From Italy to Ethiopia

Disassembly, transportation
and re-erection of the Stele of Axum

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

Special thanks to

MINISTERO DEGLI AFFARI ESTERI

DIREZIONE GENERALE PER I PAESI DELL'AFRICA SUBSAHARIANA

DIREZIONE GENERALE PER LA COOPERAZIONE ALLO SVILUPPO

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SEGRETARIATO GENERALE, ISTITUTO SUPERIORE PER LA CONSERVAZIONE ED IL RESTAURO

PROVVEDITORATO GENERALE ALLE OPERE PUBBLICHE PER IL LAZIO

STUDIO CROCI & ASSOCIATI

Special thanks to UNESCO which took the responsibility for coordinating the experts who carried out the feasibility study for the reinstallation of the stele of Axum in its site.

grafica Federici & Motta srl

1. FOREWORD

2. DISASSENBLY OF THE STELE IN ROME

3. TRANSPORTATION

4. RE-ERECTION

4.1 PHASE 1

4.2 PHASE 2

4.3 PHASE 3

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

FIGURE 1 - THE STELE LAYING ON THE GROUND IN AXUM, BROKEN IN FIVE PIECES, AFTER IT FELL DOWN FOLLOWING AN EARTHQUAKE AROUND A THOUSAND YEARS AGO'.

1. FOREWORD

The stele of Axum was transported by ship from Axum to Italy in 1937 and rebuilt in the same year in Piazza di Porta Capena, Rome, in front of the "Ministry of Colony" building (actually seat of "United Nation Food and Agriculture Organisation" – "FAO").
The stele lost its stability, collapsed and broke up into five huge blocks about one thousand years ago following an earthquake, laying on the ground in Axum (Figure 1).

FIGURE 2 – ANOTHER STELE, CLOSE TO THAT BROUGHT TO ROME

The stele was close to another similar stele still standing nowadays (Figure 2).

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

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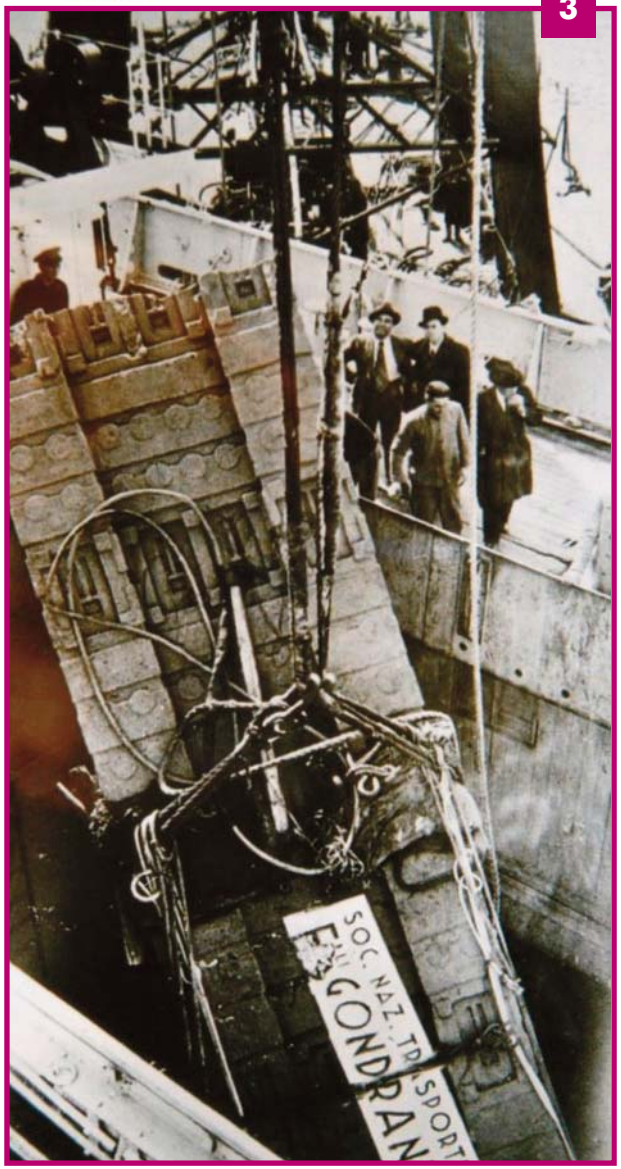

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The pieces of the stele where shipped through Massawa in Eritrea, then unloaded in the harbor of Napoli (Figure3), transported by truck to Rome (Figure 4) and eventually reerected in Rome (Figure 5).

4

FIGURE 3 – THE UNDLOADING OF A PIECE OF THE STELE FROM THE SHIP
FIGURE 4 – THE TRANSPORT ACTION OF THE STELE TO ROME
FIGURE 5 – THE STELE RE-ERECTED IN ROME IN 1937

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

In 1997 a mixed Italian-Ethiopian Commission was created with the final goal of detailing how to ship the stele back to Axum. The decision to bring back the stele was welcomed with great enthusiasm in Ethiopia where several posters (Figure 6) and maquettes (Figure 7) celebrating this event appeared timely at the airport.

FIGURE 6 – A POSTER CELEBRATING THE RETURN OF THE STELE TO AXUM
FIGURE 7 – A MAQUETTE SHOWING THE RETURN OF THE STELE TO ETIOPIA

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

THE COMMISSION HAD TO FACE TWO MAIN CHALLENGES

1) HOW TO DISASSEMBLE A STELE MADE OF FIVE PORTIONS LINKED TOGETHER WITH CEMENT AND BRONZE PIVOTS WITHOUT CREATING ANY ADDITIONAL DAMAGE TO A MONUMENT SPECIALLY PROTECTED BY THE ITALIAN LAW.

2) HOW TO TRANSPORT THE STELE, BEING IMPOSSIBLE TO USE THE SAME PATH FOLLOWED IN 1937. IN FACT ICCROM, EN CHARGED BY THE ITALIAN GOVERNMENT, VERIFIED THAT THE ROAD USED AT THAT TIME (THROUGH ERITREA) HAD BEEN MODIFIED AND WAS NOT SUITABLE FOR THE TRANSPORTATION ANY MORE.
FURTHERMORE, THE LOCAL POLITICAL SCENARIO MADE THE TRANSPORTATION BY SEA EVEN MORE DIFFICULT. THE ONLY POSSIBLE WAY WAS TO TRANSPORT THE STELE BY AIR.

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

2. DISASSEMBLY OF THE STELE IN ROME

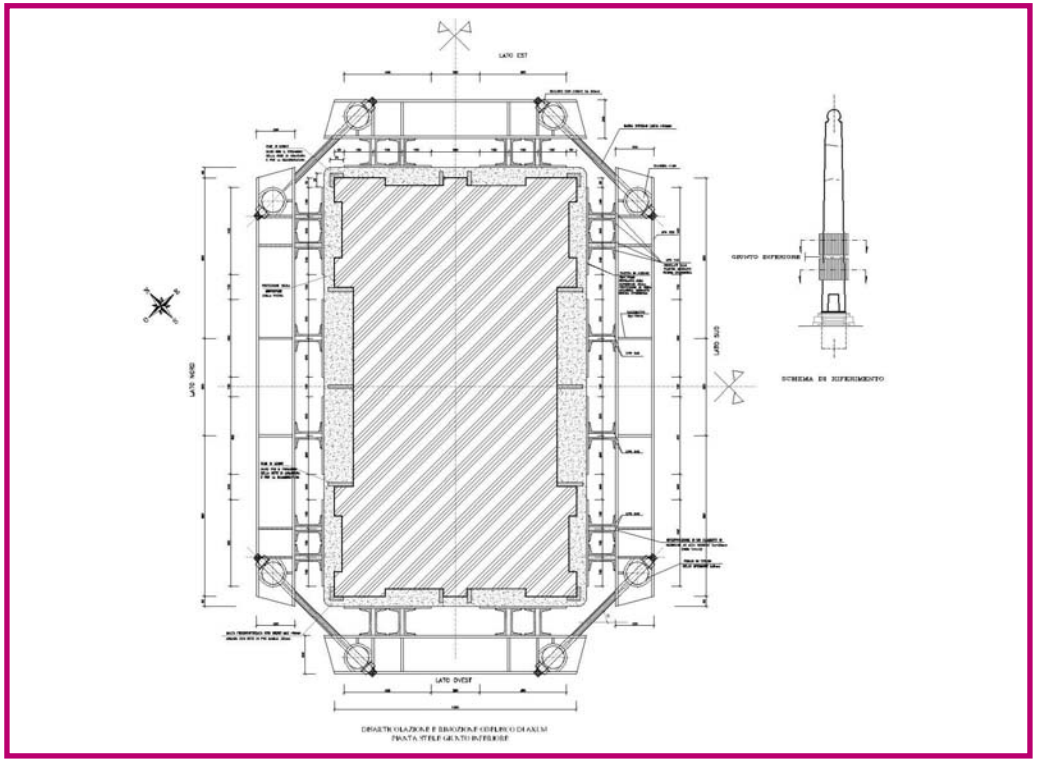
IN 1999 PROFESSOR CROCI WAS ENCHARGED BY THE "PROVVEDITORATO ALLE OPERE PUBBLICHE DI ROMA" (DIRECTOR ENG.BALDUCCI) TO PREPARE THE FINAL PROJECT.

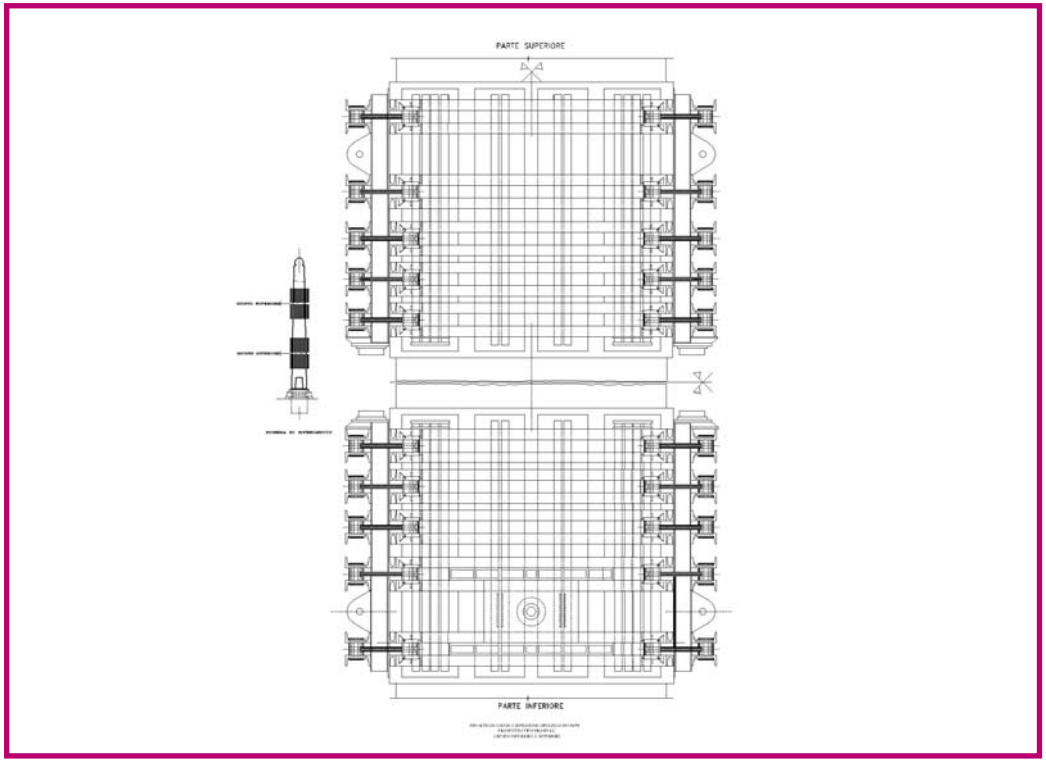
ENGINEERS RAPISADA, DE SANTIS AND GARA OF THE "PROVVEDITORATO" PARTICIPATED TO THE PROJECT WITH DIFFERENT TASKS.

GIVEN THE NECESSITY TO TRANSPORT THE STELE BY AIR IT WAS DECIDED TO DIVIDE IT IN THREE MAIN BLOCKS OPENING TWO OF THE MAIN JOINTS SEALED IN 1937; NO OTHER FURTHER ALTERATION TO THE MONUMENT WAS ALLOWED.

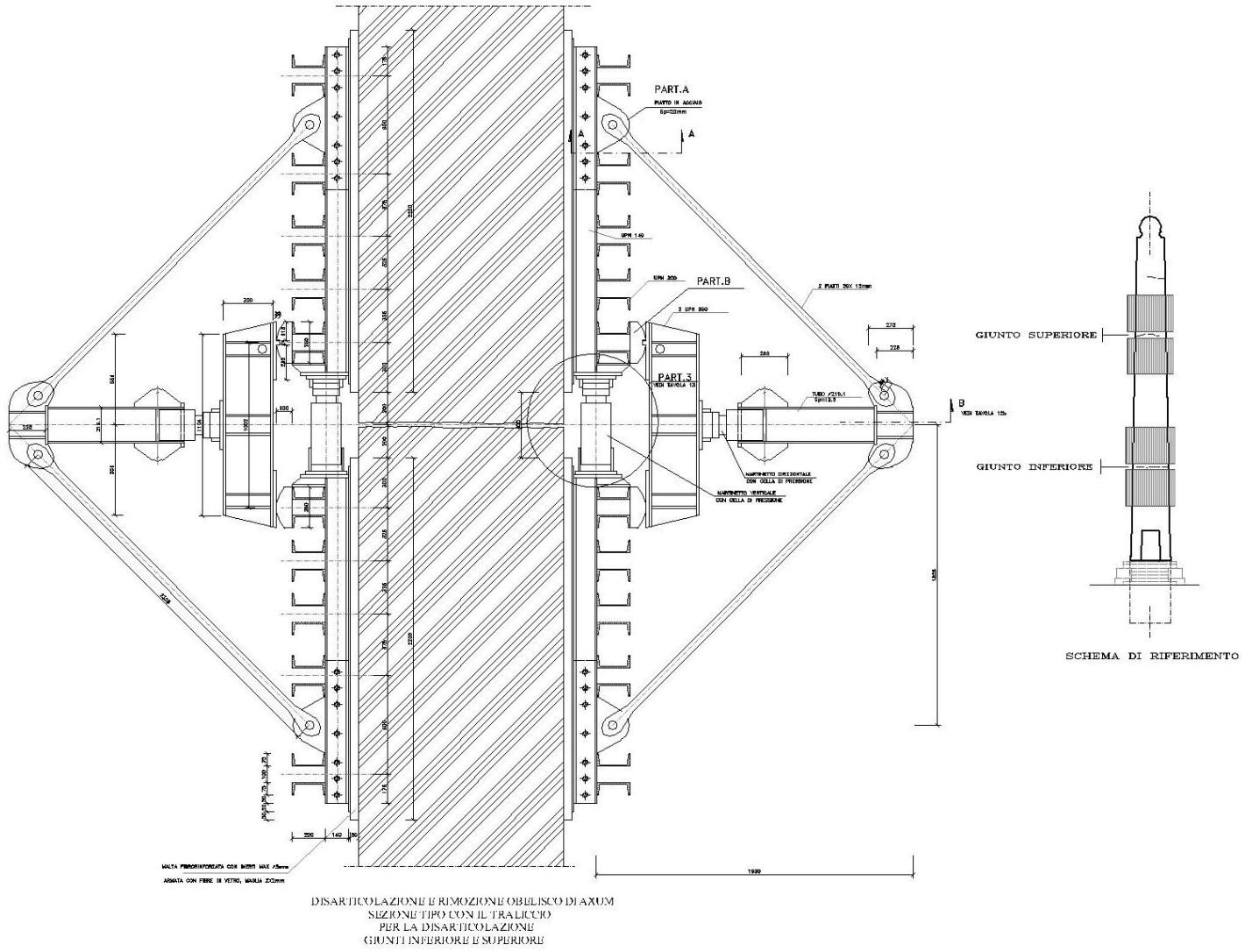
THE DISASSEMBLY REQUIRED A SERIES OF PRELIMINARY OPERATIONS SYNTHETICALLY DESCRIBED BELOW:

- THE PROTECTION OF THE EXTERNAL SURFACES OF THE STELE WITH A LAYER OF FIBER REINFORCED STRUCTURAL MORTAR, INCLUDING A STRUCTURAL MESH IN CARBON FIBERS;
- THE APPLICATION OF CIRCUMFERENTIAL STEEL REINFORCEMENTS ABOVE AND BELOW EACH OF THE TWO JOINTS TO BE OPENED (FIGURES 8 AND 9). THIS PROVISIONAL REINFORCEMENT, CIRCUMFERENTIALLY PRESTRESSED, WAS NECESSARY TO PREVENT CRACKS DURING THE WORKS AND TO BE ABLE TO APPLY A SERIES OF JACKS.



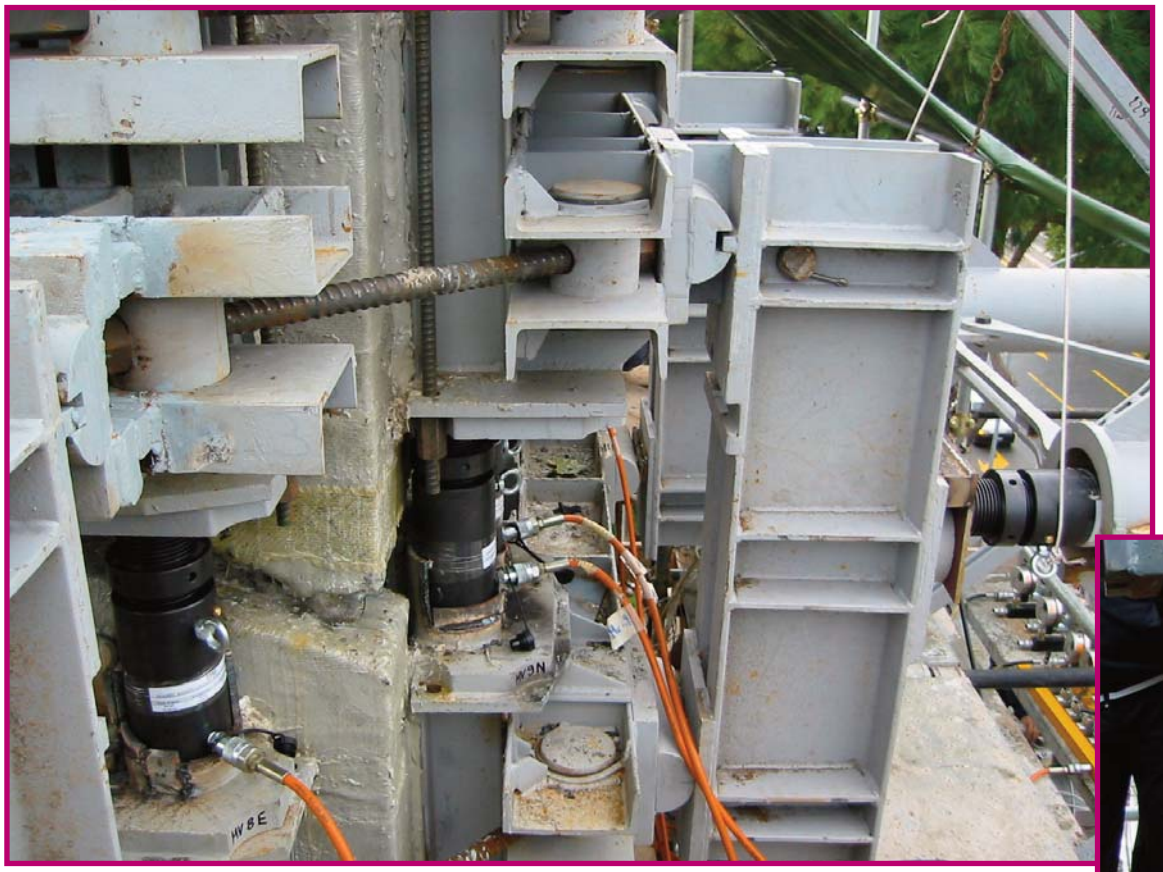


FIGURES 8, 9 – PLAN AND SECTION OF THE STEEL REINFORCEMENT PRESTRESSED STRUCTURE PROVISIONALLY PUT AROUND THE STELE, OVER AND UNDER A JOINT



In order to exceed the strength of the cement and the resistance of the bronze pivots, a complex system of oil jacks was designed (16 along the vertical direction and 8 along the horizontal direction) and connected, using high pressure pipes, to manifolds and to the electric system of pumping (Figure 10).

FIGURE 10 – SCHEME OF THE VERTICAL AND HORIZONTAL JACKS WHICH CONTRAST THE STEEL STRUCTURE

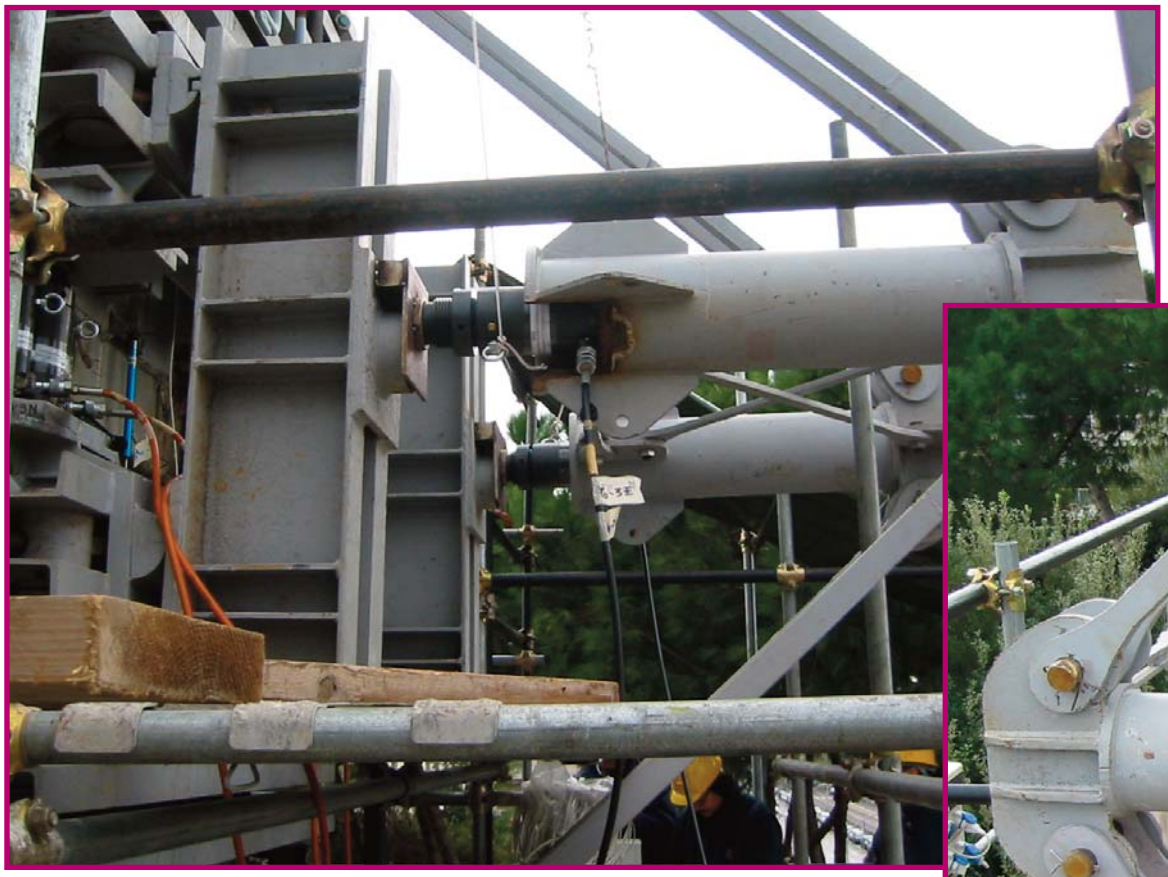


The jacks could act alternatively vertically and horizontally, in order to generate different pressures on the cement mortar leading to the opening of the joints and, eventually, to the slippage of the bronze pivots.
Vertical jacks, in the moment the joints show the first signs of opening, are visible in Figures 11 and 12.

FIGURE 11 – THE VERTICAL JACKS
FIGURE 12 – DETAIL OF THE VERTICAL JACKS. THE JOINT BETWEEN TWO PORTIONS OF THE STELE, RIGHT AFTER ITS OPENING, IS ALSO VISIBLE.

Figure 13 shows the reinforcement structure with the lateral braces which support the horizontal jacks; pertinent details are shown in Figures 14 and 15. Figure 16 shows the joint between two blocks when it is totally opened; the bronze pivots are visible as well. Figure 17 shows the irregular surface of the joint and the holes where the bronze pivots were housed.

FIGURE 13 – THE STEEL STRUCTURE INCLUDING THE BRACES WHICH SUPPORT THE HORIZONTAL JACKS



FIGURES 14, 15 – THE HORIZONTAL JACKS

FIGURE 16 – THE JOINT TOTALLY OPENED. THE BRONZE PIVOTS ARE CLEARLY VISIBLE
FIGURE 17 – THE IRREGULAR SURFACE OF THE STONE AND THE HOLES WHERE THE BRONZE PIVOTS WERE INSERTED.

FIGURE 18 – THE MANOMETERS CONNECTED WITH THE JACKS TO CONTROL ALL THE FORCES IMPOSED TO THE STRUCTURE

The control of the applied forces, of the movements at the joint and of the resulting stresses was achieved by means of a monitoring system which processed in real-time all data coming from the sensors and performed a comparison with design data and with alarm thresholds in case of excessive inclination, elevated stresses, slippage of stele framework, tension failure of connectors, crushing of compressed edge, etc.

Figure 18 shows the manometers which provided for pressure control and monitoring for all the jacks.

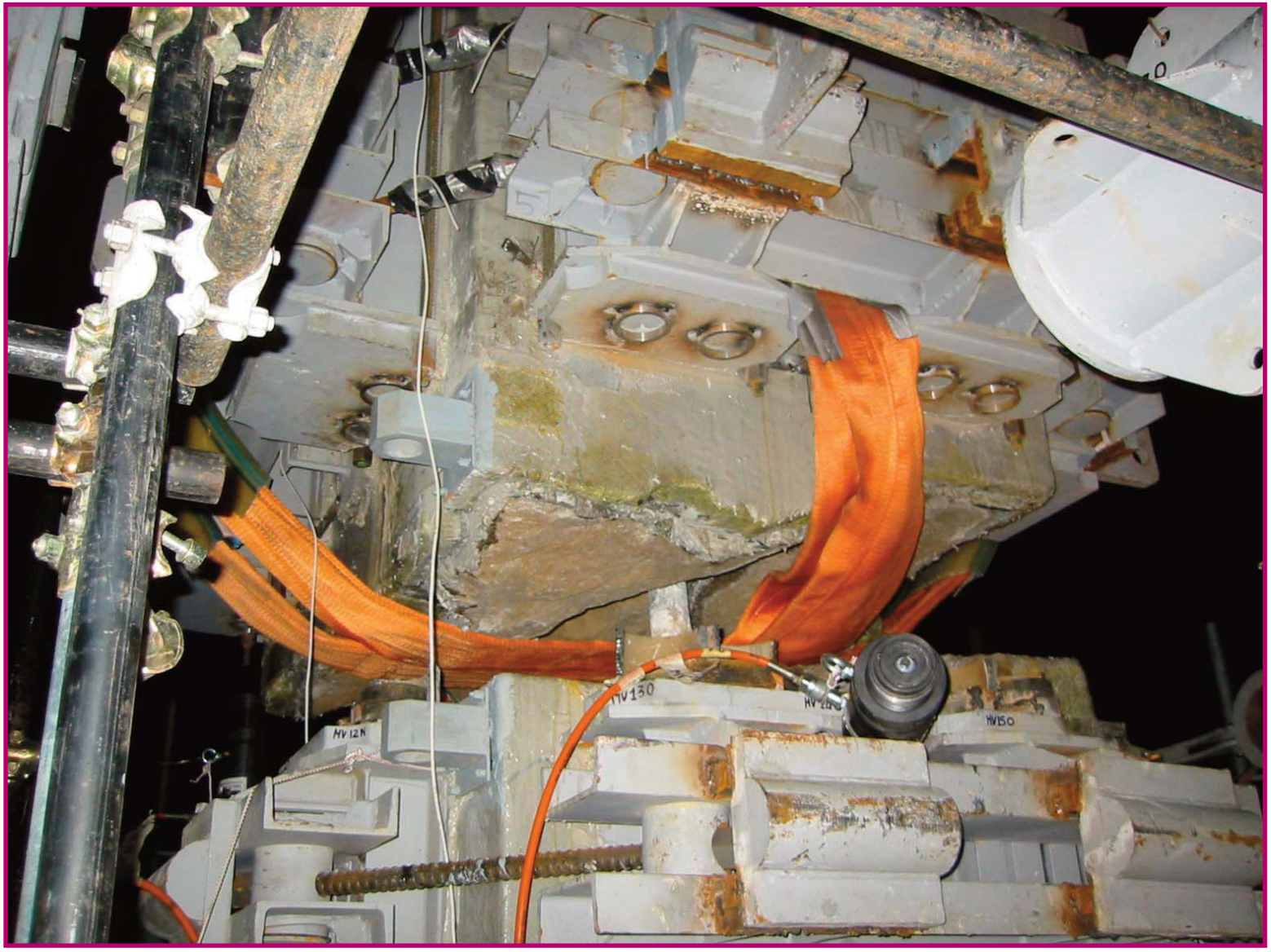


FIGURE 19 – SAFETY STRIPS PLACED AROUND THE BOTTOM OF A BLOCK READY TO BE LIFTED UP

The system was also connected with a computer able to acquire and record all significant data. Before lifting up a block after its disconnection from the next one, some provisional safety supporting strips were placed around the bottom portion in order to avoid any possible slippage of the steel reinforcements. (Figure 19)

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

FIGURES 20, 21, 22 – DIFFERENT PHASES OF THE MOVEMENT AND TRANSPORTATION OF A BLOCK

Figures 20, 21 and 22 show the lifting-up phase of a block, the successive handling and final transportation to the designated storage area close to Fiumicino Airport.

The weight of the three (upper, intermediate and lower) blocks, including the reinforcements, was respectively 47 tons, 71 tons and 77 tons. The cranes used had a bearing capacity of 300 tons.

The dismantling works were successfully carried out by specialized Contractor Lattanzi between May and December 2003.

3. TRANSPORTATION

THE STUDY OF THE CARRIAGE WAS CARRIED OUT BY THE "PROVVEDITORATO ALLE OPERE PUBBLICHE DEL LAZIO" WITH THE TECHNICAL COOPERATION OF EXPERTS IN THE FIELD OF AIR TRANSPORTATION (P.E. MAFFEY) AND STRUCTURAL ENGINEERING (PROFESSOR CROCI).

DIFFERENTLY FROM WHAT SHOWN IN THE PREVIOUS ETHIOPIAN DOCUMENTS, THE SCENARIO OF THE AIRPORT OF AXUM IMPOSES SERIOUS RESTRAINING LIMITS ON THE BEARING CAPACITY OF THE AIRCRAFTS, DUE TO THE HIGH LOCAL AIR TEMPERATURE, TO THE REDUCED LENGTH OF THE AIR RUNWAY, TO THE HIGH LOCAL ALTITUDE (2300 METERS) OVER THE SEA LEVEL (WITH A CONSEQUENT REDUCTION OF THE AIR PRESSURE AND THEREFORE OF THE BEARING CAPACITY) AND TO THE ABSOLUTE LACK OF ADEQUATE EQUIPMENT FOR THE ASSISTED NIGHT FLIGHT.

AS A RESULT, NO AIRCRAFT WAS ABLE, WITH THE REQUIRED SAFETY LEVELS, TO CARRY A WEIGHT MORE THAN 55 TONS WHILE THE WEIGHT OF THE BLOCKS AND THE ASSOCIATED REINFORCEMENT WAS MUCH BIGGER. IT WAS THEREFORE NECESSARY TO CAREFULLY REEXAMINE THE DETAILS OF THE TRANSPORTATION AND, FOR THIS PURPOSE, A SERIES OF SITE VISITS WAS PERFORMED BY CONTRACTOR LATTANZI AND THE UKRAINE COMPANY OWNER OF THE BIGGEST AIRCRAFTS OF THE WORLD (THE RUSSIAN ANTONOV).

THE LOADING OF THE BLOCK ON THE AIRCRAFT REQUIRED SPECIAL CARE ON THE ANCHORAGE OF THE GRANITE BLOCK TO THE STRUCTURE OF THE AIRCRAFT: THE CABLES OF THE ANCHORAGE HAD TO RESIST IN PARTICULAR TO THE STRONG DECELERATION GENERATED DURING THE LANDING.

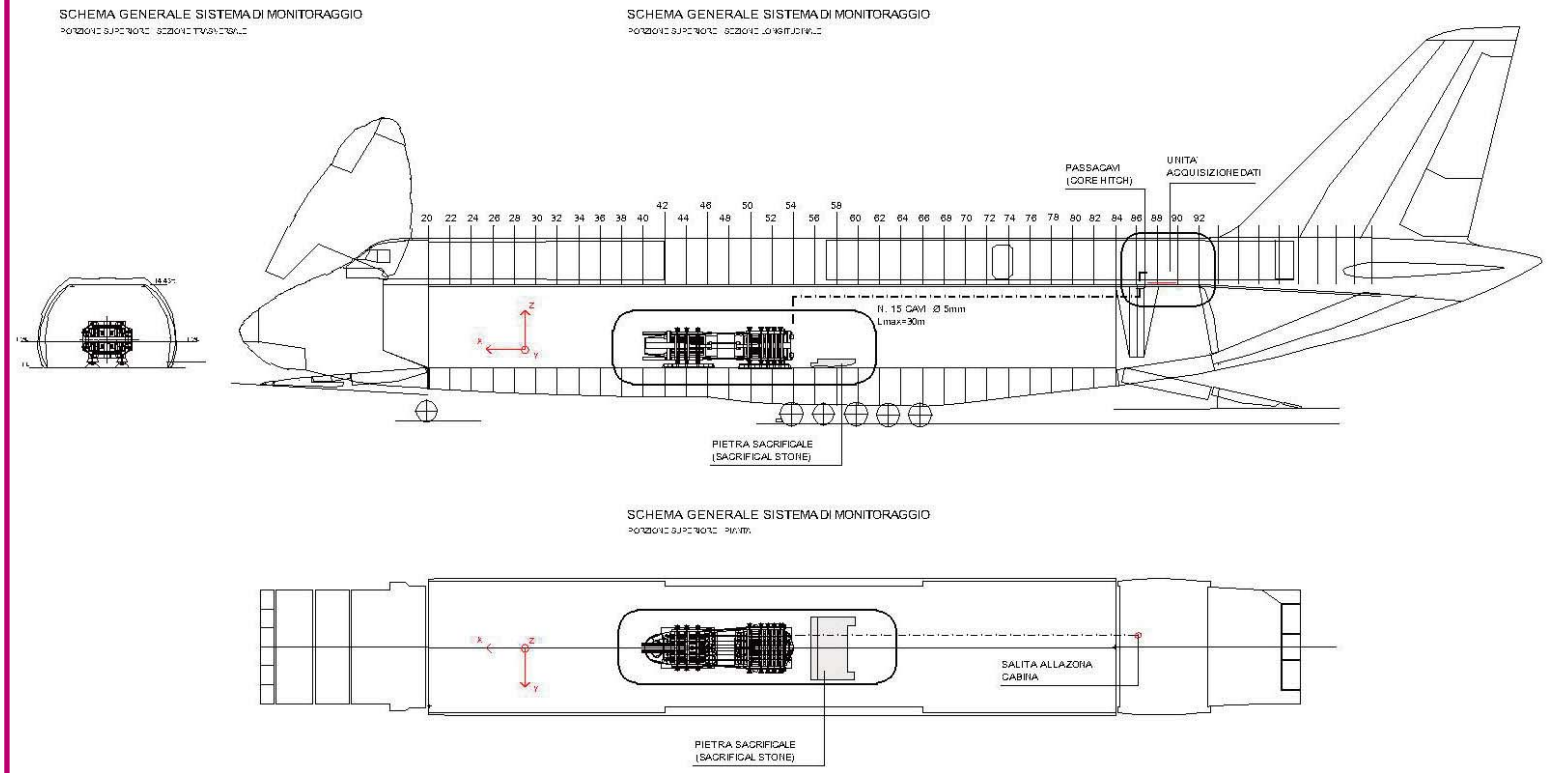


FIGURE 23 – THE POSITION OF THE LOAD INSIDE THE AIRCRAFT

Figure 23 shows the position of the load on the aircraft.

FIGURES 24, 25 – DIFFERENT LOADING PHASES

FIGURE 26 – THE ANCHORAGE OF THE BLOCK TO THE AIRCRAFT INTERIOR STRUCTURE

FIGURE 27 – THE HUGE AIRCRAFT READY TO TAKE OFF

Figure 27 shows the aircraft ready for take off.

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

A COMPUTERIZED STATIC AND DYNAMIC MONITORING SYSTEM, WITH ELECTRONIC DEVICES ABLE TO RECORD STRESSES, STRAINS, TEMPERATURE, VIBRATIONS AND ACCELERATIONS, WAS APPLIED TO THE STRUCTURES.

THE AIRCRAFT TOOK OFF FROM ROME IN THE EVENING OF 18TH OF APRIL 2005 AND, IN THE NIGHT, AFTER FIVE HOURS, LANDED IN BENGHAZI. THE TEST WAS REGARDED AS POSITIVE SINCE THE INTERPRETATION OF THE DATA ACQUIRED IN BENGHAZI IN THE LIGHT OF THE DIFFERENT SCENARIO RELATED TO THE RUNWAY OF AXUM, SHOWED THAT ALL SAFETY REQUIREMENTS COULD BE SATISFIED.

THE AIRCRAFT FINALLY LANDED IN AXUM AT SUNRISE; THIS WAS MANDATORY IN ORDER TO HAVE A LOWER TEMPERATURE AN HIGHER PRESSURE (AS MENTIONED, LANDING IN THE NIGHT WAS NOT POSSIBLE SINCE THE AUTOMATIC PILOT COULD NOT WORK IN AXUM). TWO FURTHER FLIGHTS TO TRANSPORT THE REMAINING TWO BLOCKS WERE SCHEDULED FOR AND PERFORMED ON APRIL THE 21ST AND APRIL THE 24TH.

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

A huge crowd was waiting for us at the arrival of the first flight (Figure 28); at midday, a truck, charged with the block of the stele, moved slowly from the airport to the site of Axum (Figure 29), at a distance of around 20 Km, where the blocks were provisionally housed (Figure 30).

FIGURE 28 – THE CROWD AT THE AIRPORT OF AXUM
FIGURE 29 – THE TRANSPORTATION OF A BLOCK FROM THE AIRPORT TO THE SITE
FIGURE 30 – STORAGE OF THE BLOCKS ON THE SITE OF AXUM

4. RE-ERECTION

THE "ITALIAN MINISTRY OF FOREIGN AFFAIRS" HAS FINANCED, BESIDES THE TWO PHASES ABOVE, ALSO THE RE-ERECTION OF THE STELE, EVEN THOUGH THIS WAS NOT INCLUDED IN THE PREVIOUS AGREEMENTS BETWEEN ITALY AND ETHIOPIA.

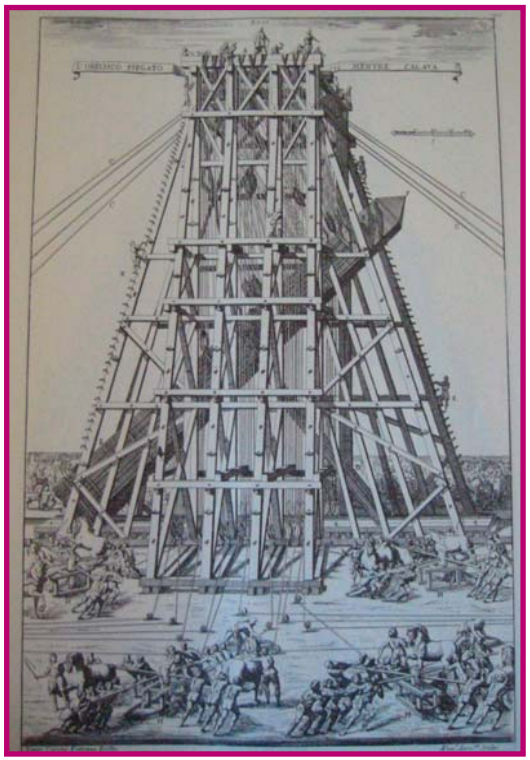
"ITALIAN MINISTRY OF FOREIGN AFFAIRS" ENTRUSTED THIS PHASE TO UNESCO (WORLD HERITAGE CENTER – DIRECTOR OF THE CENTER ARCH. BANDARIN, GENERAL COORDINATOR OF THE PROJECT ARCH. AL-HASSAN).

AS A RESULT OF AN INTERNATIONAL TENDER, "STUDIO CROCI AND ASSOCIATES" WAS IN CHARGED WITH THE FINAL DESIGN AND THE SUPERVISION OF WORKS (ENG. BOZZETTI OVERALL SUPERVISOR), S.P.C. s.r.l. WAS IN CHARGED OF THE TOPOGRAPHIC CONTROLS AND MONITORING SYSTEM (ENG. RUSSO RESPONSIBLE), WITH THE COOPERATION OF THE ETHIOPIAN CONSULTING "MH ENGINEERING PLC" (ENG. MESSELE).

SPECIALIZED CONTRACTOR LATTANZI WAS CHARGED WITH THE WORKS.

THE DESIGN OF THE RE-ERECTION TAKES INTO ACCOUNT THE FACT THAT THE STELE WAS NOT MONOLITHIC ANYMORE AND THEREFORE THE THREE BLOCKS HAD TO BE PLACED SEPARATELY ONE OVER THE OTHER.

TRADITIONAL TECHNIQUES, AS THE ONES APPLIED FOR THE ERECTION OF THE OBELISK IN ST. PETER SQUARE (FIGURE 31) OR FOR THE ERECTION OF A STELE IN AXUM, AS SHOWN IN A PICTURE FOLLOWING POPULAR IMAGINATION (FIGURE 32) WERE NOT POSSIBLE AT ALL.



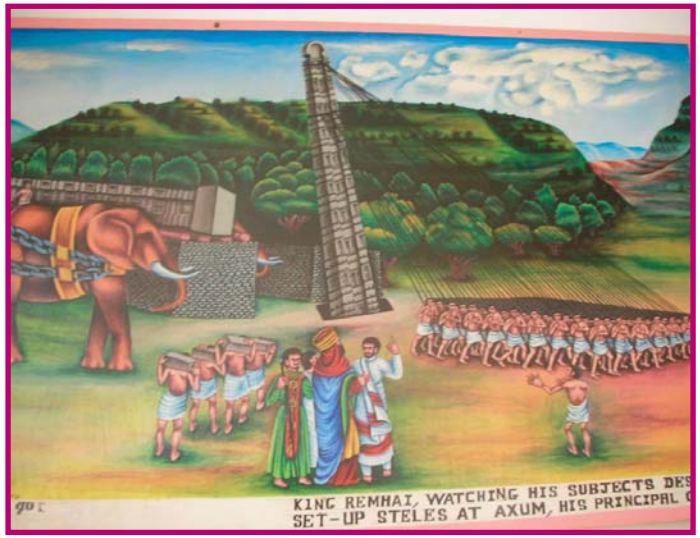


FIGURE 31 – THE ERECTION OF THE OBELISK OF ST. PETER IN ROME
FIGURE 32 – PICTURE SHOWING THE ERECTION OF A STELE IN AXUM AS PER POPULAR BELIEF

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

FIGURE 33, 34 – THE HUGE STELE N.1 LAYING ON THE GROUND AFTER THE COLLAPSE PROBABLY OCCURRED DURING THE ERECTION IN THE 4TH CENTURY

4.1 Phase 1

THE WORKS FOR THE RE-ERECTION OF THE STELE CAN BE GROUPED INTO THREE MAIN PHASES WHICH ARE DESCRIBED BELOW.

PHASE 1

THE FIRST PHASE STARTED ON SEPTEMBER 2007 AND FOCUSED ON THE ORGANIZATION OF THE SITE. ACTUALLY, IN THE SITE OF AXUM, IN ADDITION TO SEVERAL STELES OF VARIOUS DIMENSIONS (IT IS TO BE NOTED THAT AXUM IS A SACRED PLACE), THERE ARE THREE MAIN STELES ONE CLOSE TO EACH OTHER:

- THE STELE 1 IS THE BIGGEST ONE, 35 METER LONG AND AROUND 500 TONS OF WEIGHT. THIS STELE PROBABLY COLLAPSED IN THE 4TH CENTURY DURING ITS ERECTION AND NOW LIES HORIZONTALLY ON THE GROUND (FIGURES 33 AND 34);
- THE STELE 2 IS THE ONE BROUGHT BACK FROM ROME;
- THE STELE 3 HAS APPROXIMATELY THE SAME DIMENSIONS THAN THE STELE 2. IT IS THE ONLY ONE STANDING, BUT DANGEROUSLY LEANING DUE TO NOT ADEQUATE FOUNDATIONS AND TO THE PROLONGED EXPOSURE TO DIFFERENT SEISMIC OCCURRENCES.

FIGURES 35, 36 – THE LEANING STELE N.3 AND THE INSTALLED REINFORCEMENT STRUCTURE MADE OF TWO INCLINED RAFTS AND CABLES
FIGURE 37 – THE FOUNDATION OF THE RAFTS

To avoid possible negative influences due to the vibrations produced during the works for the stele 2 it was decided to install a provisional system to prevent any increase of the leaning. This system consists of two inclined rafters (Figures 35 and 36), founded at the base of the stele (Figure 37), which support two cables anchored at ends on the ground and on the stele (Figure 38). The tension on the cable can be regulated and a monitoring system allows to control the evolution of the phenomena.

FIGURES 39 – HANDLING OF THE BLOCKS READY TO BE LIFTED UP

4.2 Phase 2

THE SECOND PHASE CONCERNS THE RE-ERECTION AND STARTED AT THE BEGINNING OF 2008.

THE THREE BLOCKS WERE MOVED IN A NEW LOCATION TO ALLOW THE REMOVAL OF THE PROVISIONAL REINFORCEMENT USED DURING THE FLIGHT, NOW REPLACED BY NEW ONE NECESSARY TO LIFT UP THE BLOCKS UP TO THE FINAL POSITION (FIGURES 39 AND 40).

DURING THIS PHASE FOUR LONGITUDINAL HOLES WILL ALSO BE DRILLED CLOSE TO THE CORNERS WHERE LONGITUDINAL SYNTHETIC FIBER BARS (IN ARAMIDIC FIBERS) WILL BE INSERTED IN ORDER TO ENSURE IN THE FUTURE STRUCTURAL CONTINUITY BETWEEN THE BLOCKS AND, THEREFORE, IMPROVED SEISMIC RESISTANCE. THESE BARS WILL BE INSERTED AND ANCHORED ON THE UPPER OF TWO ADJACENT BLOCKS WHILE THE DRILLED HOLES IN THE LOWER WILL REMAIN EMPTY TILL THE UPPER BLOCK IS VERTICALLY PLACED OVER THE LOWER ONE.

FIGURES 40 – HANDLING OF THE BLOCKS READY TO BE LIFTED UP

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

IN ORDER TO PROVIDE FOR THE OPERATIONS OF LIFTING UP THE BLOCKS, A PROVISIONAL STEEL STRUCTURE, 30 METERS HIGH, WAS BUILT (FIGURE 41, 42, 43, 44).
ON TOP, A SYSTEM OF RAILS HOUSES AN OPPORTUNE BRIDGE CRAINE ABLE TO HANDLE HORIZONTALLY (TWO DIRECTIONS) AND TO LIFT UP AND DOWN THE BLOCKS (FIGG. 45, 46, 47).
AT THE BASE OF THE STEEL CASTLE A PLATFORM WITH RAILS TO SLIDE THE BLOCKS HAS BEEN BUILT (FIGG. 48, 49).
THE SCHEME OF FIG. 50 SHOWS THE MOVEMENTS OF THE BLOCKS, A VIDEO IS ANNEXED AS WELL.
THE SEQUENCE OF OPERATIONS IS PROVIDED HEREINAFTER:

- THE FIRST BLOCK WITH ITS BASE IS PLACED ON A HEMISPHERIC HINGE ALREADY INSTALLED IN THE FOUNDATION. BY MEANS OF ADEQUATE TOPOGRAPHIC MEASURING VERTICAL AND TRANSVERSAL POSITION OF THE BLOCK IS THEN VERIFIED AND A SYSTEM OF JACKS WILL ALLOW FOR THE REQUIRED CORRECTIONS. AT THIS POINT, THE BLOCK IS FIXED ON THE REINFORCED CONCRETE FOUNDATION;

- THE SECOND BLOCK IS LIFTED UP AND, THROUGH A SERIES OF MOVEMENTS, IS PLACED IN VERTICAL POSITION ON THE FIRST ONE. WHILE THE SECOND BLOCK APPROACHES THE FIRST ONE SLOWLY GOING DOWN, THE ARAMIDIC BARS ARE INSERTED IN THE HOLES SPECIFICALLY PROVIDED IN THE FIRST BLOCK. WHEN THE SURFACES OF THE TWO BLOCKS MATCH EACH OTHER, THE HOLES ARE INJECTED AND THE SURFACES SEALED WITH A SPECIAL RESIN-BASED MORTAR. VERIFICATION OF FINAL POSITIONING AND POSSIBLE CORRECTIONS ARE ACHIEVED AS MENTIONED PREVIOUSLY;

- FOR THE THIRD BLOCK THE SAME PROCEDURE IS FOLLOWED.

FIGURE 41 – THE STEEL TOWER, UNDER CONSTRUCTION, ON THE TOP OF WHICH THE BRIDGE CRAINE WILL BE HOUSED

FIGURE 42 – THE STEEL CASTLE SUPPORTING THE BRIDGE CRAINE.
FIGURE 43 – A JOINT OF THE STEEL CASTLE.

FIGURE 44 – THE STEEL CASTLE; VIEW FROM THE TOP.

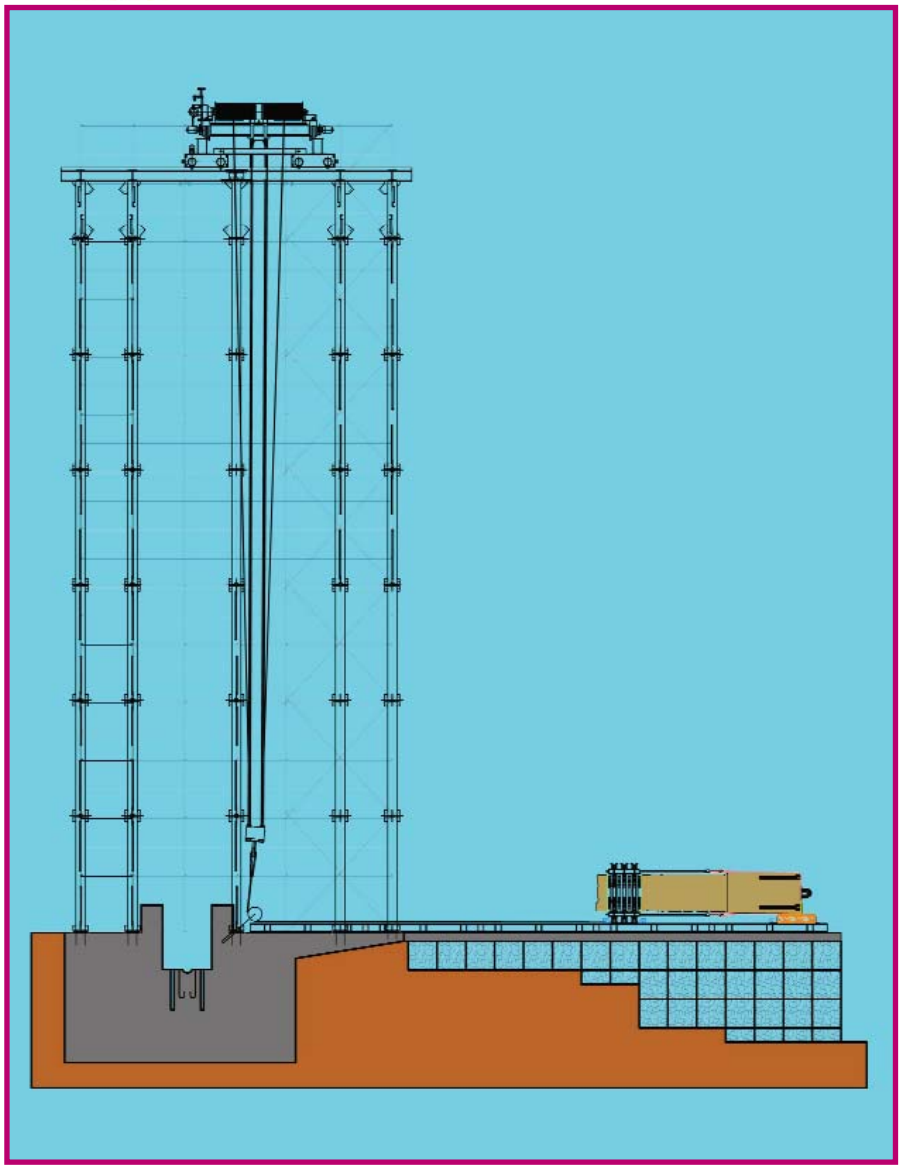
FIGURE 45 – THE BRIDGE CRAINE.

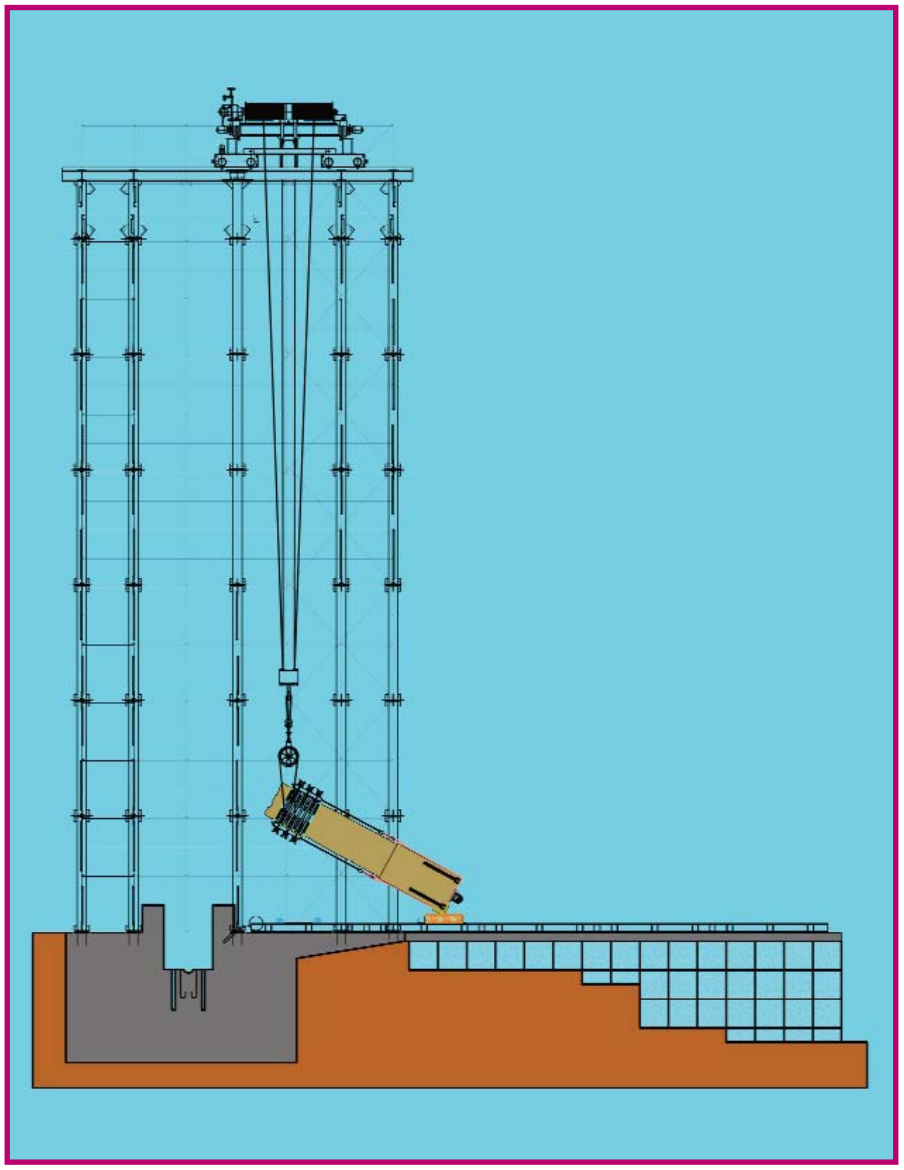
FIGURE 46 – THE BRIDGE CRAINE WINCH.

FIGURE 47 – THE BRIDGE CRAINE FROM BELOW.

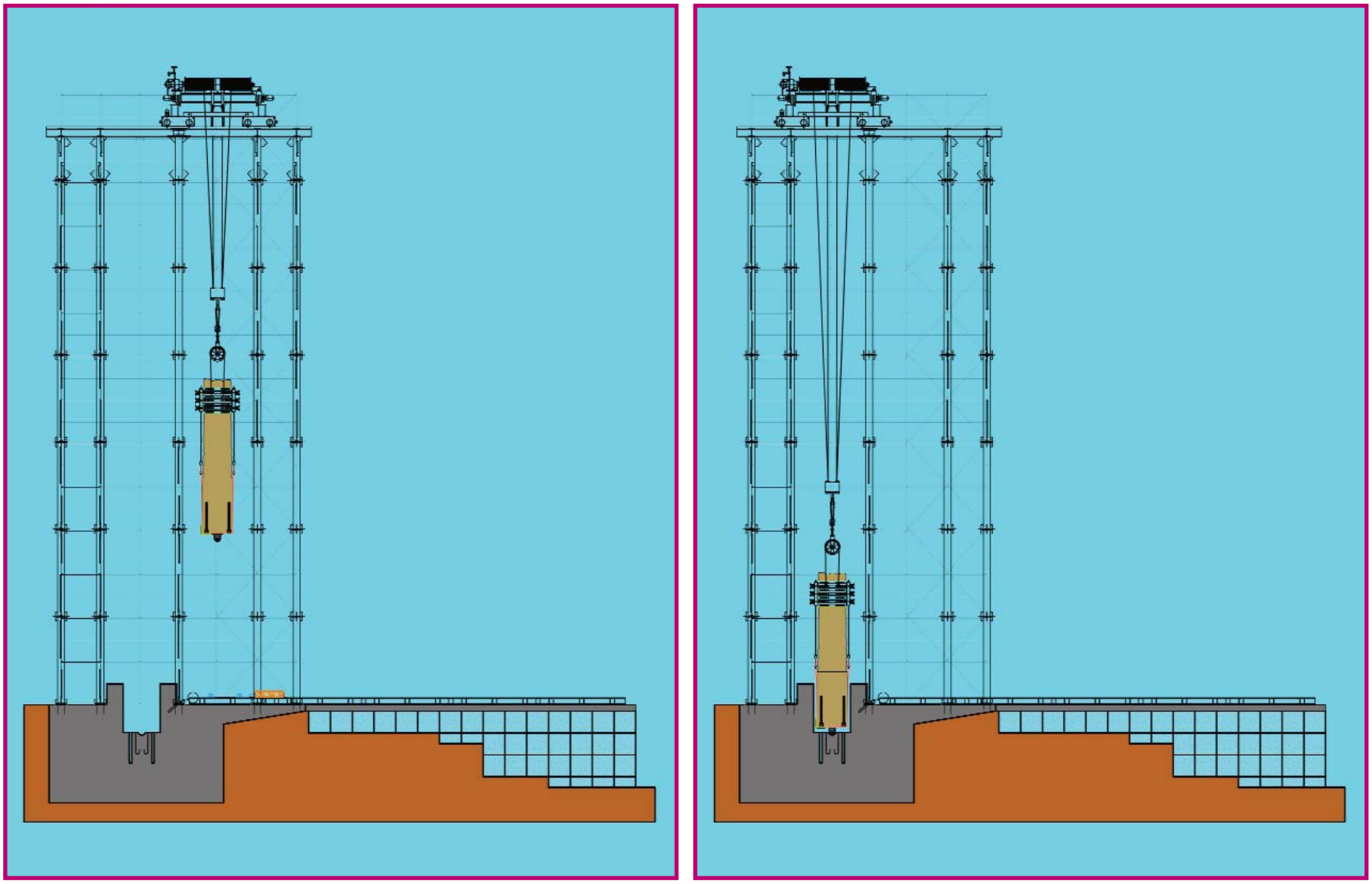
FIGURE 48 – THE RAILS USED TO SLIDE THE BLOCKS OF THE STELE.

FIGURE 49 – THE RAILS USED TO SLIDE THE BLOCKS OF THE STELE: LOOK-UP.

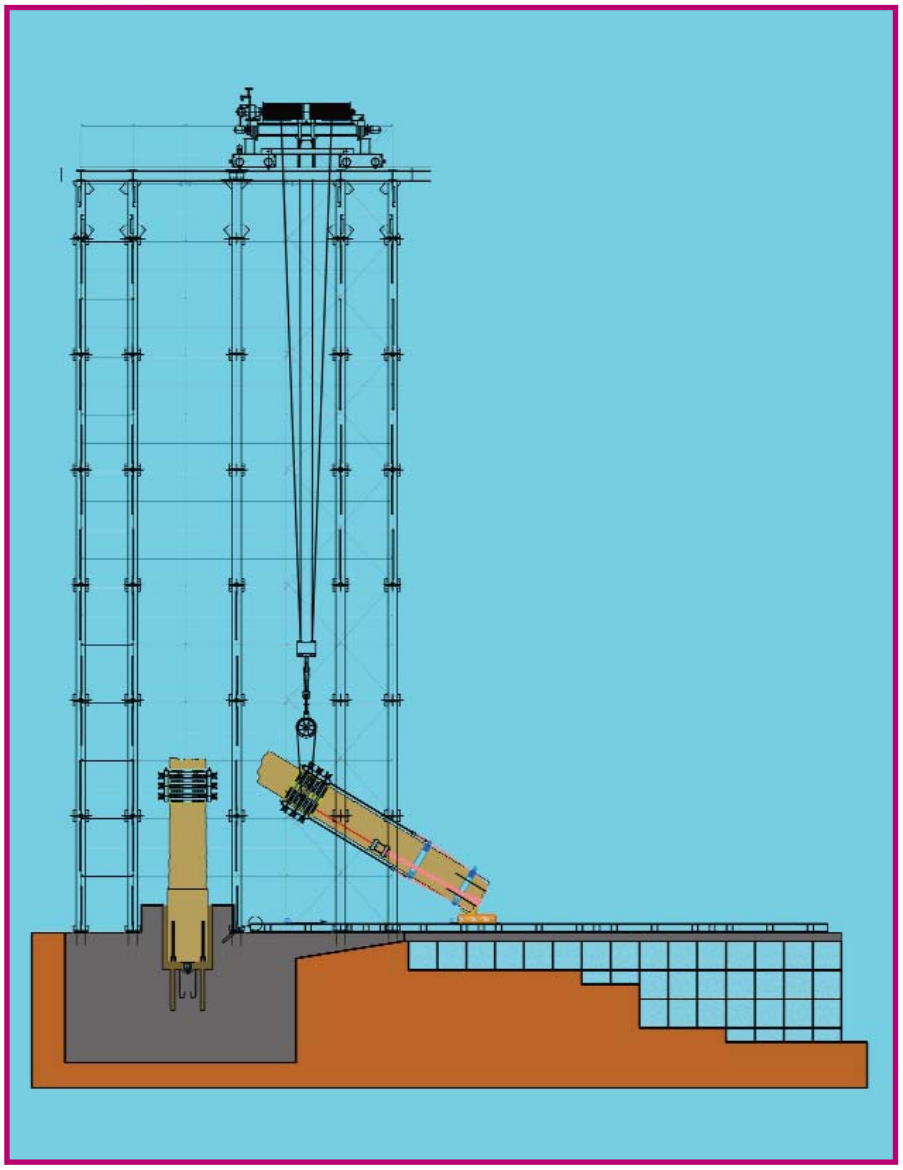


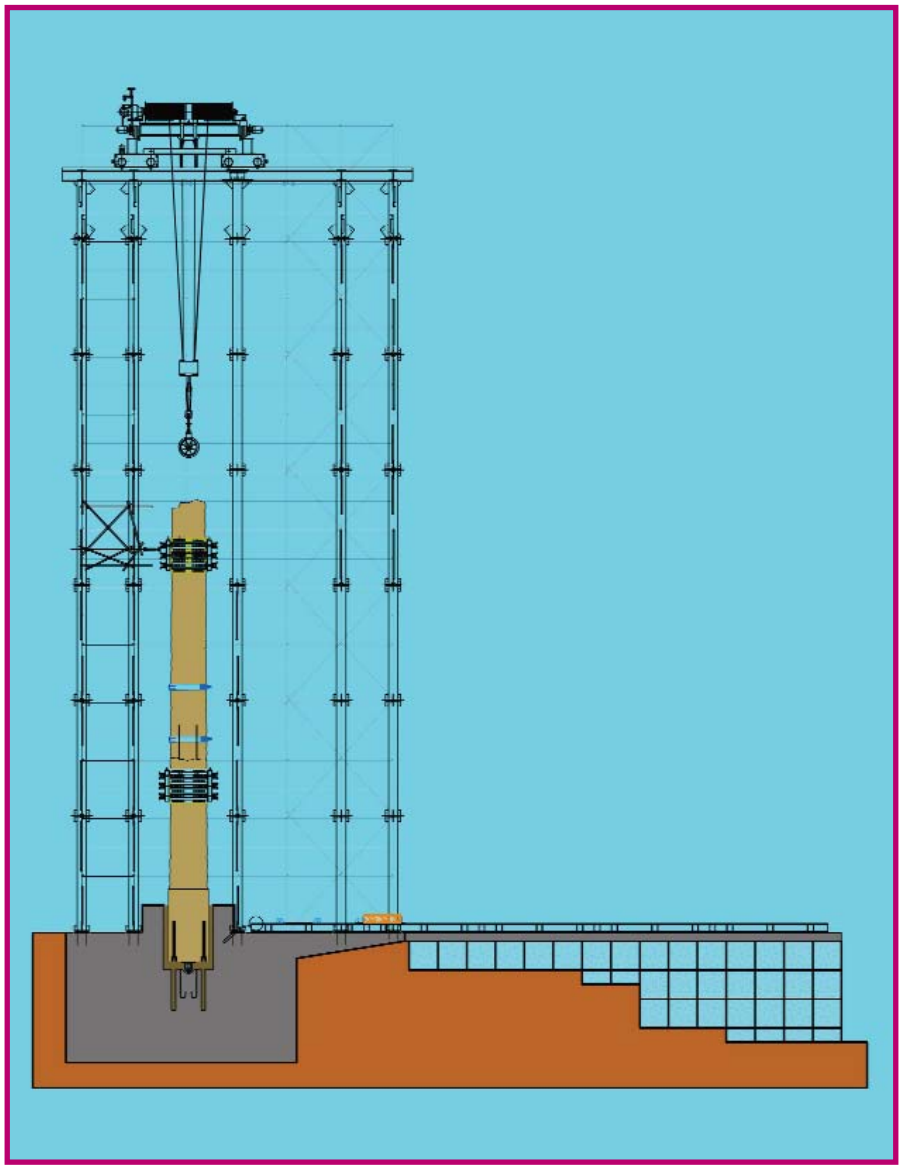


FIGURES 50.1 - 50.2 – SCHEME OF THE MOVEMENTS OF THE BLOCKS.

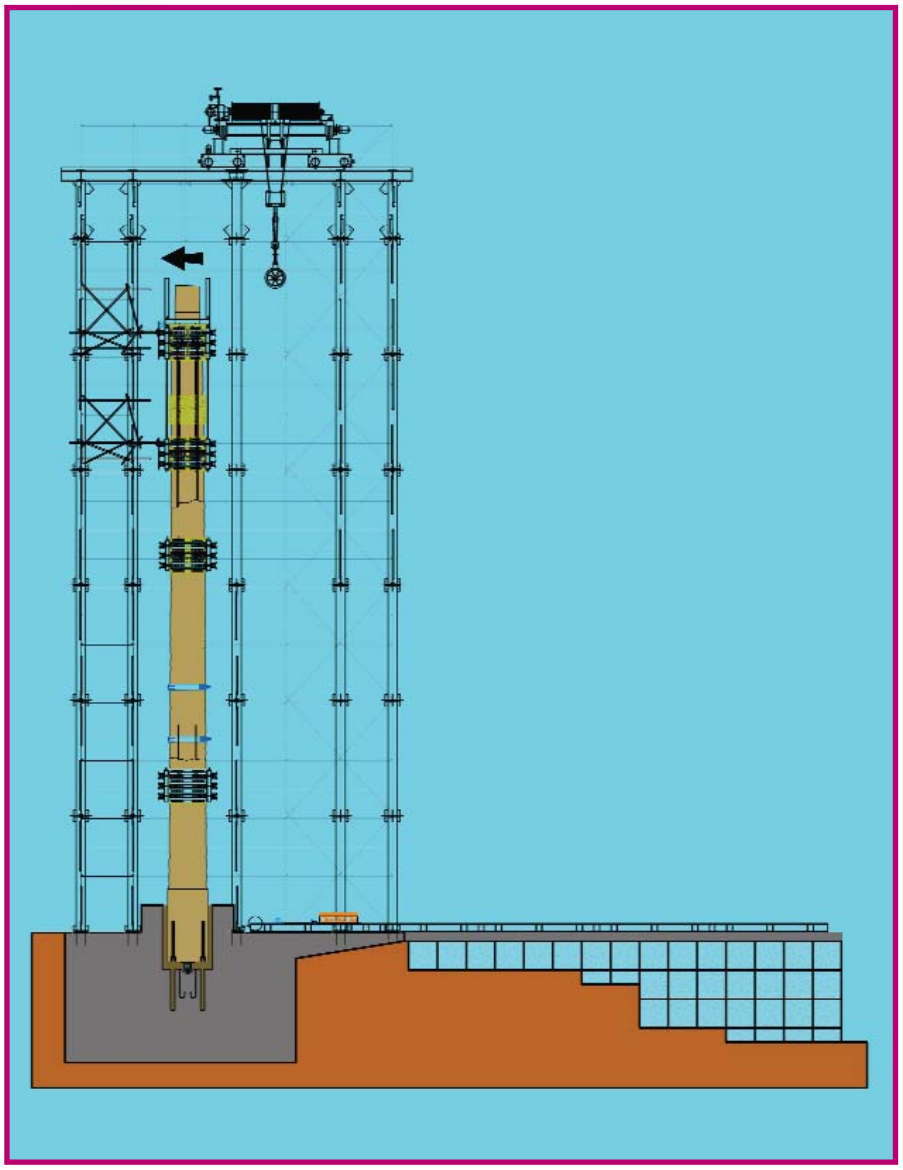


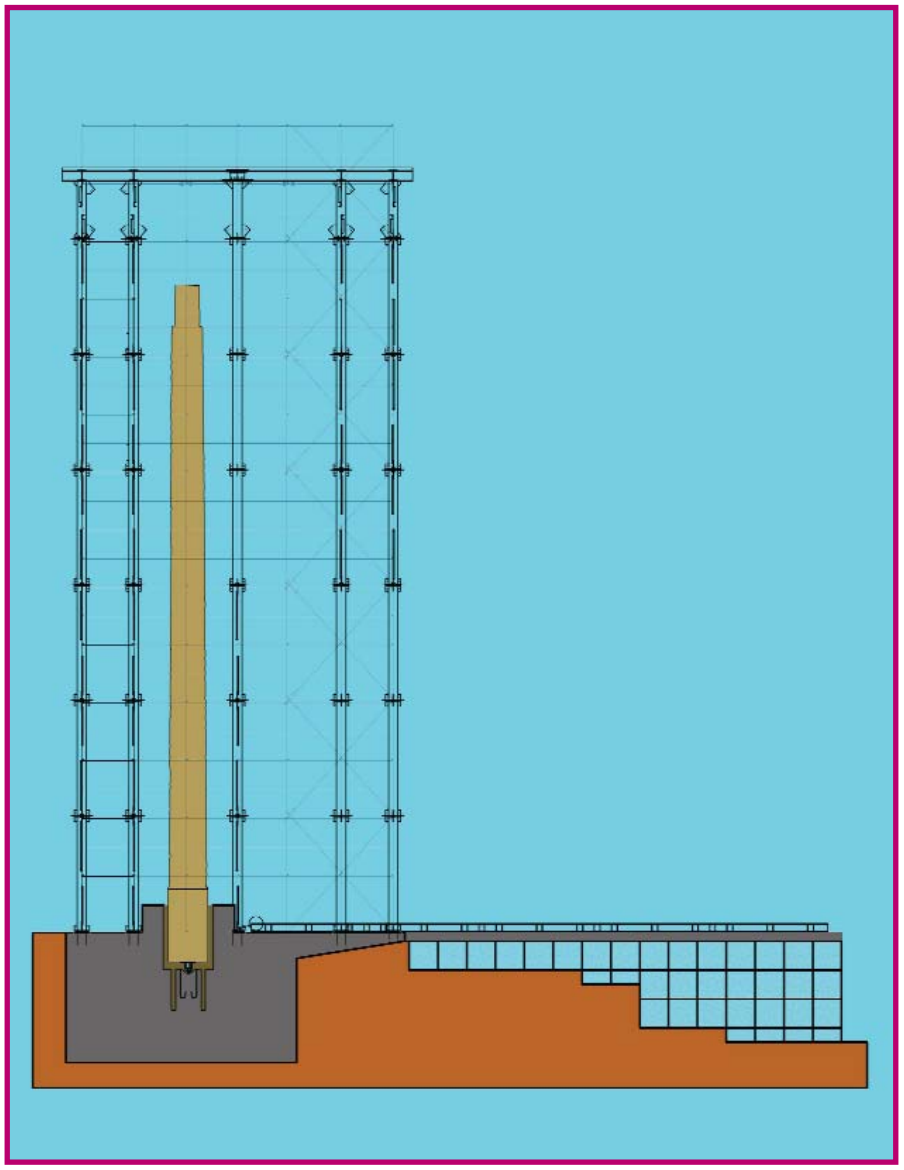
FIGURES 50.3 - 50.4 – SCHEME OF THE MOVEMENTS OF THE BLOCKS.





FIGURES 50.5 - 50.6 – SCHEME OF THE MOVEMENTS OF THE BLOCKS.





FIGURES 50.7 - 50.8 – SCHEME OF THE MOVEMENTS OF THE BLOCKS.

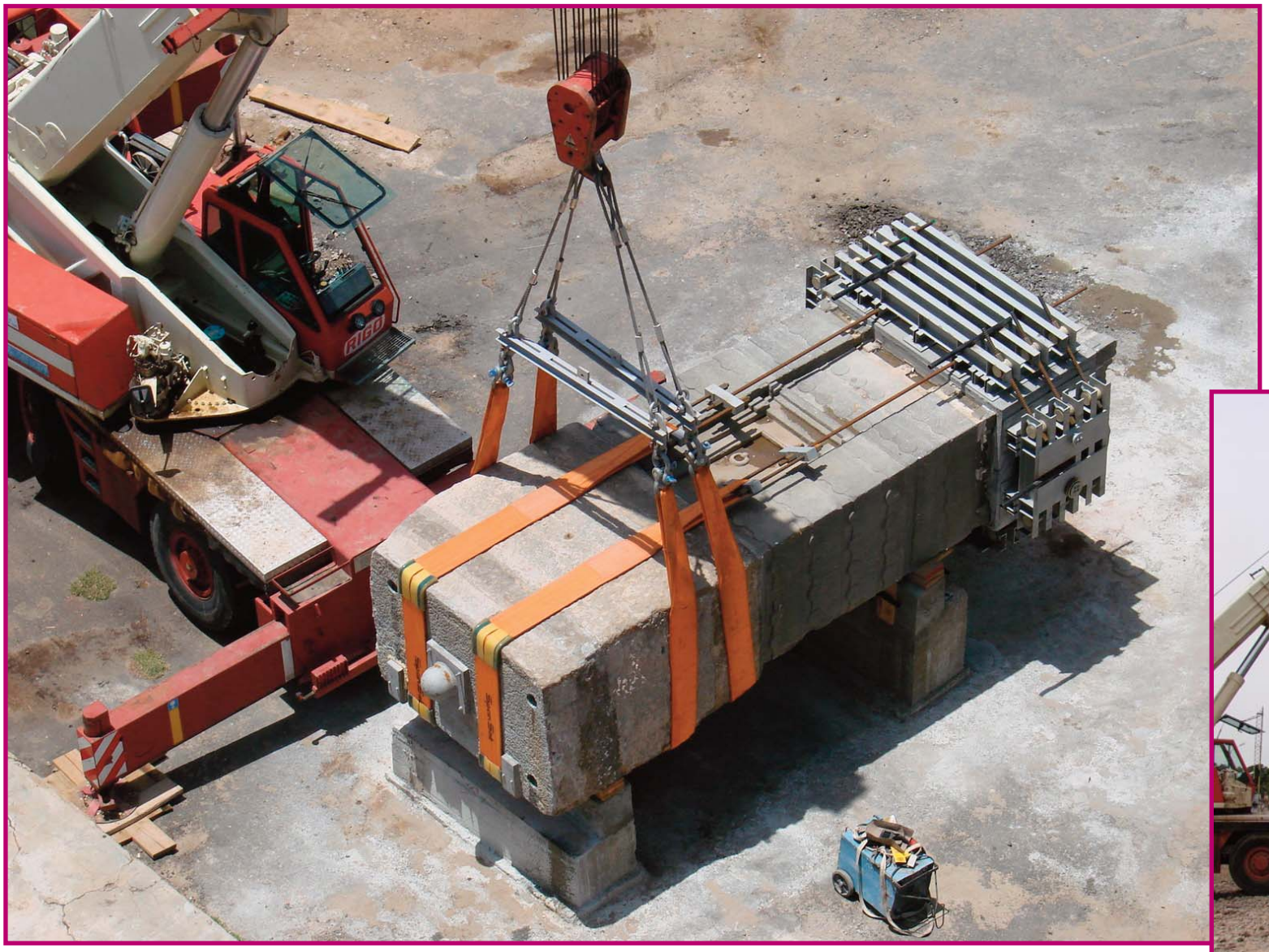


FIGURE 51 – THE BLOCK IS SECURED FIRMLY BEFORE HANDLING.
FIGURE 52 – THE BLOCK IS LIFTED AND MOVED TO THE RAILS.

FIGURE 53 – THE BLOCK IS LOCATED ON THE RAILS.

FIGURE 54 – FINAL POSITIONING OF THE BLOCK ON THE RAILS.

FIGURE 55 – PRECISION TOPOGRAPHIC SURVEY ENSURING VERTICALITY OF THE BLOCK.

FIGURE 56 – VIEW FROM BELOW OF BRIDGE CRAINE AND SUPPORTING STEEL CASTLE.

FIGURE 57 – THE BLOCK TO BE LOCATED IS MOVED INTO THE CASTLE.

FIGURE 58 – THE LOWER PART OF THE BLOCK SLIDES ON THE RAILS WHILE THE UPPER PART IS LIFTED UP.

FIGURE 59 – LOOK-UP OF THE BLOCK CENTERING AREA AT BOTTOM (SIDE VIEW).
FIGURE 60 – LOOK-UP OF THE BLOCK CENTERING AREA AT BOTTOM (FRONTAL VIEW).

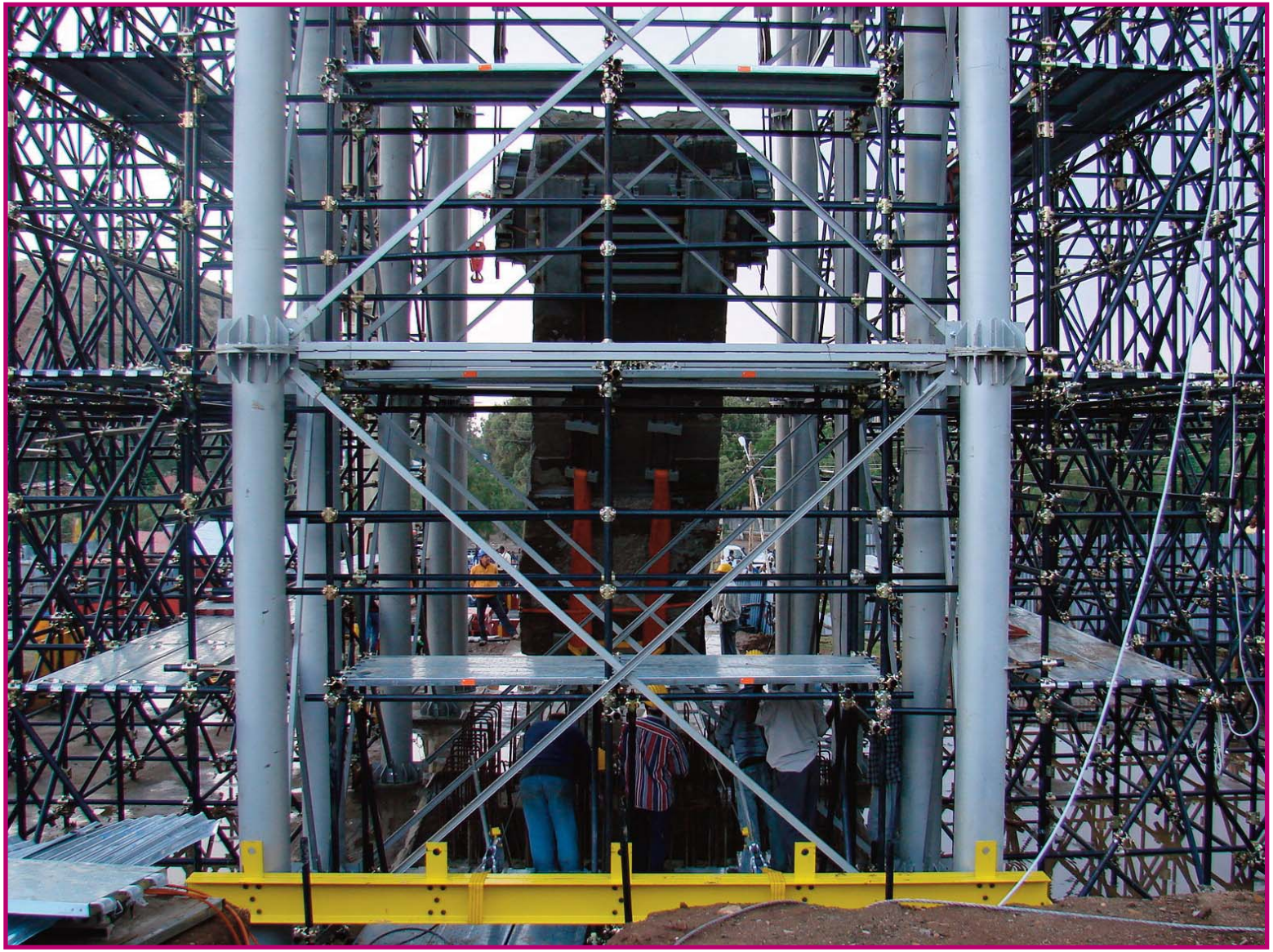


FIGURE 61 – LIFTING-UP OPERATIONS.

FIGURE 62 – THE BLOCK IS ROTATED AROUND ITS OWN AXIS.
FIGURE 63 – LIFTING-UP OF THE BLOCK: GENERAL VIEW.

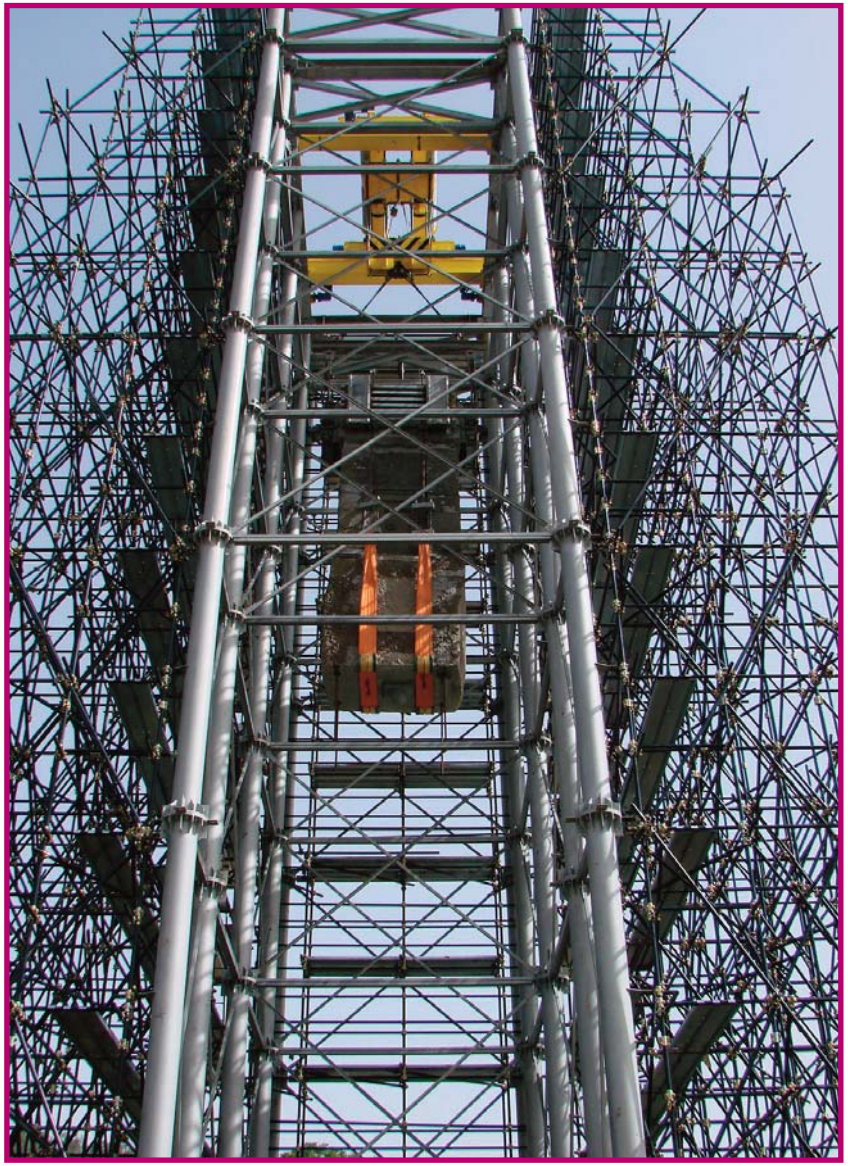


FIGURE 64 – LIFTING-UP OF THE BLOCK: LOOK-UP.
FIGURE 65 – THE BLOCK IS MOVED TO THE FINAL VERTICAL POSITION AXIS.

FIGURE 66 – FINAL POSITIONING OF THE BLOCK INTO THE HOUSING FOUNDATION.

FIGURE 67 - THE SECOND BLOCK SLIDES ON THE PLATFORM
FIGURE 68 – LIFTING UP OF THE SECOND BLOCK

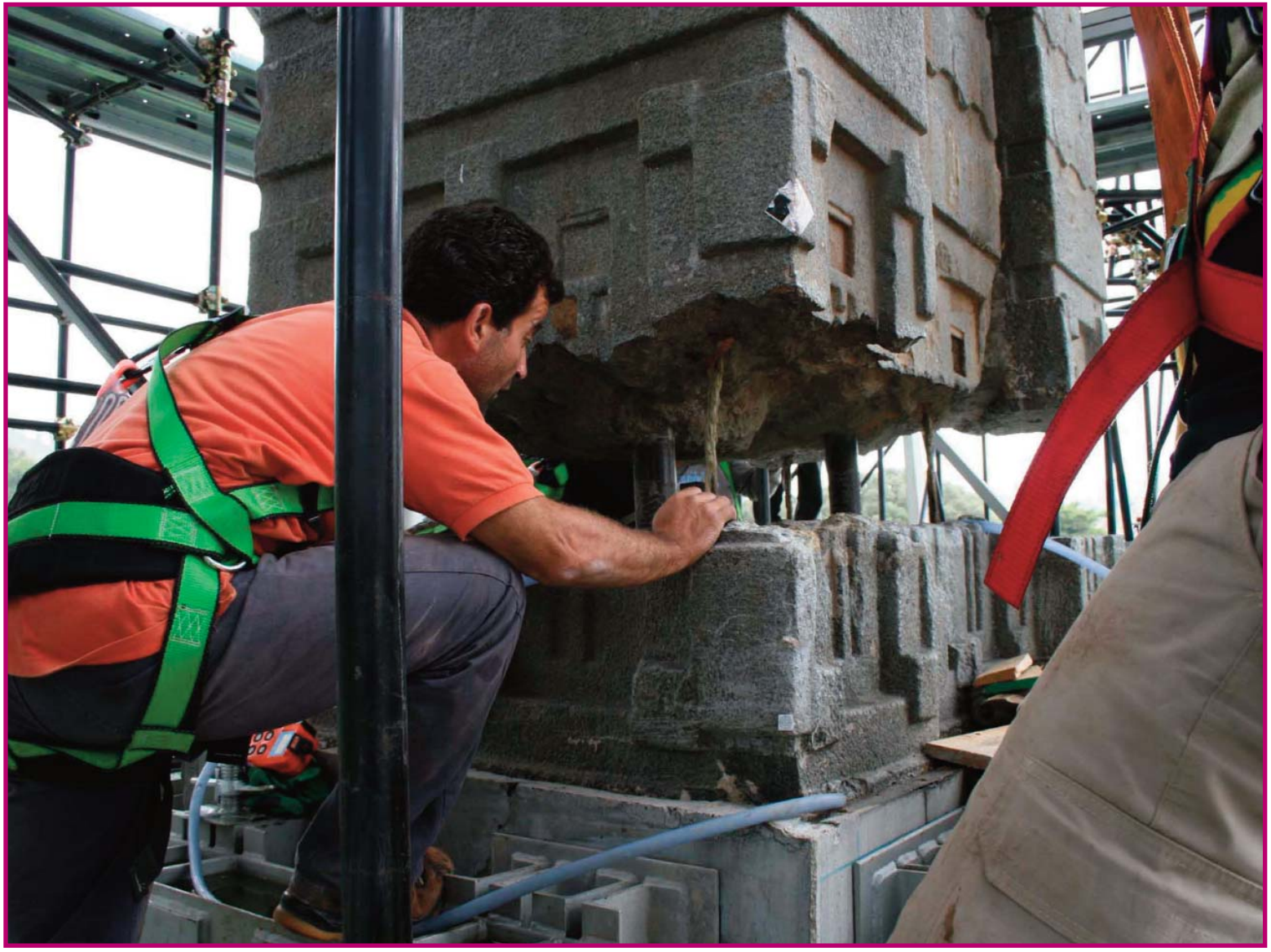


FIGURE 69 – PREPARATORY PHASES FOR THE CONNECTION BETWEEN FIRST AND SECOND BLOCK.

FIGURE 70 – POSITIONING OF THE THIRD BLOCK ON THE PLATFORM
FIGURE 71 – THE LOWER PART OF THE THIRD BLOCK SLIDES ON THE PLATFORM WHILE THE UPPER PART IS LIFTED UP BY THE CRANE.

FIGURE 72 – LIFTING UP OF THE UPPER BLOCK (THIRD BLOCK).
FIGURE 73 – THE FINAL CONFIGURATION OF THE STELE.

From Italy to Ethiopia - Disassembly, transportation and re-erection of the Stele of Axum

THE SPONTANEOUS CERIMONY

FRIDAY THE 31 OF JULY 2008, IN THE AFTER-NOON, THE UPPER BLOCK WAS FINALLY PLACED AND FOR THE FIRST TIME AFTER A MILLENIUM THE STELE WAS STANDING AGAIN. PEOPLE WERE WAITING FROM THE MORNING AND COULDN'T REFRAIN FOR SHOWING THEIR JOY AND ENTHUSIASM.

FIGURE 74 – THE CERIMONY AT THE END OF WORKS (ITALIAN AND ETHIOPIAN FLAGS WAVING).
FIGURE 75 – THE CERIMONY AT THE END OF WORKS.

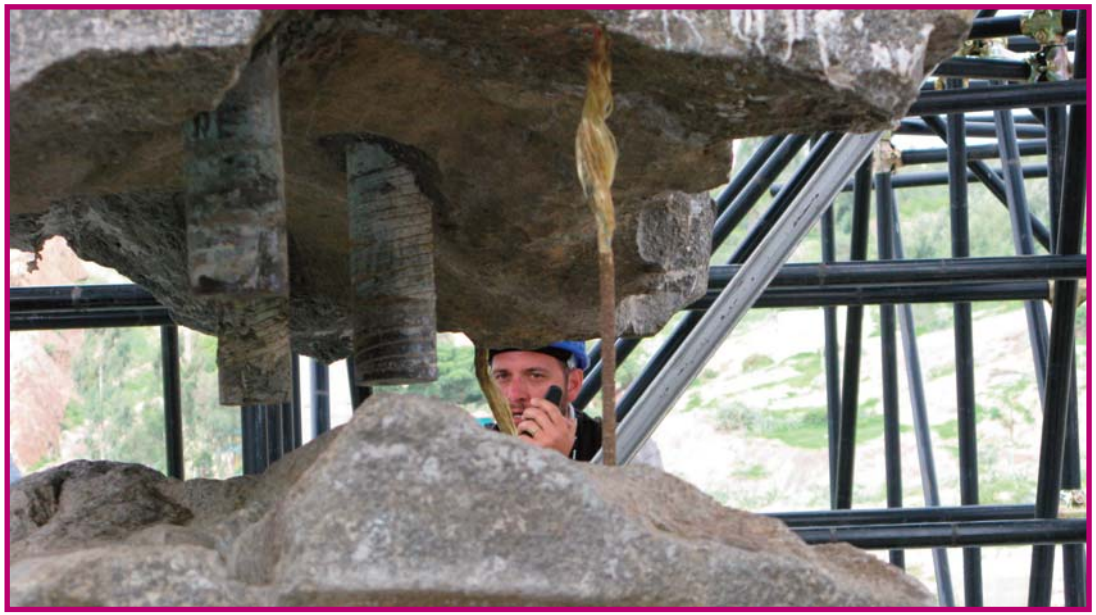


FIGURE 76 – FROM LEFT: ENG. BOZZETTI, ARCH. AL-HASSAN, ENG. RUSSO.
FIGURE 77 – ENG. RUSSO DURING THE POSITIONING OF UPPER PART.
FIGURE 78 – ENG. BOZZETTI DURING THE POSITIONING OF UPPER PART.

FIGURE 79 – FROM LEFT: ENG. BOZZETTI, ENG. CROCI, LOCAL PRAYER, ENG. LATTANZI, ENG. RUSSO, ENG.TADELE, MR. FAZZUOLI.

4.3 Phase 3

THE THIRD PHASE, EXPECTED TO BE COMPLETED BY THE END OF 2008, CONCERNS THE REMOVAL OF THE BRIDGE CRAINE, OF THE SUPPORTING STEEL STRUCTURE AND OF THE PROVISIONAL PROTECTION OF THE SURFACES OF THE STELE IN ORDER TO SET
EVERYTHING READY FOR THE FINAL RESTORATION THAT WILL BE CARRIED OUT WITH THE CONSULTING AND SUPERVISION OF I.C.R.
(ISTITUTO CENTRALE PER IL RESTAURO) WHICH WILL ORGANIZE ALSO A TRAINING COURSE FOR THE RESTAURATION OF THE
SURFACES.