



**VISHWA
SAMUDRA**

CHALLENGE IT. CHANGE IT.

STABILIZATION TECHNOLOGY

VISHWA SAMUDRA ENGINEERING PVT LTD

AN ISO 9001:2015,14001:2015,ISO 45001:2018 CERTIFIED COMPANY

VISHWA SAMUDRA ENGINEERING PRIVATE LIMITED

COMPANY PROFILE :

- Incorporated on 26th August, 2016 as Bay Area Marine & Port Engineering Services Private Limited and renamed as M/s Vishwa Samudra Engineering Private Limited (VSE) on 5th October, 2017 with a vision -

“To be India’s leading infrastructure creator pushing the boundaries of innovation and pursuing opportunities to build a sustainable future for everyone”.
- The driving force behind VSEPL’s ascending trajectory, **Mr. Chinta Sasidhar, Hon’ble Chairman** guides VSEPL by five prime principles as sustainability, integrity, innovation, ownership, transparency.
- VSEPL offers multi-disciplinary infrastructure services like **Roads, Airports, Marine structures, Irrigation works, buildings etc.**, that address complex challenges and deliver turn-key projects by using advanced technologies.

SOIL STABILIZATION TECHNOLOGY - A GREEN INITIATIVE

INTRODUCTION:

Soil Stabilization

A process in which binders/additives are added to existing soil to improve its engineering properties

Full Depth Recycling

A pavement rehabilitation technique in which the full flexible pavement section and a pre-determined portion of the underlying materials are uniformly pulverised or blended resulting in a stabilised base course



In both process, **StabilRoad Additive** is being used in combination with cement to improve over conventional cement treated base (CTB)

SOIL STABILIZATION TECHNOLOGY - A GREEN INITIATIVE

ADVANTAGES:

- Reduction in usage of aggregates, thereby reducing carbon footprints – **85% saving in aggregates**
- Usage of modern equipment for faster completion of projects – **Entire construction process is mechanized**
- Reduction in construction time – **7 days to complete 1 Lane km with asphalt**
- Higher unconfined strength and higher modulus – **Average of 6 MPa and average modulus of 7500 MPa**
- Increase in durability, resulting in very minimal life cycle cost - **Almost NIL cost over the last 5 years**
- Lower cost of construction – **5-10% depending on soils, traffic etc**
- Can work in varied climatic zones in India – **Andaman, Leh Ladakh, Northeast states**
- Can execute roads with varied design traffic conditions – **Already executed <2 msa and >200 msa traffic**

ECOLOGICAL BENEFITS OF STABILIZATION

Out of the executed **400+ lane km**, the following are:

- Fresh Soil/Aggregate **SAVINGS – 5,93,000 CUM**
- Savings in terms of truck loads – **36,000 TRUCKS**
- Savings in fuel consumption – **3,50,000 LITRES**
- Carbon emission savings – **7500 tons of CO₂e**

With these approaches of stabilization technology, we can achieve the target of **NET-ZERO carbon emissions by 2070 as per Hon'ble Prime Minister's vision.**

- STEP1 • SOIL/EXISTING ROAD PROFILING
- STEP2 • CEMENT SPREADING
- STEP3 • STABILROAD SPREADING
- STEP4 • RECYCLING
- STEP5 • COMPACTION



STEP 1: SOIL/EXISTING ROAD PROFILING



STEP 2: CEMENT SPREADING



STEP 3: STABILROAD SPREADING



STEP 4: RECYCLING



STEP 5: COMPACTION

CONTD.,

- STEP6 • GRADING
- STEP7 • ROLLING
- STEP8 • CURING
- STEP9 • SAMI LAYER/ GEO SYNTHETIC FABRIC
- STEP10 • PRIME COAT
- STEP11 • BC LAYER



STEP 7: ROLLING



STEP 6: GRADING



STEP 9: SAMI LAYER



STEP 8: CURING



STEP 11: BC LAYER



STEP 10: PRIME COAT



SOIL STABILIZATION TECHNOLOGY - A GREEN INITIATIVE

CRR I FINAL REPORT

HIGHLIGHTS:

- The UCS value (11 MPa) of stabilized cores/samples is well within and above the IRC specified range (4.5 to 7 MPa in 7days) for cementitious bases
- All field stabilized cores/samples satisfied the durability test and residual strength is much higher than required as per IS SP 89 2018
- The back calculated elastic moduli (6806 MPa) from FWD data are significantly higher than that of cement treated base (CTB) design value (5000 MPa)
- Elastic moduli for the StabilRoad stabilized bases are significantly higher (>5000 MPa) than that of conventional which enables to eliminate DBM layer in StabilRoad stabilized roads.
- The riding quality of all StabilRoad stabilized roads are good even after 3.5 years.

[CRR I Final Report](#)

Please click above to view the report



SOME OF THE PROJECTS EXECUTED BY VSE:

INFRASTRUCTURE:

1. KRISHNAPATNAM PORT, NELLORE
2. KATUPALLI PORT, CHENNAI

AIRPORTS:

1. GMR INTERNATIONAL AIRPORT, HYDERABAD

CITY ROADS:

1. NTR MARG, HYDERABAD
2. ECIL - AS RAO NAGAR ROAD, HYDERABAD

NATIONAL HIGHWAYS:

1. NH4 - ANDAMAN AND NICOBAR ISLANDS
2. NH104/77 - BIHAR

STATE HIGHWAYS:

1. PURVANCHAL EXPRESSWAY – SERVICE ROADS, UP
2. ANAYADI – KOODAL ROAD, KERALA
3. LALRU – MALAN ROAD, PUNJAB

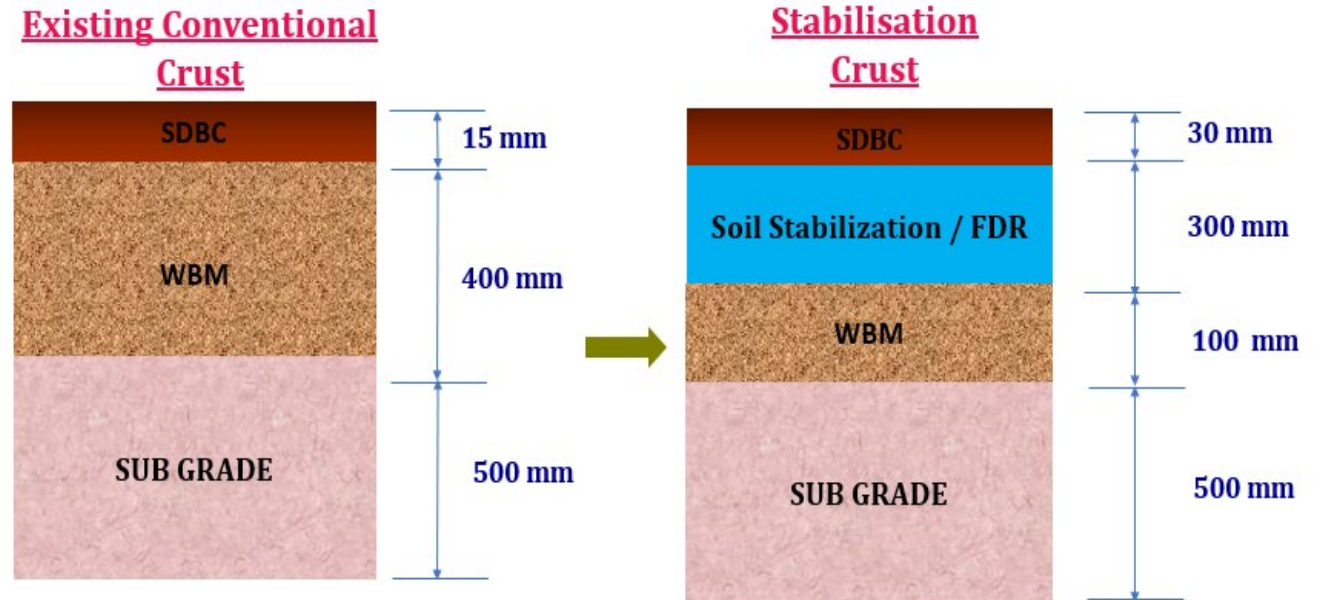
RURAL ROADS:

1. SALIPETA – PORANKI ROAD, VIJAYAWADA, ANDHRA PRADESH
2. AIIB WORKS, ANDHRA PRADESH - Total : 859 KM
3. UPFDR WORKS – 9 PACKAGES – Total: 257 KM

SALIPETA – PORANKI ROAD, VIJAYAWADA

CRUST CHANGE DUE TO STABILIZATION

- **TOTAL LENGTH: 2.265Km**
- **AVERAGE UCS : 10.05 MPa**
- **RESOURCE SAVINGS : 250 Trucks**
- **SAVINGS IN % : 91%**



SALIPETA – PORANKI ROAD, VIJAYAWADA



SPREADING OF CEMENT



SPREADING OF STABILROAD ADDITIVE

SALIPETA – PORANKI ROAD, VIJAYAWADA



RECYCLING



COMPACTION

SALIPETA – PORANKI ROAD, VIJAYAWADA



GRADING



COMPACTION



COMPACTION



CURING

SALIPETA – PORANKI ROAD, VIJAYAWADA

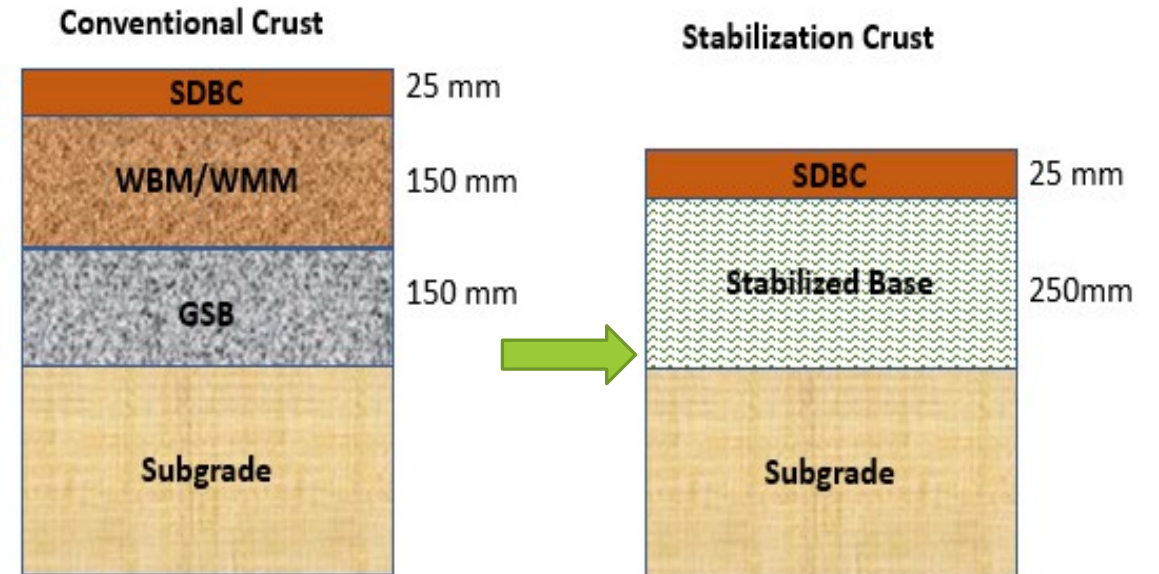


FINISHED ROAD

AIIB WORKS, ANDHRA PRADESH

CRUST CHANGE DUE TO STABILIZATION

- **TOTAL LENGTH: 859 Km**
- **AVERAGE UCS : 5.66 MPa**
- **RESOURCE SAVINGS :29,800 Trucks**
- **SAVINGS IN% : 92%**



AIIB WORKS, ANDHRA PRADESH



SPREADING OF CEMENT



SPREADING OF STABILROAD ADDITIVE

AIIB WORKS, ANDHRA PRADESH



FULL DEPTH RECYCLING (FDR)

AIIB WORKS, ANDHRA PRADESH



COMPACTION



CURING AFTER FINAL COMPACTION

AIIB WORKS, ANDHRA PRADESH



FINISHED ROAD

AIIB WORKS, ANDHRA PRADESH



PERFORMING LWD TEST ON STABILIZED BASE TO ASSESS THE STRENGTH OF STABILIZED BASE

AIIB WORKS, ANDHRA PRADESH



STABILIZED BASE CORE SAMPLE - 28 DAYS

SEGMENT WISE AVERAGE UCS STRENGTH RESULTS

SEGMENT	UCS STRENGTH (MPa)		MODULI VALUES (MPa)		AVG TOTAL SAVINGS NATURAL RESOURCES (%)
	MINIMUM	ACHIEVED	MINIMUM	ACHIEVED	
INFRASTRUCTURE	4.5	8.92	900	7422	91%
AIRPORTS	4.5	8.28	900	10444	75%
CITY ROADS	4.5	9.22	900	7987	64%
NATIONAL HIGHWAYS	4.5	7.22	900	8200	84%
STATE HIGHWAYS	4.5	5.88	900	9164	85%
RURAL ROADS	3	5.66	600	6806	90%



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