

ANNEXURE VI – WAREHOUSING GUIDELINES

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Preamble

The seasonal nature of agricultural production, in conjunction with year-round consumer requirements, has always made it necessary to store grain for short or long periods.

However, the caryopsis of cereals, like all plant life with a reduced metabolic rate, undergoes an unavoidable physiological development which can have beneficial effects (breaking of dormancy, improved baking quality and cooking quality), but which leads to ageing and, after a time, changes are detrimental and of a nature and intensity which are dependent upon the storage environment.

Storage losses have been estimated as being an average of 5% but sometimes as much as 30%, especially in countries with climates favourable to the rapid development of agents of deterioration and where storage techniques are poorly developed, such as developing countries in damp tropics. The principal causes of loss of quantity and quality are metabolic changes in the grain and the attacks of microorganisms (bacteria and moulds) and of vertebrate and invertebrate animals.

The magnitude of these figures highlight the need for promoting throughout Pakistan a rapid improvement in techniques of conservation.

The Securities and Exchange Commission of Pakistan (SECP) notified the Collateral Management Companies Regulations 2019, as amended (“ Regulations”) on July 31, 2019 which require development and issuance of Warehousing Guidelines to be followed by the warehouses accredited with the CMC System.

At the outset, it is clarified that the requirements prescribed in this document are the recommended requirements for compliance by the CMC-accredited Warehouses and are to be complied with in addition to those laid down in the Regulations, Standard Operating Procedures (“SOPs”) as well as local warehouse standards.

Part I

General provisions

1 Short Title

This document can be cited as “The Warehousing Guidelines, 2020”

2 Terms and Definitions

2.1 In this Document unless the context requires otherwise:

- 2.1.1 “Act” means the Companies Act, 2017 (XIX of 2017).
- 2.1.2 “Alleyways/Gangways” means walkways providing a passage.
- 2.1.3 “Commission” or “SECP” means the Securities & Exchange Commission of Pakistan.
- 2.1.4 “Comingled stocks” means storage of same quality of Produce belonging to different depositors together.
- 2.1.5 “Depositor of Produce” shall have the same meaning as ascribed thereto in the Regulations
- 2.1.6 “Dunnage” means matting placed on the floor of the warehouse on which the Produce is placed.
- 2.1.7 “Futures Market Act” means the Futures Market Act, 2016 (XIV of 2016).
- 2.1.8 “Gross Weight” means the total weight of the Produce along with the weight of vehicle/container and packages in which the Produce is stored.
- 2.1.9 “Holder” shall have the same meaning as ascribed thereto in the Regulations
- 2.1.10 “Peripheral Sampling” means the process of collection of samples of the Produce from the exposed bags in a truck/trolley/vehicle.
- 2.1.11 “Plinth” means the base course of the warehouse. It helps in prevention of damage during floods..
- 2.1.12 “Refractions” means all components of collected sample, which differ from normal grains such as foreign matter, other food grains, damaged grains, weevilled grains, broken, shrivelled grains etc.
- 2.1.13 “Register” means record in physical form, electronic form or both.
- 2.1.14 “Regulations” means the Collateral Management Companies Regulations, 2019
- 2.1.15 “Rolling Shutters or Sliding Doors” means gates/doors used for entry and exit from a warehouse.
- 2.1.16 “Spillage Bags” means bags which are used for collection of spilled Produce during the receiving/delivery operations at the warehouse.
- 2.1.17 “Stack Card means” a card with the physical inventory record of the stack/lot to be recorded by the Warehouse Operator.
- 2.1.18 “Stacking” means arranging the goods in neatly placed blocks. It helps in proper demarcation and facilitates aeration & fumigation of the stored Produce.
- 2.1.19 “Tare Weight” means the weight of the empty vehicle/container/bags taken during the receiving/delivery of the Produce at the warehouse.
- 2.1.20 “Ventilation” means the process of providing aeration of the Produce.
- 2.1.21 “Verandah Truss” means a structure in the warehouse to provide support to the walls and roof.

- 2.1.22 “Warehouse Height” means the clean span between the plinth and the roof which helps in improving warehousing efficiency.
- 2.1.23 “Warehouse Management” means the various processes related to maintaining and controlling a business warehouse
- 2.2 The definitions provided for under the Futures Market Act, 2016, the Companies Act 2017, the Regulations and the SOPs shall apply in these Guidelines.

3 Scope

- 3.1 These Guidelines set out the recommended requirements for physical infrastructure, equipment and process flow in warehouses storing eligible agricultural Produce as listed in Annex 1.
- 3.2 The Commission may stipulate special storage requirements for selected agricultural Produce from time to time.
- 3.3 All accredited warehouses eligible to issue electronic warehouse receipts (EWRs) shall comply with the Regulations, the SOPs and these Warehousing Guidelines.

4 Classification of Accredited Warehouses

Accredited warehouses in Pakistan are categorized under two grades (Grade A and B) based on the specific requirements provided under these Guidelines in relation to the warehouse’s quality of the storage structure, capacity and on-site equipment.

Part – II

Requirements on

Physical Infrastructure and Equipment for Bagged Storages

5 General Requirements

- 5.1 All accredited warehouses in Pakistan shall fulfil the general requirements provided hereinunder regardless of their grade or level:
 - 5.1.1 be accessible throughout the year
 - 5.1.2 be single-story structure (however it may have two-tier structure where the upstairs can be used for non-storage purposes)
 - 5.1.3 have proper drainage to ensure no water accumulation in the warehouse
 - 5.1.4 have separate storage for non-food items (in case of multiple use warehouses)
 - 5.1.5 have electricity connection for the premises and additional source of in-house power generation.
 - 5.1.6 have water supply for the premises
 - 5.1.7 have proper arrangement for sanitation including toilets, etc., for employees, Depositors of Produce/ Holders and visitors
 - 5.1.8 have communications connectivity, through land line, cellular phone, internet and/or other options through two separate providers
 - 5.1.9 have adequate security arrangements
 - 5.1.10 have an emergency fire exit
 - 5.1.11 have a proper First Aid Kit in the office
 - 5.1.12 prohibit smoking inside the warehouse

5.2 Notwithstanding the specific requirements provided under these Guidelines, the construction of the warehouse structures and their engineering aspects shall comply with the criteria set under the relevant local standards/provincial regulations/laws of Pakistan.

5.3 **Calibration:** All the equipment installed and used in the warehouse shall be calibrated by the authorised agencies as designated under the relevant law.

6 Specific Requirements on Physical Infrastructure and Equipment

6.1 The specific physical infrastructure requirements for Grade A and Grade B warehouses are provided in the Table below:

	Parameters	Specific items	Requirements for Grade A	Requirements for Grade B
6.1.1	Capacity*	Capacity (an average 5.6 sq. ft. space for every MT)	At least 2,000 MT	At least 1,000 MT
6.1.2	Building structure	Plinth Level	Preferably 1.5 ft.	No specific plinth requirement, but it is essential to ensure inexistence of threat of water entering the warehouse especially during rain (warehouse situated on a sloping land and/or no past history of flooding in the locality)
		Sandbags (10 sandbags per each door shall always be kept in the warehouse)	Not required in case of elevated warehouse	Not required in case of elevated warehouse
		Warehouse height	At least 16 ft. from the plinth	At least 16 ft. from the plinth
		Verandah Truss Height	At least 10 ft. from the plinth	Not required
		Finishing of the walls Plastering with cement (Not applicable in case of Pre-Fabricated Steel and Random Rubble masonry structures)	Required	Required

		Flooring	Cement Concrete; Plastered Flooring; cemented tile; or 5inch lined floor. It should also be non-slippery and with no pot holes.	Cement flooring, if cement flooring is not done, double plastic dunnage or pallet shall be used for storage and floor shall be relatively even with no pot holes
		Drainage	Proper drainage channel	Natural Topography for drainage to be established
		Parking space within the compound	Sufficient parking area to be earmarked for parking.	Not required
		Common Area (open area for roads and manoeuvring)	Sufficient area shall be reserved as common area	Not required
		Water storage tanks and fire extinguishers	Required	Required
		Sanitation and underground waste water Tanks	Required	Required
6.1.3	Entry Gate (Shutters steel sliding door, or similar door)	Number of Gates	Ideally one for every 450 MT capacity	Ideally two in the warehouse
		Size of Each Gate	Area of shutter/ door shall be at least 43 sq. ft.	Area of shutter/ door shall be at least 43 sq. ft.
		Padlocks (Not less than 2 padlocks per gate)	Required	Required

6.1.4	Ventilation	Ventilator	Required in case of non-availability of exhaust fans. Preferably: <ul style="list-style-type: none"> • Ventilator area more than 8 sq. ft. • One every 5 m across the length of the warehouse 	At least 1 at the top
		Exhaust fan	Adequate exhaust fans covering all storage areas	At least 2 Exhaust fans
6.1.5	Warehouse Compound	Road within premises	Cement Concrete or Paved and Gravelled	Not required
		A Compound wall at least 6 ft high	Required	Required
		Compound wall structure	Brick, Reinforced Concrete Construction or equivalent structure Barbed Wire on top of wall (barb wires are required in case of inadequate wall height).	Brick, Reinforced Concrete Construction or equivalent structure Barbed Wire on top of wall (barb wires are required in case of inadequate wall height).
		Boundary wall gate (Access gate) for vehicles	Adequate width to facilitate access for heavy vehicles	Adequate width to facilitate access for heavy vehicles
		Wicket gate for persons	Required	Not required

6.1.6	Ancillary requirements	Office space: exclusive space (including quality testing lab)	Adequate office space to enable easy access for employees and Depositors of Produce/holders. Only authorized personnel shall have access to the quality testing lab	Adequate office space to enable easy access for employees and Depositors of Produce/holders. Only authorized personnel shall have access to the quality testing lab
		Guard room	Required	Required

6.2 Depending on the grade and storage capacity, warehouses are required to have the following equipment on site:

6.2.1 **Quality analysis equipment**

All accredited warehouses are required to have the following equipment duly calibrated by a competent authority

- 6.2.1.1 Digital Moisture meter
- 6.2.1.2 Hot Air Oven (optional)
- 6.2.1.3 Hectolitre /Test Weight apparatus (only for wheat storing warehouses)
- 6.2.1.4 Physical balance of 5mg sensitivity
- 6.2.1.5 Digital balance with 0.01 gm accuracy with certified dead weight box
- 6.2.1.6 Sieves with appropriate sizes for the operations
- 6.2.1.7 Sample divider*
- 6.2.1.8 Analysis trays/Enamel plates (or similar plates)*
- 6.2.1.9 Scoops of different sizes *
- 6.2.1.10 Forceps*
- 6.2.1.11 Magnifying glass*

* Calibration not required

6.2.2 Temperature monitoring System

All Warehouses shall have temperature and humidity sensing systems in place.

6.2.3 Weighing Machines

6.2.3.1 Grade A warehouses shall have duly calibrated in-house weighbridge scale with a capacity of up to 100 Metric Tons, and a weighing scale for a minimum weight of 100 kg.

6.2.3.2 Depositor of Produce can request the warehouse operator to use another weighbridge in the nearby area (located within 3 km radius from the warehouse) upon covering the weighbridge service charge.

6.2.3.3 Grade B warehouse shall at least ensure availability of a duly calibrated weighbridge scale within a maximum of 10 km radius from the warehouse and have weighing scale for a minimum weight of 100 kg.

6.2.4 Conveyor Belt and Forklift

Warehouses of Grade A may have conveyor and forklift for loading/unloading purpose.

6.2.5 CCTV Camera

All warehouses will install CCTV camera covering all the storage spaces within the warehouses.

6.2.6 Firefighting Equipment

Based on the storage capacity, all accredited warehouses shall install fire-fighting equipment in accordance with the matrix provided in the table below. For warehouses storing raw cotton bales, sprinkler system with fire hose or similar system should be installed.

Capacity of Warehouse	No. of fire extinguishers required	No. of fire buckets required (these shall be painted bright red and placed in prominent position)
Up to 3,000 MT	4	20
Above 3,000 MT and up to 5,000 MT	6	30
Above 5,000 MT and up to 10,000 MT	8	40
Above 10,000 MT and up to 15,000 MT	10	50
Above 15,000 MT and up to 25,000 MT	15	75
Above 25000 MT	25	125

The above is recommended as a guideline and an appropriate number of fire extinguishers and buckets may be present to ensure remedial action in case of an untoward incident.

Part III Produce Handling and Management Process in

Bagged Storages

7 Accredited Warehouses implementing these processes

- 7.1 Unless provided otherwise, all accredited warehouses storing agricultural Produce, regardless of their Grades, shall implement the processes provided herein in their daily warehousing operations.
- 7.2 Warehouse operators can develop their own processes fulfilling the minimum requirements set out hereinunder.

8 Prerequisites for smooth implementation of these processes

The warehouse operator shall ensure the appropriate number of personnel having adequate technical qualifications and relevant experience to carry out the daily warehouse operations including appropriate personnel for carrying out sampling, grading, issuance of warehouse receipts, etc., and implement proper segregation of duties for better efficiency and control.

- 8.1 Verification and ensuring validity of licenses and local approvals required for running Agri-Produce warehouse operations
- 8.2 Recruitment and training of staff in accordance with the adequate manpower requirements provided herein below.

Sr. No	Capacity of Warehouse	Quality expert	Warehouse operation staff	Security guards
1	Up to 2,000 MT	1	1	2
2	2,001 MT to 4,000 MT	1	1	2
3	4,001 MT to 8,000 MT	1	2	3
4	8,001 MT to 15,000 MT	2	2	6
5	15,001 MT to 25,000 MT	2	3	6
6	Above 25,000 MT	3	4	9

The above is a guideline that may be followed. The purpose is to ensure that the warehouse has adequately trained staff to carry the day to day function properly and also has adequate security arrangements in place.

- 8.3 In addition to the personnel requirements provided under Section 8.2, every accredited warehouse shall have a warehouse manager in charge of all the warehousing operations.
- 8.4 Documentation: copies of Warehouse Management documents related to receiving of produce, physical forms for issuance/cancellation of EWRs/GRNs, quality testing of produce certificates/reports, fumigation reports, and other documents such as stack cards, and requisite registers.
- 8.5 Connectivity with the CMC's EWR System through internet for issuance of EWR, transfer, release, maintenance and related works.

9 Depositor of Produce Identity and Address

- 9.1 The Warehouse Operator shall verify and properly document a copy of the identity proof of depositor of Produce before receiving and storing Produce. -
- 9.2 The warehouse operator shall also comply with the requirements of registration and documentation of depositors as set out in the Regulations and SOPs.

10 The process flow of Produce (From Receiving to Delivery)

10.1 Receiving of Produce at the warehouse

The receiving of the Produce entails the process of desired Produce entering the warehouse for storage. The receiving of the Produce shall be done by adopting the following processes:

- 10.1.1 Prior to receiving of the Produce, the Warehouse shall ensure that the Depositor of Produce submits his/her identity proof documents to the warehouse operator.
- 10.1.2 The requirement of registration shall also be carried out in accordance with the provisions of the Regulations, SOPs, these Warehousing Guidelines and CMC requirements.
- 10.1.3 The loaded vehicle(s) shall be weighed at designated weighbridges for gross weight. The weighbridge room shall, among others, keep record of the truck gross weight, number of bags, Truck Registration Number and Depositor of Produce's identity.
- 10.1.4 Post Weighment, the loaded vehicle(s) shall be moved to the warehouse for quality check under supervision of the Warehouse Operator.
- 10.1.5 Warehouse Operator shall conduct the peripheral sampling of the stocks and take the sample for quality testing. If the quality report conforms to the prescribed standards, the stocks shall be taken for unloading.
- 10.1.6 In some cases, upon the consent of Depositor of Produce, gross weighment can be done after completing quality checking.

- 10.1.7 In absence of a weighbridge in nearby vicinity, upon the mutual consent of warehouse operator and depositor weighment can be done using manual weighing scale available at the warehouse.
- 10.1.8 In case of storage in bags, dunnage has to be placed prior to unloading of the stocks in the warehouse. If the warehouse is a new warehouse and/or if a water body is in close vicinity of the warehouse, it is recommended to use wooden pallets/mats/double layer of dunnage to ensure safety of Produce from water seepage.
- 10.1.9 Once all the above-mentioned conditions are taken care of, Warehouse Operator shall subsequently allow unloading of the Produce. For bagged storage, it shall also supervise stacking as per the pattern provided under these Warehousing Guidelines for bagged storage.
- 10.1.10 During Produce receipt in warehouse, the warehouse operator may collect samples randomly from the unloaded bags and visually check the contents for conformity. The Warehouse Operator may carry out the requisite tests in its laboratory.
- 10.1.11 In case further testing is required, the samples collected during unloading may need to be further taken to a reputable laboratory endorsed by the Collateral Management Company for quality testing and this quality report shall be considered as final and binding on all parties. The report shall be kept by the warehouse operator for record purposes.
- 10.1.12 Post unloading, the empty vehicle shall be sent again to the same weighbridge for recording the tare weight of the vehicle and a reverse entry is to be marked in vehicle register. This is not applicable if manual weighing scale was used during receipt of Produce.
- 10.1.13 A tare weight deduction will be applied to ascertain the net weight of the Produce delivered (weight of empty vehicles and weight of empty bags).
- 10.1.14 Proper counting of the total number of bags unloaded in the warehouse shall be recorded.
- 10.1.15 Necessary entries shall be made in the Stock Register by the relevant warehouse personnel.
- 10.1.16 For bagged storage, a stack card shall be prepared and tagged to the stack after counting is completed.
- 10.1.17 Spillage bags shall be maintained appropriately. The deposit number (Lot No) shall be marked on the stack for such bags.
- 10.1.18 Required entries shall be made in the stock register.

- 10.1.19 An Electronic Warehouse Receipt (EWR) shall be issued at the warehouse by authorized personnel of the Warehouse Operator or from a central location (Head office) of the warehouse company based on details of stocks received. This will be generated on the EWR System of the CMC, to which the Warehouse needs to be connected online. These authorized personnel will be notified to the CMC.
- 10.1.20 Accredited Warehouses are expected to complete EWR issuance process within the timeframe provided under the Standard Operating Procedures. A print out of the EWR shall be shared with the depositor only to serve as evidence that an EWR has been issued.
- 10.1.21 In exceptional circumstances, if the EWR cannot be issued electronically in the CMC system, the warehouse operator may issue a Good Received Note in compliance with the restrictions stipulated in the SOPs and the Regulations.

10.2 Sampling

- 10.2.1 Sampling of Produce received at the warehouse shall be done with due care only by the authorized personnel
- 10.2.2 Sampling in the warehouse shall be carried out in compliance with the following procedure
- a. Sample increments shall be drawn from the accessible bags from all sides of the loaded vehicle and from various depths of the loaded Produce in case the Produce is received in bulk.
 - b. Sample increments so drawn will be well mixed/homogenized and a bulk sample representing the lot will be prepared.
 - c. Drawn bulk sample shall be marked with the unique identification number with reference to the lot with the following information:
 - i. Sampling date
 - ii. Declared Quantity (in MT)
 - iii. Product lot (Job number)
 - d. As a best practice, it is recommended that the bulk sample will then be divided into 4 subsamples as follows:
 - i. Sample 1 of 4 will be tested for grade confirmation
 - ii. Sealed Sample 2 of 4 will be handed over to depositor
 - iii. Sealed Sample 3 of 4 and 4 of 4 may be kept for record purposes for 15 days unless otherwise instructed.
- 10.2.3 Sample increments shall also be drawn during unloading of the Produce at regular intervals and shall be visually checked for any variations to ensure conformity with the given parameters.
- 10.2.4 During sampling, the following actions are recommended to be taken against the slack and torn bags:

- 10.2.4.1 The slack bags which are filled from spillage shall be filled in standard weight;
- 10.2.4.2 The torn bags shall be stitched or replaced;
- 10.2.4.3 The wet bags shall be rejected; and
- 10.2.4.4 The unloading of infested stocks shall be avoided as much as possible. In case infested stocks may be unloaded in the warehouse, immediate fumigation shall be undertaken at the cost of depositor in a quarantine area designated for this purpose to avoid cross contamination.

10.3 Quality Testing

Testing of Produce entails checking the Produce received at the warehouse against various parameters like moisture, foreign material, and other parameters defined by the relevant rules or contract. The procedure for quality testing shall be as follows:

10.3.1 The sample shall be tested for moisture and other defined parameters and its general conditions, such as appearance, fungus, insect infestation, off odour, poisonous and deleterious materials on visual basis.

10.3.2 Refractions need to be tested and captured in the relevant register.

10.4 Stack planning and Stacking

Proper stacking and stack plans are important steps in warehousing and need to be undertaken with care. Proper stacking entails storage of bags in neat piles. Following points shall be adopted for proper stack planning.

10.4.1 The floor area of a warehouse shall be divided into convenient blocks of rectangles or squares.

10.4.2 Approximately 20 - 30 percent of the total storage space of warehouse may be used as alleyways. This may be reduced if comingled stocks are kept in the warehouse.

10.4.3 Proper stacking of Produce is essential for preservation, physical verification and accounting of stocks. Hence, care shall be taken while laying out Produce stacks.

10.4.4 The decision of Stack Height depends upon the nature of Produce, available vertical space, bag size and feasibility for optimal space utilisation. Other major factors determining Stack Height include size, weight and strength of packing material.

10.4.5 Stocks of the same Produce / variety belonging to different depositors can be stored in the same warehouse in separate stacks.

10.4.6 Mixed storage of incompatible Produce (Like Fertilizers with Food grains or Paddy with Wheat) shall not be carried out under any circumstances in a single warehouse.

10.4.7 Food grains and other edible Produce shall not be stored along with fertilizers, cement, chemicals and other poisonous or corrosive substances.

10.4.8 Essential steps to be followed during Produce stacking

- 10.4.8.1 Bags shall be stacked in basic patterns provided under these Guidelines.
- 10.4.8.2 Gangways of at least 1 m around the stack shall be maintained for Grade “A” warehouses. For Grade “B” warehouses reasonable gangways around the stacks shall be maintained for regular movements for sampling during storage period and proper fumigation
- 10.4.8.3 At least 1 square meter space needs to be maintained at door/shutter side.
- 10.4.8.4 There need to be at least 1 m gap between top of stack and roof frames/roof of warehouse.
- 10.4.8.5 Size of stacks need to conform to fumigating requirements. There need not be any obstructions for fumigation of stock, i.e. stacking around pillars and close to roof trusses shall be avoided.
- 10.4.9 The stacking patterns indicated under Annex 2 shall be employed in order to ensure proper stacking of Produce.

10.5 Treatment of Stored Produce

Inspection and pest management process shall be carried out as per good industry practice.

10.6 Revalidation of Stocks

- 10.6.1 As a best practice, it is recommended to revalidate the stocks. With passage of time, quality of stored Produce may degrade or deteriorate to some extent. It is therefore mandatory to revalidate the quality of the produce periodically as the schedule provided below for the different types of Produce.

Sr. No.	Produce	Total Validity (months)	1st re-validation (After months)	No. of Re-validations	Revalidation cycle (after months)
1	Barley	9	5	1	4
2	Paddy	9	5	1	4
3	Wheat	12	6	1	6
6	Maize	10	5	1	5
9	Oilseeds	12	6	1	6
10	Cotton bales	9	6	1	6

10.6.2 the revalidation detail of other Produce announced to be subject of warehouse receipts shall be provided by the CMC from time to time with the approval of the Commission.

10.7 Delivery of Produce

Delivery is to be carried out from the warehouse by adopting the following process:

10.7.1 The Depositor/Holder may raise a request for the delivery and withdrawal of the Produce covered by an unencumbered EWR at any time.

10.7.2 Before proceeding further the warehouse operator needs to check in the CMC EWR System whether the EWR associated with the Produce is under pledge to any Bank / Financial Institution. If it is pledged, delivery or release of the produce is forbidden, except to the financial institution in question and in compliance with a legal instruction to this effect. Once the EWR is free of pledge, the Produce may be released and the EWR may be cancelled as set out in the Standard Operating Procedures associated with these Warehousing Guidelines.

10.7.3 The warehouse shall receive the due rental charges (if any) from the depositor and withhold the produce till after the receipt of due rental charges.

10.7.4 Trucks registration no. and identity of the person taking delivery shall be recorded by the Warehouse Operator.

10.7.5 Empty vehicle(s) shall be weighed at the weighbridge for tare weight..

10.7.6 Calculation of the net weight of the bagged Produce will be carried out as follows: Vehicle loaded weight – vehicle empty weight – weight of empty bags (total number of empty bags in a vehicle X weight of empty bag) = net weight

10.7.7 Empty trucks need to be brought to warehouse for loading under supervision of concerned warehouse operator.

10.7.8 The depositor/holder of the receipt shall confirm delivery of the Produce represented by the EWR into his own custody. The warehouse operator shall forthwith cancel the relevant electronic warehouse receipt in the CMC system..

10.7.9 The warehouse operator shall make entries in relevant documents/system and CMC system such as stock register, stack cards, etc., once the delivery is complete.

11 Cleanliness and hygiene at the warehouse

During storage, food grains and other agricultural Produce deteriorate due to physical and biological factors. These factors include moisture, temperature, insects, rodents, birds and storage fungi. Losses due to these factors may be minimised by maintaining cleanliness and hygiene in warehouses. A cleanliness regimen may be undertaken to ensure cleanliness and hygiene in the warehouses. Given below is the recommended protocol:

Activity	Areas to be Checked	Frequency/ Description
Cleaning	WH Structures-Walls/Gate/Windows	Monthly
	Floors	At least weekly
	Spider Web, Birds dropping, Celphos pouches	10 Days
	Dunnage/Waste/Scrap near warehouse	10 Days
	Brushing all the bags on the top layer and the four side of the stacks	Immediately after degassing/ Weekly
	WH Surrounding Areas/Cracks on floor	60 days
	Cleaning of loading/Unloading areas	Daily at the end of the day on transaction day
Spillage Collection	Spillage collection during non-operation (loading or unloading)	Weekly / Fortnightly depending upon the conditions of bags
	Spillage collection during operation	Daily at the end of the day on transaction day
Bags	Scrap/Unused bags	To be rolled over on monthly basis and should be covered with poly sheet
Aeration	During High temperature conditions (Hot weather)	Open the gates /windows daily in morning and evening
	During Rainy Season (During rains)	Do not open the gates /windows and only do leakage checking.
	During Low temperature conditions (Cold weather)	Do not open the gates /windows during foggy season.

12 Precautions during rainy season

If rain water enters the warehouse it can cause damage to the Produce, thus it is very important to undertake timely precautions during the regular operation of the warehouse. It is therefore recommended that the following necessary precautions be taken

- 12.1 The valley gutters and underground drainage to be checked periodically for choking or blockage
- 12.2 The shutters, doors and ventilators to be closed as far as possible to minimize rainwater entering the warehouse. The shutters, doors and ventilators may be kept open on sunny days
- 12.3 All the broken glass panes on ventilators to be replaced with sound ones. Warehouses with low plinth are liable to be inundated and all steps to be taken to ensure proper drainage of rain water
- 12.4 After every day of rain, intensive inspection is required around the stacks to assess for damage, if any.

Part IV Produce Handling and Management Process in Silo Storages

13 Requirements applicable to Silo Storages

- 13.1 Unless provided otherwise, the requirements provided under this part of the Warehousing Guidelines shall apply to Silo storages.
- 13.2 In addition to the requirements provided in these Guidelines, silo storages shall comply with the operational manual and safety cautions provided by the silo manufacturer to ensure the safety of workers and stored Produce.

14 General Requirements

The general requirements provided under Clause 5 of the Warehousing Guidelines shall apply to silo storages.

15 Specific Requirements

15.1 The specific physical infrastructure requirements for Grade A and Grade B silo storages are provided in the table below:

	Parameters	Specific items	Requirements for Grade A	Requirements for Grade B
15.1.1	Capacity	Capacity (60,000 sq. ft space for a silo of 10,000 MT storage capacity)	5,000 MT and above	Below 5,000 MT
	Drainage, common areas and other facilities	Drainage	Proper drainage channel	Natural Topography for drainage to be established
		Parking space within the compound	Sufficient parking area shall be earmarked for parking.	Not required
		Common Area (open area for roads and manoeuvring)	Sufficient warehouse area shall be reserved as common area	Not required
		Water storage tanks and fire extinguishers	Required	Required
		Sanitation and underground waste water Tanks	Required	Required
15.1.2	Warehouse Compound	Compound wall	At least 6 ft tall	Not required
		Compound wall structure	Brick, Reinforced Concrete Construction or equivalent structure Barbed Wire on top of wall (barb wires are required in case of inadequate wall height)	Brick, Reinforced Concrete Construction or equivalent structure Barbed Wire on top of wall (barb wires are required in case of inadequate wall height)
		Boundary wall gate (Access gate) for vehicles	Adequate width to facilitate access for heavy vehicles	Adequate width to facilitate access for heavy vehicles
		Wicket gate for persons	Required	Not required

		Road within premises	Cement Concrete or Paved and Gravelled	Not required
15.1.3	Ancillary requirements	Office space: exclusive space (including quality testing equipment for quality lab)	Adequate office space to enable easy access for employees and depositors	Adequate office space to enable easy access for employees and Depositors of Produce/holders. Only authorized personnel shall have access to the quality testing lab
		Electronic Control Room	Required	Required
		Guard room	Required	Required

16 Equipment required

16.1 The list of quality analysis equipment provided for bagged warehouses under these Guidelines shall also be required for Silo storages.

16.2 Every warehouse operator who runs silo storages shall have a full-fledged silo structure along with all the necessary accessories required for loading/unloading and treatment of the produce during storage. These shall include including the following:

16.2.1 Inside/Outside Ladders Cages and Platforms

16.2.2 Roof Ladder and Silo Inspection Door in the roof near to eve

16.2.3 Complete Aeration System Controlled manually, while alternatively auto aeration control system could be used to increase the precisions

16.2.4 Silo Roof Exhaust System

16.2.5 Process of Temperature and Moisture detection in place

16.2.6 Sidewall Silo Inspection Door

16.2.7 Appropriate Silo Sweep System

16.2.8 Silo Central and Optional Side Discharge System

16.2.9 Standby generator to avoid operations interruptions in case of electric failure

The Process Flow of Produce in Silo Storages

17 Produce receiving, sampling and quality testing

17.1 The procedures provided under Clauses 10.1, 10.2 and 10.3 of the Guidelines for Produce receiving, sampling and quality testing shall also apply to silo storages.

17.2 While trucks/vehicles loaded in bulk/bags are unloaded in Grain Receiving Area, depositors or drivers shall stay away in the customers sheds.

18 Pre-Cleaning Tower: For Corn, Wheat and Paddy

Upon receiving the grain, a Receiving Chain Conveyor shall feed to a Bucket Elevator and further transfer it to Pre-Cleaning Tower. In the Pre-Cleaning Section the warehouse operator shall make sure the following processes are properly taking place.

18.1 Dust Control & Aspiration System may be implemented to remove Dust/Small Particles/Small & Broken Grain.

18.2 For corn and wheat, Drum Pre-Cleaners may be put in place to remove the Coarse Particles/Impurities from the Grain.

18.3 For Paddy, Vibrating Screens may be put in place to remove the coarse particles/Impurities from the Grain.

19 Collection of Impurities during Cleaning

19.1 During cleaning, Dust & Small/Broken grains, and Coarse Particles/Impurities will be fed to Elevators through flow pipes for subsequent loading into Hopper Bins.

19.2 Hopper bins will be installed at an appropriate height from the ground level for the purpose of loading trucks underneath.

19.3 Alternatively, Dust & Small/Broken grains, and Coarse Particles/Impurities can be collected into Bags and dispatched on daily basis.

20 Dispatch of Impurities

Waste/Impurity storage bins may be filled within loading operation of 7 - 15 days. Trucks/vehicles may load the waste/impurities on weekly or fortnightly basis. Waste/Impurities will be dispatched as per instructions of operator

21 Drying Line: For Corn, Wheat and Paddy

- 21.1 Wheat and corn shall flow through a drying line (grain dryer), as need be, to ensure that their moisture content is controlled as per the applicable grades. The maximum tolerable moisture content can be modified by the relevant authority from time to time.
- 21.2 Most of the paddy varieties available in Pakistan require continuous flow of drying process to meet the maximum tolerable moisture content. To this end, paddy storing silos may have appropriate number of Dryers & Stay Bins (Tempering Bins), and make sure that the paddy passes as many times as needed to meet the moisture content requirement.

22 Bulk Weighing Scale

The Cleaned/dried grain shall be fed to Bulk Weighing Scale, where final weighing of the grain is recorded. The Bulk Scale shall continuously generate reports in the form of batches and a final report shall be produced at the end of the loading process.

23 Silo Loading

The Cleaned Grain shall be fed to Silos through Bucket Elevator & Drag Chain Conveyors or Metal Chutes.

24 Silo temperature Monitoring

A system for monitoring the temperature may be installed. The monitoring system of silos may consist of the following components:

- 24.1 Temperature Cables, with thermocouples to sense the temperature variations at different levels of Grain
- 24.2 Moisture Cables to sense the moisture variation at different levels
- 24.3 CO₂ Cables to sense the presence of insects inside the silos (this is optional requirement)
- 24.4 A Central PC integrated with a Programmable Logic Controller system which is, preferably, operating as Auto Aeration/Exhaust Controls
- 24.5 Inventory Measurement process/system may also be implemented.
- 24.6 It is preferred, that the system is able to generate alarms, produce reports on weekly basis and send auto emails, mobile apps, provide historical data, and produce charts and graphs.

25 Silo Fumigation System

- 25.1 Stored grain shall be fumigated on quarterly basis or as need be. The fumigation shall be carried out by using chemicals allowed to be used for such purpose in compliance with the procedural, environmental and safety rules issued by the relevant authority of Pakistan.
- 25.2 Warehouse operators may also alternatively use OZONE Generator to carry out fumigation.

26 Silo Aeration System

- 26.1 Silo aeration system is essential to aerate the grain & keep it cooler.
- 26.2 Although the required air flow rate varies for different grains, ≥ 0.1 cfm/bushel is the minimum requirement that shall be complied with.
- 26.3 The silo aeration system shall be composed of:
 - 26.3.1 Centrifugal Fans
 - 26.3.2 Aeration Channels
 - 26.3.3 Perforated Floor Planks

26.3.4 Roof Exhaust Fans with high airflow

26.3.5 Auto Aeration Controls (Optional)

26.3.6 Auto Exhaust Controls (Optional)

27 Silo Unloading

27.1 Silo shall be unloaded through Central, Primary & then Secondary wells. All wells shall open and close through electric or pneumatic slide gates.

27.2 There shall be unloading conveyors underneath that feed Main Elevator.

28 Sweep Auger System

Each silo may have a Sweep Auger System which is used to discharge the rest of grain at the time when discharging by gravity is stopped. Sweep Augers help screw the grain towards the Discharge wells and insures all the grain has been discharged from the silo.

29 Recirculation of Stored Produces

Proper steps may be undertaken by the warehouse operator for recirculation of the stored produce

29.1 Recirculation may be undertaken by loading grain in one silo into another silo.

29.2 Recirculation of Grain within the same silo is not a good practice; this operation may damage the grain & may not recycle 100%.

30 LOADING OF TRUCK LOADING BINS

Ideally two hopper bins are required for the purpose of truck loading, clean Wheat/Corn/Paddy is unloaded from silos, a silo loading main conveyor feed it to main elevator & main elevator further supply it to Hopper Bins Loading Conveyors. However, there could be alternate arrangements which may serve the purpose without compromising the quality of Produce.

30.1 Capacity of Each Hopper bin is adequate

30.2 For the Purpose of Truck Loading underneath, each Hopper Bin is installed at appropriate height above the ground level on Civil/Steel Structure

30.3 Discharge Capacity of the Hoppers may be increased/Decreased for the purpose of Bags/Bulk Loading

30.4 Underneath Hopper Silos, Bagging Scale & Bag Closing Conveyor could be used. Manual weighing/bagging is another option.

31 Truck Logistics and Dispatch of Clean Grain

The dispatch of grain, either in Bulk or Bags, shall be carried out in compliance with the following process:

- 31.1 Trucks registration no. and Identity shall be recorded at entrance gate;
- 31.2 Empty Trucks shall be weighed at weighbridge;
- 31.3 Truck shall be loaded through truck loading bins as per prescribed instructions of the operator;
- 31.4 Outflow of Grain shall be controlled by load cells, installed at Hopper Bins; and
- 31.5 Loaded truck shall be weighed again at the weighbridge and exit from the storage compound

32 Control System

It is preferred that the system is integrated with the Programmable Logic Controller (if this is available) in such a way as to ensure full control of the system from the main control room. This shall include stop and start mechanism from Grain Receiving to Loading of Truck. However, there could be alternate arrangements which may serve the purpose.

33 Centralized Networking System

The silo storage may install an advanced information system integrating one or multiple facilities with the main server to ensure strong backup of data, strong monitoring and provide extra safety measures against leakages and pilferages.

34 Vehicle Turnaround Time

34.1 Receiving

Total preferred turnaround time of 25 MT Vehicle may be about 45 Minutes, if there are 5 x labour involved to unload the truck at Grain Receiving. The receiving process may include the following steps

- 34.1.1 Entrance & Registration
- 34.1.2 Sampling – Collection of Sample & Results
- 34.1.3 Weighing of Loaded Truck
- 34.1.4 Unloading at Grain Receiving (5 x Labours)
- 34.1.5 Weighing of Unloaded Truck
- 34.1.6 Exit

34.2 Dispatch (Clean Grain)

At dispatch total turnaround time of 25 Tons Vehicle may be about 50 minutes for manual loading of bags. The dispatch process includes the following steps

- 34.2.1 Entrance & Registration
- 34.2.2 Weighing of Empty Truck

34.2.3 Loading of Grain underneath Hopper Silo at 50 MT/Hr Discharge Capacity of Hopper Silo or Manual Loading of Bags.

34.2.4 Weighing of Loaded Truck

34.2.5 Exit

34.3 Dispatch of Waste

Turnaround time of vehicle carrying dispatch depends on Waste Unloading Capacity.

35 Safety cautions

Every warehouse operator who runs a silo storage shall comply with the safety requirements provided by the silo manufacturer and other relevant laws and rules of the Pakistan.

Part V Miscellaneous Provisions

36 Record Keeping

- 36.1 Every warehouse to be accredited shall maintain proper records and documentation as per these Regulations, SOPs and Warehousing Guidelines. The details as given below may be recorded in the relevant register(s) as required.
- 36.2 For effective record keeping it is important that proper documentation shall be maintained at the warehouse. The minimum level of records/documents that need to be maintained at the warehouse are:
 - 36.2.1 A Register providing a detailed record of the total stocks available at the warehouse, the Produce received details and Produce delivered details, depositor wise
 - 36.2.2 Detailed record of the EWRs and GRNs issued by the Warehouse.
 - 36.2.3 Visitor Register that is used for obtaining acknowledgement from the people visiting the warehouse
 - 36.2.4 Relevant staff and Security Guard Attendance Register keeping records of the presence of security guard at the warehouse
 - 36.2.5 Record of the vehicles' wise Gross weight and tare weight of the Produce received at the warehouse or delivered from the warehouse
 - 36.2.6 Record of the physical inventory on each of the lots/stacks on cards.
 - 36.2.7 Record of the Bank's or Financial Institution's charge on the warehouse receipts pledged to them by the depositor for availing finance.
 - 36.2.8 Fumigation/Hygiene record including the dates of fumigation, doses and other prophylactic treatments undertaken in the warehouse and various cleaning activities undertaken in the warehouse.
 - 36.2.9 Quality testing and relevant sampling records
 - 36.2.10 Record of the details and observations of the various inspections carried out by auditors and / or other statutory bodies from time to time.

37 Audits and Verifications

- 37.1 The Warehouse Operator shall implement a system of regular audit and physical verifications of Produce stored at the Warehouse, on regular intervals. This record shall be open for inspection by the CMC/Commission/Banks/Futures Exchanges and other relevant entities.
- 37.2 The Warehouse Operator shall allow inspections to be conducted by CMC/Commission/Bank/Futures Exchanges or other relevant entity either directly by themselves or through their third party (duly nominated) agencies.

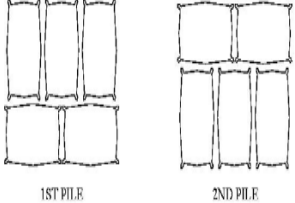
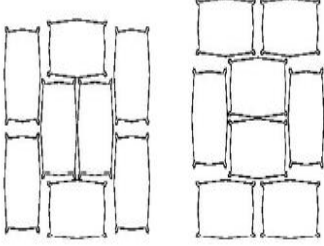
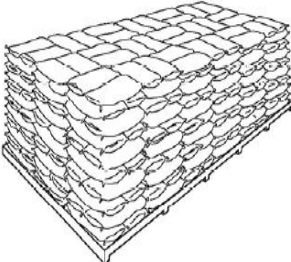
38 Measures against non-compliance with the Guidelines

- 38.1 Non-compliance with the requirements provided under the Regulations, SOPs, these Warehousing Guidelines, or other relevant laws may result in suspension or revocation of the accreditation granted to the warehouse operator.
- 38.2 The Warehouse Operator shall be fully liable for any loss or damage caused to the Depositor of Produce, financier, Holder or any other person having a right over the stored Produce, in particular on account of any deviation from the certified quantity and quality of the Produce as stated on the EWR.

**Annex 1: List of Produces that may be covered by Warehouse Receipts
(subject to the Accreditation Certificate issued to the Warehouse in Question)**

1. Paddy
2. Rice
3. Maize
4. Wheat
5. Cotton
6. Oilseeds
7. Other cereals and pulses
8. Other agricultural Produce, as notified by the CMC from time to time

Annex 2

Picture	Stacking Method	Details
 <p data-bbox="300 495 344 510">1ST PILE</p> <p data-bbox="472 495 517 510">2ND PILE</p> <p data-bbox="363 555 459 577">5 SACKS/PILE</p>	Sack / Pile method	In this method, in first layer, one row of bags is kept horizontally and other vertically. In the second layer, the first row is kept vertically and the next horizontally. Such a combination is called a Block.
 <p data-bbox="312 913 357 929">1ST PILE</p> <p data-bbox="491 913 536 929">2ND PILE</p> <p data-bbox="379 963 475 985">8 SACKS/PILE</p>	Sack / Pile block method	As depicted in the picture.
	Criss – Cross method	Criss crossing bags in a block of 2 or 3 bags as depicted in the picture.

*It is recommended that the sack / pile combination is followed and shall be kept constant for the stack to ensure neat stacking and counting