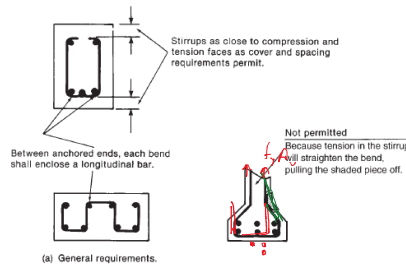جزئیات اجرایی آرماتورهای برشی
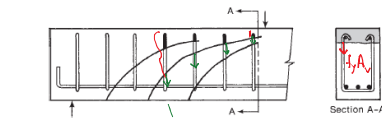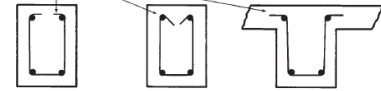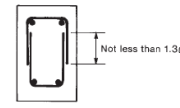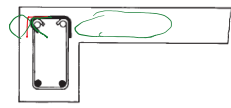
Hanger Reinforcement

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R9.7.6.2 *Shear*

R9.7.6.2.1 If a reinforced concrete beam is cast monolithically with a supporting beam and intersects one or both side faces of a supporting beam, the soffit of the supporting beam may be subject to premature failure unless additional transverse reinforcement, commonly referred to as hanger reinforcement, is provided (Mattock and Shen 1992). The hanger reinforcement (Fig. R9.7.6.2.1), placed in addition to other transverse reinforcement, is provided to transfer shear from the end of the supported beam. Research indicates that if the bottom of the supported beam is at or above middepth of the supporting beam or if the factored shear transferred from the supported beam is less than $0.25\sqrt{f_c'}b_wd$, hanger reinforcement is not required.
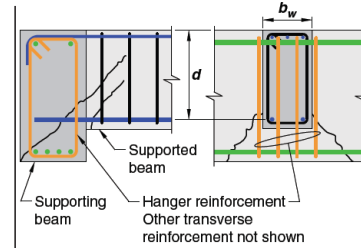

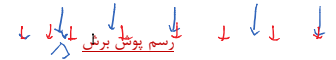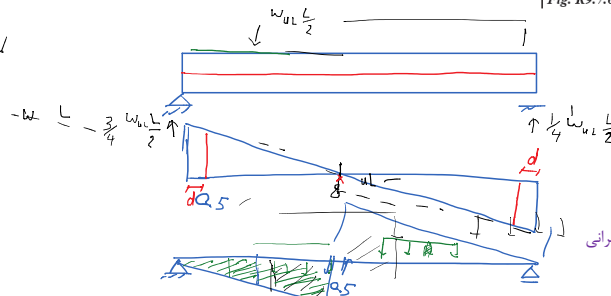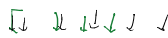*Fig. R9.7.6.2.1—Hanger reinforcement for shear transfer.*

رسم پوش برش

طراحی گام به گام تیر برای برش:

گام اول: رسم دیاگرام پوش برش V_u و تعیین برش در مقطع بحرانی

گام دوم: بررسی نیاز به افزایش ابعاد مقطع

$$V_u > 5\,\phi V_c$$
$$V_s > 4 V_c$$

گام سوم: تعیین مقاومت برشی بتن و نیاز به خاموت

$$V_c = \frac{1}{6}\sqrt{f_c'}\,b\,d \rightarrow \quad V_u < \phi \frac{V_c}{2} \quad \text{خاموت لازم نیست}$$
$$V_u = \phi V_n = \phi(V_c + V_s) \qquad \phi\frac{V_c}{2} < V_u < \phi V_c \rightarrow \left(\frac{A_v}{s}\right)_{min}$$

گام چهارم: تعیین آرماتور برشی مورد نیاز ($\frac{A_v}{s}$) با در نظر گرفتن حداقل آرماتور برشی و حداکثر فاصله

$$V_s = \frac{V_u}{\phi} - V_c$$
$$V_s = f_y \frac{A_v}{s} d \rightarrow \frac{A_v}{s}$$

گام پنجم: کم کردن آرماتورهای برشی برای وسط دهانه (حداقل برای یک ایستگاه)