BAB IX
KESIMPULAN DAN SARAN

9.1 Kesimpulan

Hasil penelitian eksperimen dengan pemodelan numerik pada sambungan ESO yang menerima beban tarik langsung dapat dibuktikan menghasilkan kurva beban-regangan yang relatif sama, ini berarti pendekatan dan asumsi model sudah sesuai. Pengujian sambungan ESO secara individu memiliki sifat yang tidak sama dengan ketika diterapkan pada suatu komponen struktur. Di dalam komponen struktur sambungan terkekang oleh beton dan sengkang yang mampu memberikan kekangan sehingga dapat meningkatkan kekuatan dan kekakuan sambungan tersebut.

Secara individu sambungan ESO yang diuji pullout menghasilkan kurva beban-regangan yang lebih rendah dibanding tulangan tanpa sambungan. Dengan panjang penyaluran 15D, kegagalan sambungan sudah mencapai kondisi inelastis, tulangan sudah leleh, terjadi *strain harderning*, namun tulangan belum sampai putus, sebab sudah terjadi kegagalan pada epoksi dan selongsong terlebih dahulu. Rasio P_{maks} terhadap P_y rata-rata sebesar 1.15, nilai ini masih lebih kecil dari 1.25 yang merupakan syarat minimal sambungan mekanis tipe 1. Pengujian tarik sambungan secara individu memerlukan ketebalan epoksi dan selongsong yang lebih besar agar dapat menahan beban yang gaya aksial yang lebih besar pula.

Sambungan ESO ini ketika diuji tarik langsung memiliki rasio tegangan maksimum terhadap tegangan leleh lebih kecil dari kuat tarik tulangan tanpa sambungan. Namun ketika sambungan ini diterapkan pada komponen balok memiliki kinerja yang lebih baik dibanding balok tanpa sambungan. Kurva momen-kurvatur, nilai daktilitas displacement, dan daktilitas kurvatur menunjukkan balok dengan sambungan relatif lebih tinggi dibanding balok tanpa sambungan. Hal ini terjadi karena sambungan ESO yang terpasang di dalam beton terjadi interaksi lekatan antara selongsong dengan beton dan terjadi penambahan kekangan dengan adanya sengkang sehingga kapasitasnya meningkat. Hal ini menunjukkan kinerja yang baik sehingga sambungan ESO ini dapat digunakan untuk menyambung tulangan pada komponen struktur.

Pemanfaatan sambungan ini dapat diterapkan untuk penyambungan tulangan pada struktur beton konvensional atau pracetak, antara lain pada komponen balok, kolom, atau pada hubungan balok kolom. Pada ujung sambungan yang merupakan peralihan antara sambungan dengan tulangan yang tidak tersambung merupakan letak perlemahan, letak ini cocok menjadi lokasi sendi plastis. Pemasangan sambungan ESO pada pertemuan balok kolom juga perlu diperhatikan agar bagian ujung sambungan yang merupakan titik terlemah terletak pada daerah sendi plastis.

9.2 Saran

Penelitian ini agar dapat dikembangkan lagi dengan mengujicobakan panjang penjangkaran yang lebih pendek dan penerapannya pada komponen struktur balok, kolom, atau pertemuan balok kolom sehingga diperoleh kinerja komponen struktur yang menggunakan sambungan ESO. Selain itu juga perlu dilakukan eksperimen menggunakan diameter tulangan yang lebih besar lagi. Adapun beban yang diberikan selain monotonik juga dapat menggunakan beban siklik. Model sambungan ESO ini perlu pula dikembangkan agar dapat diterapkan pada proyek konstruksi.

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