CPCI Technical Guide

Standard Connection Details for Cold-Formed Steel (CFS) Stud Walls and Hollowcore Slabs

2024

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Table of Contents

Introduction 1
Application 1
Purpose 1
Impact of Decisions During Project Phasing 2
Design Responsibility for CFS Stud Wall-to-Hollowcore Slab Connections 3
Design and Construction Considerations for CFS Stud Wall-to-Hollowcore Slab Connections 4
CPCI Document Reference (EOR) 15
Photo Credits 15
Connection Details 16
Partial Side Bearing HC-CFS Wall Connection With Grouted Rebar Tension Chord 17
Side Lap HC-CFS Wall Connection 18
Side Bearing HC-CFS Wall Connection – Extruded Edge Aligned with OSF of CFS Stud Wall 19
Side Bearing HC-CFS Wall Connection – Saw-Cut Edge Aligned with OSF of CFS Stud Wall 20
Side Bearing HC-CFS – Steel Beam Connection 21
Side Bearing HC – Concrete Wall Connection 22
Diaphragm Rebar Details (Collectors, Drag Struts and Chords) 23
Anti-Rotation Bar Detail 24
Partial End Bearing HC-CFS Wall Connection (L-Bars & Grouted Rebar Tension Chord) 25
Full End Bearing HC-CFS Wall Connection (U-Bars @ HC Voids) 26
Full End Bearing HC-CFS Wall Connection (J-Bars @ HC Joints) 27
End Bearing HC-CFS – Concrete Wall Connection with L-Bars 28
Interior Bearing HC-CFS Wall Connection (Transverse Diaphragm Steel) 29
End Bearing HC-CFS Steel Beam Connection @ Steel Beam 30
End Bearing HC-CFS Wall Connection – Reinforced Studs Overhanging Slab Ends 31
End Bearing HC-CFS Wall Connection – HC Set Back from OFS of Stud Walls (L-Bars) 32
End Bearing HC-CFS Wall Connection – HC Aligned with OSF Stud Walls (U-Bars @ site) 33
End Bearing HC-CFS Wall Connection – HC Aligned with OFS of Stud Walls (J-Bars @ site) 34
End Bearing HC-CFS Wall Connections – HC Aligned with OFS of Stud Walls (J-Bars @ plant) 35

List of Figures

Figure 1: A typical precast concrete hollowcore section 1
Figure 2: Vertical tie bolted connection at grouted hollowcore slab joint 3
Figure 3: Slip connection at the underside of hollowcore slab with vertical slots in the top track 4
Figure 4: Concentrated loads from individual CFS studs and CFS built-up posts 5
Figure 5: Steel plate diaphragm tension chords anchored to hollowcore 6
Figure 6: Variation of top surface profile of extruded hollowcore slabs 7
Figure 7: Shims at CFS steel studs – note the studs with no shims at red arrows 7
Figure 9: Formwork for stud wall grout pad and completed grout pad 8
Figure 8: Local grout/drypack at individual studs 8
Figure 10: Completed grout pad and vertical tie bolts for stud bottom track connection 9
Figure 11: Pre-installation of CFS stud wall, followed by non-shrink grout 9
Figure 12: Cores at ends of hollowcore slabs to be filled on-site with solid concrete or grout 10
Figure 13: Hollowcore slab cores prefilled at ends with solid concrete/grout in plant prior to shipping to site 3: Pre-grouted hollowcore slab ends 11
Figure 14: Grouting at shared hollowcore bearing joint (PCI MNL-126-15E) 11
Figure 15: Load path through shared hollowcore bearing joint (PCI MNL-126-15E) 12
Figure 16: Lateral bracing of CFS wall, and longitudinal bridging (for bracing of studs in weak direction) 13
Figure 17: Exterior sheathing fastened to CFS studs and horizontal stud tracks 14

Introduction

Precast concrete hollowcore has been widely used in Canada and around the world since the early 1960s (CPCI, 2017). Initially, precast concrete hollowcore was made using regular wet-cast concrete and in order to reduce the weight, inflatable rubber tubes were used to form the voids along the length of the slabs. This way of producing hollowcore slabs was impractical and labour intensive. This process evolved to what it is today, producing hollowcore using a dry concrete mix (concrete with zero slump), and vibrating machines that extrude the concrete into a section with voids along the span – a process developed by Spiroll.

In later years, another extrusion method was developed using shear-compaction, enabling the slab cross-section to maintain its extruded shape immediately following casting. Today precast concrete hollowcore is manufactured worldwide, with the structural benefit of the voids reducing the slab weight by up to 50% compared to a solid slab of equivalent thickness. In Canada, approximately 2.5 million square metres of precast concrete hollowcore are produced every year (CPCI, 2024).

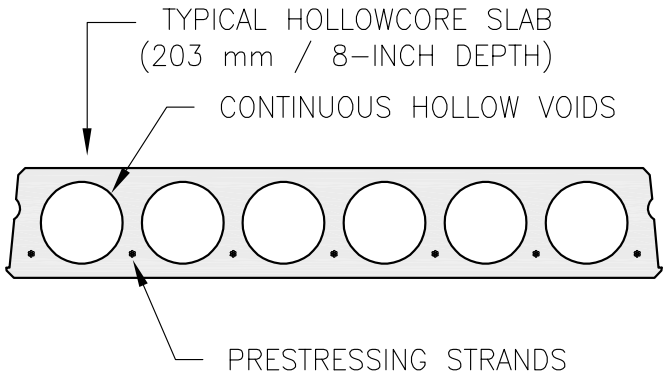


Figure 1: *A typical precast concrete hollowcore section*

Application

Precast concrete hollowcore is widely used for health care, educational, commercial, residential, and industrial facilities. Hollowcore slabs can be utilized in a Total-Precast concrete scenario, with an all-precast structural system, as well as in hybrid systems, where the gravity and/or lateral structural support system of the building is not precast concrete.

The cost of building materials may become volatile at times due to supply chain issues and inflation. The current high demand for rapid construction of new housing across Canada has put additional strain on material and labour costs. Precast concrete, in general, has remained relatively stable in terms of building material costs. Precast concrete hollowcore slabs are an excellent solution for a hybrid building system, since the relative stability of hollowcore pricing can be realized in combination with a wall support system that is most economical at the time of design and construction, or because of locally available materials.

Hollowcore slabs supported on Cold-Formed-Steel (CFS) stud walls are an increasingly common combination for hybrid systems in multi-storey residential construction. The design of CFS stud walls in conjunction with hollowcore slabs can be optimized to take advantage of reduced foundation loads (in relatively lightweight structural walls). Hollowcore slabs have a significant advantage over other floor systems including solid slabs, providing spans of up to 9.0 m, using 203 mm hollowcore without the need for interior supports.

Precast concrete hollowcore slabs are available throughout Canada from CPCI producers. More information about CPCI producer members can be found at this link: https://www.cpci.ca/en/members/active_members/

Purpose

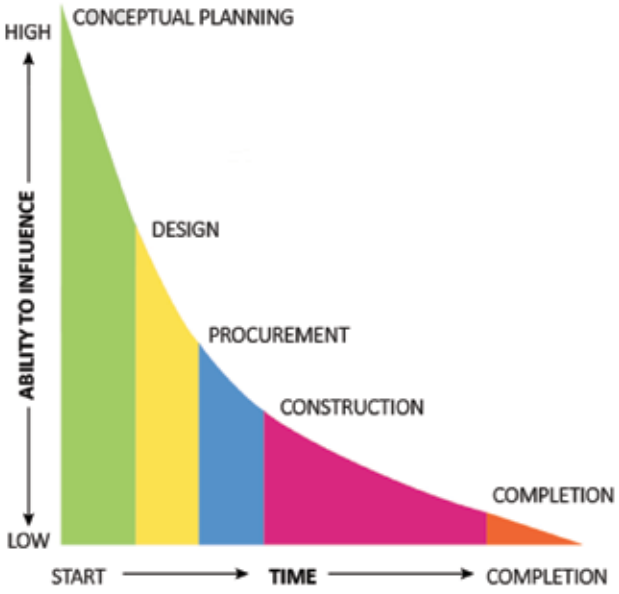
The purpose of this document is to provide building designers with typical detailing of precast concrete hollowcore floors that are supported by and interfaced with CFS stud walls. The details provided within this document are

recommended by CPCI precast concrete producers based on best practices, to minimize installation errors and delays, reduce unsafe working conditions and efficiently utilize product capacities. The design capacity of each connection provided within this document must be calculated by the Structural Engineer-of-Record (EOR).

Impact of Decisions During Project Phasing

In a traditional Design-Tender-Build project, the decision makers involved during the design phase typically include the Owner, the Project Architect (usually the Prime Consultant), the Structural Engineer and other consultants such as Geotechnical, Civil, Environmental, etc. During the design process, the team may or may not seek input from a General Contractor, and/or subtrade(s). Unfortunately, if the design is based on connection details that are impractical for one or more of the subtrades, the outcome can be an expensive building with an extended schedule, which can leave the Owner with a negative opinion about specific building system types.

In a tendered project, when there has been no input from subtrades, it is essentially too late for the design team to consider revisions that better suit best practices for construction. The most successful projects are those that involve all key decision makers early in the conceptual planning phase, which is especially important in a hybrid structure with multiple subtrades – early input from all parties is critical to ensure a successful outcome during construction:



BENEFITS OF EARLY CONSTRUCTION MANAGEMENT PARTICIPATION

The precast industry has standard details that have been developed over many years and represent best-practices for hollowcore connections. These industry standard connections result in efficient and economical construction for hollowcore projects.

Similarly, the CFS industry also has its own industry standard details that represent best practices for economical and efficient use of its steel stud wall systems. In the design of a hybrid building, hollowcore-to-CFS stud wall connections are designed by the EOR; the connections should be designed with a balanced approach that maximizes the benefits of both the precast and CFS stud wall subtrade standard details, and minimizes the impact on schedule, with practical designs that are simple to construct.

Design Responsibility for CFS Stud Wall-to-Hollowcore Slab Connections

Given the overlap of structural design responsibilities in a hybrid structure, it is not surprising that there is sometimes confusion over "who owns what" in terms of scope and specifics for design and detailing – the EOR, or the subtrade Engineer, especially when it comes to the design of structure component connections.

For a hybrid structure, the EOR applies the provisions of the National Building Code of Canada (NBC), together with the applicable local Provincial/Territorial Building Code to analyze the structure for load effects, which include gravity, wind, volume restraint effects, and seismic effects. In addition, the EOR must review and coordinate all aspects of the structural analysis and design for the overall project, as they have the final signing authority for issuance of the Letter-of-Compliance to the Authority Having Jurisdiction (AHJ) or building occupancy. This results in comprehensive specifications for manufacturers to follow from quotation to installation, allowing the owner to receive fair and matching estimates and fully utilize the speed and simplicity of the hollowcore system.

In a hybrid structure with CFS stud walls supporting multiple storeys of hollowcore floors and a roof, the EOR is required to design the wall-to-floor connections for the forces derived from their analysis of the structure. As noted previously, the EOR should work closely with the precast and CFS stud wall suppliers to develop details that would efficiently tie the components together, without compromising the beneficial advantages of each system.

Regarding the structural integrity of a hybrid structure, connections that interface precast concrete components with other structural materials must provide the same load paths and follow the design philosophy prescribed in CSA A23.3 Clause 16.5 (Structural integrity). The EOR should design and detail all connections to satisfy structural integrity requirements, and include them in the contract documents. In addition, the EOR is responsible for the review of precast and steel stud shop drawings that outline the proposed precast-precast, precast-steel stud, and steel stud connection details, and confirm that the connection details on the shop drawings meet their structural design intent for the overall structure.

Figure 2 shows an example of vertical tie connections joining the upper and lower CFS stud walls through a grouted hollowcore slab joint.

The connection details presented in this document provide designers with multiple options for typical details using CFS stud walls and hollowcore slabs. For clarity, each detail summarizes the design scope (by EOR, CFS supplier, or Precast supplier), and the supply and installation scopes (by General Contractor (GC), CFS supplier, or Precast supplier).

Figure 2: *Vertical tie bolted connection at grouted hollowcore slab joint*

Design and Construction Considerations for CFS Stud Wall-to-Hollowcore Slab Connections

Hollowcore floors are designed to resist gravity, wind and seismic loads and to transfer lateral loads to the elements of the lateral force-resisting system (LFRS) through a floor or roof diaphragm. The loads from the hollowcore are transferred through the connections to the LFRS (gravity or lateral).

Typically there are four types of connections:

1. End-bearing connections
   - Where the ends of a slab bear on a wall (in the direction of the slab span).
2. Side-bearing connections
   - Where the side edges of a slab overlap onto, or "bear" on a wall (in the direction perpendicular to the slab span).
3. Side-lap connections
   - Where the side edges of a slab are adjacent to a wall, but do not overlap with the wall (in the direction perpendicular to the slab span).
4. Slip-connections
   - Where a CFS stud wall is framed such that the hollowcore floor slabs can deflect independently without loading the wall studs (see Figure 3).

Figure 3: *Slip connection at the underside of hollowcore slab with vertical slots in the top track*

Hybrid structures that combine precast hollowcore slabs with load-bearing and non-load bearing CFS stud walls have unique design, fabrication and construction considerations, as outlined below:

1. Eccentricity of vertical axial load on CFS wall studs
   - If the hollowcore slabs are not bearing on the full thickness of the CFS stud walls, there will be bending moments induced in the walls due to eccentricity of the axial load; slenderness effects in CFS stud walls need to be checked to account for the wall bending moment and axial loads.
2. Staggered CFS studs and/or CFS posts above and below hollowcore slab level
   - Load-bearing CFS studs might not line up above and below the hollowcore slabs, which then requires a diagonal load path through the hollowcore slabs to transfer axial loads to the studs below.
   - This is more critical to consider for built-up CFS posts, which have a larger concentration of axial load, in comparison to uniformly spaced CFS studs within a wall (see Figure 4).

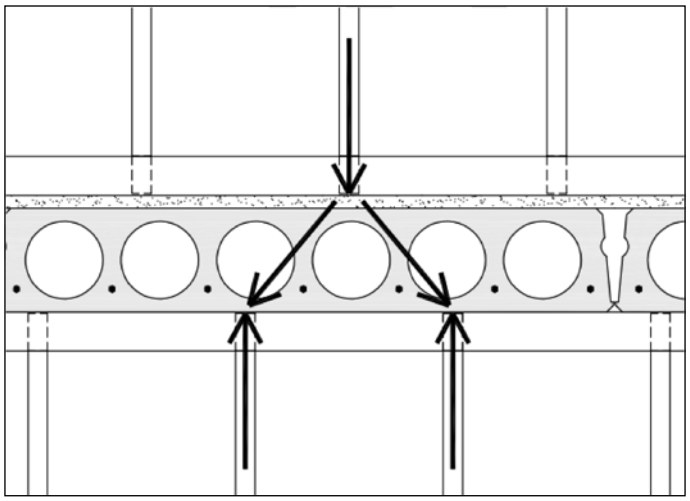


Figure 4: *Concentrated loads from individual CFS studs and CFS built-up posts*

3. Localized bearing stresses on hollowcore
   - The thin gauge of CFS horizontal stud wall tracks, coupled with the thin gauge, C-shaped profile of CFS studs doesn't provide distribution of axial loads much beyond the local area immediately adjacent to CFS studs or posts. Localized bearing stresses on the grouted ends of hollowcore caused by the axial load of the studs or posts should be checked.
4. Diaphragm continuity and resistance of tension chord forces
   - Diaphragm continuity can be achieved by utilizing the CFS horizontal stud wall tracks above and below the hollowcore, by a continuous structural steel section (flat plate, angle, or channel section), or by the introduction of rebar within the plane of the slabs – preferably beyond the slab edges for reinforcement at the building perimeter.

Figure 5: *Steel plate diaphragm tension chords anchored to hollowcore*

- Figure 5 shows flat steel plates acting as diaphragm tension chords, which are fastened to the hollowcore slabs and then covered by a concrete topping – each plate joint is field welded, to develop the full tension capacity of the plates.
- The flat plate tension chord sizes and locations need to be closely coordinated in conjunction with core drilling for mechanical and electrical subtrade services. In some cases, a cored hole may be required at the same location as a chord plate, which affects the plate capacity; some remedial work may be required if there isn't enough plate remaining at the cored hole locations to develop the design forces.
- Finally, diagonal chord plates can also be affected by slab camber and differential camber between slabs.
- If CFS horizontal stud tracks are used as diaphragm tension chords, they need to be continuous with full-tension capacity splices installed at joints in the tracks; similarly, if a structural steel section is used to resist diaphragm chord tension forces, it needs to be continuous with full-tension capacity splices (as noted above).
- Notching out the top corner of hollowcore slabs at bearing walls, to accommodate tension chord rebar in the plane of the floor is ***not*** recommended, as this can have a significant impact on the shear capacity of the slabs. In addition, notching the tops of hollowcore slabs increases the production costs of the hollowcore. If a rebar tension chord is desired, it is always preferable to place the rebar beyond the slab ends and connect the chord rebar into the hollowcore slabs by using a hooked bar that is grouted into a hollowcore void, or into the hollowcore joints to achieve a continuous in-plane, reinforced load path for the diaphragm.

- All of the above considerations assume that the hollowcore acts as the structural diaphragm – however, it should be noted that a continuous, bonded, reinforced concrete topping can also act as a diaphragm, which allows for placement of concentrated diaphragm tension reinforcement as required within the floor plan.

5. Variations in profile at the top surface of hollowcore
   - While the underside of hollowcore is cast onto a smooth steel form, the top surface of hollowcore slabs can sometimes have some local variations in the surface profile following the extrusion of the slabs.

Figure 6: *Variation of top surface profile of extruded hollowcore slabs*

- This varying profile can result in gaps between the CFS horizontal bottom track and the top surface of the hollowcore slabs, if a layer of non-shrink grout isn't used below the CFS stud wall to provide a uniform bearing.
- These gaps can range in size, and while shimming (or locally dry-packing) these gaps to ensure full bearing at each stud may appear to be a practical solution, in practice it is an unreliable means of providing uniform stud bearing onto the hollowcore slabs (Figure 7 and Figure 8).

Figure 7: *Shims at CFS steel studs – note the studs with no shims at red arrows*

- Localized gaps between the underside of the CFS bottom track and top surface of the hollowcore slabs may also result in a diminished structural capacity for the thru-bolt connection.

Figure 8: *Local grout/drypack at individual studs*

- To ensure a uniform bearing surface between CFS stud walls and precast slabs, a continuous layer of high-strength, non-shrink grout (or drypack) should be provided below all load-bearing stud walls.
- For a CFS stud wall, the grout pad can be installed before fabrication and installation of the CFS walls, which allows for easier installation of the grout (see Figures 9 and 10).

Figure 9: *Formwork for stud wall grout pad and completed grout pad*

Figure 10: *Completed grout pad and vertical tie bolts for stud bottom track connection*

- Alternatively, the CFS stud wall can be constructed and placed on localized shims, after which the joint can either be drypacked, or filled with flowable non-shrink grout – which requires a grout pad wider than the thickness of the studs, as shown in Figure 11.

Figure 11: *Pre-installation of CFS stud wall, followed by non-shrink grout*

- In order to avoid any differential bearing elevations between supporting elements, the designer and supplier of the CFS walls must take into account the thickness of the grout pad and/or thickness of shims used and adjust the overall wall height accordingly. A minimum grout pad thickness of 25 mm is recommended to account for construction tolerances, and allow for effective transfer of loads to the hollowcore.

6. Varying length of CFS studs within the stud wall system
   - CFS stud walls have allowable fabrication and construction tolerances; for effective and uniform transfer of axial loads through hollowcore slabs, the individual studs need to be as close to the same length as possible, and in firm contact with the CFS horizontal tracks at the top and bottom of the walls.
   - For studs that are noticeably shorter than adjacent studs, a reinforcing plate is sometimes screwed to the face of the low stud to extend the stud up to the underside of the CFS horizontal track top plate, ensuring even distribution of axial load to all studs.
   - The CFS designer and supplier must work within the acceptable manufacturing tolerances to ensure that the top and bottom track of the as-built stud walls are level and uniform. Any potential wavering of the track(s) due to differential stud lengths must be limited and/or remediated.
7. Core fill at ends of hollowcore slabs for axial load transfer and anchorage of wall connections
   - There are two feasible means of providing solid core fill at the ends of hollowcore slabs which are bearing on CFS walls:
     i. Filling ends of cores solid on-site by either:
        1. Damming cores on-site (as shown in Figure 12) and filling ends solid with grout or concrete before installing CFS walls above.
        2. Depending on the hollowcore supplier, it may be possible for the top flange above each core to be locally removed in the plant prior to shipping to site, or locally notched open in the field. The cores are then dammed in the field and filled solid with grout or concrete prior to installing the wall above.

Figure 12: *Cores at ends of hollowcore slabs to be filled on-site with solid concrete or grout*

Figure 13: *Hollowcore slab cores prefilled at ends with solid concrete/grout in plant prior to shipping to site*

ii. Prefilling the ends of the cores solid with concrete or grout in the manufacturing facility prior to shipping to site (see Figure 13).

- The various methods of achieving solid filled ends have a number of points to consider:
  i. It may prove difficult for the installation crew to ensure that the voids at the slab ends are completely filled solid for the full height of the cores. Upon visual inspection, the cores may appear to be filled solid, but in reality it could be possible that the achieved level of fill has begun to taper from the vertical face of the slab.
  ii. Further complications are introduced in shared bearing conditions, when the gap between adjacent slabs limits the installer's ability to pack the ends solid. (See Figure 14).

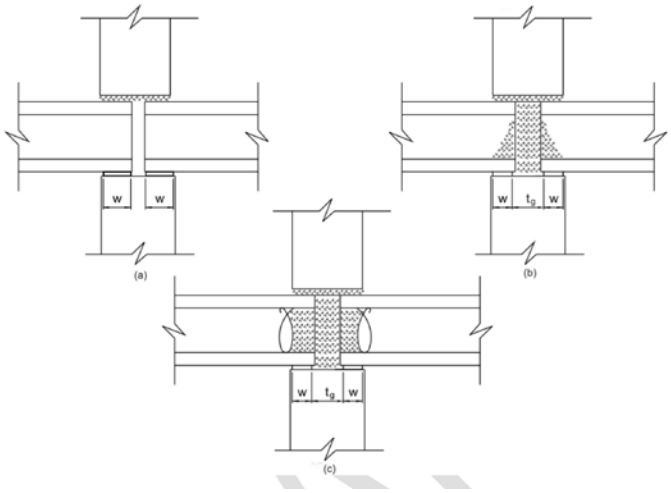


Figure 14: *Grouting at shared hollowcore bearing joint (PCI MNL-126-15E)*

iii. Various hollowcore manufacturers will have different preferences on whether the top flange of the cores should be opened prior to shipping to site, or notched open in the field. This is dependent on their manufacturing facility, their shipping and handling procedures, and the amount of work that they would prefer to perform in the field. Consult with your local hollowcore producer for further guidance.

iv. Filling of voids in a certified facility provides a more consistent and reliable method of core fill. Coordination is required at locations where reinforcing and/or connections are needed, so that specific cores can remain empty as required. Additional manufacturing and installation costs will be applicable for either of the proposed methods of providing core fill in the voids at the slab ends.

v. It is recommended for the cores of the slabs to be filled solid at locations where load bearing CFS walls are being supported by hollowcore slabs. However, in shared bearing conditions where a grout column may exist between hollowcore slabs, it may be possible for a compressive strut to form and allow the majority of the loading from above to flow through this column (Figure 15).

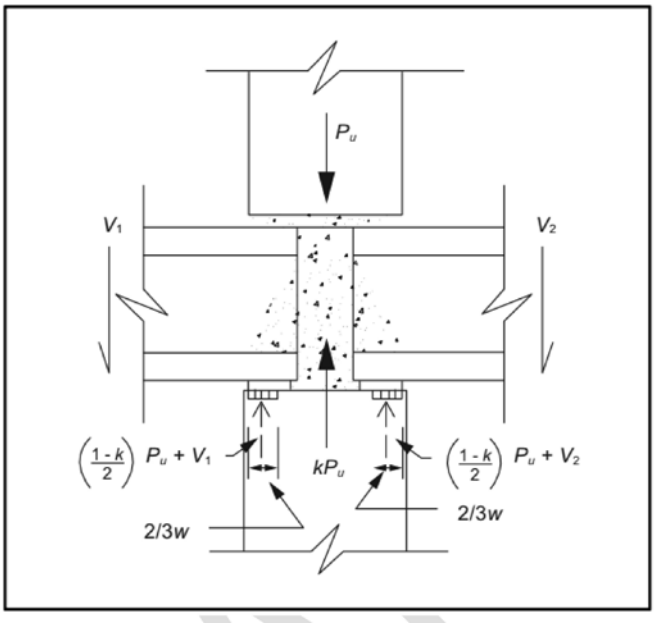


Figure 15: *Load path through shared hollowcore bearing joint (PCI MNL-126-15E)*

If the relative stiffness of the bottom track of the CFS wall allows for this mechanism to form, it may not be as critical for all ends to be filled solid. However, it is required for all cores in the vicinity of significant point loads (such as at built-up CFS stud posts above) to be filled completely solid, to effectively transfer the concentrated load to the wall below.

- Finally, it is ***critical*** for structural integrity that the hollowcore slabs are positively connected to the supporting steel stud walls at regular intervals, prior to erecting hollowcore on the floor above in order to ensure stability during construction.

8. Bracing of the CFS studs prior to hollowcore installation
   - While the EOR designs the finished structure, it is the responsibility of the General Contractor and the subtrades to ensure temporary bracing is engineered and installed, as required to maintain structural stability at all times during construction.

- It is the responsibility of the General Contractor and/or the subtrade(s) to engineer and install any temporary bracing/shoring required to maintain structural stability of the building system during construction.
- The CFS designer and/or supplier are responsible for confirming the bracing requirements of the CFS walls prior to the installation of the precast hollowcore slabs. All CFS wall and bracing assemblies must be designed to satisfy any stresses/loading that they may be subjected to during the installation of the precast hollowcore slabs.
- It is required that individual studs within the premanufactured CFS wall assemblies be braced to prevent lateral buckling, or bending within the plane of the wall during installation of the precast hollowcore slabs. This requirement is typically achieved by sheathing, strapping, or bridging (see Figure 16).

Figure 16: *Lateral bracing of CFS wall, and longitudinal bridging (for bracing of studs in weak direction)*

9. Bending of hollowcore slabs between CFS studs during installation of hollowcore and final design condition
   - Due to the manufacturing process, precast hollowcore slabs only possess reinforcing in the longitudinal direction and do not have any provided reinforcing in the transverse direction. The stiffness of individual planks in transverse bending is purely dependent on the geometry of the slab, and whether the cores at the slab ends are filled solid or not.
   - The top track of the CFS wall assembly must be sufficiently rigid in bending to provide continuous and uniform support for the entire width of each hollowcore slab. The horizontal track must be designed to span between the CFS studs, considering both strength and stiffness. The bending stiffness of the CFS top track and the transverse bending stiffness of the hollowcore slabs should be reviewed to ensure concrete tensile stresses don't exceed the slab cracking strength.
   - The installation of full-height sheathing, fastened to one or both faces of the CFS studs and CFS horizontal tracks prior to hollowcore slab installation significantly increases the stiffness of the CFS wall system, and also reduces the deformation of the top track under the self-weight of the hollowcore slabs (Figure 17).

Figure 17: *Exterior sheathing fastened to CFS studs and horizontal stud tracks*

- The same increase in stiffness and reduction in deflection also applies to the CFS horizontal track at the base of the stud wall, which also must carry axial stud loads transversely to the studs below (for cases where the studs below are offset).

A continuous, bonded structural concrete topping over the hollowcore slabs (poured prior to the installation of the supporting walls above) will mitigate or eliminate many of the concerns outlined in this document that coincide with untopped hollowcore diaphragms. Refer to CSA A23.3 for further guidance on diaphragms. The design of a structural topping diaphragm is the responsibility of the EOR.

CPCI Document Reference (EOR)

The document "Engineer of Record & Engineering Roles & Responsibilities for Precast Concrete Design" by CPCI, which provides a thorough summary of the roles and responsibilities for projects that use precast concrete, can be downloaded at the link below:

https://www.cpci.ca/en/resources/technical_publications/

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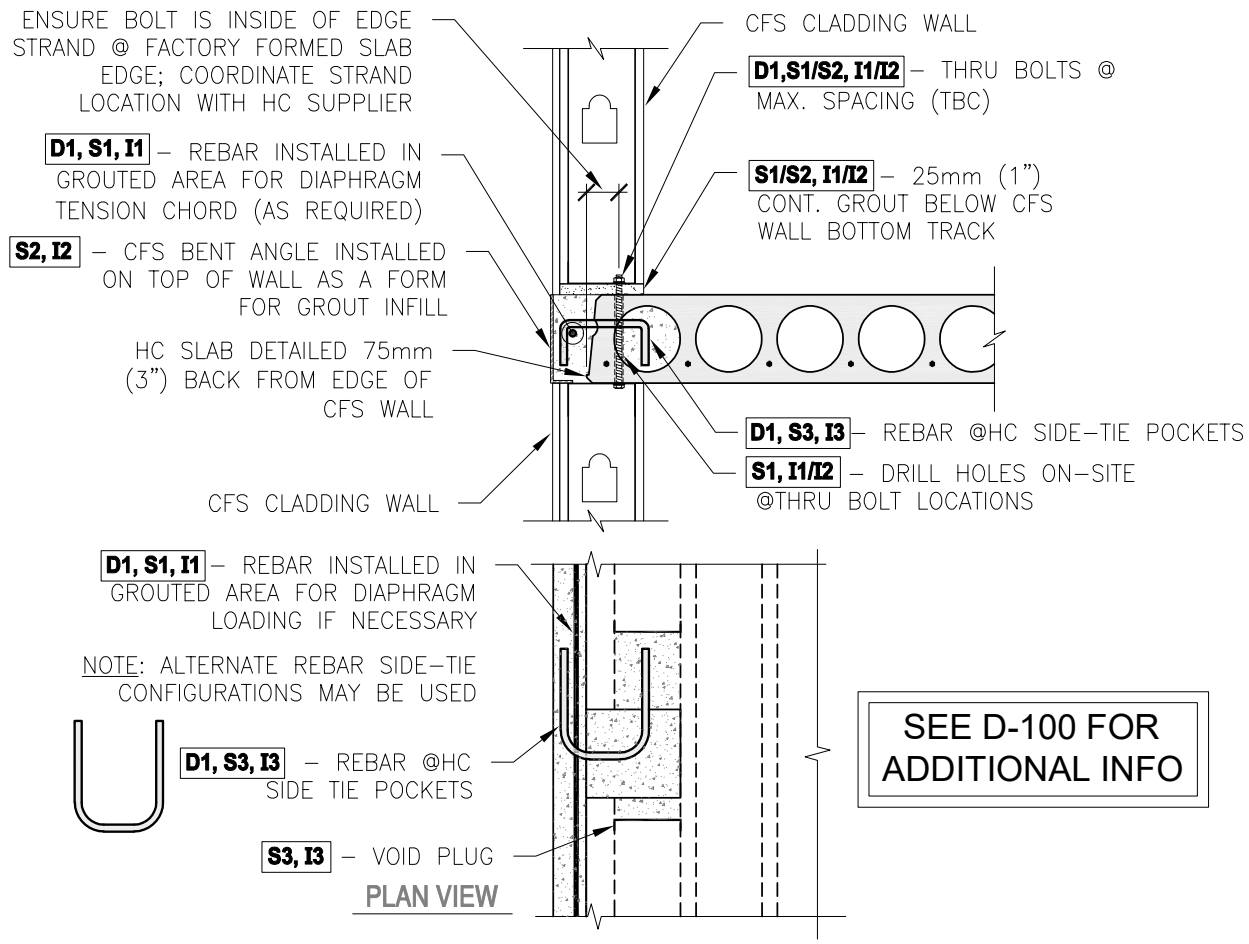
Connection Details

The following pages outline industry-standard connection details for hollowcore slabs that interface with CFS stud walls (load-bearing and non-load bearing). Additional hollowcore details are provided which show common ways to achieve diaphragm collector, drag struts and chord ties, and also anti-rotation bars at the slab joints.

Note that the connection details shown are generic, and vary from region to region (always check with your local CPCI producer members and local CFS suppliers before incorporating these details into design documents).

A few design, detailing and construction considerations that may vary from region to region include, but are not limited to, the following:

1. Ability to fill edge core with solid concrete/grout (some producers can provide fill at the edge core, while others may only be able to fill the 2nd core in from the edge, due to production limitations.
2. Grout pad thickness below CFS stud wall bottom tracks (details show 25 mm design joint, but other design joint widths may be achieved (20 mm if control of tolerances is high, for example).
3. Use of prestressing strand or rebar in grout key joints (including use of 10M or 15M bars – some producers can accommodate a 15M bar in their standard grout key joint, and achieve proper grout coverage around the grout key bar).
4. Preference to provide solid concrete/grout zones in the plant, or on-site (including placement of reinforcement into pre-filled voids at the plant, or reinforcement placed into voids and filled on-site).
5. Connection of hollowcore to steel beams (welded rebar, versus stud anchors pre-welded to beams, with reinforcement wrapped around stud anchors and grouted/concreted into slab keyways, or voids).
6. Achievement of chord reinforcement in the CFS wall / hollowcore slab system (using the CFS tracks, structural steel sections, or steel reinforcement bars).
7. Minimum length of bearing for hollowcore slabs onto load-bearing CFS stud walls.
8. Minimum/maximum gaps between slabs at horizontal grout joints with shared bearing on a single load-bearing CFS wall (slabs too close together do not permit proper grout placement into the joint between slabs, slabs too far apart may result in less than the minimum required bearing lengths.
9. A 25 mm grout joint might not be required for CFS cladding / non-load bearing walls (CFS tracks could be placed directly onto the top surface of the hollowcore slab).
10. Requirement for installation of anti-rotation bars at slab grout-key joints (some suppliers may provide anti-rotation bars for floor areas with tile finishes). Anti-rotation bars are quite common as standard details in some regions, but might not be used at all in other regions (low-seismic zones for example).



DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- INSTALLATION OF REINFORCED DIAPHRAGM TENSION CHORD @ HC FLOOR LEVEL REQUIRES PLACEMENT OF CFS CLADDING WALL BELOW; IF MULTIPLE STORIES OF CFS CLADDING WALLS ARE TO BE INSTALLED AT ONCE, CONSIDER A REINFORCED DIAPHRAGM TENSION CHORD GROUTED INTO EDGE VOID(S)
- CFS LOADED ECCENTRICALLY BY HC SLAB
- HC SLAB SIDES ARE DETAILED ±75mm (±3") BACK FROM FACE OF CFS WALL
- OFFSET BOLT LOCATION TO BE INSIDE OF EDGE STRAND (WITH TOLERANCE ON STRAND LOCATION 19mm±)

FABRICATION CONSIDERATIONS:

- EOR TO CONFIRM IF PRECAST SUPPLIER TO PROVIDE CONTINUOUS GROUT AT EDGE CORE, OR LEAVE EDGE CORE UNGROUTED AT BOLTED CONNECTION LOCATIONS (IF SIDE–TIE POCKETS ARE REQ'D, EDGE CORE CAN'T BE CONTINUOUSLY GROUTED)

INSTALLATION CONSIDERATIONS:

- A CFS FORM IS PRE–INSTALLED AT THE EXTERIOR FACE, TO BE FILLED WITH GROUT
- ALLOWS FOR INSTALLATION TOLERANCE ON HC SLABS
- GROUT INFILL CAN TAKE UP ANY VARIATIONS IN CFS WALLS OR HC SLAB
- COST OF SITE GROUTING, LABOUR AND CFS FORM
- SITE DRILL HOLES FOR BOLT INSTALLATION

PARTIAL SIDE BEARING HC-CFS WALL CONNECTION WITH GROUTED REBAR TENSION CHORD

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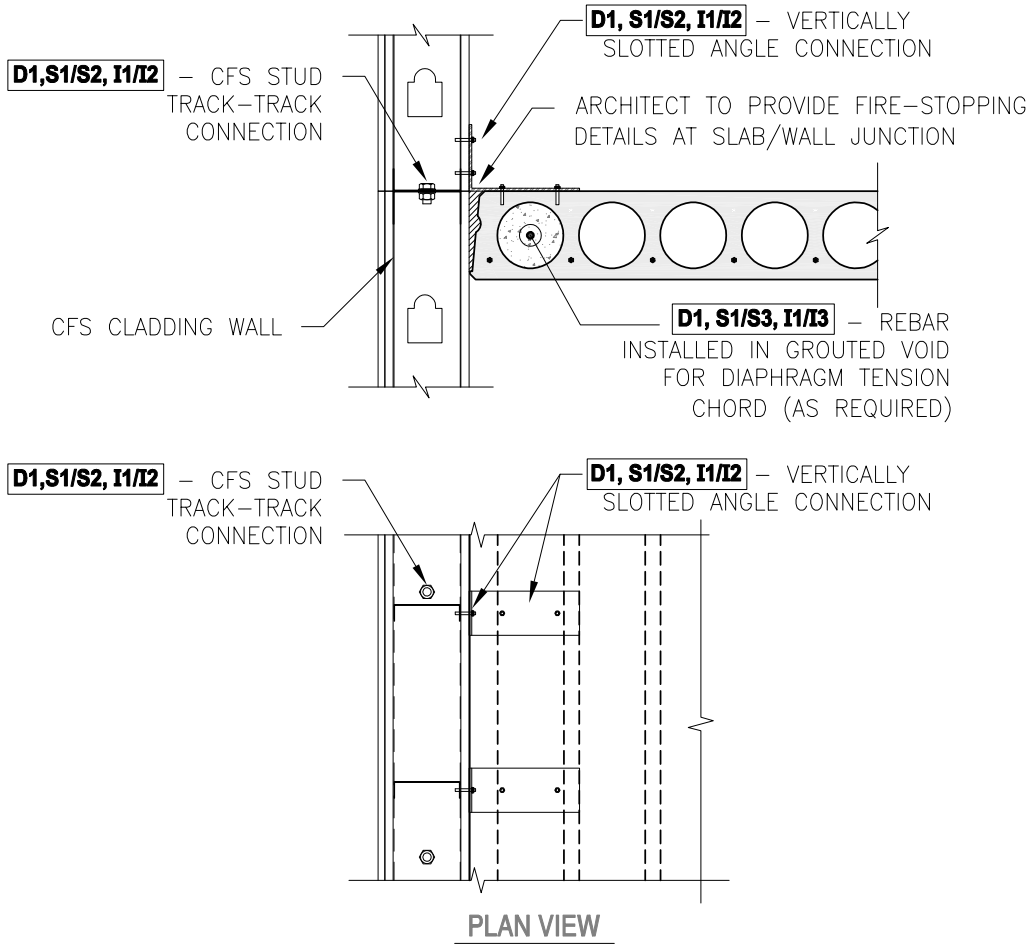
DRAWING #: D-001



PLAN VIEW

DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- CFS WALLS BYPASS HC & ARE BRACED BACK TO THE HC FOR LATERAL SUPPORT @ ANGLE CONNECTIONS
- VERTICAL SLOTS ARE REQUIRED IN ANGLE LEG TO ACCOMMODATE SLAB MOVEMENT
- FIRESTOPPING DETAILS @ SLAB–CFS WALL JUNCTION TO BE CONFIRMED BY PROJECT ARCHITECT

FABRICATION CONSIDERATIONS:

- EOR TO CONFIRM IF PRECAST SUPPLIER TO PROVIDE CONTINUOUS GROUT AT EDGE CORE, OR LEAVE EDGE CORE UNGROUTED AT CONNECTION LOCATIONS

INSTALLATION CONSIDERATIONS:

- ELIMINATES SLAB EDGE ISSUES AS A RESULT OF ALLOWABLE INSTALLATION TOLERANCES
- FIRESTOPPING OF HC–CFS WALL JOINT

SIDE LAP HC-CFS WALL CONNECTION

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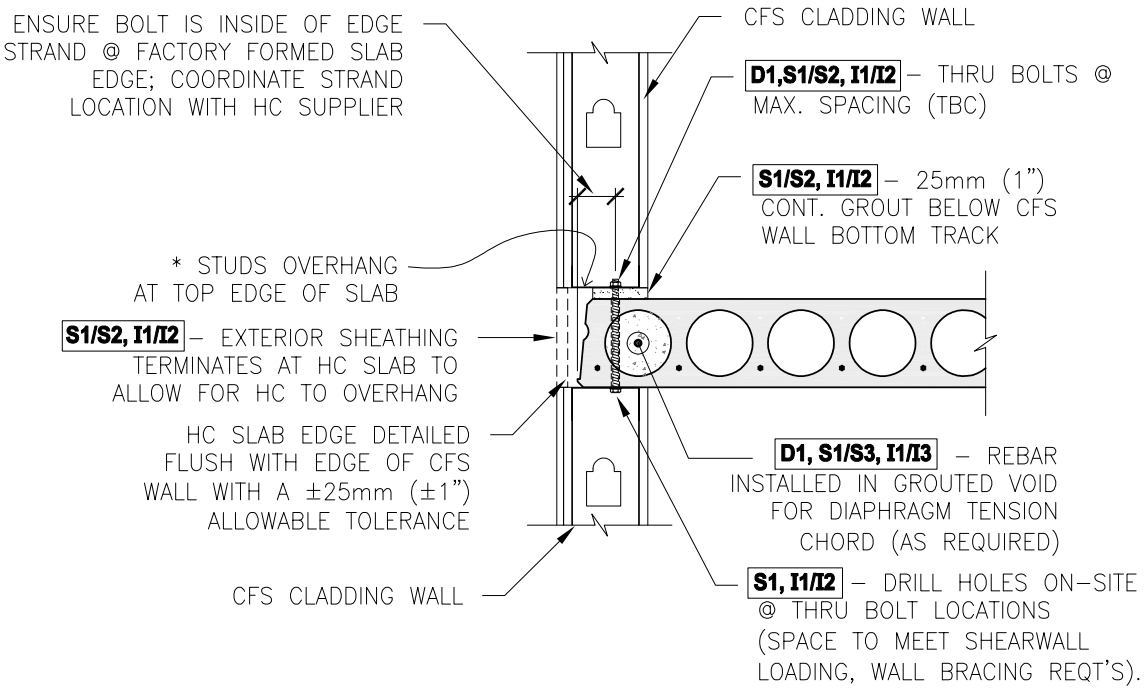
DRAWING #: D-002



SEE D-101/D-102 FOR ADDITIONAL INFO

DESIGN SCOPE:	**SUPPLY SCOPE:**	**INSTALLATION SCOPE:**
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- HC SLAB EDGE IS DETAILED FLUSH WITH OSF OF CFS WALL, WITH A ±25mm (±1") ALLOWABLE TOLERANCE
- OFFSET BOLT LOCATION TO BE INSIDE OF EDGE STRAND (WITH TOLERANCE)
- THIS DETAIL REQUIRES THE EXTERIOR SHEATHING TO TERMINATE AT THE UNDERSIDE OF HC SLAB AND CONTINUE AGAIN AT TOP OF HC SLAB (FOR SLAB INSTALLATION TOLERANCE)
- DUE TO SLOPED PROFILE @ EXTRUDED EDGE, WALL STUDS ABOVE HC SLAB WILL OVERHANG BEYOND TOP EDGE OF HC (VERIFY PROFILE WITH LOCAL HC SUPPLIERS TO CONFIRM DESIGN OVERHANG)

FABRICATION CONSIDERATIONS:

- EOR TO CONFIRM IF PRECAST SUPPLIER TO PROVIDE CONTINUOUS GROUT AT EDGE CORE, OR LEAVE EDGE CORE UNGROUTED AT CONNECTION LOCATIONS

INSTALLATION CONSIDERATIONS:

- IN LIEU OF EXTERIOR SHEATHING RUNNING PAST THE FACE OF HOLLOWCORE, ARCHITECT TO CONSIDER AIR BARRIER MEMBRANE AS AN ALTERNATIVE

SIDE BEARING HC-CFS WALL CONNECTION - EXTRUDED EDGE ALIGNED WITH OSF OF CFS STUD WALL

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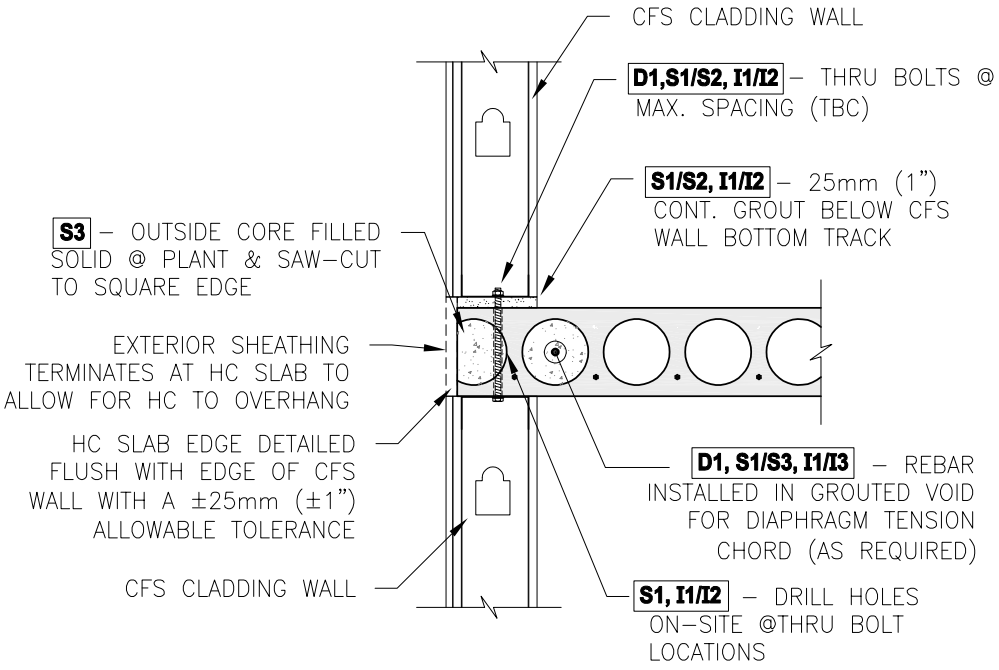
DRAWING #: D-003



DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- HC SLAB EDGE IS DETAILED FLUSH WITH OSF OF CFS WALL, WITH A ±25mm (±1") ALLOWABLE TOLERANCE
- OFFSET BOLT LOCATION TO BE INSIDE OF EDGE STRAND (WITH TOLERANCE)
- THIS DETAIL REQUIRES THE EXTERIOR SHEATHING TO TERMINATE AT THE UNDERSIDE OF HC SLAB AND CONTINUE AGAIN AT TOP OF HC SLAB (FOR SLAB INSTALLATION TOLERANCE)

FABRICATION CONSIDERATIONS:

- PRECAST SUPPLIER TO FILL AT EXTERIOR CORE, AND CUT SQUARE
- ADDED COST OF FILLING AND CUTTING SLAB EDGES IN PLANT

INSTALLATION CONSIDERATIONS:

- IN LIEU OF EXTERIOR SHEATHING RUNNING PAST THE FACE OF HOLLOWCORE, ARCHITECT TO CONSIDER AIR BARRIER MEMBRANE AS AN ALTERNATIVE
- SAW–CUT HOLLOWCORE SLAB EDGE IS SQUARE FOR EASIER ALIGNMENT

SIDE BEARING HC-CFS WALL CONNECTION - SAW-CUT EDGE ALIGNED WITH OSF OF CFS STUD WALL

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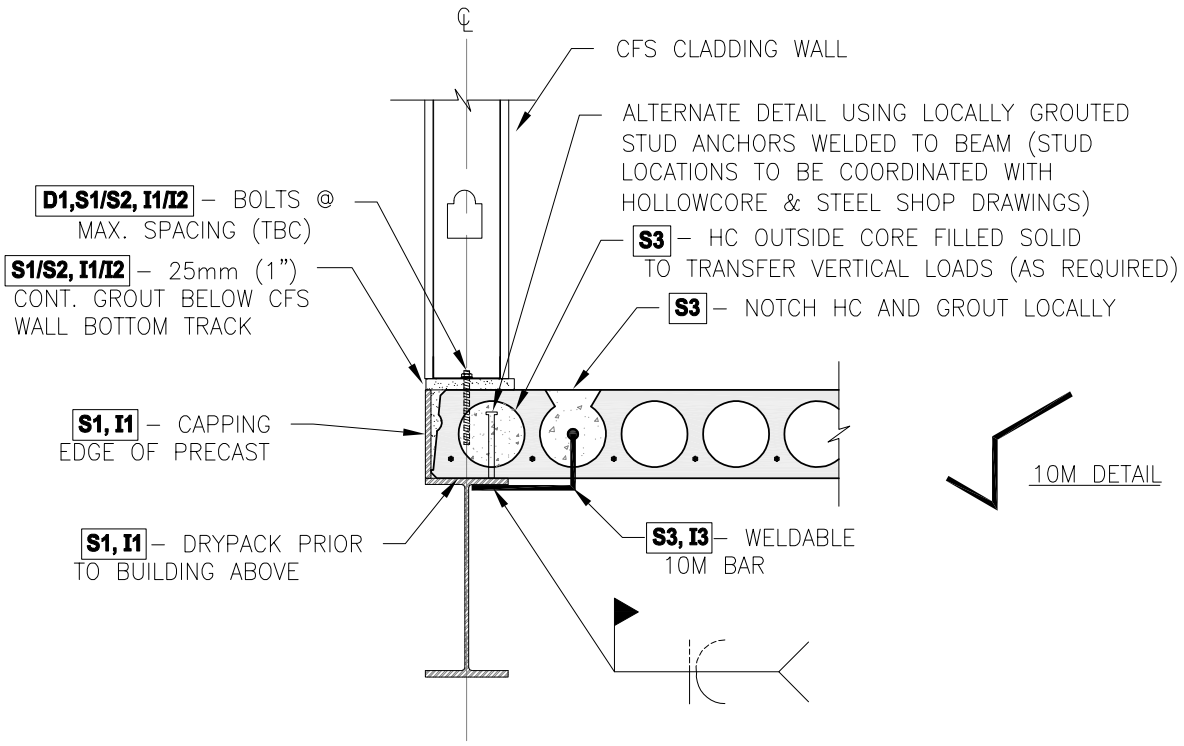
DRAWING #: D-004



DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BAR/STUD SIZE AND SPACING TO BE CONFIRMED BY EOR
- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- EOR TO ENSURE BEAM IS DESIGNED FOR ANY TORSION, DUE TO LOAD ECCENTRICITIES FROM CFS WALL
- IF H/C IS POSITIVELY CONNECTED TO STEEL BEAM VIA WELDED REBAR, STUDS OR WELDED BOLTS, THEN THE STEEL BEAM CAN ACT AS A DIAPHRAGM TENSION CHORD.

FABRICATION CONSIDERATIONS:

- EOR TO CONFIRM IF PRECAST SUPPLIER TO PROVIDE CONTINUOUS GROUT AT EDGE CORE, OR LEAVE EDGE CORE UNGROUTED AT CONNECTION LOCATIONS

INSTALLATION CONSIDERATIONS:

- SITE DRILL FOR BOLT INSTALLATION
- WELDED 10M BAR TO W–BEAM
- IF STUDS @ WRONG LOCATION, THEY CAN BE CUT OFF AND REWELDED ON–SITE @ HC STUD POCKETS

SIDE BEARING HC-CFS-STEEL BEAM CONNECTION

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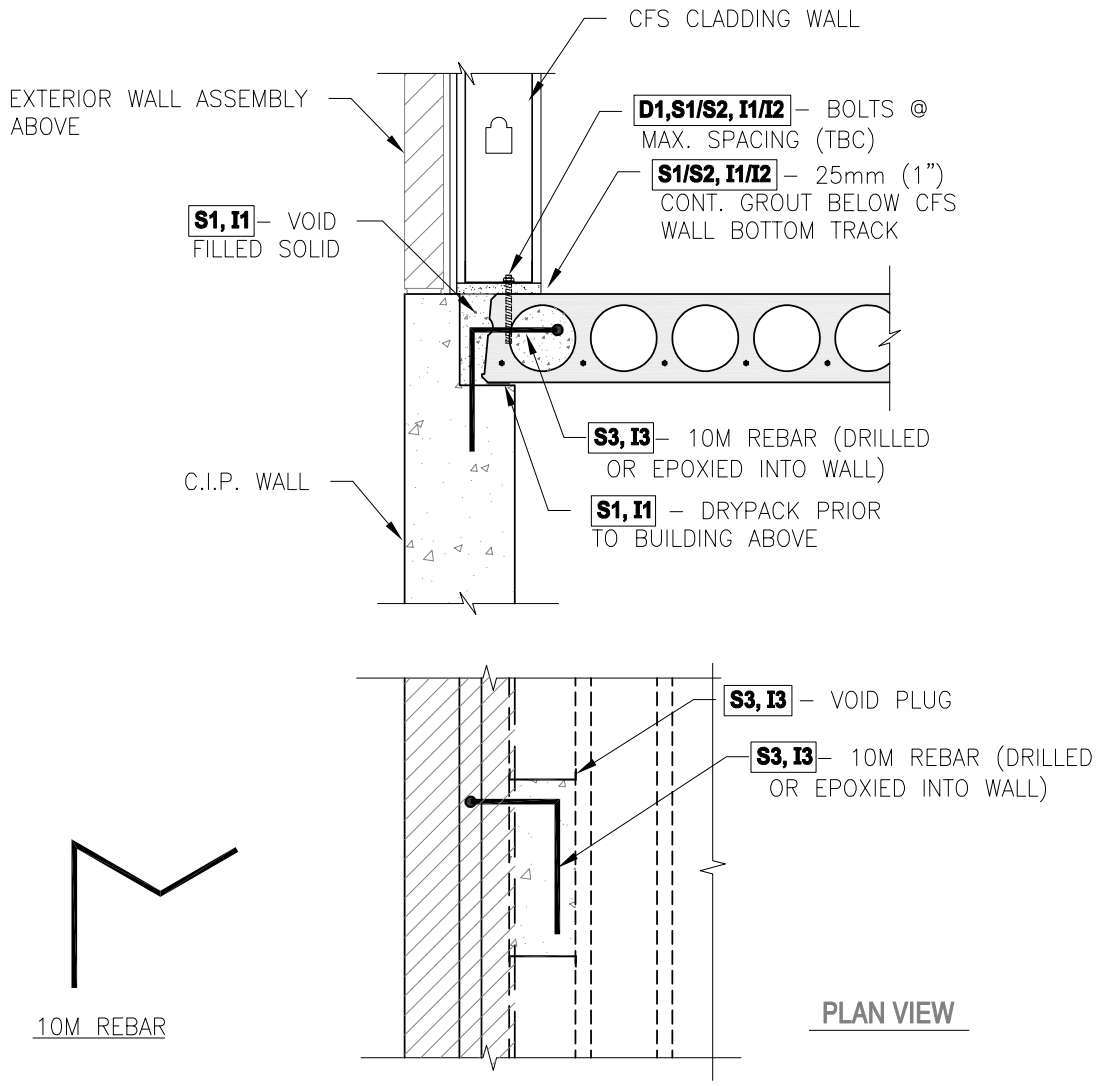
DRAWING #: D-005



DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BAR SIZE AND SPACING TO BE CONFIRMED BY EOR
- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR

FABRICATION CONSIDERATIONS:

-

INSTALLATION CONSIDERATIONS:

- SITE DRILL FOR BOLT INSTALLATION
- RECOMMENDED 10M BAR SPACED AT 1830 mm (6'–0" O/C)
- MAXIMUM 15M BAR SPACED AT 1830 mm (6'–0" O/C)

SIDE BEARING HC-CONCRETE WALL CONNECTION

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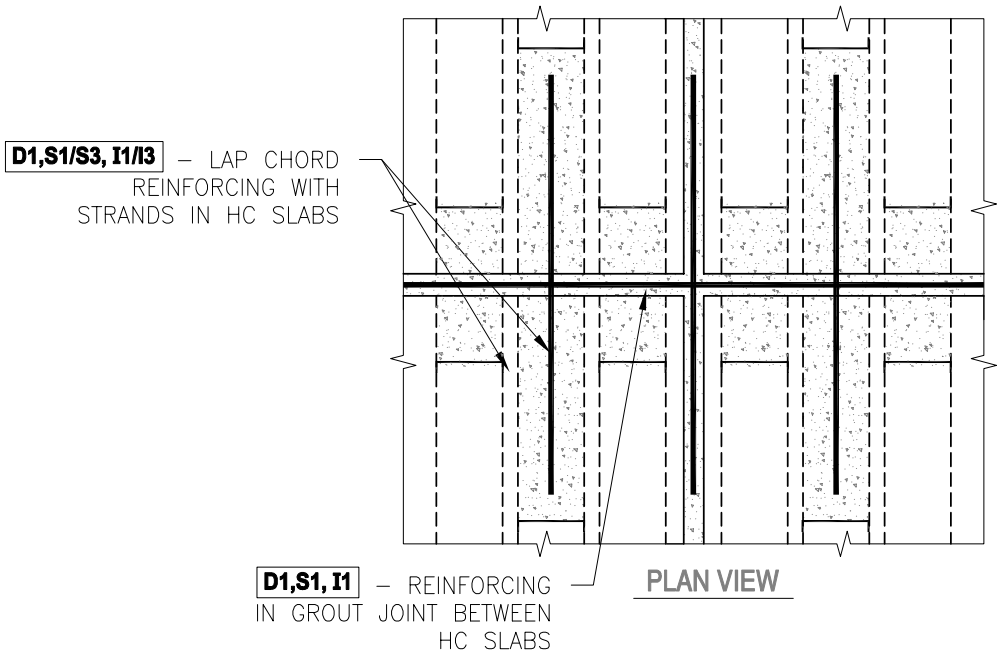
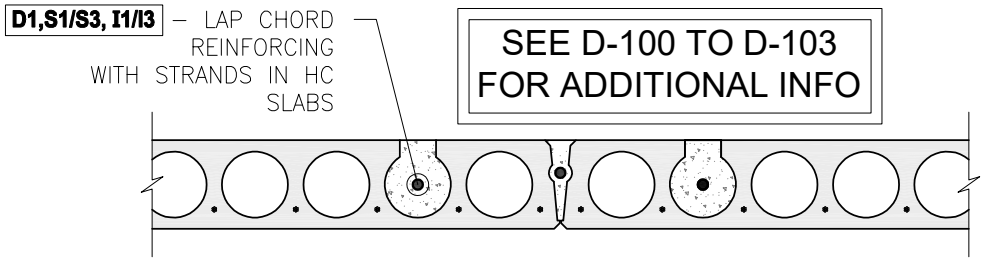
DRAWING #: D-006





DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- EOR TO CONFIRM DIAPHRAGM TENSION CHORD FORCES, INCLUDING BAR SIZES AND LOCATIONS
- DIAPHRAGM CHORD REBAR GROUTED INTO VOIDS IS LAPPED TO HC STRANDS TO DEVELOP TENSION; EOR TO CONFIRM IF ADDITIONAL TOP STRANDS ARE REQUIRED AT LARGER CHORD REBAR LOCATIONS
- DESIGN TENSION CHORD FORCES SHALL BE THE GREATER OF THAT FROM ANALYSIS, AND THE STRUCTURAL INTEGRITY REQUIREMENTS OF CSA–A23.3 CLAUSE 16.5

FABRICATION CONSIDERATIONS:

- OPEN SLOTS IN PLANT OR ON–SITE @ T.O. HC VOIDS, FOR PLACEMENT OF REBAR TENSION CHORDS

INSTALLATION CONSIDERATIONS:

- RECOMMENDED 12.7 mm (½") STRAND (OR 10M/15M STRAIGHT REBAR) IN GROUT KEY JOINTS ONLY SPACED AT 1220 mm (4'–0") O/C (CHECK WITH LOCAL SUPPLIER TO CONFIRM IF 15M GROUT KEY BAR CAN BE ACCOMODATED INTO STANDARD GROUT KEY JOINT, AND STILL MAINTAIN ENOUGH GROUT TO DEVELOP A 15M BAR IN TENSION)
- LARGER DIAMETER REBAR TO BE GROUTED INTO HC VOIDS

DIAPHRAGM REBAR DETAILS (COLLECTORS, DRAG STRUTS AND CHORDS)

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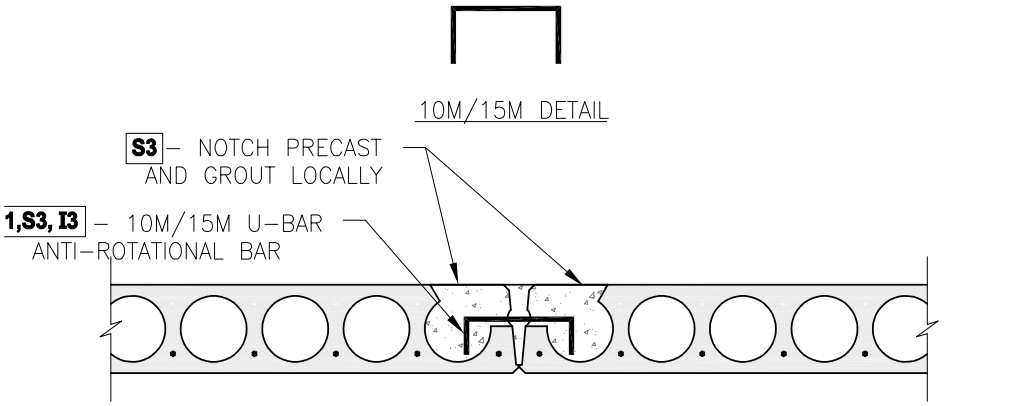
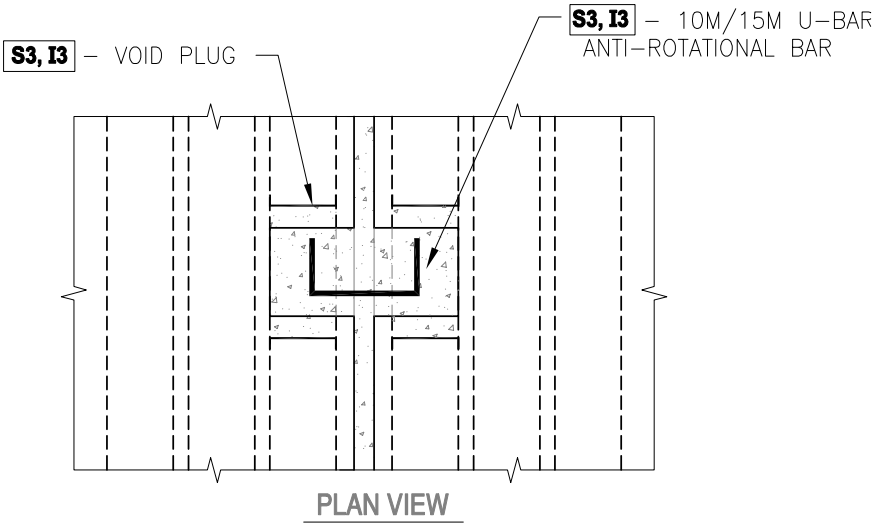
DRAWING #: D-007





DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- IF ANALYSIS INDICATES THE UNREINFORCED GROUT KEY CONCRETE SHEAR CAPACITY IS EXCEEDED (IN–PLANE OR OUT–OF PLANE CAPACITY), ANTI–ROTATION BARS ARE REQUIRED ACROSS SLAB JOINTS. SPACING TO BE CONFIRMED BY EOR OR COORDINATED WITH PRECAST SUPPLIER.
- EOR TO SPECIFY WHEN REQUIRED FOR DIAPHRAGM OR AREAS RECEIVING TILE FINISHES.

FABRICATION CONSIDERATIONS:

- POCKETS MAY BE CUT @ PLANT, OR ON–SITE

INSTALLATION CONSIDERATIONS:

- GROUT BARS LOCALLY @ POCKETS SPACED AS REQUIRED (NOT LESS THAN 1220 mm (4'–0" O/C))
- RECOMMENDED 10M/15M BAR MAX. SPACING AT 1830 mm (6'–0" O/C)

ANTI-ROTATION BAR DETAIL

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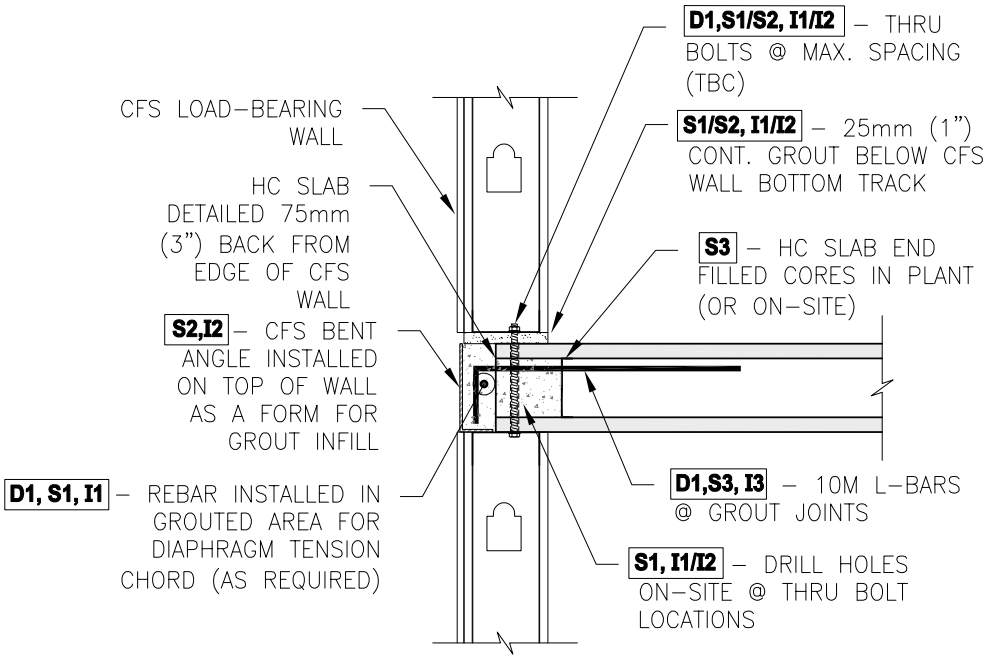
DRAWING #: D-008



SEE D-100 FOR ADDITIONAL INFO

DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- DIAPHRAGM STEEL CAN BE INSTALLED IN GROUT INFILL (AS REQUIRED)
- CFS WALL LOADED ECCENTRICALLY BY HC SLAB
- HC SLAB ENDS ARE DETAILED 75mm (3") BACK FROM FACE OF CFS WALL

FABRICATION CONSIDERATIONS:

- ENDS OF VOIDS MAY BE GROUTED @ THE PLANT OR ON–SITE

INSTALLATION CONSIDERATIONS:

- A CFS FORM IS PRE–INSTALLED AT THE EXTERIOR FACE, TO BE FILLED WITH GROUT
- SIGNIFICANT INSTALL TOLERANCE
- GROUT INFILL WILL TAKE UP ANY VARIATIONS IN CFS WALLS OR HC SLAB
- COST OF GROUT, LABOUR AND CFS FORM
- SITE DRILL HOLES FOR BOLT INSTALLATION
- 10M L–BARS ARE USED AT GROUT JOINTS TO TIE SLABS INTO CFS WALL SYSTEM
- TEMPORARY ENGINEERED SHORING OF CFS WALLS IS REQUIRED PRIOR TO HC INSTALLATION

PARTIAL END BEARING HC-CFS WALL CONNECTION (L-BARS & GROUTED REBAR TENSION CHORD)

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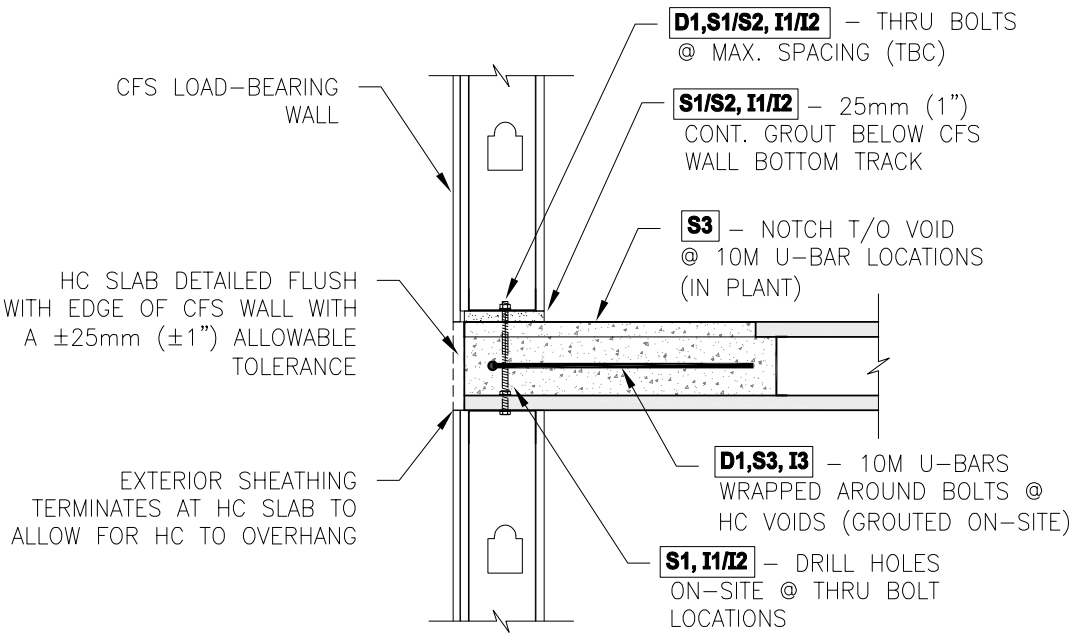
DRAWING #: D-009



SEE D-101 FOR ADDITIONAL INFO
(BARS GROUTED ON-SITE)
SEE D-103 FOR ADDITIONAL INFO
(BARS GROUTED IN PLANT)

DESIGN SCOPE:	**SUPPLY SCOPE:**	**INSTALLATION SCOPE:**
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- CFS STUD TRACKS ABOVE & BELOW HC SLABS ACT AS A DIAPHRAGM; TRACKS TO BE ANCHORED TO HC SLABS PER EOR REQUIREMENTS TO DEVELOP DESIGN TENSION FORCE @ ENDS OF CFS TRACKS
- CFS TRACK JOINTS TO BE DESIGNED AS FULL–TENSION CAPACITY SPLICES (BY EOR)
- HC SLAB EDGE IS DETAILED FLUSH WITH OSF OF CFS WALL, WITH A ±25mm (±1") ALLOWABLE TOLERANCE

FABRICATION CONSIDERATIONS:

- ENDS OF VOIDS MAY BE GROUTED @ THE PLANT OR ON–SITE
- NOTCH OUT T.O. HC FLANGE @ VOIDS IN PLANT (FOR 10M U–BAR CONNECTIONS ON–SITE)

INSTALLATION CONSIDERATIONS:

- SITE DRILL HOLES THRU HC BOTTOM FLANGE FOR BOLT INSTALLATION (USE DOUBLE NUT TO SECURE TO HC)
- 10M U–BARS ARE USED AT VOIDS TO TIE SLABS INTO CFS WALL SYSTEM
- EXTRA GROUT COMPARED TO USING 10M JOINT BARS FOR LATERAL SLAB–CFS WALL TIES
- TEMPORARY ENGINEERED SHORING OF CFS WALLS IS REQUIRED PRIOR TO HC INSTALLATION

FULL END BEARING HC-CFS WALL CONNECTION (U-BARS @ HC VOIDS)

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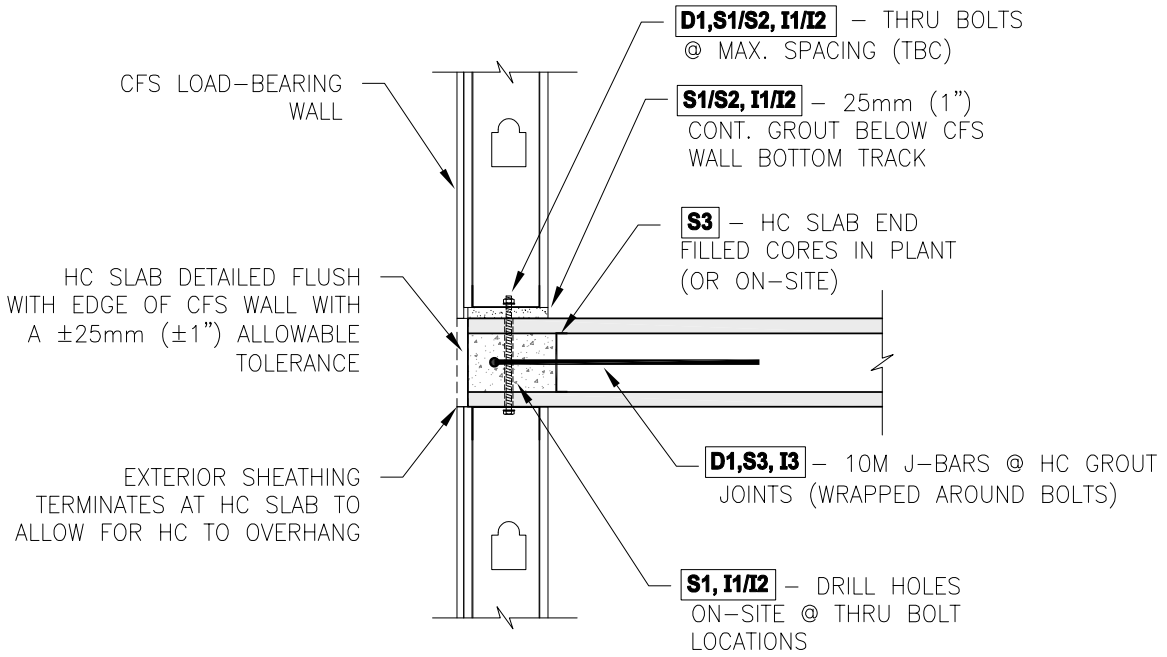
DRAWING #: D-010



SEE D-102 FOR ADDITIONAL INFO

DESIGN SCOPE:	**SUPPLY SCOPE:**	**INSTALLATION SCOPE:**
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- CFS STUD TRACKS ABOVE & BELOW HC SLABS ACT AS A DIAPHRAGM; TRACKS TO BE ANCHORED TO HC SLABS PER EOR REQUIREMENTS TO DEVELOP DESIGN TENSION FORCE @ ENDS OF CFS TRACKS
- CFS TRACK JOINTS TO BE DESIGNED AS FULL–TENSION CAPACITY SPLICES (BY EOR)
- HC SLAB EDGE IS DETAILED FLUSH WITH OSF OF CFS WALL, WITH A ±25mm (±1") ALLOWABLE TOLERANCE

FABRICATION CONSIDERATIONS:

- ENDS OF VOIDS MAY BE GROUTED @ THE PLANT OR ON–SITE
- NOTCH OUT EDGE WEB IN PLANT (FOR 10M J–BAR CONNECTIONS ON–SITE)

INSTALLATION CONSIDERATIONS:

- SITE DRILL HOLES THRU CFS TRACKS FOR BOLT INSTALLATION (USE DOUBLE NUT TO SECURE TO TRACKS)
- 10M J–BARS ARE USED AT GROUT JOINTS TO TIE SLABS INTO CFS WALL SYSTEM
- TEMPORARY ENGINEERED SHORING OF CFS WALLS IS REQUIRED PRIOR TO HC INSTALLATION

FULL END BEARING HC-CFS WALL CONNECTION (J-BARS @ HC JOINTS)

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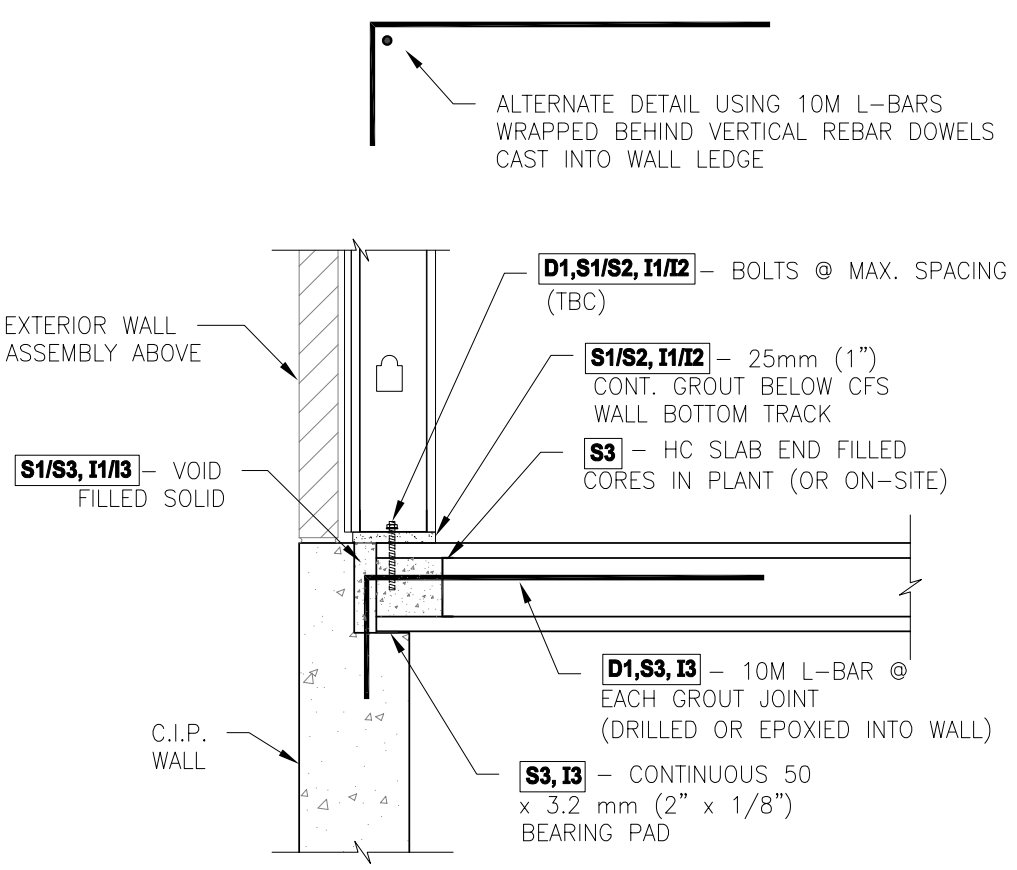
DRAWING #: D-011

PLAN VIEW



DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BAR SIZE AND SPACING TO BE CONFIRMED BY EOR
- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR

FABRICATION CONSIDERATIONS:

- ENDS OF VOIDS MAY BE GROUTED @ THE PLANT OR ON–SITE

INSTALLATION CONSIDERATIONS:

- SITE DRILL FOR BOLT INSTALLATION
- RECOMMENDED MAX. 10M/15M BAR SPACED AT 1220 mm (4'–0" O/C)
- ALTERNATE DETAIL USES HORIZONTAL 10M L–BAR @ GROUT JOINT, WRAPPED BEHIND VERTICAL REBAR DOWEL
- VERTICAL REBAR DOWEL SUPPLIED & CAST INTO LEDGE BY GC

END BEARING HC-CFS-CONCRETE WALL CONNECTION WITH L-BARS

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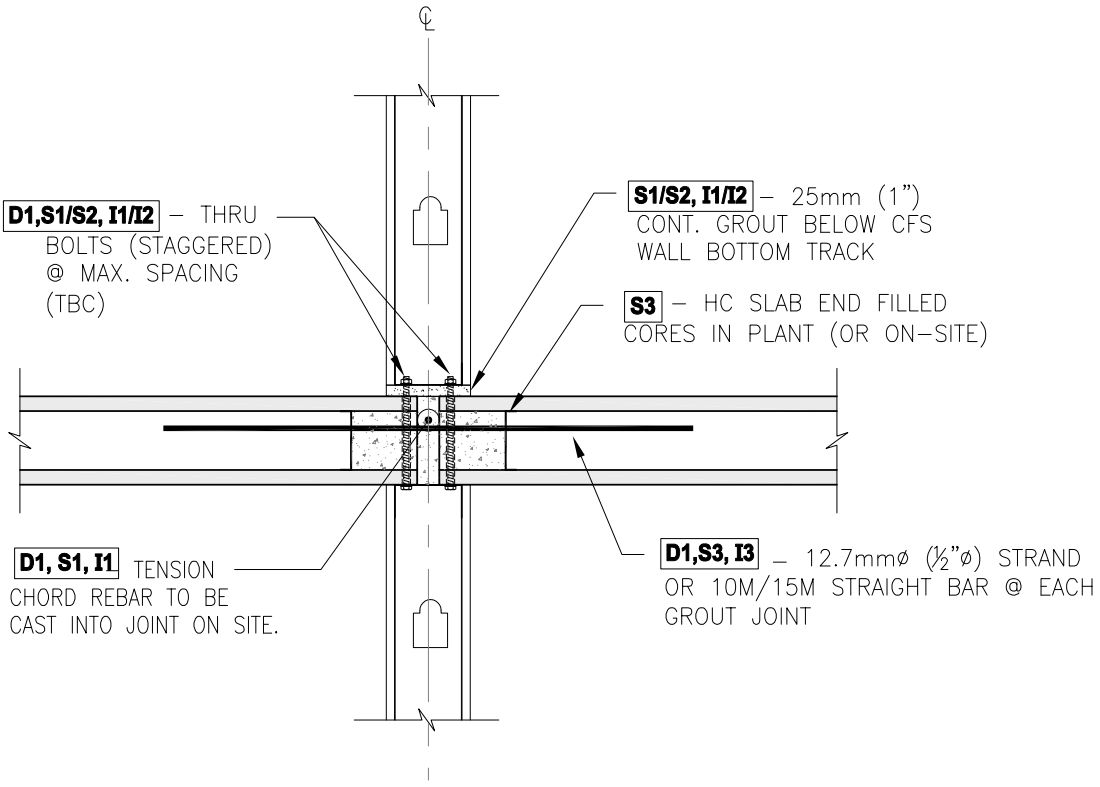
DRAWING #: D-012



DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- BOLTS NEED TO BE STAGGERED TO ACCOMODATE TRANSVERSE DIAPHRAGM REBAR @ JOINT
- IF AS–INSTALLED GROUT JOINT IS SMALL, SITE–APPLIED GROUT @ SLAB ENDS MAY NOT BE FULLY CONSOLIDATED TO T.O. VOIDS; GROUTING SLAB ENDS @ PLANT IS PREFERABLE, UNLESS THE TOP FLANGE OF THE VOIDS IS CUT BACK @ THE PLANT TO ENSURE VISUAL OF SITE GROUTING OF VOIDS
- DESIGN TENSION CHORD FORCES SHALL BE THE GREATER OF THAT FROM ANALYSIS, AND THE STRUCTURAL INTEGRITY REQUIREMENTS OF CSA–A23.3 CLAUSE 16.5
- RECOMMENDED 12.7 mm (½") STRAND (OR 10M/15M STRAIGHT REBAR) IN GROUT KEY JOINTS ONLY SPACED AT 1220 mm (4'–0") O/C (CHECK WITH LOCAL SUPPLIER TO CONFIRM IF 15M GROUT KEY BAR CAN BE ACCOMODATED INTO STANDARD GROUT KEY JOINT, AND STILL MAINTAIN ENOUGH GROUT TO DEVELOP A 15M BAR IN TENSION)

FABRICATION CONSIDERATIONS:

- ENDS OF VOIDS MAY BE GROUTED @ THE PLANT OR ON–SITE

INSTALLATION CONSIDERATIONS:

- TEMPORARY ENGINEERED SHORING OF CFS WALLS IS REQUIRED PRIOR TO HC INSTALLATION

INTERIOR BEARING HC-CFS WALL CONNECTION (TRANSVERSE DIAPHRAGM STEEL)

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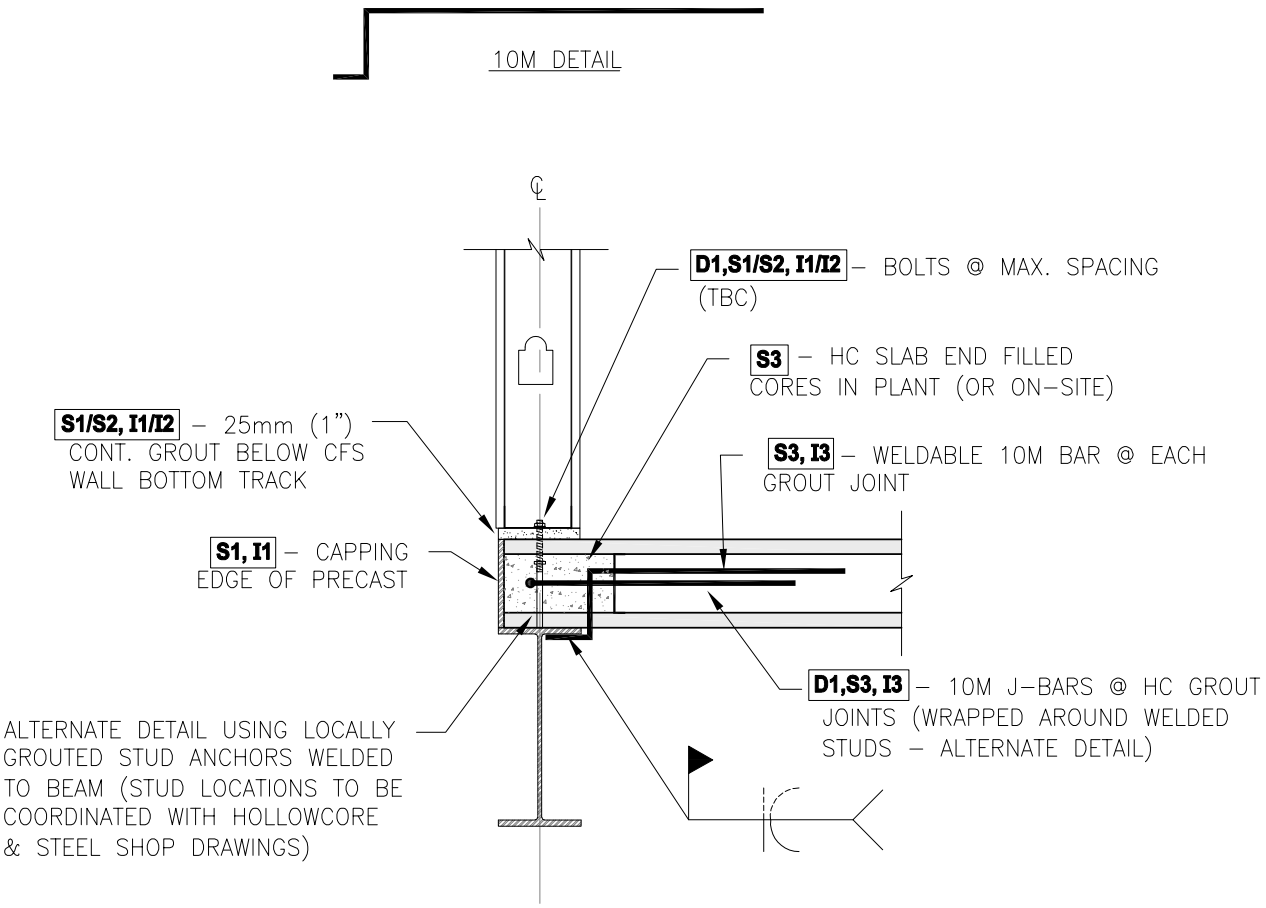
DRAWING #: D-013



DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- EOR TO ENSURE BEAM IS DESIGNED FOR ANY TORSION, DUE TO LOAD ECCENTRICITIES FROM CFS WALL
- IF H/C IS POSITIVELY CONNECTED TO STEEL BEAM VIA WELDED REBAR, STUDS OR WELDED BOLTS, THEN THE STEEL BEAM CAN ACT AS A DIAPHRAGM TENSION CHORD
- EOR TO DESIGN CONNECTION BETWEEN BEAM & HC SLABS TO RESIST THE LATERAL FORCE REQUIRED FOR BRACING OF THE COMPRESSION FLANGE OF THE BEAM (AWAY FROM AND TOWARDS THE SLAB ENDS)

FABRICATION CONSIDERATIONS:

- ENDS OF VOIDS MAY BE GROUTED @ THE PLANT OR ON–SITE
- EDGE WEB OF SLABS IS NOTCHED IN PLANT @ STUD LOCATIONS (FOR ALTERNATE OPTION)

INSTALLATION CONSIDERATIONS:

- SITE DRILL FOR BOLT INSTALLATION
- WELDED 10M BAR TO W–BEAM
- RECOMMENDED 10M/15M BAR/STUDS SPACED AT 1220 mm (4'–0" O/C)
- IF STUDS @ WRONG LOCATION, THEY CAN BE CUT OFF AND REWELDED ON–SITE @ HC STUD POCKETS

END BEARING HC-CFS-STEEL BEAM CONNECTION @ STEEL BEAM

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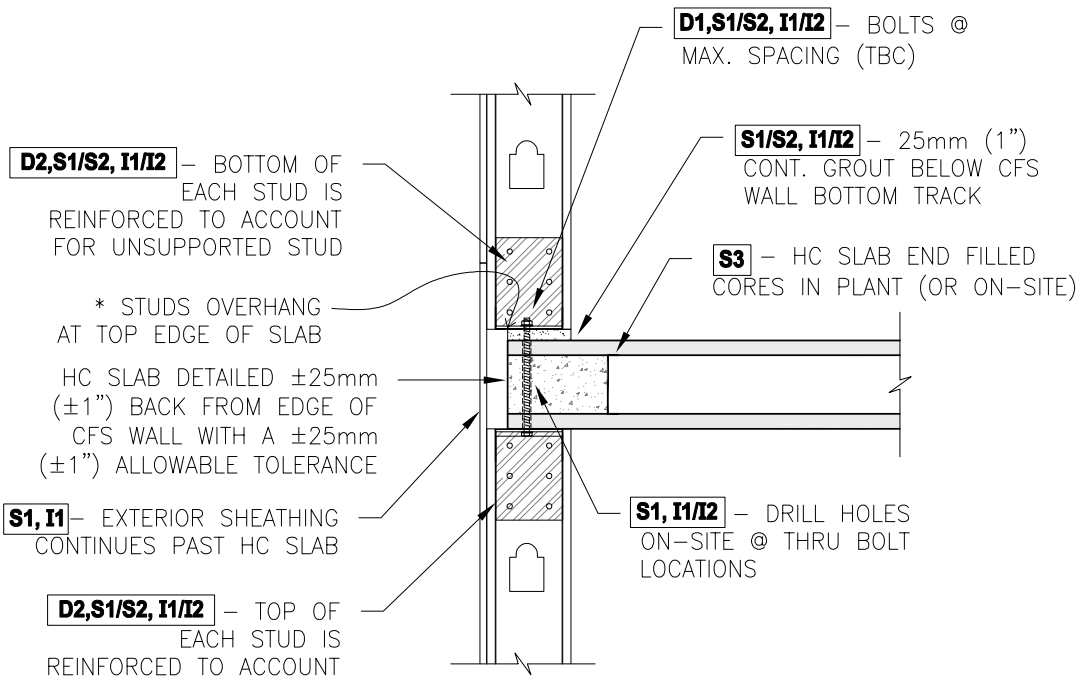
DRAWING #: D-014



DESIGN SCOPE:	SUPPLY SCOPE:	INSTALLATION SCOPE:
D1 – BY EOR	**S1** – BY GC	**I1** – BY GC
D2 – BY CFS SUPPLIER	**S2** – BY CFS SUPPLIER	**I2** – BY CFS SUPPLIER
D3 – BY PRECAST SUPPLIER	**S3** – BY PRECAST SUPPLIER	**I3** – BY PRECAST SUPPLIER

DESIGN CONSIDERATIONS:

- BOLT SIZE, GRADE AND SPACING TO BE CONFIRMED BY EOR
- CFS LOADED ECCENTRICALLY BY HC SLAB
- HC SLAB ENDS ARE DETAILED ±25mm (±1") BACK FROM FACE OF CFS WALL, WITH AN ALLOWABLE TOLERANCE OF ±25mm (±1")
- THE BOTTOM 150–300 mm (6"–12") OF STUDS ARE DOUBLED UP TO TRANSFER LOAD FROM THE UNSUPPORTED FLANGE (OUTSIDE) BACK TO HOLLOWCORE (CFS STUD WALL ENGINEER TO ACCOUNT FOR ECCENTRICITY OF LOAD, ACCOUNTING FOR INSTALLATION TOLERANCES, AND REINFORCE THE STUDS ACCORDINGLY)

FABRICATION CONSIDERATIONS:

- ENDS OF VOIDS MAY BE GROUTED @ THE PLANT OR ON–SITE

INSTALLATION CONSIDERATIONS:

- SITE DRILL HOLES FOR BOLT INSTALLATION
- EXTERIOR SHEATHING RUNS PAST THE END OF THE HC SLABS TO BE THE SHEATHING @ THE WALL STUDS ABOVE

END BEARING HC-CFS WALL CONNECTION - REINFORCED STUDS OVERHANGING SLAB ENDS

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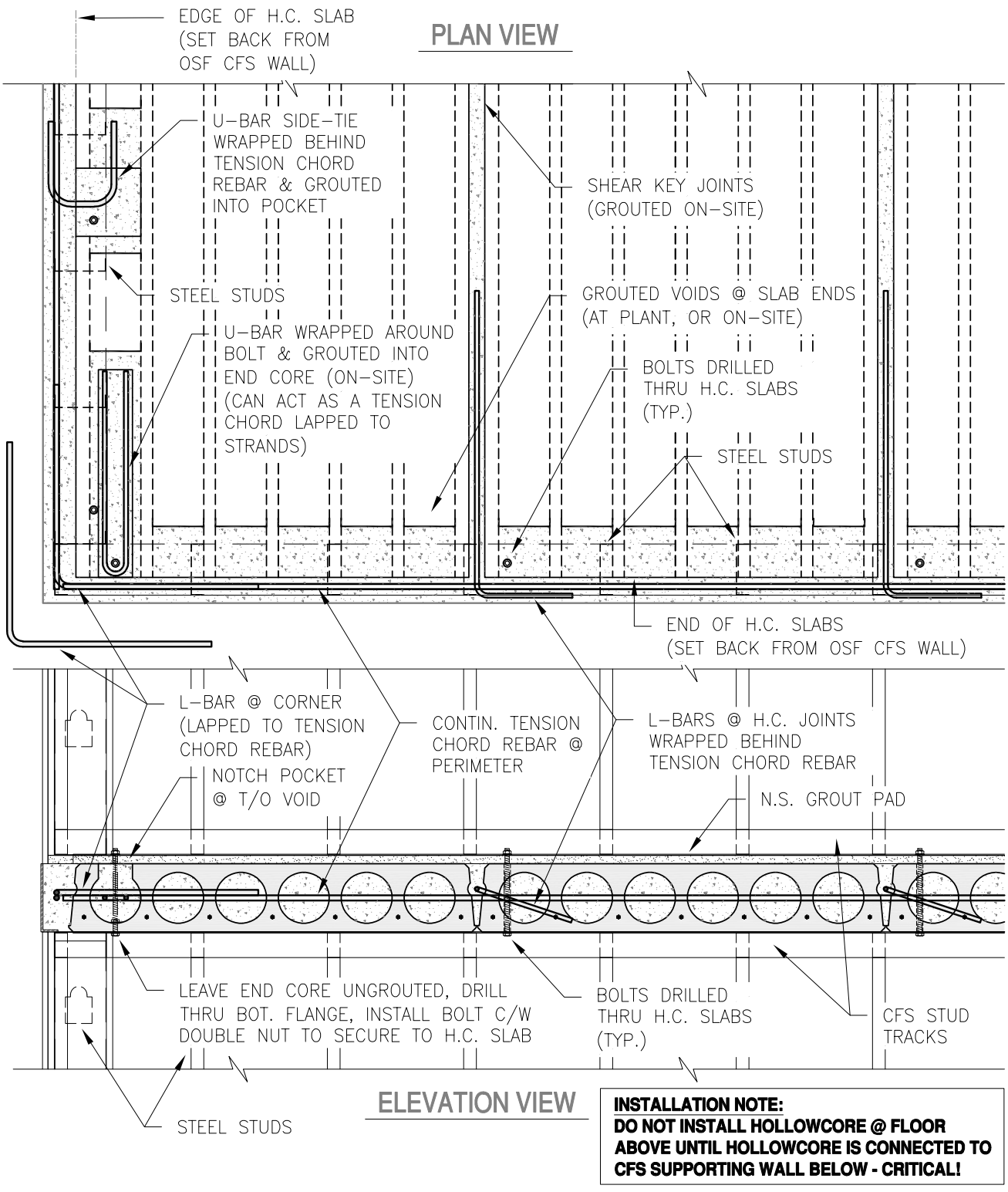
DRAWING #: D-015



INSTALLATION NOTE:
DO NOT INSTALL HOLLOWCORE @ FLOOR ABOVE UNTIL HOLLOWCORE IS CONNECTED TO CFS SUPPORTING WALL BELOW - CRITICAL!

END BEARING HC-CFS WALL CONNECTIONS - HC SET BACK FROM OSF OF STUD WALLS (L-BARS)

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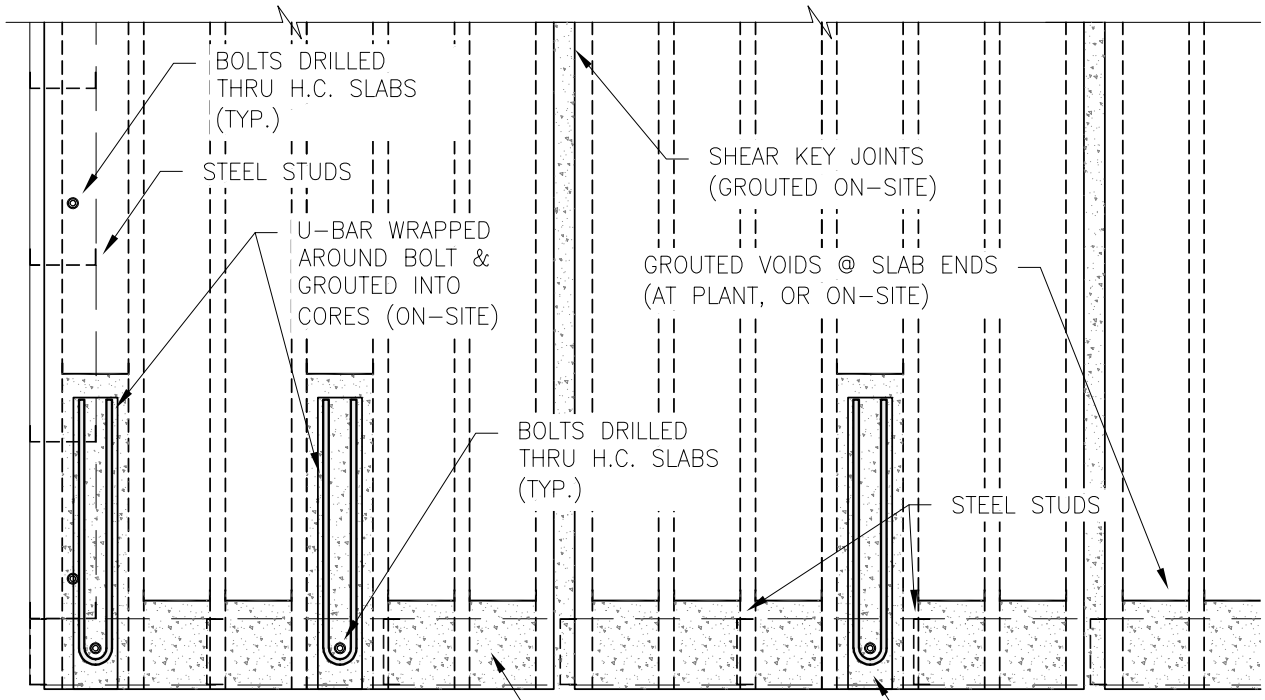
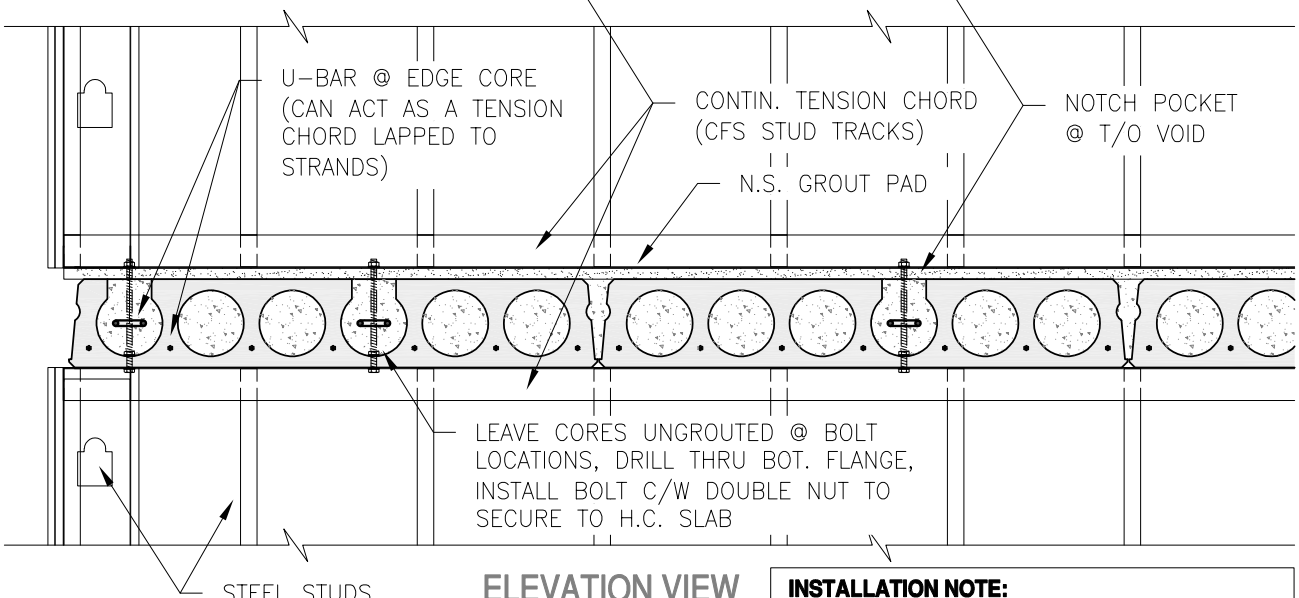
DRAWING #: D-100

PLAN VIEW





ELEVATION VIEW

INSTALLATION NOTE:
DO NOT INSTALL HOLLOWCORE @ FLOOR ABOVE UNTIL HOLLOWCORE IS CONNECTED TO CFS SUPPORTING WALL BELOW - CRITICAL!

END BEARING HC-CFS WALL CONNECTIONS - HC ALIGNED WITH OSF OF STUD WALLS (U-BARS @ SITE)

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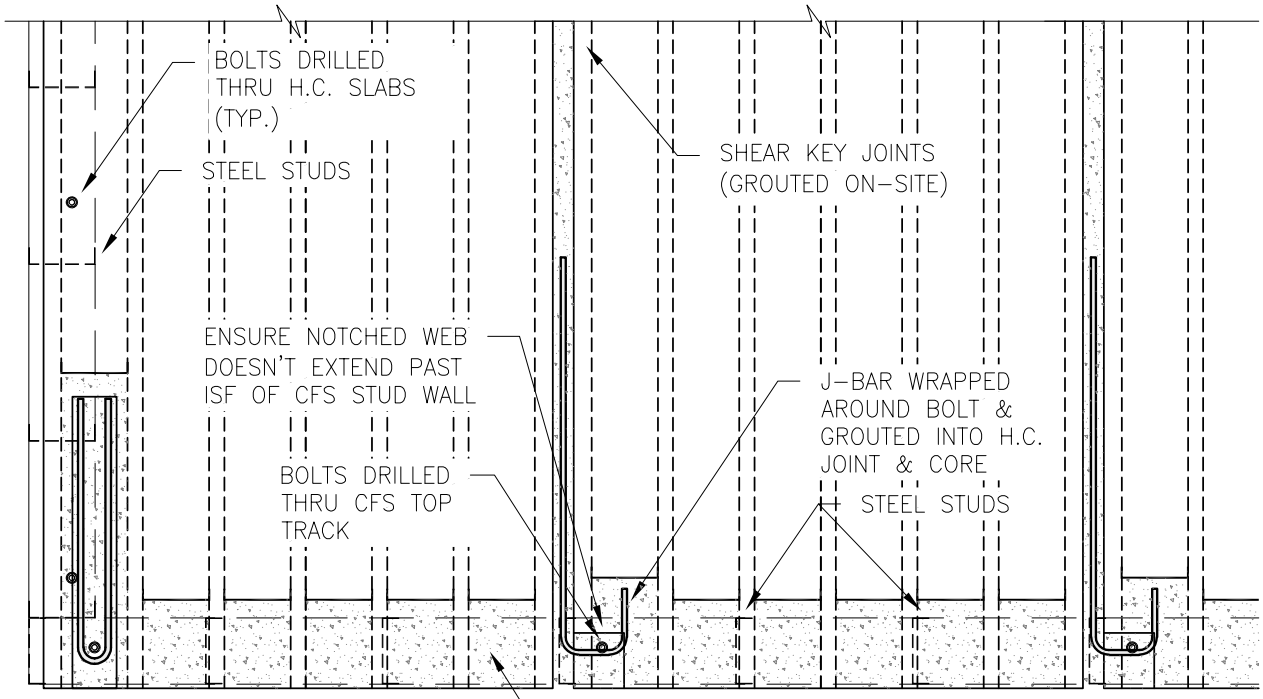
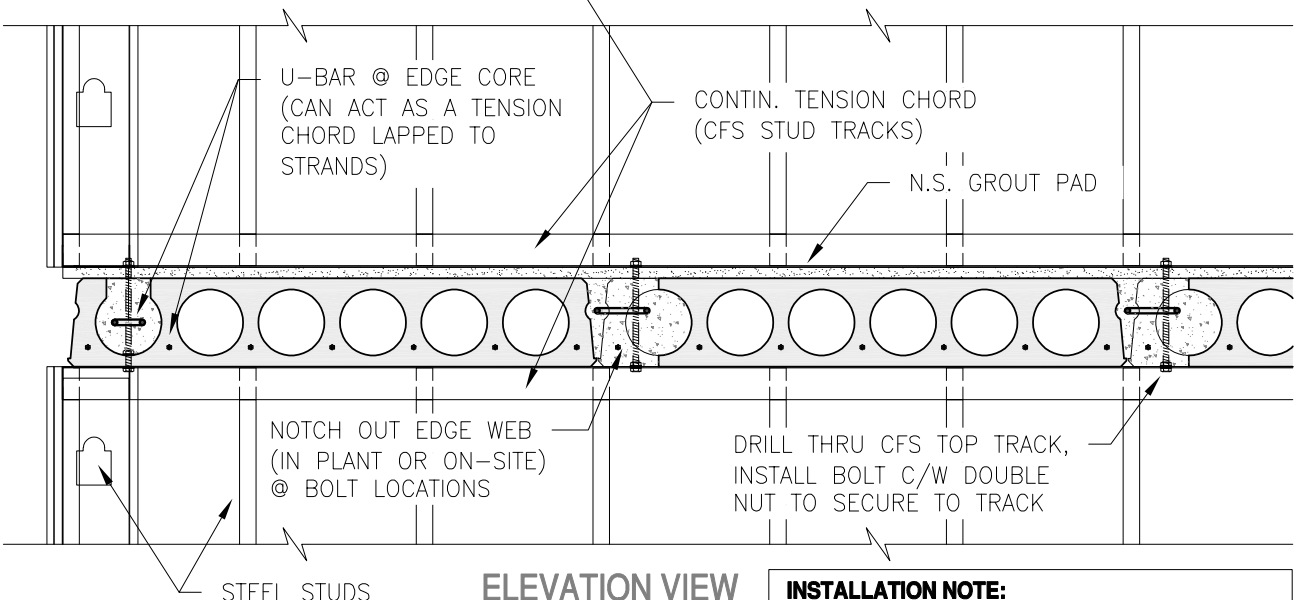
DRAWING #: D-101

PLAN VIEW





ELEVATION VIEW

INSTALLATION NOTE:
DO NOT INSTALL HOLLOWCORE @ FLOOR ABOVE UNTIL HOLLOWCORE IS CONNECTED TO CFS SUPPORTING WALL BELOW - CRITICAL!

END BEARING HC-CFS WALL CONNECTIONS - HC ALIGNED WITH OSF OF STUD WALLS (J-BARS @ SITE)

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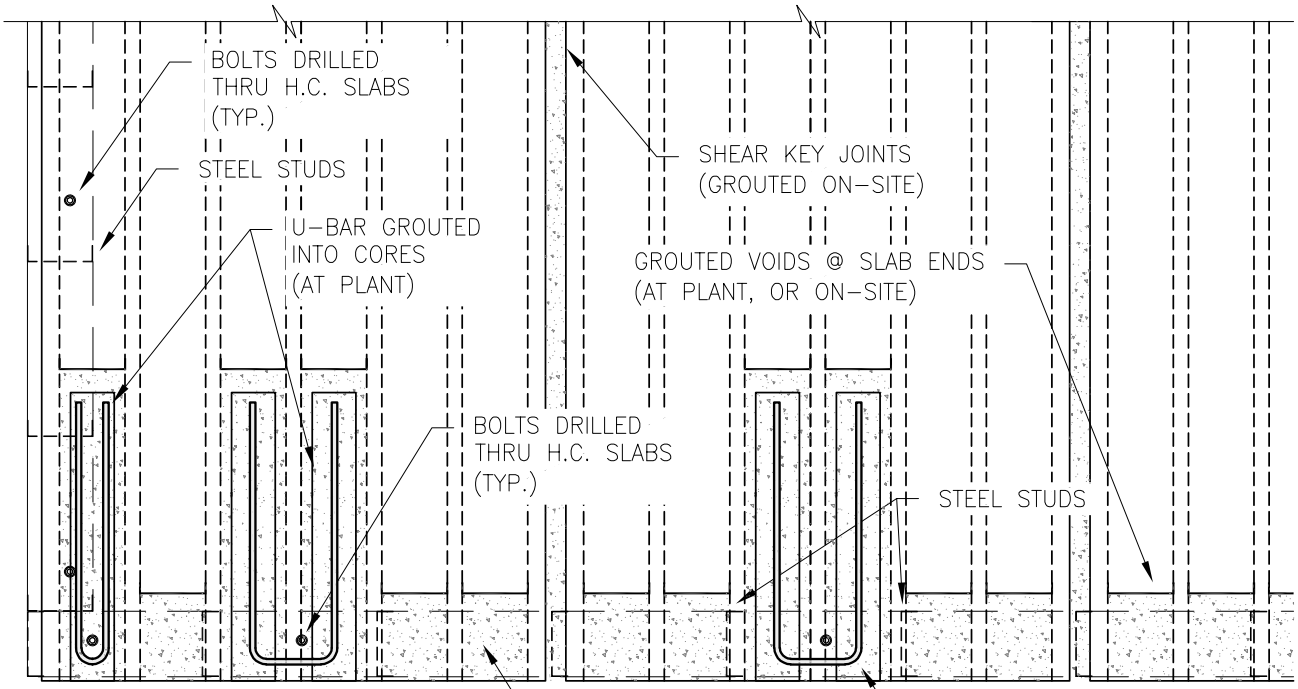
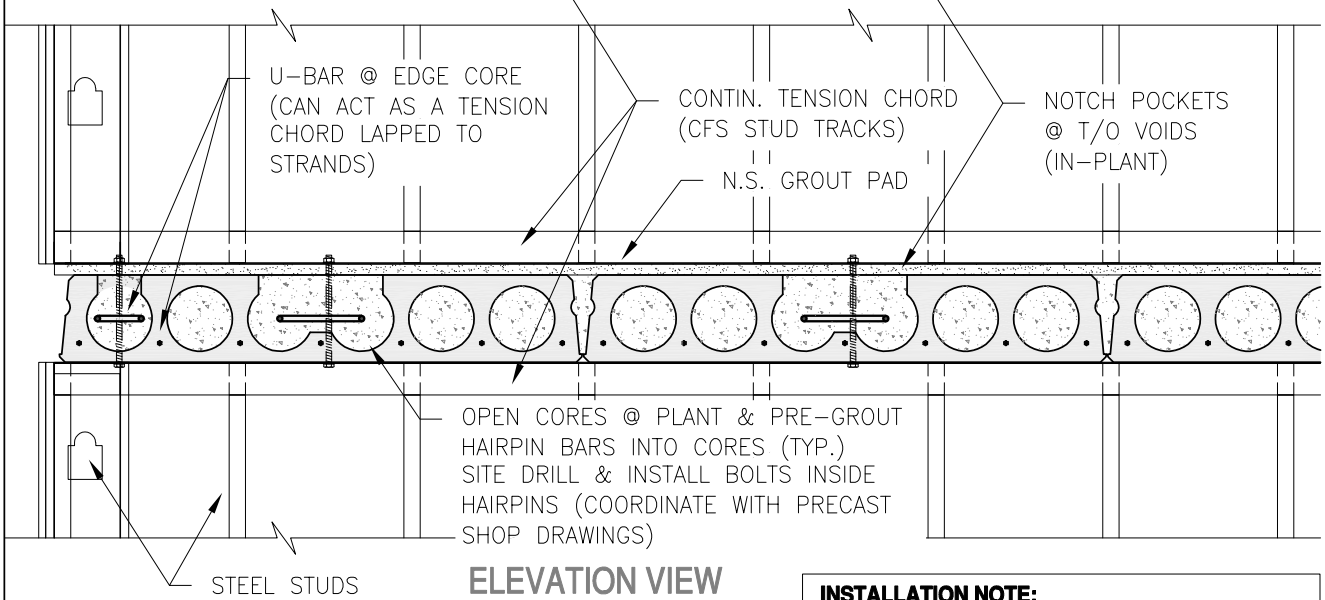
DRAWING #: D-102

PLAN VIEW





ELEVATION VIEW

INSTALLATION NOTE:
DO NOT INSTALL HOLLOWCORE @ FLOOR ABOVE UNTIL HOLLOWCORE IS CONNECTED TO CFS SUPPORTING WALL BELOW - CRITICAL!

END BEARING HC-CFS WALL CONNECTIONS - HC ALIGNED WITH OSF OF STUD WALLS (U-BARS @ PLANT)

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DRAWING #: D-103