

SOHAM DEY

Associate Engineer Transportation Bridges Team



PROFESSION

Associate Bridge Engineer

JOINED ATKINSRÉALIS

March 2023

NATIONALITY / LANGUAGES

Nationality – Indian

English, Hindi, Bengali

PROFESSIONAL ASSOCIATIONS

C.Eng. from Institution of
Engineers India,

Graduate member of The
Institution of structural Engineers
(IstructE UK)

QUALIFICATIONS

- B.E in Civil Engineering
from IEST, Shibpur
- Masters in Structural
Dynamics (Department
of Earthquake
Engineering), IIT
Roorkee

PROFILE

Soham has overall 6.5 years of experience. He has been involved in the detailed design and assessment of Highway and metro structures. He has worked on various UK and Indian Projects. He has expertise in STAAD, MIDAS & LUSAS Software.

KEY EXPERIENCE

- Analysis and design of substructures (Open and Pile foundations, of pile, pile cap, pier, pier cap (PSC / RCC)) and entry exit structures for Metro rail.
- Analysis and Detailed design of Analysis and design of Jetty and wharf structures for marine projects.
- Assessment and checking of various bridge components (PSC / RCC / steel composite) including vehicle restraint system.
- Preparing Review of Structural Review form including Risk reliability matrix of already constructed Bridges.
- Detailed design and detailing of storage reservoir outlet structure including stilling basin during drawdown condition.
- Screening of Abnormal load notification for existing bridges.
- Assessment of Wooden Bridges.
- Optioneering, Conceptualization and preliminary design of Debris flow shelter (DFS) for hill roads.
- Deck Refurbishment scheme as per UK standards

**EXPERIENCE WITH
ATKINSRÉALIS
(03/2023 - Ongoing)**

- **Optioneering, Conceptualization and preliminary design of Debris flow shelter and Debris flow wall for Hill Roads. Client: Transport Scotland (Detailed Design work):**

The A83 Trunk Road serves as a vital link between Argyll and Bute and the central belt. However, frequent landslides in the Glen Croe region led to road closures for about one-third of the year, impacting businesses, healthcare, and global affairs. To address this, the Scottish government funded short-term mitigation and mandated to find long-term and effective solution. Among 11 proposed options, Route Corridor 1 through Glen Croe is preferred due to its cost-effectiveness, quicker implementation, and reduced environmental impact. The selected route is further assessed for five possible options, out of which Brown Route is preferred by the client. Notably, GTC has played a pivotal role in the Brown Route design development, employing tasks such as structure forms, generating parametric BIM models with RHINO scripting, refining dimensions, quantity estimation, extracting 2D drawings from BIM and formulating optimal construction sequences. The Brown route comprises of 1.37km Debris flow shelter (DFS) and 0.18km Debris flow wall (DFW), with cross-drainage structures to allow stream water. In pursuit of sustainable and effective solution, an option study was conducted. The option involves a rigid portal structure, and a pinned joint portal structure. Both options were analysed with different foundations like Pile-Pad and Pile-pile, maintaining sufficient spacing between piles and an opening in abutment wall to allow culvert, leading to element sizing determinations. Also, a standalone cantilever retaining wall was assessed. Construction feasibility reports were generated for both portal and pinned structures. The option study uncovers significant insights: pinned portals have lower pile moments but higher abutment moments, while rigid portals experience higher pile moments. The importance of shear key for Pile-Pad and soil anchors for pile-pile foundations is highlighted. The construction feasibility report prioritizes a hybrid approach combining precast and in-situ methods, considering A83 route's partial closure. The study aims to determine ideal element dimensions and provide quantity estimates for efficient material procurement.

- **Cobbler Bridge Assessment, Client: Transport Scotland**

The structure comprises a continuous three-span reinforced concrete beam-and-slab deck supported by mass concrete pier columns and abutments. The span lengths (between centre lines of supports) are 12.04, 12.19m and 12.04m, and the width of the deck is 9.15m. An assessment of the superstructure has been undertaken to determine the current load carrying capacity. A combination of finite element or grillage modelling software and hand calculations have been used to assess the structure in accordance with the current versions of CS 454, CS 455 and other relevant DMRB standards. The substructure and foundations have been assessed qualitatively.

- **Deck refurbishment scheme, Client: South Wales Trunk Road Agent**

Origination of AIP, barrier upgradation requirement checks as per CD377, CS 462 Concrete testing desk study screening assessment and scheme drawing preparation for five bridges namely Bryn village, Coryton North & South, Pitt village & Park farm.

- **Whinfell Forest Overbridge (A66 Northern Trans-Pennine), Client: National Highways UK (Detailed Design work)**

The scope of work sees the construction of a two span, fully integral overbridge with steel composite superstructure, and substructure comprising reinforced concrete (RC) bank seats on reinforced earth (RE) abutments (with slip system beneath using a sand bedding) and a RC leaf pier. The superstructure comprises 6 No 635mm deep plate girders at 2070 to 2400mm spacing supporting a precast concrete deck, with in-situ stitches for composite action, and precast stringcourses. The structure is 13.310m wide to accommodate a 7.300m two lane carriageway, and 2 No 2.505m verges, the eastern verge being a shared

use footway / cycleway. The overbridge spans the A66 with spans of 19.545m and 17.090m, giving a total length of 36.635m, to accommodate the carriageways, verges, and off-slip roads below. Lateral torsional buckling check of the main girders have been performed with the Eigen value analysis by LUSAS software for different erection stages.

- **Assessment of M11 J8-9 Sign Gantries G1, G2 & G3 and Design of Aluminium Supporting Frames, Client: National Highways UK (Assessment work):**

As part of the M11 junction 8 to 9 safety improvement works, it is proposed to replace the existing Advanced Directional Signs (ADS) located on gantries G1, G2 and G3 with new ADS to the current highway standards. The proposed new ADS raises the signs' overall height above the gantries, increasing the sign face area and the wind loading on the gantry. Structural assessment for all three gantries is performed in MIDAS Civil software to ascertain the suitability of the existing PSC gantry structure, aluminium L frames as well as connections for the increased wind loading and carry out a detailed design for structural modifications required to support the revised sign layout.

- **New River Path - Timber deck Bridge replacement TQ, Client: Broxbourne Borough Council UK (Detailed Design):**

New River shared path wooden bridge replacement for widening from 2.1m to 3m width and preparation of general arrangement drawing at chainage 5483.50km with a Contractor proposed design. Preliminary assessment and design of wooden beams and planks for ULS & SLS check to ascertain the suitability of contractor proposed sectional dimensions.

**EXPERIENCE WITH
JACOBS SOLUTION INDIA
PVT. LTD.
(05/2021 – 03/2023)**

- **Chancay Multipurpose Terminal New First Stage, Peru, Client: Cosco shipping (Detailed design)**

Detailed design and detailing of four operational berths of Chancay. Multipurpose terminal project. Berths 1 & 2 are multi-purpose berths, Berth 3&4 are specialized container berths. Deck beams, pile plug, precast pile cap and precast deck slab are designed as per client requirement. Staad Pro and ACI code have been used as analysis software and design methodology respectively.

- **Mina Hamriya Design & Construction of New Quay Berths - Phase 1, Client: DP World UAE (Detailed design)**

Several options have been explored in STAAD Pro. to finalize the general arrangement of the 98m length berth.

- **Hartshead Moor Services Footbridge, Client: A-one UK (Assessment work):**

Assessment of the service footbridge which was constructed in 1972. It is a four-span concrete footbridge comprising precast rectangular spine/box beam with cantilever wings. pedestrians across the M62 mainline between junctions 25 & 26. The beams to the two carriageway spans are voided post-tensioned concrete. The side span beams are solid un-tensioned reinforced concrete. The bridge is square and symmetrical about its centreline, with 10.97m side spans and 18.89m carriageway spans, with 2.28m between the parapets. The structure has been assessed using linear elastic analysis methods with simple statics by using software package MIDAS CIVIL. CS 454 & CS455 codes have been used extensively to support the assessment methodology. As built condition, the recorded condition and two sensitivity checks have been performed by varying the losses in the cable due to deterioration because of ingress of water into the cables.

- **Iden Bridge Assessment, Client: East Sussex County Council (Assessment work):**

Preparation of RSRF, AIP and assessment methodology. Iden Bridge was commissioned in 1971 and consists of a single span skewed at 30 degrees to the riverbank, it has a skew span length of 25.24 m and an overall width of 10.50 m. The superstructure comprises of five 'Cor-ten' steel universal beams at 2 m centres, the beams are braced at the end by Universal Beam diaphragms. The beams and slab are of composite construction, each main beam has over three hundred shear connectors. The abutments are of reinforced concrete and are each supported on nine 35m long 'H' piles. The whole bridge including abutments and piles has been modelled by finite element method in LUSAS modeler v19., considering section losses of the bridge components as per various inspection reports. Abutment and piles are also modelled as per current rotations as specified in various reports. ALL 2, SV80, SV100, SV150, SV196, SVTT, SOV250 & SOV350 vehicles have been used for analysis and assessment of the bridge. All major items of the bridge like superstructure, abutment, dirt wall, pile cap, piles have been assessed in this project. CS451, CS454, CS455, CS458, CS459, PD6694 etc. codes have been used extensively.

- **Littleborough and Rochdale FRMS Phase 1 NR Downstream Headwall Structural Calculations, Client: Environment Agency U.K (Detailed design):**

Structural calculation and reinforcement detailing preparation of head wall, wing wall and stilling basin slab of culvert outlet of storage reservoir during drawdown condition, using finite element software Midas Civil. BS EN 1990 Basis of design & UK National Annex, BS EN 1991 Actions on structures & UK National Annex, BS EN 1992-2:2005 and the UK National Annex codes have been used extensively for design purpose.

Yorkshire & Northeast Abnormal Load Notification Screening Summary, Client: Highways England: Screening Summary preparation of abnormal loads for almost 600 ESDAL references using Midas Civil software.

Structural Review work for Worcestershire County Council. Client: Worcestershire County Council: Preparation of RSRF for almost 75 bridges and checking of Parapet and VRS replacement design calculations for Talbot Bridge using various UK codal provisions. Pier impact assessment of three structures.

**EXPERIENCE WITH
TANDON CONSULTANTS
PVT. LTD, NEW DELHI
(12/2020 – 05/2021)**

Detailed Design of two number of RRTS elevated Stations (i.e., Sarai Kale Khan and New Ashok Nagar including Multimodal Integration Scheme), approx.11km Elevated Viaduct (from Sarai Kale Khan up to Elevated RRTS Ramp near Khichripur and Sarai Kale Khan to Jangpura Stabling yard), Client: NCRTC (Detailed design): Detailed design and detailing of pile pile-cap pier of viaduct with and without complex utility.

**EXPERIENCE WITH
AECOM INDIA PVT. LTD,
MUMBAI.**

(03/2019 – 11/2020)

- **Detailed Design of Mumbai Metro Line 4 (32.2 KM STRETCH FROM WADALA TO KASARVAVALI COMPRISING 32 STATIONS). Client: CHEC TPL JV & ASTALDI RELIANCE INFRA JV (Detailed design):**
Detailed design and drawing of post tensioned precast concourse level cross arm for all 12 grids of typical cantilever station with the help of MIDAS CIVIL software. Detailed design and detailing of pile, pile cap, pier of viaduct (normal and cantilever type) with and without complex utility problems. Bending theory is used to design the pile and pile cap. Detailed design and detailing of cantilever cast in situ pier cap. Detailed design and detailing of open foundations for normal and cantilever locations with the help of labfil software. Detailed design and detailing of pile, pile cap pier of station. Design coordinator of package CA09 from AECOM side (client: Tata Projects Ltd).
- **Detailed Design of Mumbai Metro Line 9 (11.386 km stretch from Dahisar East to Mira Bhayandar), Client: J Kumar Infra projects (Detailed design):**
Detailed design and detailing of pile, pile cap, pier with and without complex utility problems. Rivet theory is used to design the pile and pile cap. Detailed design and drawing of post tensioned precast track level cross arm for all 12 grids of typical cantilever station with the help of MIDAS CIVIL software. Detailed design and drawing of post tensioned precast flyover cross arm of double decker spans (metro + flyover).
- **Detailed Design of Delhi Metro Phase 4 (package DC02) (12.55 KM STRETCH FROM MAJLIS PARK TO MAUJPUR), Client: Longjian KEC JV:**
Detailed design and drawing of post tensioned precast pier cap of standard T girder spans. Detailed design and drawing of post tensioned precast cantilever pier cap of U+U girder spans.

**EXPERIENCE WITH
SPECTRUM TECHNO
CONSULTANTS PVT.
LTD, MUMBAI.**

(06/2018 – 03/2019)

Detailed Design of Mumbai Metro Line 7 (16.475 KM STRETCH FROM ANDHERI EAST TO DAHISAR EAST), Client: J Kumar Infra projects (Detailed design): Conceptualization, design and detailing of entry exit structures of Bandongri and Mahindra & Mahindra station buildings. Detailed design and detailing of pile, pile cap, pier of viaduct (normal and cantilever type) with and without complex utility problems.

**EXPERIENCE WITH KIIT
UNIVERSITY,
BHUBANESWAR**

(06/2017 – 12/2017)

Teaching & Research