Designing Cladding Connections with Greater Flexibility Using the Edge-Tie™ System

Webinar Q&A

This document includes questions submitted by attendees during the live webinar, *Designing Cladding Connections with Greater Flexibility Using the Edge-Tie™ System* held on November 9th, 2022, along with presenter responses. In some cases, duplicate questions have been combined. Please send any additional technical questions to frahman@strongtie.com.

If you'd like to refer back to the webinar, you can view the recording and download the presentation slides.

	Question	Answer
1	What keeps the bolt from spinning during initial tightening?	The head of the bolt will lock into the channel slot to keep it from spinning during initial tightening.
2	I'm surprised that any rebar attachment has to be field welded. No continuous wire loop factory welded option that hooked rebar could be hooked onto?	The detail shown is representative of a typical installation. We do not prohibit other methods of attaching reinforcement to the ETS channel.
3	The flange is not pre-punched for field bolting to a beam, does it have to be field welded?	There are no holes punched in the flange. The Edge-Tie™ Channel is welded in the shop to the beam an.d shipped together to the job site. However, adding holes and bolting to the beam is still an option and is included in our Installation Details Sheet
4	In reference to Questions #2 and #3 – I'm not talking about prohibiting. I'm talking about making it easy for the contractor to install rebar to it in the field.	There are many ways to attach reinforcement (rebar, studs, and wire mesh). We are deferring that detail to the designer for now.
5	How come all the tests were done without the concrete floor, which would have contributed to the strength of the channel?	All testing was done with the Edge-Tie™ system connected directly to the element without the presence of the concrete slab. The presence of the concrete slab would have added strength to the system and we were trying to be on the conservative side to verify the demands. Concrete would have improved the strength of the channel.
6	How do you accommodate vertical movement due to thermal expansion?	Vertical adjustability is typically from the cladding attachment connection to the T-Bolts.
7	In reference to Question #6 – What if you don't have that option?	In that case, the Edge-Tie™ system is no different from a welded connection to a bent angle.

8	How about material fatigue and brittleness in the ETS channel from residual stresses caused by temperature fluctuations after 5, 10, or 20 years down the road?	Performance evaluation for material fatigue was not a part of this testing program and is currently beyond the scope of the testing AC.
9	Do you specify lubricants or special considerations with the torque-based process?	No, for pre-tensioning you would follow AISC requirements.
10	Who is responsible for the design of the system? Is it the facade engineer or the engineer-of record?	Both, the facade engineer might do the connection design while the EOR might need to check the spandrel beam for any/additional torsional load.
11	Why not do cyclic tests with full cycles to see hysteresis loops?	Tension and shear seismic tests were tested cyclically. The Testing AC does not require full cyclic to failure loading, but applies 140 cycles of a certain percentage of the design load, then load the specimen to failure after finishing the cyclic load cycles.
12	Which loading governs Shear or Moment bending shear?	This would depend on the case being considered. We have tools that would help calculate this. This would be dependent on the eccentricity that you have. If you have a large eccentricity, you have a small amount of shear, but a greater moment. Depending on what your facade setup is, you would have to check both and see which one governs.
13	Did you test for the flexure or bending strength of the Edge-Tie™ system?	Yes. We conducted a series of tests based on different standards. The loads were verified by AISC design requirements.
14	Were these tests witnessed by an independent 3rd party?	Yes. All testing was witnessed by an independent 3rd party.
15	What about a slotted connection to the beam flange+ for field adjustment?	This support option is included in our example installation details sheet.
16	What channel heights are available? Is a 6" slab possible?	An additional pour stop plate can be welded to the top at the fabrication shop to accommodate different slab heights.
17	Are there tests or data for how the Edge-Tie™ system would perform under blast loads? If not, are there any plans for this type of testing?	This was not a part of this testing program. We will keep everyone updated on future testing on our website.

18	Can this system be used for mounting balcony guards, awnings, or other cantilevered elements?	We have not designed it to do so yet. While it is not something that we have tested for or done, as long as you are meeting your design capacities and making sure that you have all the requirements for the balcony met, I don't see why not.
19	Other than glass curtain walls, are there any other types of cladding systems that the Edge-Tie™ system can be used with?	Yes, the Edge-Tie™ system can be used with masonry, cold-formed steel, and more. It is very flexible and can be used with a range of façade systems. Please reference our detail sheet for more resources on applications that the Edge-Tie™ system can be used with.
20	What is the minimum bolt spacing that was tested? Will minimum bolt spacing be specified in the upcoming ESR and/or the Excel sheet?	The minimum bolt spacing tested was 2", with a spacing of 4.5" giving full capacity. Yes, the excel tool calculations assume the minimum capacity of 2".
21	Does the safety rail system meet OSHA requirements for fall protection?	Yes, this has been tested for the OSHA requirement of 200lb load and can be used for fall protection as long as you meet that criteria in your setup.
22	As far as I remember the ETS channel was 7.5" tall, i.e. too high for 6" slab. Does the fabricator have to cut it down?	No, this is actually the opposite as it is currently too small for that channel and you would have to add an additional extension plate to hit the slab. You would not have to cut it down, you would be adding a plate.
23	Is there a Revit plugin for ETS?	No, we don't currently have a Revit plugin. This will be a 2023 project for us.
24	What would be the performance of the T-bolt and channel under the fire hazard?	Performance of the Edge-Tie™ System in fire-resistive construction has not been evaluated and is currently beyond the scope of the testing AC.
25	Was pull-out tension testing performed for the adjacent influence of bolts less than 4.5" on center?	Yes, we did 2 series of tests on this. The first one was a minimum spacing of 2 inches. The results from those showed that the capacity of connection which would be less than the full capacity. So we moved to the spacing of 4.5" and that gave us the full capacity.
26	Can you weld strap anchors on the back of the slot tie to embed into concrete?	Yes, this is possible.
27	Looking at the photo, is there construction guard rail support available as well?	Yes. We also offer a bracket and guard post support during construction. Please refer to our website for more information.
28	Are there also elevator guard rail supports?	This is a possible application that we have not used the system for yet. Please contact Simpson Strong-Tie for support if you wish to do so.

29	What slab thicknesses do the standard Edge-Tie™ systems work with? Does it require adding a welded extension along the full length and will that be very expensive?	It does require adding a welded extension plate along the full width for anything larger than 3.5". It is not an extensive added cost, as it is just a small quarter-inch plate along the length. The calculation in the weld is specified in the tool and can be used to check your design requirements and include them in your drawings.
30	How early on in the project does Simpson need to get involved to be able to detail this system in the drawings?	The earlier the better. There have been projects where the original design had specified a regular bent plate pour stop and the details that were made for a bent plate pour stop were modified for the Edge-Tie™ channel. It is possible to do it late in the game, but the earlier the better.
31	Is CJP weld required at ETS splice joint?	We have recommendations for the welds as well as their location. Refer to the detailing sheet for this.
32	What are the deflection criteria?	For roofs, the limit would be L/180 DL+LL or L/240 LL or L/240 WL (L = span length, DL= Dead Load, LL= Live Load, WL = Wind load). For floors, the limit would be L/240 DL+LL or L/360 LL, or L/240 WL.
33	Is there any significant rotations at the top edge of the system that separates the system from the concrete?	It is possible, but you would need to make sure that you design your system to avoid this, just like you would with a bent plate pour stop. You can double-check this with your excel tool. Let's say that you have a large outrigger to outrigger and a connection in the middle with an eccentricity that would cause the channel to twist, you might get separation at the top. This is something that you can calculate in the tool. You want to make sure that you are reinforcing your outrigger span to avoid this issue in the real world.
34	Is there any reason this could not be anchored into the edge of a reinforced concrete slab edge as opposed to welded to a steel spandrel beam as a pour stop?	No, there is not. You would have to provide adequate anchorage for that. In the detail sheet, there is an option where you have bolts so you might drill a hole into the horizontal leg and use that to provide the anchorage system.
35	Is this reusable if the cladding design changes over time?	Yes. The Edge-Tie™ System allows for adaptive reuse and changes to the cladding design.
36	What is the cost per foot of the embed plate?	The Edge-Tie™ Channel is $59 per square foot.
37	Have you considered using this system in multifamily housing? Will this be applicable for structural steel family housing and/or wood-based family housing?	It is possible. We include different connection options in the detail sheet. As of right now, we have not provided support within the tool specifically for wood-based family housing, but there is no reason why this would not be possible. Please contact Simpson Strong-Tie so we can help with this scenario.

38	I see different materials in use for the system. Any consideration for corrosion prevention?	There is no protection, but we don't see this as a major issue in terms of the performance of the connection.
39	When do you anticipate the ICC ES Evaluation Report ESR report to be issued for the Edge-Tie™ system?	We expect this to be issued in early 2023.
40	Is there a minimum edge distance to the edge of the slab for T-bolts at the outside corner locations?	Yes. We specify a minimum of 2". Please Refer to the Installation Details Sheet.
41	Can the calculation tool account for wind load reactions that act in both the vertical and horizontal directions simultaneously? For example, wind load reactions from a sloped facade?	Yes, you would input each component. In the tool, each of the components are individually added so you would have to do your calculation and rotate your façade load to the correct axis and input it.
42	Where are the components manufactured?	The Edge-Tie™ Channel and Post and bracket is manufactured by a vendor that is located in the United States. Bolts are manufactured in China.
43	What are the current lead times?	The product is stocked in our West Chicago Facility. Lead time is based on location and time required to ship to the job site.
44	Can a custom bracket be used in place of the J bracket assuming the same strength for the T-bolts?	Yes. Any connection system can be connected to the Edge-Tie™ system as long as it can be bolted with the T-bolts and has adequate strength.
45	How would the Edge-Tie™ system work with post-tensioning tendon anchors?	Please contact Simpson Strong-Tie if you are considering an application with post-tensioned tendons. We will provide more resources and solutions for this in the future.
46	Have you come across any jurisdiction that required the Edge-Tie™ channel system to be fire proofed?	No, not yet.

47	Do you have a Metric version of the design spreadsheet?	Not currently, but we will add this to our request list.
48	Are Canadian codes available in your excel sheet design software?	Not currently, but we will add this to our request list.
49	Where can we get a copy of the presentation and the spreadsheets? Can you send to us?	Today's slide deck can be found on page 1.
50	Where can we get the spreadsheet shown in the presentation for design?	The excel tool can be found here.