SPACE

industrial heritage . post industrial landscapes . modern heritage. heritage ecology . brownfield remediation . interpretation of industrial artefacts . difficult history . sites of conscience. memory and memorialization . urban ecological planning

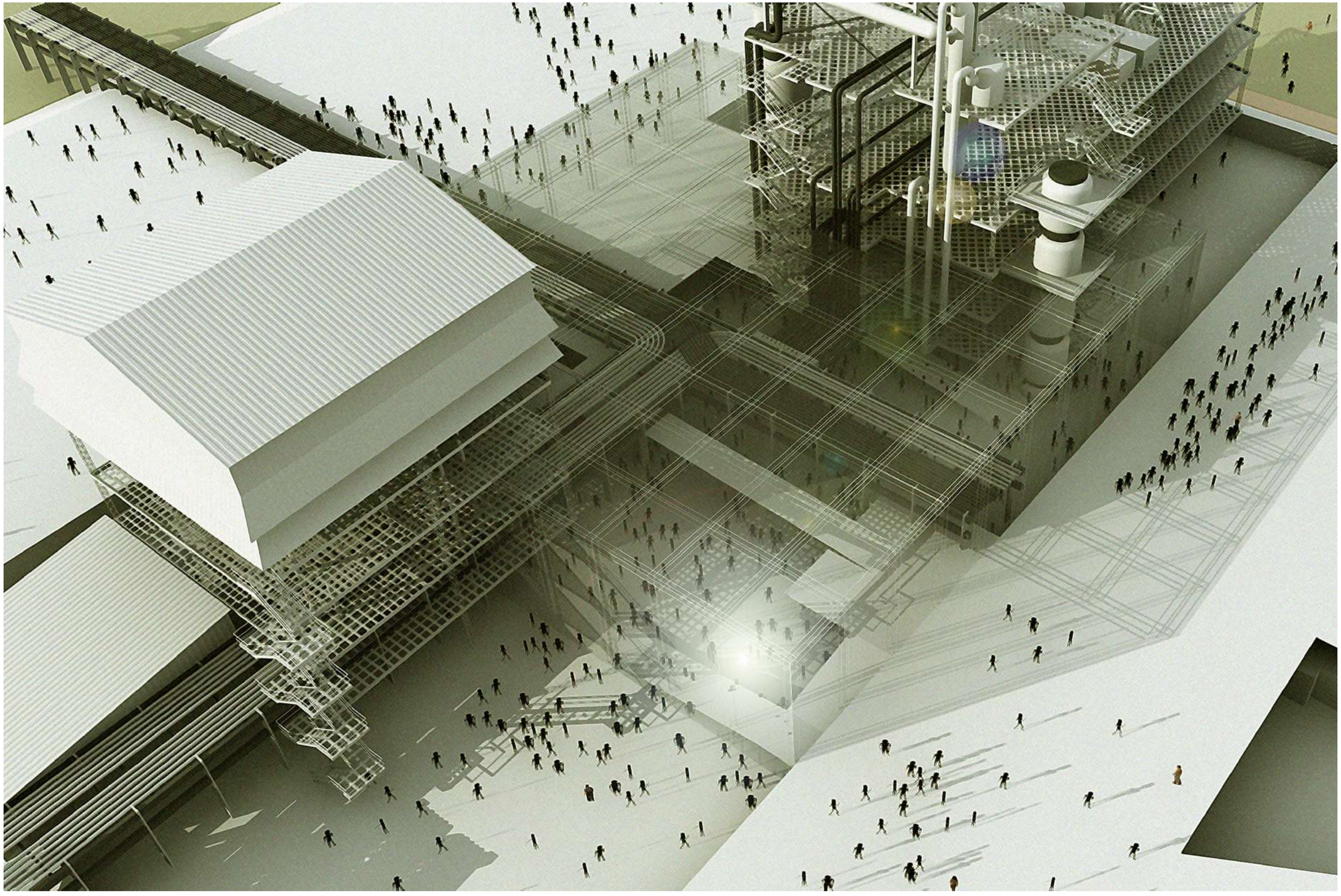
SPACE MATTERS

www.spacematters.in

ABOUT US

We at SpaceMatters have focused on the question of post-industrial landscapes since 2005, working in the intersection of heritage and ecology to convert historic, industrial landscapes into public spaces.

We are currently leading the revitalization of the Bhopal gas tragedy site. We have further developed this expertise into a curricula for industrial heritage in India, bringing together disciplines, organizations and the first ever Inventory of India's industrial heritage.



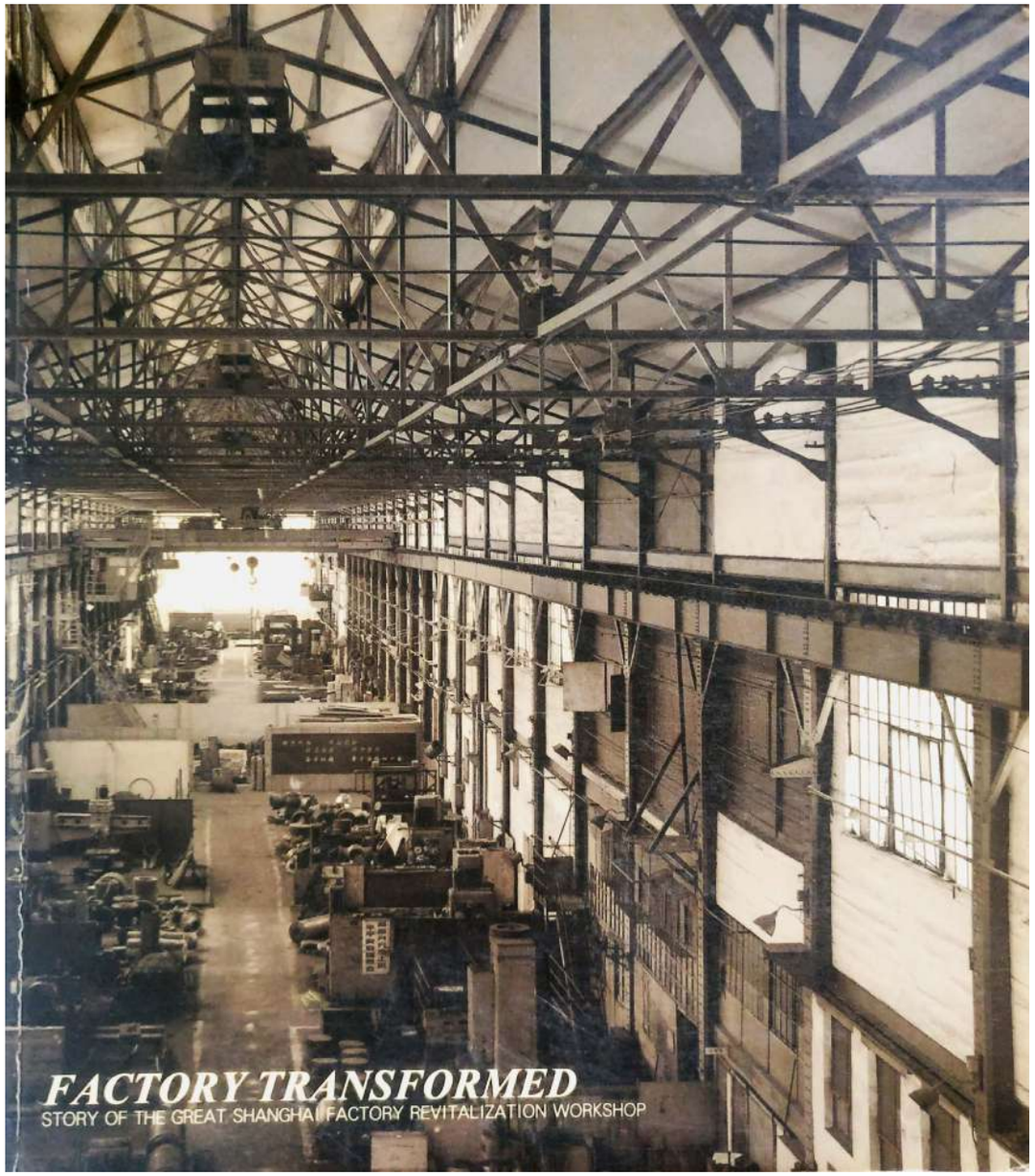
Bhopal Gas Tragedy Memorial
Award winning entry for development of the site of world's worst industrial and environmental disaster into a public memorial.

Bhopal,Madhya Pradesh
2005-Ongoing

Bhopal Gas Tragedy Memorial

Bhopal 2011 : Requeim and revitalization symposium and students workshop

Bhopal,Madhya Pradesh
2011



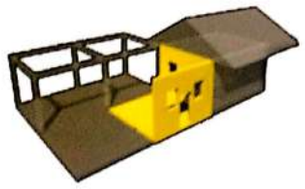
The hierarchy of elements

1/500-every element is treated equally, the superimposition of the master plan determines how the existing elements are modified

site

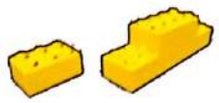
1/100-buildings not structurally sound or not in sync are digested down one rung of the hierarchy

building



1/50-buildings in this rung are now perceived as the parts that form it (walls, roofs, structures, etc.); parts that require high costs to restore (inability to perform function) are digested down one rung of the hierarchy

element

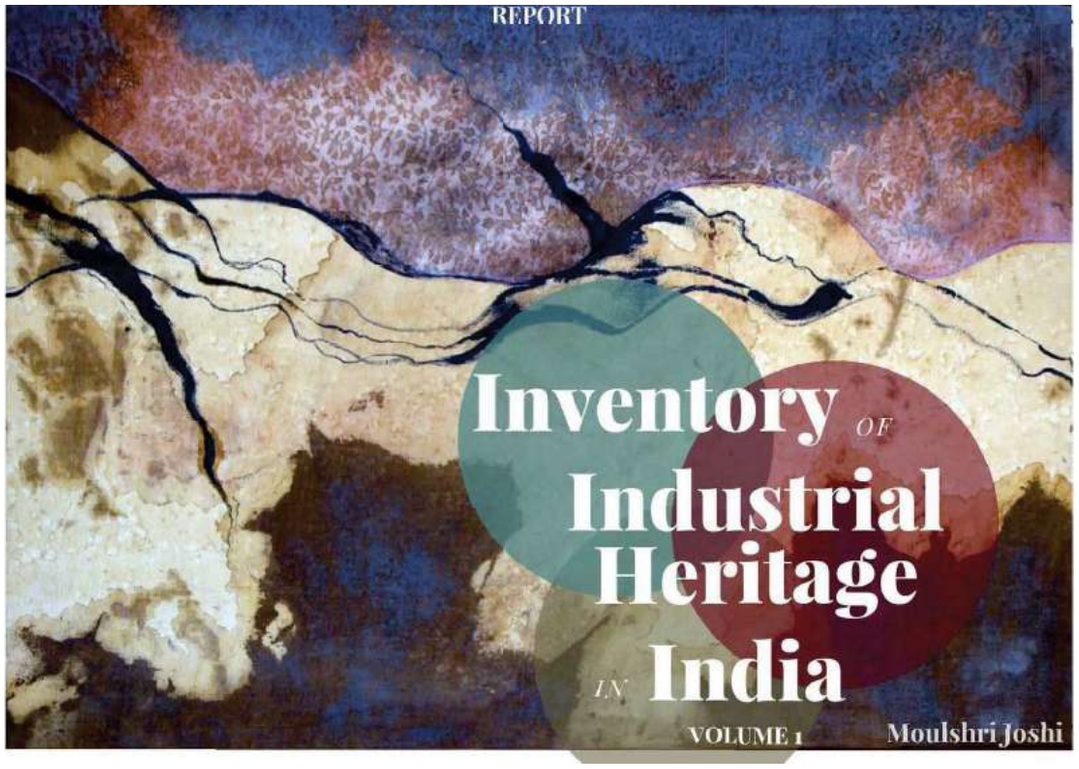


1/1-parts in this rung are now perceived as individual building units and these are gathered to form and construct new additions

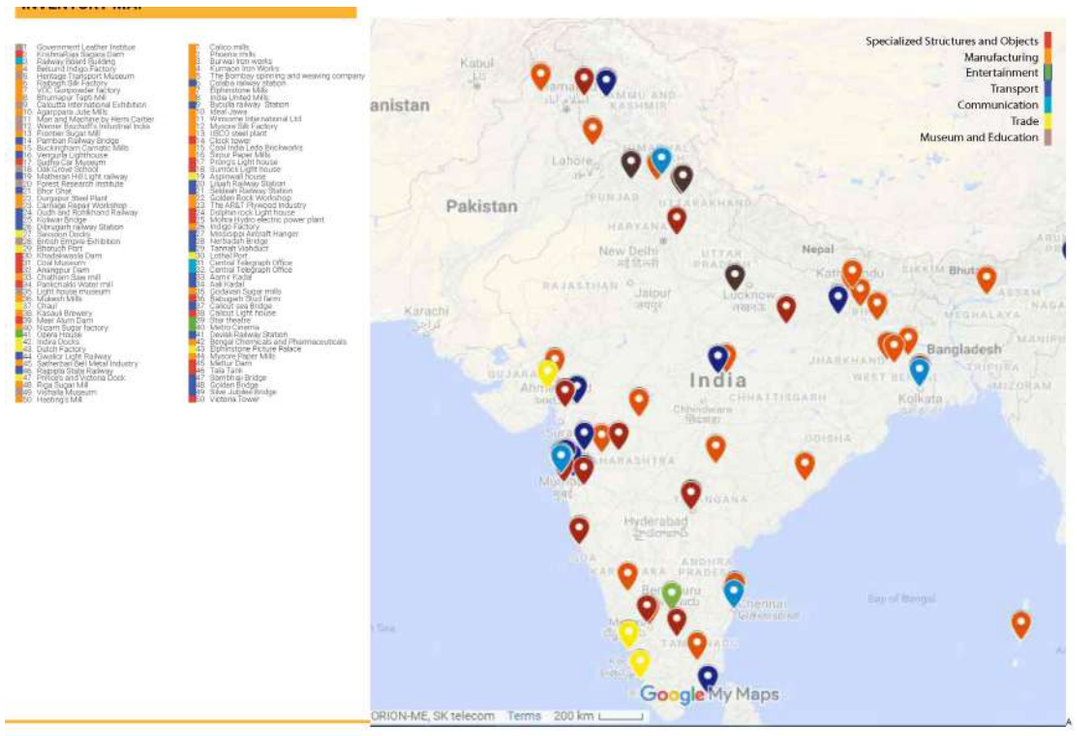
unit

Revitalization of riverfront industrial heritage in Shanghai

Shanghai, China
2003



Inventory of Industrial Heritage in India
An ongoing inventory of 300 sites across India with sites of manufacturing industry, transport industry etc.



Research
Ongoing

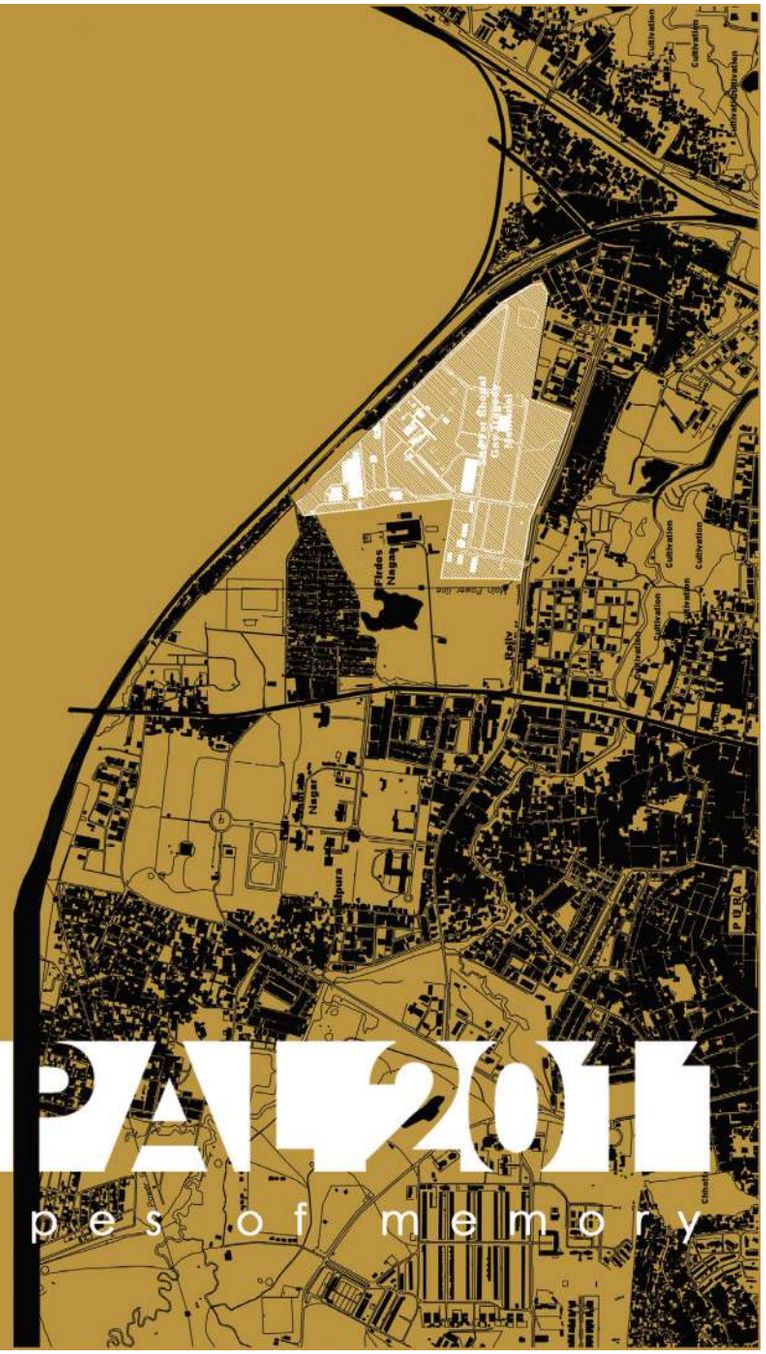
"We believe that it is critically important to preserve and communicate the memory of the Union Carbide disaster in Bhopal for realizing the possibility of a world free of disasters such as Bhopal. We believe that the structures of the MIC and Sevin plants and few remaining structures are; in the likeness of the remains of the concentration camps at Auschwitz and Buchenwald and other places, of tremendous educative value for future generations across the world and therefore must be preserved."

Excerpt from a letter addressed to UNESCO from survivors of the Bhopal Gas Tragedy seeking formal recognition of the heritage value of Union Carbide plant in Bhopal, New Delhi, 2009.

The city of Bhopal in India was the site of the Gas Tragedy of 1984, considered one of the world's worst industrial disasters. The abandoned site of the tragedy, the Union Carbide Factory in Bhopal is a repository of history and stories that need to be told. Its relevance concerns questions of power, justice and sustainability - social and ecological. The Bhopal2011 workshop and symposium, raised and addressed these questions. It focused on the possible transformation of the site into a place of remembrance and a resource for the local community and city. 'Landscapes of Memory' is a presentation of the process, participants, insights and outcomes ofBhopal2011.

A mAAN, SpaceMatters, NTNU and University of Gothenburg publication *ISBN: 978-82-725-9121-1*

BHOPAL2011 landscapes of memory



BHOPAL2011
landscapes of memory

Bhopal 2011 : Landscapes of memory
SpaceMatters, India with Norwegian University of Science and Technology (NTNU), Research Council of Norway, University of Gothenburg,Sweden, modern Asian Architecture Network (mAAN)

Publication
2011

Workshop units

The original unit briefs presented by the unit masters, who developed them for their respective units based on the themes of Bhopal2011 before the workshop commenced. The workshop participants selected their units based on their preferences, and the objectives of the unit study evolved during the course of their work in Bhopal .

INTERPRETATION OF HERITAGE AND HERITAGE AS RESOURCE

Unit Masters: Nalini Thakur, Rohit Jigyasu, Munish Pandit (India), Bosse Lagerqvist (Sweden), Vishakha Kawathekar (India)

Giving form and content to the complex narrative of the Bhopal gas tragedy site is a challenge. Questions concerning ethics, socio-politics, neo-colonialism and gender are put to the fore in the construct of the Tragedy and its perceptions in society. This exploration is also a potential democratic asset if people participate in the creation of their own history. Whether or not Bhopal can find a place in our common understanding of 'heritage' will be critical in giving us a tool & precedent for identifying and appropriating similar sites of contemporary and conflicting heritage. Regeneration through conservation is also a study on how the site can contribute positively to its surroundings through possible protection, decontamination and rehabilitation. 'Revitalisation' is interpreted in the context of the site's painful legacy and what that legacy means for different stakeholders invested in the site.

LANDSCAPES OF REGENERATION – BHOPAL MARCH

Unit Masters: Jeeth Iype (India), Norihito Nakatani (Japan)

Landscape is a cultural construct, a mirror of our memories and myths encoded with meanings that can be read and interpreted. The unit explores the possible reuses of the industrial landscape site and re-establishing its connections – physical & intangible – to the city. The former Union Carbide factory site is an urban void, 67 acres in the midst of dense urban neighbourhood. Moreover, the areas surrounding the Bhopal gas tragedy site have borne the brunt of its contamination and abandonment. Its regeneration, socially and environmentally, involves the construction of place, of history and heritage values. This unit explores the question of how the site would address the critical demands of its immediate urban context.

SPACE AS CONTAINER FOR MEMORY – SHADOW BOXING

Unit Masters: Manoj Mathur (India), Setiadi Sopandi (Indonesia)

What role does architecture of the memorial play in the evolving narrative of Bhopal? For more than 26 years, the Tragedy has been memorialised in countless ways across space and time. How does the architectural process embrace the multiplicity and dynamism of these processes? The challenge for the memorial is to address the past, communicate with the present and remain relevant in the future; providing a setting where the narratives of the tragedy are housed and invigorated through communication and dialogue. The unit explores how the architectural expression gives form to the intangible.

HERITAGE MANAGEMENT OF SITES WITH PAINFUL PASTS

Unit Masters: Kai Weise (Nepal), Diana Walters (Sweden/UK)

This unit concerns itself with the space and the role provided in heritage management frameworks to communities linked with heritage sites. Local community participation in heritage management is gaining increasing attention in heritage conservation practice. But the experiences in Bhopal have shown that there remain many theoretical and practical challenges in effectively engaging the community to influence decisions on the management of the sites that they are invested in. What are the processes that link the formal heritage management structures with informal community networks? How is community defined in a scenario wherein there are multiple stakeholders and conflicting claims?

EXPRESSIONS OF MEMORY THROUGH ART – URBAN RHIZOME

Unit Masters: Sakiko Nomura (Japan), Shin Muramatsu (Japan) and Nidhi Chopra (India) for mAAN kids

This unit explores how the narrative of the Bhopal Tragedy and the city of Bhopal can be captured, communicated and made relevant to a larger audience through the medium of art. It draws inspiration from the large body of work – in film, photography, literature, sculpture, oral histories and painting, through which the survivors and citizens of Bhopal have communicated their experience. The unit aims draw principles from these works to critically examine how the individuality of these expressions can be retained in the experience of the city. The symbolic power of art to transcend barriers, communicate and heal is explored by this unit.

JURY MEMBERS

Jagan Shah, Rachna Khare, Meera Dass

United Nations
Educational, Scientific and
Cultural Organization

UNESCO Office in New Delhi

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New Mehrauli Road
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20 March, 2009

Ref.: 3967/2009/DIR/YM

Subject: **Letter of Transmission with regard to the Bhopal Gas Tragedy**

Your Excellency,

I am writing to you with the request to look in to the matter of the preservation and restoration of the Union Carbide pesticide factory as a memorial for the major gas tragedy of 1984. The experience of UNESCO shows that the sites of major tragic events, such as Hiroshima or Masada (both on the List of World Heritage Sites), can play an important role in healing the psychological effects of affected groups and of society at large and in raising awareness at national and international level to prevent the causes leading to large scale manmade disasters.

Six Bhopal based Civil Society organizations representing the victims of the Bhopal Gas tragedy visited my office on 25 February 2009, to bring to my notice the impending destruction of the Union Carbide Factory and their wish to preserve this building as a memorial place. They also stressed the fact that chemical waste is still stocked on site and that swift and thorough action is needed to end the continued impact of these chemicals on the local drinking water and the health of the local residents. They finally informed me of their initiative to prepare a nomination for World Heritage Status of the site of the Bhopal Gas tragedy.

I have explained to the representatives of these organizations about the World Heritage nomination process having to be officially submitted by the Government of India as a State Party to the 1972 World Heritage Convention and that UNESCO is not in a position to either encourage or discourage such nominations for global recognition as a World Heritage Site. However, I am herewith transmitting to you for your perusal, the official plead of the organizations representing the Bhopal Gas tragedy victims for support in the protection and restoration of the Union Carbide pesticide factory as a memorial for the major tragedy of 1984, and to pursue the decontamination of the site of the gas tragedy.

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Preservation of former Union carbide factory in Bhopal

Bhopal, Madhya Pradesh
2007-2011

Revitalization of historic cement factory

Sumatra, Indonesia
2018

modern
Asian
Architecture
Network
mAAN
I N D O N E S I A

international design workshop

the great padang cement factory revitalization

28 june – 8 july 2009

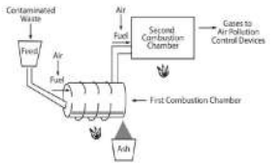
Revitalization of historic cement factory

Very High Contamination

Level Of Contamination	Very High
Public Access	None
Remediation Technique	Incineration

Incineration is the process of burning hazardous materials at temperatures high enough to destroy contaminants. It is conducted in an "incinerator," which is a furnace designed for burning hazardous materials. Although it destroys solvents, PCBs, and pesticides, incineration does not destroy metals, such as lead and chromium.

Possible Application for project :
Identification and excavation of waste dump sites
Removal of the incinerable waste from site to the Treatment, Storage and Disposal Facilities (TSDF)



Motco Inc., La Marque, Texas
Contaminant: tar and petroleum related chemicals

Investigation of the site found seven unlined waste disposal pits containing 7 million gallons of PCB-contaminated liquid and 18 thousand cubic yards of sludge and tar. The liquid, sludge, and tar were excavated and transported to an incinerator in Louisiana. The remaining contaminated soil was capped and surrounded by underground slurry walls.

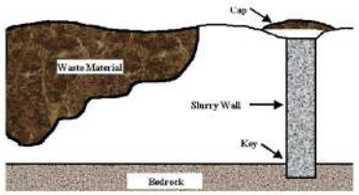
Source: USEPA

High Contamination

Level Of Contamination	High
Public Access	Visual indicators on container surfaces
Remediation Technique	In-situ Containment

Containment of contaminated soil and water is done by using subsurface vertical barriers to isolate them from the flow of groundwater. The barrier should extend upto a low-permeability layer below the contaminated area. Contained soil is capped to control surface water infiltration.

Possible Application for project :
Containment of contaminated soil in RCC barriers incorporated as part of built infrastructure of the underground museum, with visual indicators and details on the walls



ICMESA Plant, Seveso, Italy
Contaminant: Dioxin

For decontamination, the entire area was ploughed and 40cm of soil was removed and was replaced with 15 cm of topsoil. Two containment basins were constructed to contain the contaminated remains of animals, buildings destroyed and soil removed. The waste was surrounded by four barriers to separate it from the external environment.

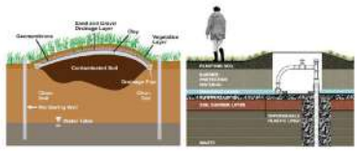
Source: responsibleconnect.eu

Medium Contamination

Level Of Contamination	Medium
Public Access	Below public green areas
Remediation Technique	In-situ Capping

Capping involves placing a cover over contaminated material such as landfill waste or contaminated soil. Such covers are called "caps." Caps do not destroy or remove contaminants but isolate them and keep them in place to avoid the spread of contamination. Caps prevent people and wildlife from coming in contact with contaminants.

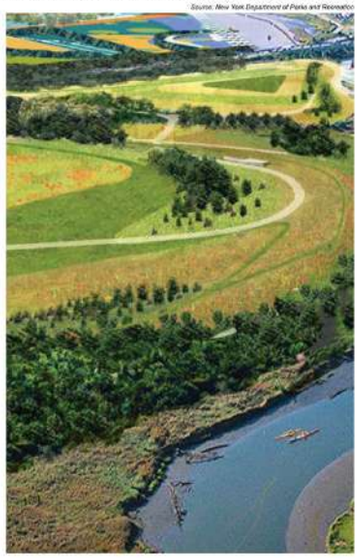
Possible Application for project :
Containment of contaminated soil in sealed landfills capped with impermeable final cover and covered with top soil layer for vegetation and site-regeneration



Freshkills, New York
Contaminants: Dioxin/Furans, Cadmium, Zinc, Lead, Volatile Organic Compounds

The landfill management systems in Freshkills includes the final cover, landfill gas collection system and leachate collection and cleansing system. The final cover over the solid waste is comprised of a sub-base layer of soil to allow for optimal slope stability and drainage, an impermeable plastic liner to prevent water from entering the waste and prevent the waste or its by products from escaping, an additional drainage layer, a thick barrier protection layer and the final layer of planting soil layer or top soil layer to protect the final cover from erosion.

Source: New York Department of Parks and Recreation

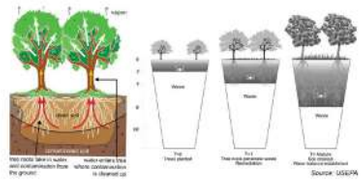


Low Contamination

Level Of Contamination	Low
Public Access	Restricted (long term process)
Remediation Technique	Phytoremediation

Phytoremediation uses plants to remove, contain, or render contaminants harmless including metals, pesticides, explosives, and oil. However, they work best where contaminant levels are low because high concentrations may limit plant growth and take too long to clean up.

Possible Application for project :
The plantation scheme includes species used in phytoremediation to help clean the soil and serve as a tool for education. Native species of plants can be used, such as bamboo or sunflower, while signage can inform the visitors of their remediation qualities

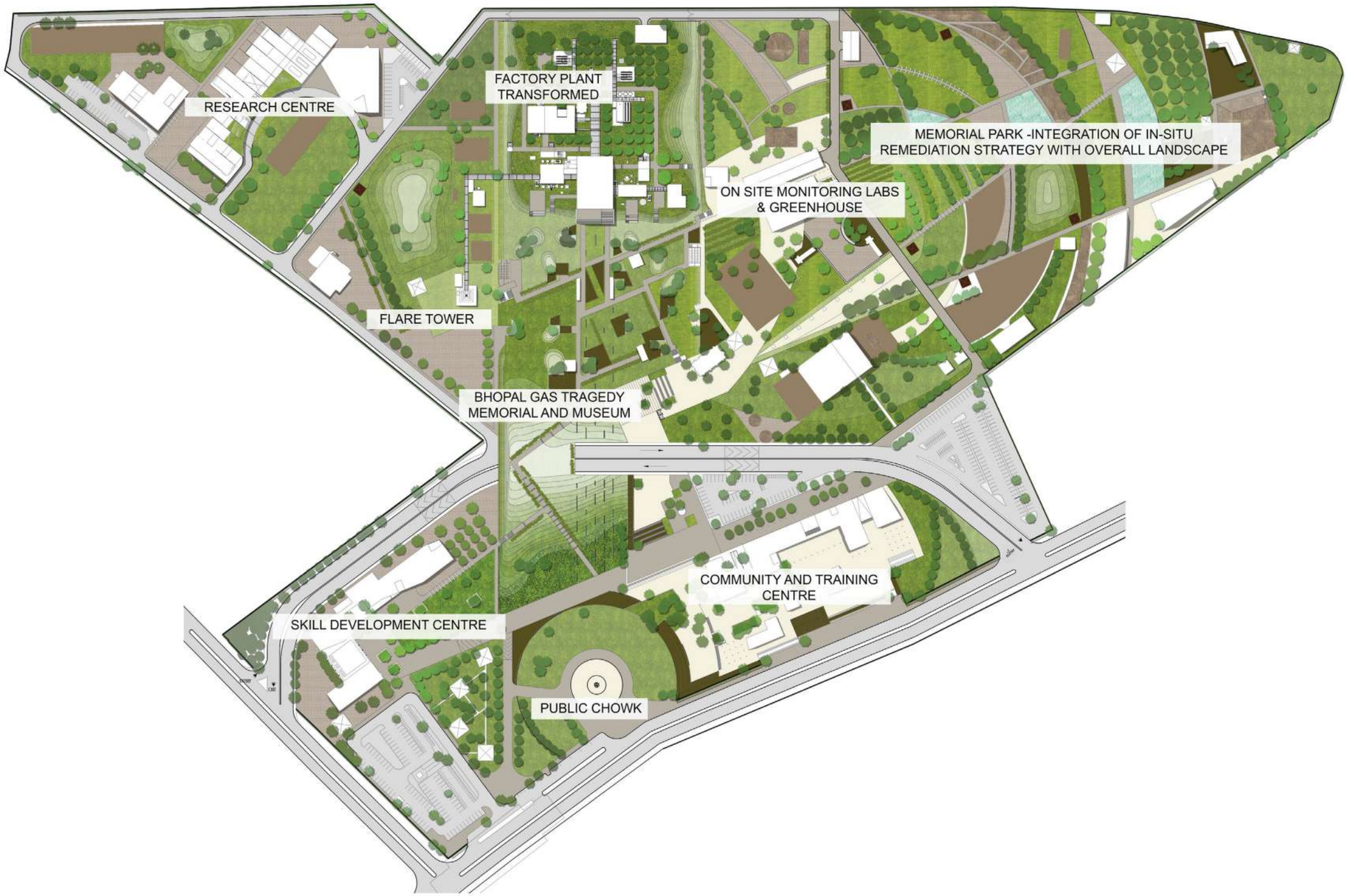


Landschaftspark Duisburg-nord, Ruhr Region, Germany
Contaminant: Arsenic, Lead

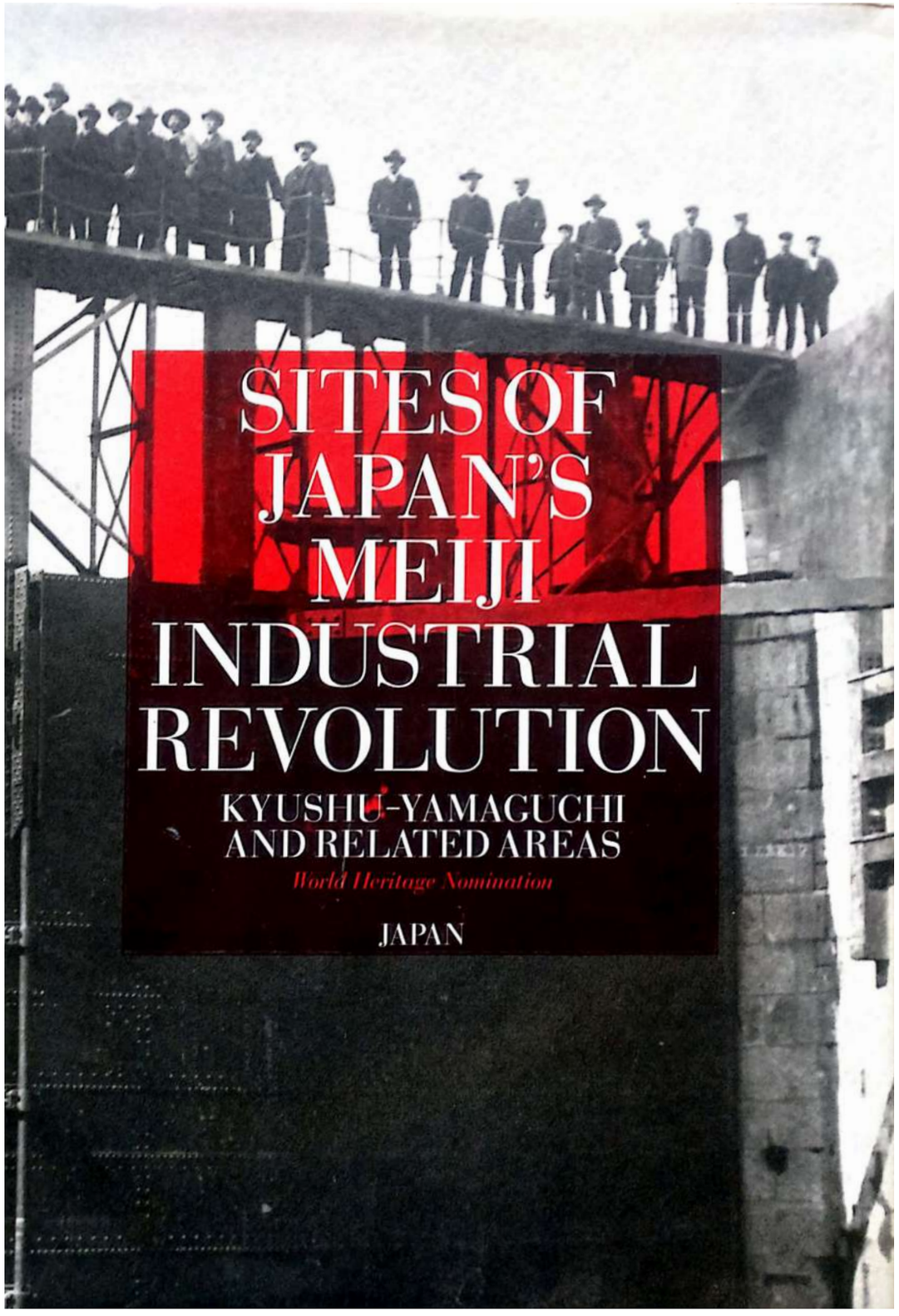
Site remediation included isolating the contaminated soil in existing bunkers on site or leaving it in place for phytoremediation. The former coke plant contaminated by polyaromatic hydrocarbons was covered with coal-mine spoil and groups of birches to reduce the contamination through long term phytoremediation. The large scale of the site permits restricting heavily contaminated areas from public access, which allows for continued development and testing of techniques.

Remediation and ecological restoration of former Union carbide factory in Bhopal

Bhopal, Madhya Pradesh
2005-Ongoing

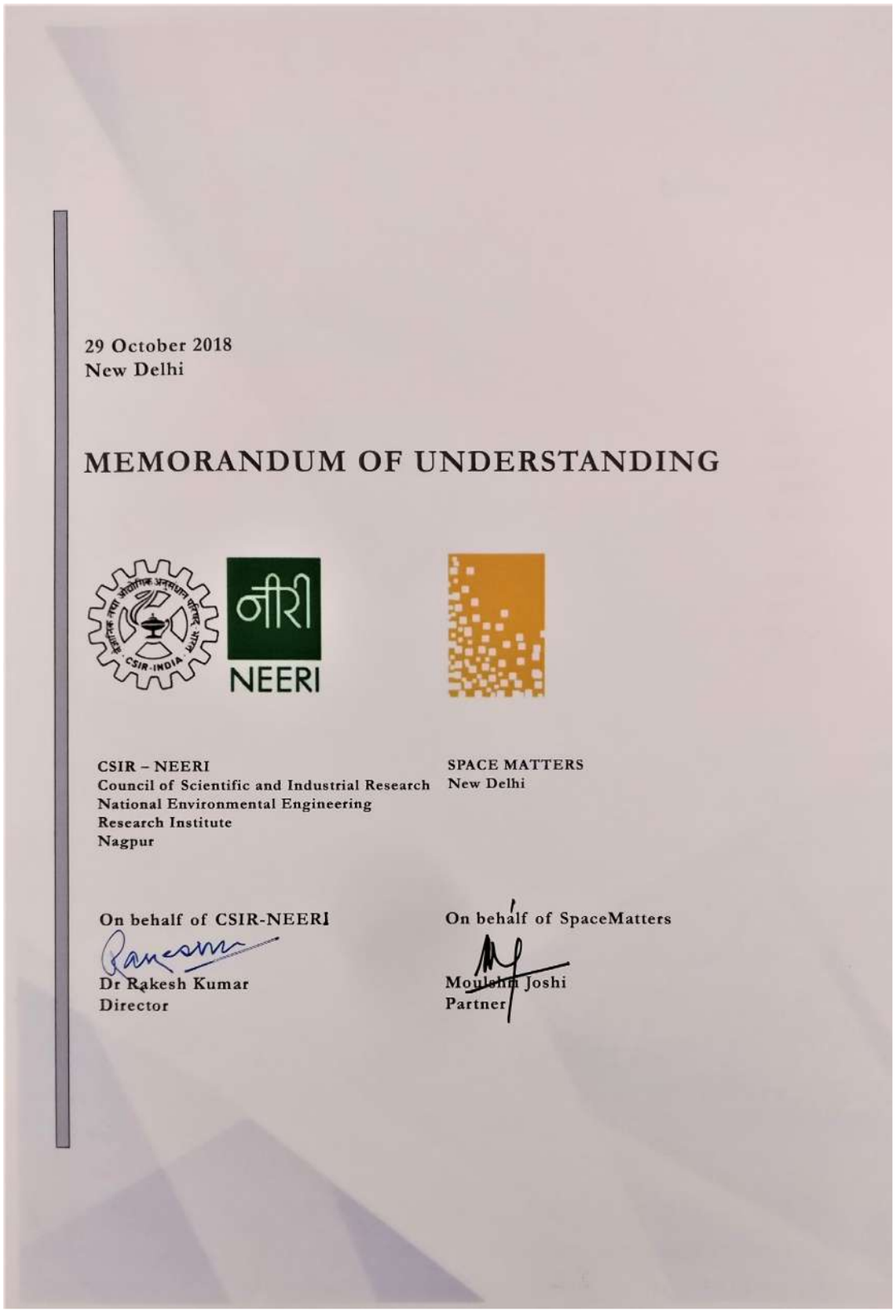


Remediation and ecological restoration of former Union carbide factory in Bhopal



Expert advisory towards UNESCO world heritage nomination of sites of Japan's Meiji industrial revolution

Japan
2009-2014


29 October 2018
New Delhi

MEMORANDUM OF UNDERSTANDING

CSIR – NEERI
Council of Scientific and Industrial Research
National Environmental Engineering
Research Institute
Nagpur

On behalf of CSIR-NEERI
Dr Rakesh Kumar
Director

SPACE MATTERS
New Delhi

On behalf of SpaceMatters
Moulshri Joshi
Partner

Memorandum of understanding with CSIR-NEERI (National Environmental Engineering and Research Institute)

2018

MATTERS

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