



THE TOD'S GROUP PRESENTS THE RESTORATION OF COLOSSEUM

TOD'S GROUP IS PROUD TO HAVE TAKEN PART IN THE RESTORATION OF THE COLOSSEUM, A TRUE HISTORICAL SYMBOL OF ITALY.

PLAN OF WORKS

THE RESTORATION OF THE COLOSSEUM IS A PROJECT WHICH WAS DEVELOPED FOR THE COMMISSIONER OF THE ARCHAEOLOGICAL AREAS OF ROME AND OSTIA ANTICA IN AGREEMENT WITH ROME'S ARCHAEOLOGICAL HERITAGE DEPARTMENT. THE PROJECT WAS IMPLEMENTED THANKS TO THE INVOLVEMENT OF THE TOD'S GROUP.

THE FIRST PHASE OF THE WORKS HAS NOW BEEN COMPLETED AND WAS CARRIED OUT ON THE NORTHERN AND SOUTHERN FAÇADES, TOTALING A SURFACE AREA OF APPROXIMATELY 13.300 MQ. IT ALSO INCLUDED THE REPLACEMENT OF THE CURRENT ARCH ENCLOSURE SYSTEM WITH NEW GATES.

THE PLAN OR WORKS WILL CONTINUE WITH THE RESTORATION OF THE COLOSSEUM'S PASSAGEWAYS AND UNDERGROUND VAULTS. A UTILITY SYSTEM WILL BE IMPLEMENTED WITHIN COMPLIANCE TESTING AND A SERVICE CENTRE FOR VISITORS WILL BE BUILT, ALLOWING VISITORS TO ACCESS FROM THE OUTER AREA OF THE COLOSSEUM AS OPPOSED TO WHERE THIS STANDS NOW, WITHIN THE WALLS OF THE SITE.

PHASES OF RESTORATION

SURFACE MAPPING

PHOTOGRAPHIC SURVEY AND MAPPING OF SURFACES NEEDING TO BE RESTORED.

SURFACE CLEANING

WASHING OF THE SURFACE WITH NEBULOUS WATER SPRAY: THE ALTERNATING ACTION OF NEBULOUS WATER SPRAYING AND SCRUBBING WITH SORGHUM BRUSHES GRADUALLY REMOVING DEPOSITS OF DIRT TO REVEAL THE CRACKS IN THE MONUMENT, THUS SAFEGUARDING THE PATINA OF AGE.

CONSOLIDATION AND REBONDING

REBONDING OF TRAVERTINE CHIPS WITH NON-HYDRAULIC LIME MORTAR AND INJECTION OF HYDRAULIC LIME MORTAR.

POINTING OF CAVITIES AND CRACKS

PREPARATION OF MORTAR: SIEVING OF BLACK POZZOLANA.
APPLICATION OF MORTAR WITH A POINTING TROWEL.
TREATMENT OF THE POINTING TO MAKE IT BLEND MIMETICALLY WITH THE TRAVERTINE SURFACES.

REMOVAL OF POINTING NO LONGER SUITABLE

MECHANICAL REMOVAL OF CEMENTS WITH MICRO-CHISELS.

LOCALIZED CLEANING

REMOVAL OF DEPOSITS NOT PERTINENT TO THE ORIGINAL SURFACE BY LOCALIZED PRECISION MICRO-SANDBLASTING.

INSTALLATION OF GATES

REPLACEMENT OF THE CURRENT ARCH ENCLOSURE SYSTEM WITH WROUGHT IRON GATES.

RESTORATION BY NUMBERS

10,150 MQ OF RESTORED TRAVERTINE SURFACES.

1,700 KG OF LIME PUTTY AND INERT AGGREGATES OF VARIOUS COLOURS AND PARTICLE SIZES USED FOR THE POINTING.

13,000 PHOTOS TAKEN TO DOCUMENT THE COLOSSEUM RESTORATION.

1,200 MQ OF IRON GATES, FRAMES AND PARAPETS.

81,895 ELEMENTS RECORDED ON THE NORTH AND SOUTH FAÇADES (3RD LEVEL, OPUS LATERICIUM).

DISCOVERIES

- A LOW-RELIEF, AROUND 60 CM HIGH, DEPICTS A GLADIATOR, PRESUMABLY DATING TO THE ORIGINAL CONSTRUCTION IN THE FLAVIAN AGE.
- LOW-RELIEFS FROM THE END OF THE 14TH CENTURY PORTRAYING CHRIST ON THE ALTAR FLANKED BY TWO BURNING CANDELABRAS THAT BELONGED TO THE CONFRATERNITA DEL SANTISSIMO SALVATORE AD SANCTA SANCTORUM.
- ON THE COLOSSEUM'S NORTHERN FAÇADE, ALONG THE LOWER CORNICE OF THE ATTIC, DENTILS ALTERNATE WITH ROSETTES, EACH ONE DIFFERENT FROM ONE ANOTHER, TO FORM AN INTEGRAL PART OF THE ARCHITECTURAL DECORATION.
- TRACES OF THREE PLAQUES IN PAINTED IN 1386 WERE FOUND ON THE KEYSTONE AND THE TWO ADJACENT BLOCKS OF ARCH 65. THE RESTORATION REVEALED COLOURS OF A FRESCO ILLUSTRATING CHRIST ON THE ALTAR BETWEEN TWO BURNING CANDELABRAS THAT BELONGED TO THE CONFRATERNITA DEL SANTISSIMO SALVATORE AD SANCTA SANCTORUM, AND THE EMBLEM OF THE ROMAN SENATE.
- RESTORATION WORK UNCOVERED NUMEROUS IRON NAILS WHOSE POSITION AND SHAPE LINK THEM TO ARCHITECTURAL SURVEY OPERATIONS CARRIED OUT IN THE 19TH CENTURY.

MAPPING

A UNIQUE CENSUS FOR THE BENEFIT OF FUTURE STUDIES AND RESTORATIONS.

THE UPDATED SURVEY OF THE MONUMENT MADE IT POSSIBLE TO DIGITALIZE ALL THE INFORMATION COLLECTED FROM IN THE SITE DOCUMENTATION TO THUS PRODUCE FOUR DISTINCT MAPPINGS:

1. STATE OF CONSERVATION
2. CONSTITUENT ELEMENTS
3. CONSERVATION WORK
4. RESTORATION TECHNIQUE.

STATE OF CONSERVATION

PRELIMINARY DOCUMENTATION IDENTIFYING THE VARIOUS TYPES OF DECAY FOUND ON THE SURFACES OF THE MONUMENT BEFORE CONSERVATION WORK COMMENCED.

BIOLOGICAL PATINA

DIFFUSE PRESENCE OF MICROORGANISMS (ALGAE AND LICHEN) DUE TO BOTH THE MORPHOLOGICAL CHARACTERISTICS OF THE TRAVERTINE AND THE MICRO-CLIMATIC CONDITIONS. THE PHENOMENON CAUSED WIDESPREAD BLACKENING OF SURFACES THAT SEEMED PARTICULARLY CONCENTRATED IN THE AREAS MAPPED.

OXALATE PATINAS

THESE COMPACT PATINAS GIVE THE MONUMENT A PLEASANTLY COLOURFUL APPEARANCE, WITH COLOURS RANGING FROM GOLDEN YELLOW TO ROSEATE AND ORANGE RED, AND FROM DARK BROWN THROUGH TO DARK GREY TONES.

SLIGHT SUPERFICIAL DEPOSITS

ACCUMULATION OF EXTRANEIOUS MATERIAL OF VARIOUS KINDS (ATMOSPHERIC PARTICULATES, DUST, SOIL, GUANO) AND OF MINIMAL THICKNESS THAT ENABLED THE UNDERLYING OXALATE PATINAS TO BE GLIMPSED.

MEDIUM SUPERFICIAL DEPOSITS

COMPACT AND HOMOGENEOUS DEPOSITS THAT CHARACTERIZED AREAS NOT DIRECTLY EXPOSED TO RAIN WASH. THIS ACCUMULATION OF ATMOSPHERIC PARTICULATES, DUST, SOIL AND GUANO MADE THE UNDERLYING OXALATE PATINAS INVISIBLE.

“BLACK CRUST” SUPERFICIAL DEPOSITS

COMPACT INCRUSTATION OF VARIABLE THICKNESS (UP TO 1 CM OR MORE), FORMED MAINLY BY ATMOSPHERIC PARTICULATES. IN SOME

AREAS THESE DEPOSITS WERE DETACHING SPONTANEOUSLY FROM THE SUBSTRATE, WHICH GENERALLY LOOKED CRUMBLY.

DEFICIENCIES

COLLAPSE OR LOSS OF PARTS ASSUMING FORMS SPECIFIC TO STRUCTURAL CHARACTERISTICS AND TEXTURE. THE AREAS WHERE THE PHENOMENON WAS PARTICULARLY NOTICEABLE WERE MAPPED.

SUPERIOR VEGETATION

LOCALIZED PRESENCE OF WEEDS OF VARIOUS KINDS DEPENDING ON EXPOSURE AND MICRO-CLIMATIC VARIATIONS. THEY INCLUDE A NUMBER OF CAPERS, WHOSE VIGOROUS ROOTS HAVE DAMAGED WALLS.

FLAKING

DECAY MANIFESTED BY TOTAL OR PARTIAL DETACHMENT OF PARTS, OFTEN AT POINTS OF DISCONTINUITY IN THE ORIGINAL MATERIAL.

EROSION

REMOVAL OF MATERIAL FROM THE SURFACE DUE TO VARIOUS DIFFERENT PROCESSES. THE PHENOMENON WAS PARTICULARLY NOTICEABLE ALONG THE OPUS LATERICIUM FACING OF THE 3RD LEVEL OF THE SOUTHERN FAÇADE.

HONEYCOMB WEATHERING

DECAY MANIFESTED BY THE FORMATION OF CAVITIES OF VARIABLE SHAPE AND SIZE. THE PHENOMENON OCCURS MOSTLY IN THE AREAS MOST EXPOSED TO RAIN.

CORROSION OF IRON ELEMENTS AND OXIDE STAINS

THE IRON ELEMENTS WERE CHARACTERIZED BY A POWDERY PATINA OF CORROSION PRODUCTS. LOCALIZED STAINS CAUSED BY THE ABSORPTION OF IRON OXIDES BY THE POROUS STONE CAN BE SEEN.

CRACKS AND FRACTURES

DECAY MANIFESTED BY THE FORMATION OF DISCONTINUITIES IN THE MATERIAL THAT MAY SUGGEST RECIPROCAL MOVEMENT OF PARTS. PHENOMENON DUE ABOVE ALL TO MECHANICAL CAUSES: STRUCTURAL MOVEMENTS, EXPANSION OF IRON BOLTS, NATURAL CAUSES IN THE STRUCTURE.

CONSTITUENT ELEMENTS

THIS MAPPING MAKES IT POSSIBLE TO IDENTIFY EVERY ELEMENT IN THE CONSTRUCTION AND KNOW WHAT IT'S MADE OF.

CONSTITUENT MATERIALS

IN ADDITION TO THE TRAVERTINE STONE FACING, THERE ARE PORTIONS IN OPUS LATERICIUM, CONCRETE ENCASEMENTS AND COVERS, CRAMP-IRONS, GRATINGS, RAILINGS AND STRUCTURES.

ANTIQUÉ MORTARS AND PREVIOUS POINTING

ON THE STONE FACING, IN ADDITION TO TRACES OF ANTIQUÉ MORTARS, NUMEROUS POINTINGS DONE DURING PREVIOUS CONSERVATION WORK CAN BE SEEN.

PRE-EXISTING TIES

THIS DATES FROM CONSOLIDATION WORK WHICH TOOK PLACE IN THE '50S-'60S, A TIME DURING WHICH HUNDREDS OF BRONZE AND IRON RODS WERE INSERTED. THE HIGHEST CONCENTRATION WAS FOUND ON THE FOUR LEVELS OF THE NORTH FAÇADE.

CONSERVATION WORK

IDENTIFICATION AND LOCALIZATION OF CONSERVATIVE INTERVENTIONS CARRIED OUT DURING THE CURRENT RESTORATION.

BIOCIDE TREATMENT AND FOLIAR APPLIED AGENTS

THE ENTIRE SURFACE WAS TREATED WITH A BIOCIDE TO ELIMINATE MICROORGANISMS, WHILE A DEFOLIANT WAS APPLIED DIRECTLY TO THE LEAVES OF PLANTS.

CONSERVATIVE TREATMENT OF IRONWORK

MECHANICAL CLEANING OF IRON ELEMENTS AND CONSERVATIVE TREATMENT WITH A RUST CONVERTER THAT TURNS THE OXIDE INTO A STABLE BARRIER.

CLEANING OF ENCASEMENTS WITH PRESSURE CLEANERS

THIS CLEANING SYSTEM WAS USED EXCLUSIVELY ON THE TOP OF THE MONUMENT, ALONG THE CEMENT MORTAR ENCASEMENTS, TO REMOVE DEPOSITS AND MICROORGANISMS.

NEBULOUS SPRAY CLEANING

DEPOSITS OF EXTRANEIOUS MATERIALS WERE REMOVED BY THE ACTION OF ATOMIZED WATER USING A HYDRAULIC SYSTEM DESIGNED AND BUILT FOR THE MONUMENT'S NEEDS.

CHEMICAL SURFACE CLEANING

CELLULOSE PULP PADS SOAKED IN DETERGENTS THAT CLEAN EFFECTIVELY, YET NOT AGGRESSIVE TO THE UNDERLYING STONE WERE APPLIED LOCALLY TO REMOVE ORGANIC DEPOSITS HAVING LOW SOLUBILITY.

FILLING AND RE- BONDING

HYDRAULIC MORTARS WITH HIGH ADHESION AND FILLING CHARACTERISTICS WERE INJECTED TO FILL HOLES IN WALLS. SMALL DETACHED FRAGMENTS WERE REBONDED USING EPOXY RESINS WITH ADDED MARBLE POWDER.

INSERTION OF BASALT, STEEL AND FIBREGLASS PINS

BASALT, STEEL AND FIBREGLASS PINS WERE INSERTED TO IMPROVE THE ADHESION AND GUARANTEE THE SAFETY OF CERTAIN MORE SUBSTANTIAL FRAGMENTS.

POINTING AND WHITENING

SEALING WITH NEW POINTING WAS AN IMPORTANT PREVENTIVE INTERVENTION SAFEGUARDING THE MONUMENT BY REDUCING INFILTRATION OF WATER INTO THE STONEMWORK. FURTHER, CERTAIN PRE-EXISTING POINTING WORK WAS WHITENED TO IMPROVE ITS APPEARANCE.

RESTORATION TECHNIQUE

THE SURVEY AND STUDY OF PREVIOUS WORK PROVIDED USEFUL INSIGHTS INTO THE TECHNIQUES USED TO BUILD THE MONUMENT AND HELPED IDENTIFY RENOVATIONS THROUGHOUT ITS HISTORY.

BLOCK CENSUS

EACH BLOCK WAS IDENTIFIED WITH A UNIQUE PROGRESSIVE NUMBER.

ARCHITECTONIC ELEMENTS

SUBDIVISION OF ELEMENTS (CORBELS, ARCHES, COLUMNS, PLINTHS, ARCHITRAVES, PILASTERS, ETC.) ON THE BASIS OF ARCHITECTURAL ORDERS.

TEXTURE OF BLOCKS

THE STUDY OF THE TEXTURE OF THE BLOCKS AND ORIENTATION OF THE SEDIMENTATION LINE HELPS ANALYSE THE SEQUENCE OF CONSTRUCTION WORK ON THE MONUMENT.

SIGNS OF WORK TECHNIQUES

ON EACH BLOCK OF TRAVERTINE TRACES OF WORK BY TOOLS USED TO FINISH THE SURFACES WERE IDENTIFIED.

MODERN ADDITIONS OF TRAVERTINE

THE MAPPING INDICATES MODERN ADDITIONS OF TRAVERTINE.