

M/s COSMOS CLEANING SYSTEMS, BANGALORE	PROPOSED BAGMANE ARGON AT BANGALORE	
	CLIENT: M/S BAGMANE DEVELOPERS PVT LTD. ARCHITECTS: M/S GENSLER, BANGALORE FAÇADE CONSULTANTS: M/S FAÇADE TECHNIK, BANGALORE	
PROJ/DESIGN STR/4/2022	STRUCTURAL CALCULATIONS FOR THE PROPOSED MS FRAMEWORK FOR THE MOVEABLE UNIT FIXED TO RCC WITH MS HIGH STRENGTH EYE BOLTS, STABILITY FOR FAÇADE CLEANING APPLICATIONS.	NOV 2022

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- A. CODES AND SPECIFICATIONS

The Structural calculations were Performed in accordance with the following codes or specifications mentioned in the Tender document.

- IS 800 - 2007: Indian code for Structural steel design
- IS 806-1968 : Indian code for Tubular steel structures Design
- Torsteel HandBook for Structural Steel Design.

B. MATERIAL SPECIFICATIONS

- STEEL TUBES OF GRADE YST 240 OF APPROVED MAKE AS PER IS 4923.
- HIGH STRENGTH MS EYE BOLTOF GRADE C45/EN8

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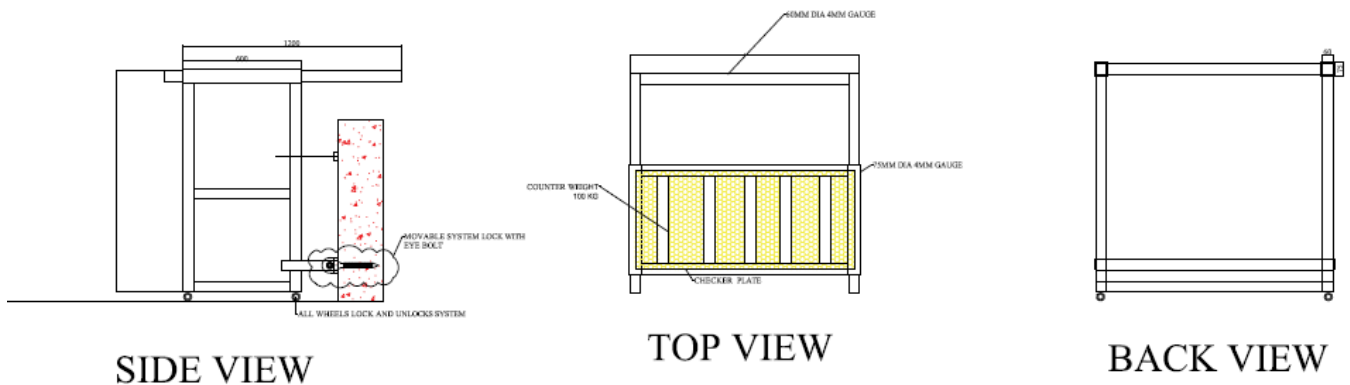
C. PROJECT SUMMARY SHEET

This structural design report is prepared to evaluate the structural performance of the **FOR THE MS FRAMEWORK AND MS HIGH STRENGTH EYE BOLTS , MS BASE PLATE, WELDS FIXED TO THE RCC FOR FAÇADE CLEANING APPLICATIONS** and to ensure the total stability of the entire system.

D. DESIGN CRITERIA AND LOADING ASSUMPTIONS.

- The maximum permissible deflection of the MS members are taken as $\text{Span}/300$ as per IS 800-2007.

FACADE ACCESS MOVABLE SYSTEM



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E. STABILITY CALCULATIONS FOR THE MS FRAMEWORK AND MS HIGH STRENGTH EYE BOLTS , MS BASE PLATE, WELDS FIXED TO THE RCC FOR FAÇADE CLEANING APPLICATIONS.

DESIGN LOADS TO BE CONSIDERED FOR THE STRUCTURAL ANALYSIS OF THE MS FRAMEWORK.

- Design Load = 500 kgs

The MS framework is made up of Vertical Column for a height of 1.216m of SHS 60 x 60 x 3mm thk spaced at 1.216m and Main members along 1.2m of SHS 60 x 60 x 3mm thk and for 600mm it is of MS Box of 72 x 72 x 4mm thk and connecting members of SHS 60 x 60 x 3mm thk and All steel tubes are of grade yst 240 as per IS 4923 of Tata/Jindal/Approved Make.

The self weight of the frame is considered in the STAAD-III analysis and the loading assumptions and Max results are tabulated as follows

- With this loading conditions The MS Framework is analysed
- using STAAD-III and Results are computed as follows.
- Maximum Bending stress in the framework as per STAAD-III
Analysis = 1187kg/sqcm < 1655kg/sqcm
- Maximum Combined Bending stress in the framework as per STAAD-III
Analysis = 1187kg/sqcm < 1655 kg/sqcm
- Maximum shear stress in the framework as per STAAD-III
- Analysis = 67kg/sqcm < 1100 kg/sqcm
- Maximum Deflection as per STAAD-III Analysis along 1.2m span = 3.33mm.
- Permissible Deflection as per IS 800– 2007: Code of practice for Steel
- in Construction = Span /300 = 1200/300 = 4mm

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**CHECK FOR THE MS HIGH STRENGTH EYE BOLTS STABILITY FOR FAÇADE
CLEANING APPLICATIONS**

**THE MS HIGH STRENGTH EYE BOLT OF M16 X 150 L OF C45/EN8 FIXED TO THE
RCC.**

- Design Load as per STAAD-III Analysis = 525kgs
- Tensile stress in the MS Eye Bolt =
- $(525)/3.14/4 \times 1.6 \times 1.6 \times 0.75 = 348\text{Kg/sqcm} < 1000 \text{ kg/sqcm}$
- Allowable Permissible Shear stress in the S.S Bolts = 1000 kg/sqcm
- Tensile stress in the MS Eye Bolt =
- $(525)/3.14/4 \times 1.6 \times 1.6 \times 0.75 = 348\text{Kg/sqcm} < 1500 \text{ kg/sqcm}$
- Where permissible shear and Tensile stress as per IS 800-2007
- Is mentioned as 150 Mpa for Tension , 100Mpa for shear, 300Mpa

**Therefore MS High Eye Strength Bolts of M16 x 150L of C45/ EN8
Grade fixed to the RCC is safe in Tensile & Shear stress criteria.**