

# Construction Sector S&T Roadmap

Updated as of 10 November 2023

Legend (Text Font):

Completed	New/Ongoing	Target
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## OVERALL STRATEGIES

- Human Resource**
- Modelling Software trainings
  - Training on New Construction Tools/Techniques/Equipment
- Needed R&D Technologies**
1. Technologies for upland, coastal, flood and earthquake resistant infrastructures
  2. Housing technologies
  3. Advanced Laboratory testing facility
  4. Value-adding agro-industrial waste for different construction products/applications
  5. Modular testing, monitoring, surveying equipment
  6. Adoption of new construction practices, tools, techniques
  7. Advance preservation S&T based strategy of heritage sites
- Facilities/Services**
1. Laboratory testing facility for:
    - Durability & performance of concrete
    - Coastal, Earthquake and Wind Engineering simulation testing laboratory
  2. Construction Materials/Product Testing Laboratory
  3. Digital Technologies innovation Center for Construction
  4. Heritage Site/Building Center
  5. Underground engineering
- S&T Policy initiatives**
1. Inclusion of locally developed construction products in the DPWH local standards and AITECH accreditation
  2. Updating of NSCP to consider the generated seismic data in seismic design of structures, and the new materials developed
  3. New testing requirement in the NBCP
  4. Local utilization and prioritization of locally developed construction products

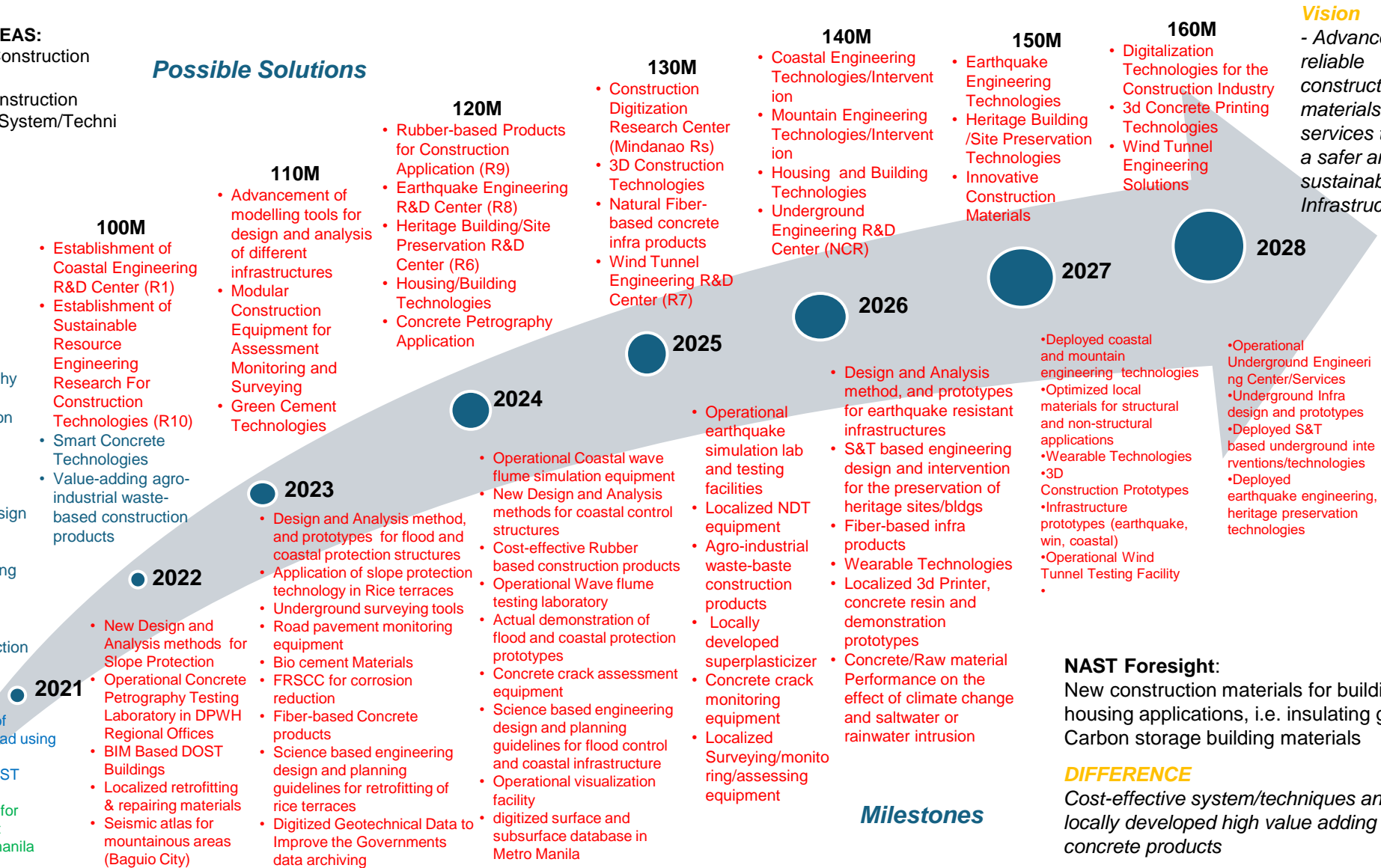
## THEMATIC AREAS:

- Sustainable Construction Materials
  - Innovative Construction Methodology/System/Techniques
- 90M**
- Nationwide establishment of Concrete Petrography testing laboratory
  - Modular Construction Equipment for Assessment
  - Generation of subsurface data to improve seismic design of structures
  - Establishment of Mountain Engineering Center towards sustainable Infrastructure
  - Innovative Construction Materials
- 2021**
- Pilot demonstration of Modified Asphalt Road using Rubber & PET
  - Seismic Atlas for DOST Smart Cities
  - Instrumented SHMS for selected government structures in metro manila

## Possible Solutions

- 100M**
- Establishment of Coastal Engineering R&D Center (R1)
  - Establishment of Sustainable Engineering Research For Construction Technologies (R10)
  - Smart Concrete Technologies
  - Value-adding agro-industrial waste-based construction products
- 110M**
- Advancement of modelling tools for design and analysis of different infrastructures
  - Modular Construction Equipment for Assessment Monitoring and Surveying
  - Green Cement Technologies
- 120M**
- Rubber-based Products for Construction Application (R9)
  - Earthquake Engineering R&D Center (R8)
  - Heritage Building/Site Preservation R&D Center (R6)
  - Housing/Building Technologies
  - Concrete Petrography Application
- 130M**
- Construction Digitization Research Center (Mindanao Rs)
  - 3D Construction Technologies
  - Natural Fiber-based concrete infra products
  - Wind Tunnel Engineering R&D Center (R7)
- 140M**
- Coastal Engineering Technologies/Intervention
  - Mountain Engineering Technologies/Intervention
  - Housing and Building Technologies
  - Underground Engineering R&D Center (NCR)
- 150M**
- Earthquake Engineering Technologies
  - Heritage Building /Site Preservation Technologies
  - Innovative Construction Materials
- 160M**
- Digitalization Technologies for the Construction Industry
  - 3d Concrete Printing Technologies
  - Wind Tunnel Engineering Solutions

**Vision**  
- Advance and reliable construction materials and services towards a safer and sustainable Infrastructures.



## Milestones

**NAST Foresight:**  
New construction materials for building and housing applications, i.e. insulating gels, Carbon storage building materials

**DIFFERENCE**  
Cost-effective system/techniques and locally developed high value adding concrete products

# List of Projects (for the whole duration of the roadmap)

R&D Technologies	Project Title	Budget Allocation ('000)							Status
		2021	2022	2023	2024	2025	2026	2027	
Concrete Petrography Application	ISCOPE P1. SoPIA: Software for Petrographic Image Analysis for Concrete Petrography			7,334	5,556				On-going
	ISCOPE P2. Effects of Extreme Weather Conditions on Coastal Concrete Structures in the Philippines: Determining Appropriate Concrete Cover			6,690	4,862				On-going
Modular Construction Equipment for Assessment	PAVE - Prototype Automated Visual Survey Equipment	5,865	4,197						Completed



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		2021	2022	2023	2024	2025	2026	2027	
Modular Construction Equipment for Assessment	Project CRUISE: A Capacitive Resistivity Underground Imaging Survey Equipment for Underground Utility Assessment of Philippine Infrastructures	12,086	6,854						
Establishment of Mountain Engineering Center Towards Sustainable Infrastructure and Upland Water Security	Boondock P1: Slope Stability Analysis and Engineering Intervention for Rice Terraces and Road Infrastructures in Terrain Areas	8,041	4,936	4,018					On-going



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		2021	2022	2023	2024	2025	2026	2027	
Innovative Construction Materials	CoBUILDTex P1. Natural Textiles as Innovative Formwork and Reinforcement for Freeform Concrete Structures	14,169	6,760						Completed
	CoBUILDTex P2. Natural Fiber-based Technical Textiles for Smart Indoor Installations	11,174	6,222						Completed
	Development of Fiber-Reinforced Self-Compacting Concrete for Corrosion Reduction (FRSCC)	4,219	3,830						Completed
	Green Fiber-reinforced Polymer (FRP) Composites as Innovative Repair System for Earthquake-prone Historical Buildings	3,932	3,683						Completed



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		2021	2022	2023	2024	2025	2026	2027	
Generation of subsurface data to improve seismic design	Optimization of the GeoRiskPH I ntegrated System through Risk Assessments, Site Suitability Models and 3D Visualizationsto Aid Policy and Decision Making (3D Earth Risk)	23,814	10,324	10,524					
	Geotechnical Mapping of Metro Manila Subsoil (GEMMMS)	7,820	5,685						Complete d



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		2021	2022	2023	2024	2025	2026	2027	
Establishment of Coastal Engineering R&D Center (R1)	Coastal Erosion Trends and Management Strategies for Region 1	4,611	4,784	3,973					Ongoing
	Assessment, Monitoring, and Prediction of Coastal Flooding of Selected Municipalities in Region 1	12,097	4,223	3,052					Ongoing
	Development of Science-based Engineering Approach to Coastal Protection in Region 1	2,998	2,330						Ongoing
	Enhancing Coastal Design and Infrastructure Intervention through Establishment of Wave Testing Facility	36,486	15,829	3,137					Ongoing



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R&D Technologies	Project Title	Budget Allocation ('000)							Status
		2021	2022	2023	2024	2025	2026	2027	
Heritage Building/Site Preservation R&D Center	Innovative NDT for Heritage Conservation for a Resilient Past				11,443	4,731	3,573		New
	Developing Innovative Retrofitting Interventions Compatible with Heritage Structures				11,953	4,171	3,015		New
	Assessment, Development, Preservation for Typhoon and Earthquake Resilient Ivatan Houses			6,723	3,593				Ongoing
Smart Concrete Technologies	Engineered Smart Concrete utilizing Indigenous Wastes for Durable and Intelligent Infrastructures	6,879	3,858						Completed



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R&D Technologies	Project Title	Budget Allocation ('000)							Status
		2021	2022	2023	2024	2025	2026	2027	
Establishment of Sustainable Resource Engineering Research for Construction Technologies	SRM P1. Development of market-ready admixtures and SMART lightweight foamed composites with passive energy-regulating and self-reinforcing properties from agro-industrial wastes for roof screeds, roof insulation, ceilings, walls and floor applications		31,341	6,110	2,754				Ongoing
	SRM P2. Development of Eco-cement using locally available industrial wastes for Construction Applications		5,782	3,472				Extended	
	SRM P3. Laminated Natural Fiber Composite as Eco-geocell and Eco-geogrid for Roadway Construction and Slope Protection		7,469	5,938				Extended	





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		2021	2022	2023	2024	2025	2026	2027	
Advancement of Modelling tools for Analysis of Different Infrastructures	Project Underground Evacuation and Facilities Design and aNalysis (Project EDEN)				42,096	7,967			
Value-adding agro-industrial waste-based construction products	StabiLign: Sustainable lignin-based soil stabilizer technology from waste wood and recycled concrete for pavements				11,220	4,968			New



# List of Projects – Construction Roadmap

2020	2021	2022	2023	2024
<p><i>PAVE (DOST GIA Funding)</i></p> <p><i>PSSIT (DOST GIA Funding)</i></p> <p><i>GEMMMS (DOST GIA Funding)</i></p> <p><i>3DEARTH (DOST GIA Funding)</i></p> <p><i>PHL CONCRETE (DOST GIA Funding)</i></p> <p><i>COBUILDTEX P1 (DOST GIA Funding)</i></p> <p><i>COBUILDTEX P2 (DOST GIA Funding)</i></p> <p><i>RUBBER (DOST GIA Funding)</i></p> <p><i>CRUISE (DOST GIA Funding)</i></p>	<p><i>COASTER Program (DOST GIA Funding)</i></p>	<p><i>SRM Program (DOST GIA Funding)</i></p>	<p><i>BAMBOO POLES (DOST GIA Funding)</i></p> <p><i>ISCOPE P1 (DOST GIA Funding)</i></p> <p><i>ISCOPE P2 (DOST GIA Funding)</i></p> <p><i>SHADE (DOST GIA Funding)</i></p>	<p><i>STABILIGN (DOST GIA Funding)</i></p> <p><i>EDEN (DOST GIA Funding)</i></p> <p><i>FIRE PROGRAM (DOST GIA Funding)</i></p> <p><i>HERITAGE PROGRAM (DOST GIA Funding)</i></p> <p><i>COBUILDTEX 2.0 Program (DOST GIA Funding)</i></p>
<p><i>FRP (PCIEERD-GIA)</i></p> <p><i>FRSCC (PCIEERD-GIA)</i></p> <p><i>PHILSIMS (PCIEERD-GIA)</i></p>		<p><i>PREDICTION OF LONG-PERIOD (PCIEERD-GIA)</i></p>	<p><i>Ivatan Project (PCIEERD GIA)</i></p>	

