



Project Report Setting up

Grain Silo



By

SYMMETRICAL ENGINEERING INC

Vadodara, Gujarat, India

FEED MILL MACHINERY – STORAGE SILO

Client: M/S Gramadhar Farmers Producer Company Ltd

Kind Attn: Mr, Nilesh More

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Design, Manufacture, Installation & Commissioning

By

Symmetrical Engineering INC

(ISO9001:2015 CERTIFIED)

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Introduction

The most pertinent aspect, from an investor point of view is that, at present, long term storage capacity in the form of proper silos is virtually non-existent in the private sector. Considering the fact that the Government procures and stores grain as a policy, any investment in a silo project has an automatic and secure revenue stream in the form of rentals.

Godowns and warehouses do exist, but are not purpose built. They do not provide any significant protection against potential infestation. They cannot be made gas impermeable to facilitate fumigation. They do not have temperature or humidity control.

The need of the industry today is, concrete or metal silos, which can store up to 50,000 tons of grain and can effectively be fumigated and provide protection against insect infestation. The Silo project will also ensure bringing the grain storage industry in Pakistan in line with international best practices in multi-grain storage and handling. This will improve international donor support to our country in this industry and also encourage private sector investment in the agri-industry leading to improved operational efficiencies.

Introduction to SEI

We, "**SYMMETRICAL ENGINEERING INC**", we carry out all type of **PRECISION MACHINED COMPONENT & ASSEMBLIES** as per customer's design & Drawings. And Manufacturing of many different product that meet the strategic objectives of valuable Industries.

Our focus shall be to engineer, the products, processes and facilities with the latest technology and contemporary practice in manufacturing. We shall endeavor to continually upgrade and update our product profile in tune with needs of our customers and the latest technology trends. We have sophisticated **WORKSHOP** and as well **TRAINED TECHNICAL STAFF** who can manufacture **PRECISION COMPONENT** as per **CUSTOMER SPECIFICATIONS**. We have also in house **TOOL ROOM** Facility. The complete fabrication procedure is accomplished under expert guidance using the latest technology and thus, outcomes introduced finally to customers are assured to deliver excellent performance in their usage with assured durability

To meet our customers' expectations and to offer them products of unmatched quality standard, we are availed with advanced working facilities and a team of experienced personnel. Our workplace is sprawled over a broad region, comprising numerous departments, each of them allotted with their own duties. Experts incorporated with us have years of industry experience and are well versed with the market requirements. Utilizing their expertise and skilled ideas, these personnel are putting in their endless efforts for achieving the company's goal.

Overview of the Sector

India is primarily an agrarian economy with the agriculture sector contributing over 17.95% to the national GDP. India has two principal crops seasons, namely the **Rabi, Kharif and Zaid crops** of which begins in April-June and harvested during October-December while rabi, begins in October-December and harvested in April-May. Besides this, India's prime natural resources are arable land and water. About 48% of India total land area is under cultivation and is watered by multiple sources with 58% watering through canals.

Grain storage in India is primarily in the public sector and is the responsibility of Food Corporation of India Ltd (FCI) and different State Government. FCI and the state departments are also responsible for regulation of agricultural commodity markets and for activities of provincial seed and fertilizer storage agencies. Self-sufficiency in food grains requires adequate facilities for its storage. The existing storage facilities of the kind envisioned are insufficient for the large increase in production. Large-scale grain storage problem exist due either to traditional methods of seed storage or shortage of commercial grain storages and their management. This, therefore, presents a highly lucrative opportunity for investing in the agribusiness value chain for 'best practice storage solutions' of agricultural produce where current post-harvest losses can be transformed into economic gain.

Advantage of Steel Silos

Bag silos are a cheap solution for grain storage but its use has some limitations and disadvantages over the storage in steel silos.

Here are some of the advantages of using a steel silo over a bag silo for grain storage: Steel silos keep the grains safe longer.

Steel silos can be equipped with complete temperature control and ventilation system that guarantees the maintenance of the grain in good conditions. That is not possible when using bag silos, therefore they are not suitable for long term storage.

Greater storage capacity in a much smaller area.

Another disadvantage of the bag silo is its limited unitary capacity. A bag silo is not often bigger than 200 Tons, and since it is a horizontal type of storage, it requires a large land area, while steel silos, due to their vertical arrangement, allow greater storage capacities in a much smaller land area.

Recommended to store high moisture grains.

Bag silos are not recommended to store high moisture grains, due to the problem of fermentation. Fermentation produces grain overheating with the inevitable loss of quality. Besides, while the grains get into the bag silo, a big amount of oxygen is expelled and therefore the grain is stored in an environment full of carbon dioxide. This lack of oxygen favors the grain fermentation and its damage. We shouldn't forget fermentation is an anaerobic process as it happens without oxygen.

Steel silos avoid humidity problems in the case of rain.

Another disadvantage of bag silos over steel silos is the frequent breakage of the plastic film, whether it is by rodent attacks or any mechanical equipment working nearby, and therefore producing humidity problems, in case of rain.

Easier to unload.

We shouldn't forget how difficult it is to unload the grain from a bag silo, entailing grain damage or losses when falling on the ground. On the contrary, a steel silo can be equipped with different unloading conveying systems, according to the type of grain and the capacity required

What we offer



SEI offers two Type of Silos

Conical Bottom Silos

50 MT to 500 MTS

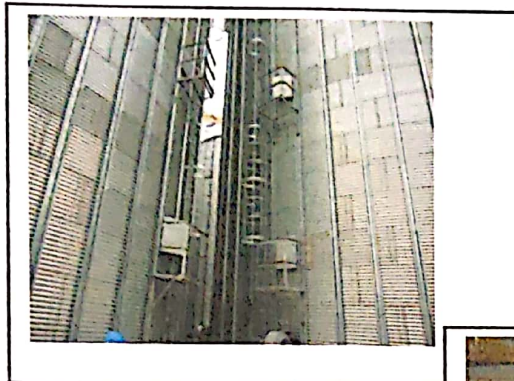
Flat Bottom Silos

1000 MTS to 27000 MTS

Peak loads are available up to **50,000 LBS.** or for snow loads up to 50 lbs. per square ft.

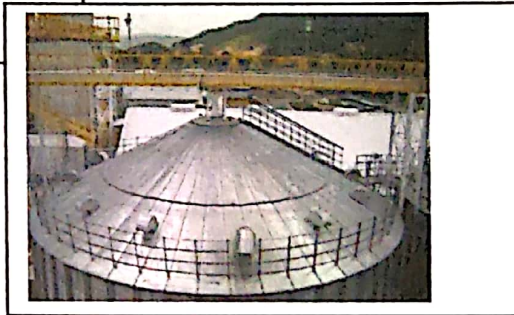
Bins use both an insert and two back plates at stiffener splices. We also utilize **7/16" HARDWARE.**

Engineered to store grains weighing up to **70 LBS. PER BUSHEL!** The industry standard is just 60 lbs/bushel.



Roofs Engineered For Ultimate Strength
Symmetrical Grain silos roof structures are designed for up to **50,000 LBS.** of peak load and utilize

Galvanized back to back "C" channels for ultimate strength. The large flat tops, Varying in diameter from 5' to 12', Provide multiple connections Points to support catwalks and Equipment loads.



ACCESSORIES

- Grain Lugs
- Grain Loop Systems
- Drag Conveyors
- Continuous Flow Dryers
- Stirring Machines
- Grain Spreaders
- Grain Monitoring
- Tower/C Shell/ Support Structure



FANS

Centralized Fans
A 30" type legs on these quiet fans allow for easy handling to and from while giving more flexibility for adjusting to environmental in a concrete pad.
Our highly-trained engineers test motor ratings and temperature under long term, maximum load conditions to ensure that the motor will stand up under tough operating conditions.



UNLOAD SYSTEMS

Drive Bin Paddle Setup
Designed to be fully automatic in grain. Simplest multiple paddle, the paddle chain moves grain gently and evenly to the floor. The paddle sweep has a capacity up to 5000 bushel.
EXTRAC Paddle Setup
Four sets independent roller spouts and partition resulting allowing the 2 sweeps to more effectively clean the grain bin. Capacity up to 11,000 bushel.



LADDERS & CAGES

Ladder & Cage Systems
Manufactured from mild steel, made to which fit the bin side wall at each rung. An economical way to gain access to the roof of the bin.
Ladder runs to drums are available and attach to the outside grain bin ladder to provide 90 degree. Cost can be reduced and measure 17" x 20"



STAIRS

Greene Stairs
Manufactured on bin in either direction. A heavy 20" wide is mounted 6" from the bin wall providing a 20" wide walkway.
- Stairs
- Platforms
- Intermediate rails
- Ladder and platform
- Platform floor
- Bottom board sheet



Technical Data Sheet

SL.NO	DESCRIPTION	TECHNICAL DATA
1	FLAT BOTTOM SILOS MODEL	SCS131014
	VOLUME IN CU-MTRS	1395
	PRODUCT DENSITY KG/M3	750
	Moisture Level	12%
	CAPACITY IN TONS (WITH <u>5%</u> COMPACTION)	1000
	DIAMETER (Mtr)	12.9
	NO. OF SIDE WALL RINGS	10
	EAVE HEIGHT (Mtr)	10.3
	OVER ALL HEIGHT(Mtr)	14.7
	ROOF PEAK LOAD CAPACITY IN KGS	12430
	GALVANIZATION – WALL SHEETS	Zinc Alu (600 GSM)
	WIND VELOCITY –KPH	155
	DESIGNED FOR SEISMIC ZONE	Seismic UBC 2B (Indian 3)
	NO OF COLUMNS / STIFFENERS	60 (W TYPE), 3 per wall sheet
	CORRUGATION PITCH (INCH)	2.66"
	HARDWARE / FASTENERS –3/8" Dia bolts;	JS 500
	Side Wall Vertical Sheets Bolting	32" Vertical Coverage
	15 GA and Thicker – QUAD Punching	112.5" Horizontal Coverage
	STEEL GRADE (WALLS & ROOF) 6-17 GA Minimum Yield Strength - 55,000 PSI Minimum Tensile Strength- 70,000 PSI	A653M

Silo Accessories

1.	INSIDE LADDER	YES, included
2.	ACCESS HOLE GUARD RAIL	YES, included
3.	ROOF LADDER WITH HAND RAIL	YES, included
4.	OUTSIDE LADDER WITH SAFETY CAGE	YES, included
5.	ROOF VENTS	YES, included
6.	ROOF EXHAUSTER PACKAGE	YES, included, 2 HP
7.	LEVEL INDICATORS	YES, included
8.	AERATION TYPE	Flush Floor type
9.	CENTRIFUGAL FAN (QTY)	1 No's / silo of 7.5 HP each
10.	SWEEP AUGER	9"-11" CMM BIN SWEEP AUGER, 2HP Motor
11.	TEMPERATURE MONITORING SYSTEM	5X5 Display Unit
12.	SEALANTS	Wall Sheet & Eave
13.	BIN EAVE SAFETY HAND RAIL	YES, included
14.	CATWALK (Eave to center of Silo)	YES, included
15.	Fumigation System	Yes
Total Cost Including all the Silos Accessories Rs		55,00,000/=

LOADING & UNLOADING SYSTEM

Sl. No	Description	Unit Rate	Qty	Amount
1	Bucket Elevator with support Tower Cap: 20 T/PH	15,00,000	01	15,00,000
2	Drag Chain Conveyor for top loading of silo 20T/PH	8,00,000	01	8,00,000
3	Drag Chain conveyor for silo Discharge 10 T/PH	9,00,000	01	9,00,000

COMMERCIALS & GENERAL TERMS

1	Ex- works at Vadodara, Gujarat Note: Delivery Time: 14 to 16 weeks after getting PO & Advance			AMOUNT
2	Total Price			
	SLNo	DESCRIPTION	RATE	QTY
	1.	Flat Bottom Silo 1000 MT	55,00,000	01
	2.	Bucket Elevator silo loading	15,00,000	01
	3.	Drag Chain Conveyor Silo loading	8,00,000	01
	4.	Drag Chain Conveyor Silo Discharge	9,00,000	01
	5.	MCC Control panel with cabling	2,00,000	01
3	ERECTION & COMMISSIONING charges			9,00,000
4	Transportation Charge			3,00,000
5	Packing Charges @ 5%			4,45,000
Sub Total				1,05,45,000
IGST @18%				18,98,100
Total				1,24,43,100

Scope of Work

1.	Civil Work (Foundation of Silos)	Client
2.	Silos Erection & Commissioning	Symmetrical Engineering
3.	Power Supply Arrangement	Client
4.	Back Up Power Supply	Client

NOTE:

1. Freight & Insurance will be in Client Scope.
2. All the Taxes as Applicable.
3. 50% Advance Payment on conformation of Order.
4. Balance 50% in the form of Letter of Credit from any Indian Bank against Dispatch.
5. Erection/ Installation Work will be done on extra charges.
6. The Buyer shall arrange boarding for our erection team free of charge and provide means for the transportation of our technician between hotel/staying place and plant.
7. Subject to Vadodara, Gujarat (India) Jurisdiction.

GST: 24AHTPM1735G1Z8

Offer Valid Till: 30th July 2022.

CONDITIONS OF SALE BINDING ON THE BUYER UNLESS OTHERWISE AGREED TO IN WRITING

1. PRICE BASIS

1.1 Prices are on ex-works, Vadodara. The quoted price is based on today's exchange rate. Any, fluctuation to the exchange rate are to the buyers account according to the regulation of Reserve Bank of India on the date of receipt of payment.

2. TAXES AND DUTIES

2.1 All types of taxes, duties, levies, Octroi etc., shall be to the buyer's account.

3. PRICE VARIATION

3.1 Quoted rates are as per the present raw material prices. Any change in price of such raw material during execution of the project has to be considered for revision of price with the mutual consent of buyer unless agreed.

3.2 In case of withhold/suspension of order on Buyer's instruction or lack of instruction, the project price shall be increased to manage any additional expense thereby incurred to / by us. Seller shall not be responsible for any further delays or damage arising subsequent to dispatch.

4. DRAWINGS / DOCUMENTS

4.1 Buyer has to maintain confidentiality for the documents, specifications submitted/mentioned along with seller's quotation and should not disclose to any other third party/person. The information given in the drawings and specifications are not final/binding in detail and the seller reserves the right to modify the design during the time of manufacture to improve/better performance in accordance with revised standards or manufacturing methods. Submitted documents / drawings must be returned to the seller if the proposal is not accepted by the buyer.

5. PAYMENT TERMS

5.1 The Buyer agrees to pay the Supplier the Price according to the payment schedule set out in the Quotation ("Terms of Payment").

6. ACCEPTANCE

6.1 The final acceptance and the effective date of start of the project will be communicated to the buyer upon receipt of advance payment realization through Cheque / NEFT/RTGS.

6.2 Purchase orders will only be acknowledged done all equipment specifications are known and agreed.

7. CANCELLATION

7.1 Purchase orders placed on Symmetrical Engineering Inc are not binding unless based solely on this quotation and these terms and conditions.

7.2 Purchase Orders once acknowledged by us, cannot be cancelled in whole or in part for whatever reason in writing. On receipt of such written notice for cancellation, Symmetrical Engineering Inc reserves the right to claim compensation for any loss or damage sustained and arising from such cancellation.

8. INSPECTION & TESTING

Symmetrical Engineering Inc or its authorized representative will inspect the item before dispatch and ensure that the item supplied is as per drawing specifications. In case where buyer intends for inspection by his representative prior to dispatch of finished goods, the cost of all such inspection including expenses for buyer's representative,

will be to buyer's account. For such inspection, buyer must carry out within 10 days of seller's notice about the readiness of goods for inspection and any failure on the part of the buyer to send his representative will be considered as waiver for inspection from Buyer's representative and seller's inspection will be considered as final and the goods will be prepared for delivery immediately thereafter.

9. DELIVERY

9.1 The Supplier will Endeavour to deliver the Equipment as per the details specified in the Quotation ("Delivery") shall be recognized as ex-works delivery from the date of receipt of technically and commercially clear order / advance payment realization, whichever is later. The delivery period mentioned in seller's offer is in good faith and subject to normal availability for raw materials, components etc. In case of any delay in the availability of such materials, which directly affect the Delivery of finished goods will be intimated to buyer's representative and thereon, any liquidated damages or penalty shall be excluded. Partial deliveries shall be accepted by the buyer and the seller reserves the right to submit an invoice for such partial deliveries and payment for such invoice shall be duly made by the buyer as per the agreed terms of payment. The seller's responsibility concludes after the goods have been delivered to the buyer or their representatives or road transport carrier, or any other carrier, and no claim for breakage or shortage will be accepted thereon.

10. TRANSIT & TRANSIT INSURANCE

10.1 Shall be in buyer's scope.

11. WARRANTY / ASSIGNMENT

11.1 All equipment supplied by Symmetrical Engineering Inc is warranted for defects free raw material and poor, workmanship for 01 Year for Silos & 12 months for all Electrical Equipments from the date of supply.

11.2. This warranty is conditional upon the equipment supplied by Symmetrical Engineering Inc being manufactured, installed and commissioned according to the conditions specified in the Symmetrical Engineering Inc manual.

11.3. All accessories which are not manufactured by Symmetrical Engineering Inc, shall be provided with manufacturer warranty (if any) applicable to such accessories and Symmetrical Engineering Inc shall not be liable for any loss or damage arising from any deficiency or defect in such equipment except to the extent that the same may be actually recovered from the original manufacturer.

12. REPLACEMENT OF DEFECTIVE MATERIAL

12.1 Any parts manufactured by Symmetrical Engineering Inc which show faulty material or workmanship will be repaired or replaced without charge, provided such defects develop under normal and proper use should be returned to us with all expenses like transport, packing, insurance and taxes etc., fully paid by the buyer, which seller has no liability to pay.

12.2 Symmetrical Engineering Inc. will rectify / replace (if necessary) the returned items to its normal working condition in such a way that the supplied equipment/system performance shall remain same. The replacement parts

will be supplied to buyer on free of cost, where buyer has to pay for packing, forwarding, freight/transport, insurance and taxes etc.

12.3 Our maximum total liability in respect of any and all claim shall be limited to the value of the item.

13. NON-LIABILITY FOR DAMAGED EQUIPMENT

13.1 Symmetrical Engineering Inc will not be responsible for or liable for any damage resulting from improper storage or handling prior to placing the equipment in service and will not assume any responsibility, expense or liability for repairs made outside its works without proper written consent.

13.2 Symmetrical Engineering Inc. will not be responsible for or liable in any way for consequential loss or damage such as loss of use, loss of profit, loss of revenue or any costs of disruption in relation to its obligations under the terms of this supply.

13.3 It is considered that Buyer is having adequate basic knowledge about the system requirements and inputs and is aware of the variables involved. No consequential damage of any kind is acceptable by the Seller in case of any failure of the equipment due to reasons beyond the technical capabilities of equipment supplied or due to contradicting specifications provided by buyer during bidding stage and changes in input conditions to Seller equipment / system. Compensation due to failure of unit equipment in Seller system due to poor design,

Workmanship etc. is limited to the unit value of such equipment as given in the price break-up if available. Such compensation is applicable only during the performance guarantee period of the equipment / system supplied by Seller.

14. DISCLAIMER

14.1 Symmetrical Engineering Inc and their subcontractors undertake to use their best efforts and endeavors to carry out the quoted work as expeditiously and efficiently as feasible but cannot accept responsibility for the use of information derived by others or data provided by client or any third party.

15. RETENTION OF TITLE

15.1 Notwithstanding that the risk in the equipment shall have passed to the Purchaser, title and property in the equipment shall remain with Symmetrical Engineering Inc until full payment is made to Symmetrical Engineering Inc, for all amounts owing by the Purchaser.

15.2 If the Purchaser fails to make payment for the equipment in accordance with Clause 5 of these Commercial Terms and Conditions, Symmetrical Engineering Inc shall have the right to recover from the buyer the equipment and for that purpose the employee's / representatives /agents of Symmetrical Engineering Inc may enter upon the Purchaser's premises (or any premises under the control of the Purchaser, or the Purchaser's agent if the equipment is stored at other premises) in order to effect recovery, and use any reasonable means of force to effect recovery without liability for trespass or any resulting damage, Symmetrical Engineering Inc shall have the right to resell or otherwise dispose of the equipments or recovered without reference to the Purchaser.

15.3 In the event that the Purchaser sells the equipment to a third party before payment in full for the equipment has been made to Symmetrical Engineering Inc, then the Purchaser, in a position of fiduciary, shall:

- Assign to Symmetrical Engineering Inc the benefit of any claim against such third party and account fully to
- Symmetrical Engineering Inc for the proceeds of the sale of the equipment sold, or any part thereof, until the Purchaser's total indebtedness to Symmetrical Engineering Inc is discharged.

16. INTELLECTUAL PROPERTY / COPYRIGHT

16.1 Ownership of all intellectual property rights (other than third party intellectual property rights) associated with the Equipment or Spare Parts and any documentation provided by the Symmetrical Engineering Inc pursuant to the supply of the Equipment or Spare Parts is vested and shall vest in Symmetrical Engineering Inc.

16.2 Seller reserves the right to use all designs made by him on behalf of buyer. All designs made by seller are the property of the seller and shall not be used by buyer for competitive bidding by others or for own use in fabrication, assembly or installation.

17. LIMITATION OF LIABILITY

17.1 Notwithstanding any other provision of these Terms and Conditions, and except to the extent that liability cannot be limited or excluded, the liability of Symmetrical Engineering Inc, to the Purchaser, whether arising under or in connection with these Terms and Conditions or the performance or non-performance thereof or anything incidental thereto, and whether by way of indemnity, by statute, in tort (for negligence or otherwise), or on any other basis in law or equity is hereby limited and excluded as follows:

- Symmetrical Engineering inc shall have no liability what so ever to the Purchaser for loss of use, data, production, profit, revenue, business, contract or anticipated saving, or for any delay (other than liquidated damages expressly provided for and limited in the Contract),
- Financing cost so increase in operating costs or any economic loss or for any special, indirect or consequential loss or damage;

17.2 For the purpose of this clause, the term Symmetrical Engineering Inc shall mean SEI, its affiliates, sub-contractors and suppliers of any tier, and their respective agents and employees, whether individually or collectively

18. FORCE MAJEURE & APPLICABLE LAW

18.1 Delivery is contingent upon Force Majeure. Force Majeure shall mean any event or circumstance or combination of events and circumstances, which is beyond the control of the seller, such as

- a. Natural phenomena, including but not limited to weather conditions, floods, draughts, earthquakes etc.
- b. Acts of any Government Authority, domestic or foreign, including but not limited to any emergency declared or undeclared, priorities, quarantines, embargoes, licensing control or production or distribution restrictions, power cuts / shortage etc.

c. Accidents and disruption including but not limited to fires, explosions, break-downs of essential machinery or equipment and power storage.

d. Transportation delay due to force-de-majeure, non-availability of railway / truck booking or accidents, damages to equipment, in transit or during erection.

e. Strikes, slow down, lockouts and sabotage.

f. Failure or delay by sub-contractors / suppliers in supply of finished / semi-finished goods. Additional time shall be granted due to force-de-majeure and the contract shall be read and understood as if it had contained from its inception the delivery date as extended.

18.2 This contract shall be governed by and be construed in accordance with the law of India, under Vadodara jurisdiction.

19. PROVISIONS OF THESE COMMERCIAL TERMS AND CONDITIONS TO PREVAIL

19.1 The Purchaser agrees that these Commercial Terms and Conditions (which cannot be waived or varied except with the express agreement in writing of Symmetrical Engineering Inc shall prevail overall conditions of the Purchaser's order form to the extent of any inconsistencies.

For Symmetrical Engineering Inc

Arvind Kumar Mishra

(Authorized signature)