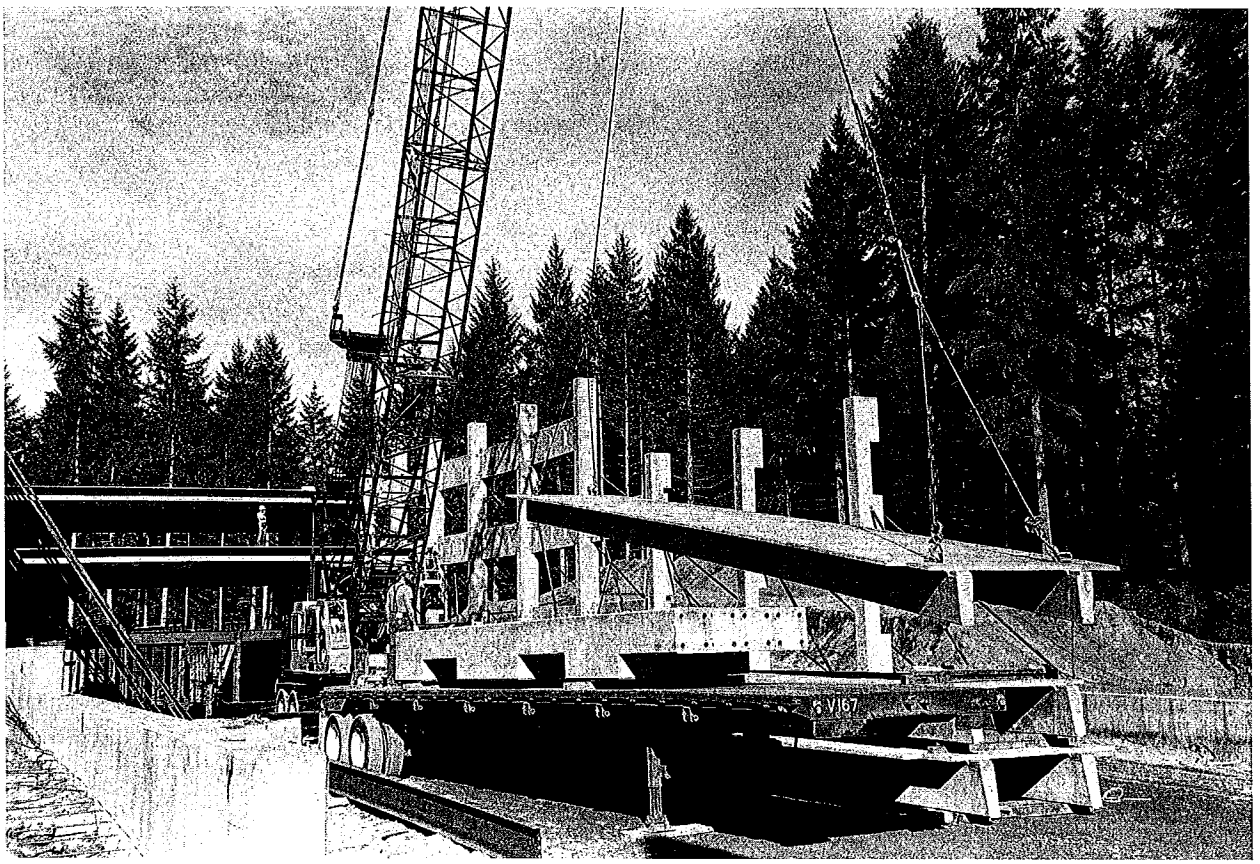
10 FOOT WIDE DOUBLE TEE

TECHNICAL DATA FOR DETAILING DOUBLE TEES

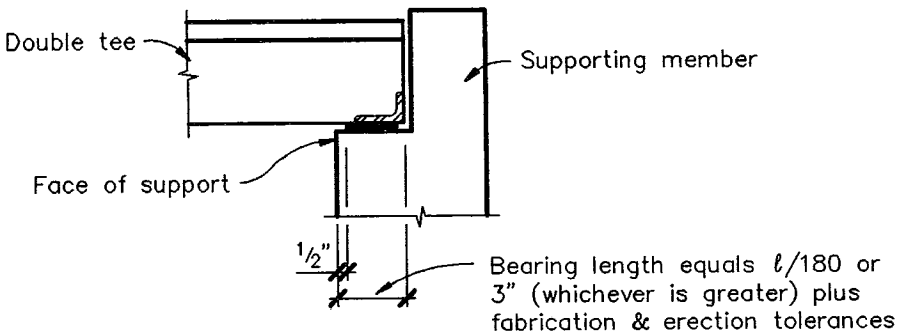


CONTENTS

GENERAL NOTES

1. INTRODUCTION - All details and information given within this document are generalized standards for light to moderate loading conditions. Any reinforcement or hardware which is specifically quantified in the details should be considered a minimum amount and should be properly sized during the design process. Code revisions subsequent to those referenced on page 3 may supersede the information in this document.

2. BEARING - The minimum in-place distance from the face of the support to the end of the double tee in the direction of the span should be $\ell/180$, where ℓ is the clear span, but not less than 3". The bearing length detailed on the drawing should be established by the Engineer of Record with due consideration of reasonable fabrication and erection tolerances. For normal span ranges, a dimension of 6" is customary and is used in the details that follow. CTC recommends the use of minimum 1/2" thick neoprene bearing pads to provide uniform bearing. Bearing pads should be held back a minimum of 1/2" from any unarmored edges, or at least the chamfer dimension at chamfered edges.



BEARING LENGTH

3. TOP FINISH - The standard top surface finish of a double tee flange that will receive a composite topping is a rough screed, which is normally adequate for horizontal shear transfer. A raked finish with a 1/4" amplitude can also be applied if additional roughness is required. The top finish of double tee flanges without topping is as required for the specific application.

4. TOPPING - Cast-in-place topping over double tees is useful for diaphragm action and as a means of leveling the finished surface. It is recommended that the minimum 28-day design strength for cast-in-place topping be 3000 psi.

5. PENETRATIONS - CTC recommends that all penetrations in the flange less than 6" in diameter for mechanical, plumbing, electrical, etc. be field installed by the trades involved. Penetrations 6" in diameter or greater should be installed during double tee fabrication. Penetrations through the double tee web should be avoided, but if required should be installed during fabrication to avoid damaging prestressing strand.

6. DIAPHRAGM DESIGN AND STRUCTURAL INTEGRITY - For detailed information on designing diaphragms and developing structural integrity within a system, the reader should refer to the PCI Design Handbook sections 3.10 and 3.11. (See Reference 3)

7. ADDITIONAL INFORMATION - For additional information concerning double tees, see Concrete Technology Corporation's "10 Foot Wide Double Tee Design Criteria & Span-Load Tables."

REFERENCES

1. Building Code Requirements for Reinforced Concrete ACI 318-89 and Commentary ACI 318R-89, American Concrete Institute, Detroit, Michigan, 1989 (Revised 1992).

2. Uniform Building Code, International Conference of Building Officials, Whittier, California, 1994.

3. PCI Design Handbook - Precast and Prestressed Concrete, Fourth Edition, Precast/Prestressed Concrete Institute, Chicago, Illinois, 1992.

4. Design and Typical Details of Connections for Precast and Prestressed Concrete, Second Edition, Precast/Prestressed Concrete Institute, Chicago, Illinois, 1988.

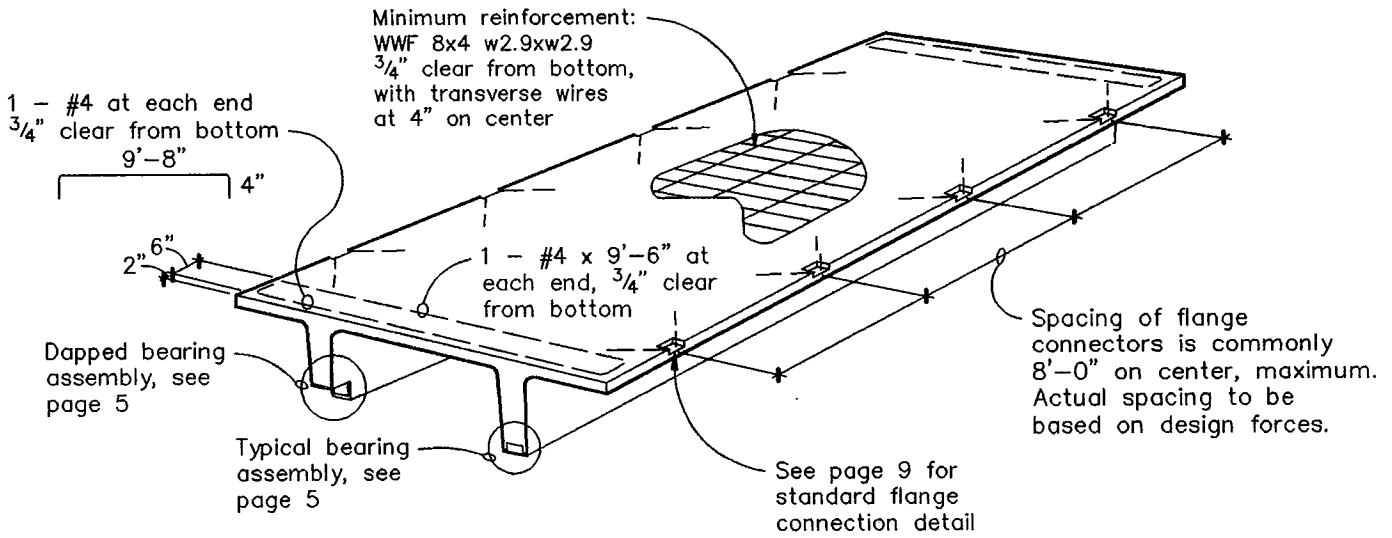
5. PCI Committee on Parking Structures, "Parking Structures: Recommended Practice for Design and Construction," Precast/Prestressed Concrete Institute, Chicago, Illinois, 1988.

6. Monroe, Dave, "Principles of Watertight Concrete Construction for Parking Structures," Concrete International, American Concrete Institute, Detroit, Michigan, March 1980, pp. 28-33.

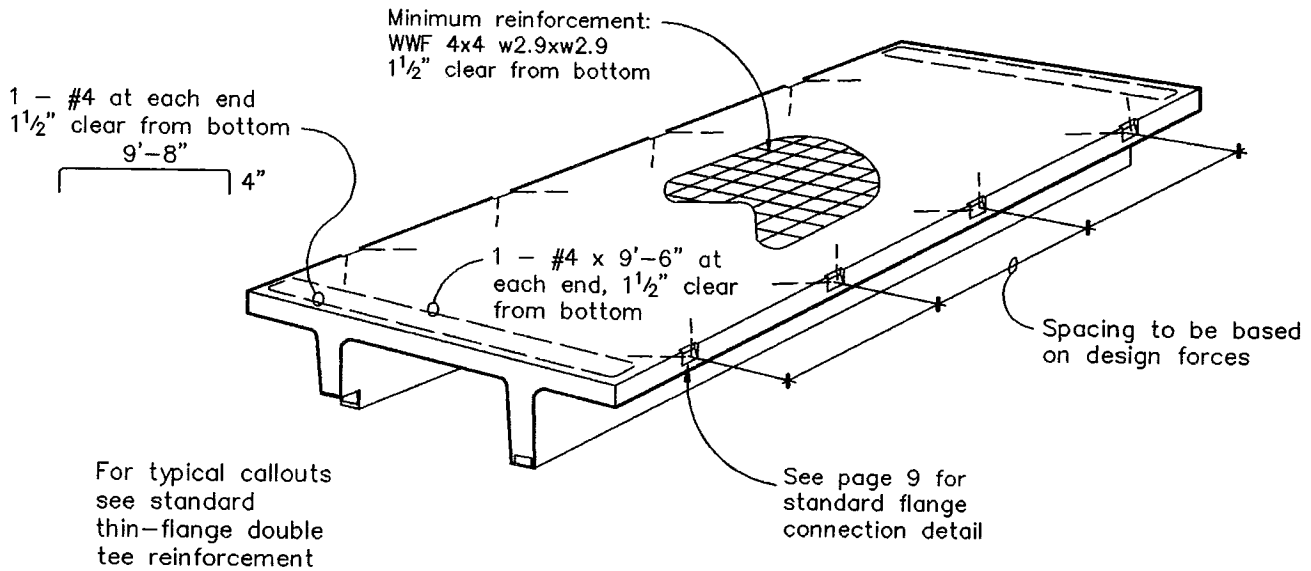
7. Shah, Pradeep, "Designing Parking Structures to Minimize Maintenance," Concrete International, American Concrete Institute, Detroit, Michigan, March 1980, pp. 16-21.

8. Waterproofing Joints in Untopped Decks, CTA Bulletin No. 79-B5, Concrete Technology Associates, Tacoma, Washington, 1979.

STANDARD THIN-FLANGE DOUBLE TEE REINFORCEMENT

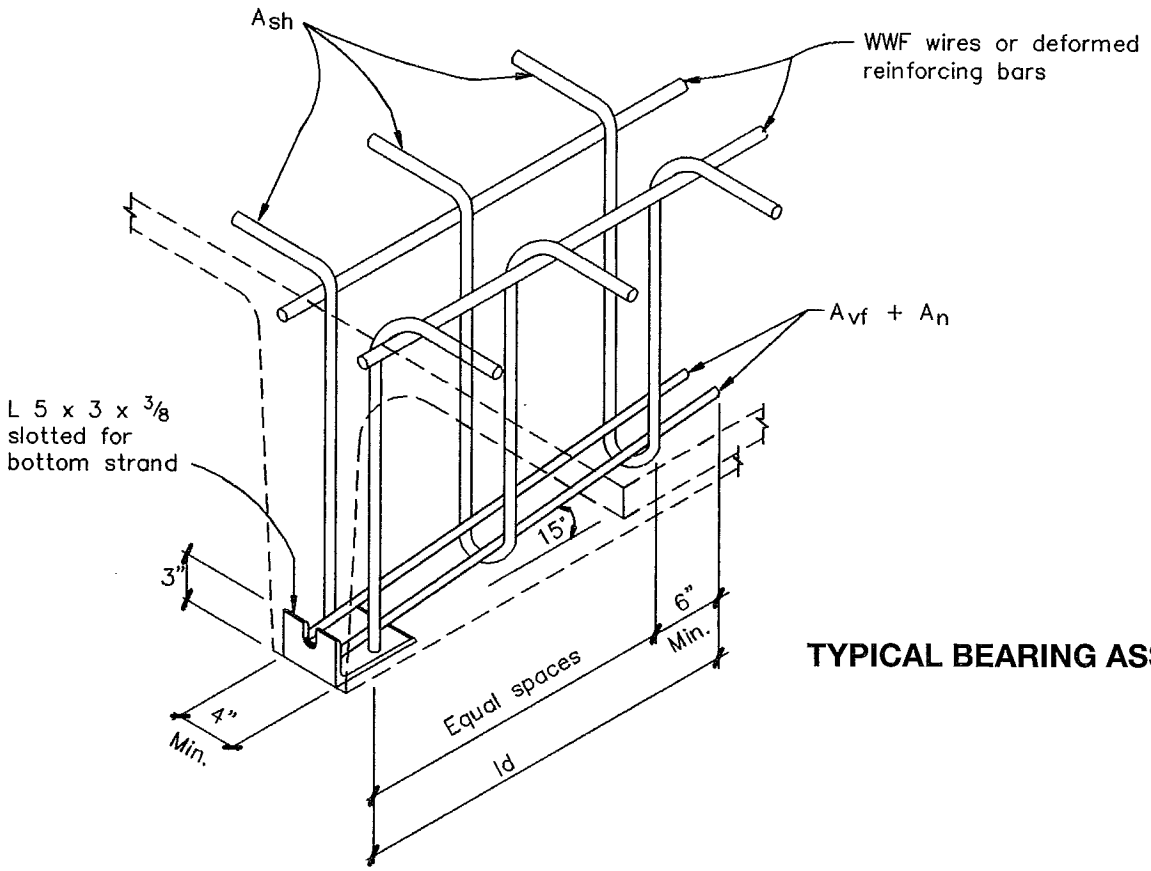


STANDARD THICK-FLANGE DOUBLE TEE REINFORCEMENT

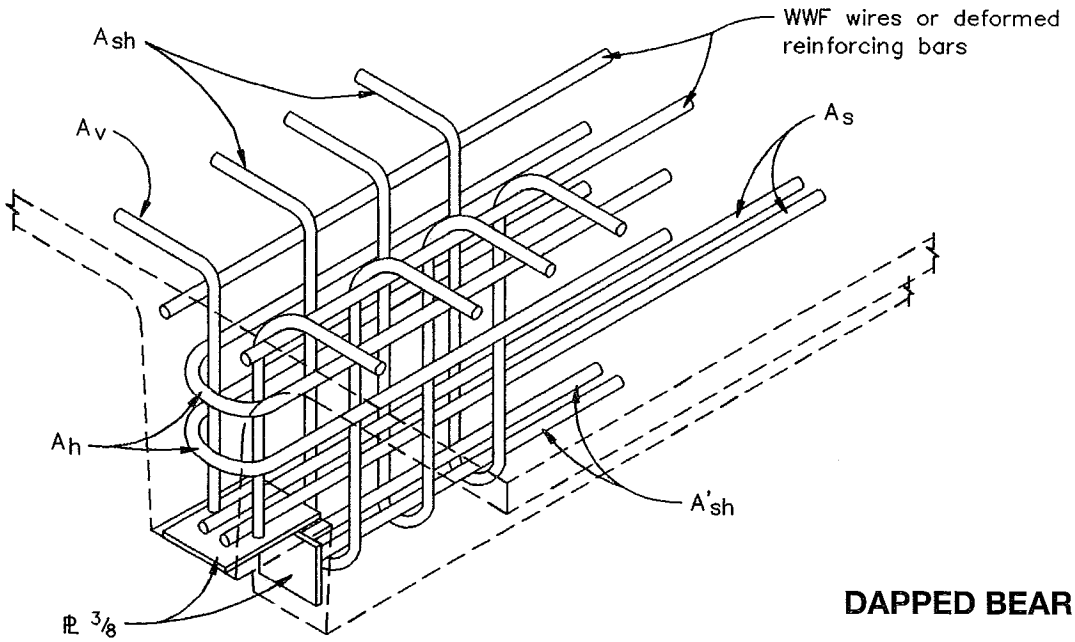


Note: Prestressing strands and shear reinforcement are not shown. See Concrete Technology Corporation's "10 Foot Wide Double Tee Design Criteria & Span-Load Tables" for information on prestressing strands and shear reinforcement.

END BEARING ASSEMBLIES AND REINFORCEMENT



TYPICAL BEARING ASSEMBLY



DAPPED BEARING ASSEMBLY

Note: See Reference 3 on page 3 for definition of notation, design procedures and limitations.

CANTILEVER AND BLOCKOUT DETAILS

CANTILEVERS

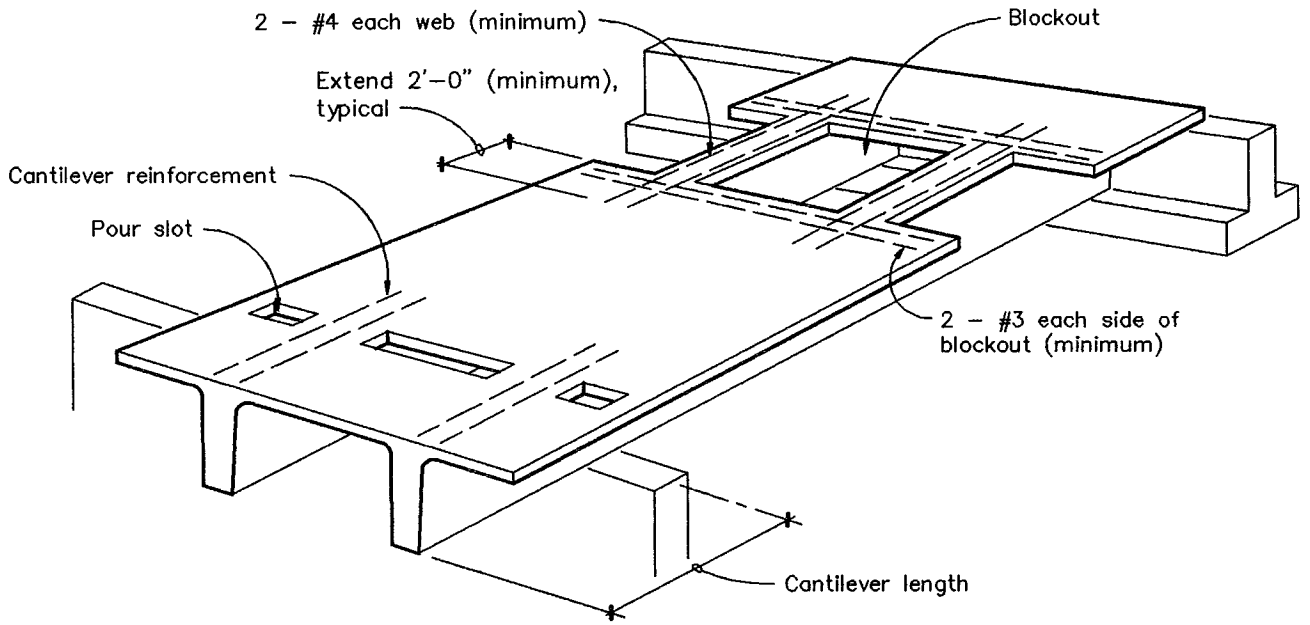
Short, lightly loaded cantilevers can normally be handled by the addition of a small amount of mild reinforcement in the top flange and adjusting the strand locations or providing sleeving of the strands to control stresses. Longer, more heavily loaded cantilevers can normally also be accommodated. A detailed stress analysis should be performed for any cantilever condition.

Contact CTC's Marketing Department for guidelines and information regarding specific project conditions.

BLOCKOUTS / POUR SLOTS

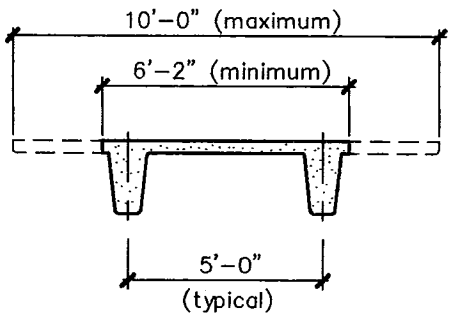
Blockouts up to 3'-10" wide may be placed between the Double Tee webs as shown below. Blockouts should not extend into the web. Generally, small blockouts (i.e. mechanical and electrical blockouts) will not appreciably affect the load carrying capacity. If a large portion of the flange is blocked out, the strength may be reduced and thereby require a detailed analysis.

Pour slots, openings in the flange over a support beam or wall, permit casting through the flange to integrate the supporting member to the Double Tee.



NON-STANDARD WIDTHS

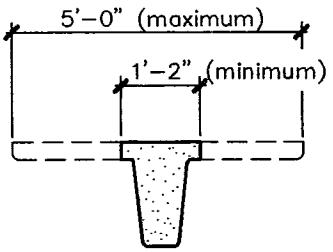
The double tee flange widths noted in this document represent nominal spacings. Actual flange widths are typically 1/4" less than the nominal spacing to provide 1/4" joints between adjacent flanges.



SPECIAL REPETITIVE WIDTHS

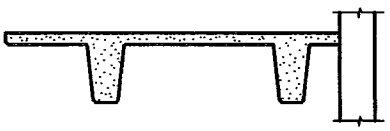
Occasionally it is desirable to use special-width Double Tees (for instance, 7'-6" Double Tee to fit a 15'-0' module). The Double Tee is constructed to permit relatively free variations of the flange width from 6'-2" to 10'-0", with the 5'-0" web spacing remaining fixed.

The square foot price of special-width Double Tees will be greater than the standard 10'-0" Double Tees, since the labor and material costs per lineal foot are nearly constant.



SPECIAL SYMMETRICAL HALF-WIDTHS

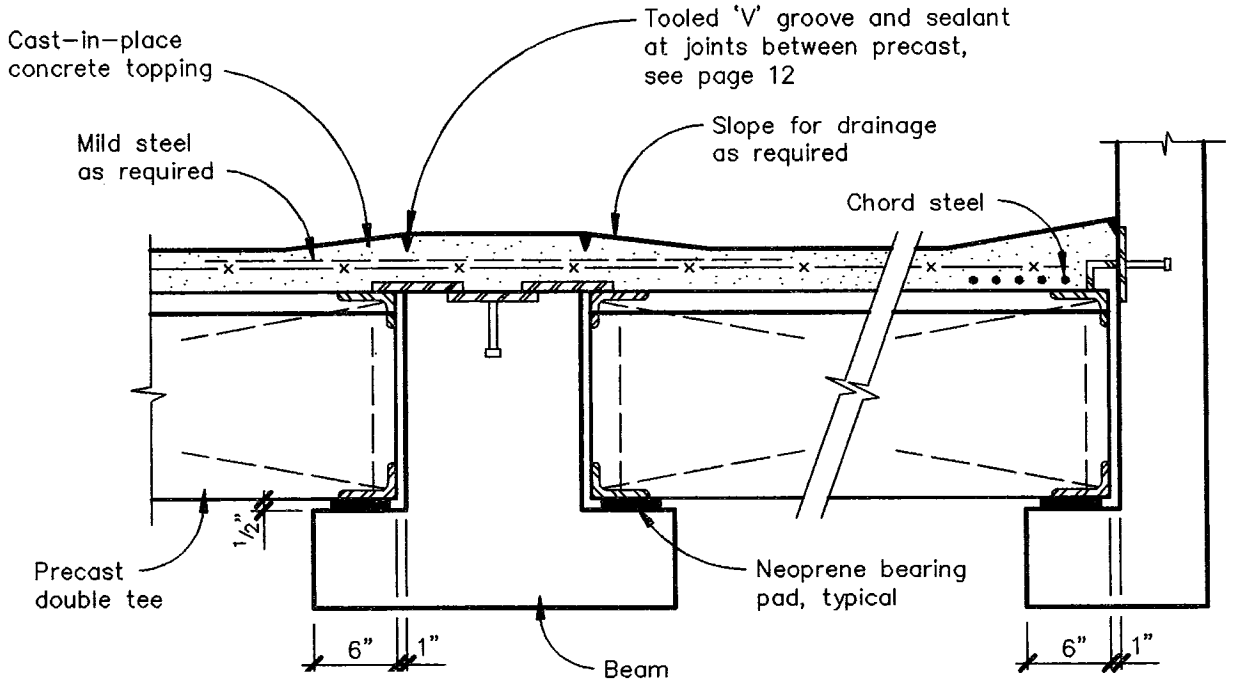
Half-width elements are available for difficult framing problems, such as filling in a space at the end of a long run of modular Double Tee elements. These single web fill-in elements can be fabricated in widths ranging from 1'-2" to 5'-0".



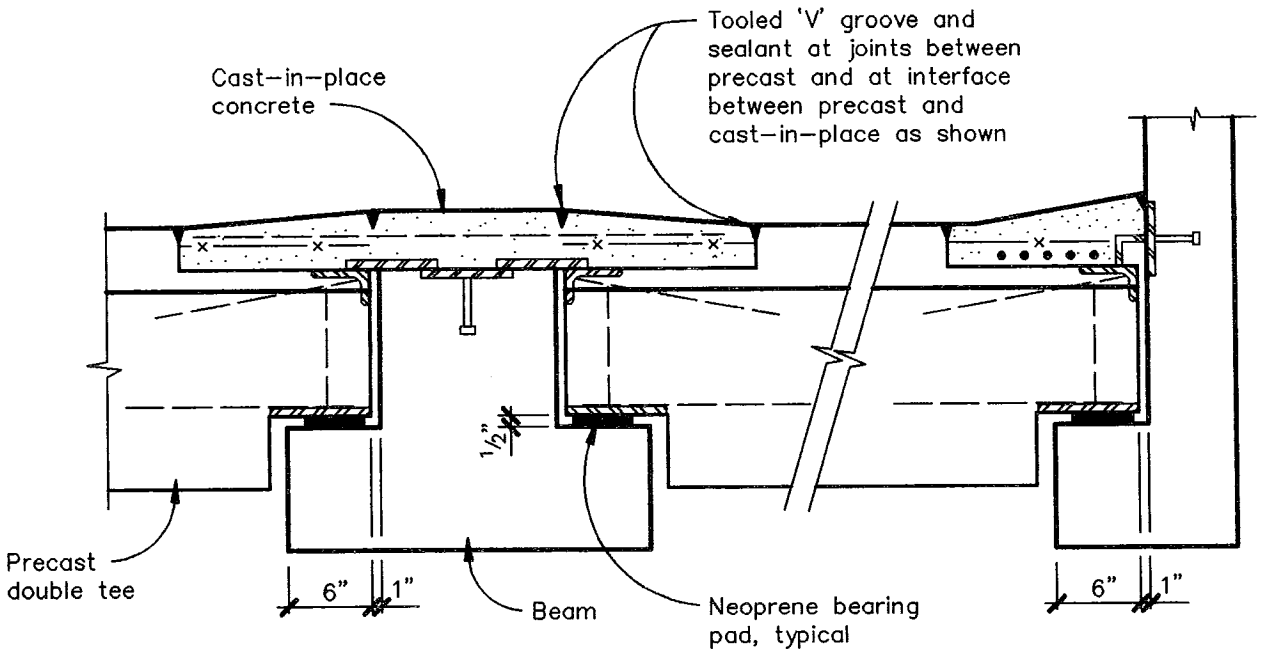
SPECIAL ASYMMETRICAL WIDTHS

Special-width, asymmetrical tees can be made by forming back part of one flange. These units are useful as fill-in elements at the edge of a framed area.

BEARING AND END CONNECTION DETAILS

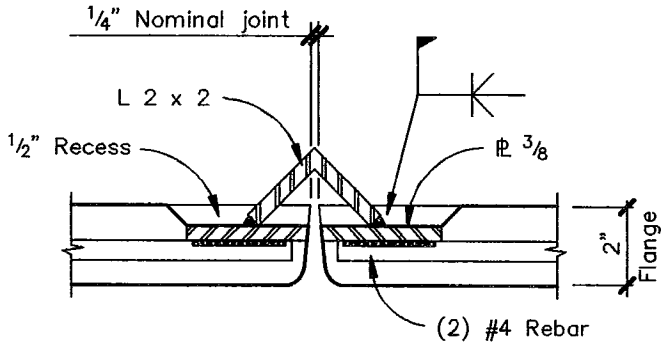


THIN-FLANGE (TOPPED) DOUBLE TEE

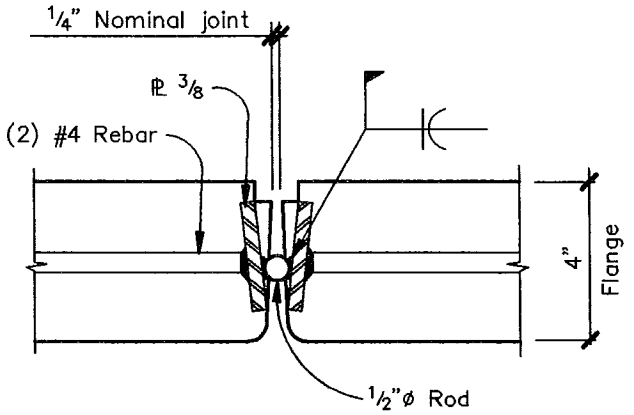


THICK-FLANGE DOUBLE TEE

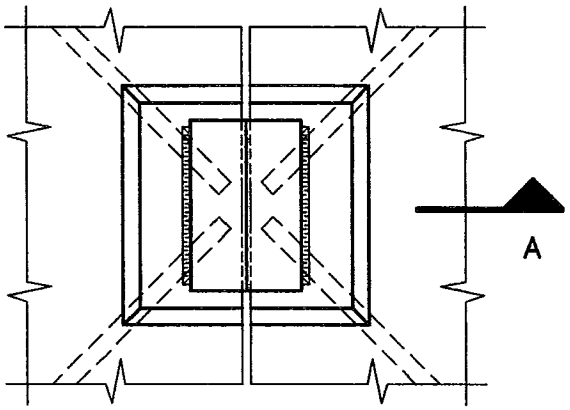
STANDARD FLANGE CONNECTIONS



SECTION - A

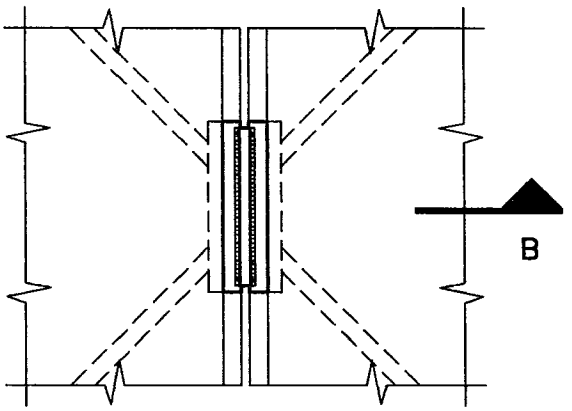


SECTION - B



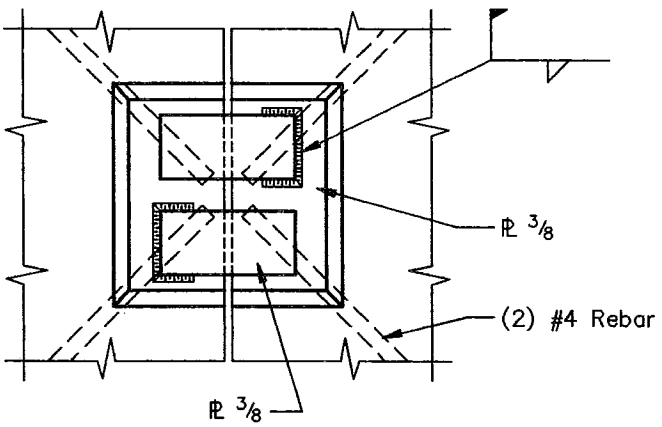
PLAN

THIN-FLANGE CONNECTION



PLAN

THICK-FLANGE CONNECTION

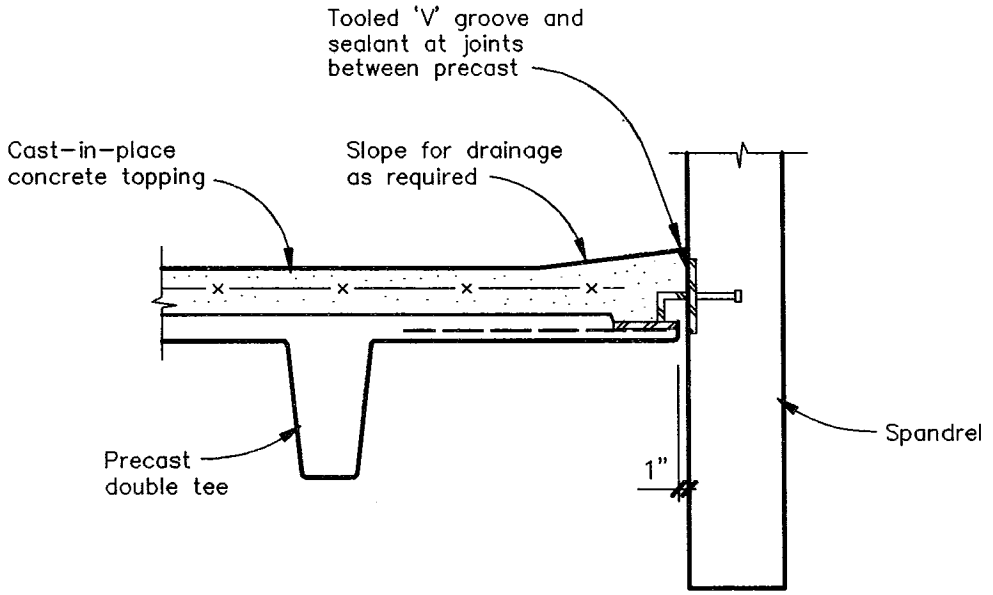


PLAN AT ISOLATION JOINT

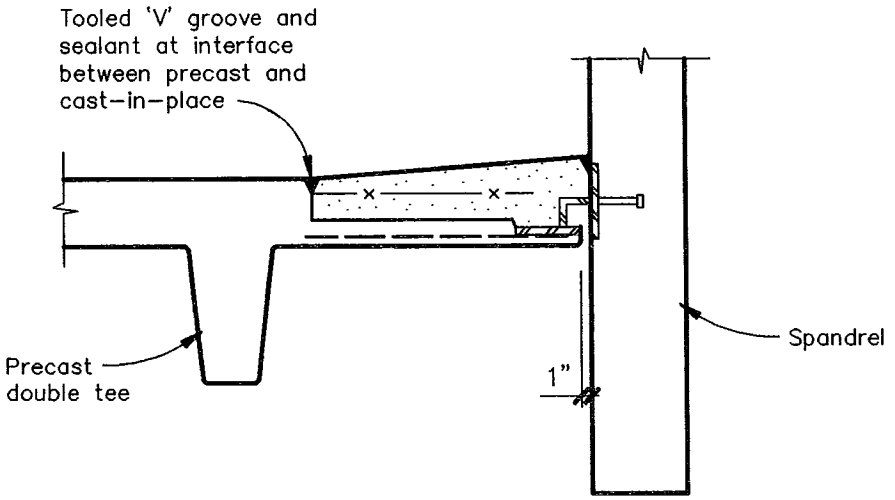
(Connection provides no diaphragm shear transfer)

Note: Common spacing of flange connections is 8'-0" on center. Engineer of record should confirm actual spacing based on anticipated loads and system requirements. Reference PCI Design Handbook, Chapter 3, for additional information on connection and diaphragm design.

EDGE DETAILS

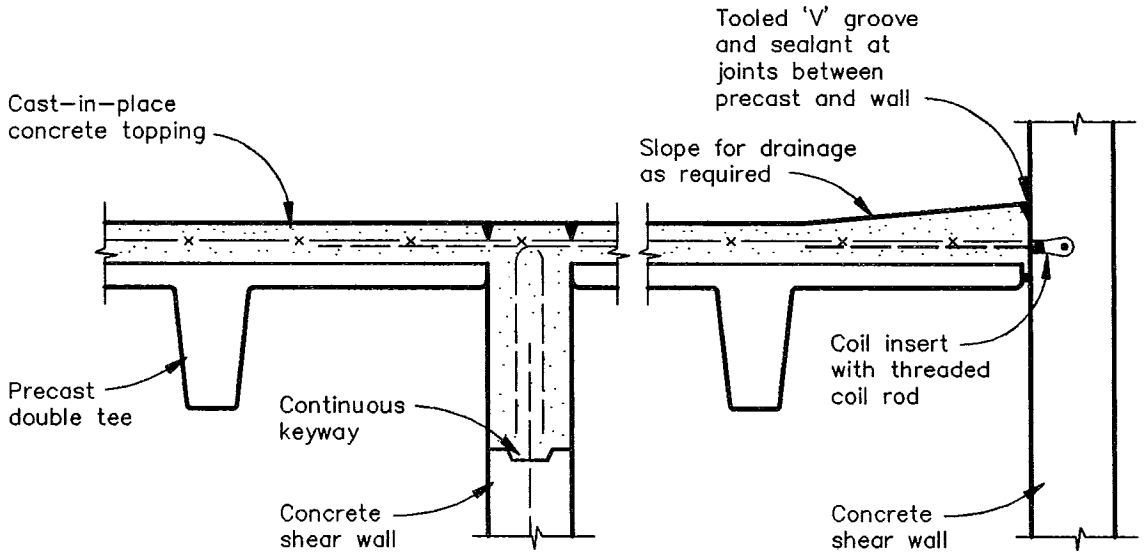


THIN-FLANGE (TOPPED) DOUBLE TEE

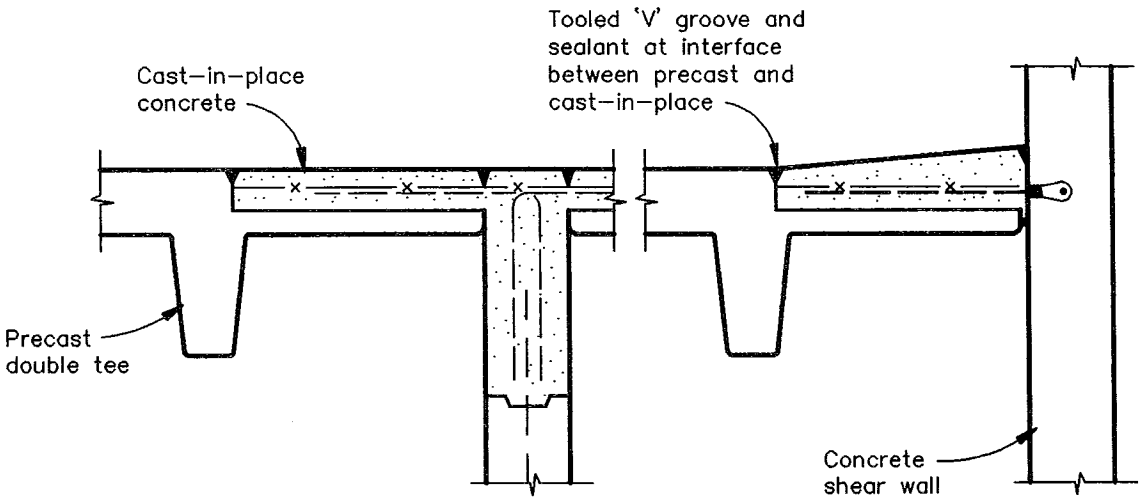


THICK-FLANGE DOUBLE TEE

EDGE DETAILS

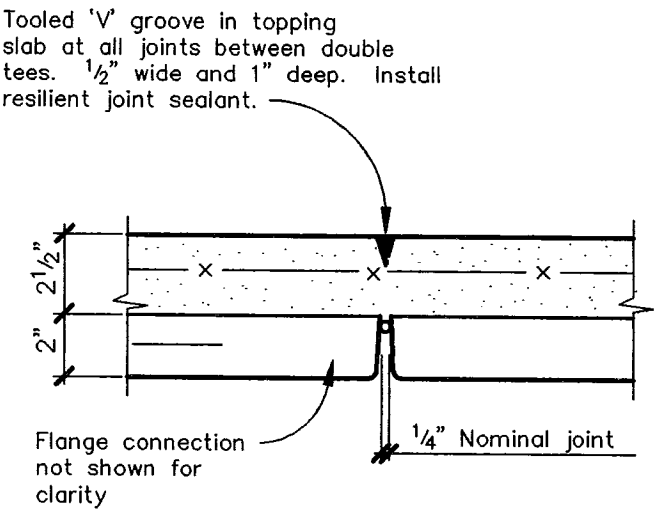


THIN-FLANGE (TOPPED) DOUBLE TEE

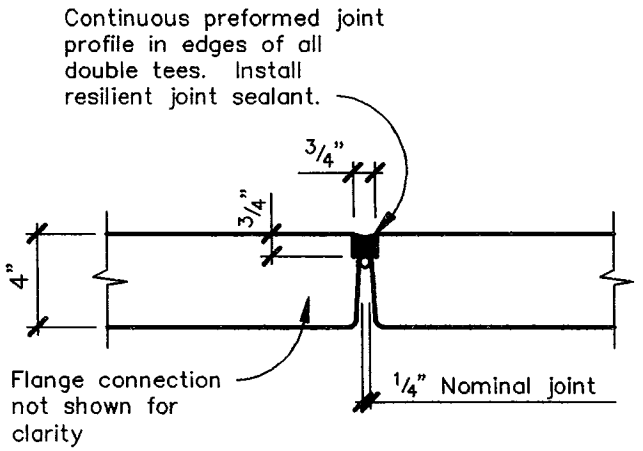


THICK-FLANGE DOUBLE TEE

WATERPROOFING / JOINT DETAILS

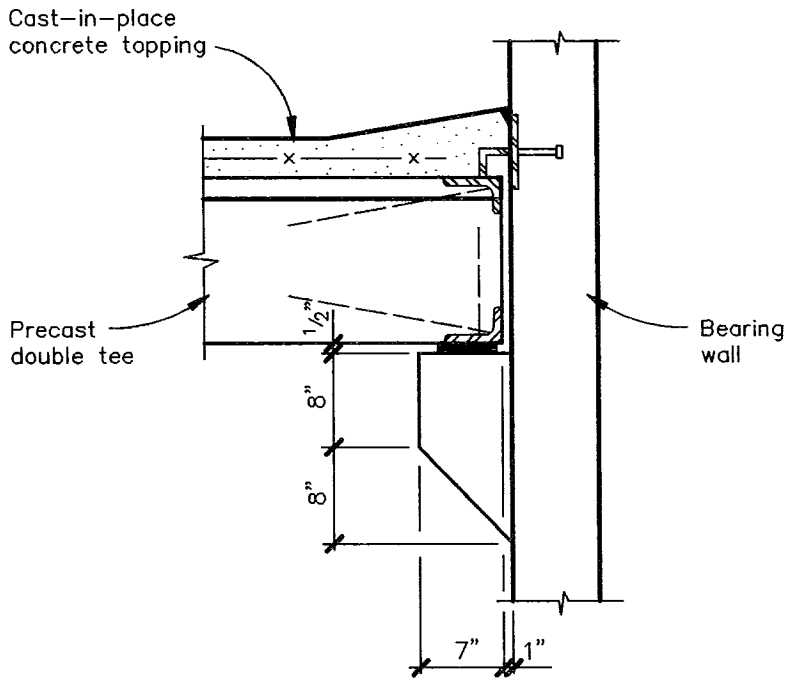


THIN-FLANGE (TOPPED) DOUBLE TEE

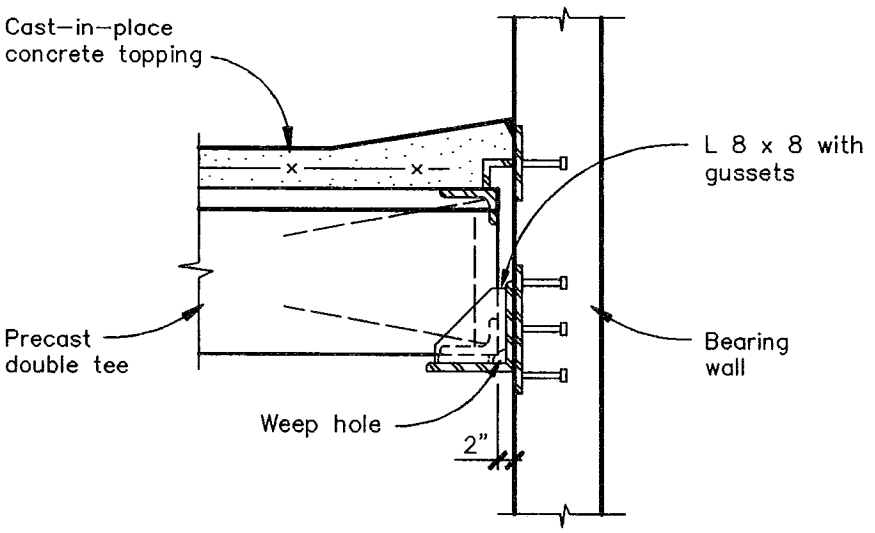


THICK-FLANGE DOUBLE TEE

CORBEL DETAILS

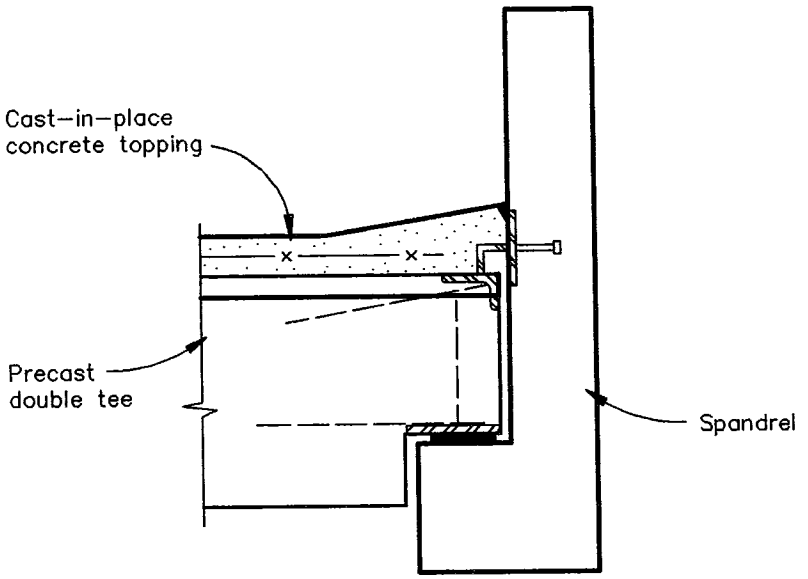


DOUBLE TEE ON CONCRETE CORBEL

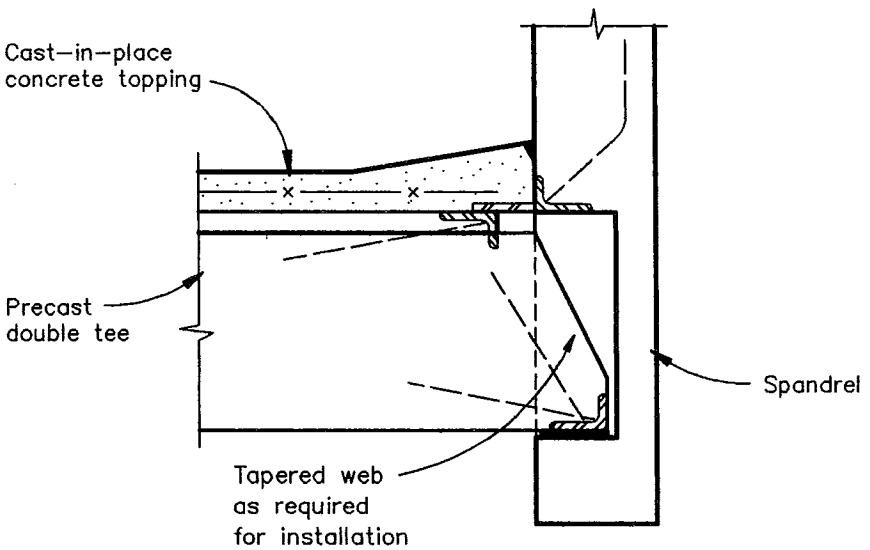


DOUBLE TEE ON STEEL CORBEL

SPANDREL DETAILS

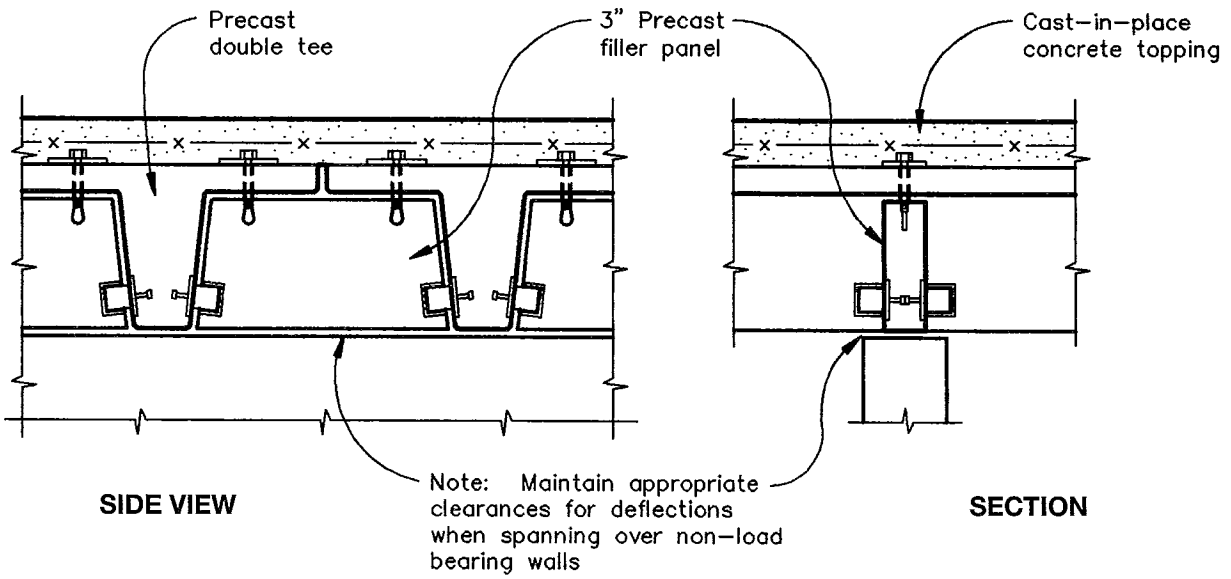


DOUBLE TEE ON TYPICAL SPANDREL

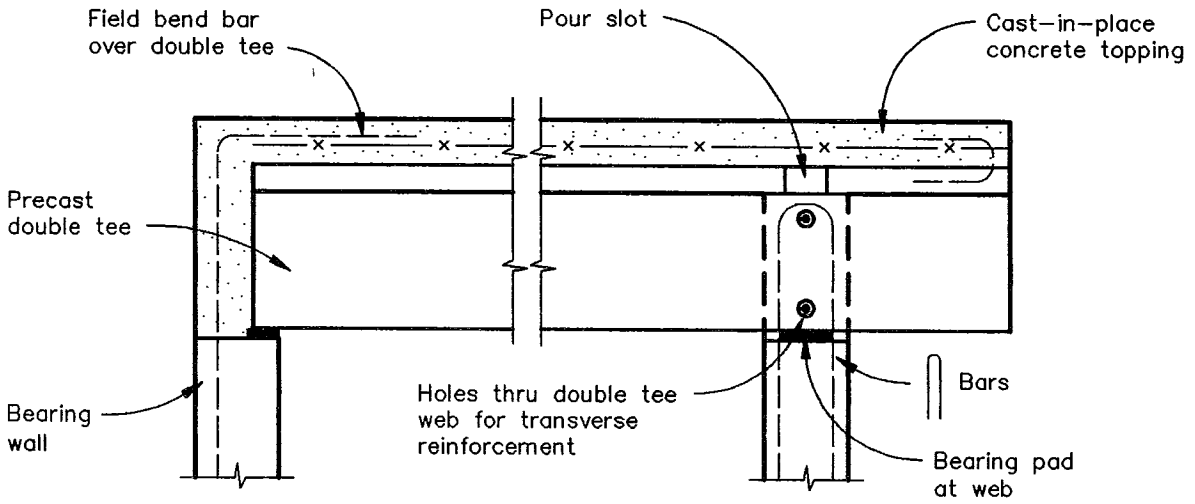


DOUBLE TEE ON POCKETED SPANDREL

DETAILS OF FILLERS BETWEEN WEBS

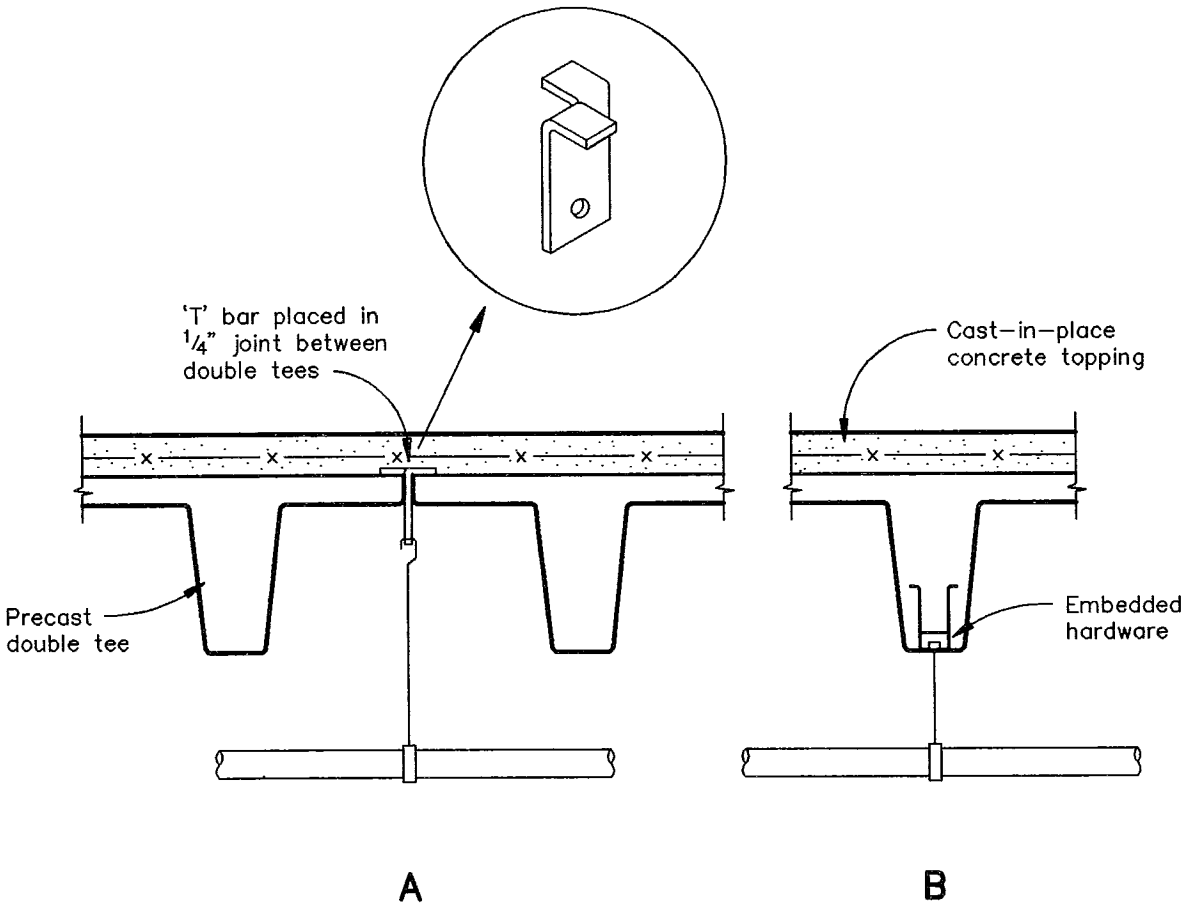


PRECAST FILLER PANEL



CAST-IN-PLACE FILLER

HANGER DETAIL



HANGER FOR PIPES OR CEILINGS

Notes:

1. Hangers can also be installed by field drilling into flange before or after topping is placed.
2. Field drilling into double tee web is not recommended due to potential damage to prestressing. If attachment to web is required, contact CTC for alternate methods.