

RIS

Ruhi Infra Solutions (Formerly M/S Singh Enterprises)

Way towards Better....

Mechanically Stabilized Earth Wall



<u>About Us</u>

Ruhi Infra Solutions (Formerly M/S Singh Enterprises) is a Pvt. Company which started operations in India from 2010.

In Year 2012 the company got registered as a company and started working into the specialized segments i.e., MSE wall, Slope protection, Canal Linings, Gabion walls and other Geotechnical fields and other Technical Engineering services in the country with over one decade of experience and expertise in the construction industry.

The company has considerably broadened its field of specialisation from MSE Wall to different services and products and in different sectors of the construction Industry with a pan India presence having projects across the nation.





Ruhi Infra Solutions total manpower strength is around 200 which includes Site Staff, Design Team, Marketing and Labour on its roll and on Contract Basis.



The company has Completed more than 1.6 Lakh Sqm of RE wall in India in Both EPS & EPC Module and also provided specialised services to Clients for casting and erection of panels with labour and machinery Support.

What We Do:

- Gabion Walls
- Canal lining/Slope Protection.





- MSE wall
- Geo Mat and Geo cell protection System.
- Slope turfing.







Mechanically stabilized Earth- Retaining wall:

MSE walls existence is more than 3000 years from Great wall of China and mud wall of India with Bamboo mats to Ziggurats of Mesopotamia. MSE walls were used without any prior knowledge of the technology.



Later in 1960 Sir, Henry Vidal invented the reinforced earth technology while playing with kids on a beach, and later he patented the same.





MSE walls are gravity structures consisting of alternating layers of soil reinforcement and granular backfill with Modular precast concrete facia i.e., Panel or Block and wire facia as Gabion and Steel mesh. The system is widely used in the infrastructure and other civil engineering applications related to soil retention and protection due to its high load carrying capacity and construction ease.

The performance Advantages of the System are:

- Flexibility and ease of construction
- Economical
- Aesthetical
- Cost effective
- Accommodate high differential settlement
- Rapid and repetitive construction
- Finished wall alignment
- Different wall heights can be achieved



Reinforced Earth is a material formed by combining Earth and Reinforcement. In actual Construction, the Reinforced earth structures are composed of earth and reinforcing elements in the form of Strips/Straps disposed in horizontal Layers.



Reinforcement's:

Steel Strips with Connector



Ribbed Reinforcing Strips

- 50mm wide
- Galvanized steel
- High tensile Strength
- Bolted connection to facing elements
- Inextensible



Nut Bolt Loop connector

Synthetic Strip/Strap With Connector Pet



Pet Geogrid Mesh reinforcement





Geosynthetic Reinforcing Strips

- Extensible
- 50/90 mm wide
- Polyester fibers in a Polyethylene sheath
- High tensile capacity
- Ideal for highly corrosive environments
- Sleeve or wrap around connection to facing elements



Loop Connection



Box Sleeve connection

Facia elements

Facing is a component of the reinforced soil system used to prevent the soil from ravelling out between the rows of reinforcement.

The facing type depends on the application, aesthetics, differential settlement, service life, and other factors.

Common facing includes precast concrete panels, dry stacked modular Blocks, gabions, welded mesh and wrapped sheet of geo-synthetics



Panel Facia





Applications of Mechanically Stabilized Earth walls

The selection of mechanically stabilized earth walls will vary from one site to another but can be used in these situations



As temporary structures for highway projects Use as soil retention structures or dikes As containment structures around oil and gas tanks



- Dams' construction and levees
- Storage tanks
- Construction sites with poor soil conditions

Gabion facia



Residential walls

Considerations while building MSE wall

Following aspects should be considered for this kind of retention system

- Foundation should be properly compacted and levelled
- Panel and soil reinforcement should be checked prior to placement
- Soil used for backfill should be tested and approved
- Fill lifts should be about 150mm
- Batter of panels should be verified and adjusted as needed
- Expansion joint should be provided between different materials of cast in place concrete

Benefits of using MSE Earth Retaining Wall.

- Simple construction
- The use of heavy equipment is reduced
- More land is available for construction
- Faster construction than traditional concrete wall
- Reduced the need of wall finishing
- Less site preparation is needed
- Can be built in confined areas where a normal concrete wall is almost impossible to be constructed
- Reduces need of land acquisition process
- Susceptible to elastic deformation
- High seismic load resistance
- Can be combined with other products
- Various shapes and forms can be made
- Excavation for footings is almost reduced

Design Check of MSE Walls

- External Stability
- Sliding
- Bearing Capacity
- Eccentricity
- Overall Stability

Internal Stability

- Reinforcement Rupture
- Reinforcement Interaction with Reinforced Fill
- Connection Strength

Compound Stability

• Modes initiated outside the reinforced zone and exit through the reinforcement and facing.

Design Methods

- Coherent Gravity Method
- Tieback Wedge Design Method
- AASHTO Simplified Method
- FHWA Structure Stiffness Method
- K-Stiffness Method
- Ehrlich and Mitchell Model

MSE Wall Specifications

- FHWA Standard Specifications for Reinforced Earth (MSE Walls)
- AASHTO Standard Specification for Highway Bridge
- AASHTO LRFD Bridge Design Specification

Construction Sequence of MSE Walls with Precast Panel Facings

- Preparation of subgrade.
- Placement of a leveling pad for the erection of the facing elements.
- Erection of the first row of facing panels on the prepared leveling pad.
- Placement and compaction of reinforced wall fill on the subgrade to the level of the first layer of reinforcement and its compaction.



- Placement of the first layer of reinforcing elements on the wall fill.
- Placement of the wall fill over the reinforcing elements to the level of the next reinforcement layer and compaction of the wall fill.
- Construction of traffic barriers and copings.

MSE Wall Project Photos





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Project Name: Mp Border To Godhra

Area: 23000 Sqm **Completion:** 2014

> Contractor: BSCPL

Project Name: Godhra To Ahmedabad Area: 14000 Sqm Completion: 2014 Contractor: DBL

> Project Name:Rewa project Area: 4500 Sqm Completion: 2014 Contractor: DBL

Registered Office:

18k, Luchui, Ward-10, Sahjanwa,Dist.: Gorakpur-273209 (U.P) Mob No.: +91- 9415320856 Email: Info@rubin6ra.com Website: www.rubiinfra.COM

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Completed Projects					
S.NO	CONTRACTOR	PROJECT	AREA (Sqm)	COMPLETION	
1	Hindalco Industries	Bargwa Singrauli, M. P	6500	2012	
2	BSCPL Infrastructure Pvt Ltd	M.P Border to Godhara.	23000	2014	
3	Dilip Buildcon Ltd	Godhra To Ahmedabad	14000	2014	
4	Gautam Construction company	Bikaner ROB	3300	2015	
5	C & C Construction Pvt Ltd	Jaipur ROB	9500	2016	
6	Vinod construction Pvt Ltd	Fly Over at Ujjain	4500	2016	
7	C & C Construction Pvt Ltd	Balipur Flyover, Dehradun	3000	2017	
8	Dilip Buildcon Ltd	Rewa, M.P	13000	2017	
9	Viva Infracon Pvt Ltd	Nasik to Sinner	20000	2018	
10	Viva Infracon Pvt Ltd	Bandari	1400	2018	
11	Viva Infracon Pvt Ltd	Ramgad Jharkhand ROB	4200	2019	
12	Monte Carlo Ltd	Gorakhpur Bypass, U. P	7500	2020	
13	Sawant Infrastructure	Chikali to Mehkar, Maharashtra	6000	2020	
14	Anika Construction Pvt Ltd	Chhattisgarh	3500	2020	
15	Unicorn Infra Pvt Ltd	Naya Raipur	8000	2020	
16	BSCPL infrastructure Pvt ltd	Hyderabad Balanagar	7000	2021	
17	G S Malhotra Construction Pvt Ltd	Tori Jharkhand ROB	3200	2021	
18	Mehul Construction Pvt Ltd	Bidar to Maharashtra Border	17500	2021	
19	JK Infracon Pvt Ltd	Chandigarh	6000	2021	
20	Shreeji Infrastructure	Satna Bela, M. P	8000	2022	

Ongoing Projects							
S.NO	CONTRACTOR	PROJECT	AREA (Sqm)	START			
1	Sinhotia Metals & Minarals Pvt ltd	Angul, Odisha	13500	2023			
2	Agroh Infrastructure and Developers Pvt Ltd	Tarson to Fagane	45000	2021			
3	PRL Infrastructure Pvt Ltd	Rob at Phulera, Rajasthan	4000	2022			
4	Giriraj Stone Crusher Pvt Ltd	Rob at Varanasi, U. P	11700	2022			