



CFS SYSTEM ASSEMBLY GUIDE

From Panels to Structure: How the CFS System Goes Together

An eleven-step visual sequence from factory-supplied wall panels and trusses to one continuous engineered load path.

IMPORTANT — PROJECT-SPECIFIC ENGINEERING

This guide illustrates the assembly principles of the WD1 CFS System using the referenced Natural Development Ltd structural drawing set as an example. Member sizes, connections, fasteners, anchors, spacing, straps, hold-downs and structural details vary by project and location. The project-specific engineered structural drawings and approved fabrication/assembly drawings always govern installation.

Natural Development Ltd | Structural sheets S01 – S14

01 How the system is supplied

FROM PANELS TO STRUCTURE

The Cold-Formed Steel (CFS) framing system is designed to make the on-site installation process organized and straightforward.

The exterior and interior walls are pre-panelized in the factory, generally into manageable sections approximately 2 ft to 10 ft in length, depending on the wall design, openings, structural requirements and transportation.

The floor and roof trusses are also prefabricated prior to delivery. The truss system is manufactured with truss location/positioning references so the trusses can be correctly positioned in relation to the wall framing and stud locations during installation.

At the fabrication stage, a separate panel layout/assembly drawing is provided. Each wall panel and truss is identified and numbered so the installation team can see exactly where each component is located within the building.

The panel layout is a fabrication/assembly document and is provided when the framing system is fabricated; it is separate from the structural engineering drawings.

Before erection begins, verify foundation dimensions, elevations, wall layout and applicable anchor locations against the approved project drawings. Any discrepancies should be resolved before installation proceeds.

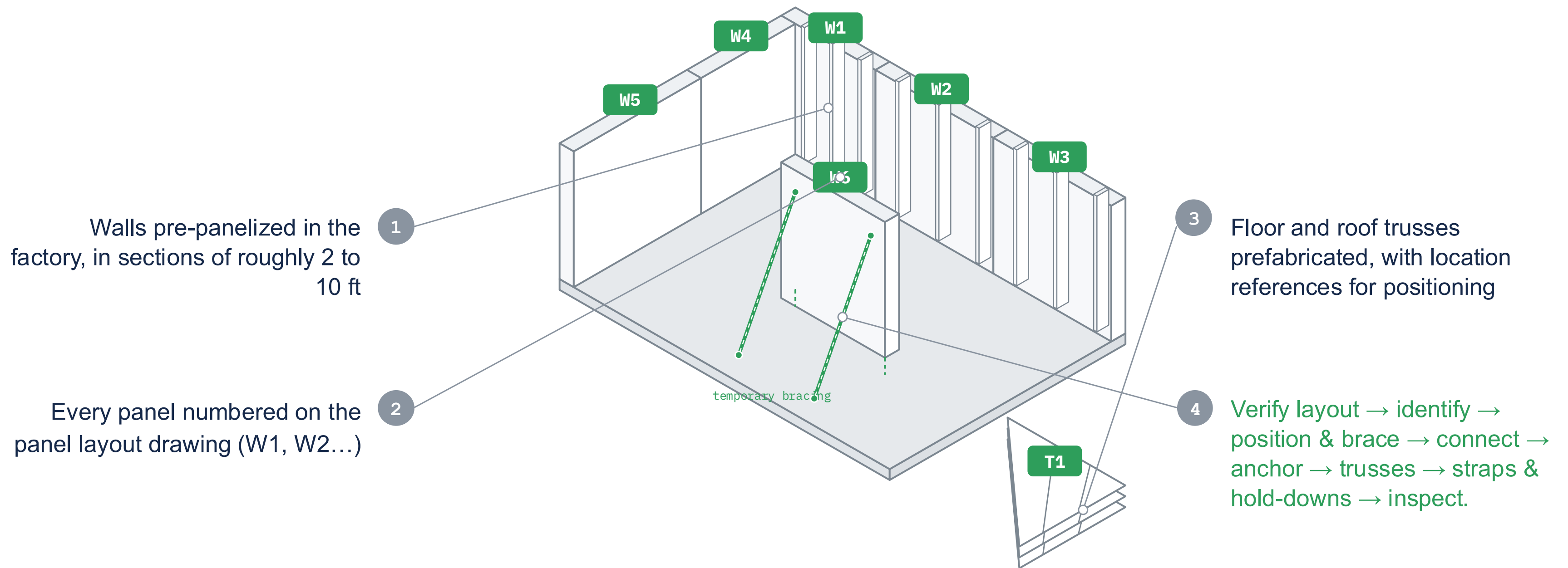
INSTALLATION SEQUENCE

- 1 Verify foundation and layout
- 2 Identify panel
- 3 Position and temporarily brace panel
- 4 Align and connect adjacent panels
- 5 Install engineered anchors/connections
- 6 Verify plumb, line and level
- 7 Install floor and/or roof trusses as applicable
- 8 Install specified blocking, straps and hold-downs
- 9 Complete all engineered structural connections
- 10 Perform final connection inspection

Do not enclose the framing until all engineered hold-downs, straps, anchors, bracing and structural connections have been inspected/verified.

01 How the system is supplied

FROM PANELS TO STRUCTURE



Verify the foundation and layout first; each numbered component then has a fixed place, so installation runs in sequence with temporary bracing until connections are complete.

02 Fasteners, connectors and anchors

FROM PANELS TO STRUCTURE

The framing package includes the specified CFS framing connection hardware identified within the agreed supply scope. Refer to the project-specific material and hardware schedule for the items supplied.

The structural drawings identify where these connections are required and the type and quantity of fasteners required at the different connection points.

It is important to understand that not every connection uses the same screw, connector or anchor. The engineer has specified different connections according to the structural loads at each location.

The structural notes specifically require CFS components to be connected by approved screw, bolt or welded connections, and require the fasteners and proprietary connectors shown on the drawings to be installed according to the engineering and manufacturer requirements.

INCLUDED IN THE PACKAGE — AS APPLICABLE AND
WITHIN THE AGREED PROJECT SUPPLY SCOPE

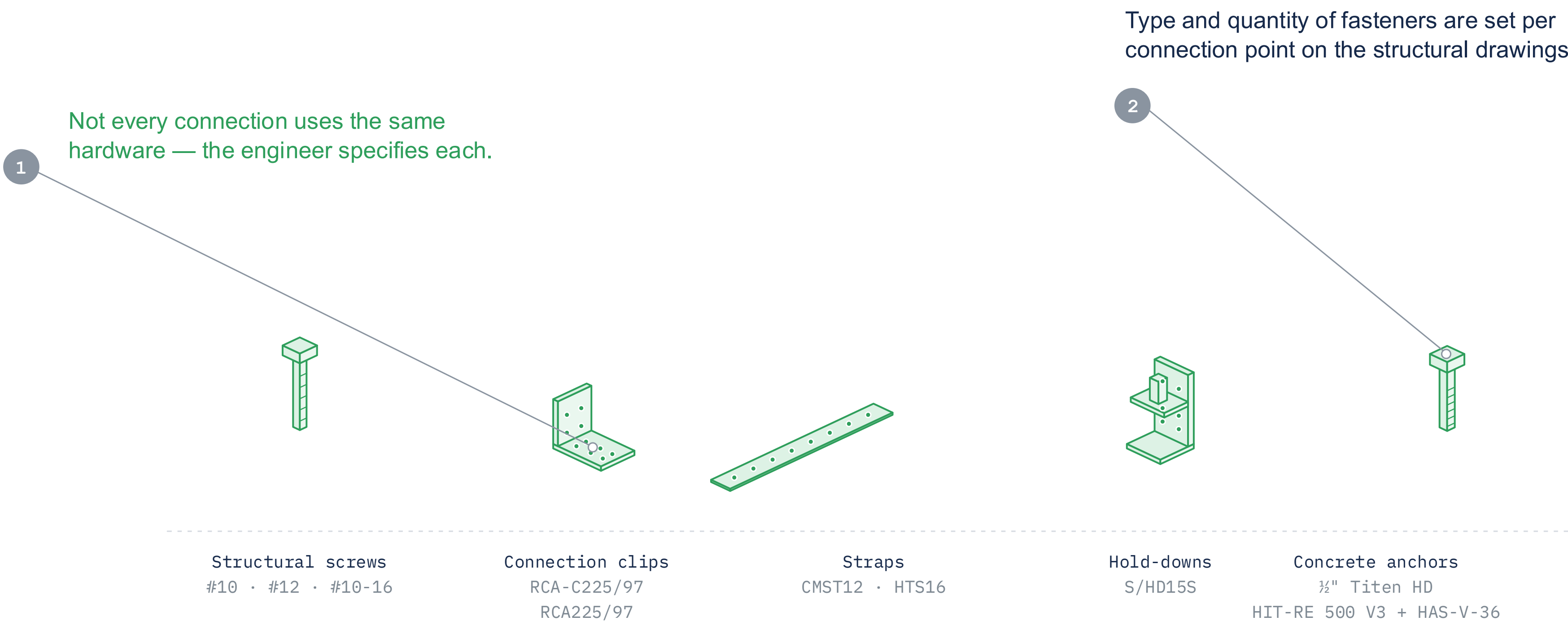
- 1 Structural screws and fasteners
- 2 CFS connection clips
- 3 Straps
- 4 Hold-downs
- 5 Framing connectors
- 6 Concrete anchors required for the CFS framing system

Not every connection uses the same connector. Proprietary clips, hold-downs, screws, bolts and anchors shall not be substituted without engineering approval.

Where framing or fasteners are exposed to severe marine conditions during construction, protect completed work from salt-laden moisture and repair damaged galvanized coatings before enclosure.

02 Fasteners, connectors and anchors

FROM PANELS TO STRUCTURE



The framing package includes the specified connection hardware identified within the agreed project supply scope. Refer to the project-specific material and hardware schedule.

03 How a wall panel is built

FROM PANELS TO STRUCTURE

Each wall panel consists primarily of a top track, vertical CFS studs, horizontal blocking/bridging and a bottom track.

The vertical studs are seated into the top and bottom tracks and mechanically fastened. Horizontal blocking/bridging is installed where specified to provide restraint, maintain stud alignment and contribute to the engineered performance of the wall system.

The drawings show #10-16 screw connections at the stud flanges and horizontal blocking at a maximum of 4 ft on center.

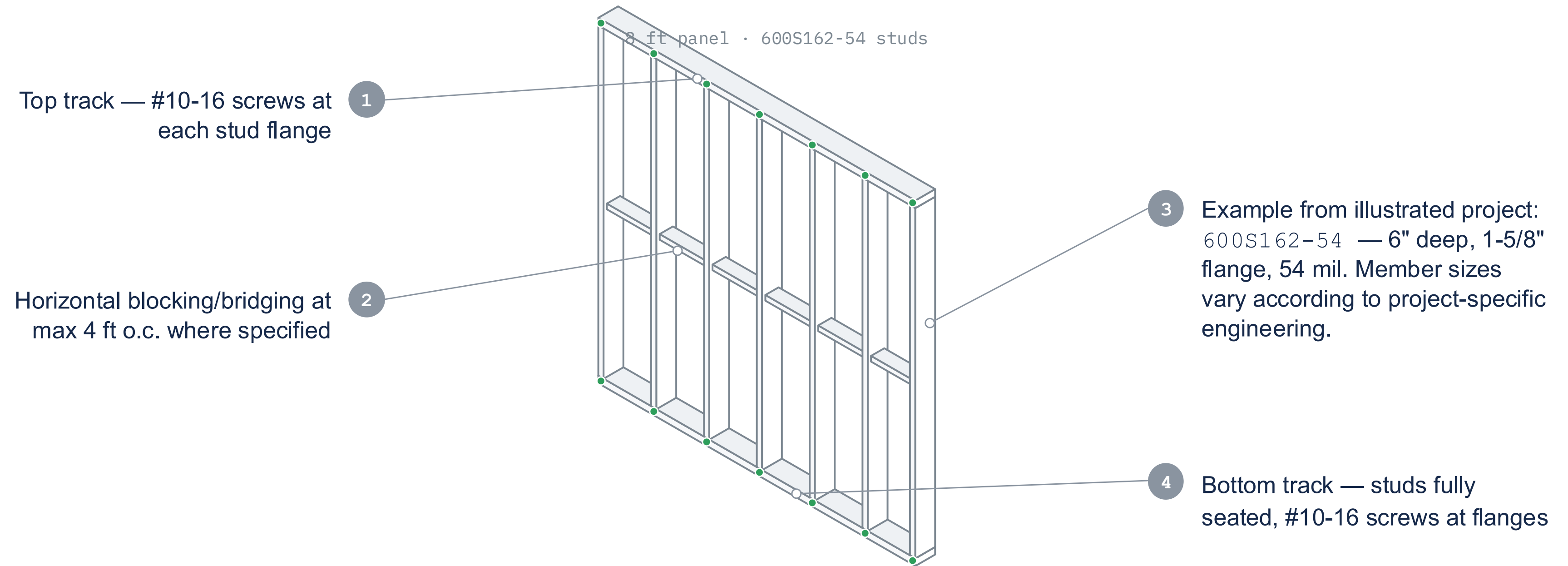
Sheet S11 provides the main details for the construction of the individual wall panels and is useful for understanding how an individual CFS wall panel is put together.

SHEET S11 SHOWS

- 1 Detail 1 – Stud to top track connection
- 2 Detail 2 – Stud wall bridging/blocking
- 3 Detail 3 – Stud to bottom track connection
- 4 Detail 4 – Sill track connection
- 5 Details 5, 6 and 9 – Header assemblies
- 6 Detail 7 – Header track detail

03 How a wall panel is built

FROM PANELS TO STRUCTURE



ILLUSTRATED PROJECT DETAIL

Studs seat fully into the top and bottom tracks and are mechanically fastened at each flange.

04 How panels connect on site

FROM PANELS TO STRUCTURE

Once the panels are delivered, they are positioned according to the numbered panel layout drawing provided with fabrication.

Adjacent wall panels are aligned and mechanically fastened together.

These connections are shown on Sheet S09, Detail 2 – Standard Site Connection. The detail identifies the inline, L and T wall junctions and specifies (2) #10 screws at each indicated connection location. Connection shown is from the illustrated project. Always follow the project-specific structural drawings for required fastener type and quantity.

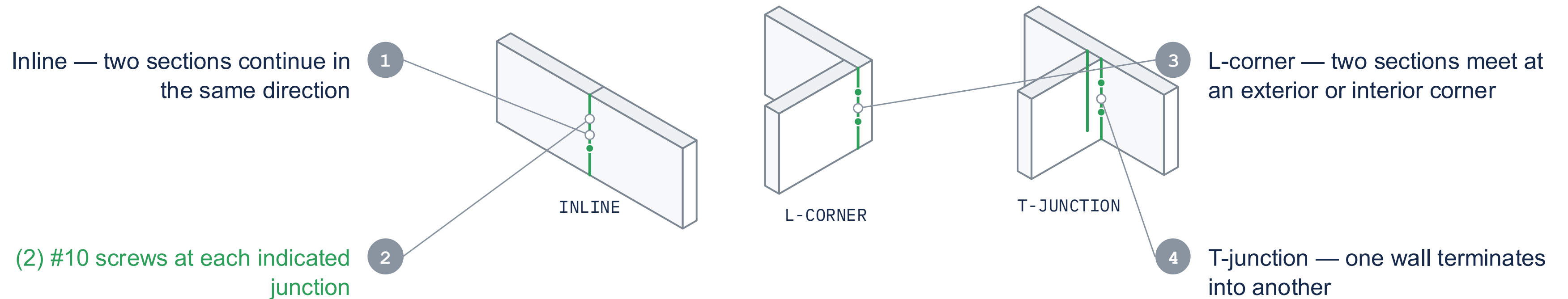
This is the main detail to look at when asking: “How do the individual wall panels connect together?”

TYPICAL CONNECTIONS

- 1 Straight / inline wall connection — two wall sections continuing in the same direction are mechanically connected together
- 2 L-junction / corner — two wall sections meet to create an exterior or interior corner
- 3 T-junction — one wall terminates into another wall

04 How panels connect on site

FROM PANELS TO STRUCTURE



ILLUSTRATED PROJECT DETAIL Connection shown is from the illustrated project — follow the project-specific structural drawings for fastener type and quantity.

05 Anchoring to the foundation

FROM PANELS TO STRUCTURE

The steel wall frame does not simply sit on the concrete. The CFS framing is mechanically anchored into the concrete foundation using engineered anchors and steel connectors.

The drawing specifies a 1/2" Titen HD anchor with 3-1/4" nominal embedment into the concrete, together with the Simpson connector and eight #10 screws for the illustrated 6-inch wall connection.

These details are shown on Sheet S09: Detail 3 – CFS Wall to Concrete Anchorage Detail 02 and Detail 4 – CFS Wall to Concrete Anchorage Detail 01.

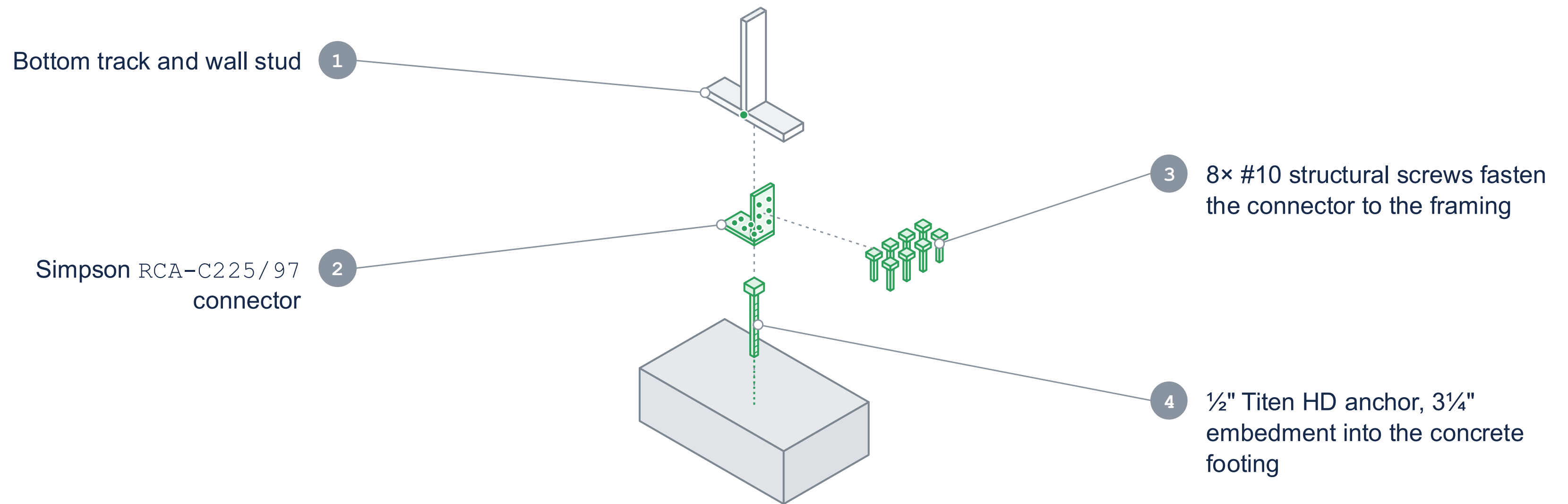
In simple terms: the concrete anchor connects the steel connector to the foundation, and the structural screws connect that connector to the CFS wall framing. This creates a positive mechanical connection between the building frame and the foundation.

ILLUSTRATED PROJECT CONNECTION – 6-INCH CFS WALL

- 1 CFS wall stud / bottom track
- 2 Simpson RCA-C225/97 connector
- 3 #10 structural screws
- 4 1/2" Titen HD concrete anchor
- 5 Concrete foundation

05 Anchoring to the foundation

FROM PANELS TO STRUCTURE



ILLUSTRATED PROJECT DETAIL The frame is anchored, not resting.

06 Floor system connections

Where the project incorporates CFS floor trusses, these are also prefabricated and mechanically connected to the wall framing.

The drawings specify the appropriate clips/connectors and the number and type of screws required. For example, the drawings show Simpson connectors with specified #10 or #12 screws depending upon the particular connection.

Sheet S12 provides additional floor connections, including floor truss to CFS wall, girder truss to CFS post, and floor truss to structural steel beam.

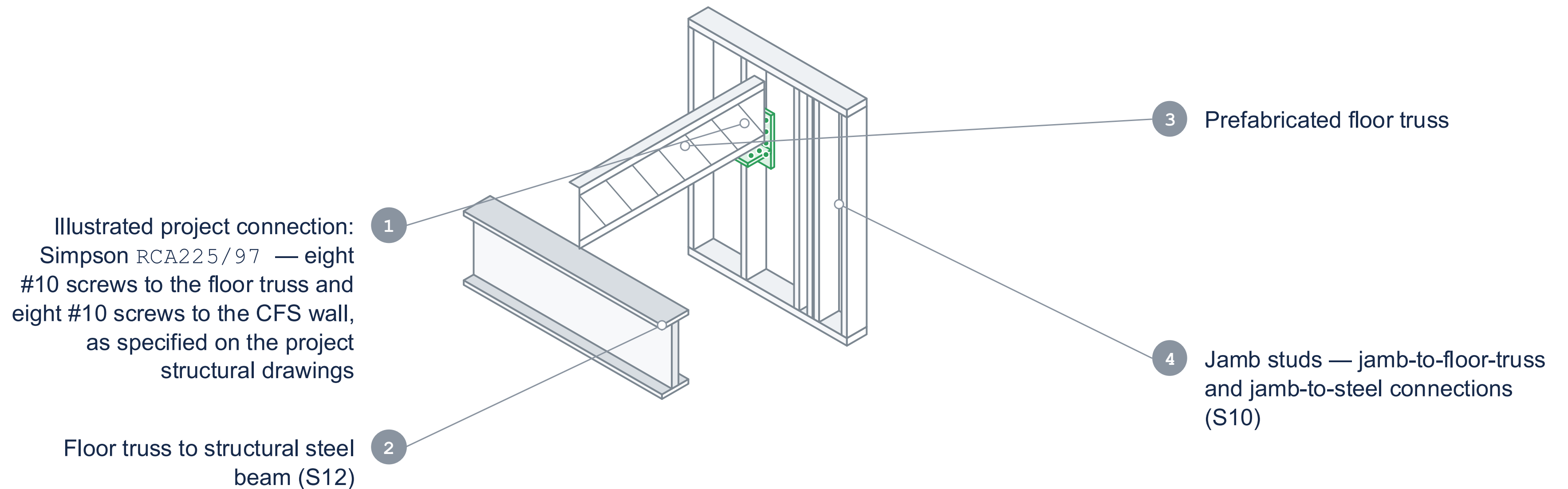
For example, the floor-truss-to-CFS-wall detail specifies a Simpson RCA225/97 connection with eight #10 screws to the floor truss and eight #10 screws to the CFS wall, as specified on the project structural drawings.

SHEET S10 INCLUDES

- 1 CFS wall to CFS floor anchorage
- 2 CFS wall to structural steel beam anchorage
- 3 Jamb bottom connections
- 4 Jamb-to-floor-truss connections
- 5 Jamb-to-structural-steel connections

06 Floor system connections

FROM PANELS TO STRUCTURE



ILLUSTRATED PROJECT DETAIL Prefabricated floor trusses are mechanically connected to the wall framing with the specified clips.

07 Roof truss connections

FROM PANELS TO STRUCTURE

Once the wall framing is erected, aligned and anchored, the prefabricated roof trusses are positioned according to the framing/fabrication layout.

The roof trusses are then mechanically connected back into the wall system using the engineered connectors and fasteners specified on the structural drawings.

For the illustrated project, the engineered exterior roof connection specifies Simpson HTS16 connectors at the locations shown on the structural drawings, together with the specified structural screw connections.

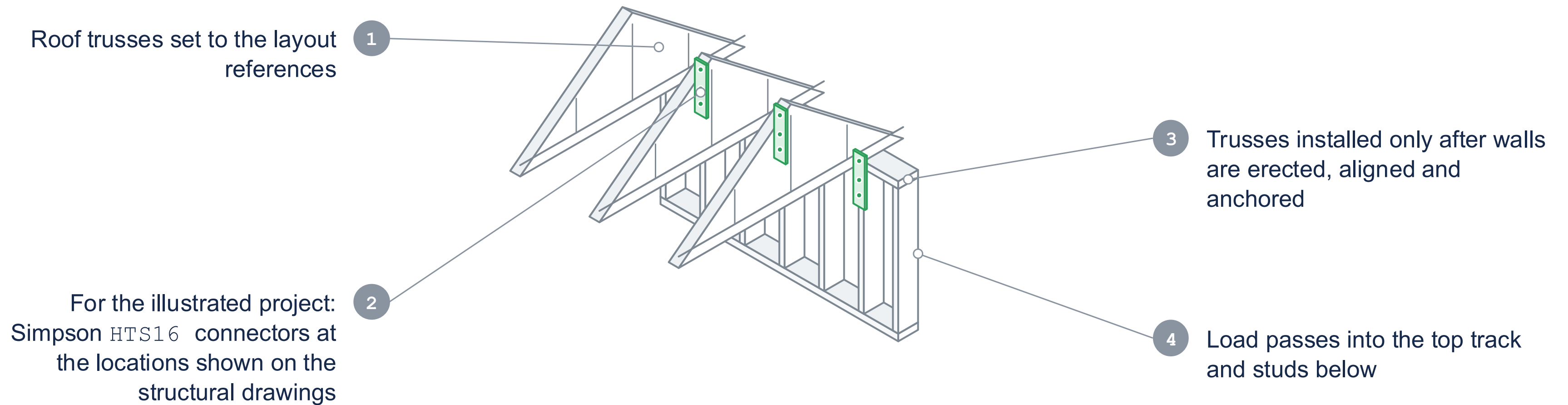
Sheet S12 shows Detail 1 – Roof Truss to External Wall, Detail 2 – Roof Truss to Internal Wall, Detail 3 – Roof Truss to Structural Steel Beam, Detail 4 – Half Truss to Truncated Truss and Detail 5 – Hip Truss to Half Truss.

THE BASIC PRINCIPLE

- 1 Roof truss
- 2 Engineered connector / strap
- 3 Structural screws
- 4 CFS wall top track / stud
- 5 Wall structure

07 Roof truss connections

FROM PANELS TO STRUCTURE



ILLUSTRATED PROJECT DETAIL Roof trusses are tied back into the wall system with the engineered connectors shown on the drawings.

08 Blocking, bracing and straps

FROM PANELS TO STRUCTURE

The framing also incorporates engineered blocking, bracing and straps to transfer structural loads through the building.

For example, the blocking details specify #10 screw connections between the blocking, trusses and wall top track.

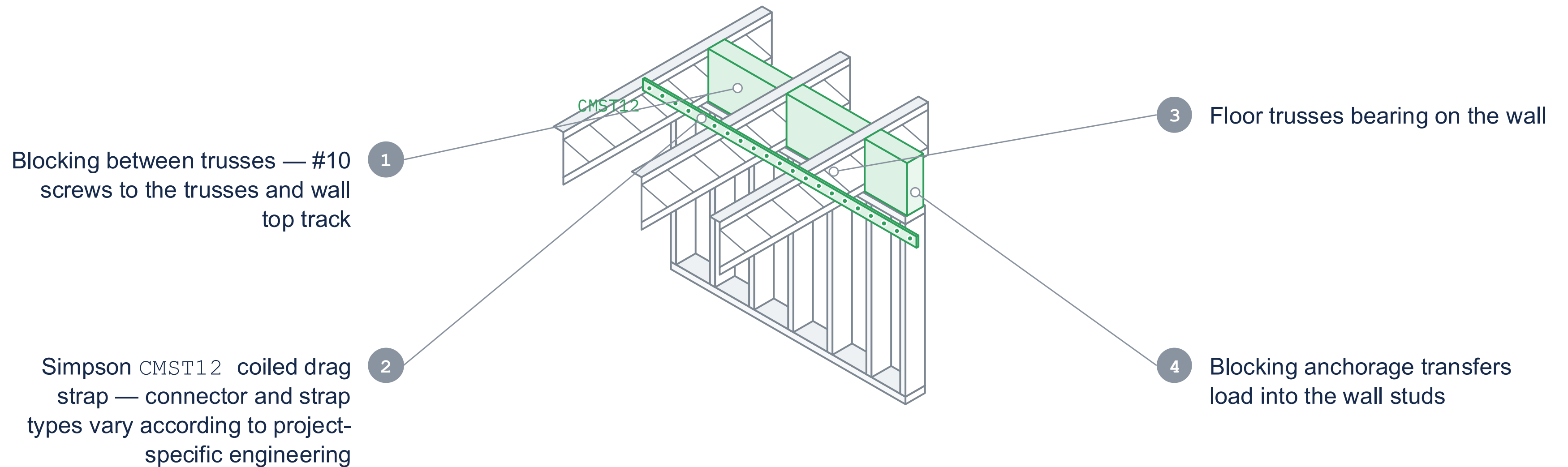
These elements help tie the different parts of the structure together rather than allowing the walls, floors and roof to act independently.

SHEET S13 INCLUDES

- 1 Floor truss to steel column connection
- 2 Floor truss to girder truss connection
- 3 Floor truss to internal wall connection
- 4 Blocking anchorage
- 5 Drag strap connection
- 6 CFS post anchorage

08 Blocking, bracing and straps

FROM PANELS TO STRUCTURE



ILLUSTRATED PROJECT DETAIL

Blocking and straps tie walls, floors and roof into one system instead of independent parts.

09 Shear walls and engineered hold-downs

FROM PANELS TO STRUCTURE

There is another important level of anchorage within the building. The normal wall anchors secure the framing to the concrete, but designated shear walls receive additional engineered anchorage and hold-downs to resist higher lateral and uplift forces.

The drawings specifically require hold-downs at the start and end of designated shear walls.

The illustrated project hold-down connection includes a Simpson S/HD15S hold-down and a Hilti 1-inch HIT-RE 500 V3 + HAS-V-36 anchor with 12-inch nominal embedment into the footing.

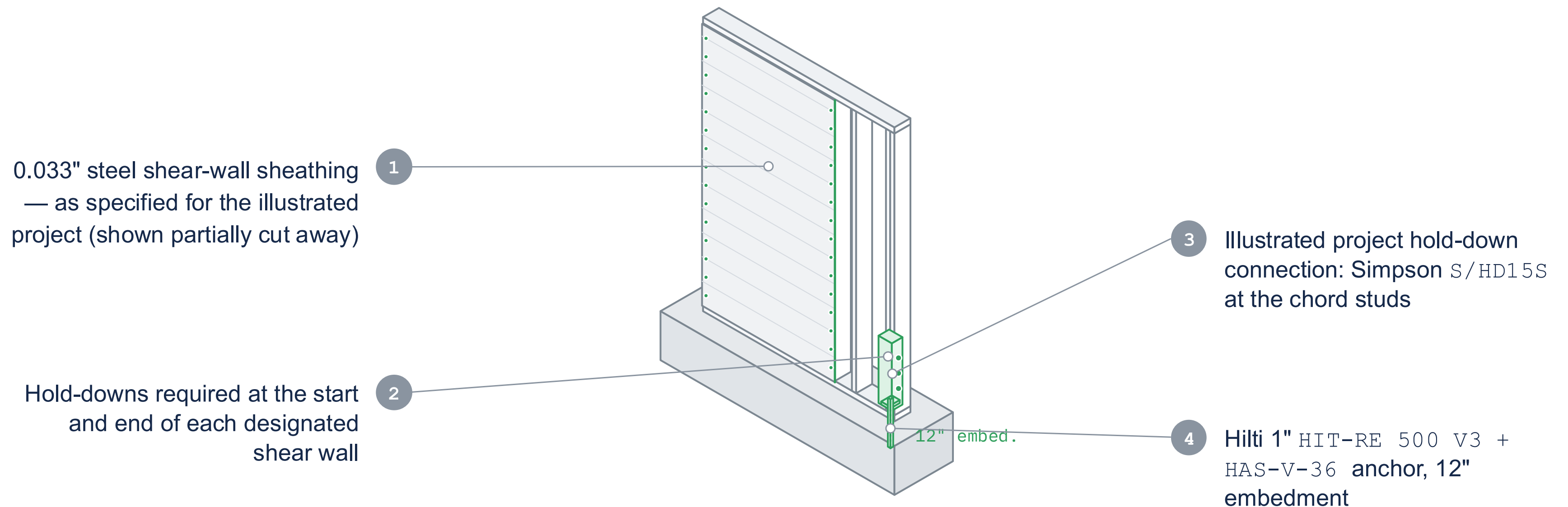
This provides the stronger anchorage required at the engineered shear-wall locations.

SHEET S14 SHOWS

- 1 Steel-sheathed shear walls
- 2 Double-story shear-wall connections
- 3 Inter-story shear-wall connections
- 4 Hold-down anchorage
- 5 Shear-wall chord stud configurations
- 6 Shear-wall to structural steel connections
- 7 Anchor embedment

09 Shear walls and engineered hold-downs

FROM PANELS TO STRUCTURE



ILLUSTRATED PROJECT DETAIL

Designated shear walls receive heavier anchorage to resist higher lateral and uplift forces.

10 Why connections differ

The client may notice different screws, clips and anchors throughout the drawings. That is intentional.

A standard wall connection does not experience the same structural forces as the conditions listed here. Therefore, the engineer specifies the appropriate connection for each condition.

The installer should always follow the specific structural detail and schedule rather than assuming one connection method applies throughout the building.

DO NOT FIELD MODIFY STRUCTURAL COMPONENTS WITHOUT APPROVAL.

Do not cut, notch, relocate, remove or modify structural studs, tracks, trusses, shear-wall components, straps, hold-downs or engineered connections unless shown on the approved drawings or authorized by the project engineer.

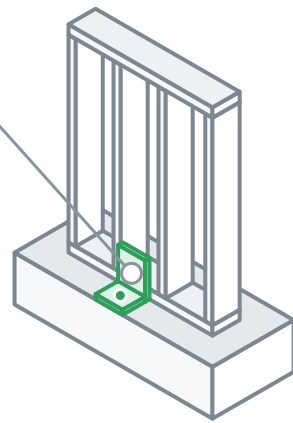
CONDITIONS WITH THEIR OWN CONNECTION

- 1 A shear wall
- 2 A building corner
- 3 A window or door jamb
- 4 A structural post
- 5 A floor truss
- 6 A roof truss
- 7 A structural steel beam connection

10 Why connections differ

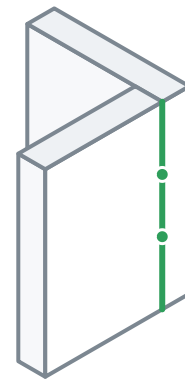
FROM PANELS TO STRUCTURE

- 1 Each condition carries different structural forces, so each receives its own engineered connector



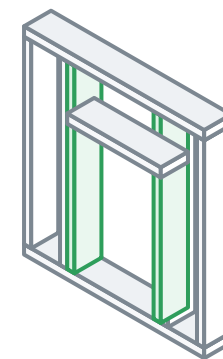
Standard wall

RCA-C225/97
½" Titen HD



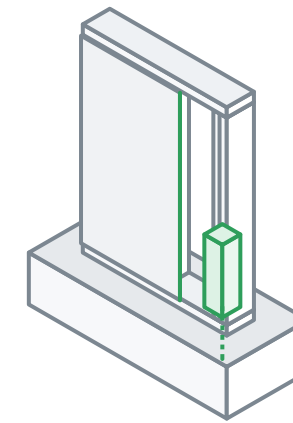
Corner

(2) #10 screws
per junction



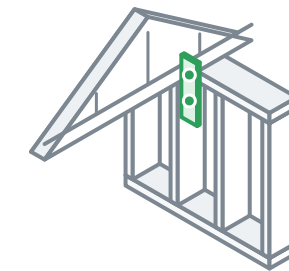
Window / door jamb

jamb connections
per S10



Shear wall

S/HD15S
HIT-RE 500 V3 + HAS-V-36



Truss bearing

HTS16
at each truss

Follow the detail, never assume one method fits all.

Illustrative project connections only. Refer to the project-specific engineered structural drawings for construction.

11 The complete load path

FROM PANELS TO STRUCTURE

The completed WD1 CFS Superstructure works as one integrated engineered structural system. The roof, walls, floors where applicable, shear walls, connectors, straps, hold-downs and anchors work together to transfer structural loads through the building and into the foundation.

This provides a continuous structural connection through the building.

For this particular project, this is especially important because the structural design criteria identify a 180 mph basic wind speed, Risk Category II and Exposure D.

FROM THE ROOF TO THE FOUNDATION

- 1 Roof trusses
- 2 Structural screws / clips / straps
- 3 Top track
- 4 CFS wall studs & shear walls
- 5 Bottom track
- 6 Connectors / hold-downs
- 7 Concrete anchors
- 8 Foundation / footings

11 The complete load path

FROM PANELS TO STRUCTURE

Roof trusses

structural screws · clips · straps

Top track

CFS wall studs & shear walls

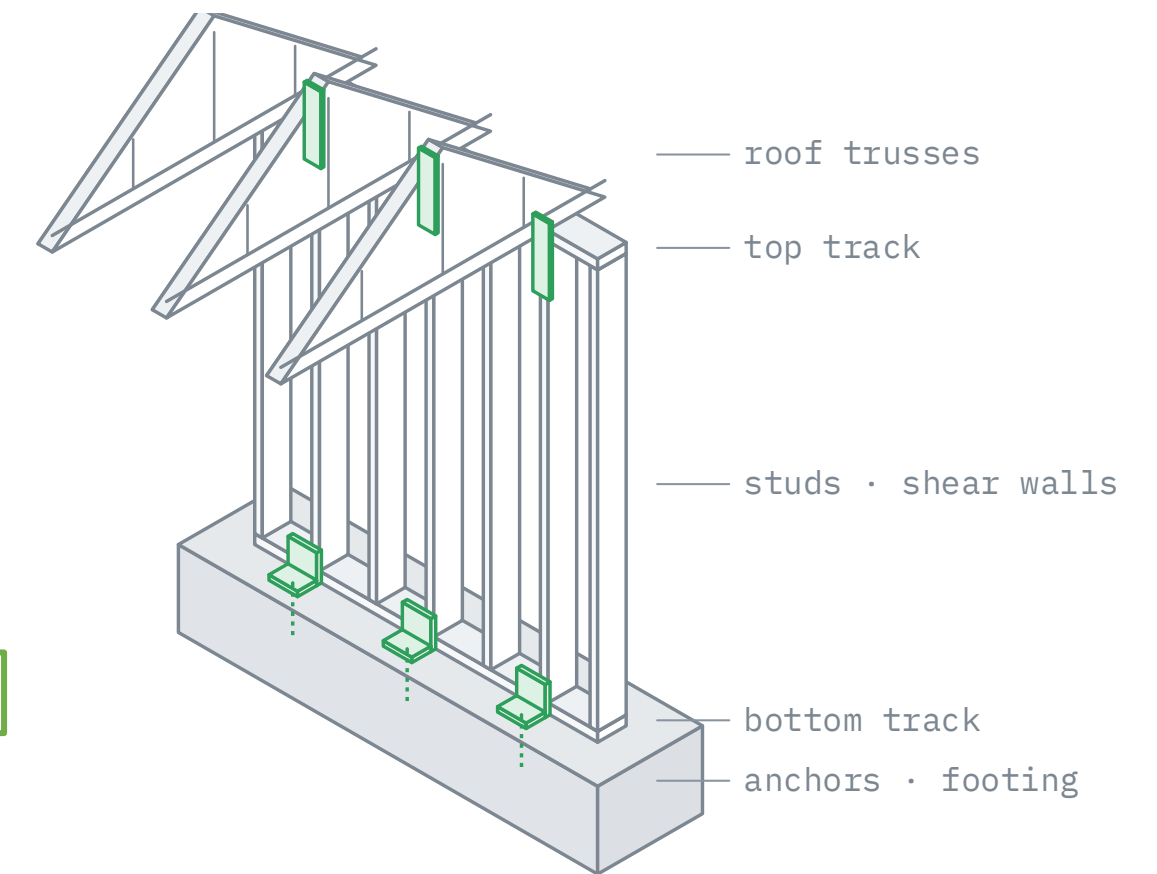
Bottom track

connectors · hold-downs

concrete anchors

Foundation / footings

One continuous engineered system.



FROM ROOF TO FOUNDATION — ONE CONTINUOUS ENGINEERED LOAD PATH

Every component has a purpose. Every connection has a location. Together, they create one integrated engineered CFS Superstructure.

IMPORTANT: This guide is intended to explain the general assembly principles of the WD1 CFS System and uses a specific engineered project for illustration. It does not replace project-specific structural drawings, approved fabrication/assembly drawings, manufacturer installation requirements, applicable codes or instructions from the project engineer. Where any discrepancy exists, the approved project-specific documents govern.

NATURAL
DEVELOPMENT