ENG1001 Project 1 : Monash Carpark Truss Footbridge Design

Marking Feedback Oct Intake 2020

Report Structure, Quality and Clarity (3.5/14)

GROUP 105	Excellent	Very Good	Good	Satisfactory	Below Standard
Summary (0.5/14)	Faultless and concise summary that captures the overarching principles as well as a detailed and nuanced insight into the project in terms of the concept and detailed design components.	Includes all information in terms of the main aims, an approach outline and the most important findings. But fails to distinguish between the concept and detailed design aspects of the project. May include some irrelevant material.	Includes some aspects in terms of the main aims, an approach outline and the most important findings. But fails to capture the full requirements of what the project was actually about. Either too concise or too long containing irrelevant material.	Includes some of aspect in terms of the main aims, an approach outline and the most important findings, but is superficial and lacks detail. Either too concise or too long containing a significant amount of irrelevant material.	No summary provided or very poor example
Report structure/Format (0.5/14)	-		Report template provided has been used or similar standard formatting used. Report has consistent formatting, section layout, page numbers etc. with no obvious errors or oversights noted Good Section headings made. Calculation template paper used correctly with title blocks all filled in	Report template provided has been used or similar standard formatting used. Report has generally consistent formatting, section layout, page numbers etc, however some formatting errors made. Generally good Section headings used.	Report template provided has not been used and poorer formatting standard used. Notable evidence of omissions and/or errors in organisation. Contents sections, pagination made, as well as poor section layout structure. Calculation template paper not used correctly or used at all.
Figures and Tables (1/14)	An error free, and exemplary set of Figures and Tables that are all clearly referenced in text. Figures show details of truss on site, accurately dimensioned truss being designed, loading on truss and analysis results, making for a very easy to process report. Appropriate summary Tables of critical members and their forces and final member sizes member forces and member sizes.	A mainly error free, set of appropriate Figures and Tables, presented in main body of report, that are all clearly referenced in text. One or two figures/tables missing (refer previous text), or Tables used where graphics would have been more better.	Most appropriate Figures and Tables presented in main body of report, and mainly referenced in text. Possibly Tables used where graphics would have been better.	Many Figures and Tables missing from main body of report, making ofr difficult reading and processing of the report. Also possibly Tables used where graphics would have been better.	Few Graphics/Tables presented, making for difficult reading and processing of the report.
Technical language (0.5/14)	Excellent grammar, punctuation, use of contextually appropriate terminology and spelling in effective sentences that make logical sense. Applies a proper academic style that is void of clichés and informal colloquial phrases / language.	Proper grammar, punctuation and spelling using reasonably effective sentences that generally make logical sense. Applies a proper academic style that generally avoids clichés and informal colloquial phrases / language.	Some instance of inconsistent grammar punctuation or spelling in the submission. Some sentences are ineffective and do not make logical sense. Inconsistently applies a proper academic style and on occasions uses clichés or overly informal or colloquial language.	Inconsistent grammar punctuation or spelling throughout the submission. Some sentences are ineffective and do not make logical sense. Does not have a proper academic style and often uses clichés or overly informal or colloquial language.	Improper grammar, punctuation or spelling throughout the submission. Many of the sentences are ineffective and do not make logical sense. Does not have a proper academic style and often uses clichés or overly informal or colloquial language.

Assumptions (0.5/15)	At least 5 relevant assumptions provided in own section.	At least 4 relevant assumptions provided.	At least 3 relevant assumptions provided.	At least 2 relevant assumptions provided or 3 but scattered throughout report.	No assumptions section or less than two relevant assumptions provided.
Final Discussion & Conclusion (0.5/15)		Succinct synopsis of the outcomes and conclusions that draws on the information contained within the report.	Good synopsis of the majority of outcomes and conclusions.	Brief and superficial summary of the outcomes of the project and conclusions.	Outcomes and conclusion of the report is inconsistent with the findings.
Concept Design and loading (2/14)					
	Excellent	**Very Good**	**Good**	**Satisfactory**	**Below Standard**
Concept geometry design (0.5/15)		Concept design geometry of truss depth and span and footbridge width clearly and succinctly defined. Values are all justified with reference to sources utilised and all lie within expected range.	Concept design geometry values of span, width and height clearly defined and lie within expected range. Not all values however are justified with reference to sources utilised.	Concept design geometry values of span, width and height clearly defined and most lie within expected range. Few values are justified with reference to sources utilised.	
Loading (1.5/14)	Loading calculations well set out and easy to follow, values all correctly chosen, referenced and justified. Loads are correctly calculated as UDL, independent of bridge length, before conversion to point loads for analysis purposes. ULS factors correctly applied. Succinct and easily understood loading summary presented in body of report.	Minor errors made in either load calculations or justifications. Good loading summary presented in body of report.	A number of errors made in either load calculations or justifications. OK loading summary presented in body of report.	Truss loading is difficult to follow and understand in places and not fully justified, and there are some incorrectly calculated values.	Truss loading has a number of major errors made, is not fully referenced and justified and calculations are not easy to follow.
Truss Analysis (2.5/14)					
	Excellent	**Very Good**	**Good**	**Satisfactory**	**Below Standard**
Method of joints & Sections calculations (1.8/14)				Both Joints & Section calculations all appear correct and in agreement.	There are errors in the calculations and/ or they are not complete or Sections check missing
Method of joints & sections presentation & discussion (0.7/14)		Calculations all very neatly presented with excellent supporting figures of truss system, joint FBDs and truss figure showing all numeric results. Text included a concise introduction to the analysis methods, a succinct discussion of the results, i.e. patterns of member forces and locations of critical force members all noted, and Sections and joints comparison made.	Calculations generally neatly presented. However some supporting figures missing making it more difficult for the reader to interpret the calculations and/or discussion of results and analysis method may lacking detail.	Calculations presented reasonably well however supporting figures missing making for difficult interpretation of results and also in body of report some missing discussion.	

Member Design and Horizontal loading consideration (3.0/14)					
	Excellent	**Very Good**	**Good**	**Satisfactory**	**Below Standard**
General design and horizontal loading discussion (1.5/14)	Concise and clear text explaining member design requirements based on yield and buckling. Exceptional understanding shown of; - origins of horizontal loading sources, - corresponding load paths and structural actions. - physical means of achieving two column end conditions specified in brief correctly explained. Shows exceptional understanding of truss stability in 3D.	Clear text explaining member design requirements based on yield and buckling. Very good understanding shown of; - origins of horizontal loading sources, - corresponding load paths and structural actions. - physical means of achieving two column end conditions specified in brief correctly explained. All directions of possible horizontal movement possibly not considered.	Explanation made of member design requirements based on yield and buckling. Reasonable understanding of the; - origins of horizontal loading sources, - corresponding load paths and structural actions. Possibly Physical means of achieving two column end conditions specified in brief not fully understood.	A number of key aspects were missed or poorly explained when discussing; - origins of horizontal loading sources, - corresponding load paths and structural actions. - physical means of achieving two column end conditions specified in brief correctly explained. -member design procedures.	Little to no discussion of horizontal loading, corresponding structural actions and load paths and means of achieving two column end conditions and member deign procedures.
Truss member design (1/14)			All four member 'types' correctly designed based on correct choice of critical analysis force results'. Calculations neatly presented and explained in Appendix and well summarised in main body of report.	Most of member 'types' correctly designed. Possible incorrect choice of critical analysis member forces.	Less than half of member 'types' correctly designed, and/or incorrect member forces chosen.
Column Design (0.5/14)			Correct critical column loading found and column correctly designed for two end condition cases specified in brief	Incorrect critical column loading calculated but column corrected designed for two end condition cases specified in brief	Possible incorrect loading and/or only one column condition designed for. In worst case scenario column not designed at all.
Structural Drawings					
	Excellent	**Very Good**	**Good**	**Satisfactory**	**Below Standard**
Drawings (3/14) **Bonus marks awarded for 3D image of truss Yes/No**	An exemplary set of error free drawings that closely follow the example drawings and drawing information requested. Drawings all have title blocks, drawing numbers, are drawn to scale, show truss and member lengths/dimensions. Beam schedule table and steel specifications included Site plan drawing shows outline of surrounding site features and is not a google maps image.	A very good set of mainly error free drawings that closely follow the example drawings and drawing information requested –as noted in previous section. Site plan drawing however may show google maps image of site and/or one or two other formatting errors or omissions i.e. columns missing from fabrication drawings.	The majority of drawings are generally relevant, drawn to scale, with title block etc, Site plan drawing however may include google maps image and/or three-four formatting errors or omissions made i.e. columns missing from fabrication drawings, steel specification missing.	Drawings fail to communicate the design in sufficient detail to be easily constructed. Scales may be inappropriate, lacking dimensions, and/or required views.	Drawings fail to communicate the design in sufficient detail to be easily constructed. Scales may be inappropriate, lacking dimensions, and/or required views.

ENG1001 Project 1 General Feedback

Well done on your first team technical report. Most teams generally understood most of the technical content.

Generally, the reports were well compiled. Marks were generally lost for not providing a satisfactory summary, lack of tables & figures (complete with details such as dimensions and labelling), some never showing the form of their truss bridge, only describing it in the main body of the report. This made it very difficult for the reader (the marker) to understand what was done in the project. Please note that "a picture says a thousand words", so when explaining the loading and the results of your analysis (such as MoJ, MoS, Yielding & Buckling check) try doing so using figures showing your trusses with these values clearly shown and labelled on them.

Please do make use of the library resources on how to produce quality technical reports, in terms of general formatting and what to include in summaries, introductions etc. For improvement, please review 'technical report writing' document noted in the project brief before writing your next technical report. https://www.monash.edu/rlo/assignment-samples/engineering/eng-writing-technical-reports

Generally, teams did well with the vertical load calculations, MoJ and MoS, and received most to all the marks here. Marks lost here was usually due to results not being clearly and concisely presented on diagrams i.e. figures of joints and figures showing where the joints were and what the loading was and thus calculations were difficult to follow. At least one Method of Sections (MoS) check is required (to be done at an appropriate location in the truss), in order to verify your MoJ results.

Many teams however, did poorly on their horizontal loading discussion component of the report and how the differing column end conditions could be physically achieved.

You are not required to carry out any calculations for horizontal loads. However, you are required to consider and discuss where this loading may originate from, and should it occur, clearly explain the load path and structural actions by which this loading will be transferred out of the footbridge and into the ground.

Design for the most heavily loaded footbridge was generally well done. However, some groups applied the incorrect load, some did not design for both possible end condition cases as required in the brief (1) columns are pin-ended and (2)columns have one end fixed and one end free. The 2 cases should be discussed - how they can be physically achieved in reality, and the effect on the column sizing. And finally, a conclusion of which condition will be selected for your bridge design. Unfortunately, some teams have failed to include their column design entirely.

For this we expected you to mention and consider horizontal loading perpendicular AND parallel to the line of your bridges. For example, for loading acting perpendicular to your bridges, say from wind, this load would act on the truss steelwork and any handrail/balustrading system and travel up/down from the vertical elements of the vertical truss through the structural action of bending and shear – into the horizontal trusses in the top/bottom of your bridges. Through truss action (structural action: axial tension and compression forces) this load would then transfer to the top of the columns. If you decided to have columns that had fixed-free end conditions, this load would then work its way to the ground through the structural actions of bending and shear in the columns, with the base of the column noted as being a rigid fixed base achieved by a rigid connection to a rigid concrete base footing. If your columns had pinned-pinned end conditions, you had to note how this was achieved first. For intermediate columns the only way to achieve this, was through cross-bracing (typically running between the columns from the column tops to the ground), and thus the structural action would be through tension and compression axial forces. For those with a single span bridge, we accepted that the columns could be tied horizontally to the buildings and thus any horizontal load could be transferred to the ground, not through the columns that carry the bridge vertical loads, but through the relatively rigid buildings they connect to.

In general, the drawings were done well. You were asked to produce, (standalone) structural drawings of your concept footbridge structure in relation to the site, and also detailed drawings of your planar truss design. Some of you failed to make this distinction, in your drawings as well as, in general, in your reports.

It was not acceptable to simply draw your bridge on a screen-shot of a Google maps plan view of the site for your Engineering Drawings'. A site outline drawing showing surrounding buildings, roads and garden beds was required. Beam schedules and steel Specifications were missing from many drawings, as well as all dimensions that would be required to manufacture the trusses. Column were also missing from many of the drawings.

Well done!