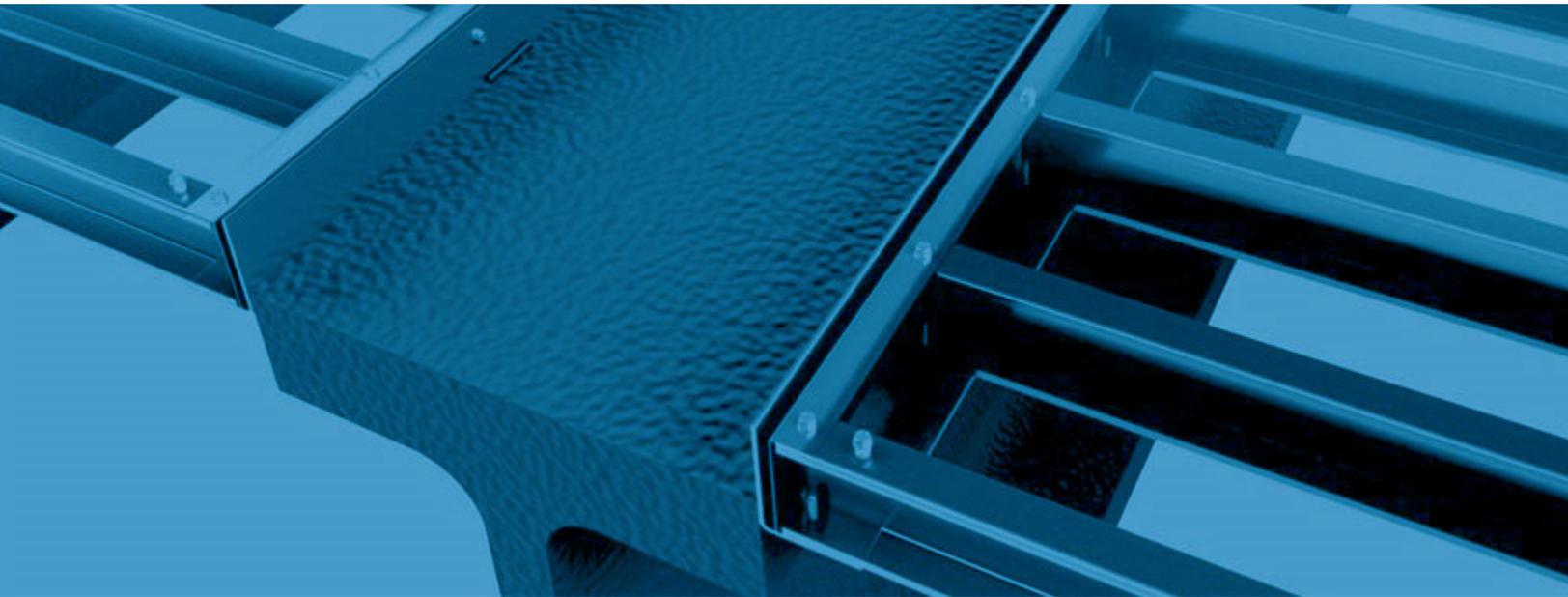




Installation Guide



LAST UPDATED: September 2024

SECTION 1 // PRODUCT DESCRIPTION // page 2

Typical Form Dimensions // page 2

Form Components // page 3

Typical Supports on Bridge Beams // page 4

Setting Forms + Typical Connections to Supports // page 5

SECTION 2 // APPROVED DRAWINGS // page 6

SECTION 3 // PACKAGING, DELIVERY + UNLOADING // page 6

SECTION 4 // STORAGE + HANDLING // page 7

SECTION 5 // INSTALLATION // page 8

SECTION 6 // REPAIRS + MODIFICATIONS // page 10

.....

APPENDIX // Technical Information for Acrylic Panels // page 11

1 // Product Description

ClearCast forms (Patent No.8739496) are a transparent stay-in-place bridge deck forming system composed of flat acrylic sheets supported on a rigid frame of galvanized, cold formed structural grade steel joists and tracks. The standard ClearCast form is 4 feet in length, with widths varying based on project requirements. The typical depth of the form is 4 inches (nominal), measured from the top of the acrylic sheet to the bottom of the steel track. The weight of the form varies with width, ranging from 40 to 150 pounds for widths ranging from 3 feet to 9 feet, respectively.

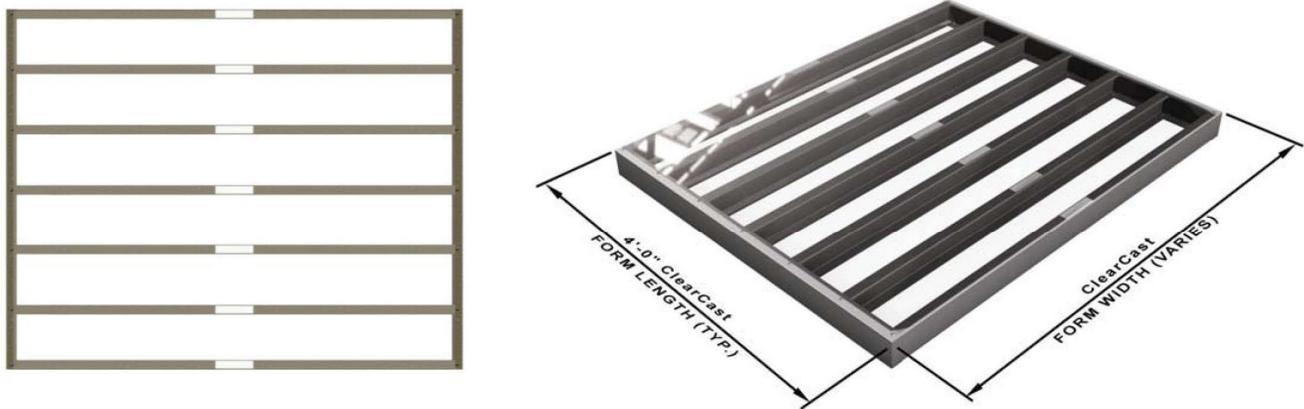
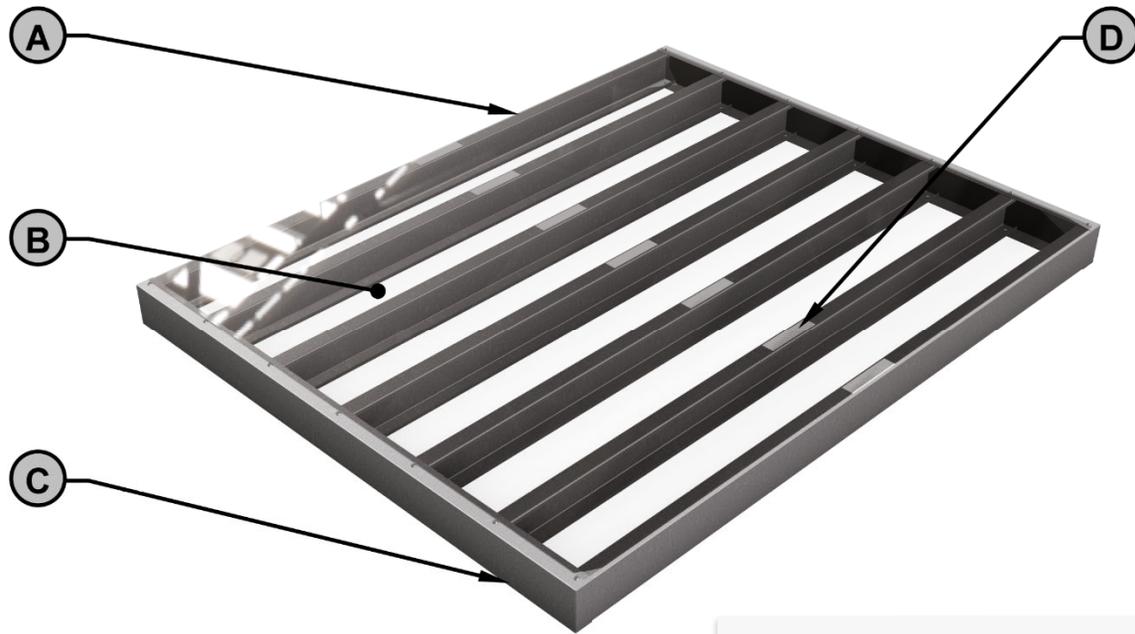


Fig. 1 Plan View + Isometric of Typical ClearCast form

Each ClearCast form is designed and furnished custom to the bridge geometry for easy installation. The modular forms are prefabricated to ensure quality, adherence to schedule, and fast, simple installation once delivered.

A typical form consists of structural joists equally spaced at 8 inches on center, placed parallel to one another, and secured within a 4 foot track with self-drilling screws or rivets. The acrylic sheet is cut to width and length for the project and placed atop the steel then adhered with structural two-sided VHB tape. Special form dimensions can be designed and furnished to meet any bridge deck length, most skews, and various loading conditions.



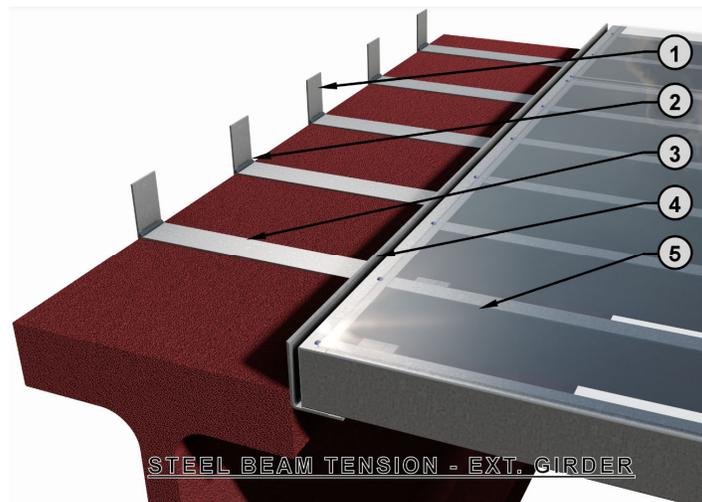
- A – Structural Steel Joist**
- B – Transparent Acrylic**
- C – Structural Steel Track**
- D – VHB Structural Adhesive**

Fig. 2 Components of the ClearCast form

ClearCast forms are typically set atop steel angle supports attached to the bridge beams, like other types of stay-in-place form systems. The forms are set end-to-end with a butt joint between forms. No screw attachments or welds are required along the transverse joint.



1 – Structural Steel Joist, 2 – Steel Angle Support, 3 – Fillet Weld, 4 – Weld Anchor or Weld Strap

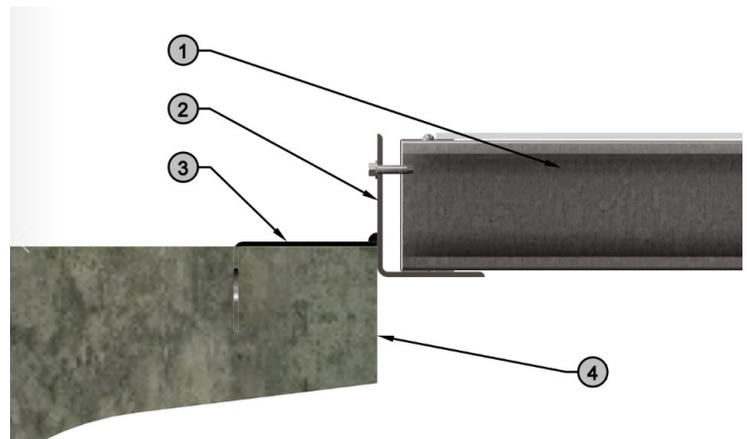
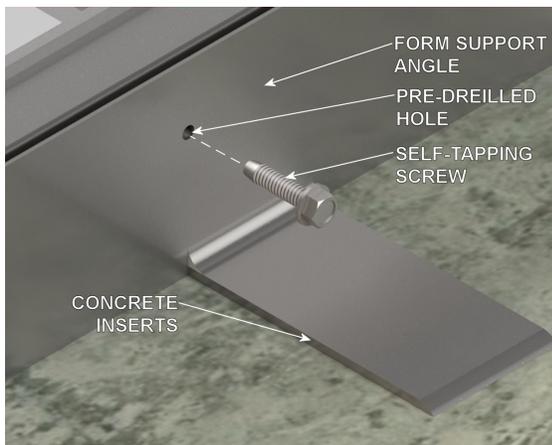


1 – Clip Angle, 2 – Fillet Weld, 3 – Strap, 4 – Steel Angle Support, 5 – Transparent Acrylic

Fig. 3 Types of ClearCast form Supports on Bridge Girders



The longitudinal edge of the ClearCast form is then attached to the steel angle on the bridge beam with self-drilling screws prior to any loads being applied or the next form set.



1 – ClearCast form, 2 – Steel Angle Support, 3 – Weld Anchor, 4 – Precast Girder

Fig. 5 Attachment Details — ClearCast form to Support

Once installed and fastened to the bridge, ClearCast forms act as a support for workers, materials, and the fresh deck concrete. When deck construction is complete, ClearCast forms remain in place, allowing for visibility of the concrete condition over the life of the bridge deck.

2 // APPROVED DRAWINGS

Prior to installation, the submittal drawings for the project must be reviewed and approved for construction by the Owner or the Owner's representative. The contractor is responsible for reviewing the drawings, general notes, installation instructions and any special details. Only the drawings marked "approved for construction" may be used for installation.

3 // PACKAGING, DELIVERY + UNLOADING

Each ClearCast form will be labeled along the edge with a sticker identifying some or all of the following:

- Contech Engineered Solutions Project Number
- Project Name
- Project Location
- Form identification (match to approved drawings)
- Any special instructions (installation, storage, etc.)



Forms are typically stacked on a pallet in heights up to 87" tall, but may vary project to project. The forms and pallet will be tightly bound for shipping and transport with shrink wrap and straps.

Any special site conditions that will affect shipping should be communicated to Contech Engineered Solutions in advance of fabrication such that appropriate action can be taken well in advance of delivery.

Delivery to the jobsite will typically be via flatbed trucks, however, covered vans may be used if material size permits. Proper access and material handling equipment (forklift) capable of safely lifting the forms from the truck is required. Fork extenders may be required to properly support the load.

All materials should be checked as received – each pallet of forms counted and inspected for damage. The bill of lading should be verified prior to signing for the material. If there are any discrepancies, Contech Engineered Solutions should be contacted immediately.

Typically, a separate delivery will be scheduled for the installation materials such as the steel support angles, self-tapping screws, and any other materials shown in the table “Materials Provided by Contech Engineered Solutions” in the Approved Drawings. All other materials required to construct the bridge deck according to the contract drawings and specifications shall be supplied by the contractor.

Unless partial shipments are agreed upon, full truckload shipments are standard.

4 // STORAGE + HANDLING

Care should be taken when off-loading the pallets of ClearCast forms from the truck. Impact forces from fork lifts or improper handling may damage the steel and acrylic.

Store pallets of ClearCast forms at least three inches off the ground with one end elevated to allow for drainage. Place on stable ground to avoid tipping, sliding, and shifting of forms.

Keep the straps around the forms until the forms are ready for installation to reduce the potential for damage.

ClearCast forms are supplied with a protective polyethylene masking on the top surface. Masked forms must NOT be stored in direct sunlight for prolonged periods of time. Prolonged

exposure to direct sunlight may make the masking brittle, which may cause the masking to tear when removed.

Do not store ClearCast forms near radiators, steam pipes, or other heat sources as exposure to excessive heat may soften or deform the plastic. Do not store near or expose them to solvent vapors that may penetrate the masking and damage the panel surface.

Do not stack materials, drop large tools or run heavy equipment over the forms. Any damaged forms must be replaced by the contractor prior to installation.

Lift the forms from beneath the steel track at all times. Do not lift from the acrylic sheet.

5 // INSTALLATION

Prior to placing ClearCast forms, the contractor shall set the elevation of the form supports to meet the required screed elevations, deck thickness and plan profile. The contractor shall verify all dimensions and adjust supports as needed.

If welds or welding is required, it must be in accordance with the project specifications and special provisions and performed by a qualified welder.

Any permanently exposed steel with damaged galvanized coating must be cleaned and repaired at the discretion of the Engineer.

Place ClearCast forms on form supports to meet the minimum bearing lengths shown in the plans. Do not set and attach forms directly on the top of beam flanges.

Joints between adjacent ClearCast forms and the support angle shall be mortar tight. Joints larger than 0.50 inches shall be sealed with an approved material (provided by contractor) to prevent leakage of the concrete.

Connect ClearCast forms to the form supports before applying any load or walking on the form, and before the end of each work shift. It is recommended to connect ClearCast forms to the form supports immediately upon placement to prevent movement or uplift.

It is recommended that connections with screws be installed with torque-limiting devices to prevent stripping.

All screws must be placed such that there is a minimum distance of 0.29 inches between the center of the screw and any material edge, unless approved in writing by Contech Engineered Solutions.

The masking, provided on the top surface of the ClearCast form, should be left in place during installation operations to provide protection of the transparent surface.

Carefully remove the masking by rolling it back from an edge. Remove just prior to setting reinforcing steel. Use only plastic putty knives or scrapers to remove masking and take care not to scratch the surface of the ClearCast form.

If moisture is present on the ClearCast form, take precautions to avoid slipping. It is recommended to remove water before working on the surface.

The contractor shall protect the installed ClearCast forms from any cleaning solutions, solvents such as acetone, gasoline, alcohol or lacquer thinners as they may damage the form (See appendix ***“Technical Information for acrylic panels from the plastic supplier”*** for additional information related to chemical compatibility.)

The form surface shall be protected during stud welding for shear connectors. The forms shall be inspected before and after setting the reinforcement for the bridge deck. Any forms that are damaged shall be repaired or replaced, as directed by the Engineer.

Cutting or drilling of the ClearCast form may only be done by acceptable methods with approval by Contech Engineered Solutions and the Engineer. Cutting by torch or burning is not permitted.

Prior to pouring concrete, remove all debris and extraneous matter from the forms. If special circumstances require cleaning of the surface, cleaning is best accomplished with water using a high-pressure washer.

Control the placement and thickness of concrete such that the pressure applied does not exceed the design pressure.

Do not drop concrete from a height greater than 10 inches above the ClearCast form.

Minimize or avoid contact of equipment, tools, vibrators with the top of ClearCast form to prevent scratching and damage to the transparent surface. Rubber tip vibrator heads are required.

Plastic supports are preferred to hold up reinforcement bars in the deck. Bars in the bottom of the deck are recommended to be supported on continuous bar supports placed transversely to the bottom bars at a maximum spacing of 30 inches. Bars in the top of the deck are recommended to be supported on either continuous or individual high chairs placed on the form transverse to the bottom bars of the top mat at a maximum spacing of 24 inches. If chairs are supported from the bottom reinforcing bars, i.e. not directly on the form, spacing may be increased to 3 feet. Chairs with 4 legs are recommended. Place all chairs at least 6 inches from the edge of the ClearCast form track, unless it can be placed directly on the steel track.

Concrete with calcium chloride (or any admixture containing salts) shall not be used. All concrete admixtures are to be reviewed for compatibility with acrylic (see PG 12).

Contech Engineered Solutions supplies the ClearCast form and components for the structure detailed herein. It is the contractors obligation to prepare and execute a project specific installation sequence, material unloading, handling and bracing and fall protection system. The notes and drawings do not relieve the contractor of his responsibility to construct the bridge deck according the project plans and specifications and contract documents or compliance with all fall protection, safety, laws, standards and procedures required.

6 // REPAIRS + MODIFICATIONS

Repairs to damaged acrylic sheets: For all damaged acrylic identified prior to deck reinforcing bar placement, it is recommended to remove the acrylic and replace it. Additional sheets of acrylic plastic will be supplied with the ClearCast form delivery. If an acrylic sheet is damaged, detach the sheet from the steel frame and replace it in accordance with Contech Engineered Solutions' acrylic sheet replacement procedure. For questions related to the replacement procedure, contact Contech Engineered Solutions. If an acrylic sheet is damaged after deck reinforcing is placed, the sheet shall be repaired in accordance with Contech Engineered Solutions' acrylic sheet repair procedure.

Repairs to damaged steel frames: For minor touch-up of galvanization, reference ASTM 780 for applying an approved zinc galvanizing compound. If steel joists or tracks are deformed in any

way from the design cross-section, contact Contech Engineered Solutions for repair or replacement options.

Field Modifications: All modifications for holes, dimensional changes or loading conditions shall be reviewed by Contech Engineered Solutions prior to making changes. Recommendations and drawings (if necessary) will be provided for review and approval from the owner or their representative.

APPENDIX

Technical Information for acrylic panels from the plastic supplier:

The table below gives an indication of the chemical resistance of acrylic panels. Plastic materials can be attacked by chemicals in several ways. The methods of fabrication and/or conditions of exposure of plastic as well as the manner in which the chemicals are applied, can influence the final results even for “R” coded chemicals. Some of these factors include:

Fabrication – stress generated while sawing, sanding, machining, drilling, and/or forming.

Exposure – length of exposure, stresses induced during the life of the product due to various loads, changes in temperatures, etc.

Application of Chemicals – by contact, rubbing, wiping, spraying, etc.

The table should be used as only a general guide and, in case of doubt, it should be supplemented by tests made under actual working conditions. The codes used to describe chemical resistance are:

R = Resistant

Acrylic panels withstand this substance for long periods and at temperatures up to 120°F (49°C).

LR = Limited Resistance

Acrylic panels resist the action of this substance for short periods at room temperatures. The resistance for a particular application must be determined.

N = Not Resistant

Acrylic panels are not resistant to this substance. It is swelled, attacked, dissolved or damaged in some manner.

(See table, below)

Chemical	Code	Chemical	Code
Acetone	N	Heptane	R
Ammonium Chloride	R	Hexane	R
Ammonium Hydroxide (Concentrated)	R	Hydrochloric Acid	R
Aromatic Based Graffiti Removers	N	Ice Ban® Ultra™ M	R
Battery Acid	R	Isopropyl Alcohol	LR
Benzene	N	Kerosene	R
Butyl Acetate	N	Lacquer Thinner	N
Calcium Chloride (100%)	R	Magnesium Chloride	R
Calcium Hypochlorite	R	Methyl Alcohol (30%)	LR
Calcium / Magnesium Acetate	R	Methyl Alcohol (100%)	N
Citric acid (20%)	R	Methyl Ethyl Ketone (MEK)	N
CMAK (Potassium Acetate/Calcium Magnesium acetate)	R	Methylene Chloride	N
Diesel Oil	R	Potassium Acetate	R
Ethyl Alcohol (30%)	LR	Sodium Acetate	R
Ethyl Alcohol (95%)	N	Sulphuric Acid (3%)	R
Ethylene Glycol	R	Sulphuric Acid (30%)	R
Gasoline	LR	Sulphuric Acid (Concentrated)	N
		Toluene	N