



PATIL GROUP PRESENTS

HIGH-PERFORMANCE PRECAST CONCRETE SOLUTIONS

FOR INDIAN RAILWAY INFRASTRUCTURE





INTRODUCTION

Precast Concrete is Revolutionizing Indian Infrastructure

Indian Railways, with its vast network, demands construction methods that are fast, durable, and minimize track possession time. Our state-of-the-art manufacturing facilities produce high-precision precast components meeting rigorous Indian Railways standards while delivering accelerated installation timelines — from drainage systems and culverts to coping slabs, signalman cabins and UHPC solutions.



OUR PRODUCT RANGE

Twelve specialised categories engineered for Indian Railways

#	PRODUCT CATEGORY	#	PRODUCT CATEGORY
01	U-Drains & Covers	02	Box Culverts
03	Manhole Chambers	04	Platform Wall
05	Coping Slabs	06	Retaining Walls
07	Toilet Blocks	08	Signalman Cabins
09	Precast Columns	10	Precast Beams
11	Precast Slabs	12	Precast Staircases
★	UHPC Solutions	★	Ultra-High-Performance Concrete



01

PRODUCT CATEGORY

PRECAST U-DRAINS & COVERS



Efficient drainage vital for track stability and station maintenance. Our precast U-drains offer controlled hydraulics, flow and high structural integrity with minimal track possession time.

CONCRETE	Minimum M35
STANDARD	IS 456, IS 15916, RDSO
COVER TYPES	Solid / Slotted / FRC

TABLE 1 — STANDARD PRECAST U-DRAIN & COVER SIZES

PRODUCT TYPE	WIDTH (MM)	DEPTH D (MM)	WALL BASE T (MM)	LENGTH L (MM)	COVER TYPE	LOAD RATING
U-Drain 300	300	300	75/100	1000/2000	Solid/Slotted	Light Duty (L7.5)
U-Drain 450	450	450	100/125	1000/2000	Solid/Slotted	Medium Duty (M-15)
U-Drain 600	600	600	125/150	1000/2000	Solid/Slotted	Heavy Duty (H25)
U-Drain 900	900	900	150/175	1000/2000	Solid (Heavy)	Extra Heavy (E-60)
U-Drain 1200	1200	1200	175/200	1000/1500	Solid (R.C.C.)	Special Loads

APPLICATIONS [Trackside Drainage](#) | [Platform Drainage](#) | [Station Approach Roads](#) | [Yard Drain](#)



02

PRODUCT CATEGORY

PRECAST BOX CULVERTS



Engineered for rapid installation under existing or new tracks for cross-drainage, balance culverts, or pedestrian subways. Segmental design minimises possession time.

DESIGN LOADING	RDSO MBG/HM loading and earth pressure
JOINTS	Flat / Spigot-and-socket
CONCRETE	Minimum M40
CELL OPTIONS	Single cell / Multi-cell

TABLE 2 — STANDARD BOX CULVERT SIZES (SINGLE CELL)

CLEAR SPAN S (MM)	CLEAR HEIGHT H (MM)	WALL THICK. (MM)	SLAB THICK. (MM)	SEGMENT LENGTH (MM)	MAX FILL DEPTH (M)
1000	1000	150	150	1000/2000	5
1500	1500	175	175	1000/2000	5
2000	2000	200	200	1000/2000	5
3000	3000	250	250	1000	5
4000	4000	300	300	1000	5

APPLICATIONS Cross-Drainage | Balance Culverts | Pedestrian Subways | Under-Track Crossings



03

P R O D U C T C A T E G O R Y

PRECAST MANHOLE CHAMBERS

Standardised access units for underground utilities including signalling cables, S&T lines and sewage systems. Eliminate time-consuming on-site brickwork or casting entirely.

DESIGN	Circular / Rectangular
FEATURES	Openings for Pipes
COVERS	CI / SFRC / UHPC (A/B/C/D, E-250)
CONCRETE	Minimum M35

TABLE 3 — STANDARD RECTANGULAR MANHOLE CHAMBERS

INTERNAL LENGTH (MM)	INTERNAL WIDTH (MM)	DEPTH D (MM)	DEPTH H (MM, MODULAR)	WALL THICK. (MM)	BASE THICK. (MM)	OPENINGS (NO. X DIA)
600	600	600	600/800/1200	125	150	2 x 150mm
900	600	900	900/1200/1500	125	150	2 x 200mm
1200	900	1200	1200/1500/1800	150	175	4 x 200mm
1500	1200	1500	1200/1500/1800	150	175	4 x 250mm

APPLICATIONS **Signalling Cables** | **S&T Lines** | **Sewage Networks** | **Telecom Ducts**



04

PRODUCT CATEGORY

PRECAST PLATFORM WALL



Robust and aesthetically pleasing wall systems for new platform construction or station redevelopment. Designed for rapid crane assembly during track possession.

DESIGN	Cantilever with Counterfort
JOINTS	Flat
CONCRETE	Minimum M40
DRAINAGE	Weep holes

TABLE 4 — PRECAST PLATFORM WALL — TYPICAL DIMENSIONS

WALL HEIGHT (MM)	BASE WIDTH (MM)	PANEL LENGTH L (MM)	PANEL THICKNESS (MM)	BASE THICKNESS (MM)
995	980	900	70	70
1400	980/1100	900	70	80
1400	980/1100	900	70	80

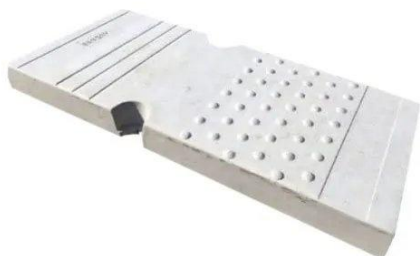
APPLICATIONS New Platform Construction | Station Upgrading | Amrit Bharat Stations



05

P R O D U C T C A T E G O R Y

PRECAST RAILWAY COPING SLABS



Railway platform coping is an RCC edge element used on station platforms to ensure passenger safety, define the platform edge, and enable safe boarding. Compliant with RDSO drawings. Key uses: Durable load-bearing barrier, reduced gap with trains, tactile paving integration, non-slip surface.

S T A N D A R D	RDSO Drawing — as per Indian Railways specification
C O N C R E T E	Minimum M35, RDSO Specifications
P L A T F O R M T Y P E S	New Precast Platform & Existing Platform (Retrofit)

TABLE 5 — PRECAST RAILWAY PLATFORM COPING SLAB SIZES

COPING TYPE	PLATFORM APPLICATION	DIMENSIONS L X W X T (MM)	WEIGHT (KG)	STANDARD
Coping Slab — Type A	New Precast Platform	150 x 750 x 900	240	RDSO Drawing
Coping Slab — Type B	New Precast Platform	900 x 650 x 150	240	RDSO Drawing
Coping Slab — Type C	Existing Platform (Retrofit)	1125 x 530 x 100	14	RDSO Drawing

APPLICATIONS **New Platform** | **Existing Platform** | **Amrit Bharat Stations** | **Tactile Accessibility**



06

P R O D U C T C A T E G O R Y

PRECAST L-SHAPE RETAINING WALLS



Essential for stabilising railway embankments or in constrained locations. Options include RCC cantilever or segmental retaining walls with pre-stressed options for higher elevations.

TECHNOLOGY	Pre-stressed options
INSTALLATION	Rapid crane assembly
CONCRETE	Minimum M40
DESIGN	L-shape cantilever or segmental

TABLE 6 — PHASED L-SHAPED RETAINING WALL — ILLUSTRATIVE SIZES

RETAINED HEIGHT H (M)	BASE WIDTH B (M)	STEM THICK. T1 (MM)	STEM THICK. BASE (MM)	BASE THICK. T2 (MM)	SEGMENT WIDTH (M)	LOAD / SURCHARGE
1.0	0.6	150	200	200	1.0/1.5	Load Bearing
2.0	1.2	150	300	250	1.0/1.5	Load Bearing
3.0	1.8	200	400	300	1.0	1.5 Slope + Traffic
4.0	2.4	250	450	350	1.0	1.5 Slope + Traffic

APPLICATIONS **Embankment Stabilisation** | **Railway Cuttings** | **Slope Protection**



07

PRODUCT CATEGORY

PRECAST TOILET BLOCKS



Hygienic, anti-vandal, ready-to-use units supporting the Swachh Bharat initiative at stations, level-crossings, and staff quarters. Fully fitted — dispatched as a complete self-contained unit.

FEATURES	Prefixed Plumbing, Electrical, Tiling
INTERIORS	Premium tiling, Partitions, Urinals & Fixtures
CONCRETE	Minimum M40
TANK	Concealed connections for septic/bio-tank

TABLE 7 — PRECAST TOILET BLOCK UNITS

MODEL TYPE	EXTERNAL DIMENSIONS L X W X H (MM)	NO. OF UNITS	INSTALLATION TIME	TANK CONFIGURATION	MATERIAL
Single Stall (Compact)	1200 x 1200 x 2500	1	1-2 days	Optional Overhead	M40 Concrete
Double Stall (Gents/Ladies)	2400 x 1500 x 2500	2	1-2 days	Optional Overhead	M40 Concrete
Multi-Stall (Premium)	6000 x 3000 x 2500	4+ urinals	As per Req.	Optional Overhead	M40 Concrete

APPLICATIONS Stations | Level Crossings | Staff Quarters | Swachh Bharat Initiative



08

P R O D U C T C A T E G O R Y

PRECAST SIGNALMAN CABINS



Weatherproof, fire-resistant, and secure enclosures for signal interlocking equipment and operating personnel. Placed precisely by crane in congested trackside areas — no civil work required.

P R O T E C T I O N	Thermal insulation; security doors
C O N C R E T E	Minimum M35
P R O V I S I O N S	AC, Server rack, Electrical conduits
R O O F	Flat or sloped

TABLE 8 — PRECAST SIGNALMAN CABINS

MODEL	EXTERNAL DIMENSIONS L X W X H (MM)	FLOOR AREA (SQ.M)	WALL THICKNESS (MM)	ROOF TYPE	KEY FEATURES
Compact	2500 x 2500 x 2600	6.25	100/125	Flat/Sloped	Single Room, 1 Door, Window, AC Provision
Standard	4000 x 3000 x 2700	12.00	125/150	Flat/Sloped	Room + Small WC, 1 Door, 2 Windows
Large (Modular)	6000 x 4000 x 2800	24.00	150	Flat	2 Rooms + WC/Pantry, Server Rack Provision

APPLICATIONS Signal Interlocking | S&T Equipment Room | Level Crossing | Control Post



09

P R O D U C T C A T E G O R Y

PRECAST COLUMNS



Precast columns are vertical structural members manufactured off-site and designed to transfer axial loads, bending moments and shear forces. Produced as single-storey or multi-storey units with cast-in connections, corbels or grouted sleeve joints.

GRADE	M30 – M60 (as per structural design)
SECTION	Square / Rectangular / Circular / H-Section
WIDTH / DIA	200 mm – 600 mm
HEIGHT	2.4 m – 9.0 m (multi-storey splices available)
CONNECTION	Grouted sleeve / Bolted base plate / Welded
STANDARD	IS 15916:2020, IS 456:2000, IS 13920:2016

TABLE 9 — PRECAST COLUMN TECHNICAL SPECIFICATIONS

PARAMETER	SPECIFICATION / VALUE
Longitudinal Rebar	Fe 415 / Fe 500 HYSD bars (4–12 nos.)
Stirrups / Ties	Fe 415 / Fe 500, dia 8–16 mm @ 100–200 mm c/c
Nominal Cover	40 mm (moderate exposure) per IS 456:2000
Tolerance — Length	±10 mm (IS 15916:2020 Cl. 7.2)
Tolerance — Section	±5 mm on each face; Straightness: L/600 or 10 mm
Surface Finish	Class F2 (as struck) or Class F3 (off-form smooth)

APPLICATIONS Industrial Sheds & Warehouses | Multi-Storey Car Parks | Metro Station Structures | Station Platform Structures



10

PRODUCT CATEGORY

PRECAST BEAMS



Precast beams are horizontal structural members designed to span between columns or walls, supporting floor or roof slabs. Common profiles include rectangular, L-beam, inverted-T and I-girder sections, often pre-stressed for longer spans and higher load efficiency.

GRADE	M35 – M60 (pre-stressed beams use higher grades)
SECTION	Rectangular / L-Beam / Inverted-T / I-Girder / U-Beam
WIDTH	150 mm – 600 mm
DEPTH (D)	300 mm – 900 mm (up to 1200 mm for bridge girders)
SPAN	4 m – 18 m (pre-stressed: up to 35 m)
STANDARD	IS 15916:2020, IS 456:2000, IS 1343:2012

TABLE 10 — PRECAST BEAM LOAD CAPACITY GUIDE

BEAM TYPE	SPAN (M)	DEPTH (MM)	INDICATIVE UDL (KN/M)	TYPICAL APPLICATION
Rectangular RCC	4 – 8	300 – 500	20 – 50	Industrial frames, warehouses
Inverted-T PSC	8 – 15	500 – 750	50 – 120	Car parks, commercial floors
I-Girder PSC	15 – 35	900 – 1200	80 – 200+	Bridge girders, long-span roofs

APPLICATIONS Multi-Storey Building Frames | Industrial Warehouses | Flyover & Bridge Decks | Station Roof Structures



11

P R O D U C T C A T E G O R Y

PRECAST SLABS (HOLLOW CORE / SOLID)

The Hollow Core Slab (HCS) is the most widely used precast floor system — a pre-stressed slab with longitudinal circular voids that reduce self-weight by ~25–30% while maintaining high flexural and shear capacity.

GRADE	M40 – M60 (pre-stressed)
STD WIDTH	1200 mm (cut to any width)
THICKNESS	100, 120, 150, 200, 250, 270, 300, 400 mm
SPAN RANGE	3 m – 23 m (depending on depth and imposed load)
SELF - WEIGHT	~2.95 kN/m ² vs ~4.80 kN/m ² solid — 38% lighter
STANDARD	IS 15916:2020, IS 10297:1982, IS 1343:2012

TABLE 11 — SPAN-LOAD PERFORMANCE GUIDE (200MM HCS)

SPAN (M)	MAX IMPOSED LOAD (KN/M²)	TYPICAL APPLICATION
4	12.5	Short span / storage floors
6	10.5	Office / residential floors
8	7.5	Car park decks
10	5.0	Retail / commercial floors
12	3.5	Long-span floors
15	2.5	Max span; structural topping recommended

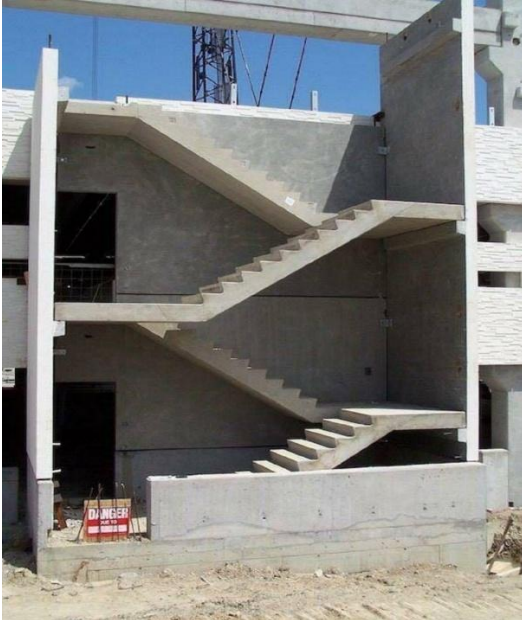
APPLICATIONS Residential Floors & Roofs | Commercial Buildings | Car Park Decks | Industrial Floor Slabs



12

PRODUCT CATEGORY

PRECAST STAIRCASES



Precast staircases are factory-manufactured stair flights complete with steps, landings, handrail anchors and bearing pads. Produced as single-flight or double-flight (dog-leg) units with nosings, anti-slip finishes and precise riser/tread geometry.

GRADE	M30 – M45
RISER HEIGHT	150 mm – 190 mm (IS 15916: 175 mm typical)
TREAD	250 mm – 350 mm (250 mm min. per NBC 2016)
FLIGHT WIDTH	900 mm – 1800 mm (clear)
STEPS / FLIGHT	10 – 18 steps (standard flight)
STANDARD	IS 15916:2020, IS 456:2000, NBC 2016

TABLE 12 — PRECAST STAIRCASE TECHNICAL SPECIFICATIONS

PARAMETER	SPECIFICATION / VALUE
Waist Slab Thickness	120 mm – 200 mm (varies with span & load)
Nosing	25 mm overhang; anti-slip carborundum finish
Design Live Load	3.0 kN/m ² (residential) / 5.0 kN/m ² (public)
Bearing Length	≥ 75 mm on each support (non-shrink grouted)
Tolerance — Length	±15 mm (IS 15916:2020 Cl. 7.2)
Surface Finish	Class F2; GRC nosing optional; exposed aggregate available

APPLICATIONS Residential Apartment Buildings | Commercial & Office Complexes | Metro & Transit Stations | Station Buildings



THE PRECAST ADVANTAGE

Why Precast is the Right Choice for Indian Railways

By adopting high-quality precast solutions, Indian Railways can achieve its infrastructure modernization goals 30–40% faster, more economically, and with higher reliability — backed by IS-certified manufacturing and proven performance.

1 SPEED OF CONSTRUCTION

Components pre-manufactured off-site. On-site activity reduced to assembly, cutting "mega block" possession times by 30–40%. A 10 km drainage installation completed in weeks — not months.

2 UNCOMPROMISED QUALITY

Factory-controlled batching delivers M30–M60 grade uniformity with coefficient of variation <5%, vs 15–20% typical for field-cast concrete — eliminating weather and curing variables entirely.

3 DURABILITY

Controlled steam curing ensures 50+ year design life with minimal maintenance. Lifecycle cost savings of 25–35% over conventional — critical for Railways' long-term asset management strategy.

4 WEATHER INDEPENDENT

Manufacturing continues year-round regardless of monsoons or extreme heat, eliminating the 3–4 month monsoon productivity loss of site casting. Supply chain continuity protects all project schedules.

5 COST EFFICIENCY

On-site labour reduced by 40–50%. Zero shuttering cost, material waste <2% (vs 10–15% in-situ). Direct savings of Rs.15–25/kg placed — directly improving EPC contract margins.

6 SUSTAINABILITY

Site air and noise pollution cut by up to 60%. Water usage down 30% through efficient factory curing. Precision manufacturing minimises raw material waste and supports Railways' green infrastructure goals.



ADVANCED MATERIALS DIVISION

UHPC Solutions for Indian Railways

*Ultra High Performance Concrete — Defining the Future of Resilient Railway Infrastructure***120-200 MPa**COMPRESSIVE
STRENGTH**100+ Years**

DESIGN LIFE

50-70%DEAD WEIGHT
REDUCTION

UHPC PRECAST PRODUCTS

PRODUCT APPLICATION	DESIGN STRENGTH FCK (MPa)	THINNESS VS RCC	KEY ADVANTAGES	COMMON USES
UHPC Platform Coping Slabs	150-180	50%-60%	Resists chipping from passenger/trolley loads. Integrated tactile patterns. Lightweight for rapid installation.	Platform edges, Amrit Bharat Station upgrades
UHPC Drain Covers (High Load)	140-170	60%-75%	Drastically reduced weight for manual handling, handles heaviest yard traffic (E-60+), excellent chemical resistance.	Heavy-traffic yards, fuelling points, maintenance depots
UHPC Cable Trays & Covers	120-140	50%-60%	Lighter handling, precise interlocking for sealing, high protection for crucial S&T cables.	Trackside signalling, telecommunication lines
UHPC Bridge Deck Panels (Modular)	150-180	40%-50%	Reduced dead load, rapid assembly during short blocks, superior fatigue resistance under dynamic train loads.	New rail bridges, replacement of corroded steel decks
UHPC Noise Barriers	120-140	60%-70%	Highly effective sound insulation, durable in all weather, aesthetically adaptable.	Elevated tracks near residential areas, station peripheries
UHPC Boundary Wall Panels	130-150	50%-60%	Lightweight, anti-vandal, extremely difficult to break, rapid securement of railway land boundaries.	Station security fencing, trackside boundary walls



THE BUSINESS CASE

Precast RCC vs UHPC Precast

FEATURE	PRECAST RCC/PSC	UHPC PRECAST	IMPACT ON INDIAN RAILWAYS OPERATIONS
Compressive Strength	35-60 MPa	120-200 MPa	Smaller, lighter structures; handles higher loads
Section Thickness	Standard / Heavy	Ultra-Thin	Significant reduction in material usage and dead weight
Handling Weight	High	Low (50%+ less)	Faster installation, smaller cranes, less possession time
Durability / Service Life	25-50 years	100+ years	Drastic reduction in maintenance and replacement costs
Permeability	Low	Negligible	Impervious to water and chemical ingress
Fatigue Resistance	Moderate	Very High	Vital for track components and bridge decks
Overall Lifecycle Cost	High (maintenance)	Low (zero maintenance)	Most cost-effective solution over asset life

THE BOTTOM LINE

UHPC Precast components deliver the lowest lifecycle cost for Indian Railways — combining ultra-high strength, century-plus design life and dramatically reduced installation footprint.



CONTACT US

PATIL GROUP

Accelerating Infrastructure. Ensuring Reliability.

OUR PRODUCT RANGE

- Precast U-Drains & Drain Covers (300mm – 1200mm)
- Precast Box Culverts (1000mm – 4000mm Single Cell)
- Precast Manhole Chambers (Rectangular & Circular)
- Precast Railway Platform Wall (RDSO Compliant)
- Precast Platform Coping Slabs (RDSO Compliant)
- Precast L-Shape Retaining Walls (1.0m – 4.0m+)
- Precast Toilet Blocks (Swachh Bharat Initiative)
- Precast Signalman Cabins (Compact to Large Modular)
- UHPC Precast (Drain Covers, Bridge Decks, Noise Barriers)
- UHPC Boundary Walls, Cable Trays (Permanent Shuttering)

All products manufactured with minimum M35/M40 grade · IS 456 compliant · RDSO loading standards

EMAIL	PHONE	ADDRESS	WEBSITE
rohit@patilgroup.com krishnamraju@patilgroup.com	+91 9977882602 +91 9848938338	6-3-1239/B/111 Raj Bhavan Rd, Somajiguda, Hyderabad – 500082	www.patilgroup.com