CURRICULUM VITAE

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EDUCATIONAL QUALIFICATIONS

a) ***Ph.D*** *(Structural Dynamics, Both Linear and Non-linear Statics & Dynamics of Cable System) in 1998.*

Structural Laboratory, Saitama University (National University), Japan. Thesis title: **"Vibration Control and its Mechanism in Cable System with Secondary Cable"**. Research is done under the financial assistance of Monbusho scholarship programme from the Ministry of Education, Culture and Science of the Japanese Government.

b) ***Master of Science in Civil Engineering*** *(Structural division) in 1994.*

Bangladesh University of Engineering & Technology (BUET), Dhaka, Bangladesh. Part-time study-2 years. Thesis title: **"A Design Rationale for Circular Silos Based on Finite Element Analysis"**.

c) ***Bachelor of Science in Civil Engineering*** *in 1992.*

Bangladesh University of Engineering & Technology (BUET), Dhaka, Bangladesh. Full time study-4 years. Thesis title: **"Finite Element Analysis of Axi-symmetric Structures with Special Reference to Silo"**. Received tallentpool scholarship from University and secured **first position** with honours marks among 189 successful students. Gold Medal was awarded for this excellent academic result.

MEMBERSHIPS

Member of **Professional Engineers Ontario** (2004 to Current, No. 100073198)
Member of **American Society of Civil Engineers** (from 2003 t0 2005)
Member of **Institute of Engineers Australia** (from 1999 to 2002)
Member of **Japan Society of Civil Engineers** (from 1995 to 1999)

SELECTED WORK EXPERIENCES

a) *The Employer* **S-AlgoL Consulting and Software, Toronto, Ontario, Canada (My own Company)**
Position Structural Engineer & Principal Developer
Period From June 2014 to date
Nature of job I have been working to develop some specialized software for additional automation in structural engineering design and delivery process. I have been working as a part-time senior engineer in another structural consulting company (please see next section) under contract.

MY INVOLVMENT IN S-ALGOL CONSULTING AND SOFTWARE

❖ **Automation in Shear Wall design for high-rise building ("LatSys" Application)**

Some advanced software, like ETABS, are being used in structural engineering design offices to develop 3D model for the analysis of building structures using Finite Element method. Design forces for shear walls are exported from the analysis results, obtained from Finite Element model, to another software for design purpose. In this process, every shear wall needs to be designed individually. In a typical high-rise building, the total number of shear walls could be several hundred. Importing individual results and designing shear walls individually is time consuming and it is very easy to make mistake in this process. This whole process of importing results and designing all the shear walls can be automated

programmatically with some specially developed software. It may also become possible to generate shear wall schedule in .DXF or .dwg format programmatically. Finally, AutoCAD or Revit Structure can import/open that .DXF or .dwg file to generate production drawing with very minimum editing. Currently, I have been working to develop a graphical interface for this software.

- **Automation in Column design and producing Column Schedule ("EasyColumn" Application)**

Traditionally, column load rundown is done either manually or in another software and the actual design of columns is performed in separate software. Mark-ups for column schedule are prepared by the design engineer and given to draftsman to produce production drawings. This process may need back-checking of the drafted drawings by the design engineer several times. Efficiency of this design and drafting process can be increased significantly by developing a single software capable of performing load rundown, designing columns and producing .DXF or .dwg file for column schedule. Finally, AutoCAD or Revit Structure can import/open that .DXF or .dwg file to generate production drawing with very minimum editing. I am hoping to continue working in this direction in the future.

- **Automation in Beam design and producing Beam Schedule (Schedule from Excel Application)**

I believe, designing beams and producing beam schedule drawings programmatically in the same software is not very difficult. I am hoping to continue working in this direction in the future.

S-AlgoL Consulting & Software has been, also, trying to develop several other software applications, very briefly presented, as below;

- **Section Properties & Sectional Analysis for standard, custom & generic shapes ("SectionPro" Application)**
- **Steel Design software ("SteelMatrix' Application)**
- **Excel to Revit Table Conversion Tool ("CadLink" Application)**
- **Bluebeam PDF Markups to CAD & Revit Software ("CadLink" Application)**
- **Structural Detail Software ("S-Details" Application)**
- **Calculation Tool for Design ("EnCalcs" Application)**
- **Model Generation for ETABS, SAP2000 & SAFE, (using PDF Markups & Excel files) ("ModelGen" Application)**
- **Generating CAD files (.dwg or .dxf) from PDF Markups ("MarkUps2Cad" Application)**

b) *The Employer* **PICCO Structures (PSL), Concord, Ontario, Canada**
Position Senior Engineer (Part-time and under contract)
Period From October 2021 to date
Nature of job In PSL, I have been working for advanced analysis and design of complex building projects. These projects include new projects and renovation & expansion of existing residential & commercial buildings.

MY INVOLVMENT IN PSL (Part)

- **Marina Cavtat & Resort, Vukovarska 22 20 000, Dubrovnik, Croatia 2023**

The project is located between Mo major tourist centres and larger cities in Southern Croatia and is in close proximity to the Dubrovnik international airport. This is a high-end luxurious resort, the site combines about 9 ha of land and 8 ha of water development that integrates various building uses and marina anticipating possibility for further growth and expansion. In general, this project embraces architecturally expressive and integrated designs combining hospitality, residential, mix-use, luxury villas, amenities and marina facilities.

- **Pier 8 – Blocks 3 and 6 Development, City of Hamilton, Ontario, 2024**

Two residential mid-rise blocks, Block 3 and 6.

- **Hedgewood House, Toronto, Ontario 2025**

A new residential building located at the end of Hedgewood Road in Toronto. This sizeable residential building includes two storeys above grade and two levels below ground with a gross external area (GEA) estimated at approximately 28,500 sf. The proposed structural system is highly advanced and integrates a blend of building materials, as well as some locally uncommon construction techniques. The material mix combines natural stone and masonry, cast-in-place (CIP) and precast concrete, timber construction, and limited structural steel framing. The concrete portion is further compartmentalized to include

conventionally reinforced CIP concrete and precast elements, as well as areas that will require further enhancement by incorporating post-tensioning tendons. Similarly, the segmental natural stone construction for perimeter beams and/or columns will require post-tensioning in its 'true structural' applications. This last item is considered exceptionally unique for the local practice.

- **Ancaster Residence – Ancaster, Ontario, 2024**

This project involves design of a new approx. 24,700 sf house with a 500 sf pool house and 2,100 sf heated building located in Ancaster, ON.

- **153-185 Eastern Avenue Redevelopment – Pre-design Consulting Services, Toronto, Ontario 2023**

This involved pre-design structural engineering consulting services for a large site redevelopment project located in downtown Toronto, Ontario. Once fully constructed, this development will incorporate three new high- rise residential buildings, multi-level underground parking, public and amenity spaces, and other associated facilities.

- **96-98 Centre Beach Road – Custom Home, Tiny Township, Ontario, 2025**

This project involves the design of a new, large three-storey custom home with a basement and an integrated two-car garage on the ground floor. The development is located on a currently occupied lot in Tiny Township. The project is expected to embrace architecturally modern design and amenities, integrating high aesthetics and functionality throughout the building.

- **2048 & 2058 King Road – Commercial Development, Township of King, Ontario 2025**

A new 6-storey commercial building with one level of underground parking. Currently, the structure to incorporate a cast-in-place concrete frame to grade, including the ground level slab and the stair/elevator shafts above grade. Structural steel framing is envisioned for the superstructure columns and beams with a composite metal deck and concrete topping slab or hollow-core for superstructure floors.

- **2 West Water Street – Post-Tensioned Stone Stair, Sag Harbor, NY, 2022**

This project involved a post-tensioned stone stair system within a private residence located in Sag Harbor, NY. The stair is comprised of 3 separate flights connecting the Garage Level to the 3rd Floor Level. Each flight of the stair employs a system of solid stone treads working in union with concealed post-tensioned cables. The performance of the system is highly dependent on fabrication and installation tolerances and is influenced by the stiffness of the base building framing supporting the ends of each flight. Structural steel anchoring components interfacing with base building framing are configured to maximize stiffness while minimizing visual impact in the final condition.

c) *The Employer* **Read Jones Christoffersen (RJC), Toronto, Ontario, Canada**
Position Senior Engineer
Period From October 2014 to 2020
Nature of job In RJC, I have been working mainly on high-rise building projects. These projects include new projects and renovation & expansion of existing residential & commercial buildings.

MY INVOLVMENT IN RJC (Part)

- **45 Bay Tower (CIBC Square), Toronto, Ontario 2019**

The 45 Bay Tower is located just south of the Union Station train tracks and opposite to Air Canada Centre on Bay Street. This is a 58 story office tower with a podium (ground level to level-08) and three (3) levels of basement. The podium consists of the new Metrolinx bus station at GF and L2, having 24m (78.7 ft) clear span at L2 with 900mm deep post-tensioned slab. Above L2, the blast resistant mechanical floor is situated. Full story high steel truss between L3 and L4 has been designed as the transfer system for the columns above L4 to l8. I was responsible for the design of the 900mm deep post-tensioned slab supporting the GO bus station. I designed the above-mentioned transfer truss as well, considering necessary blast requirement.
North foundation wall, around 100 m long and 1000mm thick, is acting as both shear wall and crash wall for the possible events of train derailment. I designed this component considering both Building code and relevant AREMA design code, as required. The load path for this building structure was very complicated due to the requirement of having GO bus station inside this building. I was responsible for the design of all the podium columns with some critical transfer system. I was, also, responsible to design many other structural elements in the podium part of this project. This building is now under construction and I am still involved to deal with the unexpected site conditions (preparing responses for RFIs, as applicable).

❖ **141 Bay Tower, Toronto, Ontario 2019**

The 141 Bay Tower is located just north of the Union Station train tracks, and in fact, the south portion of the tower overhangs directly above the proposed track expansion. This is a office tower having 52 office levels and five basement levels for parking. This project is the second phase of a large development and it has to fit and merge with the previously constructed North Portal, the West Park/terrace of 81 Bay development and the adjacent proposed work by Metrolinx and TTC. I was responsible for the preliminary design of the lateral system and major framing of the floor and trusses.

❖ **The Rose, Toronto, Ontario 2019**

The Rose is a 102-story residential tower with a mechanical penthouse, likely, housing dampers. The lower section of this tower will house rental apartments and the upper portion above the sky-lobby and amenity spaces will house condominium apartments. The tower includes an 11-storey podium accommodating amenities at the upper floors, 7 levels of office space and 3 levels of retail.
RJC was responsible for the schematic design of this building and I was assigned to perform the required analysis and design of the lateral system, including transfer beams and floor system. Lateral load resisting system for this building is comprising of concrete shear wall with outrigger system. The perimeter vertical elements, eight columns, are subjected to very high axial forces due to both gravity and lateral loads. In order to control the overall sway of the building and the inter-story drift, we inserted four W360x1086 steel sections inside each column to increase the axial stiffness to improve lateral performances of this slender tower. However, acceleration due to wind load was beyond the allowable limits. In our preliminary design, we proposed several options to reduce this wind acceleration in order to provide acceptable comfort levels to its occupants. In our preliminary design, we proposed options using one or more of the vibration controlling system, such as VCD, TMD and TLD.

d) *The Employer* **CH2M Hill, Yolles and Halcrow Yolles, Toronto, Ontario, Canada**
Position Senior Engineer
Period From November 2006 to May 2014
Nature of job I was working as a senior engineer in CH2M Hill (previously known as Halcrow Yolles and Yolles) with the involvements in the design works of different types of structural systems. My responsibilities included almost all types of professional duties related to structural engineering. For some projects, my involvement started from the conceptual design to the final detail design. I used to maintain co-ordination with the architects and other parties related to a particular project. I used to attend project-meetings in order to take critical decisions to meet the needs of the client, satisfying relevant constraints as much as possible.

<u>MY INVOLVMENT IN CH2MHILL, YOLLES & HALCROW YOLLES</u>

❖ **Casey House; Hariri Pontarini Architects; Toronto, Ontario; 2013**

In charge of the design of this 5 storied hospital building having a 6.8 m cantilever floor at level 4. I was responsible for lateral design, design of other vertical components, footing and the above-mentioned cantilever box. Special attention was given in the design of this cantilever box to control vibration due to normal office use considering relevant code of practice.

❖ **621 King Street West; SAUCUER + PERROTTE Architects; Toronto; Ontario; 2014**

Reviewing previous slab design and redesign all upper level slabs to correct deficiency of this 18-storey condominium building.

❖ **Citadel Hotel Redevelopment; Chamberlain Architects; Halifax; Nova Scotia; 2013**

In charge of the lateral design of this 15-storey hotel building, including foundation design related to the lateral system.

❖ **Granite Club; Toronto; Ontario; 2013**

In charge of redesigning the lateral system of this 5-storey building, including foundation design related to the lateral system. Originally, It was designed for 250% of actual lateral load by mistake.

❖ **Fairfield Inn and Suites, Marriott; Chamberlain Architects; St. John's; Newfoundland; 2012**

Project Engineer and In charge of the lateral design of this 6-storey hotel building, including foundation design related to the lateral system.

- **Sick kids Research Tower; Sick Kids Hospital; Toronto, Ontario; 2010**

In charge of the lateral design of this 27-storey research building, including foundation design related to the lateral system.

- **Canadian Museum for Human Rights (CMHR); Winnipeg; 2010**

This complex museum building is comprising of both steel and concrete materials with unique geometry both in plan and elevation. I was responsible to review and finalize the design of some of the complex elements.

- **State Academic Mariinsky Theatre II; St. Petersburg; Russia; 2010**

This theatre building has many unusual structural systems comprising of both steel and concrete, including several spiral stairs and complex steel stairs supported by tension hangers. Vibration problems and geometrical constraints was a major challenge and I was responsible to design this system considering advanced dynamic analysis.

- **Richard Ivey School of Business; University of Western Ontario; London; Ontario; 2010**

In charge of designing the library building comprising of steel columns having unusual geometry. I reviewed and redesigned some other structural elements as well.

- **Pedestrian Bridges in "The Bow" with TMD; Calgary; 2010.**

There are two steel box girder bridges connecting BOW north tower with Suncor Tower and Telus Building. Due to slenderness characteristic of this bridge, vibration was a big issue in the design phase and Tuned Mass Damper was added to control the vibration acceleration within allowable limit. I was responsible for the overall design of these bridges.

- **The Bow (South Block); Calgary; 2010**

Project Engineer and in charge of coordinating and designing the ground floor system of this building considering future vertical expansions and transfers.

- **Ryerson University; Toronto; Ontario; 2011**

Reviewing and checking the design of the lateral system of this 11-storey University building for updated shear wall layout.

- **Union Station Redevelopment; Toronto; Ontario; 2008**

Designing and reviewing several critical elements of this complicated structure.

- **The Edmonton Clinic North; University of Alberta; Edmonton; 2008**

In charge of the lateral design of this 6-storey university building, including foundation design related to the lateral system.

- **Aga Khan Museum; Toronto; 2009**

Checking lateral stability and reviewing and designing several complicated structural elements.

- **Royal Jubilee Hospital Review; Vancouver; 2009**

This hospital building was designed by another company but, significantly wider cracks were found before finishing the construction. I reviewed the design to find out the cause of cracking in the slabs as requested by the Lawyer appointed by client.

- **Lakehead University; Orillia; Ontario; 2009**

In charge of the lateral design of this 4-storey university building. Also, was responsible for foundation design of the lateral system.

- **Block 20 (Regent Park); Toronto; 2011**

In charge of the lateral design of this 14-storey apartment building. Also, was responsible for foundation design of the lateral system.

- **Cartier at Yorkdale Mall; Toronto, Ontario; 2012**

Coordinating and designing the shop front and renovating the structural elements for new shop for Cartier at Yorkdale Mall.

- **Capital Pointe; Hilton Garden Inn; Regina; 2011**

In charge of the lateral design of this 30-storey mixed-use building, including the design of the big mat foundation supporting the lateral system.

❖ **MarS Tower; Toronto; Ontario; 2008**

Reviewing the lateral design of this 24-storey building, including foundation design related to the lateral system. Slab design was also reviewed as requested by the contractor to reduce the reinforcement.

❖ **Drexel University; Instructional Lab Building; Philadelphia; USA; 2008**

In charge of the lateral design of this 6-storey university building, including foundation design related to the lateral system.

❖ **Jameson House; Vancouver, British Columbia; 2007**

This was a mixed-use 46-storey building situated at the site of a heritage building. We were not allowed to make any changes to that heritages building. But, we had to construct 9-storey parking spaces below that heritage building keeping the 2-storey heritage building in place. Therefore, it was a challenging project and I was responsible for the design related to this heritage part of this project. I was also the reviewer and designer of several complicated lower level slabs.

❖ **MGM Pedestrian Bridge; Las Vegas; USA; 2006**

This was complex steel box girder bridge consisting of two bridges connecting several buildings. Geometry of cross-section of this bridge was changing along the axis of this bridge in an unusual pattern and thereby making the design work very challenging. Vibration due to pedestrian walking loads was also a problem. Alauddin was responsible for the design of this bridge. However, these bridges were not built due to lack of funding.

e) *The Employer* **Carruthers & Wallace Limited (A division of Trow Associates Inc.), Toronto, Ontario, Canada**
Position Senior Project Engineer
Period From November 2004 to November 2006
Nature of job I worked as a senior project engineer in Carruthers & Wallace Ltd. and was responsible for looking after design-related issues for several major projects.

MY INVOLVMENT IN CARRUTHERS & WALLACE LIMITED

❖ **Baha'i Temple of Light, Santiago, Chile**

Baha'i Temple is one of the major projects designed by Carruthers & Wallace Limited. It is the place for future religious activity of Baha'i community in Chile. It is a very special type of structure both architecturally and structurally. It has a concrete basement, ground floor and mezzanine level. Above the mezzanine level, a curved and nine-leafed stone-claddings of about 25 meters in height acts as the outside walls and as the roof simultaneously.

The major challenge for this project is to design the nine un-coupled leafs (acting both as wall and roof) under earthquake loading. Chilean structures are subject to huge amount of lateral loadings due to earthquake shaking having significantly higher magnitude. In order to keep the lateral loading as minimum as possible, base isolation devices are used below the ground level slab to increase the natural time period of vibration. However, deformation limit plays a very important role in deciding the degree of isolation. We selected double-curvature-friction-pendulum type metal isolator and one of them is used on top of each basement columns below ground floor slab.

❖ **St. Michael's Hospital, Li Ka Shing Knowledge Institute**

It is an 18-storied Institutional development in St. Michaels Hospital in Toronto, with approximately 32000 sq-ft of floor area at each level. This building consists of two wings namely "Research Building" and "Education Building", and both of these buildings include 3 levels of future extension above the currently designed roof. The Research Building has four underground parking and the Education Building includes one basement. An Auditorium in level 2 with a big open space required several major columns to be relocated in lower levels. Architectural constraints prohibited us to design transfer beams to support these heavily loaded terminated columns. We used several symmetrical inclined columns satisfying all the restrictions to solve this problem.

❖ **Bank of Bermuda, Hamilton, Bermuda**

It is an 8-storied commercial development in Hamilton, Bermuda, with approximately 19000 sq-ft of floor area at each level. This commercial building includes one basement level and consists of a number of transfers at several levels to accomplish the set-backs required by the Bermuda Building Authority. The basement level of this building is well below the water table during the high tide period. The construction

of the big mat footing on porous Bermuda rock below water table was our major challenge in this project. There were also special requirements for the design of two big vaults included in this building.

I was responsible for all of the design works of this project as a project engineer. I needed to keep close relationship with architects and other parties, involved in this project, to deliver an economic design and to finish the project in time. I was attending the regular consultants meetings to discuss design issues among different consultants and to get updated information related to the overall progress of the project.

❖ **Richmond Hill Chinese Community Church, Richmond Hill, Ontario**

This complicated church has three major levels and one basement with one theatre-like big hall room at ground floor. It has ten roofs at different levels and several big and tall crosses. All the suspended floors are precast core slab supported by steel columns and beams. I was responsible for the design of all the vertical elements including the foundations. I designed Vertically Braced Frames and reinforced concrete masonry walls as the lateral force resisting system. Some underpinning was required to design for the existing structure.

❖ **Scarborough General Hospital Critical Care Wing, Toronto, Ontario**

This new additional wing has seven main levels and one basement with three levels of future extension above the currently designed roof. Existing multi-storied buildings surround this new addition almost at all sides. In addition to that, there are in-service existing tunnels for mechanical ducts at this site. All these above-mentioned existing structures made the design of this new building more complicated. Continuous underpinning was required at all sides at different levels. Interference of new and old footing forced us to use special techniques to design the new foundations. Due to eccentricity of the loadings on the foundations, I had to use soil anchor at several locations.

❖ **Commerce Court South Expansion, Toronto, Ontario**

It was a study to determine the economical feasibility of vertical extension of Commerce Court south building by two more levels. It was a big opportunity for me to know about the design practice and available construction material used in this region in the past. The composite columns and waffle slab system, with some beams, make the lateral load resisting system for this building. Several two-storied high steel truss are used to transfer heavily loaded columns at court level. However, none of the steel sections are available in the market now. None of the currently-used software package has built-in section properties for those steel sections. I developed a STAAD model of the complete building for lateral analysis using section properties created by MS Excel spreadsheets. Every columns, beams and slabs are checked for capacity, and reported accordingly.

❖ **Maple Leaf Gardens, Toronto, Ontario**

This project consisted of the design works related to the renovation of the Maple Leaf Arena by adding several floors to convert the arena into a Loblaws store. The design works was very challenging since we had to work considering many architectural and existing structural constraints. We designed several new floors keeping old roofs and concrete core. I was responsible for the design of several concrete floors, columns and foundations. Lateral capacity of the existing concrete core was also checked against the new level of lateral loads.

❖ **Proposal for Le Frank Condominiums, USA**

I was involved in helping our project manager in preparing a proposal for this high-rise condominium building in New Jersey, USA. I created an ETABS model for this 50-storied concrete building to study the behaviour of this building under lateral loadings. A schematic design of this proposed building, including the type of foundation, was prepared on the basis of this analysis.

❖ **Union Station Renovation, Toronto, Ontario**

Union Station renovation is a special type of renovation project since it includes a number of different types of heritage structures. The main objective of this project is to renovate the existing structure preserving the every element of the existing structure architecturally and structurally. I was responsible to design several skylight roofs satisfying the current codes & standards following many restrictions. I was also responsible for the design of the major pedestrian bridge.

❖ **Toronto Zoo Quarantine Facility, Toronto, Ontario**

It was a single story building with crawl space under the concrete slab cast on steel deck. The steel deck was used to act as a formwork without any composite action. The whole floor was supported by a series of caisson supported concrete beams. The roof was sloped steel deck. I was responsible for the design of concrete floor including al beams and caisson foundations.

❖ **Peterborough Regional Health Center, Peterborough, Ontario**

My involvement in this big hospital project started after the original submission of the tender drawings. The cost of the project exceeded the budget and the client wanted some big changes in some of the wings of this hospital including deletion of some floors and part of floors. I was responsible to check the lateral stability of the modified buildings with the new shear wall layouts. I created 3-Dimensional ETABS models for some of the wings. The shear walls also have been redesigned with the new ETABS results. I was also involved in the redesign of the few floors with adjusted layouts.

❖ **Ontario Food Terminal, Toronto, Ontario**

My involvement in this project was limited to the design of the exterior concrete loading dock. Due to poor bearing capacity of the soil, I had to design the loading dock as framed slab supported by beams and caisson foundations.

❖ **Toronto East General Hospital, Toronto, Ontario**

The hospital authority decided to replace several heavy electric transformers with new types. Generally, the new transformers were heavier than the old ones. After reviewing the capacity of the existing floors and roofs of several wings, I determined the transportation route for the removal of old transformers and installation of the new ones. New access door-openings in the existing walls were also designed.

f) *The Employer* **"C & V Engineering Ltd." and "Y & V Engineering Ltd.", Markham, Ontario, Canada**

I started working in "C & V Engineering Ltd." from February 2003. "C & V Engineering Ltd." divided into two companies from January 2004. "Y & V Engineering Ltd." is one of the above-mentioned two companies.

Position Senior Structural Design Engineer

Period From February 2003 to October 2004

Nature of job My involvement started from the conceptual design to the final detail design of a project using different software packages for the analytical modelling (2-D & 3-D as necessary) of the related structures. I used to maintain co-ordination with the architects and other parties related to a particular project. I was, primarily, responsible for the design works of several mid-rise and high-rise condominium buildings in "C & V" and "Y & V" Engineering Ltd. These condominiums were concrete buildings with some steel and masonry components. I was also involved in the design works of a number of commercial and retail building structures such as Canadian Tire store, Shoppers Drug Mart store, Future Shop store, Loblaws etc..

MY INVOLVMENT IN "C & V" and "Y & V" ENGINEERING LTD.

❖ **Thorrnhill Condominiums, John Street, Markham, Ontario**

It was a 12-storied residential development in Markham, with approximately 3400 sq-m of floor area at each level. This condominium building included two parking levels and consisted of a major transfer at ground level. I was responsible for all of the design works of this project as a project engineer.

Lateral stability of this concrete building under wind and earthquake loading was checked and appropriate design was done according to relevant Canadian Building Codes.

❖ **Cresford Condominium, Charles Street, Toronto, Ontario**

It was a 25-storied residential development in Toronto, Ontario. This condominium building included four parking levels and consisted of a major transfer at ground level. A 3-dimensional ETABS model was developed to determine the lateral stability of this high-rise concrete building under wind and earthquake loading using relevant Canadian Building Codes.

Design of all columns was done using "WD" software and Shear Wall Design module available in ETABS. Drawings, corresponding to column schedule, were prepared using AutoCAD 2002. I wrote VBA macro in AutoCAD environment to bring complete automation in this drafting process.

❖ **70 High Park Condominium, Toronto, Ontario**

It was a 23-storied residential development. I was, initially, involved in the preliminary design and review of several elements of this buildings. I designed the Slab of the Mechanical Roof level, including few important beams. I also reviewed the foundation design of this high-rise building. **ADOSS** software has been used for this purpose.

I was responsible for the detail design of the RAFT of this high-rise building.

❖ **Steel Design for Retail & Commercial Development**

I was involved in the design, related to several retail developments, in Ontario and in other provinces. Almost all of them were steel structures including some concrete and masonry elements. In case of all these projects, whole buildings were modelled in **"RAM Steel"** software for the design of beams and to get the column loads for column design and foundation design. I was involved in the design works of the following projects in this respect;

(a) No Frills, Brampton Heart lake; Project No.: 034509
(b) Zehrs Markets; Project No.: 034506
(c) Old Navy, Building B, London North; Project No.: 033121
(d) Markham Subaru; Project No.: 031700
(e) 130 Dundas Street, London; Project No.: 032106
(f) 618 Wharncliff Road, London; Project No.: 032107
(g) Mark Work Wear house; Project No.: 032108
(h) Canadian Tire Store, 1019 Sheppard Avenue; Project No.: 022114
(i) FIRSTPRO Shopping Centre, Pickering, Building J; Project No.: 033112
(j) FIRSTPRO Shopping Centre, Pickering, Building H; Project No.: 033111
(k) FIRSTPRO Shopping Centre, Pickering, Building K; Project No.: 033113
(l) FIRSTPRO Shopping Centre, Pickering, Building G; Project No.: 033110
(m) Part Source, Nepean, Ottawa; Project No.: 032105
(n) FIRSTPRO Shopping Centre, Bolton, Building J; Project No.: 033127

g) *The Employer* **Hyder Consulting, Sydney, Australia**
Position Senior Structural Design Engineer
Period From November 2001 to January 2003
Nature of job I worked as a senior structural engineer in Sydney office with skills in Computer-Aided-Design of Buildings, Bridges & Railway structures. I was involved in the design works of several major projects in Hyder Consulting, Sydney, Australia. These projects include a wide range of structural systems including high-rise concrete building, long-span post-tensioned balanced cantilever bridges, railway tunnels, different types of foundations and steel structures.

MY INVOLVMENT IN HYDER CONSULTING

❖ **Taiwan High Speed Rail Tunnel & Other Projects**

I started working in Hyder Consulting, a multi-national & multi-disciplined engineering company, from November 2001. **Taiwan High Speed Rail Tunnel** is a 365 km long TAIWANESE rail tunnel project consisting of different types of tunnel structures. Some part is Cut & Cover tunnel, some part is Mined tunnel and other parts contain Bridges, Viaduct, pile supported Tunnel and other auxiliary structures. My major involvements, including in this very big and challenging project, are as follows:

❖ **Balanced Cantilever Bridges (DU70, DU72, DU73, DU76 & DU12.2)**

I was working as a member of the design-team responsible for the design of several Balanced Cantilever Railway Bridges for **Taiwan High Speed Rail Tunnel Projects**. The design of these bridges needs static as well as dynamic analysis (Response Spectral Analysis) as per the condition in the contract documents. These design units are Single-Box-Girder viaducts supporting two railway tracks. I was responsible for the transverse design of all the above-mentioned design units. Appropriate modelling was done, using LUSAS & MICROSTRAN, to get design forces and moments under different loading conditions, including earthquake loading. I was responsible for the design of diaphragms of all these design units. I was also responsible for the reinforcement design of several piers of these viaducts.

❖ **Balanced Cantilever Bridge (DU75)**

This design unit consists of a Double-Box-Girder viaduct supporting four railway tracks. I have done the transverse design and I was responsible for the design of diaphragms of this bridge.

❖ **Bridge in DU28**

This design unit was, actually, a viaduct bridging the waterway between cut & cover tunnels on both sides. The client decided to use the same cross-section as nearby cut & cover tunnels for this viaduct. I was responsible for the design of piers, foundations and decks of this viaduct. It needed an appropriate 3-dimensional modelling for the dynamic analysis using multi-modal response spectrum method.

- **Design Units consisting of Standard Tunnel Section (Cut & Cover Tunnel)**

Hyder consulting is responsible for the design of about 60 km of the above-mentioned Taiwan High Speed Rail Tunnel Project. This part of this tunnel has been divided into several standard tunnel sections (Cut & Cover Tunnel), where applicable, in order to simplify the design works. I was responsible to perform the design of several of these standard tunnels using appropriate modelling. I have done review of the design works of several of these cut & cover tunnels as well.

- **Design Unit 36 (Piled Supported Cut & CoverTunnel)**

This part of cut & cover tunnel is supported on very weak soil of about 10 m in depth. This situation made the design works comparatively complex. This needed a very careful computer modelling of the tunnel to simulate the actual condition. This part has been designed as a tunnel supported on piles (Bored Piers) of different length as the depth of rock was varying along the tunnel axis.

- **Design Unit 24 & 30 (Pressure Relieve Tunnel; Cut & Cover Tunnels)**

Design of Pressure Relieve Tunnel (PRT) was different from other parts due to its bigger vault diameter. It consisted of standard tunnel section (smaller Vault Diameter) at one side and PRT at the other end. Transition from standard tunnel section to the PRT and the presence of several openings in PRT made the design of this part of tunnel more complicated. A full 3-Dimensional model has been created for the whole PRT with standard section to get the accurate distribution of forces and moments along the tunnel axis. 2-Dimensional modelling has also been done for the transverse design at some locations. This comprehensive modelling and analysis help me to perform an efficient, accurate and economical design.

- **Design Unit 22 (Highway Bypass over the rail tunnel)**

In this location, the new tunnel passes under an existing highway road. A design was necessary to do the construction of the tunnel without interrupting the activity in that highway, including the services under this existing roadway. Special considerations were necessary to meet these requirements. Again, the design and analysis of the bridge became complicates as the tunnel does not cross the existing roadway perpendicularly. A 3-dimensional modelling has been performed for the whole box including the four wing walls to get the accurate design forces and moments for the box bridge and the wing walls. Finally, an efficient and economical design has been made from this comprehensive analysis and design.

- **RTA Western Distributor**

It is an investigation regarding the modification of an existing elevated highway in Sydney. This portion of this elevated highway is about 120 m long and consists of decks at two levels above the ground. Road and Transport Authority (RTA) of Australia decided to remove the lower deck altogether and thereby making the unsupported length of the columns bigger. I was responsible to find out the best way of modifying the existing structure, to keep it stable without the lower deck, after examining the various possible alternatives.

- **City Quarter, Sydney**

It is a big commercial & residential development in Sydney metropolitan area consisting of three buildings having approximately 1200 square meters of floor area per building at each level. Total number of floor levels in Building A, B and C are 17, 16 & 15 respectively, including five car park levels and several retail and commercial levels in each building. I was involved in the design works of this development. Preliminary design has been done and the design has been submitted to the city council for approval. This preliminary design included determination of the layout of beams, columns and lift cores with appropriate slab and wall thicknesses.

- **AMP Olympic Sculpture Relocation, Canberra**

Three steel sculptures- Sprinter, Gymnast & Basketballer were constructed at the time of Sydney Olympic 2000 and erected on the top of AMP tower, Sydney. Hyder Consulting was the structural consultant for this project. The authority decided to relocate two of these three sculptures (Gymnast and Basketballer) to Canberra Sports Institute, Australia. This relocation work involves extensive analytical study and making engineering judgment since the loading and support conditions are different from the original design. Appropriate support conditions are decided on the basis of three dimensional nonlinear STRAND7

analysis, since flexible cables are used to restraint these 12 m and 15 m tall sculptures without changing the original member sizes of these sculptures.

❖ **Skywalk Tower Pedestrian Bridge, Dubai, U.A.E.**

This steel pedestrian bridge, having a span of 73 m and at a height of about 55 m above the ground ,connects two blocks of Skywalk Tower Building in Dubai (U.A.E) at 19th level. This is a very light structure having high possibility of big vibrational displacement under dynamic loadings due to human walking, wind and earthquake events. Passive control measures are adopted, using Tuned Mass Damper (TMD) and Tuned Liquid Damper (TLD), to reduce this vibrational movements. Necessary wind tunnel tests were also performed. The design of this structure was done by Dubai branch of Hyder Consulting. I was asked to review and to do the appropriate independent checking of this design work before final construction.

h) *The Employer* **Robert Bird and Partners Pty. Ltd. , Sydney, Australia**
Position Structural Design Engineer
Period From May 1999 to November 2001
Nature of job I worked as a structural engineer in Sydney office for two and half years with skills in Computer-Aided-Design of Building structures. I was working on several major projects in Robert Bird & Partners. These projects include a wide range of structural systems including high-rise concrete building with steel & timber-made components, airport structures, long-span space frame and trusses, different types of foundations and transfer structures.

SOME OF MY MAJOR INVOLVMENT IN ROBERT BIRD & PART. PTY. LTD.

❖ **Sydney Airport Redevelopment**

I was, mainly, involved in the design & reviewing the design of several fixed links including pile foundations for these structures.

❖ **Meriton Kent Tower, Sydney**

This 36-storied residential building, located over proposed rail tunnel, consisted of nine basement mechanical carpark levels. The size of the stair core, resisting the lateral load, becomes smaller in size by about 3 meters in these carpark levels and thereby producing a huge amount of unbalanced moments in this core below. A 3-dimentional model of the whole structure is developed using "ETABS" software to know the exact load path for this structure. From this analysis, layout of vertical elements with appropriate sizes was determined. Additionally, I was responsible for the detail design of the main transfer above the proposed rail tunnel. I designed & detailed reinforced concrete slabs for several levels, columns and main core walls including foundations.

❖ **Regency-Chatswood, Sydney**

This 17-storied residential building with several basement levels, consisted of a 30m-span steel truss in order to accommodate a big swimming pool. This truss supported seven levels of apartment building with bondek slabs. I carried out the detailed design of this 30m-span steel truss, including seven levels of bondek floors. It was very challenging from design and detailing point of view.

❖ **King Street Wharf, Sydney**

It was a 15-storied residential & commercial building with three basement levels. I was responsible for the design of several parts of the wharf project on Site-2 & Site-3. I designed the main post-tensioned transfer Beams and the Slab at level-3. I was responsible for reviewing and checking the design of all post-tensioned slabs, done by Austress. I had to do appropriate design of timber-floor mezzanine at Level 2, considering resonance and vibrations. I was responsible for the analysis and design of complicated Steel & Timber water-front canopy (awning) for site-2 building.

❖ **Broadway Development, Sydney**

I was working as a designer for the two car-park levels in stage-one development. I was responsible for the design of foundations, columns and two levels of post-tensioned slabs with band beams, including the design of several critical transfer beams (post-tensioned)

❖ **National Australia Bank, Melbourne**

It was a 10-storied commercial building including two car park levels (approximate total floor area 90,000 square meters). The whole building was to be built on a site with very soft 25-30 meter deep silty clay

layer (30 kPa ultimate bearing capacity) at the top. Every footing was designed to be supported on a number of very long concrete driven piles. Lateral earthquake loading was very critical since the lateral capacity of the piles was very low due to the presence of soft soils at the top. The concrete core was strong enough to resist the lateral loading. But, core foundation was capable of resisting only 25% of the total lateral loads. We, therefore, decided to distribute the unbalanced foundation level lateral loads among all piles supporting the column footings. I had to do a very accurate 3-dimensional finite element modelling using "ETABS" in order to evaluate the foundation level lateral loads on each pile. Initial column dimensions and core wall thickness were also decided on the basis of the results obtained from this sophisticated analysis.

- **Cove, Sydney**

This 54-storied residential & commercial building was originally designed by "Meinhardt" (NSW, Australia) Pty. Ltd. There was a big transfer at the top of nine carpark levels. This was a very slender building and the client was not completely happy with the final design. Again, the layout of the vertical elements below the transfer level was almost impossible to be built. The client, therefore, asked Robert Bird and Partners to review the overall design. My boss, Nimal Perera, asked me to do an accurate 3-dimensional modeling of the whole building. We had to adjust slab and wall thickness at several locations to make it working under lateral loads, on the basis of this analysis. Nimal Perera helped me to do significant simplification of the layout of vertical element below transfer levels.

- **Riverside II, Brisbane**

It was a 55-storied building with nine spiral carparks and several basements levels, having some inclined columns in the lower part of the building. My boss, Nimal Perera, asked me to develop a 3-dimensional line-model for this structure in order to determine its stability under lateral loads. We considered several options in modelling in order to keep the serviceability displacement within acceptable limit.

- **Peer Review, Sydney**

This column supported 9-storied building was designed by Lend Lease, Australia. All the columns were designed using 60 MPa concrete. After construction of the building, non-destructive tests were carried out on the constructed concrete in the columns. It was found that the constructed concrete in the column is of lower strength (between 50 to 60 Mpa). The client asked Robert Bird & Partners to review & justify the safety and stability of this building under the original occupancy with the reduced strength of columns. I was responsible for this review work, including all modelling and necessary calculations.

i) *The Employer* **Queensland University of Technology, Brisbane, Australia**
Position Research Assistant, School of Civil Engineering.
Period From January 1999 to May 1999
Nature of job I conducted research work on Steel Structures based on both the experimental and analytical investigations. Particularly, I was involved in investigating the nonlinear behavior of steel roof cladding to develop an empirical formula for estimating the pull-out capacity under wind load. Analytical investigation was carried out using 3-dimansional modelling of the steel roof cladding in ABAQUS. MSC PATRAN was used to model the steel sheeting as well as the fasteners. Full geometric non-linear analysis was done using some contact element available in ABAQUS. Actually, PATRAN was used as pre-processor and post-processor for the ABAQUS modelling.

j) *The Employer* **Saitama University (national university), Japan.**
Position Research Student, Structural Laboratory.
Period October 1995 to September 1998.
Nature of job I was doing research work based on both experimental and analytical investigations of cable vibrations, leading to doctoral degree (Ph. D.). It involved an extensive use of Finite Element modelling and analysis using FORTRAN programming. From his doctoral study in Japan, I have become familiar with most of the modern techniques, being used in the current world, for controlling the structural vibration.

k) *The Employer* **Civil Engineering Department, Bangladesh University of Engineering & Technology (BUET), Dhaka 1000, Bangladesh.**
Position Lecturer and Assistant Professor.
Period October 1992 to October 1995.

Nature of job In my three years of university teaching profession, as a lecturer and assistant professor, I taught a number of theoretical and practical courses in the civil engineering study. I offered some courses related to steel and concrete construction & design, including engineering computation using FORTRAN programming. I had the opportunity to work with other faculty members working as a consultant in structural engineering for the design and construction of a number of multi-storied buildings, trusses and bridges. I was also working as a consultant in quality control for various construction works. These consulting works included laboratory testing of different construction materials, such as concrete, steel, cement, aggregate etc..

COMPUTER KNOWLEDGE

Operating Environment	: Dos, Windows 95 to Windows 11, Macintosh, Unix and Mainframe.
Programming	: FORTRAN, Visual C++, C++, C#, Objective-C, Java and Visual Basic for Applications (MS Excel, AutoCAD programming).
Word Processing	: Page Maker, Corel Word Perfect and Microsoft Word.
Spread Sheet	: Microsoft Excel, Grapher, Freelance, Origin, Kaleidagraph and Stanford Graphics.
Graphics	: AutoCAD, Revit Structure, Harvard Graphics, Canvas, Minicad, Microsoft Power Point, Adobe Photoshop & Adobe Illustrator.
Computing Software	: Matlab, Mathematica, Mathcad and Mapple.
Database	: Microsoft Access 2003, MS SQL Server 2005, 2008 and 2012, SQLite
Structural Engineering Software	: SAP2000, ETABS, SAFE, STAAD, RAM Steel, CSS, ADOSS, WD, LPILE, STRAND7, LUSAS, NASTRAN, MSC PATRAN, ABAQUS, MICROSTRAN, RAPT, COMPBEAM, BIAXIAL, BHP WEBPEN, COLDES, SLABS, RAM Concept, ADAPT RC, ADAPT PT
Additional design programs & spreadsheets (self-developed and others)	: VBA program for column load calculation, Section properties calculation spreadsheet, Core wall design & Single shear wall design spreadsheet (can handle ETABS text output). Beam & column design program (beam bending, shear, and torsion, including deep beams and corbels), Crack width calculation program, Wind & Earthquake load calculation spreadsheet, Rain & snow load calculation spreadsheet. Many others.

RESEARCH WORKS AND PUBLICATIONS

Journal and conference papers

[1] Yamaguchi, H. and Alauddin Md., "Control of Cable Vibrations Using Secondary Cable with Special Reference to Nonlinearity and Interactions ", ", *Engineering Structures*, Vol. 25 (2003), pp 801-816.

[2] Yamaguchi, H., Alauddin, Md. and N. Poovarodom, "Dynamic Characteristics and Vibration Control of a Cable System with Substructural Interactions ", *Engineering Structures*, Vol. 23 (2001), pp 1348-1358.

[3] Md. Alauddin and Ahmad, S., "Design Forces and Moments in Circular Silos Based on Finite Element Analysis" , *Journal of Civil Engineering Division*, Institute of Engineers Bangladesh, Vol. CE23, No. 1, 1995.

[4] Ahmad, S., Md. Alauddin and Zia Wadud, "Finite Element Analysis of Circular Silos Under Wind Loads", *Proceedings of the First Annual Paper Meet and International Conference on Civil Engineering*. Civil Engineering Division, Institute of Engineers Bangladesh (IEB), Chittagong, November 2001

[5] Alauddin, Md. and Yamaguchi, H., "Control of Cable Vibration Through Interaction Among Main and Secondary Cables," *Proc. of Second World Conference on Structural Control*, Kyoto, Japan, June 1998.

[6] Alauddin, Md. and Yamaguchi, H., "On Interaction Among Cables in a Cable System," *Proceedings of the 52th Annual Conference of the Japan Society of Civil Engineers*, I-B166, pp.332-333, September 1997.

[7] Alauddin, Md. and Yamaguchi, H., "Nonlinear Effects of Secondary Cable on its Control Performance," *Proceedings of the 51th Annual Conference of the Japan Society of Civil Engineers*, I-B31, pp.66-63, September 1996.

[8] Md. Alauddin and Yamaguchi, H., "Nonlinear Effects of Secondary Cable on its Control Performance", *Proc. of the Third Int. Conf. on Motion and Vibration Control*, Chiba, Japan, pp 36-41, Vol. 2, September 1-6, 1996.

Theses

[1] Vibration Control and its Mechanism in Cable System with Secondary Cable - Ph.D. (Civil, Structural) Thesis, Saitama University, Saitama, Japan, September 1998.

[2] A Design Rationale for Circular Silos Based on Finite Element Analysis - M. Sc. Engineering (Civil, Structural) Thesis, Bangladesh University of Engineering & Technology, Dhaka, Bangladesh, November 1994.

[3] Finite Element Analysis of Axi-symmetric Structures with Special Reference to Silo - B.Sc. Engineering (Civil) Thesis, Bangladesh University of Engineering & Technology, Dhaka, Bangladesh, September 1992.

DISTINGUISHING QUALIFICATIONS & EXPERIENCES

- I am involved in the advanced modeling, analysis and design of various types of structural systems for last 25 years. This includes Buildings, Tunnels, Bridges, Air Port structures and others. For example, I was responsible for the overall design of the Bow pedestrian bridge in Calgary, including the evaluation and improvement in performance of this bridge under crowd loading in case of possible vibration. Tuned Mass Damper (TMD) was added to control the vibration of this slender and reasonably long-span structure. Appropriate modeling and analysis was performed considering all relevant aspects of this special situation.

- Involvements in the design works of many high-rise buildings, in Canada and abroad, has given me the confidence in solving different types of problems associated with this specific type of slender structure. Designer of a high-rise building, normally, faces unusual challenges in every phases of the design process. These challenges may be related to the design of both super-structure and sub-structure. Unusual geotechnical condition or complex geometrical layout of lateral system may make the early phases of design works very difficult and challenging. Design of super-structure becomes very challenging due to long-span transfers, wind vibration, complex and unexpected changes in vertical load paths. Optimum solution, under these situations, is achievable by advanced analysis only. This needs adequate knowledge about the structural system and adequate knowledge about the efficient and effective use of proper software. My long experiences, coupled with very strong academic background and performances, have given me the confidence to face these types of challenges easily.

- Conventional design technique is not adequate under certain situations. Structural systems in some countries in the world are used to experience very high lateral loads due to seismic events with high intensity. I had the opportunity to design such a structural system, **Baha'i Temple in Chile**, with complex geometry. This building needed **base isolation system** in order to reduce the seismic lateral forces to make the overall design economically feasible. Non-linear behaviour of the "**Double Curvature Friction Pendulum**" base isolation system was properly modelled in a 3D situation using SAP2000 software. Appropriate analysis and design was performed, as required by the relevant codes. This type of challenging projects has given me the opportunity to become familiar with the latest technology in solving unusual and unique structural problems. Also, I have become an expert user of a wide range of sophisticated software packages including SAP2000, STAAD, ETABS, SAFE, RAM Concept, NASTRAN, LUSAS, ABACUS and others.

- Experiences in working in a number of countries, including Bangladesh, Japan, Australia and Canada, helped me to become knowledgeable in using different CODES in different environments efficiently and effectively. These global experiences also helped me to become mature in applying appropriate professional judgement in solving unusual problems depending on situations quickly and effectively. Experiences in working in different countries in different companies with different people helped me to find out many alternatives to solve a single particular problem. Additionally, my involvement in the design works of several major overseas projects has given me the opportunity of becoming familiar with ACI, ASCE, BOCA, IBC, AASHTO, British and Euro CODES, in addition to Canadian codes.

- Involvements in working in different countries in a broad range of complex structural systems helped me to become familiar with many specialized software packages. For example, as a member of a design team responsible for the design of "Taiwan High Speed Rail Tunnel" project in Hyder Consulting in Australia, I became familiar with different design aspects related to Bridge and Tunnel design. This valuable experience also helped me to become an expert user of special software packages, specifically, useful for these type of structures. This long experience in using different software also helped me to find out an effective solution for a problem beyond the capability of the commercial software by developing smaller plug-in-type or Design-Aid-type software using VBA, C, C++, C# and others.

- My programming capability in several high level languages is also helpful for me in getting easy, accurate and appropriate solutions for complicated problems. I have found that combining the built-in and programming capabilities of Microsoft Excel and Microsoft Access with those of structural engineering software, to get quick, easy, accurate and appropriate

solution for complex structural problems, is extremely rewarding. I have been using this type of wise & clever technique effectively and successfully.

- On the basis of my long experiences, I believe, there exists a lot of room to develop specialized software, either isolated or as add-on, in automating overall design and delivery process in structural consultancy related industry. I believe, an experienced and knowledgeable structural designer can be the best person to architect and develop the most powerful and handy software for his industry. I am very interested to continue to work in this direction to increase my efficiency in design works and to help other people to do that. I think, it is not very difficult to integrate and automate designing columns, beams and shear walls and producing corresponding schedule using some specially developed small software.
- As mentioned above, I worked for several consulting companies in Australia and Canada after finishing my PhD in cable dynamics in Japan. After graduation from Bangladesh University of Engineering and Technology (BUET), I was appointed as a faculty member (1992 to 1995) for civil engineering department as a reward of my outstanding academic results. My higher education and working experience in a broad range of civil engineering structures, in addition to my sincerity and work ethic, has given me the confidence in working as a successful and efficient structural engineer as well as a mentor. I worked as a researcher, as a teacher and, currently, have been working as a consultant. I am very keen to share my knowledge with others and also, thereby learning more from others to broaden my knowledge.

REFEREES

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