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SOFTWARE APPLICATION TO COMPARE BETWEEN BRITISH STANDARD (BS 5950-1:2000) AND EUROCODE 3 (EN 1993-1-1:2005) IN DESIGNING THE RESTRAINED STEEL BEAM



PROBLEM STATEMENT

- The design code for structural steel in Malaysia is primarily based on the British Standard (BS 5950).
- Malaysia haven't fully implemented Eurocodes 3 (EC3).
- This phenomenon is due to the lack of information of designers towards Eurocodes 3 (EC3) and the different terminologies used in EC3 compare to British Standards. Most of the engineers are sceptical with the usage of EC3.

PRODUCT DESCRIPTION

- This software application will utilize the design formulas and produce result which then can be compared between the two design codes.
- Various functions is available to resolve the calculation within a few seconds based on data requirements such as different loading types, loading data, beam lengths and steel grades.
- The results can be compared to choose the structural elements that are most economical and safe to use.

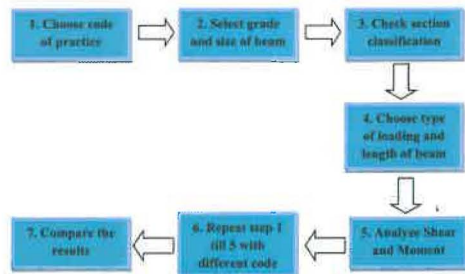
NOVELTIES

	U MAP PRODUCT	PRODUCT 1	PRODUCT 2
LANGUAGE	English	Malay	English
BEAM PROPERTIES	Auto – Details with diagram	Auto – NO diagram	Manual – NO diagram
LOADING	Point Load (PL),UDL and Combined PL & UDL	UDL only	Single Concentrated Load only
SECTION CLASSIFICATION	Details	Details	Doesn't check
SHEAR & BENDING DIAGRAM	Auto with max. value and diagram	Auto with max. value but NO diagram	Fully Manual
SHEAR & MOMENT CAPACITY	If failed, immediately can change section	If failed, has to start from beginning	If failed, has to start from beginning
DEFLECTION	Details	Less Details	Less Details
PRINTING	Available	Not available	Not available

PRODUCT ADVANTAGES

- Simplify** the design process, minimize the error in design.
- Analysis, design and comparison process of steel beam can be done within a **short period of time**.
- Various** loading types, loading data, size of steel beam, length of steel beam and grade of steel beam can be analyzed.
- Environmental friendly** in terms of zero number of paper used and reusable.
- Cost effectiveness**, in terms of time saving and costing.

FLOWCHART OF THE SOFTWARE APPLICATION



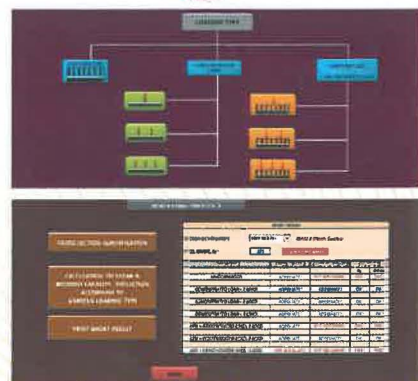
COMMERCIAL POTENTIAL

- Potentially to be the best medium for construction industry in Malaysia to clearly understand and more exposed about the benefit in designing steel structure by using Eurocode compared to the British Standard.
- Academician can use this software application as teaching aid tool or reference in teaching steel structure design.

RESULT

SHEAR FORCE ANALYSIS

CRITERIA	Design Shear Force		Design Shear Resistance and Size		Design Shear Resistance and Size	
	EC3	BS 5950	EC3	BS 5950	EC3	BS 5950
Beam Length = 8m Gk & Qk= 75 kN/m	855 kN	900 kN	870.31 kN 533 x 165 x 75	846.82 kN 533 x 165 x 75	1058.3 kN 533 x 210 x 109	957.5 kN 533 x 210 x 109
Beam Length = 10m Gk & Qk= 100 kN/m	1425 kN	1500 kN	1494.15 kN 610 x 305 x 179	1337.96 kN 610 x 305 x 179	1688.18 kN 686 x 254 x 170	1537.2 kN 686 x 254 x 170
Beam Length = 12m Gk & Qk = 125 kN/m	2137 kN	2250 kN	2288.62 kN 914 x 305 x 201	2086.20 kN 914 x 305 x 201	2665.9 kN 914 x 305 x 253	2430.9 kN 914 x 305 x 253



PUBLICATIONS

- Mustaqqim Abdul Rahim et. al. Comparison of Shear Capacity for the structural steel beam between BS 5950:Part 1:2000 and Eurocode 3. The 4th International Malaysia-Ireland Joint Symposium Engineering, Science and Business 2014 (IMIEJS 2014) June 2014 Penang Island Malaysia .