Micro Engineering Company

ASSEMBLY INSTRUCTIONS
N TALL STEEL VIADUCT
#75-518 N 200 ft, #75-519 N 320 ft

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I. GENERAL

The Micro Engineering N scale Tall Steel Viaduct model represents a medium duty mid 20th century bridge. The viaduct can be constructed for straight track or curved track down to a 12 inch radius.

· This kit is easy to modify. Longer viaducts, can be constructed by combining two or more Tall Steel Viaduct kits increasing the length from 200' to 400' or more. A 320' long viaduct is possible by substituting three 80' x 9' girder assemblies for the three 40' x 5' intermediate span girder assemblies supplied with the kit (see fig. 5). This modification requires three Micro Engineering 80' Deck Girder Bridge kits, #75-150, but the three unused 40' spans can be used as normal deck girder bridges elsewhere on your layout. The 80' girders will limit the radii that can be used if building a curved track viaduct (see section II.B.). Other kits available for modifying the viaduct are additional Tall Steel Viaduct Towers #80-176, N Code 70 Bridge Flex-Trak #11-110, N Code 55 Bridge Flex-Trak #11-112, and N Oil Drums #80-146, used as water barrels. The bridge track is in 3' lengths and includes guard rails, guard timbers, and four barrel platforms.

· Most parts in this kit are made of injection molded styrene plastic and should be glued with a styrene solvent cement (such as Testors). Glue the Delrin bridge track, the white metal parts, and the nickel silver rail with a cyanoacrylate (CA) or a rubber based cement (such as Pliobond , available from Micro Engineering).

· Read each instruction step completely before proceeding with that step. Refer to the photos and drawings for reference.

II. PARTS & TERMINOLOGY

· Before beginning assembly cut the plastic and white metal parts from their sprues and trim off or file any flash, ejector pads, and gate nibs. Use care when handling the parts as some are thin and easily broken. If a part breaks, lay it on a flat surface and cement it back together. When trimming the ejector pads from the tower X-bracing, position the parts with the rivet detail up so the rivet plates are trimmed square.

· The following parts and the number needed to assemble your kit are listed below and keyed to the photo (see fig. 2). Extra parts that will not be used are included in your kit.

	Part	Parts per Kit
1	girder	10
2	lateral bracing	10
3	girder X-brace	25
4	support plate	8
5	bent	4
6	tower X-bracing	4
7	bridge shoe	4
8	bridge Flex-Trak	2
9	rail joiner	2
10	guard timber	10
11	guard rail	4
12	floor section	2
13	side railings	4
14	back railings	4
15	barrel	2

· The Tall Steel Viaduct consists of five 40' girder assemblies supported by two tower assemblies. The five spans are comprised of three intermediate spans and two tower spans. Each tower assembly is made up of two bent assemblies connected together by two tower X-bracing assemblies (see fig. 1 & 2).

III. GIRDER ASSEMBLIES

A. Straight Track Viaducts

1. Each girder assembly consists of two girders 1 , two lateral bracings 2 , and five girder X-braces 3 . When constructing a girder assembly, construct the entire assembly in one session so the span can be squared up before the cement is completely set.

2. Place a girder on your work surface with the rivet detail down. Note the three slots on one edge, two slots on the opposite edge, and the five ribs (see fig. 3). Hold a lateral bracing on edge, aligned with the three rivet plates at the bottom and the rivet detail facing the outside of the girder. Cement the edge of the rivet plates in the three slots of the girder.

3. Cement the five girder X-braces to the girder, against the ribs, and on the correct side of the ribs as shown in fig. 3. Also cement the girder X-braces against and centered on the lateral bracing rivet plates. Adjust the lateral bracing and the girder X-braces so they are perpendicular and square to the girder.

4. Cement the second girder against the lateral bracing and girder X-braces, aligning the two-slot edge of the girder with the lateral bracing and with the ribs on the correct side of the girder X-braces. Be sure the assembly is square while holding pressure against the girder until the glue has dried.

5. Place the assembly so the installed lateral bracing is down. Align the second lateral bracing with the rivet detail out and cement in place in the five slots on the edges of the girders. When the glue is sufficiently set, place the girder assembly on a sanding block and sand off the lateral bracing rivet detail and the draft angle on the edges of the girders *on one side only*. The bridge Flex-Trak will be cemented to the sanded side later. The girder assembly is now complete. Fabricate the other four girder assemblies.

B. Curved Track Viaducts

1. Assemble two of the five girder assemblies as described in A. above. These assemblies will be used for the two tower spans. The three intermediate span girder assemblies require the girder on the inside of the curve to be shortened before assembly (see fig. 4).

2. Place a girder on your work surface with the rivet detail down. With a razor saw, cut a length off each end of the girder using the table below to determine the length of the cut sections based on the radius of the curve you are using. Note that the table includes lengths for 80' girders for a modified longer viaduct (see II.C.). Place a lateral bracing on your work surface and cut the same length off the rivet plates at each end.

Radius of Curve	Length to Trim Off Each End 40' Girder	80' Girder
12"	.138" (1/8+)	——
14"	.118" (1/8-)	——
16"	.104" (3/32+)	——
18"	.093" (3/32)	——
20"	.084" (3/32-)	——
22"	.076" (1/16+)	——
24"	.070" (1/16+)	.105" (3/32+)
28"	.061" (1/16)	.091" (3/32)
32"	.053" (1/16-)	.079" (3/32-)
36"	.047" (1/32+)	.071" (1/16+)

3. Assemble the three shortened intermediate span girder assemblies as described in A. above with the following changes. Start with the shortened girder on your work surface and cement the shortened lateral bracing to the girder with the three rivet plates in the three slots of the girder. Cement the five X-braces to the girder aligning the two end X-braces flush with the ends of the shortened girder, filing off the two end ribs if they interfere with the two end X-braces. Cement a full length girder to the X-braces and lateral bracing. Cement a full length lateral bracing in the five slots on the edges of the girders. It may be necessary to file a small notch in the two end X-braces where the full length lateral bracing crosses the X-braces. When sanding

one side of the girder assembly, be sure to sand the track side (top) of the girder assembly which is determined by placing the shortened girder to the inside of the curve.

C. Modified 320' Long Viaducts

1. Assemble two of the 40' girder assemblies as described in A above. These assemblies will be used for the two tower spans. The three intermediate span girder assemblies will require three Micro Engineering 80' Deck Girder Bridge kits, #57-150 (see fig. 5). Assemble the 80' girder assemblies according to the instructions supplied with the kits.

2. The support plates 4 are used to support the 40' girder assemblies on the towers at the same level as the 80' girder assemblies (see fig. 6). Locate four left hand and four right hand support plates and sand or file off the draft angle on the edge that will join the girder. Cement a support plate, with the rivet detail out and flush with the end of the girders, at each corner of the two 40' girder assemblies.

IV. TOWER ASSEMBLIES

1. Each tower assembly consists of two bents 5 and two tower X-braces 6 . When constructing a tower assembly, construct the entire assembly in one session so the tower can be squared up before the cement is completely set.

2. Place a bent flat on your work surface. Note on the tower X-bracing that the rivet plates have rivet detail on one side and a small step along their edge. Hold a tower X-bracing on edge, with the rivet detail toward the outside of the tower, and the open end at the top end of the bent (see fig. 7). Align the center cross-laced strut of the tower X-bracing with the center strut of the bent and align the rivet plate steps with the I-beam flange of the bent leg (so the rivet plate is flush with the outside of the bent leg). Cement the tower X-bracing in place holding it square to the bent while the cement dries. Cement the second tower X-bracing to the bent in the same manner.

3. Place the second bent flat on your work surface. Turn the tower assembly up side down and align the tower X-bracings with the second bent, as described above, and cement in place. Be sure all the tower X-bracing rivet plates are flush with the outside of the bent legs. Place the tower up-right and check that the tower is square and sits level. Adjust the glue joints if necessary. The tower assembly is now complete. Assemble the second tower.

V. PAINTING & FINAL ASSEMBLY

1. Paint and weather your viaduct before further assembly. Prototype tall steel viaducts were usually a flat black or silver color. For simulating rusty areas we recommend toning down Floquil's Rust with their Roof Brown. Paint the bridge shoes 7 black or silver, the barrels 15 black or red, and weather both with the rust color.

2. You may want to weather the bridge Flex-Trak 8 and barrel platforms after assembling them in part V below. Spray the sides of the rails with Rail Brown or Roof Brown. Then using a mixture of Roof Brown and Concrete for the ties, spray straight down so the rail sides are not covered. Weather the center of the track with black chalk or a wash of paints to simulate oil leaks. Paint the barrel platforms with the tie color.

3. After the paint has dried, remove paint with a file from those areas where cement will be applied. Center and cement a tower span girder assembly on the top of each tower assembly leaving room on half of the bent tops to attach the adjoining girder assemblies.

4. Place the tower assemblies on your work surface, the correct distance apart (and at the correct angle for a curved viaduct). Place an intermediate span girder assembly between the towers and cement to the bent tops using a straight edge to be sure the top surface of the girders are in good vertical alignment. On the two remaining girder assemblies, determine which ends will be attached to bridge abutments and cement two bridge shoes 7 to the bottom of the girders at these ends.

5. You may want to assemble the remainder of your viaduct on the layout or you can assemble the entire bridge before placing it on the layout using the bridge track to support the two end girder assem-

blies. Which ever method you use, the two end girder assemblies will eventually be cemented to the bent tops at one end, with the bridge shoes cemented to bridge abutments at the other end. Again, use a straight edge to be sure the top surface of the girders are in good vertical alignment. The tower legs should be cemented to bridge piers or to the “ground”.

VI. BRIDGE TRACK

1. Connect the two sections of bridge Flex-Trak 8 together using the rail joiners 9 or solder the rail ends together. Adjust the tie spacing and trim the track to length to fit your bridge but do not cement the track to the bridge yet. For curved viaducts, bend the Flex-Trak to the proper radius to fit the bridge.

2. Using CA cement, glue the guard timbers 10 to the top of the ties, with the bolt head detail up, 2 scale inches (.013") in from the tie ends. For curved viaducts, the guard timbers should be cut to 10 scale foot lengths (3/4") and each timber installed at an angle to follow the curvature.

3. On prototype bridges the guard rails are usually made from rail lighter than the running rails and they extend off the end of the bridge onto the regular track. Two lengths of the Code 40 guard rails 11 placed end to end will extend 1-1/2" longer at each end than the 15" long viaduct (see fig. 8). Check the fit of the guard rails on the bridge Flex-Trak by inserting them between the inside spikes of the running rails and the rows of spike heads molded on the ties. Form the easement at the guard rail ends by curving the last 1" of the guard rails in toward the track center until the rail ends almost touch. Cement the guard rails in place using CA cement.

4. Assemble the barrel platforms by cementing the floor section 12 , with the planks running side to side, on top of the bottom board of a left hand and right hand side railing 13 (see fig. 9). Cement the two back railings 14 to the two side railings across the back of the platform. Cement the barrel 15 on the center of the platform. Fit, but do not cement, the finished barrel platforms to the bridge track, centering a platform on each tower, with both platforms on the same side of the track. Insert the platform timbers between ties on the side of the bridge Flex-Trak that does not have the plastic web under the rail. It may be necessary to file the timbers slightly for a good fit.

5. If you want to weather the bridge Flex-Trak do so at this point (see IV.2.). Center the finished bridge track on the bridge and cement the track to the top edge of the girders using a rubber based cement. Cement the barrel platforms at the locations determined in step 4 with the platform floors against the tie ends. Touch up with paint where needed and your Tall Steel Viaduct is finished.