



COMBUSTIBLE ASSEMBLAGES

[ARCHIVING MATERIAL DESTRUCTION OF THE PYROCENE]

CYNTHIA GEORGE AND CATHY WU

DISSIMULATING AND DISSHEVELING MATTER
SYRACUSE SCHOOL OF ARCHITECTURE 2021

WILDFIRE PERIMETER HISTORY



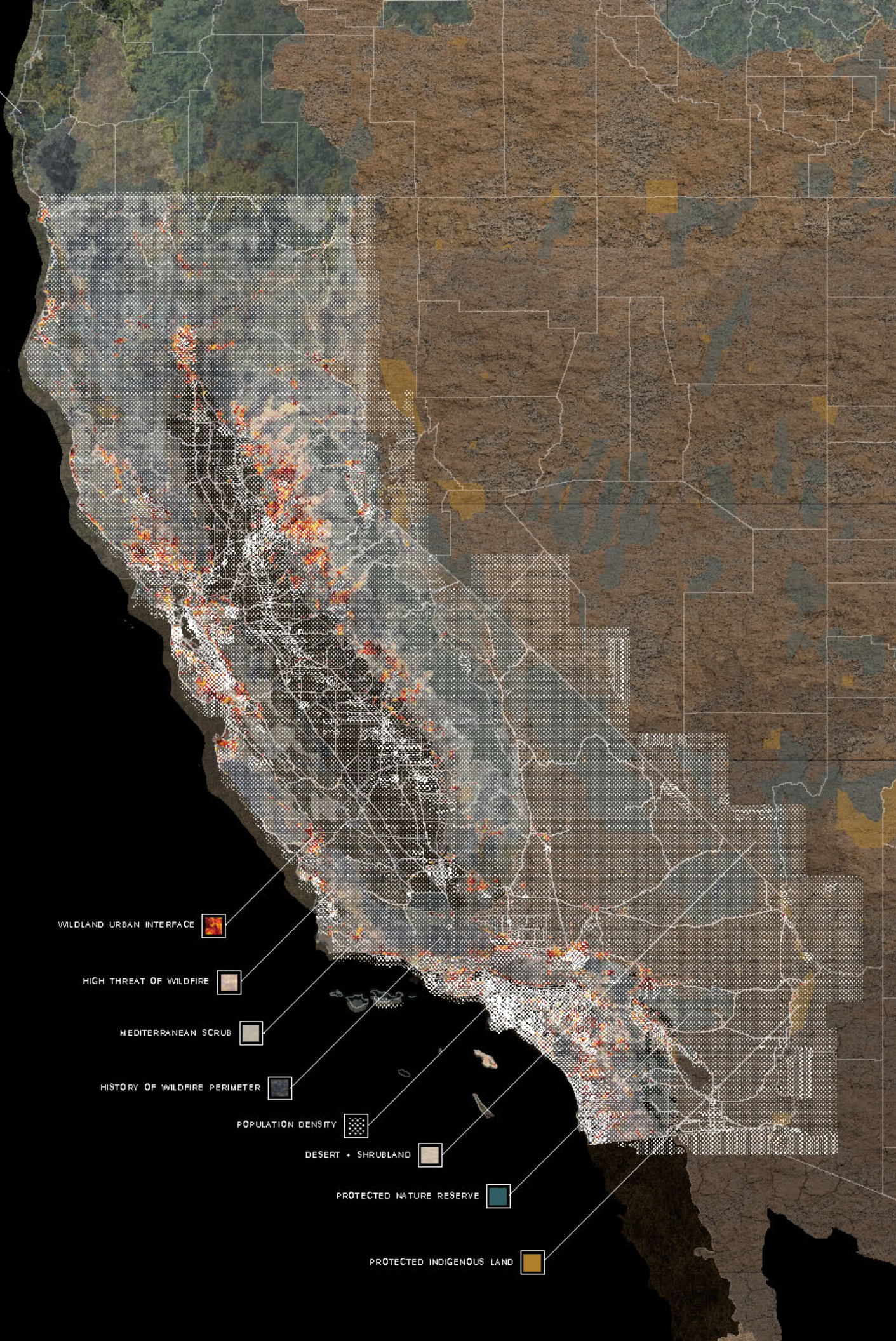
WILDLAND URBAN INTERFACE



FUTURE THREAT



TEMPERATE FOREST



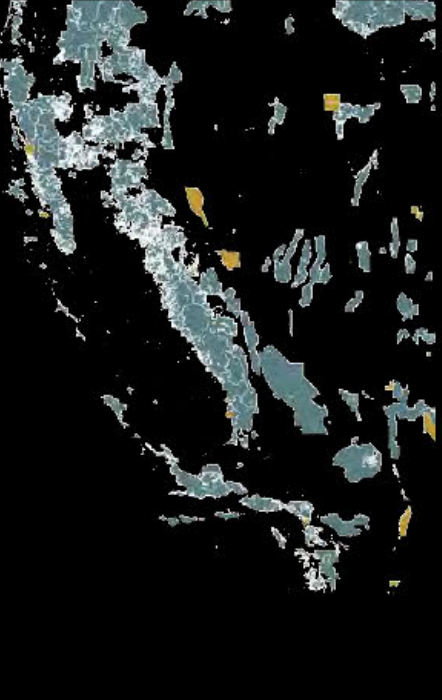
ECOREGIONS



POPULATION DENSITY



PROTECTED LANDS



IN THE ONSET OF THE PYROCENE, WILDFIRE IS DOMINATING THE INCREASINGLY URBANIZED LANDSCAPES OF ECOLOGICAL TERRITORIES PRONE TO NATURAL COMBUSTION. THESE INTERMIXED TERRITORIES OF INHABITED AND NATURAL LANDSCAPES ARE SPREADING THROUGHOUT THE GRASSLANDS OF CALIFORNIA AS COMMUNITIES NAIVELY EXPAND INTO AREAS AT HIGH RISK OF WILDFIRE. DESPITE THE DEEPLY EMBEDDED PRACTICE OF ABSOLUTE MITIGATION OF FIRE'S THREAT, WHICH ARE ENCODED INTO BUILDING STANDARDS AND EVERYDAY SAFETY MEASURES, THE BUILT ENVIRONMENT WILL INEVITABLY COMBUST AND DECAY, DISRUPTING THE COLLECTIVE MEMORY HELD WITHIN PUBLIC SPACE. FIRE THREATENS THE STABILITY AND PROTECTION OF THE HUMAN-CONSTRUCTED ENVIRONMENT AS IT CONTINUES TO DESTROY THE ILLUSIVE PERMANENCE OF ARCHITECTURAL PRACTICES, LEAVING TRACES THROUGH ITS TOTAL ERASURE AND DESTRUCTION.

WILDLAND URBAN INTERFACE



HIGH THREAT OF WILDFIRE



MEDITERRANEAN SCRUB



HISTORY OF WILDFIRE PERIMETER



POPULATION DENSITY



DESERT + SHRUBLAND



PROTECTED NATURE RESERVE



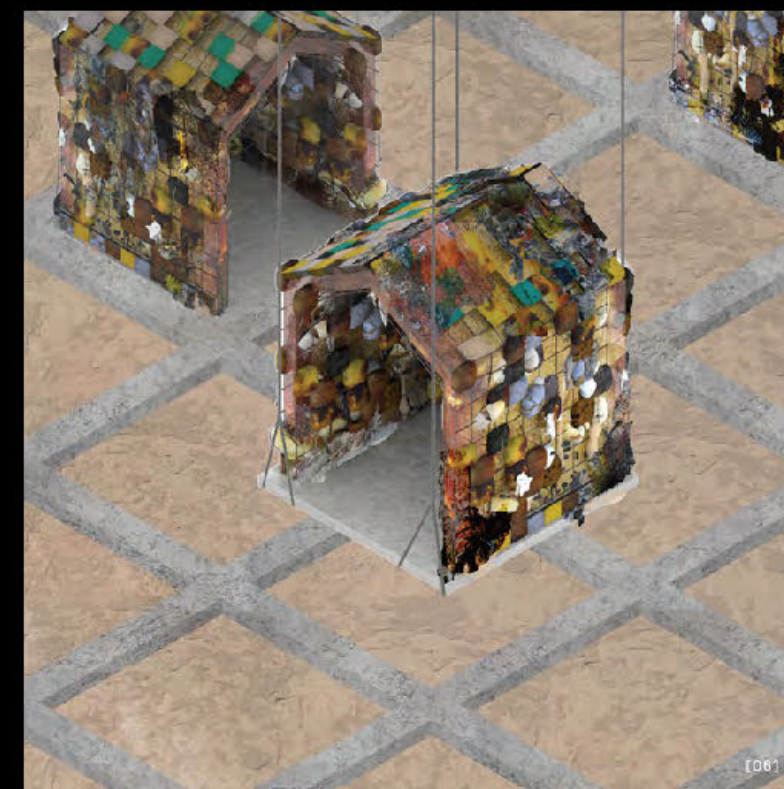
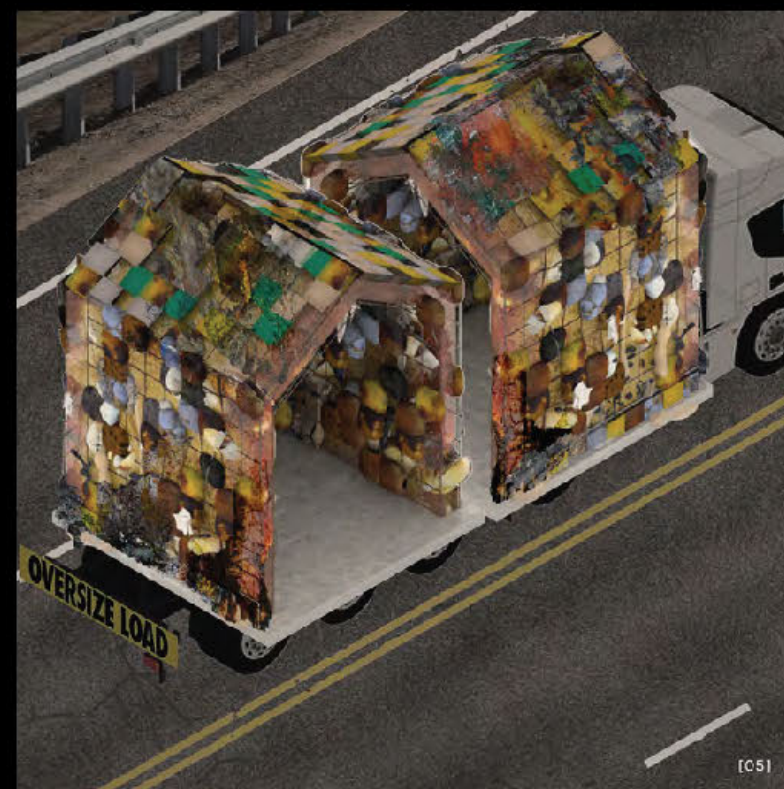
PROTECTED INDIGENOUS LAND



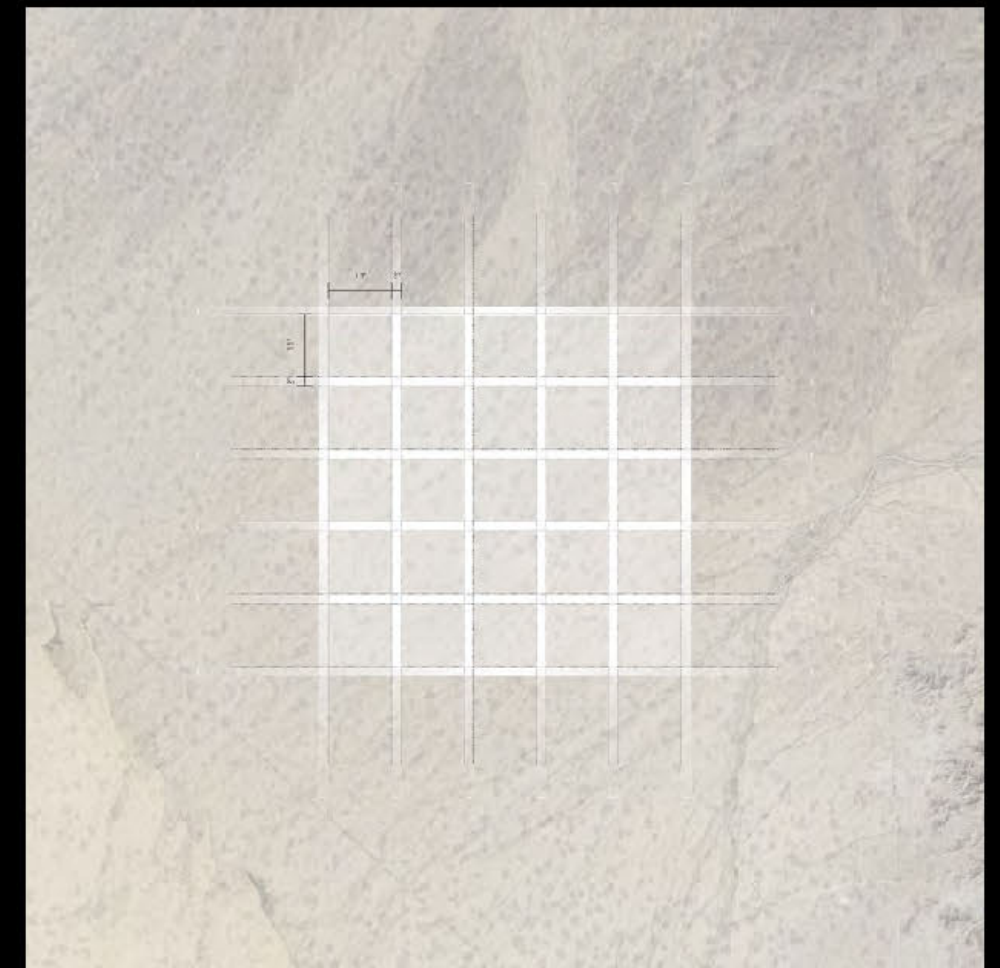
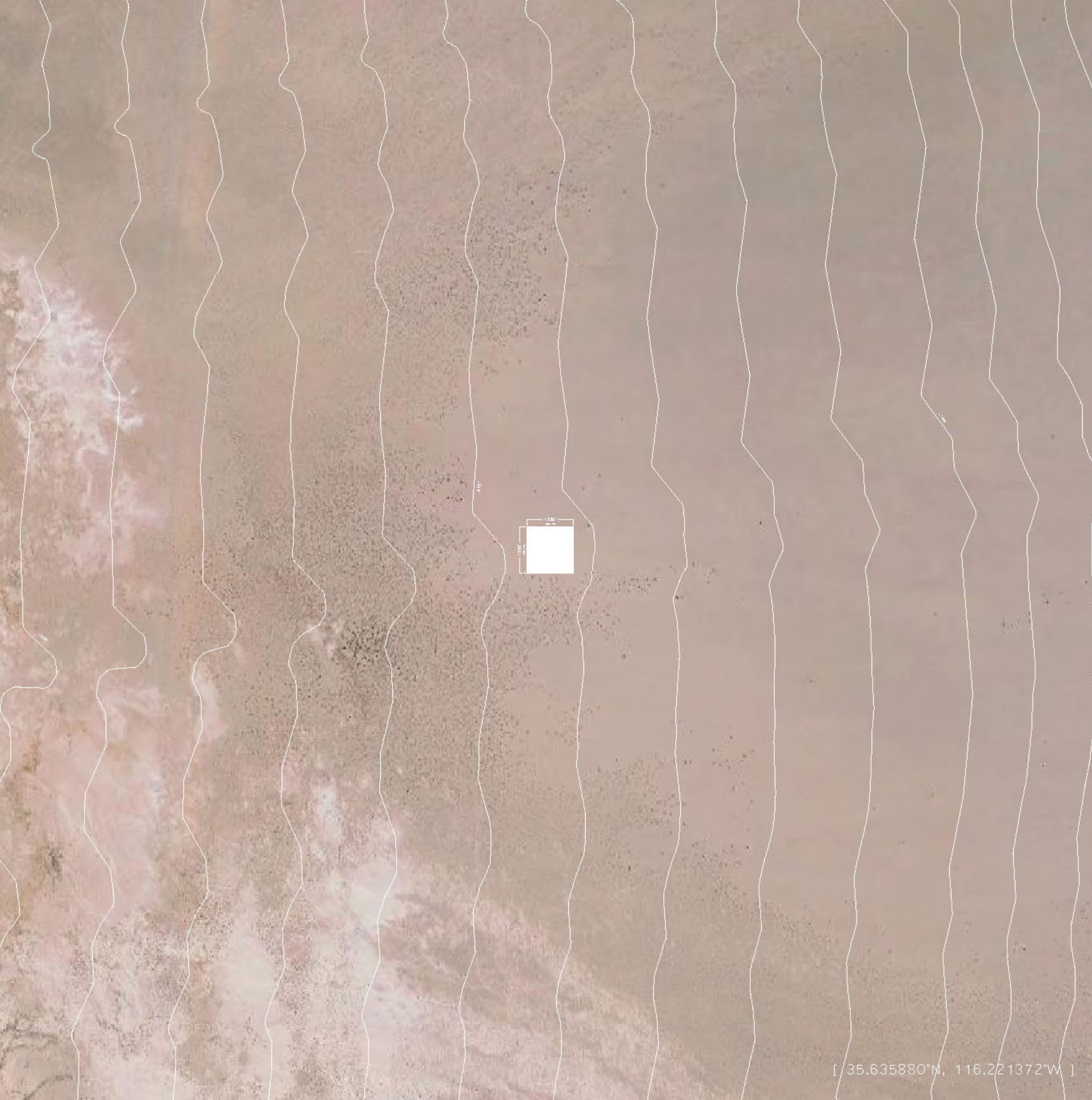


DISPERSING INDEXICAL ARTIFACTS TO BE BURNED

A COLLECTIVE, GROWING ARCHIVE OF THE PYROCENIC ENVIRONMENT IS CONSTRUCTED THROUGHOUT THE WILDLAND URBAN INTERFACE OF CALIFORNIA, WHERE COMMUNITIES HAVE EXPANDED INTO TERRAINS AT HIGH RISK OF WILDFIRE. 10,000 SERIAL ARTIFACTS COVER EVERY SQUARE MILE OF THE INTERFACE TERRITORY, AWAITING THE ONSET OF FIRE TO EACH MATERIAL CONSTRUCTION, CALLING ATTENTION TO THE GUARANTEED FUTURE BURNING OF THE EARTH. RATHER THAN FIGHTING TO AVOID ANY RISK OF FIRE TO CREATE PERMANENT EDIFICES, EACH REPLICATED MONUMENT IS DESIGNED TO EXPLORE THE VARIETY OF MATERIAL REACTIONS UNDER COMBUSTION. BY RELIEVING ARCHITECTURE OF ITS FABRICATED PERMANENCE, NEW AESTHETICS EMERGE THROUGH THE LAYERING OF MATERIALS' UNIQUE, EXPRESSIVE PROCESSES OF DESTRUCTION BY FIRE.



A SPECIFIC MATERIAL CONSTRUCTION IS REPRODUCED AS A SERIES OF PUBLIC HEARTHS ACROSS BUILT COMMUNITIES WHICH ARE THREATENED BY ENVIRONMENTAL WILDFIRE. APPEARING AT FIRST AS A STURDY, PROTECTIVE FACADE, THE ORIGINAL STABILITY OF THE CONTAINER WILL DEMATERIALIZER WHEN AFFECTED BY WILDFIRE, EXPOSING THE REACTIVE LAYERS ENCLOSED WITHIN THE WALL TO EXPLORE NUANCED FORMS AND TEXTURES. THE UNKNOWN FACTORS OF THE FUTURE PROGRESSION OF THE FIRE ON THE STRUCTURE WILL UNIQUELY TRANSFORM EACH MONUMENT, DOCUMENTING SPECIFIC MATERIAL REACTIONS TO THE BURNING ENVIRONMENT.



ARCHIVE PREPARATION: FRAME LAYOUT

ONCE TRANSFORMED ONE BY ONE ACROSS EACH COMMUNITY, EACH MONUMENT IS EXTRACTED AND REAGGREGATED ON A NEW SITE, LEAVING PHYSICAL VOIDS IN THE GROUND WHERE EACH WAS BURNED. THE RE-COLLECTING OF DIFFERENTIATED STRUCTURES WILL PRODUCE AN UNPRECEDENTED ARCHIVE EXPLORING THE PRESENCE OF ARCHITECTURAL PRODUCTION WITHIN A BURNING LANDSCAPE. FIRE BECOMES THE DESIGN TOOL OF TEXTURE, SURFACE AND FORM OF THE TRAUMATIC AESTHETICS OF CORRUPTED, SCARRED SURFACES, FRAGILE MATERIALS, AND DISHEVELED FORMS, WHICH UNDERMINE THE ILLUSION OF HUMAN CONTROL OVER AND PERMANENCE IN THE ENVIRONMENT, AND INDEX THE PLANETARY CRISIS OF LIVING IN THE PYROCENE.

[35.635880°N, 116.221372°W]



PROGRESSIVE AGGREGATION OF PYROCENIC ARCHIVE



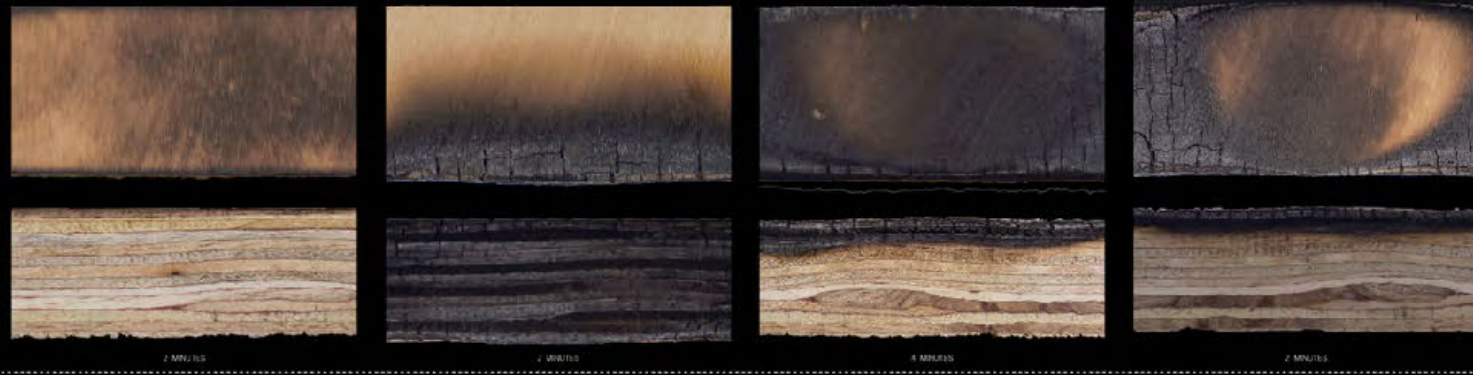
LOSS EMBEDDED WITHIIN MATERIAL DESTRUCTION

AS HUMANITY ENTERS THE PYROCENE, WE ARE CONFRONTED WITH INEVITABLE, CONSTANT, RAPID DECAY IN OUR BUILT ENVIRONMENT. THE CURRENT REPETITIVE SOLUTION OF ERASING THE AFTERMATH OF CATASTROPHE, INSISTING ON REDEVELOPING COMMUNITIES IN THE SAME MALADAPTIVE MANNERS, MANUFACTURES AN ILLUSION OF STABILITY AND EXPOSES HUMAN NEGLIGENCE TO RECONCILE THEMSELVES TO THE CURRENT CRISIS OF INCINERATION. THE CHARRED RUINS OF HUMAN DEVELOPMENTS ARE PART OF THE EVOLUTION OF ARCHITECTURE IN THE WILDLANDS, WHERE THE FUTURE DESTRUCTIVE NATURE OF WILDFIRE TO OUR LIVING ENVIRONMENT IS GUARANTEED. THROUGH THE CONSTRUCTION, COMBUSTION, AND RECOLLECTION OF THESE SERIAL ASSEMBLAGES, WE SEEK TO CREATE AGENCY FOR COMMUNITIES TO COLLECTIVELY MARK THEIR FLEETING PRESENCE IN THE BURNING WORLD, WHICH HOLDS ITS MEMORY IN ITS DESTROYED OUTCOME, SYMBOLIZING HUMAN LOSS EMBEDDED WITHIN THE PHYSICAL MARK OF ERASURE. THESE MONUMENTS MANIFEST THE POWERLESSNESS OF INDIVIDUALS AND COMMUNITIES WHEN FACING NATURAL FORCES, AND THE PROLIFERATION OF MONUMENTS CREATES AN EXPANSIVE PHYSICAL PRESENCE OF THE INTENSIFYING PYROCENE, WHICH PROVOKES SOCIETY TO CONFRONT THE ANXIETY OF IMPERMANENCE AND INSTABILITY OF COMBUSTIVE DISASTER.

MATERIAL DATABASE: COMBUSTIVE REACTIONS

REACHING BEYOND THE SCOPE OF FIRE TESTING PERFORMED BY ASTM FOR BUILDING SAFETY ASSURANCE, INDIVIDUAL MATERIALS ARE TESTED IN RESPONSE TO FIRE TO UNDERSTAND THEIR TEXTURAL AND FORMAL NUANCES AS TRANSFORMED BY COMBUSTION. EACH MATERIAL IS DOCUMENTED THROUGH IMAGERY AND DATA COLLECTION TO UNDERSTAND ITS COMPREHENSIVE REACTION, INCLUDING THE TIME A SAMPLE BURNS UNTIL FAILURE OR COMPLETE DESTRUCTION, OFF-GASSING, CONTINUED BURNING AFTER THE FLAME IS REMOVED, AND ITS TOXIC BYPRODUCTS. MATERIALS ARE THEN CATEGORIZED BY THEIR FORM OF REACTION: HARDENING, MELTING, FRAGMENTING, CHARRING, EXPANDING, AND ERASING. THIS GENERATES A COMPARATIVE DATABASE OF A VARIETY OF MATERIALS COMMONLY UTILIZED IN BUILDING AND EVERYDAY PRACTICES, WHICH THEN INFORMS THE COMBINATION OF MATERIALS INTO MULTIPLE FACADE LAYERS, WHICH WILL GENERATE NEW AESTHETICS AND FORMS THROUGH THE INTERMIXING OF MATERIALS WITH UNIQUE COMBUSTIVE REACTIONS.

WOOD
CHARRING + FRAGMENTING



FIBERGLASS
BURN TRANSFORMATION + TOXICOLOGY



ALUMINUM SHEET
MELTING

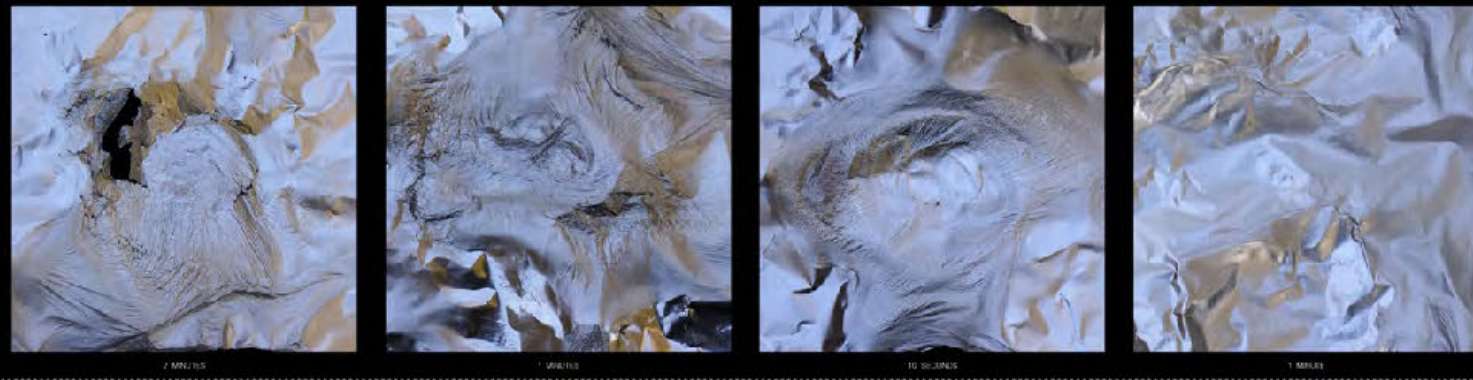


CHART DOUGH
CHARRING + FRAGMENTING



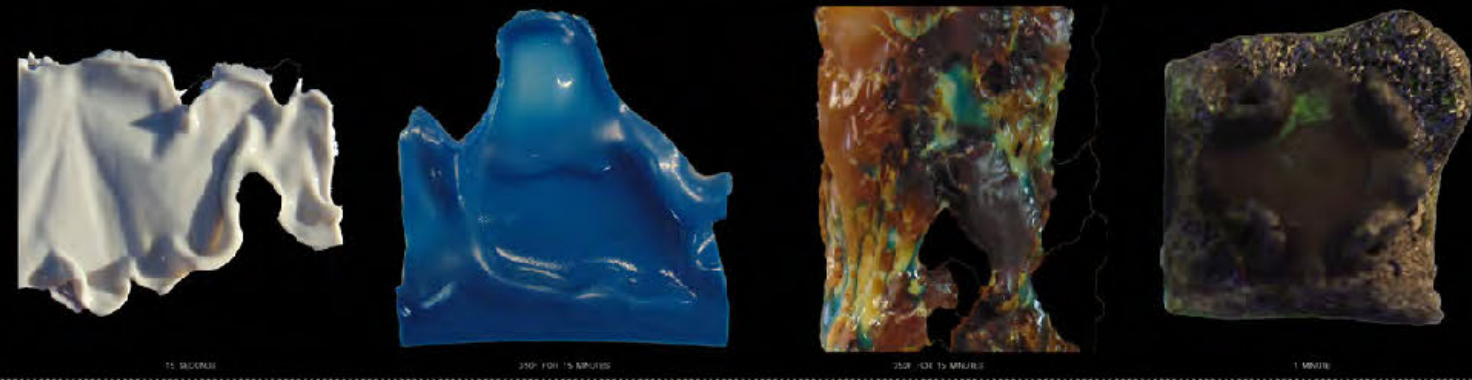
CONK
BURN TRANSFORMATION + TOXICOLOGY



GLASS
BURN TRANSFORMATION + TOXICOLOGY



ACRYLONITRILE BUTADIENE STYRENE
MELTING

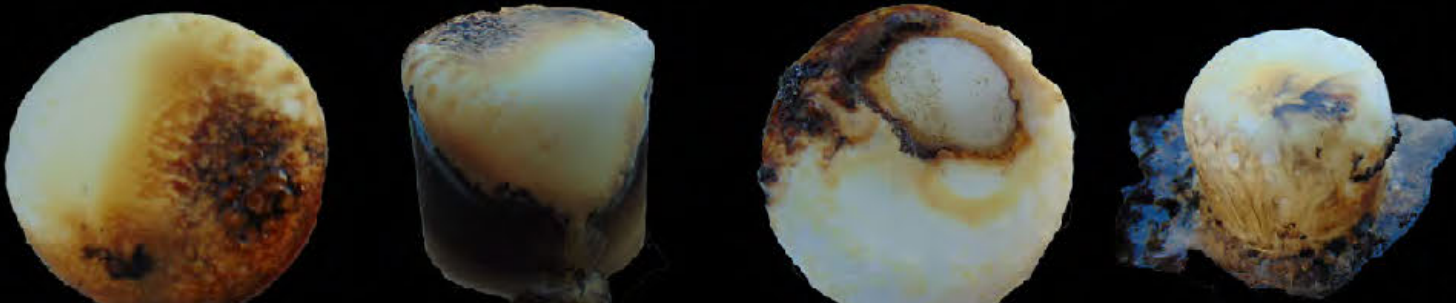


LOW DENSITY POLYETHYLENE



100% POLYETHYLENE
100% POLYETHYLENE
100% POLYETHYLENE
100% POLYETHYLENE

POLYETHYLENETEREPHTHALATE



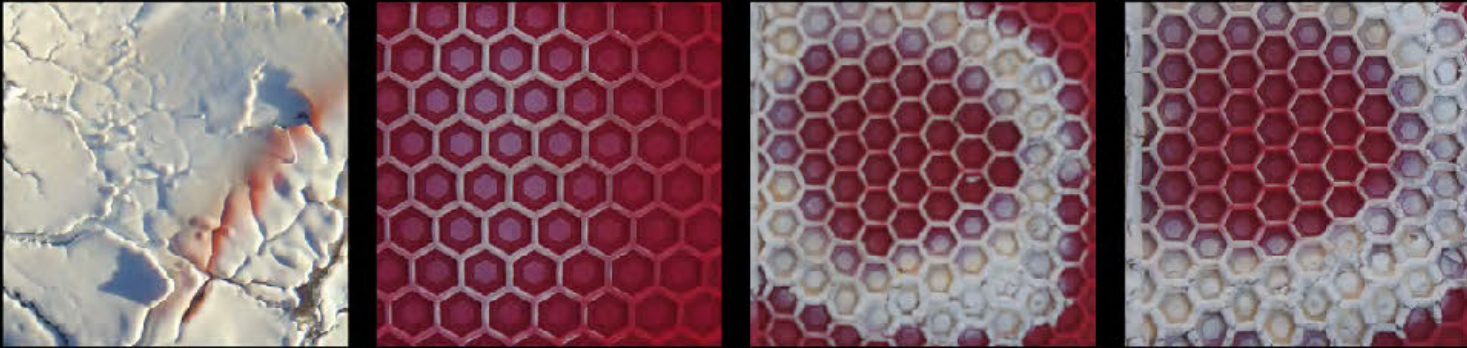
100% POLYETHYLENETEREPHTHALATE
100% POLYETHYLENETEREPHTHALATE
100% POLYETHYLENETEREPHTHALATE
100% POLYETHYLENETEREPHTHALATE

EPOXY RESIN



100% EPOXY RESIN
100% EPOXY RESIN
100% EPOXY RESIN
100% EPOXY RESIN

SILICON



100% SILICON
100% SILICON
100% SILICON
100% SILICON

CARBON SODA



100% CARBON SODA
100% CARBON SODA
100% CARBON SODA
100% CARBON SODA

POLYSTYRENE



100% POLYSTYRENE
100% POLYSTYRENE
100% POLYSTYRENE
100% POLYSTYRENE

POLYURETHANE



100% POLYURETHANE
100% POLYURETHANE
100% POLYURETHANE
100% POLYURETHANE

POLYVINYL CARBONATE



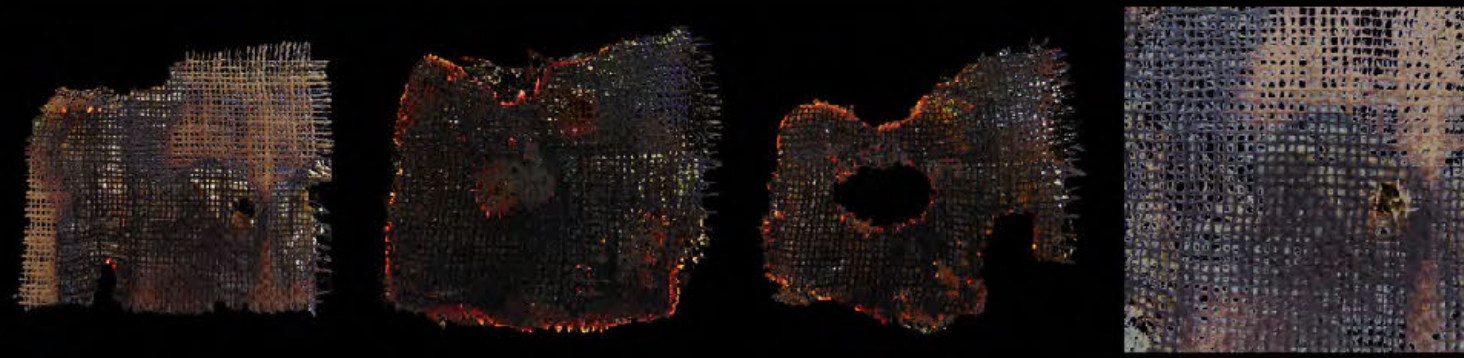
100% POLYVINYL CARBONATE
100% POLYVINYL CARBONATE
100% POLYVINYL CARBONATE
100% POLYVINYL CARBONATE

PLASTER STUCCO



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CARBON STEEL



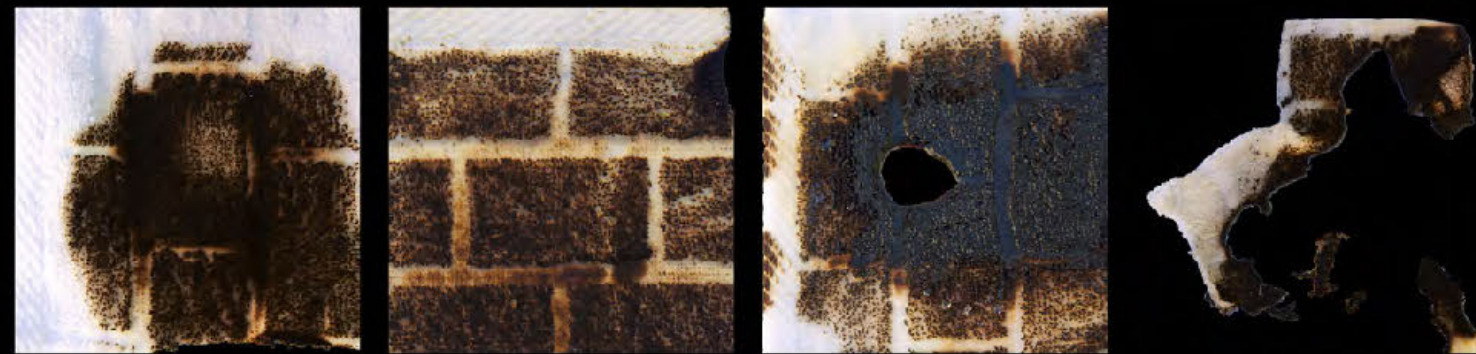
www.oxfordjournals.org

CLAY



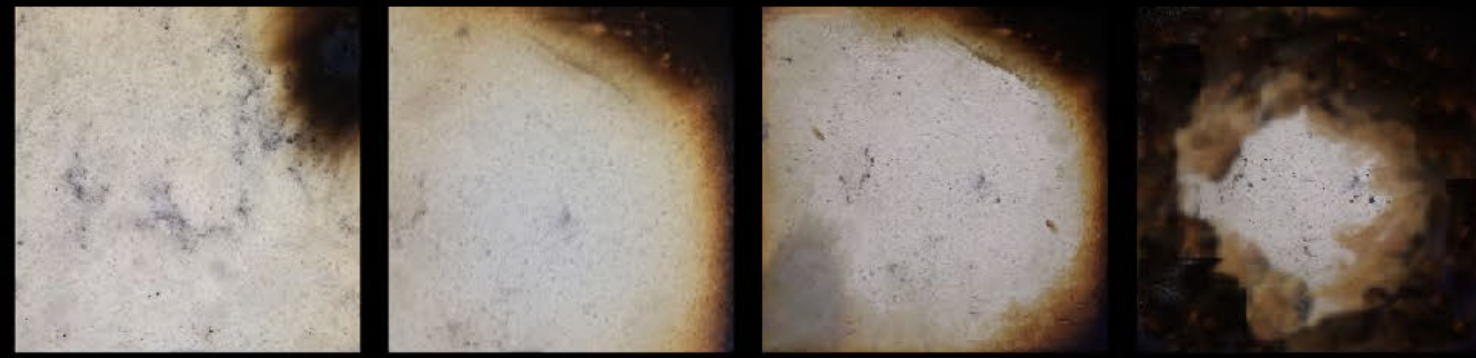
Source: *U.S. Census Bureau, 1997*

WOVEN COTTON
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QUARTZ



THEORY OF THE EARTH AND ITS HISTORY

PARAFFIN WAX
MELTING

Full text: <http://www.elsevier.com/locate/jbiotec>

SUET

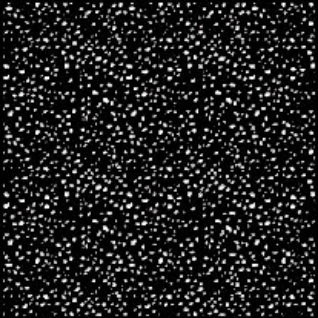


Journal of Management Education

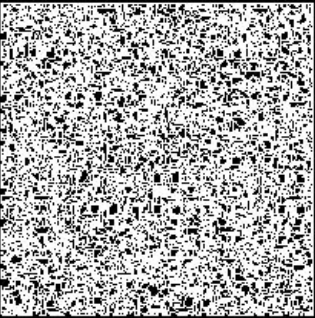
MATERIAL TRANSFORMATION ANALYSIS

ONCE TESTED INDIVIDUALLY, EACH SELECTED MATERIAL IS STUDIED IN CLOSE DETAIL. EACH MATERIAL'S COMPOSITION BEFORE AND AFTER BURNING IS COMPARED THROUGH MANUAL DRAWING, USING MICROSCOPIC AND TEXTURAL IMAGERY TO PROCESS THE TRANSFORMATIONS IN FORM AND TEXTURE OF EACH SAMPLE UNDER COMBUSTION.

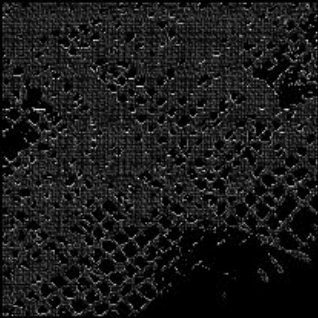
01_WRAPPER



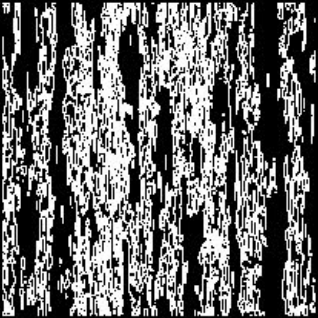
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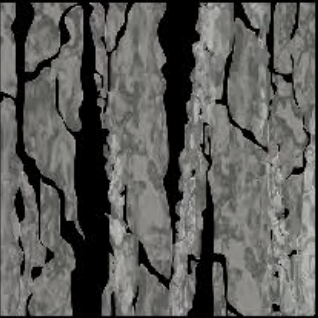
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04_STRUCTURE



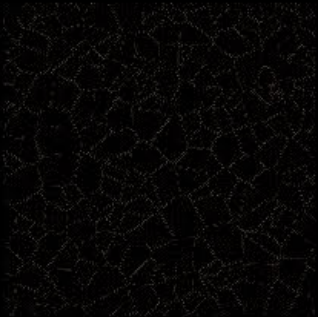
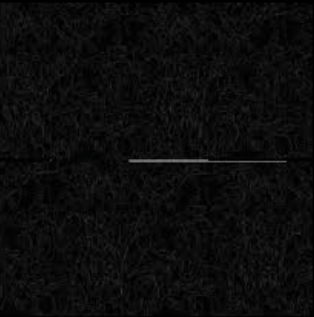
STEEL



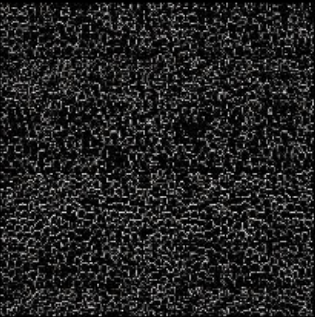
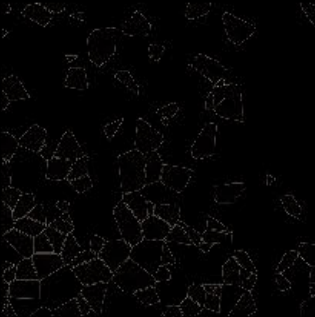
02_PANELING



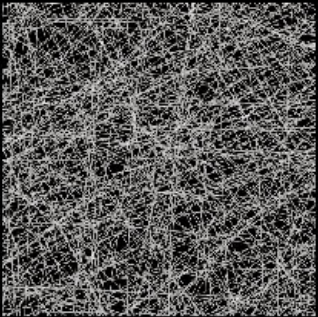
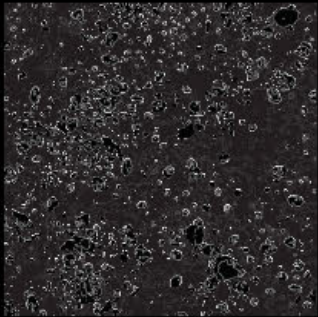
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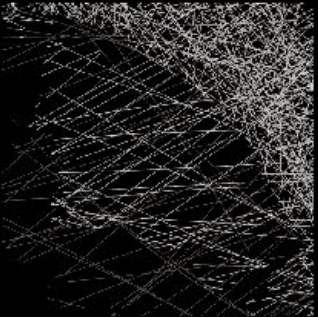
CORK



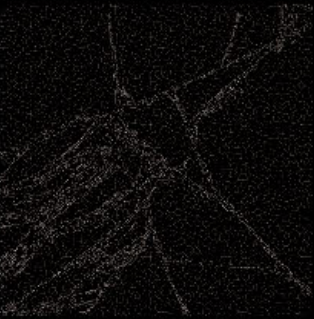
CRAFT DOUGH



FIBERGLASS



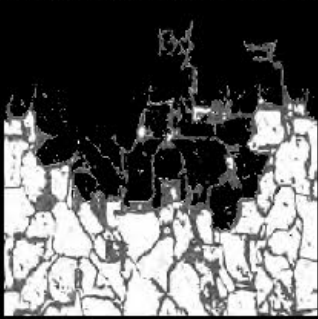
GLASS



SHEET METAL



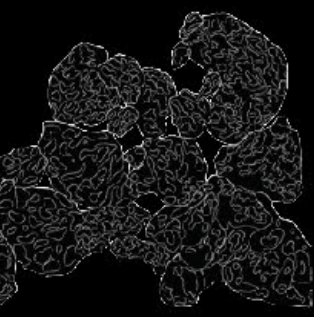
WOOD



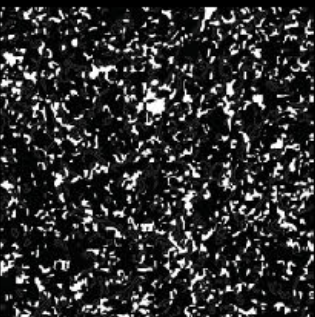
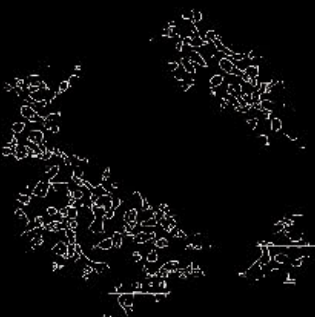
03_INFILL



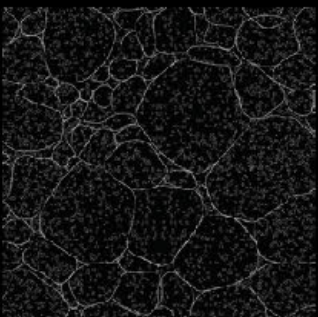
CARBON SODA



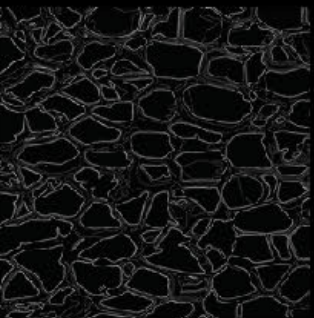
EPOXY RESIN



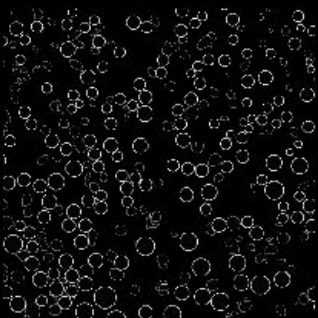
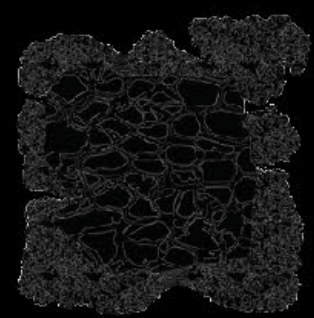
LOW DENSITY POLYETHYLENE



POLYSTYRENE



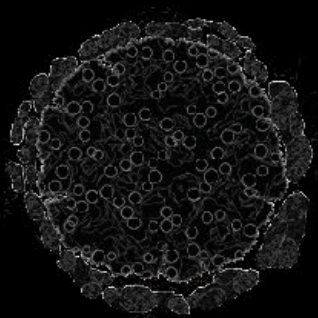
POLYVINYL CARBONATE

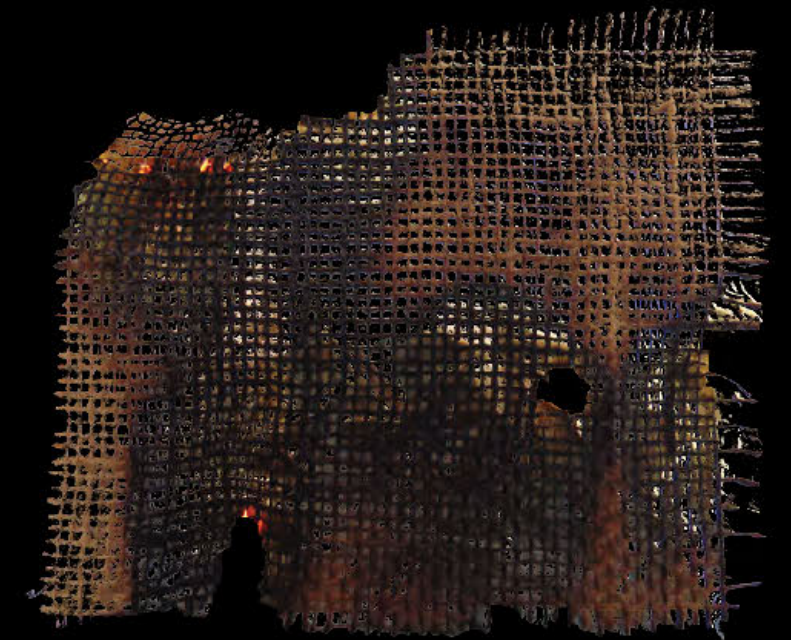


POLYURETHANE



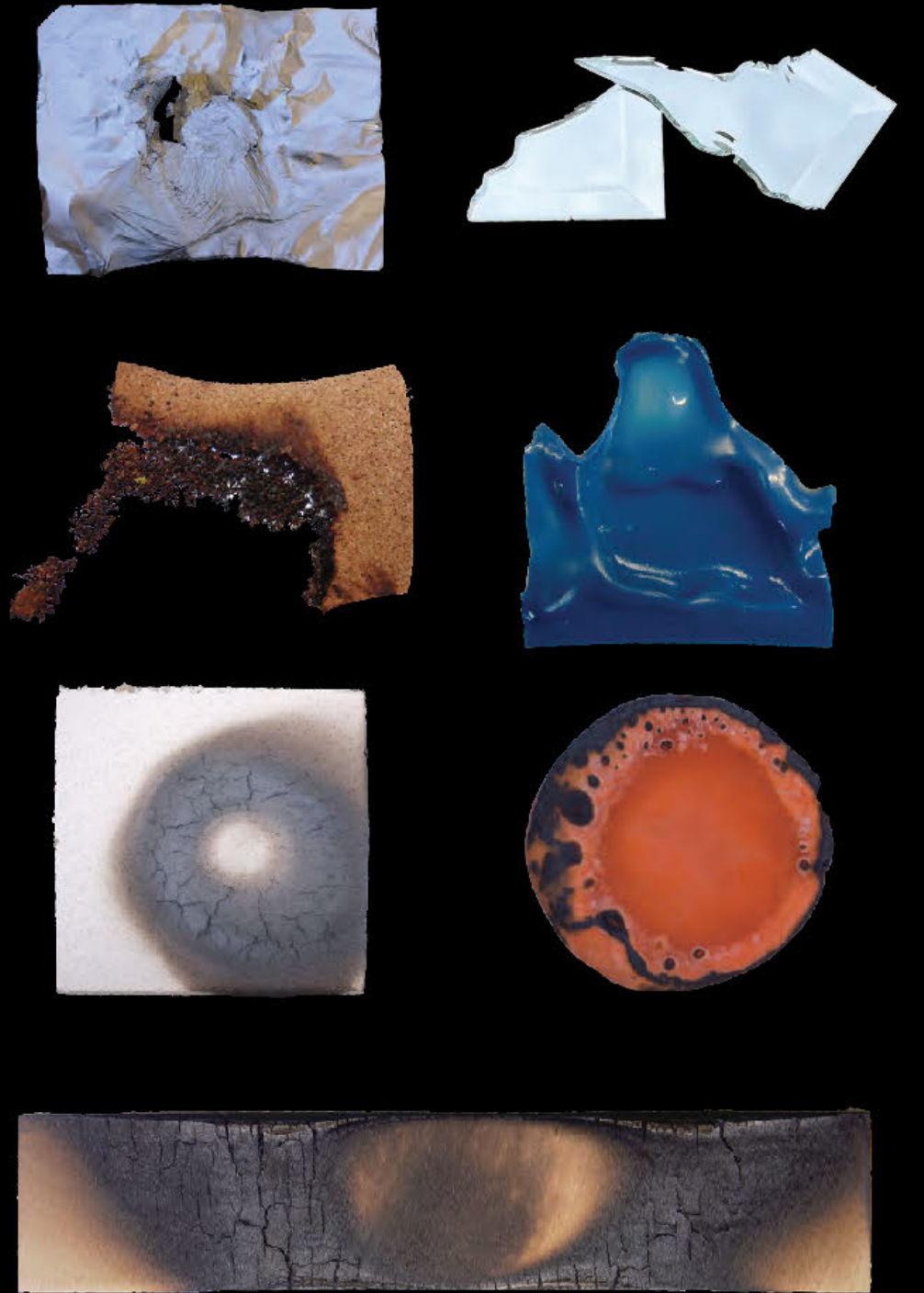
SILICON





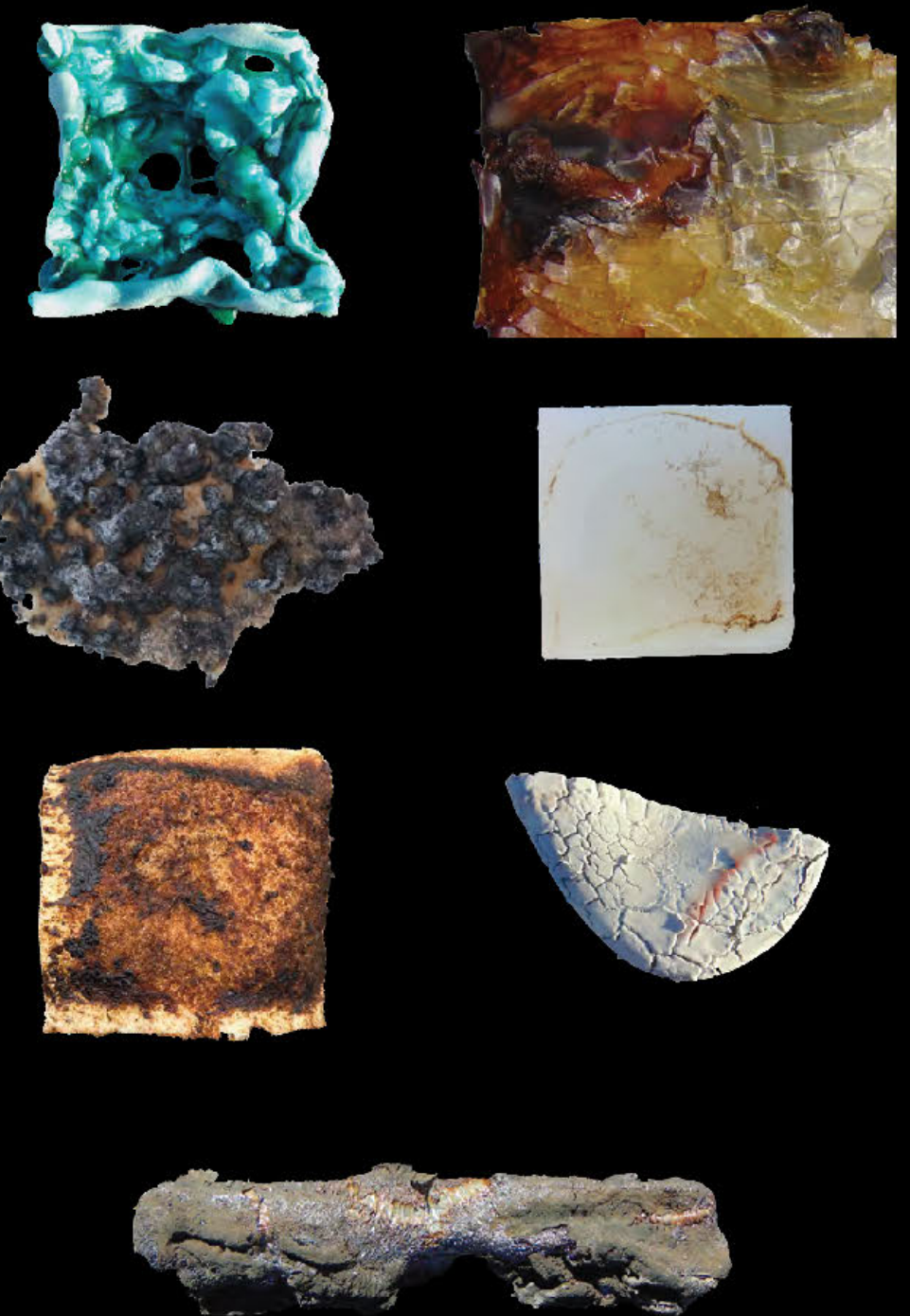
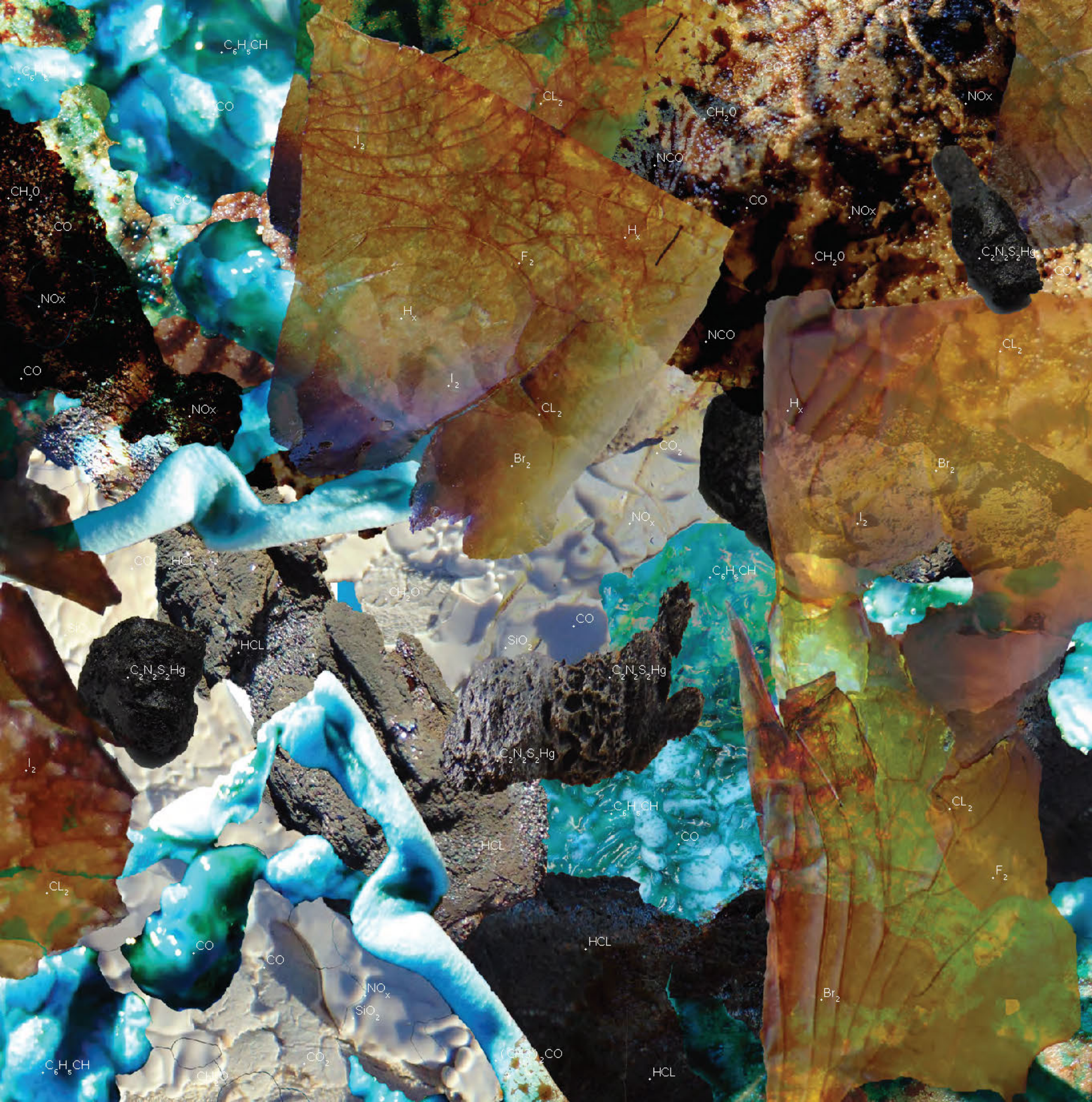
LAYER 01_WRAPPER

EACH LAYER OF THE ENCLOSURE SYSTEM IS DESIGNED TO BECOME INCREASINGLY REACTIVE AND EXPRESSIVE, WORKING FROM FINE SURFACE TEXTURES TO COMPLETE VOLUMETRIC RESHAPING OF THE ENCLOSURE. THE OUTERMOST LAYER IS A PLASTERED SHELL ATTACHED TO A JUTE FIBER MESH, WHICH CREATES A PURE, CLEAN FINISH TO THE ASSEMBLY. WHEN EXPOSED TO FIRE, THE PLASTER QUICKLY FRAGMENTS AND CRACKS ON ITS SURFACE, ERASING WHAT WAS ONCE A SOLID EXTERIOR TO EXPOSE THE PROTECTED LAYERS BENEATH.



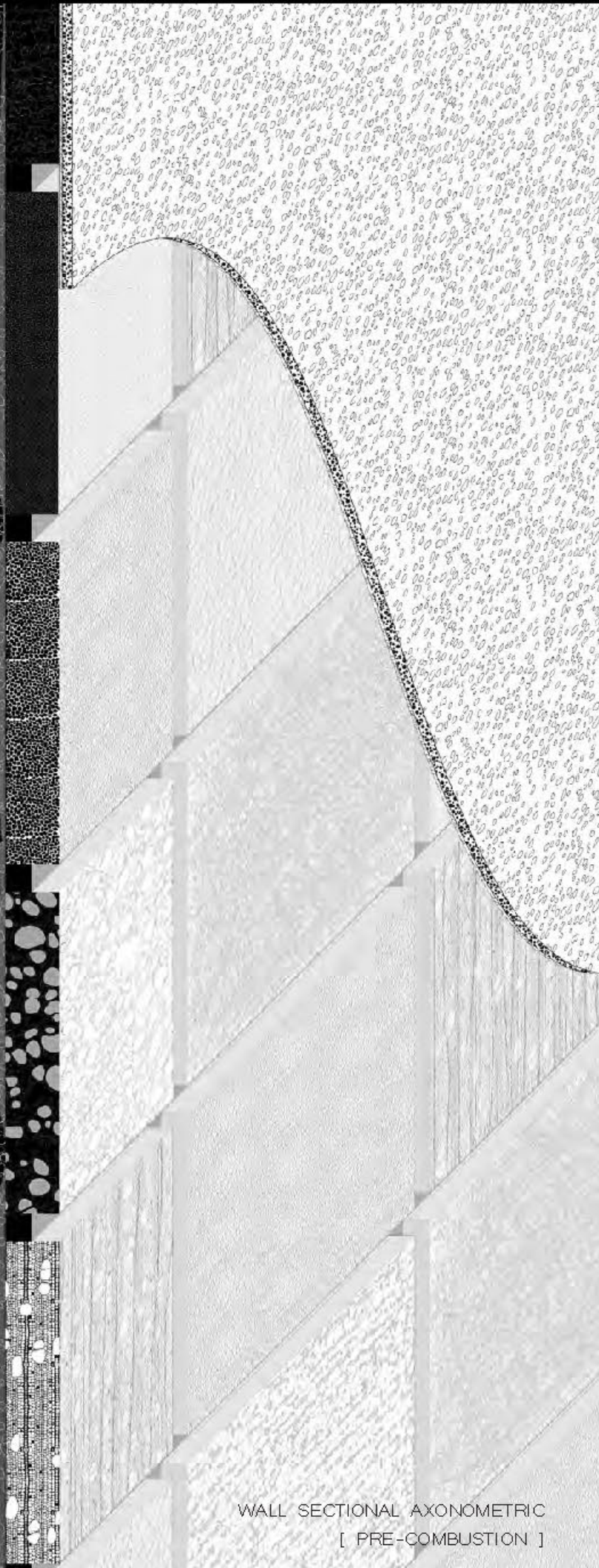
LAYER 02_PANELING

JUST BENEATH THE SHELL IS A THICKENED PANELING SYSTEM CONSISTING OF NUMEROUS PLANAR MATERIALS. EACH MATERIAL HAS UNIQUE REACTIONS AND SPEEDS OF DEFORMATION, WHICH ARE INCORPORATED FOR THEIR EXPRESSIVE TEXTURES AND PATINAS AS THE FLAME SPREADS ACROSS EACH SURFACE. AS EACH PANEL ERODES AT DIFFERENT RATES, THE FIRE WILL THEN SPREAD UNEQUALLY THROUGH THESE HOLES INTO THE DEEP INFILL OF THE WALL SYSTEM.



LAYER 03_INFILL

THE INNERMOST, PROTECTED LAYER OF THE FACADE CREATES A DENSE INFILL OF THE WALL CAVITY AROUND A LIGHT STEEL STRUCTURE. THE MASS IS FILLED WITH VARIOUS PLASTICS WITH INTENSE VOLUMETRIC CHANGES UNDER COMBUSTION AS THE MOST INTENSE WILDFIRES SPREAD DEEP INTO THE WALL THROUGH THE OUTER LAYERS. THESE INFILLS ARE INTERMIXED IN THE INTERIOR CAVITY AS A COLLAGE, AND WILL MELT, OOZE, GROW, AND BUBBLE AROUND THE LIGHT STRUCTURE TO CREATE MASSES AND PORES THROUGH WHAT WAS ONCE A SOLID, CLEAN STRUCTURE.

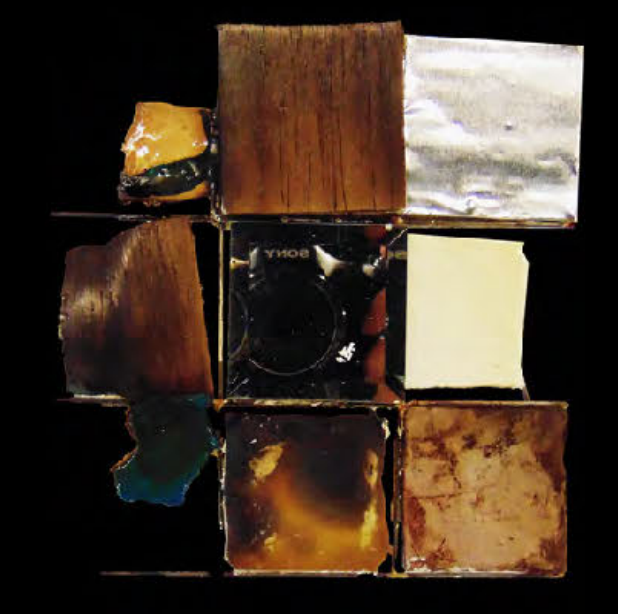
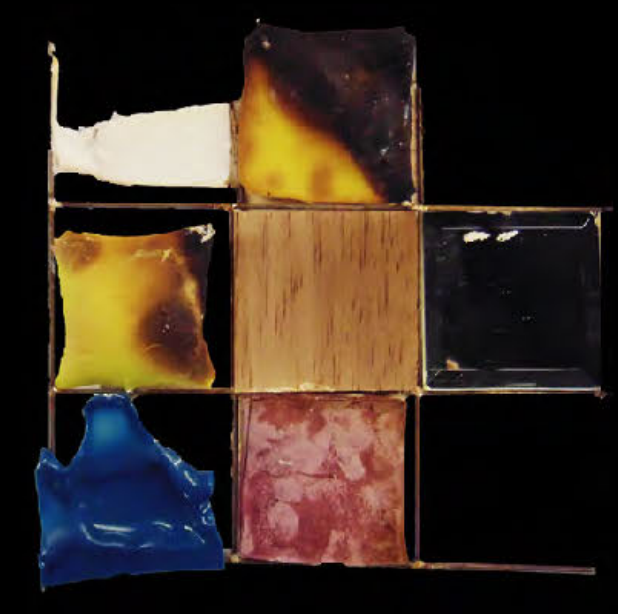


WALL SECTIONAL AXONOMETRIC
[PRE-COMBUSTION]



WALL SECTIONAL AXONOMETRIC
[POST-COMBUSTION]

FACADE LAYER TESTING



[01_WRAPPER]

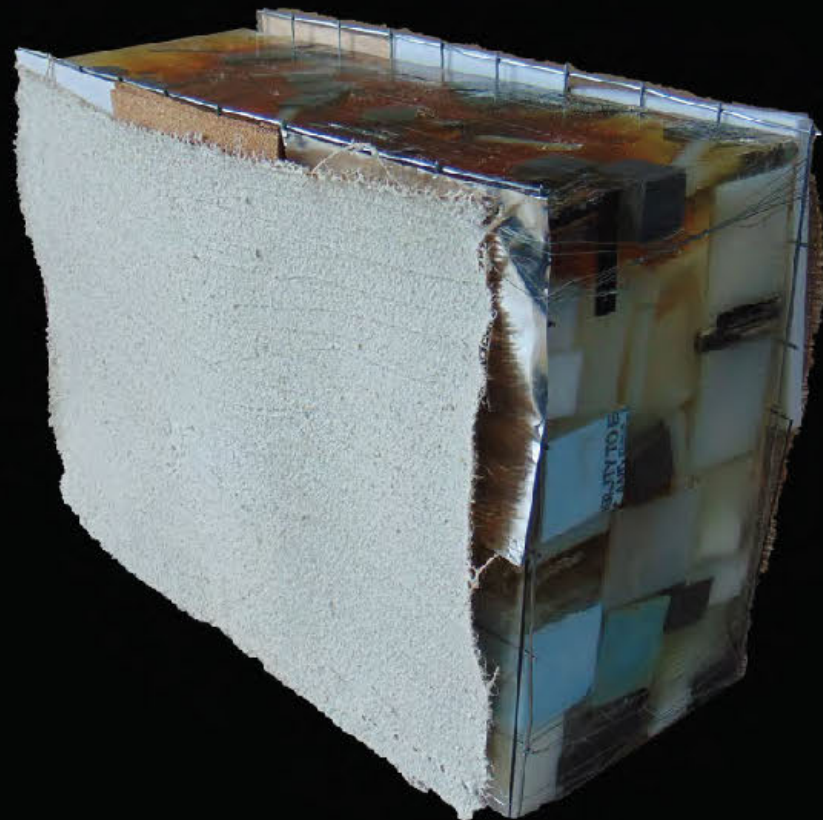
[02_PANELING]

[03_INFILL]

[04_STRUCTURE]

LAYERED FACADE MOCKUPS + TESTING

THESE HYPOTHESES OF THE DESIGNED ASSEMBLY'S PROGRESSIVE MATERIAL TRANSFORMATION HAVE BEEN CONSTRUCTED INTO SCALED MODELS OF THE SERIAL ARTIFACTS TO BE EXPOSED TO FIRE AS A VITAL EXPLORATION OF THE TOTAL REACTION OF THE ASSEMBLAGE TO FIRE AS A LAYERED SYSTEM. TWO MODELS WERE BUILT, ONE AS A 1-INCH-TO-1-FOOT SCALE FULL MOCKUP, AND ONE AS A HALF-SCALE CHUNK OF THE FACADE. BURNED BY HAND UNTIL THEY APPROACH THEIR THRESHOLDS OF FAILURE, THE MODELS PRODUCE A TANGIBLE, MULTISENSORY EXPERIENCE OF THE BURNT AESTHETIC EFFECTS WHICH ERODE AND CARVE AWAY AT THE PERMANENCE OF THE BUILT ENVIRONMENT. THESE MODELS, WHICH COMBINE MATERIALS WHICH ARE ALL COMMONLY USED IN ARCHITECTURAL PRACTICE AND EVERYDAY LIFE, MELT, BUBBLE, SMOKE, CREATE STENCHES AND RESIDUES AND EMIT TOXIC FUMES, PROVOKING FEELINGS OF DISCOMFORT THROUGH THEIR VISCERAL NATURE WITH FIRE'S INEVITABLE ERASURE OF CONSTRUCTED SPACE.



1/2 SCALE CHUNK MODEL



1":1' MONUMENT MODEL LAYERING





