BRIDGE B/C

Satellite Meet

Team # _____ **School and Team Name:** _____ **Student Names:** _____

Rule	Test Apparatus Verification (False = Tier 2)	Format	Score
6.g	**Structure Scale** shall have minimum resolution of 0.1 grams; recommended resolution is 0.01 grams. Resolution >0.1g = False	T/F	
6.g supplement	***Structure Scale is digital and measures in grams*** *. If dial scales, manual beam scales, balance scales, spring scales, hand held or similar are used.*	T/F	
6.h	**Sand Scale and Load Verification Scale** shall have minimum resolution of 10 grams; recommended resolution is 1 grams. Resolution >10 g = False	T/F	
6.h Supplement	***Sand Scale and Load Verification Scale*** *must read in grams or kg (if kg, then it must display 3 digits to the right of the decimal point) If the scale reads any other units (newtons, pounds, etc.) = False*	T/F	
6.h Supplement	***Sand Scale and Load Verification Scale*** *must be digital platform type. If Bathroom scales, dial scales, manual beam scales, balance scales, spring scales, handheld scales or similar are used, = False*	T/F	
5.II.b, supplement	***Timer,*** *count down with audible alarm, counts in seconds, can be stopped/started, 6 minute capacity minimum.*	T/F	
6.f	**Bucket-stabilizing sticks (2)** 1/2" dowel with spring type door stop *or at minimum two ½" diameter dowels approximately 18" long.*	T/F	
6.a	**Test Base** shall be a solid, level surface at least 55 cm x 32 cm with 20 cm x 20 cm opening with centerline and clear span lines: Division B = 35 cm, Division C = 45 cm	T/F	
6.b	**Test supports (2)**: 1.5" x 1.5" x 6" to 2" x 2" x 6"	T/F	
6.c	**Pass Thru Block** (6.c.) Student will demonstrate that the Pass-Thru Block is the proper size. Division B = 7 cm high by 4 cm wide by 1 cm Division C = 12 cm high by 7 cm wide by 1 cm	T/F	
6.d.i	**Loading Block** approximately 5 cm x 5 cm x 2 cm with hole for eye bolt	T/F	
6.d.ii	**Eye Bolt** 1/4" x 2-1/4" long (minimum) with a wing nut	T/F	
6.d.iii	**Chain with S hook**	T/F	
6.d.iv	**5 gallon bucket**	T/F	
6.d.v	**Loading Assembly Mass** may not exceed 1.5 kg (6.d.i - 6.d.iv)	T/F	
5.I.e	**Loading Assembly and Sand** in bucket is a combined mass of at least 15,100 g. but no more than 15,200 g.	T/F	
Supplement	**Length Measurement Device** with resolution of 1 mm. at least 50 cm long (for example: meter stick)	T/F	

Rule	Competition Check-In	Format	Score
4.a	**Design Log**: Teams must submit a Design Log with documentation of bridges tested prior to competition.	T/F	
3.f	**Design Knowledge:** Team is able to answer questions on design, construction and operation	T/F	
1, 2.b	**Eye Protection B**, Safety Spectacles with side shield are worn (F = Tier 3)	T/F	
3.a	**Construction**: Single Structure, no separate, loose or separate parts, constructed of wood, bonded by adhesive	T/F	
3.c.i 3.d.i	**Loading Block Height** (LBH) above Test Supports Division B = at least 10 cm; Division C = at least 15 cm. (shown before placing on Test Supports)	T/F	
3.c.ii 3.d.ii	**Pass Thru Block** Students will demonstrate the Pass Thru Block can move from one end to the other of the structure under the Loading Block position	T/F	
3.c.iii 3.d.iii	**Clear Span** Division B = 35 cm; Division C = 45 cm	T/F	
5.I.b	**Boomilever Mass**	0.01 gram	
5.I.c	**Estimated load scored**	grams	

Rule	Competition Testing (6 Minutes)	Format	Score
	Start Timer with 6 minutes		
5.II.c, 3.b	**Participants place T**est Supports in bearing zones on Test Base. Bridge sits on top of the Test Supports and supports the Loading Block of the Loading Assembly (6.d) at the center of spanned opening.	T/F	
	Stop Timer and verify:		
5.II.e.i	**Test Supports** are properly placed on the Test Base	T/F	
5.II.e.ii	**Structure is placed properly** on the Test Supports and the loading point must be within 2 cm of the center of the span	T/F	
5.II.e.iii	**No portion of the structure is below** the top of the Test Supports for the entire length of the structure	T/F	
	Start Timer & Begin loading sand		
5.II.d	**Structure is not adjusted** once loading of sand has begun	T/F	
5.II.f	Direct contact of bucket is only by **stabilizing sticks**	T/F	
5.II.g	**Loading stops** when structure cannot carry any additional load, if any part of the load supported touches anything other than the bridge, the bridge touches the Test Base or time expires.	T/F	
1	**Test completed** in 6 minutes or less.	T/F	
5.II.h	**Minimum load supported** is the mass of the Loading Assembly (5.b).	T/F	
5.I.d	**No alterations, substitutions, or repairs** made after check-in process has started	T/F	
5.II.a	**Team did not leave** event area after check-in or gain outside assistance, materials, or communication	T/F	
5.II.h	**Load Supported** (grams to the nearest gram) may not exceed 15,000 g. Minimum load supported is the mass of the Loading Assembly (5.b).	grams	

7.a SCORE = (_____ / _____) = _____
Load Supported (g) + Bonus Bridge Mass (g)

7.d. Tier 1: holding any load and meeting all construction parameters and competition requirements;
Tier 2: holding any load with any violations of the Test Apparatus, construction parameters and/or competition requirements;
Tier 3: unable to be loaded (e.g. cannot accommodate or hold Loading Assembly, no eye protection worn

The following "Reminders" are provided as reference information to help guide Students/Coaches towards a disciplined execution and submittal of the ***VIDEO SUBMITTAL*** process for highly competitive formal Science Olympiad events.

A. Video submittals should be a carefully orchestrated and practiced activity to create a process that provides full evidence of compliance to all requirements, and that an Event Supervisor could easily confirm/validate that the requirements were achieved, so that the proper Tier ranking is used. Student's/Coaches should ensure that the video submittal (and any other supplemental photos) are readable, and provide overwhelming evidence for compliance. Its recommended that the Student's also submit a checklist (photo or file) as a supplemental evidence with the Team information, measurements, and process checks.

B. Preferred that the video is a continuous full length (minimize multiple files) and converted to MP4 format for file size management. The full duration can be broken up into the "validation" and "Test" portions if the file size is too large. Students should practice the entire event to manage the total time to be minimized. With practice, the entire demonstration, including all measurements and the 6 minute maximum test time, can be executed within a 10 minute video duration.

C. Students should perform all event activities, including all measurements. Process deviations or equivalent equipment may cause the bridge score to be ranked in the lower Tiers.

D. The scales used (5.g: Mass of Bridge, and 5.h: Load held) are critical for achieving Tier 1 ranking, so please ensure that the scales used have the proper units (grams or 0.1 grams), resolution, and range as specified in the Rules, as noncompliance will cause the score to be ranked in lower Tiers. Review Rules Supplemental information and the SO Website for additional guidance and clarifications.

E. The Design Log (or Logbook) is part of the compliance criteria, or you will be ranked in lower Tiers if not presented, or the information is less than the items described in Rules 4.a. Please consider the Scientific Process when writing information in the Log (research, design, test, results, diagnosis, changes, … repeat!)

F. Students should demonstrate in the video that ALL EQUIPMENT is compliant by demonstrating the measurement of every piece of required equipment (Test Apparatus dimensions, Test Supports, Load Block, Pass-Thru Block, scales, 15,000gm minimum load, 15,200gm maximum load) before the test is performed.

G. Students should have a ruler that is the proper length (at least 50cm long) and units to validate all measurement requirements of the Test Apparatus, bridge, and associated equipment. Smaller rules can be used to measure the shorter distances, but it is not recommended to link multiple rulers to create the needed length to validate measurements.

H. Students should be careful of the Test Support Block positioning on the Test Base to ensure that the bridge span is validated (Rule 6.a.iv), and it is suggested that the Student uses a rule to confirm the span while the bridge is on the Test Stand. This measurement should be captured in the video submittal.

I. Student's video must show their measurements of the Bridge (5 Part I.b), minimum Load (6.d.v), maximum load (5 Part I.e), and load held (5 Part II.h).

J. Students should measure their bridge in an area that has calm air flow, so that scale reading can stabilize.

K. Student's video should demonstrate that the Bridge meets all construction parameters, including showing the Load Block Height measurement and demonstration of the Pass-Thru test, where the block must travel inside the full length of the bridge.

L. The "Load Held" includes the bucket, load Block Assembly, and chain, and those items should be included when measuring the achieved load.

M. Students may choose not to use any Stabilization Sticks without any penalty, but if used, then ensure that the sticks are compliant to the Rule 5.f, as other alternatives could cause the score to be ranked in a lower Tier.

N. Students should include in their video submission the timer used for compliance to Rules 5 Part II.b, showing the start time of 6 minutes, and the resultant count-down time at the completion of the test. The use of the video duration is not a preferred method of validating the time requirement, and not showing the timer readings may cause the Bridge score to be ranked in lower Tiers.