

# TECHNICAL SPECIFICATION

**IN RESPECT OF DELIVERY OF EQUIPMENT, SILO BINS AND STEEL STRUCTURE  
FOR THE PROJECT “Increasing the storage capacity of the Grain Terminal at  
the Berth 80 from Constanta Port North”**

## **A. GENERAL DESCRIPTION**

In the west area of COMVEX Grain Terminal (“CGT”) will be added two new silo bins with total storage capacity of 11,800 mt (5,900 mt each silo bin).

Basically, from operational point of view, to 6 existent small flat bottom silo bins in the west storage area will be added two new flat bottom silo bins. They can be loaded from any of two existent chain conveyors which are placed above 6 existent small flat bottom silo bins:

- Either from CC12.1 over silo bins SB22, SB23 and SB24 [or B00, B01 and B02 (initial construction codes from 2018)];
- Or from CC12.3 over silo bins SB19, SB20, SB21 [or A00, A01 and A02 (initial construction codes)].

In the area between SB22 and SB23, at the bottom of existent chain conveyor CC12.1, will be inserted new slide gate SGCC12.1.4 which will allow redirection of grain towards new bucket elevator BE51 through long gravity spouting. Similarly, in the area between SB19 and SB20, at the bottom of existent chain conveyor CC12.3, will be inserted new slide gate SGCC12.3.4 which will allow redirection of grain towards new bucket elevator BE51 through long gravity spouting.

Two long gravity spouting for feeding BE51 are placed between levels of about +29.90m (bottom level of CC12.1/CC12.3) and +4.80m (inlet level of BE51). Cross section to be 500 mm x 500 mm.

All spouting to have minimum slope of 40 degrees. At least at each 6 m vertical distance to be installed drop flow retarder. Spouting to be lined by polyurethane liners 6 mm thickness (vertical parts to be fully lined, while inclined parts to be lined at bottom and 2/3 of height of lateral walls). Spouting covers to be detachable for easy inspection and maintenance access.

By new bucket elevator BE51 grain will be lifted to about +49.65m (outlet from BE51) and through spouting and 2-way valve EV51 will be directed to one of new chain conveyors (CC51/CC52) to feed one of two new silo bins (SB25/SB26).

New chain conveyors CC51 and CC52 are with one inlet and with one outlet each. No any slide gate at outlet.

Silo bins will have storage capacity of 5,900 mt each (storage capacity is based on wheat with density 780 kg/m<sup>3</sup> and 6% compaction). Total height of silo bin is 37 m (cylinder 32.60 m plus roof 4.40 m). Diameter is 16.37 m (it fits between existent silo bins). Silo bins to be equipped with aeration system and temperature monitoring system.

Silo bins will have 3 outlets:

- a) One central for capacity rate of 1,500 mt/hour. Central outlet will be equipped with slide gate with proportional opening for controlling grain outflow.
- b) Two auxiliary outlets with dimensions of 300 mm x 300 mm at distances of 6.80 m and 3.4 m from silo bin center. Each auxiliary outlet will be equipped with slide gate with non-proportional opening (only open/closed positions).

Each silo bin will be equipped with sweep auger. Handling capacity rate of sweep augers will be 250 mt/hour.

From two new silo bins grain will be reclaimed by new completely enclosed belt conveyor BC51 (1,500 mt/hour handling capacity rate). Belt conveyor BC51 will have 6 inlets:

- a) Two inlets from central silo bin outlets for capacity rate of 1,500 mt/hour (one outlet per silo bin); and
- b) Four inlets from auxiliary silo bin outlets 300 mm x 300 mm (two outlets per silo bin).

Belt conveyor BC51 will feed new bucket elevator BE52 (1,500 mt/hour handling capacity rate).

Bucket elevator BE52, through 2way-valve EV52, will feed one of two new chain conveyors (CC53 towards existent belt conveyor BC01 or CC54 towards existent belt conveyor BC02). Chain conveyors are 1,500 mt/hour handling capacity rate.

### **Imposed features:**

#### 1) Storage capacity:

Silo bins will have storage capacity of 5,900 mt each (10,800 mt total both ; capacitatea de depozitare se bazează pe grâu cu densitate 780 kg/m<sup>3</sup> și compactare 6%)

#### 2) Handling capacity rates:

- a) Silo feeding system is 600 mt/hour (from existent chain conveyors CC12.1 and CC12.3 to inlets of silo bins);
- b) Silo reclaiming system is 1,500 mt/hour (from silo bins central outlets to existent belt conveyor BC01 and BC02); and
- c) Sweep augers are 250 mt/hour each.

#### 3) Steel structure:

- a) Erection without welding, only by bolts
- b) Corrosion protection: by galvanization

### **ATEX REQUIREMENTS**

- a) Tunnel under silo bins and elevator pit for BE52 are ATEX22 areas.
- b) Interiors of silo bins are ATEX 21 areas.

## **B. LIST OF HANDLING EQUIPMENT**

### **1. Slide gate SGCC12.1.4**

- Dimensions: 500 mm x 500 mm
- Positions: open / closed

### **2. Slide gate SGCC12.3.4**

- Dimensions: 500 mm x 500 mm
- Positions: open / closed

### **3. Bucket elevator BE51**

- Total height: H = 49 m
- Handling capacity rate: 600 mt/hour
- Receiving from CC12.1 or CC12.3 (inbound flow controlled by slide gates SG12.1.4 or SG12.3.4)
- Feeding CC51 or CC52 through 2-way valve EV51
- Equipped with two SIMATEK spot filters JM15/14V (one at bottom and another one on top)

### **4. 2-way valve EV51**

- Handling capacity rate: 600 mt/hour
- Construction: two electrical slide gates; one inlet and two outlets (dimensions of inlets and outlets: all 500mm x 500mm)
- Scope: directing grain from BE51 to CC51 or CC52

#### **5. Chain conveyor CC51**

- Total length: L = approx. 15 m
- Horizontal conveyor
- Handling capacity rate: 600 mt/hour
- 1 inlet / 1 outlet (from BE51 through EV51 to SB25)
- Height: above silo SB25 at elevation of about +42 m (bottom of chain conveyor)

#### **6. Chain conveyor CC52**

- Length (inlet/outlet) L = 14.38 m
- Horizontal conveyor
- Handling capacity rate: 600 mt/hour
- 1 inlet / 1 outlet (from BE51 through EV51 to SB26)
- Height: above silo SB25 at elevation of about +42 m (bottom of chain conveyor)

#### **7. Sweep auger SA25**

- Length: L = 7.50 m (for silo bin diameter D = 16.37 m)
- Handling capacity rate: 250 mt/hour

#### **8. Belt conveyor BC51**

- Overall length: L = 42.50 m
- Handling capacity rate: 1,500 mt/hour
- Completely enclosed conveyor (no any dust dissipation)
- 6 inlets / 1 outlet

#### **9. Bucket elevator BE52**

- Total height: H = 23.70 m
- Handling capacity rate: 1,500 mt/hour
- Feeding silo new chain conveyors CC53 and CC54 through 2-way valve EV52
- Equipped with 3 SIMATEK spot filters (2 pieces JM15/19V at top and one JM15/24V at bottom)

#### **10.2-way valve EV52**

- Handling capacity rate: 1,500 mt/hour

- Construction: two electrical slide gates; one inlet and two outlets; dimensions of inlets and outlets: all 800mm x 800mm)
- Scope: directing grain from BE52 to CC53 or CC54

### 11.Chain conveyor CC53

- Total length (inlet/outlet) L = 16.15 m
- Handling capacity rate: 1,500 mt/hour
- 1 inlet (from BE52 through EV52) / 1 outlet (to BC01)
- Position: on catwalk at elevation of about +7.50m

### 12.Chain conveyor CC54

- Length (inlet/outlet) L = 16.15 m
- Handling capacity rate: 1,500 mt/hour
- 1 inlet (from BE52 through EV52) / 1 outlet (to BC02)
- Position: on catwalk at elevation of about +7.50m

### 13.Spouting & transition pieces

- Set of spouting and transition pieces necessary to connect all new handling equipment and silo bins with existent handling equipment:
  - grain sources: existent chain conveyors CC12.1 and CC12.3
  - grain destinations: existent belt conveyors BC01 and BC02

*Remark: spouting to be delivered knocked-down. Lining: COMVEX will put at disposal BlueOx polyurethane sheets and bolts to be lined on site. Dimensions of BlueOx polyurethane sheets: 3.00x1.20m (to be tailored on site).*

**Remark:** All above mentioned dimensions are approximate. Bidder will determine them on the basis of equipment / silo bins / steel structure offered.

## MODIFICATIONS OF EXISTENT EQUIPMENT

The following existent equipment will suffer modifications:

### 1. Chain conveyors CC12.1 and CC12.2

Location: over small flat bottom silo bins:

- CC12.1: over silo bins SB22, SB23 and SB24
- CC12.3: over silo bins SB19, SB20 and SB21

Modifications: cut out bottom for connecting 600 mt/hour slide gates (SGCC12.1.4 at CC12.1 and SGCC12.3.4 at CC12.3).

## **2. Belt conveyors BC01 and BC02**

Location: tail section (the most western area of both belt conveyor).

Modification: new inlets for feeding 1,500 mt/hour instead of existent inlets for 600 mt/hour.

## **3. Chain conveyor CC44**

Location: alongside silo bins SB24 and SB23.

Modification: to split existent chain conveyor CC44 into two chain conveyors to allow construction of silo bin SB26:

- a) CC44: approximate length: 20 m
- b) CC44A: approximate length: 19 m

# **C. STEEL STRUCTURE**

## **A. Towers**

1. Tower TW51 for bucket elevator BE51
  - Total height: about 50 m (from +3.00m to +53.00m)
  - Accessory: zig-zag stairs
2. Tower TW52 for bucket elevator BE52
  - Total height: about 20 m (from +3.00m to +23.00m)
  - Accessory: inside ladders

## **B. Catwalks with support structure**

1. **Connection catwalk CW-CL-A-B between existent CC12.1 and CC12.3**
  - Length: 30 m
  - Elevation: +30.00m (about 27 m above concrete platform)
  - To connect existent catwalks for CC12.1 and CC12.3 and two towers (existent for BE42 and new for BE51)
2. **Catwalk CW-CC5152 over new silo bins SB25 and SB26**
  - Length: 47 m
  - Elevation: +41.00m (about 38 m above concrete platform)
  - For new chain conveyors CC51 and CC52

### 3. Catwalk CW-CC5354 for new chain conveyors CC53 and CC54

- Length: about 35 m
- Elevation: +7.50m (about 4.5 m above concrete platform)
- Support towers are included

## D. PRELIMINARY DOCUMENTATION ATTACHED TO THIS TECHNICAL SPECIFICATION:

1. 2024-01-25 COMVEX Expansion West - 0 Layout.dwg
2. 2024-01-25 COMVEX Expansion West - 1 Plan view.pdf
3. 2024-01-25 COMVEX Expansion West - 2 Foundations and tunnel.pdf
4. 2024-01-25 COMVEX Expansion West - 3 Sections.pdf
5. 2023-12-19 Flow chart - Expansion 2 silo bins WEST 1 Entire Terminal.pdf
6. 2023-12-19 Flow chart - Expansion 2 silo bins WEST 2 West area.pdf

## E. OFFER

**Bidder must present technical and commercial offer which will comprise:**

- a) **Drawings** with layout of all equipment, silo bins and steel structures (plan view, top view and typical sections).
- b) **List of equipment** with technical specification (power, dimensions, sensors, weight).
- c) **List of silo bins** with technical specification (dimensions, capacity, weight).
- d) **List of steel structures** with technical features (dimensions and weights).
- e) **Commercial offer defalcata** [each piece of equipment, silo bins and steel structure componens (catwalks/towers)].
- f) **Confirmation** to meet the below indicated Delivery Schedule:

Nr.	Component	Delivery DAP Comvex
1	Silo bin SB25	30.06.2024
	Temperature monitoring system	
	Aeration system (roof)	
2	Silo bin SB26	31.08.2024
	Aeration system (roof)	
	Tower TW1 for bucket elevator BE51	
	Catwalk CW-CL-A-B	
	Chain conveyor CC44A	
	Chain conveyor CC51	
	Chain conveyor CC52	
	Bucket elevator BE51	
	Spouting for 600 mt/hour	
	Slide gates and 2-way valve for 600 mt/hour	

3	Belt conveyor BC51	30.09.2024
	Bucket elevator BE52	
	Chain conveyor CC53	
	Chain conveyor CC54	
	Spouting for 1500 mt/hour	
	Slide gates and 2-way valve for 600 mt/ora	
	Tower TW2 for bucket elevator BE52	
	Support structure for CC53 si CC54	
4	Sweep augers	15.11.2024

Issued by:

Djordje Krkljus

Reasearch & Development Manager