

BlueOval City

Lindapter Girder Clamps provided an ICC-ES approved solution for connecting seismic bracing cables to the primary steel of this electric vehicle battery plant cleanrooms.

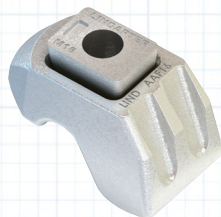
Project Background

Location: Stanton, Tennessee USA
Seismic Design Category: "D" High Hazard

Client: Ford

Product: Type AAF Girder Clamp

Quantity: 2,000



The BlueOval City in Stanton, Tennessee, is a significant part of Ford's push towards electric vehicles. This massive campus will include a state-of-the-art battery plant, known as the BlueOval SK Battery Plant, which is set to begin production in late 2025.

This facility is part of Ford's broader strategy to lead the electric vehicle revolution and create a sustainable manufacturing ecosystem in the United States.

Client Requirement

BlueOval City is close to the New Madrid seismic zone and is in Seismic Design Category (SDC) D meaning there is a hazard from very strong shaking in the event of an earthquake.

Due to being in SDC D the engineer was proposing heavy duty diagonal seismic bracing cables made of 12mm diameter 6x19 steel wire rope to connect the suspended ceiling to the primary beams and to restrain pipe racks.

Ford stipulated that they did not want any permanent connections to the primary steel to future proof the plant should they want to reconfigure it in the future, so the engineer contacted Lindapter and enquired about a clamping solution that would be approved and compliant for seismic designs.



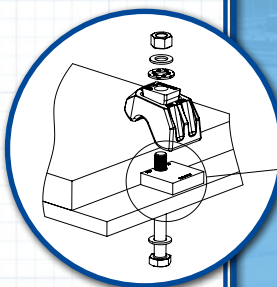
Type AAF is quick and easy to install at height

BlueOval City

Design Solution

The engineer provided Lindapter's technical support team with the loads and locations of where the seismic cable braces were to be installed along with the cable brace forces that had to be resisted. The lateral force that needed to be resisted was substantial at 2709 kg for each cable brace, with one brace installed every 1200mm throughout the plant.

From the information supplied Lindapter's technical support team was able to propose a solution that was ICC-ES approved for use in Seismic Design Category D. The design consisted of an end plate with a fabricated gusset plate welded to it with two pre-drilled holes. The end plate was to be connected to the primary steel beams of the building with Lindapter Type AAF adjustable high slip resistance girder clamps (size M12 and M20) in a 4-bolt configuration. The seismic bracing cables would then attach to the holes in the gusset.



Result

Lindapter Type AAF heavy duty girder clamps provided an SDC D approved solution compliant with ICC-ES report ESR-3976. They also provided sufficient strength to resist the high loads that would be present in an event of an earthquake. Installation was quick and easy with no on-site drilling or welding so no damage was caused to the primary steel. Lindapter's technical solution met the client's key requirement of a code-compliant, seismic resistant connection that can be removed for future reconfiguration of this world-class manufacturing facility.

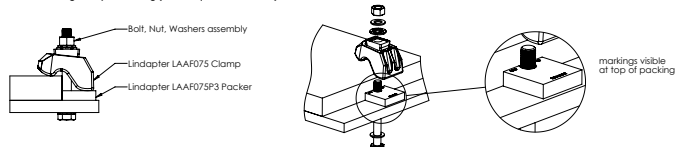


2000 AAFs are used at the 15 square kilometre site



Section Size	Beam Width, W	Flange Thickness, T	Plate Length, L	Bolt Centers, C	Lindapter Clamp	Lindapter Packing	Bolt
W14x90	14.520	0.710	21	15.375	LAAR075	-	3/4" x 5.5"
W14x119	14.405	0.860	21	15.475	LAAR075	-	3/4" x 5.5"
W14x193	15.710	1.44	22	15.5625	LAAR075	-	3/4" x 6"
W14x233	15.890	1.72	22	16.75	LAAR075	LAAR075P3	3/4" x 6.5"
W14x257	15.995	1.89	22	16.8125	LAAR075	LAAR075P3	3/4" x 6.5"
W14x283	16.110	2.07	23	16.9375	LAAR075	LAAR075P3	3/4" x 7"

Guidance on using Lindapter Packing (when required - see table):



REFER TO DRAWING SW21810-AR FOR DETAILS

INFORMATION PROVIDED BY CUSTOMER:
DESIGN METHOD ASD
SEISMIC DESIGN CATEGORY D
GRADE 50 (ASTM A572)
ELECTRODEPOSITION (ED)
ELECTRODEPOSITION (ED) (Galvalume) or ICB (CI)

VALUES SHOWN IN THE TABLE ARE BASED ON A 4 BOLT ASSEMBLY - ALL VALUES SUBJECT TO CAPACITY OF SUPPORTING SECTION

E88-2019 TABLE 1.5.2		Static		Seismic Design Category A, B and C		Seismic Design Category D, E and F		DO NOT SCALE THESE CAPACITIES. THESE ARE THEORETICAL CAPACITIES ONLY.		Plate Fabrication and Components Supplemental		Lindapter		GR-200939	
Beam	Section	Design Strength	Allowable Strength	Design Strength	Allowable Strength	Design Strength	Allowable Strength	Design Strength	Allowable Strength	Beam	Section	Design Strength	Allowable Strength	Beam	Section
W14x90	A36	108	72	108	72	108	72	108	72	W14x90	A36	108	72	W14x90	A36
W14x119	A36	144	96	144	96	144	96	144	96	W14x119	A36	144	96	W14x119	A36
W14x193	A36	216	144	216	144	216	144	216	144	W14x193	A36	216	144	W14x193	A36
W14x233	A36	270	180	270	180	270	180	270	180	W14x233	A36	270	180	W14x233	A36
W14x257	A36	300	200	300	200	300	200	300	200	W14x257	A36	300	200	W14x257	A36
W14x283	A36	336	224	336	224	336	224	336	224	W14x283	A36	336	224	W14x283	A36

Installation

Lindapter's solution enabled the quick installation throughout the plant and overcame the challenge of connecting to six different thicknesses of wide flange beams varying from W14x90 up to W14x283. For the beams with thicker flanges such as the W14x283 that has a flange around 50mm thick the girder clamp connection design also included packing pieces to increase the clamping range of the girder clamps. In total the contractor used 2,000 Type AAF Girder Clamps to connect the end plates to the primary beams. Installation was quick and easy as the connection assemblies could be positioned close to where they were needed before final adjustments were made and the clamps fully tightened.

Benefits

- ✓ ICC-ES seismic approved solution
- ✓ Heavy duty, high load capacities
- ✓ No drilling or welding required
- ✓ Removeable for adaptability
- ✓ Fully adjustable on-site



Click here to watch the installation video >>>

