INDEPENDENT ENGINEER

MONTHLY REPORT
SEPTEMBER 2022

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MONTHLY REPORT

Contents

1 INTRODUCTION

1.1 PURPOSE

This document is issued on basis of the Independent Engineer Services contract signed between IPSA Institute, Government of Montenegro and Žičara Kotor - Lovćen Ltd. Podgorica, number 8854 (IPSA Institute), as a report on monitoring and supervision of works on construction of the Kotor – Lovćen Ropeway, on weekly level.

1.2 SCOPE

All major aspects of the construction process are commented within different chapters of the document. Proposals are given for eventual open issues between the participants of the project. Any ongoing process relevant for further development of project is analysed and its potential to impede the time schedule assessed.

2 GENERAL UPDATE AND THE TIME SCHEDULE

2.1 MAJOR ACTIVITIES DURING SEPTEMBER

- During September, Contractor's site activities were mostly focused on construction of line foundations and station foundations for the ropeway facility.
- Preparation of foundations for the top station building is ongoing.

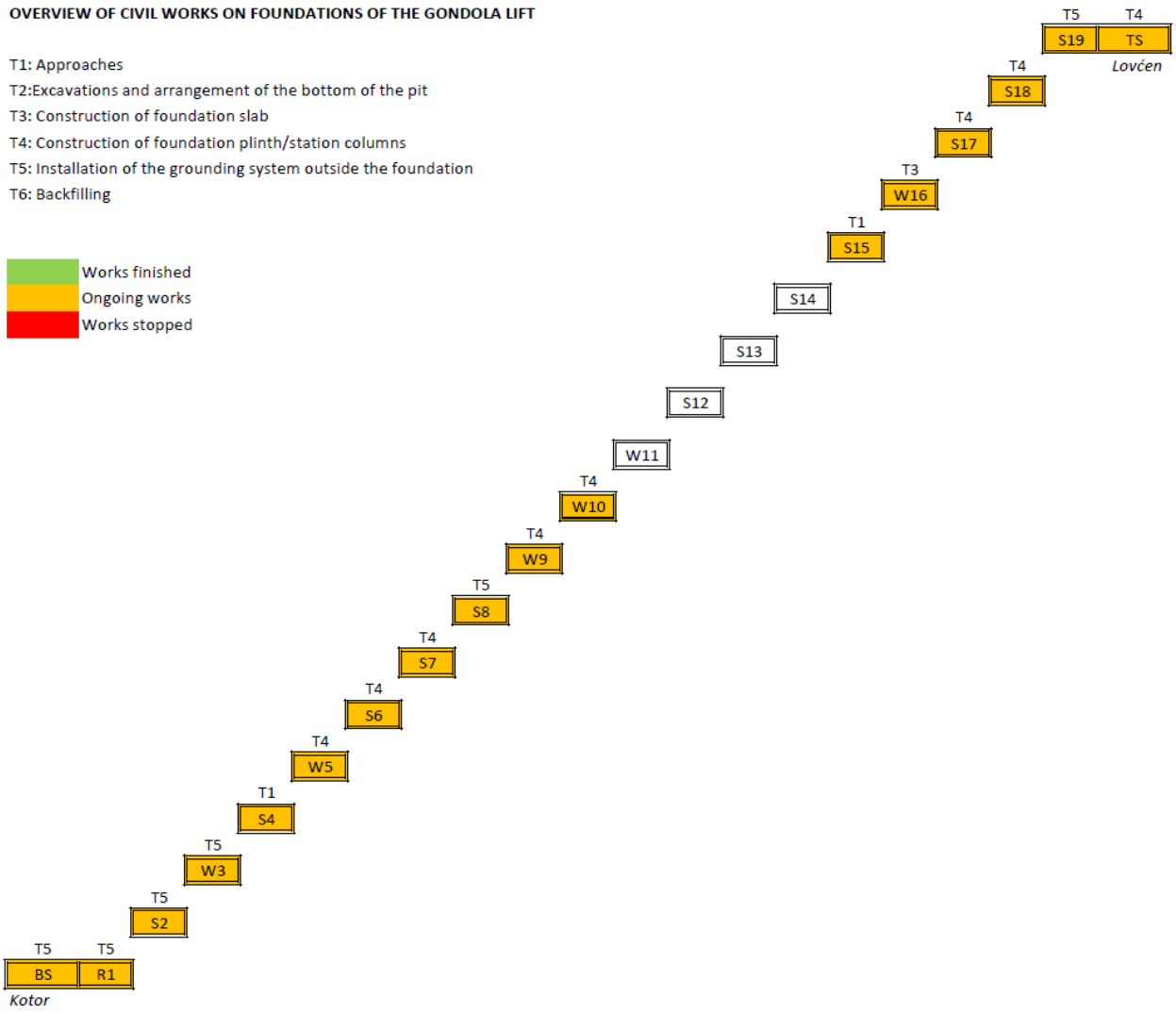

Figure 2-1: Overview of civil works on the ropeway facility, as of CW 39

2.2 THE OVERALL PROGRESS OF WORKS

Comparisons between planned and executed (finished) activities will be given with respect to the time schedule (Gantt chart) adopted for the whole project, i.e. all the activities related to the project and necessary for its implementation.

Important milestones:

- Signing of the contract: 15/12/2021.
- Approval of design documents: 08/07/2022.
- Notification on start of works: 12/07/2022.

Remark: In the previous report, comparisons had been given with respect to the time schedule prepared by BRIV Company (issued on 21/07/2022). This time schedule covers civil works only. The actual progress of works on the site over last two months departed largely from this schedule, which made it obsolete and useless. The updated version of this time schedule was issued on 03/10/2022 (see the annexes). In this and future monthly reports, this time schedule (and possible updates) won't be discussed in detail but only its compliance with the overall schedule for the project checked.

Progress of works (ahead, in line with or behind the schedule) is assessed on monthly level. The real-time start of activities displayed on the Gantt chart (Annex 1) is the date of the notification of stat of works (12/07/2022). The overview is shown below. "Days" refer to calendar days

2.3 ACTIVITIES PERFORMED BY THE CONCESSIONAIRE

2.3.1 THE ROPEWAY FACILITY

2.3.1.1 CIVIL WORKS

78 days after the Notification on start of works

1) Preparation of the approaches (deadline 90 days): behind the schedule.
    - Approaches to W11, S12, S13, S14 and S15 have not been completed yet and it is unlikely that all these works can be performed within 12 days.
2) Manufacturing of components (270 days): in line with schedule
3) Civil works (150 days): in line with schedule

2.3.1.2 DELIVERY AND INSTALLATION OF COMPONENTS

1) Installation of components is scheduled for December.

2.3.2 THE BOTTOM STATION BUILDING AND GONDOLA PARKING

78 days after the Notification on start of works

1) Manufacturing of components (deadline 90 days, duration 45 days): no information.
2) Construction of foundations (deadline 150 days, duration 30 days): ongoing, in line with the schedule.
3) Assembly of components on the site (deadline 210 days, duration 30 days): works have not started yet.
4) Craftsmen works and installation of equipment (deadline 300 days, duration 30 days): works have not started yet.

2.3.3 ANCILLARY STRUCTURES AT THE BOTTOM STATION

1) Civil works (deadline 60 days, duration 40 days): behind the schedule, works have not started yet.
2) Craftsmen works (deadline 150 days, duration 60 days): works have not started yet.
3) Installation of equipment (deadline 240 days, duration 60 days) works have not started yet.
4) Landscaping (deadline 330 days, duration 60 days): works have not started yet.

2.4 THE TOP STATION BUILDING

1) Civil works (deadline 60 days, duration 40 days): behind the schedule, works have not started yet.
2) Craftsmen works (deadline 150 days, duration 60 days): works have not started yet.
3) Installation of equipment (deadline 240 days, duration 60 days) works have not started yet.
4) Landscaping (deadline 330 days, duration 60 days): works have not started yet.
5) Utility facilities (deadline 360 days, duration 90 days): works have not started yet.

2.5 ANCILLARY STRUCTURES AT THE TOP STATION

1) Civil works (deadline 120 days, duration 120 days): behind the schedule
2) Craftsmen works (deadline 420 days, duration 210 days): works have not started yet.
3) Installation of equipment (deadline 240 days, duration 120 days) works have not started yet.
4) Landscaping (deadline 690 days, duration 60 days): works have not started yet.
5) Utility facilities and equipping of the restaurant (deadline 690 days, duration 360 days): works have not started yet.

2.6 OBLIGATIONS OF THE AUTHORITY

2.6.1 ELECTRICITY AND POWER INFRASTRUCTURE

- Transformer station TS 10/0.4 kV Dub with connection to transformer station TS 35/10 kV Grbalj and TS 10.04 kV Tunel: works have not started yet.
- 10 kV cable (conduit) for TS 10/0.4 kV Dub to TS 35/10 kV Grbalj: works have not started yet.
- 10 kV cable (conduit) for TS 10/0.4 kV Kuk to TS 35/10 kV Kuk: works have not started yet.
- Transformer station TS 10/0.4 kV with connection to transformer station TS35/10 kV Kuk: works have not started yet.
- Double overhead lines 35 kV from TS 35/10 kV Kuk to the connection point with the existing overhead lines 35 k V Cetinje – Škaljari: works have not started yet.

2.6.2 ROAD INFRASTRUCTURE

- Parking lot near the Bottom Station Dub with utility facilities and the connection road: works have not started yet.
- The approach road from the top station Kuk to the main road Njeguši – Ivanova korita with utility facilities: works have not started yet.

2.7 LAGGING ACTIVITIES AND/OR EVENTS THAT CAN IMPEDE THE COURSE OF WORKS

As per information received from representatives of the Concessionaire regarding the construction of the public infrastructure, following has been done up to now:

1) Directorate for capital projects signed the contract with the BRIV company for:
    - Preparation of the Preliminary Design, Main Design and the execution of works on the construction of the approach road from the top station Kuk to the Main Road following a design-and-build procurement route.

- Preparation of the Preliminary Design, Main Design and the execution of works on the construction of the approach road from the bottom station Dub to the existing road following a design-and-build procurement route.

Tender procedures for selection of the Reviewer and the Supervisor have not been completed yet.

2) CEDIS have formed a Committee to be concerned with the construction of the electricity and power infrastructure necessary.

After having an insight into the time schedule for construction of the Kotor – Lovćen Ropeway with utility facilities, it can be seen that the deadline for building of the public infrastructure is May 2023. Based on the current state on the day of preparation of this Report, the Independent Engineer must express concern regarding the implementation of this project within deadlines prescribed in the time schedule.

3 OVERVIEW OF WORKS ON THE ROPEWAY FACILITY

3.1 CIVIL WORKS

3.1.1 BOTTOM STATION

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 30)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 31)	
3	Construction of the foundation slab	Finished (CW 34)	Date of casting: 26/08/2022
4	Construction of columns	Finished (CW 38)	Date of casting (f): 16/09/2022 Date of casting (r): 21/09/2022
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.2 TOWER R1

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 30)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 34)	Date of casting: 27/08/2022
4	Construction of the plinth	Finished (CW 37)	Date of casting: 15/09/2022
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.3 TOWER S2

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 30)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 31)	
3	Construction of the foundation slab	Finished (CW 34)	Date of casting: 27/08/2022
4	Construction of the plinth	Finished (CW 38)	Date of casting: 21/09/2022
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.4 TOWER W3

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 32)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 35)	Date of casting: 29/08/2022
4	Construction of the plinth	Finished (CW 38)	Date of casting: 23/09/2022
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.5 TOWER S4

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 39)	
2	Excavations and arrangement of the bottom of the pit	-	
3	Construction of the foundation slab	-	
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.6 TOWER W5

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 32)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 35)	Date of casting: 30/08/2022
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.7 TOWER S6

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 32)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 35)	Date of casting: 31/08/2022
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.8 TOWER S7

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 32)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 35)	Date of casting: 31/08/2022
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.9 TOWER S8

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 32)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 35)	Date of casting: 01/09/2022
4	Construction of the plinth	Finished (CW 39)	Date of casting: 30/09/2022
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.10 TOWER W9

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 33)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 35)	Date of casting: 02/09/2022
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.11 TOWER W10

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 37)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 38)	
3	Construction of the foundation slab	Finished (CW 38)	Date of casting: 23/09/2022
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.12 TOWER W11

Task No.	Description	Status	Remarks
1	Approaches	-	
2	Excavations and arrangement of the bottom of the pit	-	
3	Construction of the foundation slab	-	
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.13 TOWER S12

Task No.	Description	Status	Remarks
1	Approaches	-	
2	Excavations and arrangement of the bottom of the pit	-	
3	Construction of the foundation slab	-	
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.14 TOWER S13

Task No.	Description	Status	Remarks
1	Approaches	-	
2	Excavations and arrangement of the bottom of the pit	-	
3	Construction of the foundation slab	-	
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.15 TOWER S14

Task No.	Description	Status	Remarks
1	Approaches	-	
2	Excavations and arrangement of the bottom of the pit	-	
3	Construction of the foundation slab	-	
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.16 TOWER S15

Task No.	Description	Status	Remarks
1	Approaches	Ongoing	
2	Excavations and arrangement of the bottom of the pit	-	
3	Construction of the foundation slab	-	
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.17 TOWER W16

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 37)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 38)	
3	Construction of the foundation slab	Ongoing	
4	Construction of the plinth	-	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.18 TOWER S17

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 32)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 35)	Date of casting: 03/09/2022
4	Construction of the plinth	Ongoing	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.19 TOWER S18

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 32)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 35)	Date of casting: 03/09/2022
4	Construction of the plinth	Ongoing	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.20 TOWER S19

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 32)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 34)	
3	Construction of the foundation slab	Finished (CW 35)	Date of casting: 03/09/2022
4	Construction of the plinth	Finished (CW 39)	Date of casting: 01/10/2022
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.1.21 TOP STATION

Task No.	Description	Status	Remarks
1	Approaches	Finished (CW 34)	
2	Excavations and arrangement of the bottom of the pit	Finished (CW 35)	
3	Construction of the foundation slab	Finished (CW 36)	Date of casting: 10/09/2022
4	Construction of columns	Ongoing	
5	Installation of the grounding system outside the foundation	-	
6	Backfilling	-	

3.2 INSTALLATION OF COMPONENTS

3.2.1 DELIVERIES

- No components were delivered during September.

3.2.2 PROGRESS OF INSTALLATION

- Installation of components has not started yet.

4 THE BOTTOM STATION BUILDING AND GONDOLA PARKING

4.1 CIVIL WORKS

- No works during September.

4.2 ARCHITECTURE

- Works have not started yet.

4.3 HYDRO TECHNICAL WORKS

- Works have not started yet.

4.4 ELECTRO TECHNICAL WORKS

- Works have not started yet.

4.5 MECHANICAL WORKS

- Works have not started yet.

5 THE TOP STATION BUILDING

5.1 CIVIL WORKS

- Excavation of ditches for strip foundations.
- Casting of strip foundations.

5.2 ARCHITECTURE

- Works have not started yet.

5.3 HYDRO TECHNICAL WORKS

- Works have not started yet.

5.4 ELECTRO TECHNICAL WORKS

- Works have not started yet.

5.5 MECHANICAL WORKS

- Works have not started yet.

6 QUALITY CONTROL

6.1 GENERAL OVERVIEW

- The Contractor prepared checklists for construction of foundations. These are to be submitted to the Supervisor for control and approval.
- LEITNER specification W 00040 e, which prescribes tolerances for the installation of anchors and anchor rings, shall be strictly followed for all the site work related to the ropeway facility.
- For all built-in materials, products and the equipment installed, proper certificates and/or test results are to be submitted to the Supervisor.

6.2 QUALITY ASSURANCE DOCUMENTS, TEST RESULTS AND CERTIFICATES OF MATERIALS

- Check lists for civil works on foundations (survey control of position) – submitted for all works executed as so far on foundations and signed/approved by the Supervisor.
- N22/53 (01/09/2022) – Test results for compaction of bedding
- N22/54 (01/09/2022) – Test results for compaction of bedding
- N22/55 (05/09/2022) – Test results for compaction of bedding
- N22/56 (08/09/2022) – Test results for compaction of bedding
- N22/58 (29/09/2022) – Test results for compaction of bedding
- N22/59 (29/09/2022) – Test results for compaction of bedding
- Certificates for reinforcement are missing or not made available to IE.
- Certificates for grounding bands are missing or not made available to IE.
- W 00040 e tolerance checks for the bottom station and the foundation R1 (30/09/2022).

7 HSE

- No severe HSE incidents noted.
- Personal protective equipment is not used by all workers present on the site.
- The container for workers near the top station was placed and left without proper grounding for at least one week.

8 NON-CONFORMITIES

- The strategy for construction of foundations S11 and S12 has not yet been defined, as well as the installation procedure.
- The Contractor will proceed with works downhill from S17 towards S13 following the concept given in the Main Design. However, the Contractor intends to make adjustments of geometry and position of the approach road.
- The equipment delivery schedule and the installation schedule are missing.
- Time schedules for construction of station buildings are missing.
- No results of position checks for anchors in accordance with W 00040 e were submitted before casting.
- W 00040 e tolerance checks after casting were submitted only for the bottom station and the foundation R1.
- For the works in the scope of the Authority (grantor), no time schedule has been submitted as so far. Serious delays may be expected.
- Remedy of defects on the rear column of the bottom station has been performed without previous approval of the Supervisor and without previous agreement on the remedial measures.

9 REMARKS (ISSUES FOR FURTHER CLARIFICATION, PROPOSALS)

- Approaches to tower locations from S13 to W16 will most likely be constructed along the ropeway line, going down from W16 to S13. 60 m wide corridor reserved for the ropeway must be respected.
- Smaller departures from the Main Design, due to some specific conditions on the site, always have to be checked and approved by the Designer of the Main Design before performing any site activities.
- Casting of plinths and/or station columns can only be allowed upon submittal and acceptance of the LEITNER specification W 00040 e, which prescribes tolerances for the installation of anchors and anchor rings.
- Missing time schedules for delivery and installation of ropeway facility components, the bottom station building and the top station building should be prepared and submitted as soon as possible. These schedules have to be harmonized between each other, as well as with the overall schedule of the project, in order to avoid unnecessary delays of work and to enable easier recognition of possible bottlenecks.
- **The Independent Engineer highly recommends the Authority/grantor to speed up the construction of the electricity and power infrastructure and the road infrastructure in order to enable timely completion of works on the construction of the Kotor – Lovćen ropeway.**

10 PHOTOS


Figure 10-1: The bottom station


Figure 10-2: R1


Figure 10-3: S3


Figure 10-4: W3

Figure 10-5: S4


Figure 10-6: W10


Figure 10-7: S16


Figure 10-8: S17

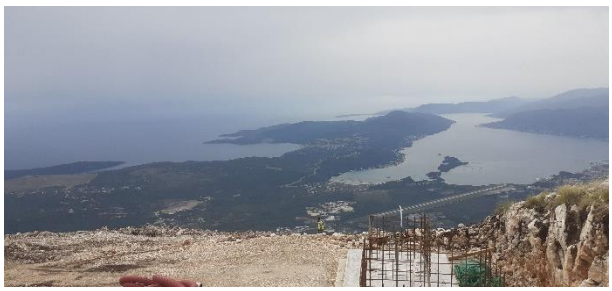


Figure 10-9: S19


Figure 10-10: The top station

Figure 10-11: The top station (casting of the foundation slab) and foundations S17 to S19