basic equivalents of the metric and the English units of length, to make conversions easy.

Basic Conversions:

Table 1.3 Converting Between Metric and English Units of Length

	millimeters	**centimeters**	**meters**	**kilometers**
1 inch	25.40 mm	2.540 cm		
1 foot		30.48 cm	0.3048m	
1 yard		91.44 cm	0.9144 m	
1 mile			1609 m	1.609 km
	inches	**feet**	**yards**	**Miles**
1 meter	39.37 in	3.281 ft	1.094 yd	
1 kilometer		3281 ft	1094 yd	0.6214 mi

Examples:

Example 1: Pipes delivered in the site had diameters of 4 and 6 inches. What are the diameters in mm? Since 1 in = 25.4 mm, a 4-in pipe would be:

4 in x 25.4 mm/in = 101.6 mm, *which is nominally referred to as a 100 mm pipe.*

A 6-in pipe would be:

6 in x 25.4 *mm*/*in* = 152.4 mm, nominally 150 *mm*

Example 2: the 10 pipes delivered were 20 ft each in length. What is the total length in meters? Since there are 3.281 ft in one meter:

10 *pipes* x 20 ft *each* = 200 *ft* ÷3.281 *ft/m* = 60.96 *m*

Measures of Volume

Volume can be defined as the amount of space occupied by an object, or conversely, the amount of space available to accommodate materials. For SSWPs, volume measurements of containers and water are important.

In the case of solids and the internal space (capacity) of containers, the common basic unit is the cubic meter (m^3). In the case of liquids like water, it is the liter (l). One liter is equal to 1,000 cubic centimeters (cm^3) and 1,000 liters is equivalent to one kiloliter (kl) or 1 cubic meter (m^3).

In conventional and water industry use, large volumes of water are expressed in terms of cubic meters – in other words, in terms of the capacity (volume) of the containers they would fill. (It is easier to measure the 3 dimensions of a container, than it is to measure uncontained water.) Since 1 kl of water, in standard testing conditions, is equal to one cubic meter (m^3), it is common to use cubic meters to refer to larger volumes of water, although in many instances thousands and millions of liters are the more impressive expressions used.

Volume of Containers

The measurement of volume for simple box-like containers (rectangular prisms) involves the measurement of three dimensions, namely length, width, and height.

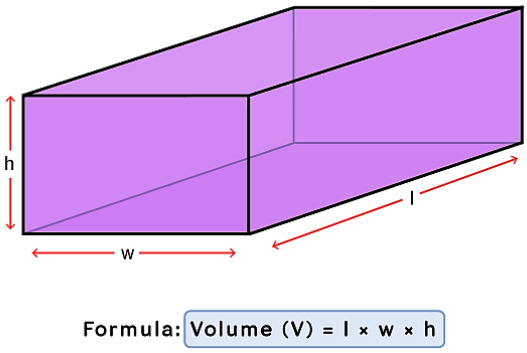


Figure 2.1 Rectangular Prism

Where:

v = volume of rectangular prism

l = length

w = width

h = height

Examples:

Find the volume of a rectangular prism that is 10 m tall and has a base that measures 4 m by 5 m.

Solution:

V = l x w x h

= 5*m* x 4*m* x 10*m*

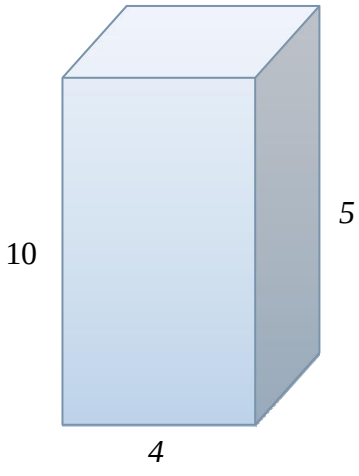
= **200m^3**

In liters,

200 m3 x 1,000 *l*

1 m3

= 200,000 *liters*



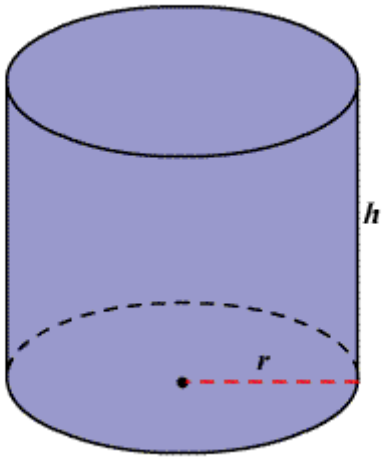
In the case of cylindrical containers, which are common in the water business, the calculation of internal volume involves measuring the radius and applying the formula:

$$V = \pi r^2 h$$

Where:

V = volume of cylinder
Π = 3.1416
r= radius (=1/2 diameter)

h = height



Example:

Find the volume of a cylindrical reservoir with a radius of 7m and a height of 12 m.

Solution:

$V = \pi r^2 h$ $= 3.1416 \times 7^2$ m x 12 m

$= 1{,}847.2608\ m^3$ or 1,807,206.8 *l*

Note that the illustrations seem to indicate external dimensions. In the case of containers, the measurements should be of the internal dimensions. Where precision of internal capacity is an issue but the container does not allow direct internal measurement, simply measure the outside dimensions but deduct the thickness of the container walls to obtain the exact internal dimensions.

Metric Units of Volume for Water

Table1.4 Metric Units of Volume

Prefix	**kilo**	**hecto**	**deka**	**liter**	**deci**	**centi**	**milli**
Unit	Kiloliter	Not widely used in the water industry, except hectoliter in Australia. (1hl = 100l)			Deciliter	Centiliter	Milliliter
Multiplier	1,000			1	0.1	0.01	0.001
Symbol	kl			L or l	dl	cl	ml

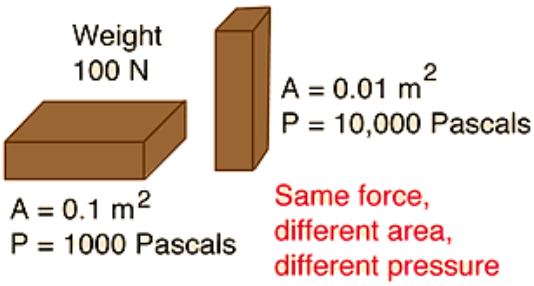
Pressure/Head

Pressure is defined as force per unit area. It is usually more convenient to use pressure rather than force to describe the influences of fluids. The standard unit for pressure in the English system is pounds per square inch (psi) while in the metric system it is the Pascal (Pa), which is:

Newton per square meter (N/m^2).

Pressure gauges in the Philippines are usually scaled in **psi** or **N/cm^2** or bars. Justremember that one bar or **14.7 psi** = **10.1 N/cm^2**. So if a pressure gauge reads **22 N/cm^2**, it is equivalent to **14.7 x 22/10.1** = **32 psi**. For an object sitting on a surface, the force pressing on the surface is the weight of the object, but in different orientations it might have a different area in contact with the surface and therefore exerts a different pressure.

$$Pressure = \frac{Force}{Area} = \frac{F}{A}$$



Note that bar refers to atmospheric pressure, which is equivalent to 14.7 psi. This means that under standard measurement conditions, a column of air with one square inch area, sitting on the Earth's surface and extending to space - weighs 14.7 pounds.

One bar is 100,000 Pa, and for most practical purposes can be considered equivalent to one atmosphere.

Converting Head to Pressure

Head and pressure are used almost interchangeably with respect to water systems. Since pressure gauges often are calibrated in psi or bar, it may be necessary to convert to head in meters or in feet.

Converting head in feet to pressure in psi:

Feet of head can be converted to pressure - psi - by the expression:

$$p = 0.434 h\ SG$$

Where:

p = pressure (psi)
h = head (ft)
SG = specific gravity

---

1 bar = 0.9869

In the English system, the SG of water is 1

Example

The pressure gauge on the discharge pipe from the reservoir reads 30 psi. how high is the water level from the gauge level?

Answer:

Since p = 0.434h, therefore h = p/0.434

H= 30psi/0.434 = 69.*ft* x 1m/3.28ft = 21 *m*

Useful to remember:

4.34 psi is equal to 10 feet or 3 meters head of water

Converting head in meters to pressure in bar:

Meters of head can be converted to pressure-bars-by the expression:

$$p = 0.0981 h\ SG$$

Where:

p = pressure (bar)
h = head (m)

Converting Pressure to Head

Converting pressure in psi to head in feet:

$$h = 2.31\, p\, SG$$

Where:

p = pressure (psi)
h = head (ft)

Converting pressure in bar to head in meters:

$$h = 10197 p/SG$$

Where:

p = pressure (bar)
h = head (m)

Converting pressure in kg/cm^2 to head in meters:

$$h = 10 p/SG$$

Where:

p = pressure (bkg/cm^2)
h = head (m)

Example: Determining Pressure Gauge Accuracy

The pressure gauge beside the elevated reservoir reads 40 psi. But the operator doubts the accuracy of the pressure gauge. How can he determine the accuracy of the gauge?

To convert psi to head in feet the formula is h = 2.31*p*, therefore the height of the water level should be h = 2.31 x 40 = 92.4 *ft*

The operator has to measure the height of the water level in the reservoir from the gauge level. If the measured height is not 92.4 ft (or 28.2 meters), then the gauge accuracy is in question.

Flow Requirements

For liquids, various units are used depending upon the application and industry, but might include gallons per minute (gpm), liters per second (lps), or when describing river flows, cumecs (cubic meters per second) or even million liters per day (mld).

Perhaps the simplest way to measure volumetric flow is to measure how long it takes to fill a known volume container. A simple example is using a container of known volume, filled by a fluid. The stopwatch is started when the flow starts, and stopped when the container starts to overflow. The volume divided by the time gives the flow. This method can be employed for measuring the flow of well sources.

To convert gpm to lps, divide gpm by 15.852.

Example:

A pump is rated at 200 gpm. Convert to lps:

$$lps = \frac{gpm}{15.852} = \frac{200}{15.852} = 12.6\ lps$$

Electrical Calculations

kW and HP

Horsepower (hp) is a unit of work originally established to measure the amount of energy required to raise coal out of a coal mine. One horsepower is equivalent to 33,000 foot-pounds of work performed in one minute. This is equivalent to lifting 454 kg, 101 meters in ten minutes[3]. It was estimated then that one hp was equivalent to the amount of work a strong horse could perform.

Pumps are rated according to their hp capacity. Pump hp is a function of its head and flow capacity.

One hp is equal to 746 watts or 0.746 kW. Given the pump hp, multiply hp by 746 to get watts.

Power, Voltage and Current

The relationships among Power, Current and Voltage are shown in the following three expressions:

Or 454 kg, 10 m in one minute or 45 kg, 10 m in 6 minutes

Power = Current x Voltage or P = I x v or I = P/V or V= P/I

P = power in watts (W)

V = voltage in volts (V)

I = current in amperes (A) sometimes referred to as amps in English system.

Example:

A 700 watt, 220 volt electric iron is to be used.

What should be the minimum amp rating of an electric power extension cord, if one has to be used?

I = P/V = 700W/220V = 3.2 A

Energy and Power

The amount of energy used (or supplied) depends on the power and the amount of time it is used:

Energy = Power x Time

The standard unit for energy is the joule (J), but a J is a very small amount of energy for mains electricity. For utility use, electrical energy in kilowatt-hours (kWh) is used. 1 kWh is the energy used by a 1 kW power equipment when it is switched on for 1 hour:

1 kWh = 1 kW × 1 hour

Examples:

A 100 W (0.1 kW) bulb switched on for 8 hours uses 0.1 x 8 = 0.8 kWh

A 3hp motor used for 12 hours uses 3hp x 0.746 kW/hp x 12 hours = 27 kWh

REQUIREMENTS

MANAOAG WATER DISTRICT (MANWAD)
Manaoag, Pangasinan
Tel.#s 529-0254; 0922-839-3878
Application for
NEW CONNECTION
Name: _____
Address: _____

Requirements:
[ ] 1 - copy recent picture 1"x1" or 2"x2"
[ ] 1 - photocopy valid IDs (front and back)
[ ] 1 - photocopy (**all pages**) Proof of Ownership of House & Lot (Tax Declaration or Land Title or Notarized Deed of Absolute Sale)
[ ] Brgy. Certification of Residency (state # of years)
[ ] Proof of Billing (optional)

***** If the Applicant is not the Lot Owner:***
[ ] Letter of Consent
[ ] 1 - photocopy valid IDs (front and back)
[ ] Affidavit of Undertaking (**see *Note***)

***** If by Representative:***
[ ] Authorization Letter
[ ] 1 - photocopy valid IDs (front and back)
[ ] Affidavit of Undertaking (**see *Note***)

Budget: More or Less **P 5,000.00**
7 to 10 Days Processing after payment.

NOTE in Affidavit of Undertaking:
- specify owner/s of the House & Lot;
- if problems / complaints arise from the said H & L, applicant has no objection if water connection needs to be disconnected.

MANAOAG WATER DISTRICT
Manaoag, Pangasinan
Tel.#s 529-0254; 0922-839-3878
Application for
RECONNECTION (Re-application)
Name: _____
Account Number:: _____

Requirements:
[ ] 1 - copy recent picture 1"x1" or 2"x2"
[ ] 1 - photocopy valid IDs (front and back)

****** If by a Representative:***
[ ] Authorization Letter
[ ] 1 - photocopy valid IDs (front and back)

Full payment of Water Bill, Fees & Charges:
Water Bill P _____
Reconnection Fee _____
Notarial Fee _____
Guarantee Dep./Update _____
Others: _____
Sub-Total P _____
PLUS: Materials (For survey) more or less P4,000.00

******NOTE in Affidavit of Undertaking:***
- specify registered owner of the account;
- if problems / complaints arise from the said account, applicant has no objection if water connection needs to be disconnected.

Date Disconnected:

MANAOAG WATER DISTRICT
Manaoag, Pangasinan
Tel.#s 529-0254; 0922-839-3878
Application for
Transfer of Ownership & Recon(Re-Appl'n)

Requirements:
Original Owner: _____
Account Number: _____
[ ] Notarized Waiver
[ ] 1 - photocopy valid IDs (front and back)
[ ] Death Certificate (photocopy)

New Owner:
[ ] Birth Certificate **OR** Marriage Certificate (1-photocopy)
[ ] 1 - copy recent picture 1"x1" or 2"x2"
[ ] 1 - photocopy valid IDs (front and back)
[ ] Proof of Ownership
[ ] Affidavit of Undertaking
- specify registered owner of the old account;
- if problems / complaints arise from the said H & L, applicant has no objection if water connection needs to be disconnected.

Date Discon.

MANAOAG WATER DISTRICT
Manaoag, Pangasinan
Tel.#s 529-0254; 0922-839-3878 / 0917-508-7934
RELOCATION to
Name: _____
Account Number: _____

Requirements:
[ ] Relocation Fee P_____; Plus Materials
[ ] 1 - photocopy valid IDs (back to back)
[ ] Affidavit of Undertaking (***see notes***)
[ ] Proof of Ownership of House & Lot (Tax Declaration or Land Title or Deed of Absolute Sale) Xerox
[ ] Authorization Letter / Letter of Consent
[ ] 1 - photocopy valid IDs (back to back)

NOTE in Affidavit of Undertaking:
- specify owner/s of the House & Lot;
- if problems / complaints arise from the said H & L, applicant has no objection if water connection needs to be disconnected.

MANAOAG WATER DISTRICT
Manaoag, Pangasinan
Tel.#s 529-0254; 0922-839-3878
TEMPORARY/PERMANENT DISCONNECTION

Requirements:

Name:

Account Number:

[ ] Disconnection Fee P_____
[ ] Water Bill P_____
[ ] Request Letter
state reason and
refund of Guarantee Deposit.
[ ] 2 - photocopies valid IDs (back to back)

If by Representative:
[ ] Authorization Letter
[ ] 2 - photocopies valid IDs (back to back)

REPUBLIC OF THE PHILIPPINES
MANAOAG WATER DISTRICT

Tel.#s 529-0254; 0922-839-3878

Name: _____

A/C#: _____Date Reg._____

SENIOR CITIZEN Discount

Requirements:
{ } 1 - photocopy SR. CITIZEN I.D.(front and back)
{ } 2 - Latest Picture (2"x2")
{ } Barangay **CERTIFICATE of Residency**
(Proof of Residence)
{ } Guaranty Deposit/Update _____
IF BY A REPRESENTATIVE:
{ } Authorization Letter (authorizing a Representative)
{ } 1 - photocopy valid I.D./s (front and back)
{ } 5-R Picture of the Senior Citizen
holding the latest newspaper (clear date
& publication)

MANAOAG WATER DISTRICT
Manaoag, Pangasinan
Tel.#s 529-0254; 0922-839-3878
Application for
TRANSFER OF OWNERSHIP

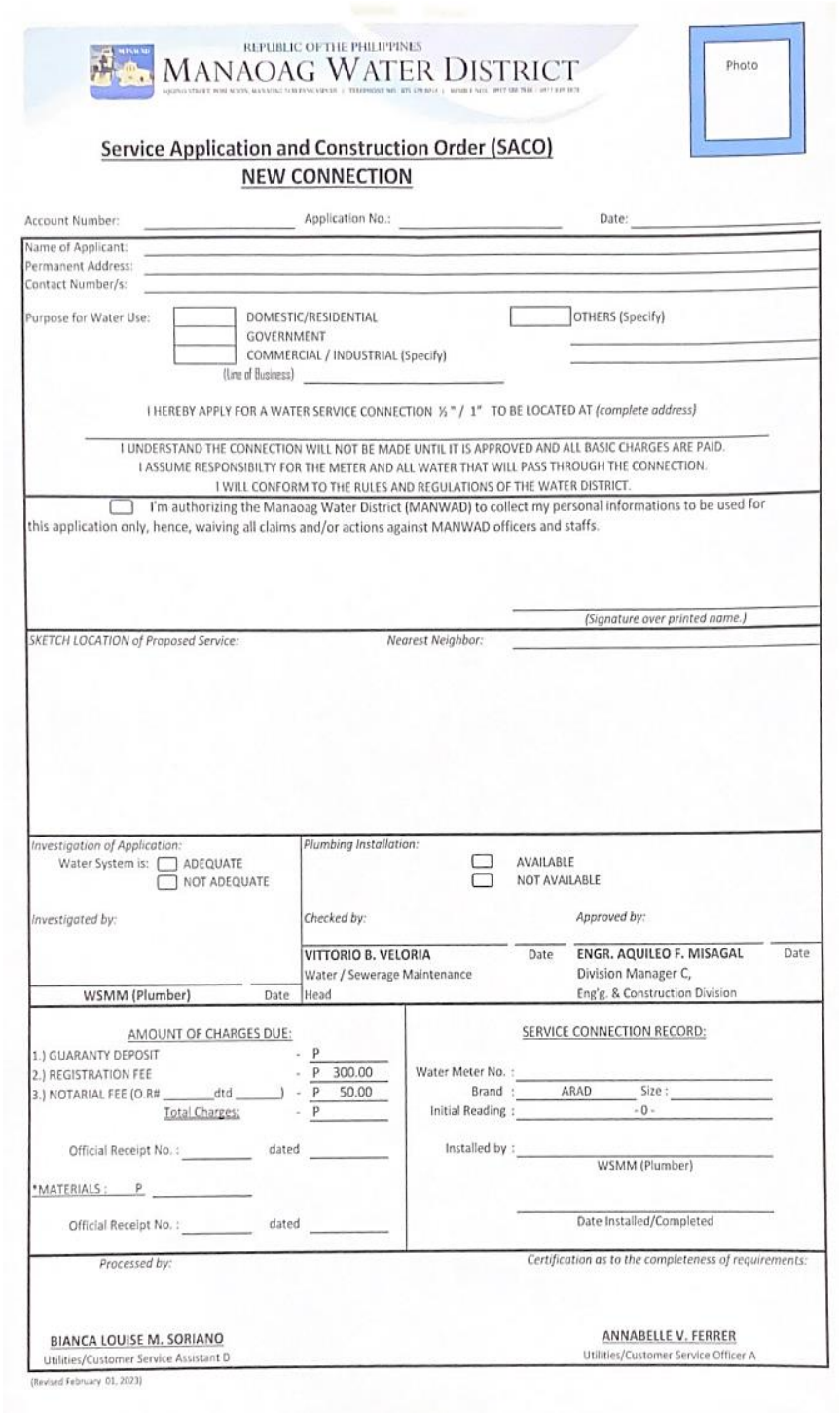
Requirements:
Fr. Original Owner: _____
Account Number: _____
[ ] Notarized Waiver
[ ] 1 - photocopy valid IDs (front and back) ***OR***
[ ] 1 - photocopy Death Certificate

Fr. New Owner: _____
[ ] Birth Certificate **OR**
Marriage Certificate (1-photocopy)
[ ] 1 - copy recent picture 1"x1" or 2"x2"
[ ] 1 - photocopy valid IDs (front and back)
[ ] Affidavit of Undertaking ***(See Note)***
[ ] Notarial Fee: P 50.00
[ ] Guarantee Deposit/Update: P

******NOTE in Affidavit of Undertaking:***
- specify registered owner of the old account;
- if problems / complaints arise from the said account, applicant has no objection if water connection needs to be disconnected.

FORMS

Service Application and Construction Order (SACO) – New Connection



REPUBLIC OF THE PHILIPPINES
MANAOAG WATER DISTRICT

Photo

Service Application and Construction Order (SACO)
NEW CONNECTION

Account Number: _____ Application No.: _____ Date: _____

Name of Applicant: _____
Permanent Address: _____
Contact Number/s: _____

Purpose for Water Use:
☐ DOMESTIC/RESIDENTIAL
☐ GOVERNMENT
☐ COMMERCIAL / INDUSTRIAL (Specify)
(Line of Business) _____
☐ OTHERS (Specify) _____

I HEREBY APPLY FOR A WATER SERVICE CONNECTION ½" / 1" TO BE LOCATED AT *(complete address)*
_____
I UNDERSTAND THE CONNECTION WILL NOT BE MADE UNTIL IT IS APPROVED AND ALL BASIC CHARGES ARE PAID.
I ASSUME RESPONSIBILTY FOR THE METER AND ALL WATER THAT WILL PASS THROUGH THE CONNECTION.
I WILL CONFORM TO THE RULES AND REGULATIONS OF THE WATER DISTRICT.

☐ I'm authorizing the Manaoag Water District (MANWAD) to collect my personal informations to be used for this application only, hence, waiving all claims and/or actions against MANWAD officers and staffs.

_____
(Signature over printed name.)

SKETCH LOCATION of Proposed Service: *Nearest Neighbor:* _____

Investigation of Application:
Water System is: ☐ ADEQUATE ☐ NOT ADEQUATE
Investigated by:
WSMM (Plumber) Date

Plumbing Installation:
☐ AVAILABLE
☐ NOT AVAILABLE
Checked by:
VITTORIO B. VELORIA Date
Water / Sewerage Maintenance Head

Approved by:
ENGR. AQUILEO F. MISAGAL Date
Division Manager C,
Eng'g. & Construction Division

AMOUNT OF CHARGES DUE:

1.) GUARANTY DEPOSIT	-	P
2.) REGISTRATION FEE	-	P 300.00
3.) NOTARIAL FEE (O.R# ____dtd ____)	-	P 50.00
Total Charges:	-	P

Official Receipt No. : _____ dated _____

*MATERIALS : P _____

Official Receipt No. : _____ dated _____

SERVICE CONNECTION RECORD:

Water Meter No. : _____
Brand : ARAD Size : _____
Initial Reading : - 0 -

Installed by : _____
WSMM (Plumber)

_____
Date Installed/Completed

Processed by:

BIANCA LOUISE M. SORIANO
Utilities/Customer Service Assistant D

Certification as to the completeness of requirements:

ANNABELLE V. FERRER
Utilities/Customer Service Officer A

(Revised February 01, 2023)

Service Application and Construction Order (SACO)

Reconnection (Re-application)

REPUBLIC OF THE PHILIPPINES
MANAOAG WATER DISTRICT

Photo

Service Application and Construction Order (SACO)
RECONNECTION (Re-Application)

Account Number: _____ SR/MJO No.: _____ Date: _____

Name of Applicant: _____
Permanent Address: _____
Contact Number/s: _____

Purpose for Water Use:
☐ DOMESTIC/RESIDENTIAL
☐ GOVERNMENT
☐ COMMERCIAL / INDUSTRIAL (Specify)
(Line of Business) _____
☐ OTHERS (Specify) _____

I HEREBY APPLY FOR A WATER SERVICE CONNECTION ½ " / 1" TO BE LOCATED AT *(complete address)*
_____
I UNDERSTAND THE CONNECTION WILL NOT BE MADE UNTIL IT IS APPROVED AND ALL BASIC CHARGES ARE PAID.
I ASSUME RESPONSIBILTY FOR THE METER AND ALL WATER THAT WILL PASS THROUGH THE CONNECTION.
I WILL CONFORM TO THE RULES AND REGULATIONS OF THE WATER DISTRICT.

☐ I'm authorizing the Manaoag Water District (MANWAD) to collect my personal informations to be used for this application only, hence, waiving all claims and/or actions against MANWAD officers and staffs.

_____
(Signature over printed name.)

SKETCH LOCATION of Proposed Service: *Nearest Neighbor:* _____

Total Guaranty Deposit: P _____

Investigation of Application:
Water Source is: ☐ ADEQUATE ☐ NOT ADEQUATE

Investigated by:

_____ _____
WSMM (Plumber) Date

Plumbing Installation:
☐ AVAILABLE
☐ NOT AVAILABLE

Checked by:

VITTORIO B. VELORIA Date
Water / Sewerage Maintenance Head

Approved by:

ENGR. AQUILEO F. MISAGAL Date
Division Manager C,
Eng'g. & Construction Division

AMOUNT OF CHARGES DUE:

1.) GUARANTY DEPOSIT / UPDATE	-	P _____
2.) RECONNECTION FEE	-	P 300.00
3.) NOTARIAL FEE (O.R# _____ dtd _____)	-	P 50.00
Total Charges:	-	P _____

Official Receipt No. : _____ dated _____

*MATERIALS : P _____

Official Receipt No. : _____ dated _____

SERVICE CONNECTION RECORD:

Water Meter No. : _____
Brand : ARAD Size : _____
Initial Reading : - 0 -

Installed by : _____
WSMM (Plumber)

_____
Date Reconnected

Processed by:

BIANCA LOUISE M. SORIANO
Utilities/Customer Service Assistant D

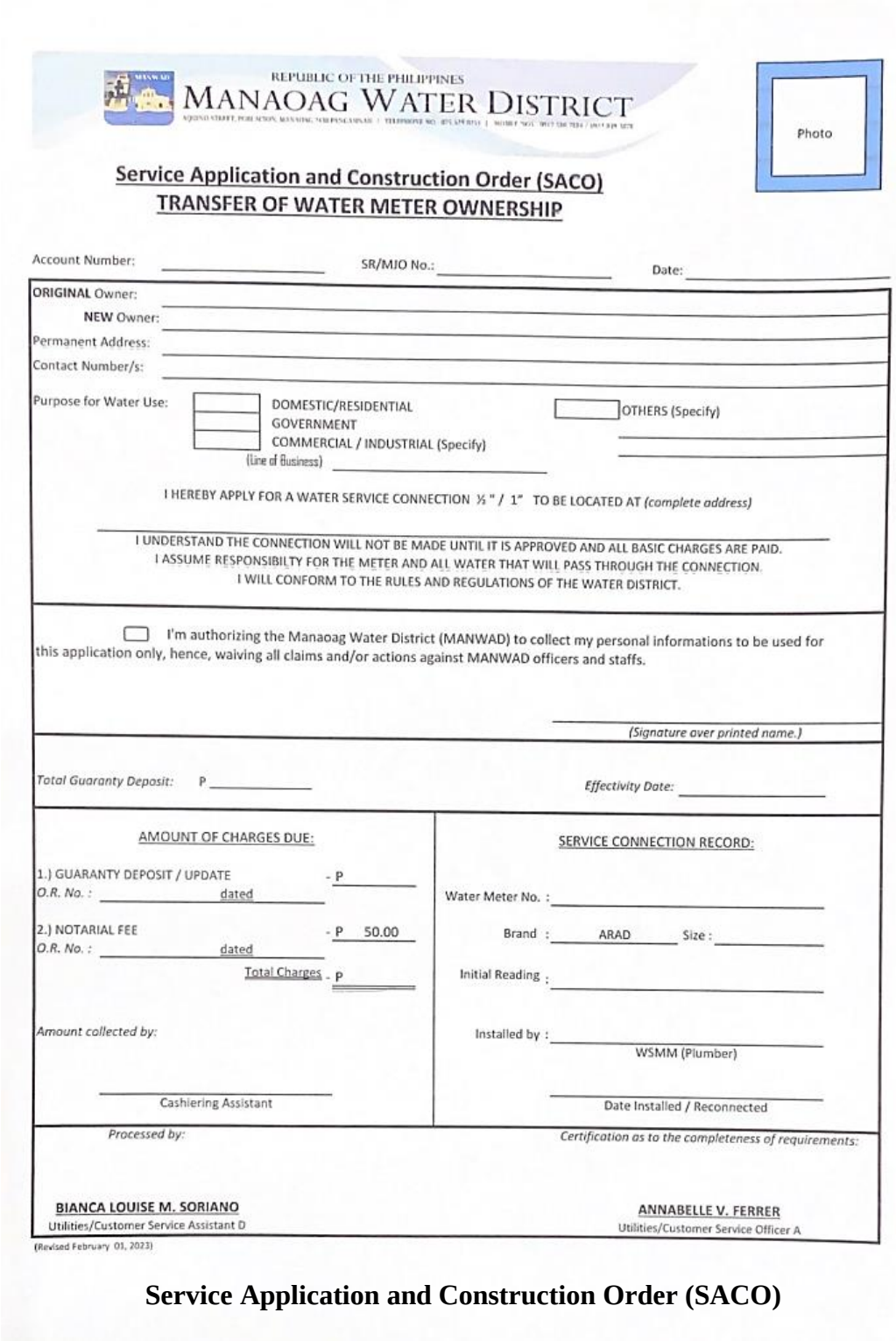
Certification as to the completeness of requirements:

ANNABELLE V. FERRER
Utilities/Customer Service Officer A

(Revised February 01, 2023)

Service Application and Construction Order (SACO)

Transfer of Water Meter Ownership



REPUBLIC OF THE PHILIPPINES
MANAOAG WATER DISTRICT

Photo

Service Application and Construction Order (SACO)
TRANSFER OF WATER METER OWNERSHIP

Account Number: _____ SR/MJO No.: _____ Date: _____

ORIGINAL Owner: _____
NEW Owner: _____
Permanent Address: _____
Contact Number/s: _____

Purpose for Water Use: ☐ DOMESTIC/RESIDENTIAL ☐ GOVERNMENT ☐ COMMERCIAL / INDUSTRIAL (Specify) (Line of Business) _____ ☐ OTHERS (Specify) _____

I HEREBY APPLY FOR A WATER SERVICE CONNECTION ½ " / 1" TO BE LOCATED AT *(complete address)*
_____
I UNDERSTAND THE CONNECTION WILL NOT BE MADE UNTIL IT IS APPROVED AND ALL BASIC CHARGES ARE PAID.
I ASSUME RESPONSIBILTY FOR THE METER AND ALL WATER THAT WILL PASS THROUGH THE CONNECTION.
I WILL CONFORM TO THE RULES AND REGULATIONS OF THE WATER DISTRICT.

☐ I'm authorizing the Manaoag Water District (MANWAD) to collect my personal informations to be used for this application only, hence, waiving all claims and/or actions against MANWAD officers and staffs.

_____
(Signature over printed name.)

Total Guaranty Deposit: P _____ *Effectivity Date:* _____

AMOUNT OF CHARGES DUE:

1.) GUARANTY DEPOSIT / UPDATE - P _____
O.R. No. : _____ dated _____

2.) NOTARIAL FEE - P 50.00
O.R. No. : _____ dated _____

Total Charges - P _____

Amount collected by:

_____
Cashiering Assistant

SERVICE CONNECTION RECORD:

Water Meter No. : _____
Brand : ARAD Size : _____
Initial Reading : _____
Installed by : _____
WSMM (Plumber)

_____
Date Installed / Reconnected

Processed by:

BIANCA LOUISE M. SORIANO
Utilities/Customer Service Assistant D

Certification as to the completeness of requirements:

ANNABELLE V. FERRER
Utilities/Customer Service Officer A

(Revised February 01, 2023)

Service Application and Construction Order (SACO)

Reconnection (Re-application), Relocation and Transfer of Water Meter Ownership

REPUBLIC OF THE PHILIPPINES
MANAOAG WATER DISTRICT

Photo

Service Application and Construction Order (SACO)
RECONNECTION (Re-Application), RELOCATION and TRANSFER OF WATER METER OWNERSHIP

Account Number: _____ SR/MJO No.: _____ Date: _____

Name of Applicant: _____
Permanent Address: _____
Contact Number/s: _____

Purpose for Water Use:
☐ DOMESTIC/RESIDENTIAL
☐ GOVERNMENT
☐ COMMERCIAL / INDUSTRIAL (Specify)
(Line of Business) _____
☐ OTHERS (Specify) _____

I HEREBY APPLY FOR A WATER SERVICE CONNECTION ½ " / 1" TO BE LOCATED AT *(complete address)*
_____
I UNDERSTAND THE CONNECTION WILL NOT BE MADE UNTIL IT IS APPROVED AND ALL BASIC CHARGES ARE PAID.
I ASSUME RESPONSIBILTY FOR THE METER AND ALL WATER THAT WILL PASS THROUGH THE CONNECTION.
I WILL CONFORM TO THE RULES AND REGULATIONS OF THE WATER DISTRICT.

☐ I'm authorizing the Manaoag Water District (MANWAD) to collect my personal informations to be used for this application only, hence, waiving all claims and/or actions against MANWAD officers and staffs.

_____
(Signature over printed name.)

SKETCH LOCATION of Proposed Service: *Nearest Neighbor:* _____

Total Guaranty Deposit: P _____ *Effectivity Date:* _____

Investigation of Application:
Water Source is: ☐ ADEQUATE ☐ NOT ADEQUATE
Investigated by:
_____ _____
WSMM (Plumber) Date

Plumbing Installation:
☐ AVAILABLE ☐ NOT AVAILABLE
Checked by:
_____ _____
VITTORIO B. VELORIA Date
Water / Sewerage Maintenance Head

Approved by:
_____ _____
ENGR. AQUILEO F. MISAGAL Date
Division Manager C,
Eng'g. & Construction Division

AMOUNT OF CHARGES DUE:

1.) GUARANTY DEPOSIT / UPDATE	-	P
2.) RECONNECTION FEE	-	P 300.00
3.) RELOCATION FEE	-	P 300.00
3.) NOTARIAL FEE (O.R# _____ dtd _____)	-	P 50.00
Total Charges:	-	P

Official Receipt No. : _____ dated _____

*MATERIALS : P _____

Official Receipt No. : _____ dated _____

SERVICE CONNECTION RECORD:

Water Meter No. : _____
Brand : ARAD Size : _____
Initial Reading : - 0 -
Installed by : _____
WSMM (Plumber)
_____
Date Installed/Completed

Processed by:

BIANCA LOUISE M. SORIANO
Utilities/Customer Service Assistant D

Certification as to the completeness of requirements:

ANNABELLE V. FERRER
Utilities/Customer Service Officer A

(Revised February 01, 2023)

Service Application and Construction Order (SACO)

Reconnection (Re-application) and Relocation

REPUBLIC OF THE PHILIPPINES
MANAOAG WATER DISTRICT

Photo

Service Application and Construction Order (SACO)
RECONNECTION (Re-Application) & RELOCATION

Account Number: _____ SR/MJO No.: _____ Date: _____

Name of Applicant: _____
OLD Account No.: _____ NEW Account No.: _____
Permanent Address: _____
Contact Number/s: _____

Purpose for Water Use:
- ☐ DOMESTIC/RESIDENTIAL
- ☐ GOVERNMENT
- ☐ COMMERCIAL / INDUSTRIAL (Specify)
  (Line of Business) _____
- ☐ OTHERS (Specify) _____

I HEREBY APPLY FOR A WATER SERVICE CONNECTION ½ " / 1" TO BE LOCATED AT *(complete address)*
_____

I UNDERSTAND THE CONNECTION WILL NOT BE MADE UNTIL IT IS APPROVED AND ALL BASIC CHARGES ARE PAID.
I ASSUME RESPONSIBILTY FOR THE METER AND ALL WATER THAT WILL PASS THROUGH THE CONNECTION.
I WILL CONFORM TO THE RULES AND REGULATIONS OF THE WATER DISTRICT.

☐ I'm authorizing the Manaoag Water District (MANWAD) to collect my personal informations to be used for this application only, hence, waiving all claims and/or actions against MANWAD officers and staffs.

_____
(Signature over printed name.)

SKETCH LOCATION of Proposed Service: *Nearest Neighbor:* _____

Total Guaranty Deposit: P _____

Investigation of Application:
Water System is: ☐ ADEQUATE ☐ NOT ADEQUATE

Investigated by:

WSMM (Plumber) Date

Plumbing Installation:
☐ AVAILABLE ☐ NOT AVAILABLE

Checked by:

VITTORIO B. VELORIA Date
Water / Sewerage Maintenance Head

Approved by:

ENGR. AQUILEO F. MISAGAL Date
Division Manager C,
Eng'g. & Construction Division

AMOUNT OF CHARGES DUE:

1.) GUARANTY DEPOSIT / UPDATE	- P	
2.) RECONNECTION FEE	- P	300.00
3.) RELOCATION FEE	- P	300.00
4.) NOTARIAL FEE (O.R# _____dtd _____)	- P	50.00
Total Charges:	- P	

Official Receipt No. : _____ dated _____

*MATERIALS : P _____

Official Receipt No. : _____ dated _____

SERVICE CONNECTION RECORD:

Water Meter No. : _____

Brand : ARAD Size : _____
Initial Reading : - 0 -

Installed by : _____
WSMM (Plumber)

_____
Date Reconnected & Relocated

Processed by:

BIANCA LOUISE M. SORIANO
Utilities/Customer Service Assistant D

Certification as to the completeness of requirements:

ANNABELLE V. FERRER
Utilities/Customer Service Officer A

(Revised February 01, 2023)

Maintenance Job Order / Service Request (1/2)

REPUBLIC OF THE PHILIPPINES

MANAOAG WATER DISTRICT

Soriano St., Poblacion, Manaoag 2430 Pangasinan | TELEFAX: 075.529.0254 |
MOBILE: 0917.580.7884 / 0922.839.3878 | manwad91280@yahoo.com

ecord Number

SERVICE REQUEST

SR NUMBER :	
SR DATE/TIME :	

ACCOUNT NUMBER :

ACCOUNT NAME :

ADDRESS :

CONSUMER TYPE :

CONTACT NO. :

NEAREST Connection :

NATURE OF COMPLAINTS/REQUEST FOR SERVICE

SERVICE REQUEST	PARTICUALRS
1	

REMARKS

REQUESTED BY:

Signature over printed name

Date

PREPARED BY:

BIANCA LOUISE M. SORIANO

Casual

Maintenance Job Order / Service Request (2/2)

REPUBLIC OF THE PHILIPPINES
MANAOAG WATER DISTRICT
Soriano St., Poblacion, Manaoag 2430 Pangasinan | TELEFAX: 075.529.0254 |
MOBILE: 0917.580.7884 / 0922.839.3878 | manwad91280@yahoo.com

MAINTENANCE JOB ORDER

MJO NUMBER :
MJO DATE/TIME :

ACCOUNT NUMBER :
ACCOUNT NAME :
ADDRESS :
CONSUMER TYPE :
CONTACT NO. :
NEAREST Connection :

METER NUMBER	SIZE	BRAND	READING

NATURE OF COMPLAINTS/REQUEST FOR SERVICE

MJO REQUEST	PARTICULARS
1	

WATER METER

[ ] Involuntary [ ] Voluntary

DISCONNECTION DETAILS

Date Disconnected : _____
[ ] Padlock [ ] Water Meter [ ] Tapping Point [ ] Mainline

METER CONDITION

[ ] Accurate [ ] Under Reg [ ] Over Reg

SERVICE CONNECTION
[ ] Possible leak/s after the water meter

ACTION TAKEN / RECOMMENDATIONS

_____
_____

Customer's Acknowledgement:

Pinatutunayan kong nagpunta dito si _____, kawani ng Manaoag Water District ngayong ika-____ ng _____, 20____, upang tingnan, ayusin o magbigay payo sa akin hinggil sa kahilingan kong nasasaad sa itaas ng bahagi ng Service Request na ito.

[ ] Ito ay nagawa [ ] Hindi pa ito nagawa [ ] Tinatanggap kong obligasyon ko ang pagpapagawa nito

_____
Lagda sa ibabaw ng Pangalan

_____
Petsa

WORK COMPLETION :

Date Completed: _____
Accomplished By: _____
Time Accomplished: _____

APPROVED BY:

_____
Engineering Manager

Promissory Note

REPUBLIC OF THE PHILIPPINES

MANAOAG WATER DISTRICT

Soriano St., Poblacion, Manaoag 2430 Pangasinan | TELEFAX: 075.529.0254 |
MOBILE: 0917.580.7884 / 0922.839.3878 | manwad91280@yahoo.com

ecord Number

PROMISSORY NOTE

PNNUMBER :	
DATE ISSUED :	
DUE ON :	

ACCOUNT NUMBER :

ACCOUNT NAME :

ADDRESS :

CONSUMER TYPE :

CONTACT NO. :

I, , with A/C# , a resident of , acknowledges that I have an unpaid account of in the amount of **(P).** That I promise to pay the Manaoag Water District on or before . That upon the failure to pay the same, I will not object to the action of the Management to disconnect the said water service line and/or endorse the case to the Legal Counsel.

SCHEDULE OF PAYMENTS: **Total Amount : P**

1st Payment:
Amount:_____ O.R.#:_____ Dtd:_____ Bal.P_____

2nd Payment:
Amount:_____ O.R.#:_____ Dtd:_____ Bal.P_____

3rd Payment:
Amount:_____ O.R.#:_____ Dtd:_____ Bal.P_____

CONFORME:

_____ _____
Signature over printed name Date

RECEIVED BY:

BIANCA LOUISE M. SORIANO
Casual

RECOMMENDING APPROVAL:

RUSTY MARK V. FLORES
Division Manager C. Finance and Commercial

APPROVED BY:

FLORDELIZA N. TEJANO
General Manager

Inspection Report

MANAOAG WATER DISTRICT

Aquino St. Poblacion Manaoag, Pangasinan

Application No. : _____ Date Applied : _____

Applicant Name : _____ Classification : _____

Nearest Connection : _____ Contact No. : _____

Location/ Landmark : _____ Manaoag, Pang.

INSPECTION REPORT

Water Pressure	High		Low					
Needs Underground Boring	Yes		No					
Needs Excavation	Yes		No					
Needs Excavation Permit	DPWH		City Engineer					
Pipe Size								
Distance from Mainline								
Water Meter Connection	Cluster		Standard Connection		Dual		Cross road	

METER INFORMATIONS			
SIZE	BRAND	READING	SERIAL NUMBER

Guarantee Deposit : _____

Registration Fee : _____

SACO Materials : _____

Paid WBOR# : _____

Dated : _____

Remarks

_____

_____

_____

_____

Received By:

_____

Date:

Requested By:

_____

Date:

Inspection performed In the presence of:

_____

Applicant's or Representative's Signature over Printed Name

Inspection Performed By:

_____

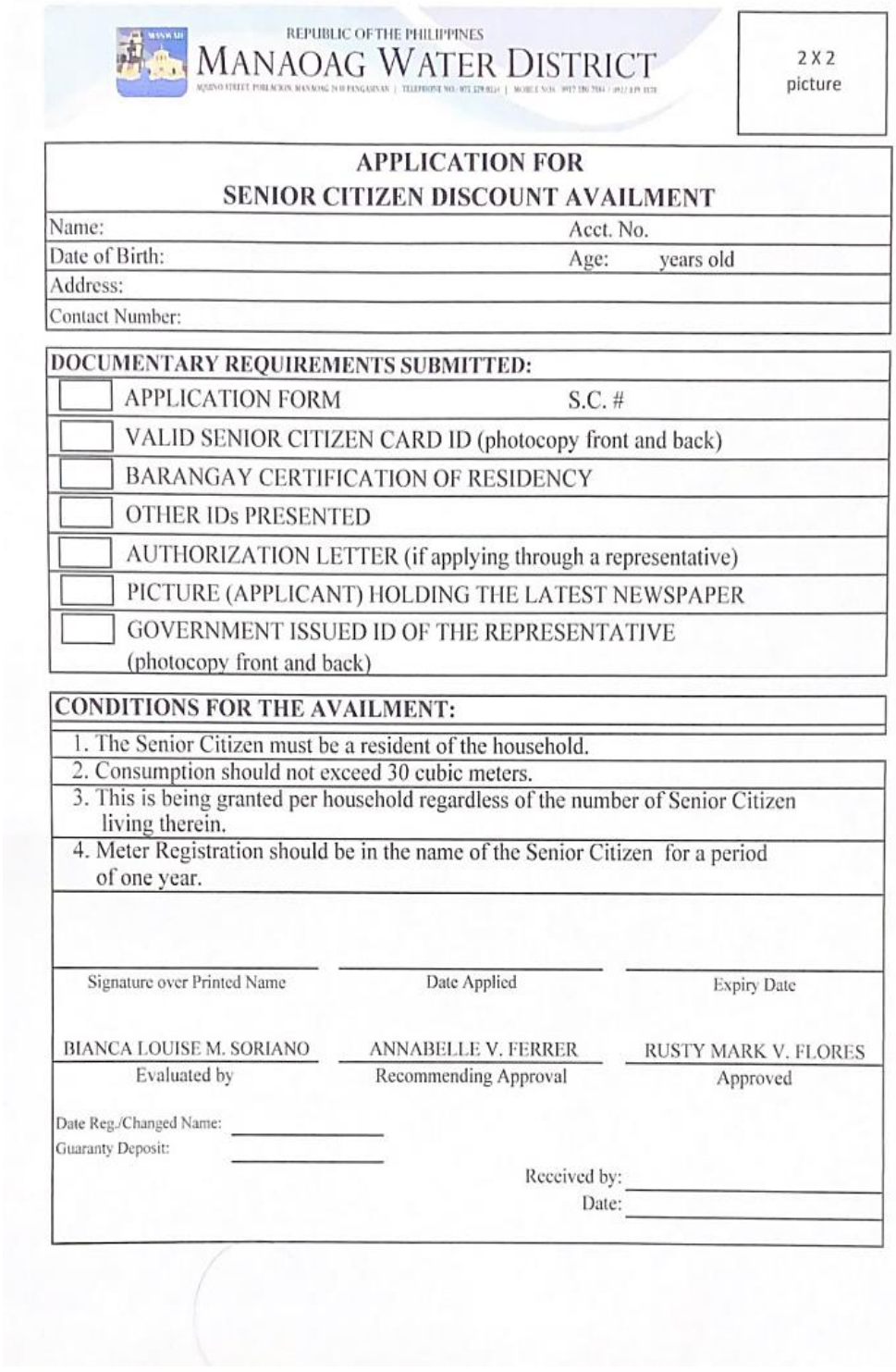
Maintenance

Installed By:

_____

Date Installed:

Application for Senior Citizen Discount Availment



REPUBLIC OF THE PHILIPPINES

MANAOAG WATER DISTRICT

2 X 2 picture

APPLICATION FOR SENIOR CITIZEN DISCOUNT AVAILMENT

Name:	Acct. No.
Date of Birth:	Age: years old
Address:	
Contact Number:	

DOCUMENTARY REQUIREMENTS SUBMITTED:

- ☐ APPLICATION FORM — S.C. #
- ☐ VALID SENIOR CITIZEN CARD ID (photocopy front and back)
- ☐ BARANGAY CERTIFICATION OF RESIDENCY
- ☐ OTHER IDs PRESENTED
- ☐ AUTHORIZATION LETTER (if applying through a representative)
- ☐ PICTURE (APPLICANT) HOLDING THE LATEST NEWSPAPER
- ☐ GOVERNMENT ISSUED ID OF THE REPRESENTATIVE (photocopy front and back)

CONDITIONS FOR THE AVAILMENT:

1. The Senior Citizen must be a resident of the household.
2. Consumption should not exceed 30 cubic meters.
3. This is being granted per household regardless of the number of Senior Citizen living therein.
4. Meter Registration should be in the name of the Senior Citizen for a period of one year.

Signature over Printed Name	Date Applied	Expiry Date
BIANCA LOUISE M. SORIANO	ANNABELLE V. FERRER	RUSTY MARK V. FLORES
Evaluated by	Recommending Approval	Approved

Date Reg./Changed Name: _____

Guaranty Deposit: _____

Received by: _____

Date: _____

Temporary / Permanent Disconnection

_____
(Date)

To whom it may concern:

May I request from your good office to **TEMPORARY / PERMANENT DISCONNECT** the water service line in the account of _____, with Account Number _____ for the reason that _____.

I will just inform you when it will be reconnected after paying all the necessary charges on the said account.

Hoping for your prompt action on this request.

Thank you and more power!

Very truly yours,

_____
(Signature over printed name.)
Address: _____
_____

Received by & Date: _____ *Discon. Fee* P100.00 *pd WBOR#* _____
Date Disconnected: _____ *dated* _____
Last Reading: _____
By Plumber: _____

MJO No.: _____ *Remarks:* _____
Date Installed: _____ *Guaranty/Meter Deposit:P* _____
MDR No.: _____

Request(reconnection).word 09/24/2012

Reconnection with representative

_____
(Date)

To whom it may concern:

I, _____, a resident of _____ and in behalf of _____, my _____ with A/C# _____, would like to request for the **RECONNECTION** of his / her water meter connection and undertake to pay whatever legal fees as may be required in the said application.

That I will pose no objection in the event that the water service connection needs to be disconnected due to **problems/complaints** that may arise in connection to the said account. *Likewise, **the undersigned, the account holder, heirs and legal representatives hereby waive all claims and or action against Manaoag Water District, all officers and staff.***

Thank you.

Respectfully yours,

_____
(Signature over printed name.)

Request(reconnection) word 03/02/2012

Letter of Consent

LETTER OF CONSENT

To whom it may concern:

I, _____, of legal age, Filipino citizen and residing at _____, being the registered owner of the lot located at _____ Manaoag, Pangasinan, covered by notarized Deed of Absolute Sale dated _____ / Land Tax Declaration Number _____ / Original/Transfer Certificate Title Number _____ of the land records of Manaoag, Pangasinan, Phils., do hereby give my consent to _____, my _____, to install water service connection in his/her/my house built on the said lot.

Attached herewith are the photocopies of my identification card/s and proof of ownership for reference and as required by Manaoag Water District (MANWAD) for his/her water service application purposes only.

_____
(Signature over printed name.)
Date: _____

Acknowledgement Receipt

REPUBLIC OF THE PHILIPPINES

MANAOAG WATER DISTRICT

AQUINO STREET, POBLACION, MANAOAG 2410 PANGASINAN | TELEPHONE NO.: 075 529-0254 | MOBILE NOS.: 0917 580 7884 / 0922 839 3578

ACKNOWLEDGMENT RECEIPT

This is to acknowledge the receipt of one (1) pc **OLD WATER METER** with the following details:

Account Name: _____

Account Number: _____

Service Address: _____

Water Meter Brand	
Water Meter No.	
Last Reading	
Remarks	

Issued by:

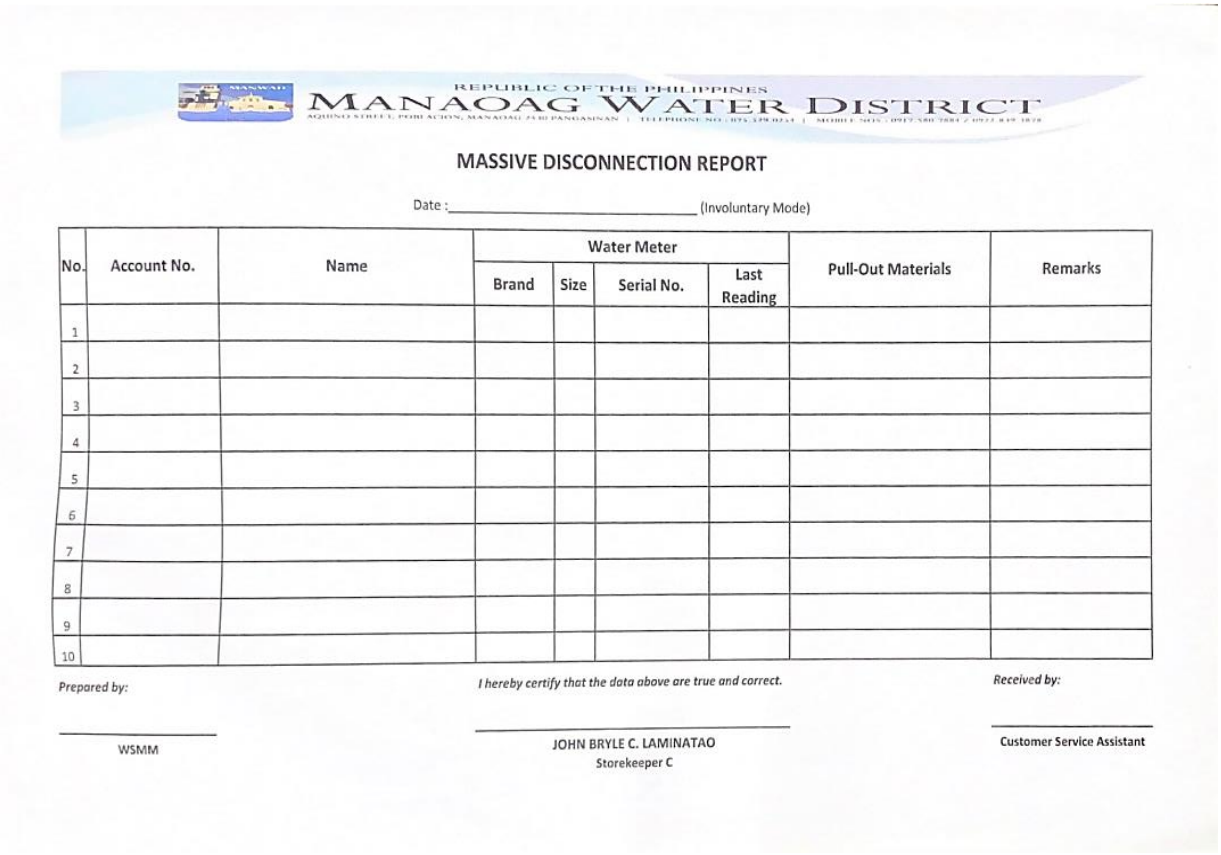
RODELL S. SORIANO
Storekeeper A

Received by:

_____
(Signature over printed name.)
Date: _____

_____
Plumber

Massive Disconnection Report



REPUBLIC OF THE PHILIPPINES
MANAOAG WATER DISTRICT

MASSIVE DISCONNECTION REPORT

Date :_____ (Involuntary Mode)

No.	Account No.	Name	Water Meter				Pull-Out Materials	Remarks
			Brand	Size	Serial No.	Last Reading		
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

Prepared by:

WSMM

I hereby certify that the data above are true and correct.

JOHN BRYLE C. LAMINATAO
Storekeeper C

Received by:

Customer Service Assistant

Acronyms and Definition of Terms

AAO	-	Agency Authorized Officer
ABC	-	Approved Budget for the Contract
APP	-	Annual Procurement Plan
APP-CSE	-	Annual Procurement Plan – Common Use Supplies and Equipment
ATL	-	Audit Team Lead / Leader
AWWA	-	American Water Works Association
BAC	-	Bids and Awards Committee
BAM	-	Billing Adjustment Memo
BCS	-	Billing Collection System
BIR	-	Bureau of Internal Revenue
BUR	-	Budget Utilization Request
CCTV	-	Closed Circuit Television
COA	-	Commission on Audit
COC	-	Compensatory Overtine Credit
CTO	-	Compensatory Time – Off
DAR	-	Department of Agrarian Reform
DBM	-	Department of Budget and Management
DCPR	-	Daily Cash Position Report
DILG	-	Department of Interior and Local Government
DOH	-	Department of Health
DPWH	-	Department of Public Works and Highways
DTR	-	Daily Time Record
EOSSP	-	Existing Organizational Structure and Staffing Plan
FS	-	Financial Statement
GPPB	-	Government Procurement Monitoring Report

GSIS	-	Government Service Insurance System
GOCC	-	Government Owned and Controlled Corporation
HDMF	-	Home Development Mutual Fund (PAG-IBIG)
ICS	-	Inventory Custodian Slip
IRRUP	-	Inventory and Inspection Report of Unserviceable Property
IPRC	-	Individual Performance Commitment and Review
JEV	-	Journal Entry Voucher
LBP	-	Land Bank of the Philippines
LGU	-	Local Government Unit
LWD	-	Local Water Districts
LWOP	-	Leave Without Pay
LWUA	-	Local Water Utilities Administration
KPI	-	Key Performance Indicator
MANWAD	-	Manaoag Water District
MIDS	-	Monthly Data Sheet
MJO/SR	-	Maintenance Job Order/Service Request
MOA	-	Memorandum of Agreement
MRIS	-	Materials Requisition Accounting System
NSO	-	National Statistics Office
NWRB	-	National Water Resources Board
NWRC	-	National Water Resources Council
OGCC	-	Office of the Government Corporate Counsel
OPCR	-	Office Performance Commitment and Review
PACD	-	Public Assistance Complaints Desk
PAL	-	Position Allocation List
PAR	-	Property Accountability Receipt
PDF	-	Position Description Form

PhilGEPS	-	Philippine Government Electronic Procurement System
PMT	-	Performance Management Team
PNSWD	-	Philippine Standard for Drinking Water
PO	-	Purchase Order
POSSP	-	Proposed Organizational Structure and Staffing Plan
PPMP	-	Project Procurement Management Plan
PPP	-	Proposed Plantilla of Personnel
PRAISE	-	Program on Awards and Incentives for Service Excellence
PRS	-	Property Requisition Slip
PSD	-	Personnel Selection Board
RFQ	-	Request for Quotation
RHU	-	Rural Health Unit
SA	-	Supervising Auditor
SACO	-	Service Application and Construction Order
SALN	-	Statement of Assets Liabilities and Net Worth
SPMS	-	Strategic Performance Management System
WHO	-	World Health Organization

Definition of Terms

1. **Major Final Output (MFO)** – the good or service that a water district is mandated to provide its external clients through the implementation of programs, activities, and projects. It may be a single output or group of outputs targeted at the same organizational/sector outcome and capable of being summarized by a common performance indicator.

2. **Performance Indicator (P)** – a characteristic of performance (quality, quantity, timeliness or cost) that is to be measured and will illustrate the standard by which a water district is expected to deliver its MFO. Performance indicators should be verifiable, observable, credible and sustainable.

3. **Performance Target (PT)** – a predetermined numerical target level of performance (quantity, quality, timeliness and cost of an output) against which actual performance can be compared.

4. **Delivery units** – Departments and Divisions of the LWD responsible for the achievement of the LWD's MFO and committed to performance targets which are tracked by a reporting system within the year and verified by LWUA.

5. **Potability** – the quality of water that renders it safe and fit for human consumption. LWD Performance with respect to this indicator shall mean compliance to the Philippine National Standards for Drinking Water (PNSDW) and all issuances and guidelines by the Department of Health (DOH) and the Local Water Utilities Administration (LWUA).

6. **Adequacy and Reliability of Service** – performance of LWD rated in accordance with 24/7 availability of supply, capacity to meet the present and future water demand.

7. **Access and Coverage** – performance of LWD in pursuing the goal of providing access and water service to the greater percentage of the population within their respective service areas.

8. **Affordability** – performance of LWD rated in accordance with their ability to ensure that their rates are kept affordable for the low-income groups (LIG). It has been ascertained that a water consumption of 10 cubic meters per month will provide for the basic requirements of those in the LIG based on NSO and LGU data.

9. **Low Income Group** – the sector of residential consumers having the lowest capability to pay for water service. For this purpose, the minimum charge for ½" residential connection should not exceed 5% of the average income of the LIG in the service area. This is a measure of the reasonableness of rates and has been regarded as the maximum amount that this income group can pay for their monthly bill.

10. **Prima Facie** (Latin word) – at first sight or at first impression

11. **Dormant Account-** customer's account which receivable is uncertain and no movement or update for 10 years or more.

12. **Non-Revenue Water -** The amount of water produced from sources but not actually billed.

Board Resolution

REPUBLIC OF THE PHILIPPINES

MANAOAG WATER DISTRICT

AQUINO STREET, POBLACION, MANAOAG 2430 PANGASINAN | TELEPHONE NO.: 075 529 0254 | MOBILE NOS.: 0917 580 7854 / 0922 839 1878

BOARD OF DIRECTORS' RESOLUTION

Resolution No. 35
Series of 2023

Resolution adopting National Food Authority implementing guidelines on the one-time grant of rice assistance to all government employees and workers for Fiscal Year 2022.

WHEREAS, the National Food Authority issued implementing guidelines on the one-time grant of rice assistance to all government employees and workers for Fiscal Year 2022;

WHEREAS, the management attests that all conditions as set in implementing guidelines are fully met by the Manaoag Water District to qualify the employees to the accordant grant of the one-time rice allowance at a uniform quantity of twenty-five (25) kilograms;

NOW THEREFORE, upon the unanimous decision of the members of the Board of Directors, be it…

RESOLVED, as it is hereby RESOLVED, to adopt National Food Authority implementing guidelines on the one-time grant of rice assistance to all government employees and workers for Fiscal Year 2022;

RESOLVED FURTHER, as it is hereby FURTHER RESOLVED, to authorize the disbursement of funds for the payment of the one-time grant of rice assistance to all government employees and workers for Fiscal Year 2022;

RESOLVED FINALLY, as it is hereby FINALLY RESOLVED, that this Resolution is hereby approved and confirmed for implementation.

CERTIFICATION

I hereby certify that the foregoing is a true and correct copy of the resolution adopted by the Board of Directors of the Manaoag Water District during its Special Board Meeting on the 7th day of August, 2023.

Dir. Erlinda C. Tambaoan
Board Secretary

Attested:

Dir. Lourdes B. Veloria
Chairman

Dir. Patricio D. Bautista, Jr.
Vice Chairman

Dir. Gladys D. Giron
Member

Dir. Franklin Z. Cariño
Member

Manaoag Water District Profile and Contact Information

Address:	Aquino Street Poblacion Manaoag, Pangasinan (2430)
Telephone:	075-529-0254
Cellphone:	0922-839-3878
Email Address:	manwad91280@yahoo.com
Facebook Page:	facebook.com/ManaoagWD

Board of Directors

Dir. Lourdes B. Veloria	-	Chairman	-	Women Sector
Dir. Patricio D. Bautista	-	Vice Chairman	-	Civic Sector
Dir. Erlinda C. Tambaoan	-	Secretary	-	Professional Sector
Dir. Glady G. Giron	-	Member	-	Educational Sector
Dir. Franklin Z. Cariño	-	Member	-	Business Sector

Key Personnel Profile and Contact Information

Flordeliza N. Tejano
General Manager C
0998-845-2939

Isaac Ian D. Joaquin
Secretary C
0920-976-4671

Marlene Constancia F. Manaois
Division Manager C
Administrative and General Services
0920-976-6271

Rusty Mark V. Flores
Division Manager C
Finance and Commercial
0998-510-3124

Casimero G. Claveria
Division Manager C
Production and Water Quality
0998-510-3689

Aquileo F. Misagal
Division Manager C
Engineering and Construction
0918-902-8254