

*Shuriken™
Conceptual
Details*

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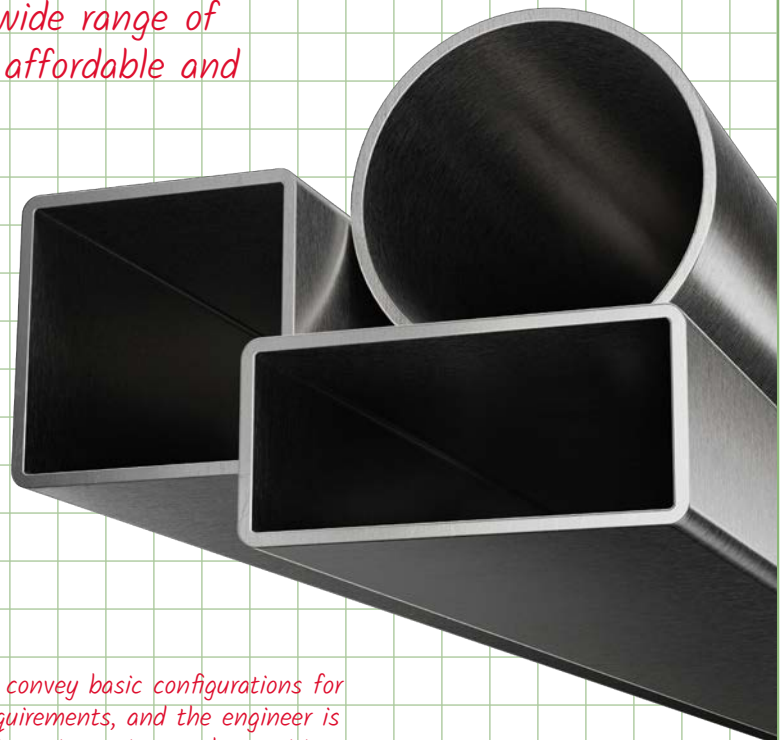
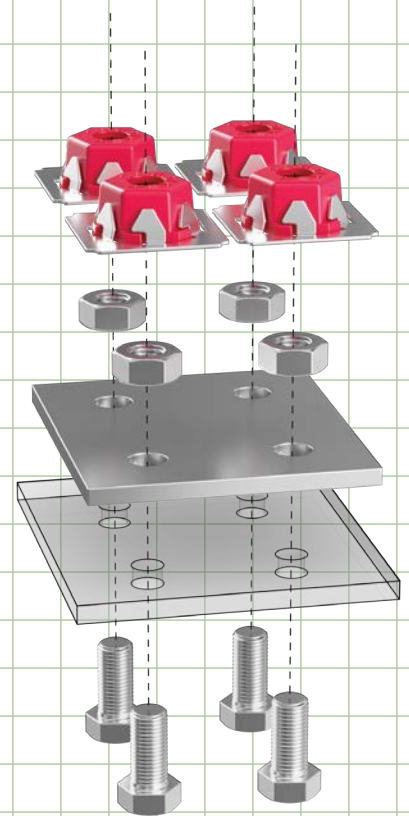
Shuriken Better Bolted Connections

Shuriken is a revolutionary way to field bolt connections that used to require field welds. The built-in wrench allows you to design for a wide range of quick and easy field-bolted connections, like HSS, SpeedCore and more. By eliminating field welds and other expensive one-sided connections, Shuriken saves you time and money on the job and simplifies inspections to accelerate erection.

Unlock All the Benefits of HSS

With Shuriken, you can use HSS in more designs, more ways, more affordably. With high strength-to-weight ratios, exceptional torsional resistance and an aesthetically pleasing appearance, HSS are a more efficient and sustainable option than wide-flange sections. However, complicated connections and field welds have held engineers back from freely incorporating HSS into their designs. Not anymore. With Shuriken, you can easily field bolt a wide range of HSS connection types, making them more affordable and accessible than ever.

To learn more about Shuriken visit atlastube.com/shuriken. For immediate project support contact our team.

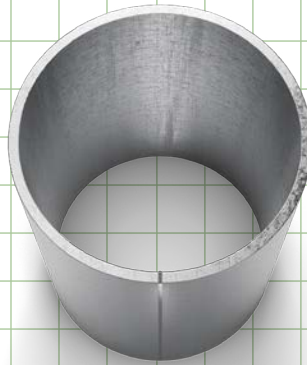


These conceptual details are presented to spark imagination and convey basic configurations for using Shuriken. Every project has different physical and code requirements, and the engineer is responsible for choosing and verifying acceptable materials, configurations, sizes and quantities to satisfy those requirements, regardless of the information shown in this document.

ATLAS TUBE SIZE RANGE



SQUARES UP TO
22" x 22" x 1"



ROUNDS UP TO
28" OD x 1"



RECTANGLES UP TO
34" x 10" x 1"

HSS MATERIAL SPECIFICATIONS

ASTM A500 Gr. C: $F_y = 50$ ksi; $F_u = 62$ ksi; MOST COMMON HSS MATERIAL
DESIGN WALL THICKNESS = $.93 \times$ NOMINAL WALL THICKNESS

ASTM A1085: $F_y = 50$ ksi; $F_u = 65$ ksi; MORE DEMANDING APPLICATIONS
DESIGN WALL THICKNESS = NOMINAL WALL THICKNESS

ASTM A847: $F_y = 50$ ksi; $F_u = 70$ ksi; IMPROVED CORROSION RESISTANCE
DESIGN WALL THICKNESS = $.93 \times$ NOMINAL WALL THICKNESS

COMPACTNESS LIMITS (PER AISC 360-22; $F_y = 50$ ksi & $E = 29,000$ ksi)

COMPRESSION MEMBERS

NON-SLENDER IF $b/t < 33.72$

FLEXURAL MEMBERS

FLANGES

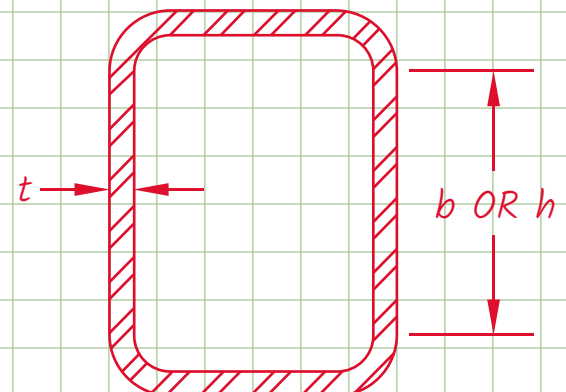
COMPACT IF $b/t < 26.97$

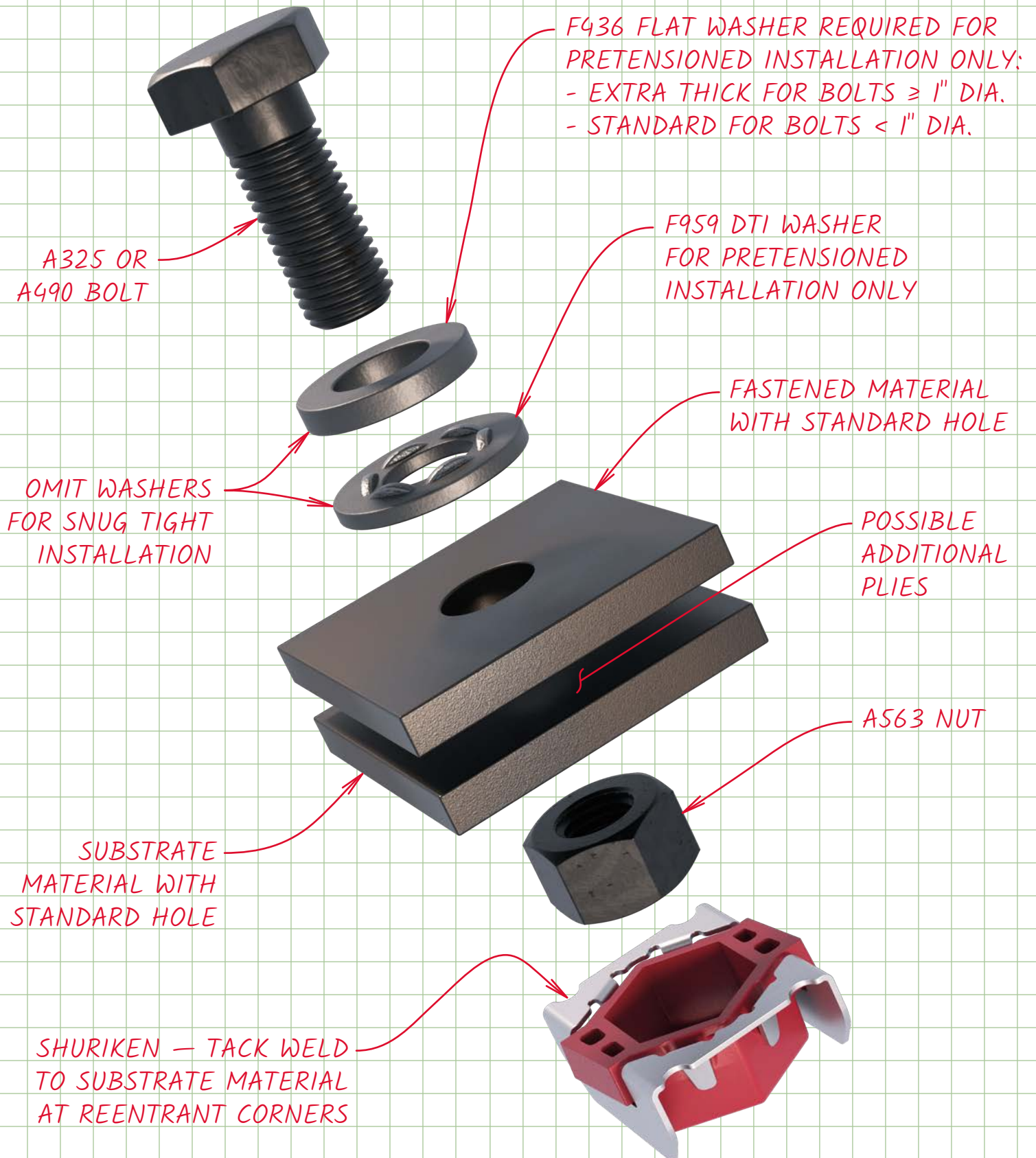
NON-COMPACT IF $b/t < 33.72$

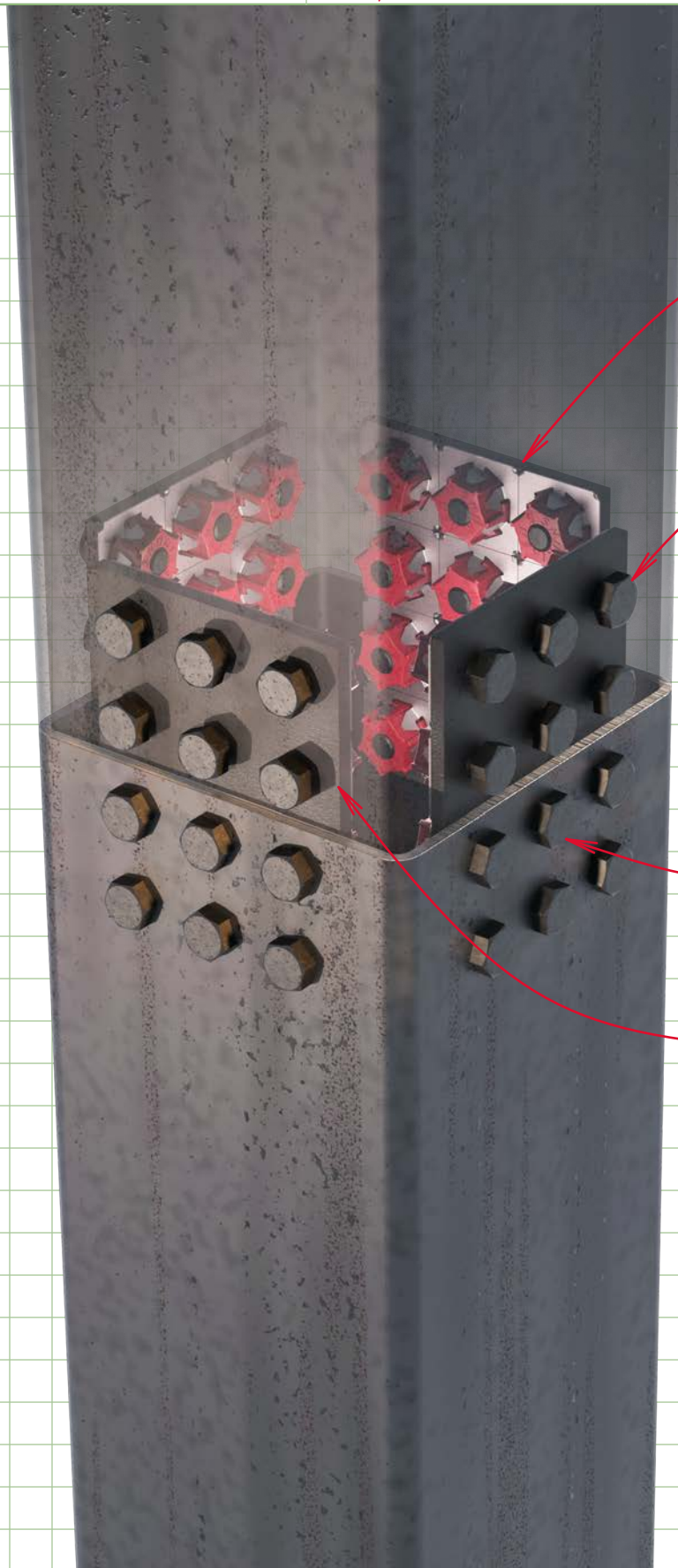
WEBS

COMPACT IF $b/t < 58.28$

NON-COMPACT IF $b/t < 137.3$







HSS COLUMN

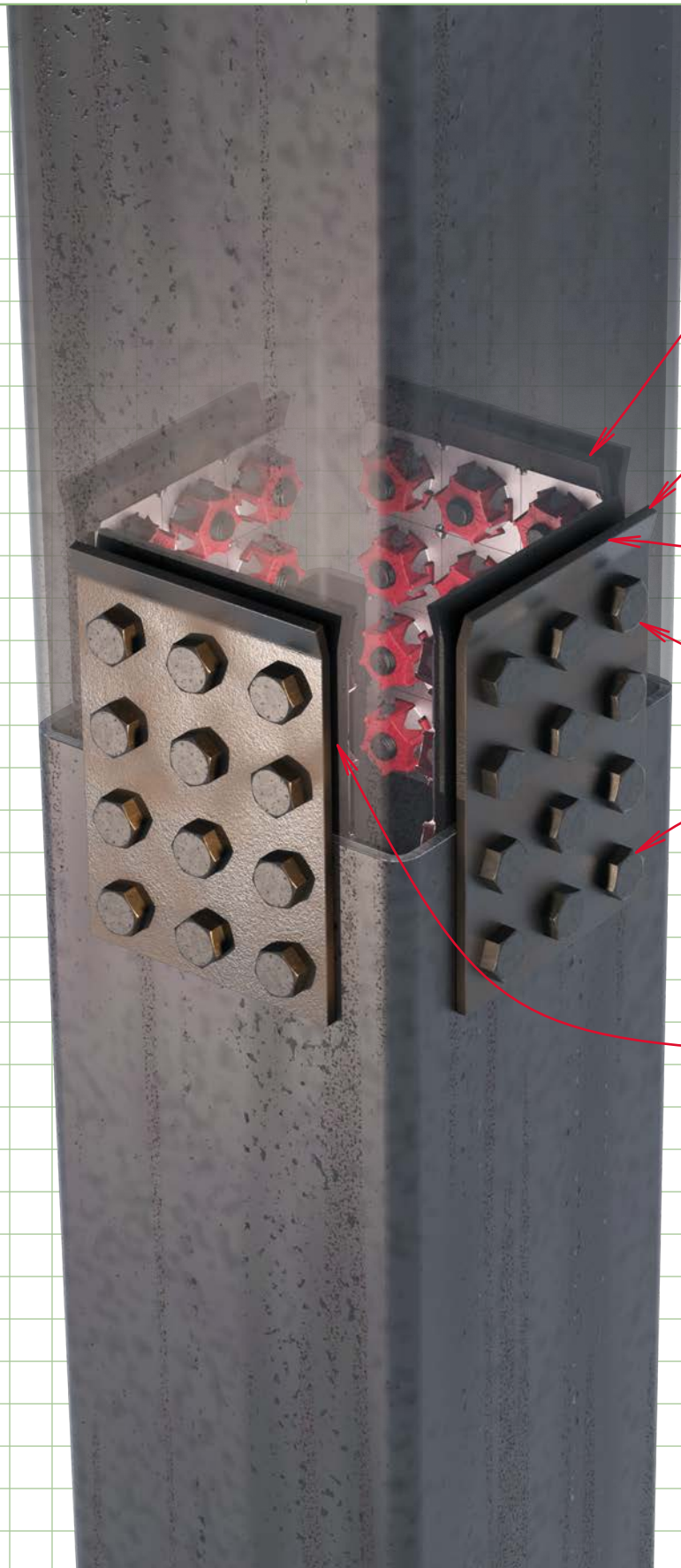
INTERNAL SPLICE
PLATE WITH SHURIKEN

SHOP BOLTS. LOOSEN
SLIGHTLY PRIOR TO
ERECTION FOR
ADDITIONAL TOLERANCE.

FIELD BOLTS

SHIM PLATES AS REQUIRED
WHEN UPPER AND LOWER
COLUMN SECTIONS HAVE
DIFFERENT WALL
THICKNESSES

THE SINGLE SHEAR SPLICE HAS A
CLEAN AESTHETIC WELL-SUITED TO
AESS APPLICATIONS. MORE BOLTS
MAY BE REQUIRED THAN THE
DOUBLE SHEAR SPLICE.



HSS COLUMN

INTERNAL SPLICE
PLATE WITH SHURIKEN

EXTERNAL SPLICE PLATE

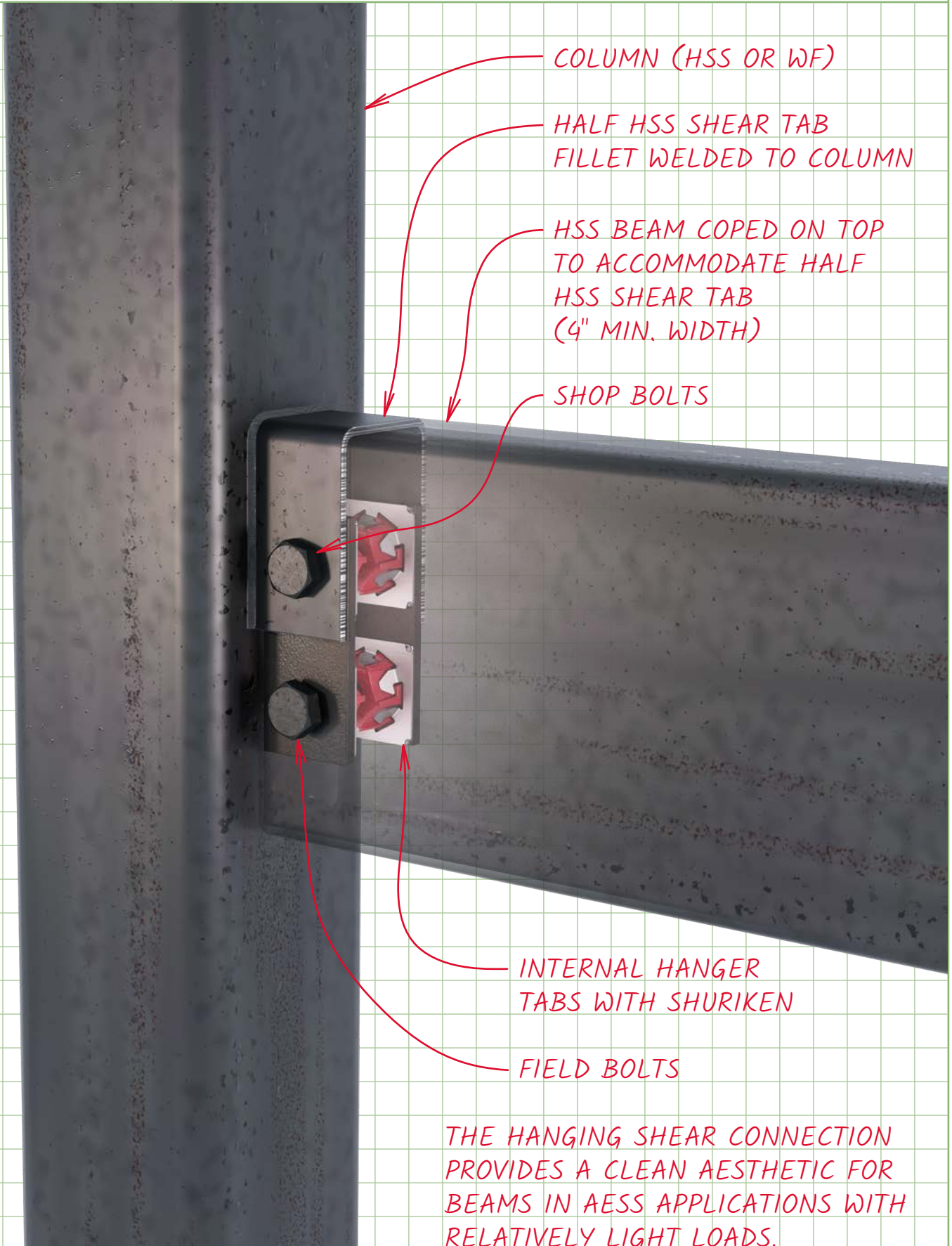
OPTIONAL BEND ON
SPLICE PLATES TO
EASE ERECTION

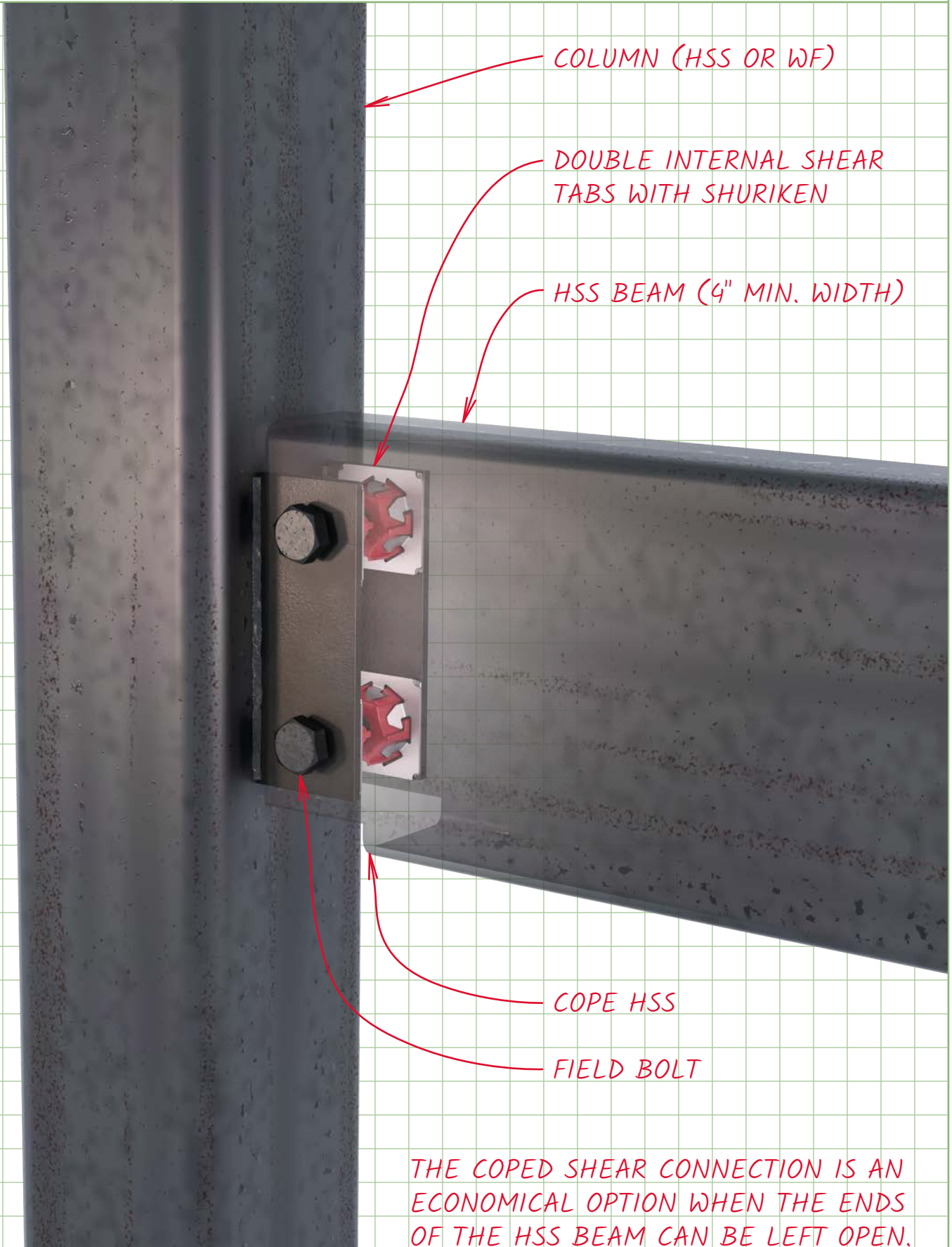
FIELD BOLTS

SHOP BOLTS. LOOSEN
SLIGHTLY PRIOR TO
ERECTION FOR ADDITIONAL
TOLERANCE.

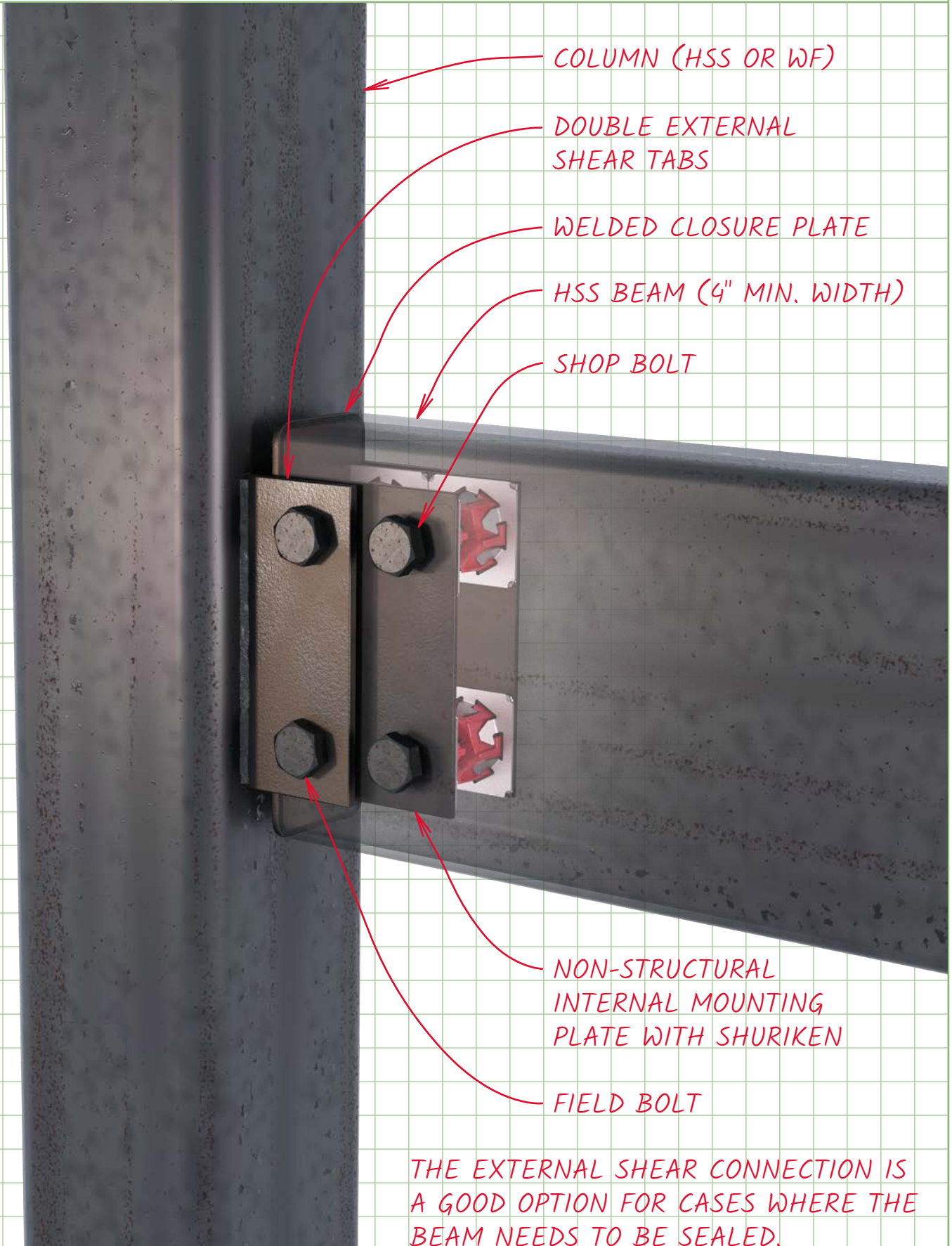
SHIM PLATES AS REQUIRED
WHEN UPPER AND LOWER
COLUMN SECTIONS HAVE
DIFFERENT WALL
THICKNESSES

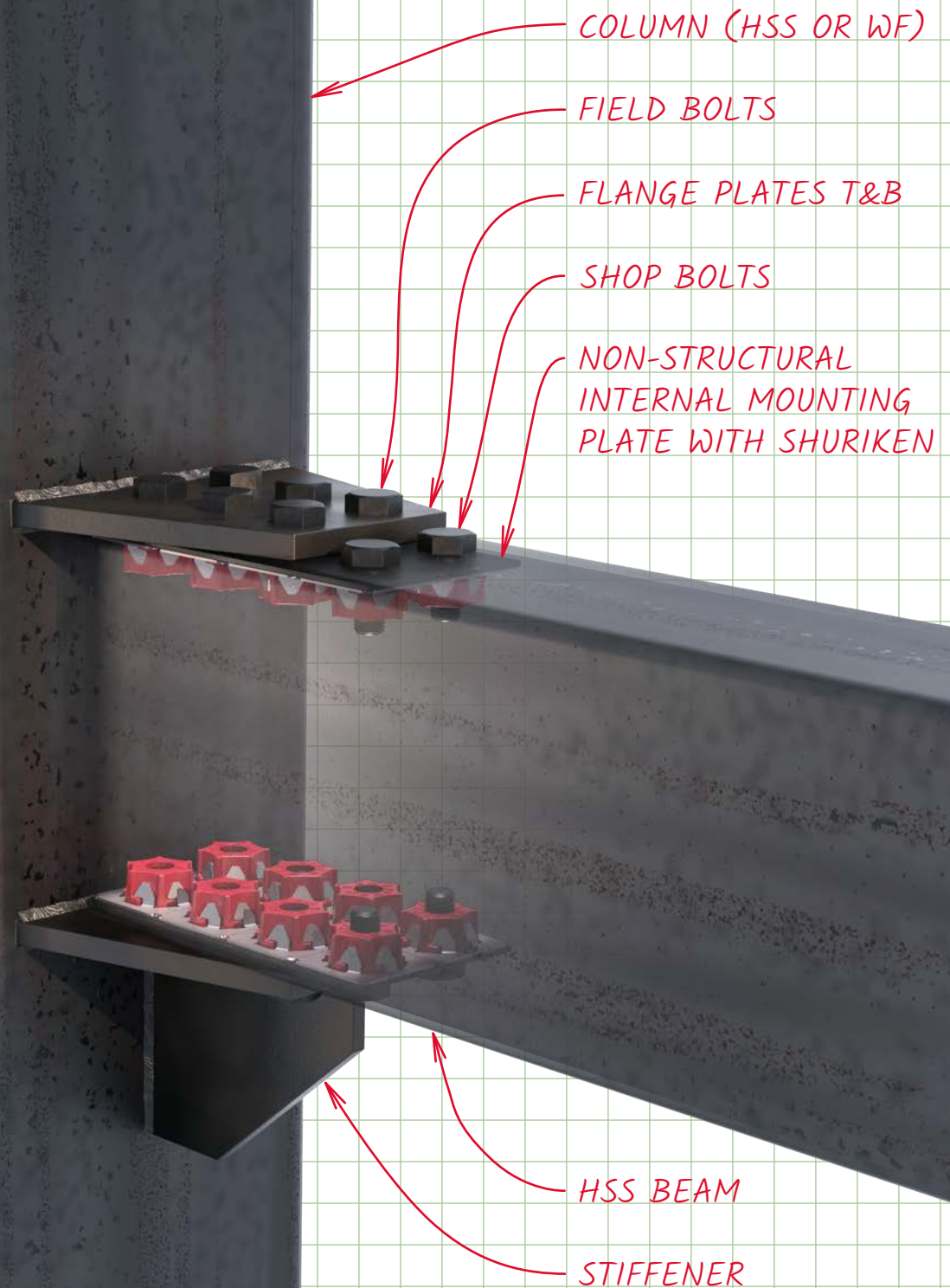
THE DOUBLE SHEAR SPLICE
REQUIRES FEWER BOLTS AND
LESS MATERIAL THAN THE SINGLE
SHEAR SPLICE BUT LEAVES
PLATES EXPOSED TO VIEW.



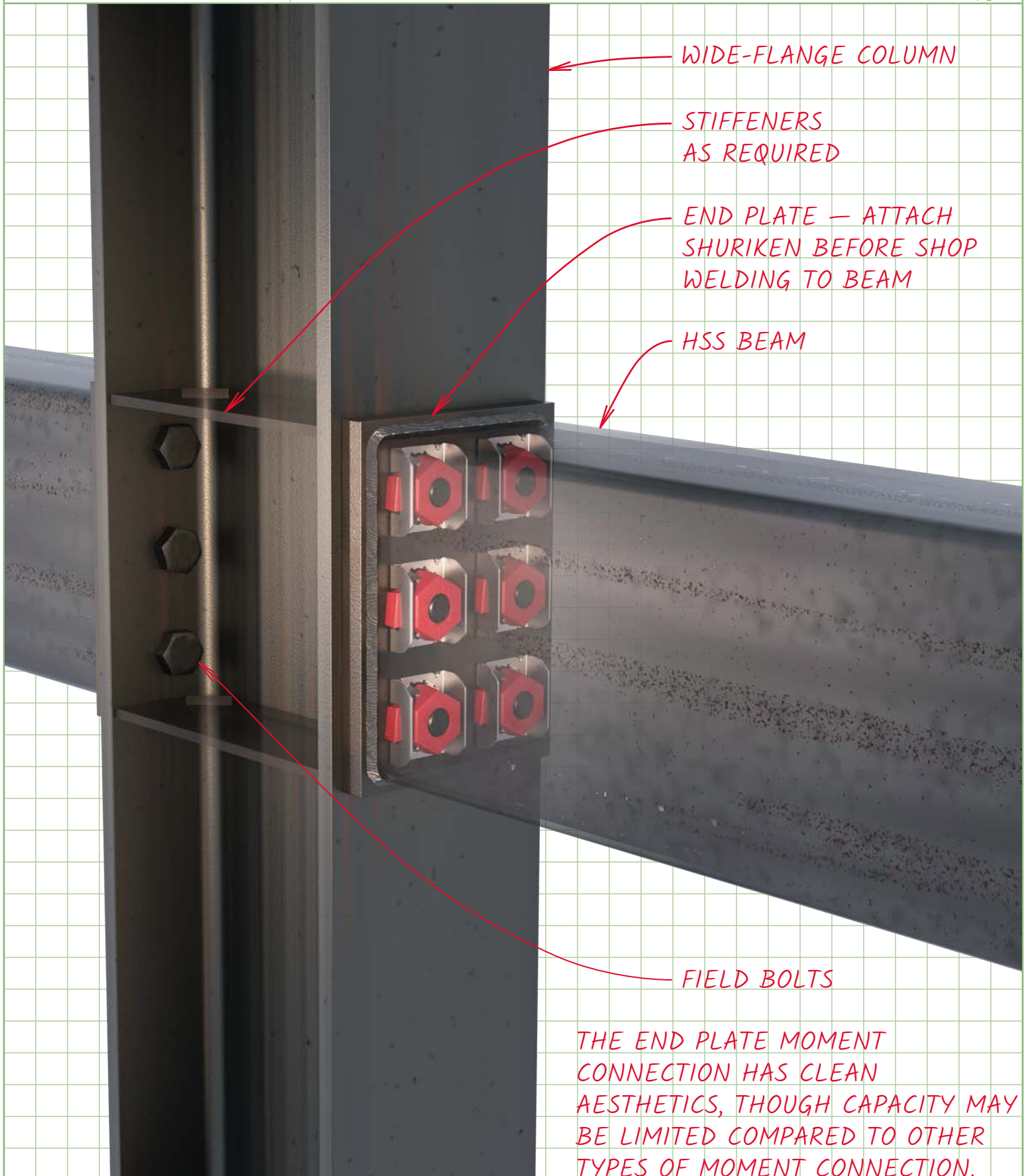


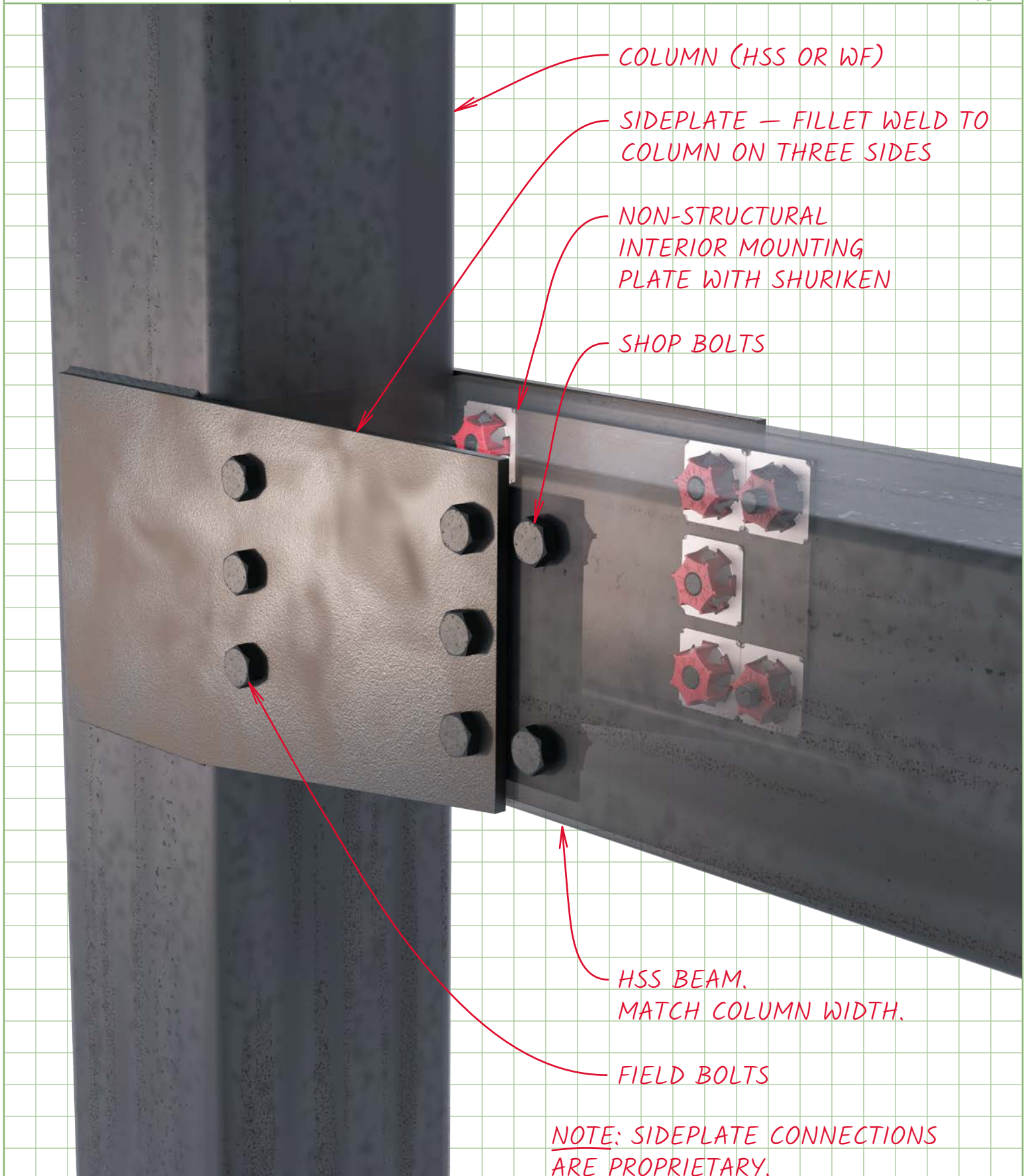
THE COPED SHEAR CONNECTION IS AN ECONOMICAL OPTION WHEN THE ENDS OF THE HSS BEAM CAN BE LEFT OPEN.

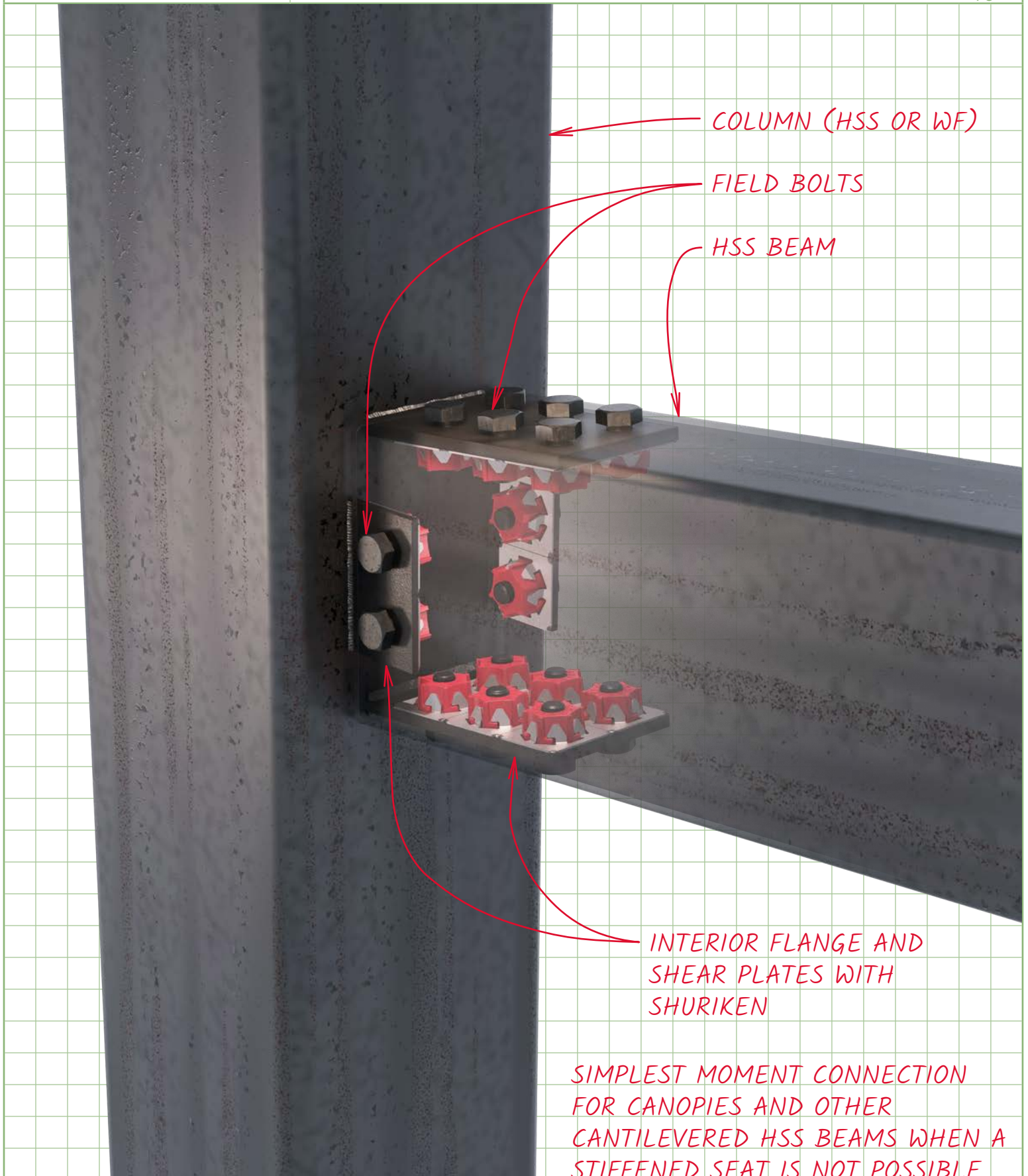


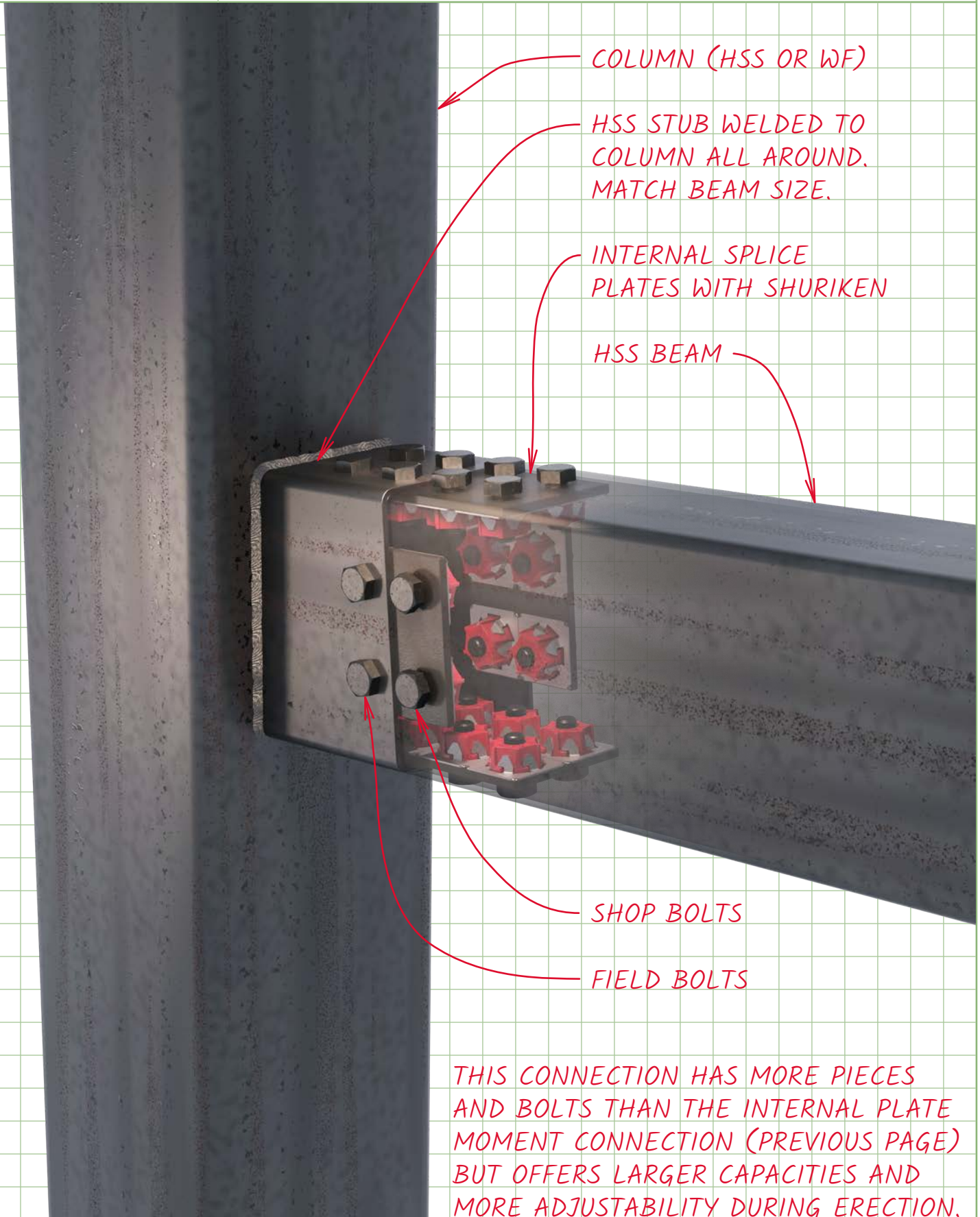


THE SEATED MOMENT CONNECTION IS EFFICIENT AND EASY TO ERECT, BUT REQUIRES SPACE FOR THE STIFFENER.









COLUMN (HSS OR WF)

HSS STUB WELDED TO
COLUMN ALL AROUND.
MATCH BEAM SIZE.

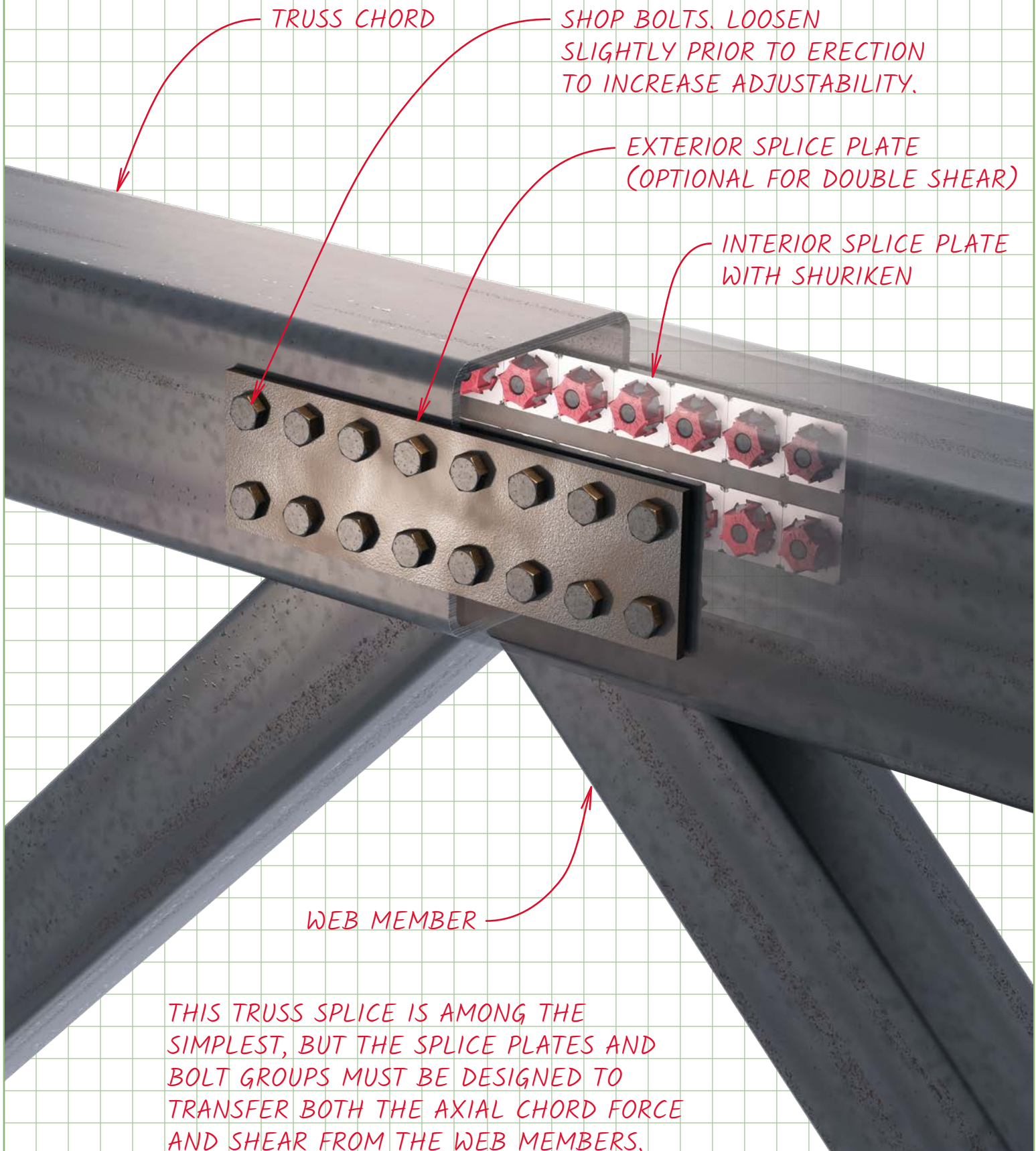
INTERNAL SPLICE
PLATES WITH SHURIKEN

HSS BEAM

SHOP BOLTS

FIELD BOLTS

THIS CONNECTION HAS MORE PIECES
AND BOLTS THAN THE INTERNAL PLATE
MOMENT CONNECTION (PREVIOUS PAGE)
BUT OFFERS LARGER CAPACITIES AND
MORE ADJUSTABILITY DURING ERECTION.



INTERNAL SPLICE PLATE WITH SHURIKEN
(ADD EXTERIOR PLATE FOR DOUBLE SHEAR)

SHOP BOLTS. LOOSEN
SLIGHTLY PRIOR TO ERECTION
TO INCREASE ADJUSTABILITY.

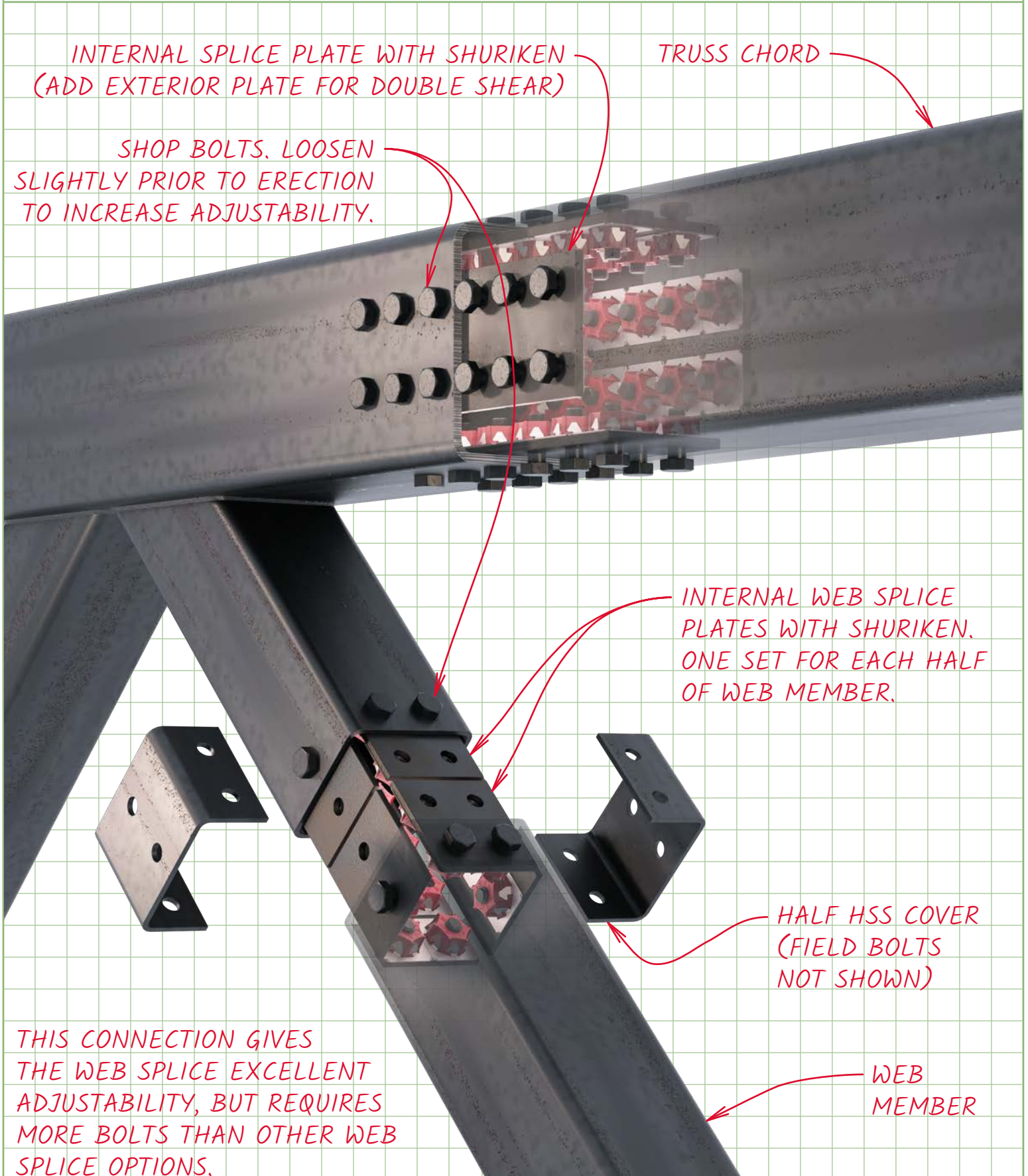
TRUSS CHORD

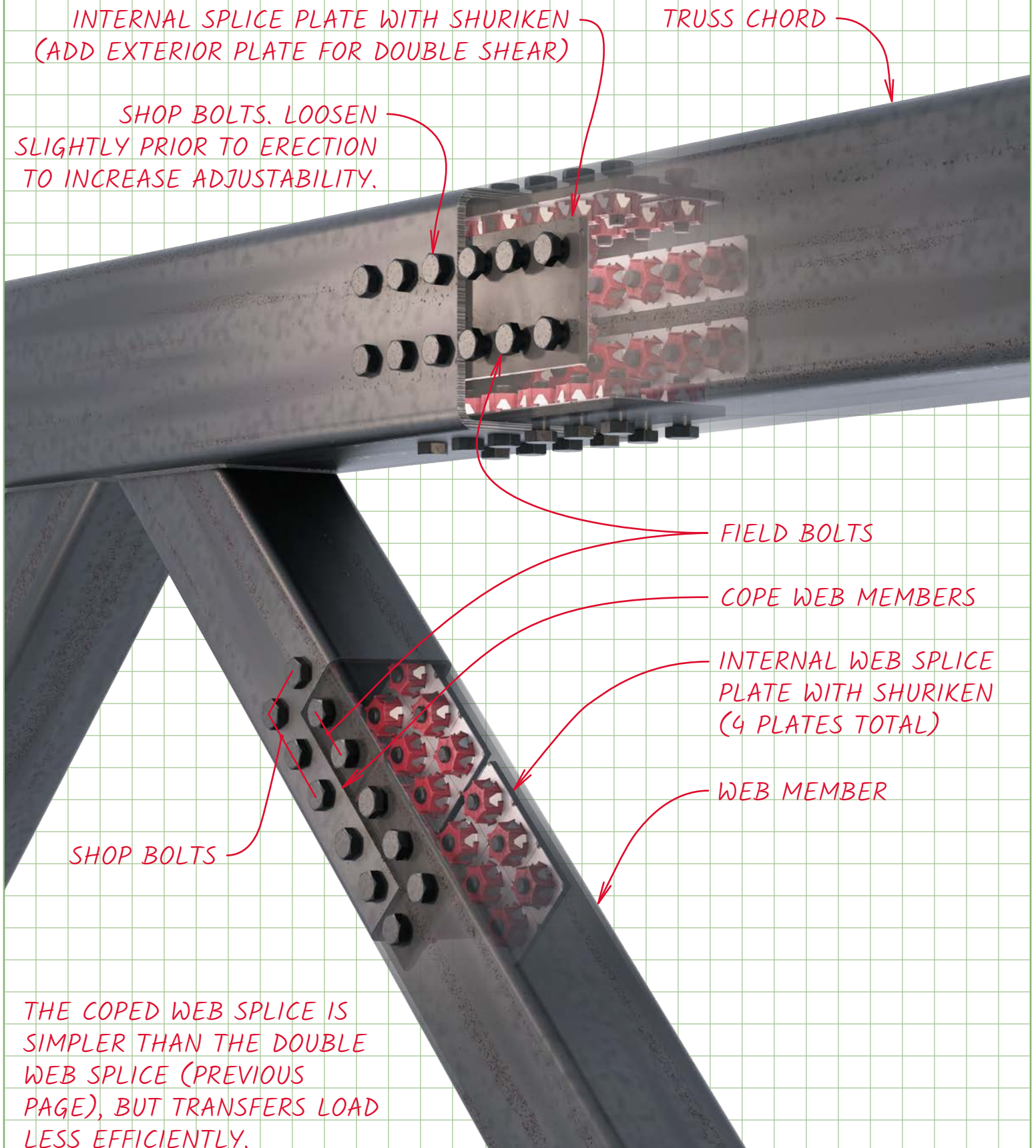
INTERNAL WEB SPLICE
PLATES WITH SHURIKEN.
ONE SET FOR EACH HALF
OF WEB MEMBER.

HALF HSS COVER
(FIELD BOLTS
NOT SHOWN)

THIS CONNECTION GIVES
THE WEB SPLICE EXCELLENT
ADJUSTABILITY, BUT REQUIRES
MORE BOLTS THAN OTHER WEB
SPLICE OPTIONS.

WEB
MEMBER





INTERNAL SPLICE PLATE WITH SHURIKEN
(ADD EXTERIOR PLATE FOR DOUBLE SHEAR)

TRUSS CHORD

SHOP BOLTS. LOOSEN
SLIGHTLY PRIOR TO ERECTION
TO INCREASE ADJUSTABILITY.

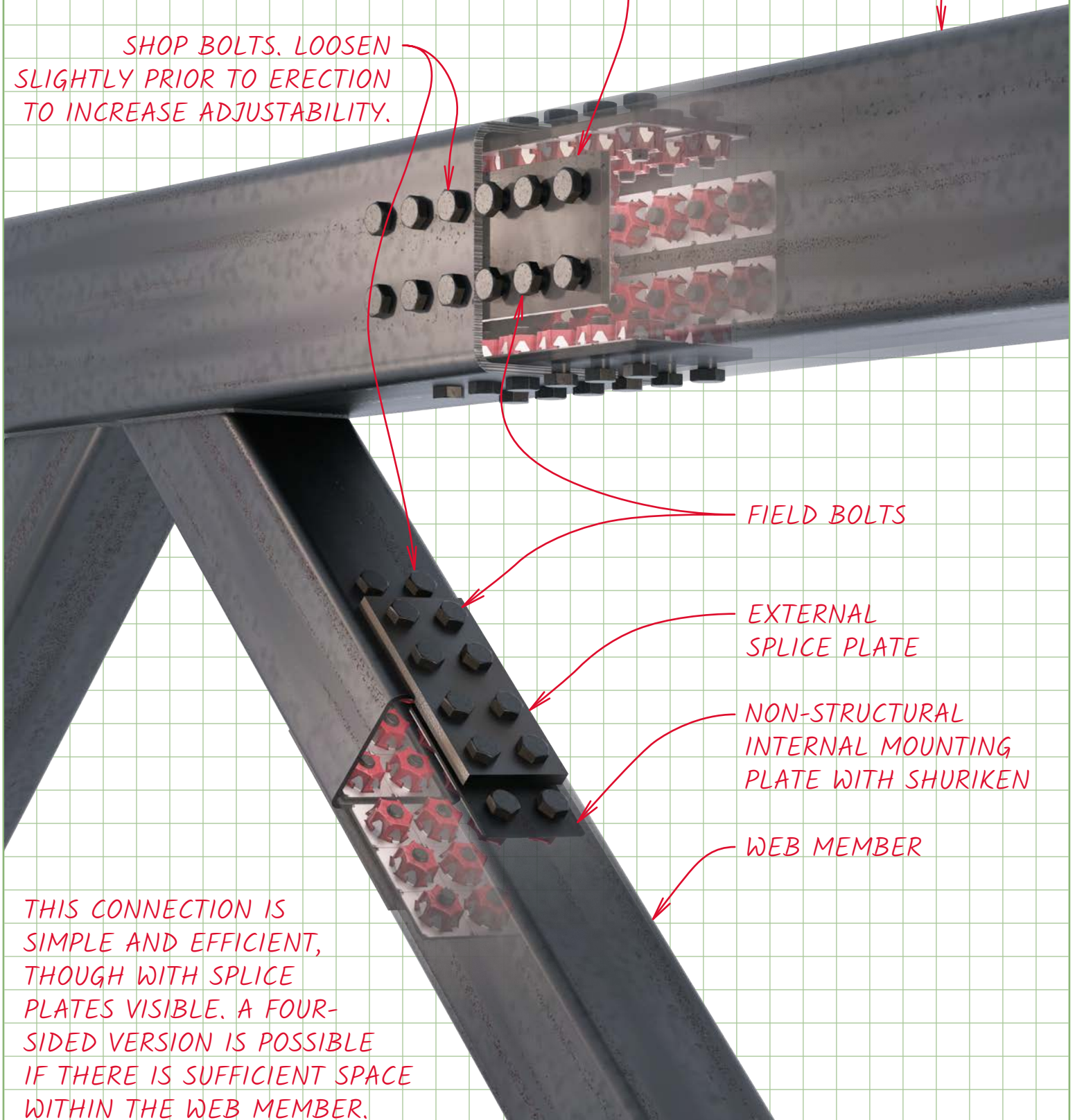
FIELD BOLTS

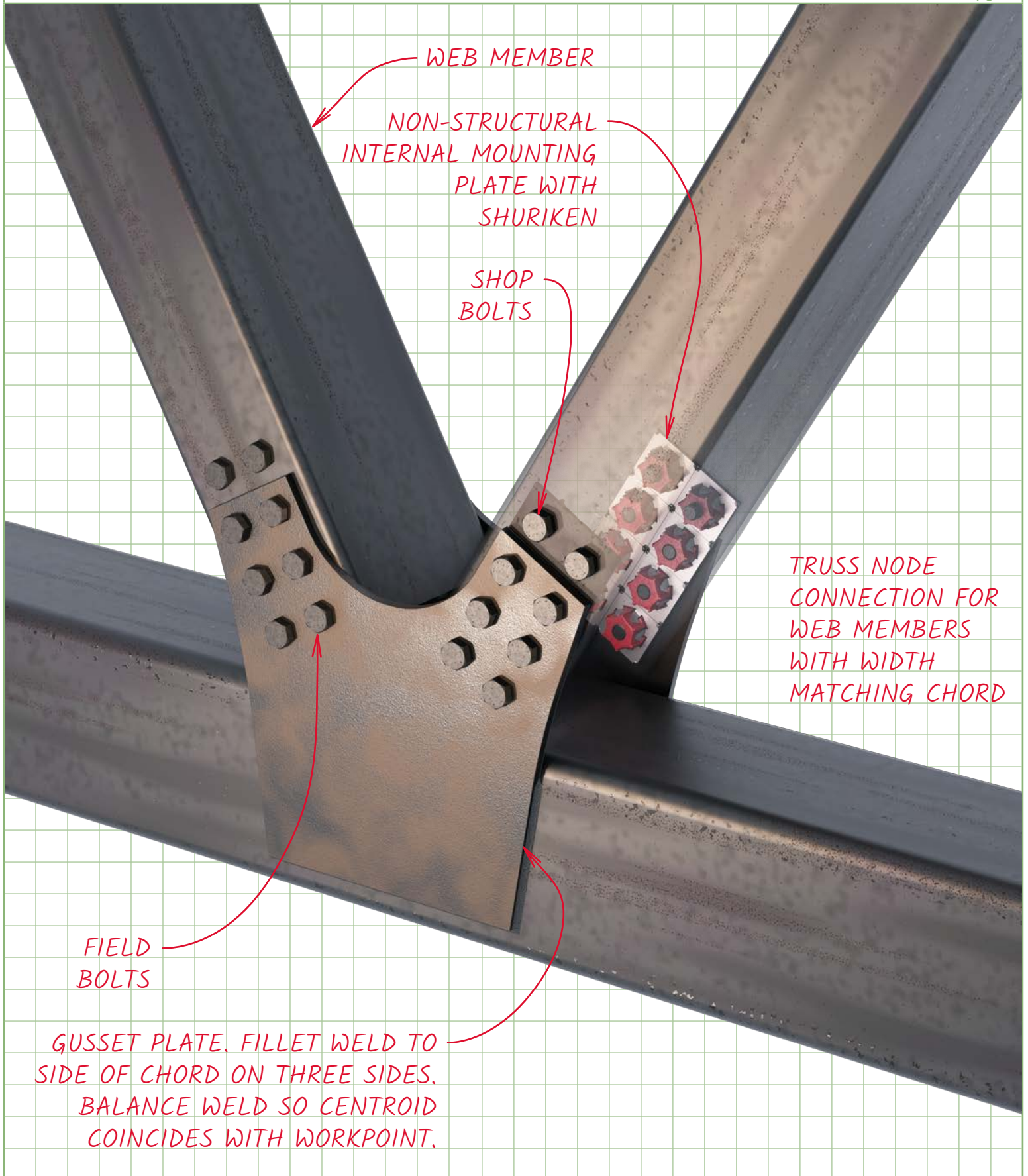
EXTERNAL
SPLICE PLATE

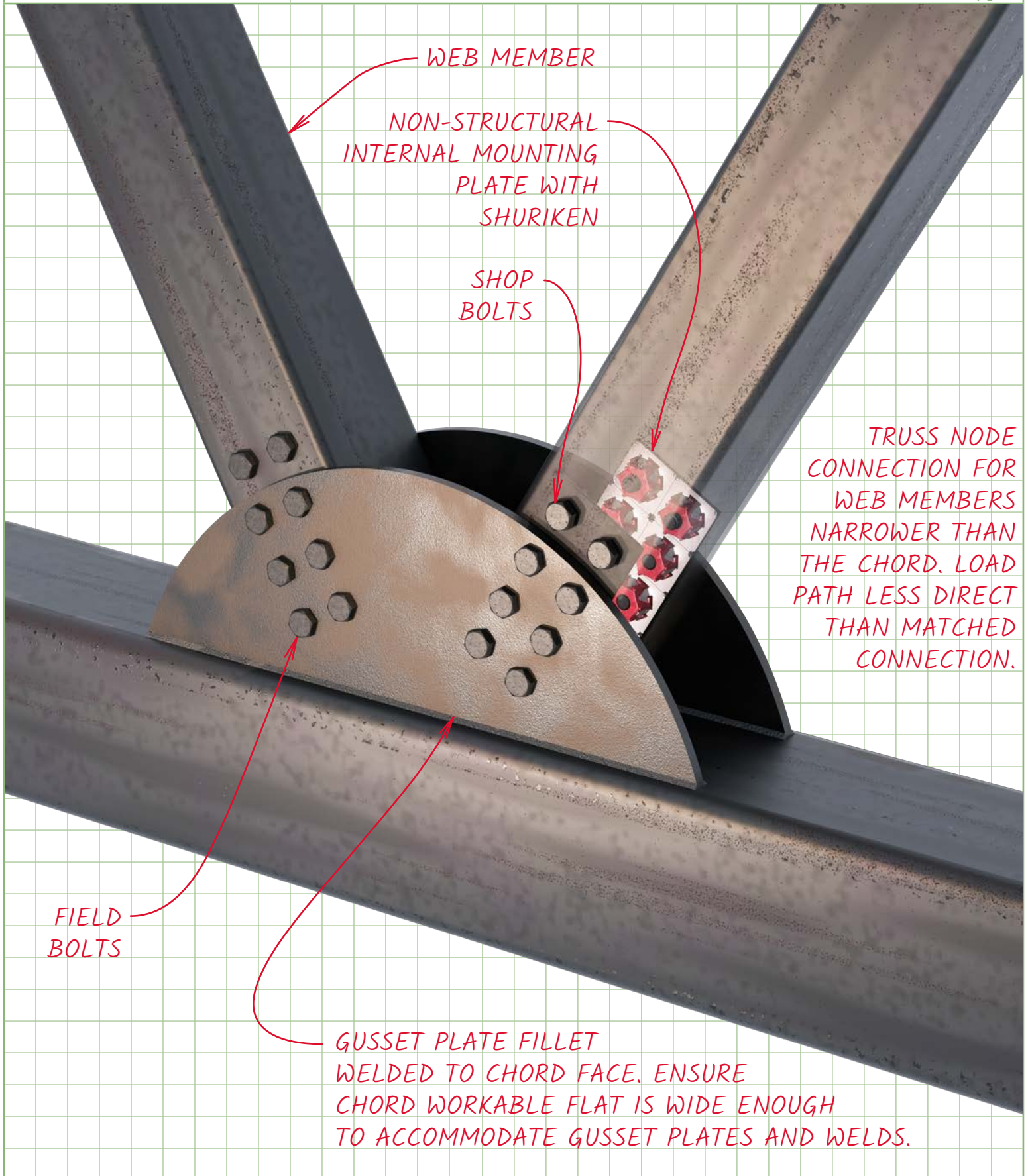
NON-STRUCTURAL
INTERNAL MOUNTING
PLATE WITH SHURIKEN

WEB MEMBER

THIS CONNECTION IS
SIMPLE AND EFFICIENT,
THOUGH WITH SPLICE
PLATES VISIBLE. A FOUR-
SIDED VERSION IS POSSIBLE
IF THERE IS SUFFICIENT SPACE
WITHIN THE WEB MEMBER.







COLUMN
(HSS OR WF)

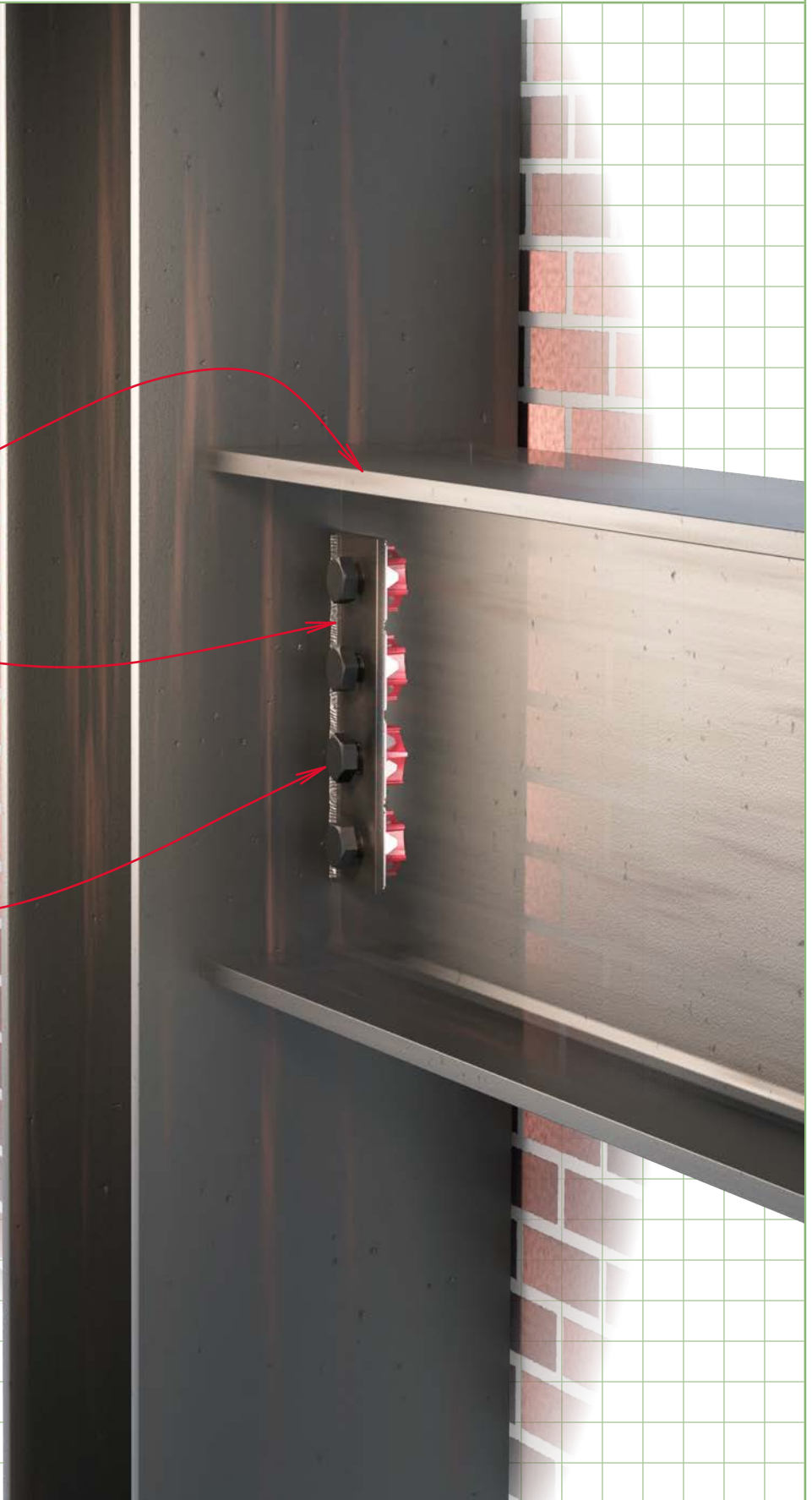
EXISTING WALL
BLOCKING
ACCESS

WF BEAM

SHEAR PLATE
WITH SHURIKEN
MOUNTED TO
INACCESSIBLE
SIDE

FIELD BOLTS

SHEAR CONNECTIONS
WITH SHURIKEN AVOID
THE NEED FOR LARGE
COPEES OR ACCESS
HOLES AND ASSOCIATED
REINFORCEMENT.



COLUMN
(HSS OR WF)

EXISTING WALL
BLOCKING ACCESS

STIFFENERS
AS REQUIRED

FLANGE PLATE

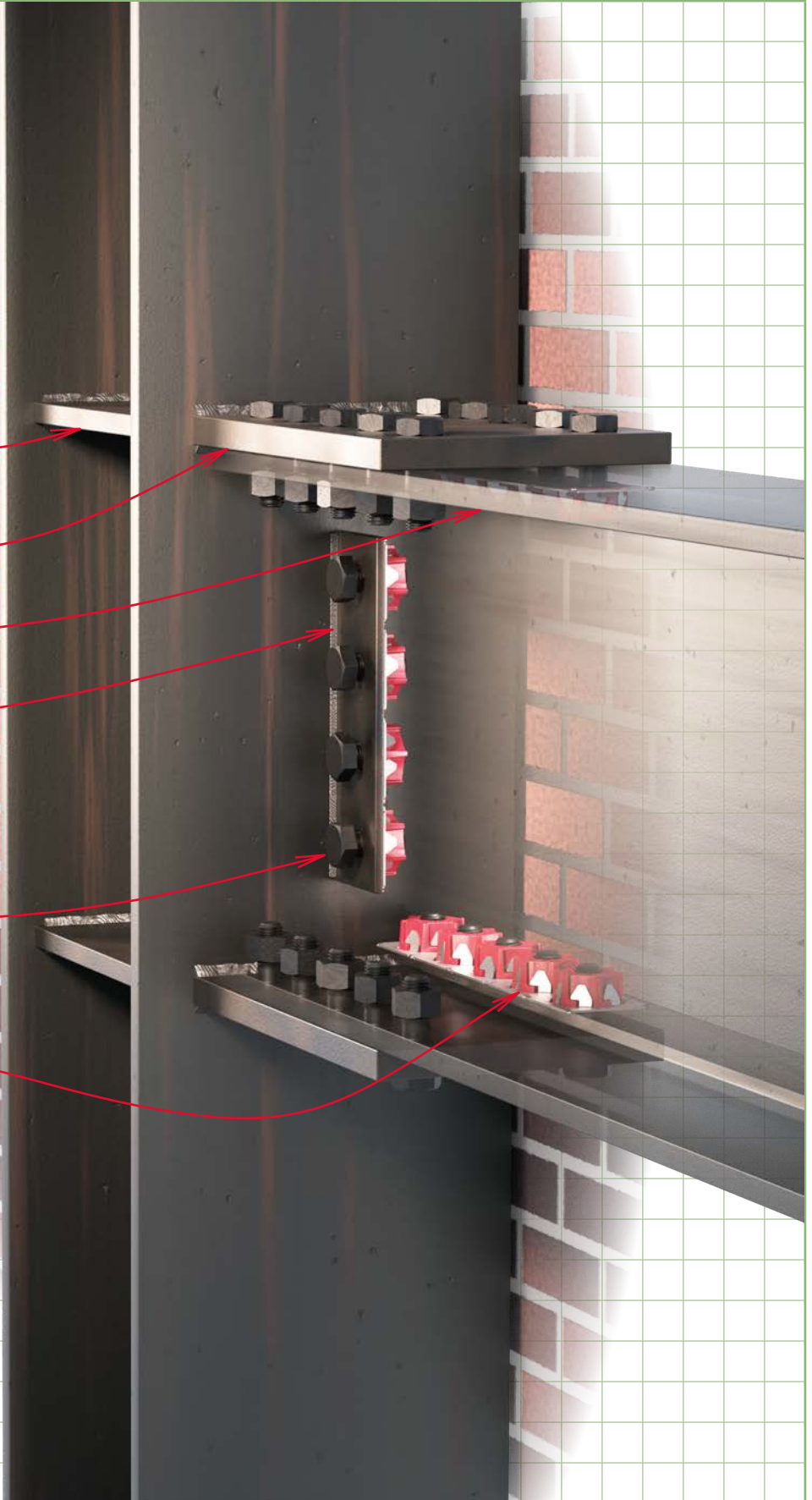
WF BEAM

SHEAR PLATE
WITH SHURIKEN
MOUNTED TO
INACCESSIBLE SIDE

FIELD BOLTS

SHURIKEN
DIRECTLY MOUNTED
TO INACCESSIBLE
FLANGE

THIS CONNECTION IS AN
EFFICIENT ALTERNATIVE
TO WELDED MOMENT
CONNECTIONS.

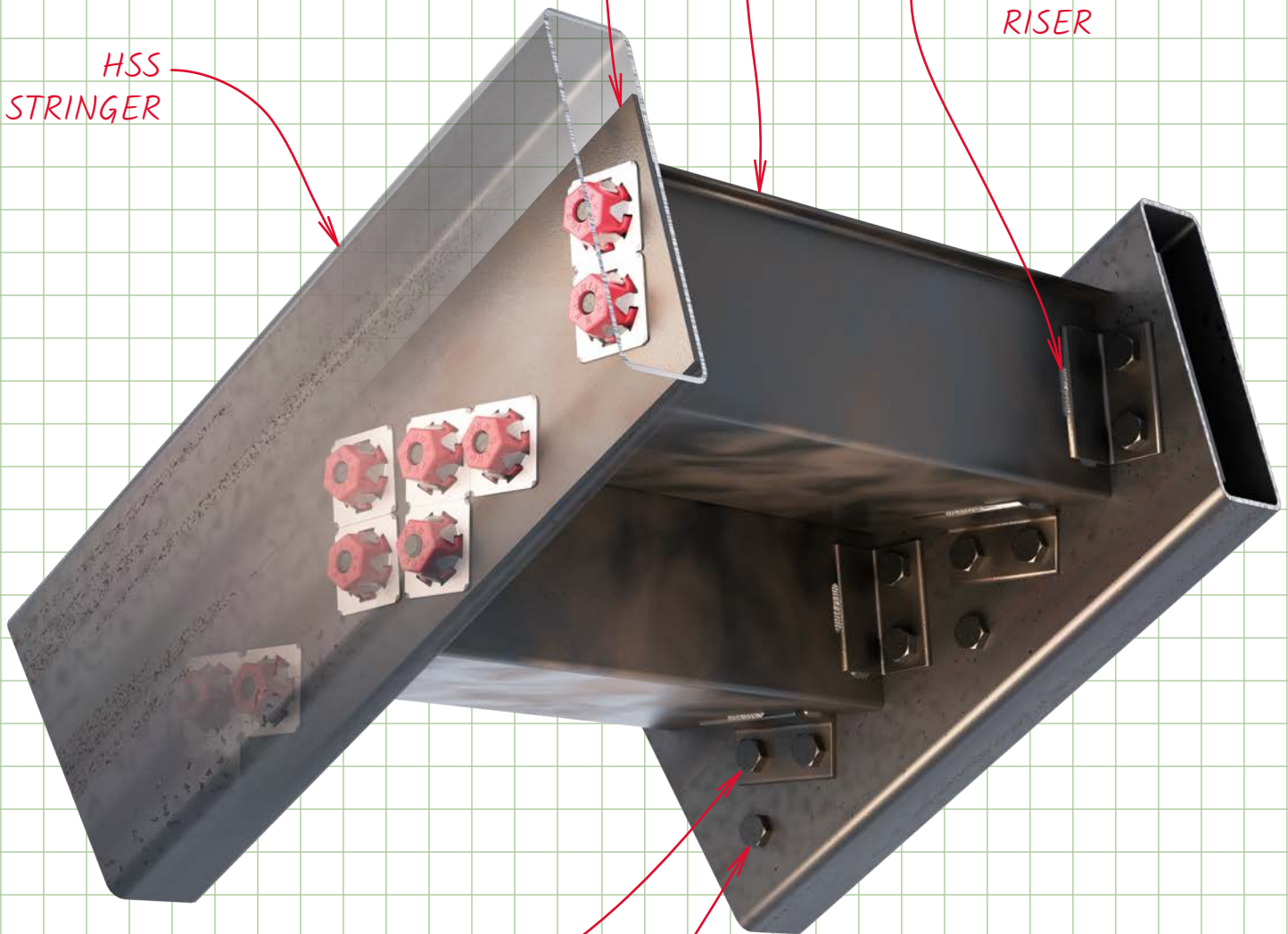


INTERNAL MOUNTING PLATE
WITH SHURIKEN. INSTALL
BEFORE CONNECTING STAIR
AND LANDING PORTIONS OF
STRINGER.

BENT PLATE
TREAD AND RISER

SHOP WELD CLIPS
TO TREAD AND
RISER

HSS
STRINGER



FIELD BOLTS

SHOP BOLTS
HOLDING SHURIKEN
MOUNTING PLATE
WITHIN STRINGER

THIS DETAIL ALLOWS FIELD-BOLTED
STAIR ASSEMBLY WHILE MAINTAINING
VISUALLY CLEAN SURFACES ON THE
TOPS AND SIDES OF THE STRINGERS.

SHORE AND
CUT OUT
DAMAGED
PORTION OF
EXISTING
COLUMN

COLUMN DAMAGE IS
COMMON IN WAREHOUSES
AND OTHER FACILITIES
WHERE FORKLIFTS ARE
ACTIVE. THIS REPAIR
AVOIDS FIELD WELDING.



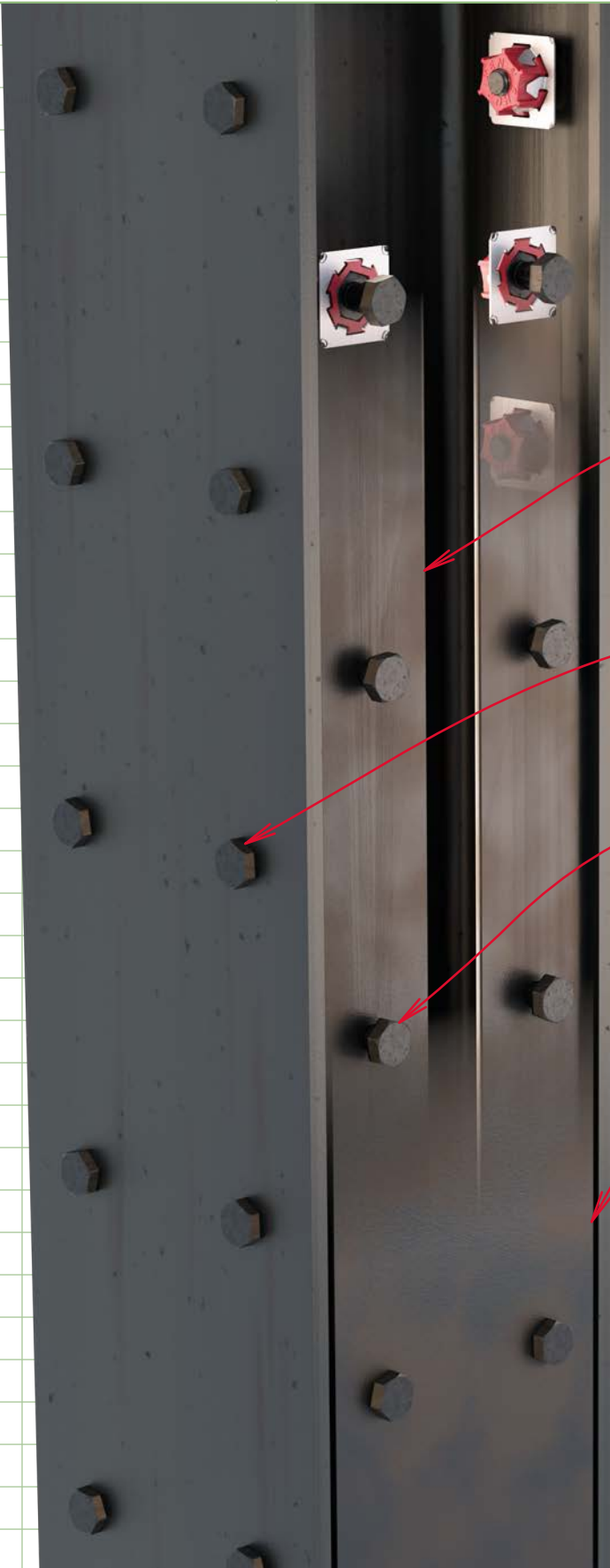
DAMAGED
EXISTING
COLUMN

SPLICE PLATES
WITH SHURIKEN
TO TRANSFER
COLUMN LOAD

STITCH PLATES
WITH SHURIKEN
TO TIE HSS
HALVES

SPLIT HSS,
MATCH EXISTING
COLUMN SIZE.

FIELD BOLTS
TO CARRY FULL
COLUMN LOAD



EXISTING WIDE-
FLANGE COLUMN

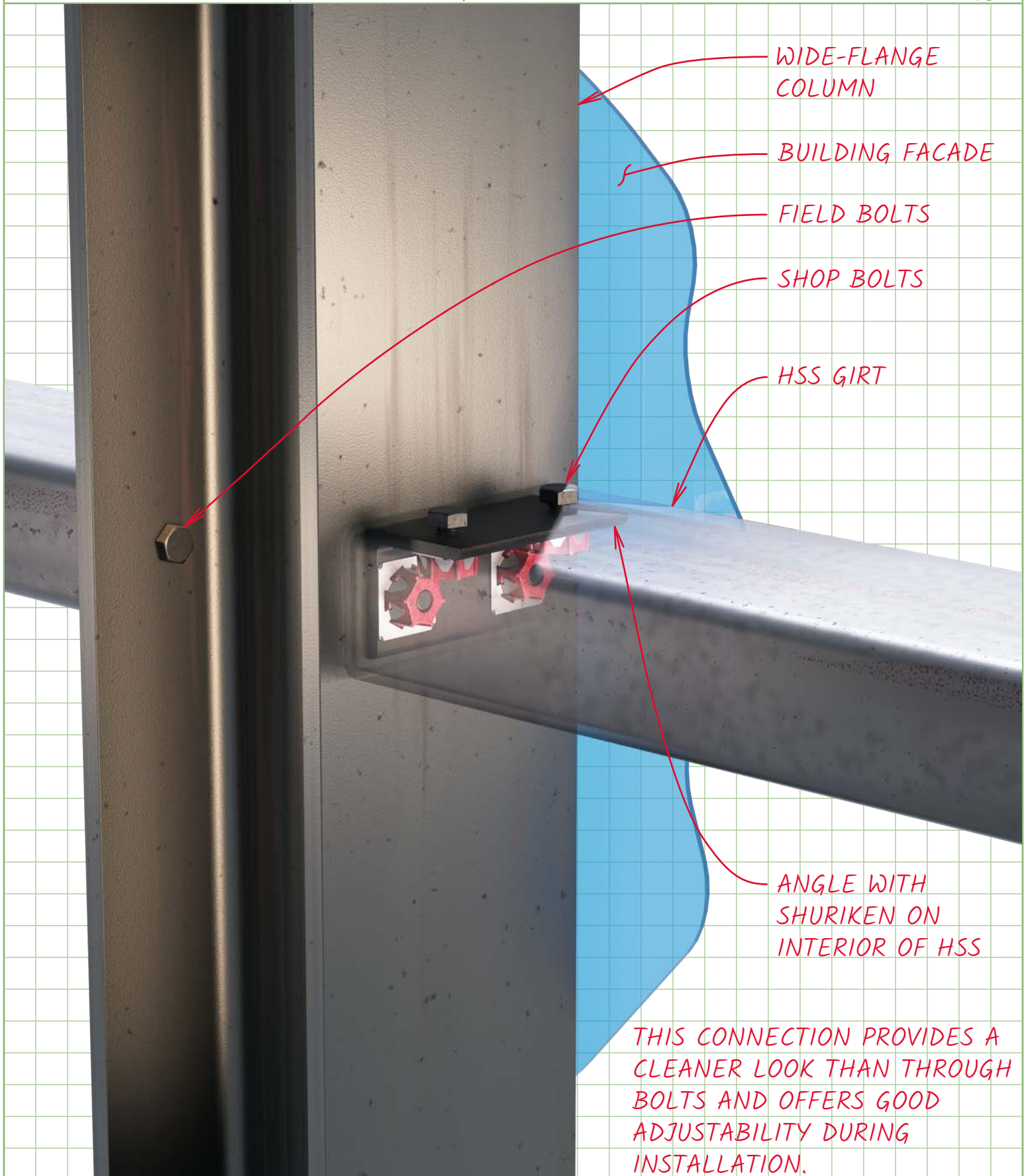
CONTINUOUS ANGLES
WITH SHURIKEN ON
EACH LEG (STAGGERED)

FIELD-DRILLED HOLES
IN EXISTING COLUMN

FIELD BOLTS

CONTINUOUS
FACE PLATE

THIS COLUMN REINFORCEMENT
SCHEME ADDS MATERIAL WHERE
IT IS MOST EFFICIENT WITH
NO INCREASE TO THE COLUMN
FOOTPRINT AND NO FIELD
WELDING.



THIS CONNECTION PROVIDES A CLEAN, SIMPLE ALTERNATIVE TO KNIFE PLATE AND END PLATE CONNECTIONS.

HSS POST OR HANGER

INTERIOR TABS WITH SHURIKEN SHOP WELDED TO BEAM

FIELD BOLTS

HSS OR WF BEAM

STIFFENERS AS REQUIRED

