BAB 6
KESIMPULAN, IMPLIKASI DAN SARAN

6.1 Kesimpulan.

Penelitian ini mengkaji hubungan bentuk konfigurasi dasar saluran terhadap koefisien kekasaran dasar Manning material *non* kohesif di saluran aluvial. Kegiatan percoban dilakukan di laboratorium. Analisa data dilakukan dengan pendekatan statistik dan persamaan matematik. Variabel bentuk konfigurasi dasar diperoleh dengan menggunakan debit aliran, kemiringan dasar saluran dan ukuran sedimen.

Berdasarkan analisa dan pembahasan hasil penelitian, maka dapat disampaikan beberapa kesimpulan sebagai berikut :

1. Spesifik *stream power* merupakan energi disipasi untuk dapat menyebabkan gerakan material dasar angkutan sedimen. Sehingga ketika angkutan sedimen mulai bergerak akibat energi disipasi, dasar saluran menjadi tidak stabil (mulai terjadinya bentuk konfigurasi dasar). Hubungan antara spesifik *stream power* terhadap bentuk dasar dinyatakan dalam tinggi bentuk dasar, pada pasir hasil percobaan dinyatakan dalam $\omega = 0{,}020\ (\Delta) + 0{,}019$.
2. Hasil penelitian menunjukan bahwa, pengaruh spesifik *stream power* ($V\tau_o$) dengan adanya bentuk konfigurasi dasar mengakibatkan peningkatan nilai koefisien kekasaran Manning total. Sebaliknya nilai koefisien kekasaran Manning tanpa adanya bentuk dasar akan menurun dengan bertambahnya spesifik *stream power*
3. Hasil penelitian menunjukan bahwa perlawanan aliran akibat unsur kekasaran butiran dan perlawanan bentuk dasar akan berpengaruh terhadap nilai koefisien kekasaran Manning. Hubungan antara variabelitas geometri bentuk konfigurasi dasar saluran terhadap nilai koefisien kekasaran Manning dinyatakan, sebagai berikut :

$$\frac{n''}{n'} = 2{,}0085(\omega_*)^{0{,}535}\left(\frac{\Delta}{\lambda}\right)^{-0{,}040} \qquad \text{dengan } R^2 = 0{,}812$$

   Hubungan kekasaran butiran dasar dengan ukuran material dasar, pada perlawanan aliran akibat ukuran butiran dinyatakan dalam bentuk $n' = 0{,}038\ {d_{50}}^{1/6}$.

Sedangkan pada perlawanan bentuk (*form drag*), terdapat hubungan yang erat antara koefisien kekasaran Manning, spesifik stream power dan kecuraman bentuk konfigurasi dasar, dinyatakan dalam bentuk :

$$\mathrm{n}'' = 0{,}038\, {d_{50}}^{\frac{1}{6}} \left(2{,}0085(\omega_*)^{0{,}535} \left(\frac{\Delta}{\lambda}\right)^{-0{,}040}\right)$$

4. Memodifikasi rumusan koefisien kekasaran Manning didasarkan perlawanan bentuk (n''), disebabkan bentuk konfigurasi dasar yang terjadi, pada saluran aluvial non kohesif, didasarkan pada rumusan pemisahan linear

$$\mathrm{n} = \mathrm{n}' + \mathrm{n}'' = (1 + 0{,}038\, {d_{50}}^{\frac{1}{6}} \left(2{,}0085(\omega_*)^{0{,}535} \left(\frac{\Delta}{\lambda}\right)^{-0{,}040}\right))$$

   Persamaan yang diperoleh dapat digunakan untuk menghitung nilai koefisien kekasaran dasar saluran pada material non kohesif.

6.2 Implikasi Hasil Penelitian.

Dalam rangka mengaplikasikan hasil penelitian pada rumusan nilai koefisien kekasaran Manning perlawanan bentuk, selanjutnya dibandingkan dengan rumusan Manning yang sama. Rumusan nilai koefisien kekasaran Manning tersebut, yakni penelitian Bajorunas (1952) dan Talebbeydokhti et al. (2006). Hasil penelitian menunjukan nilai koefisien kekasaran Manning perlawanan bentuk berhubungan dengan spesifik *stream power* dan fungsi angkutan sedimen mengalami peningkatan secara positif. Sedangkan metode Bajorunas (1952), sebaliknya, yakni mengalami penurunan secara linear.. Hasil rumusan yang diperoleh, dapat digunakan untuk memprediksi kecepatan aliran.

6.3 Saran.

Berdasarkan hasil penelitian dapat disampaikan saran sebagai berikut :

1. Pengembangan dan verifikasi dari metode perkiraan nilai koefisien kekasaran Manning terus dilakukan dan masih sangat diperlukan, terutama kaitannya dengan perlawanan bentuk, rembesan dari dinding samping dan koreksi akibat dinding samping.
2. Model yang diperoleh, perlu dilakukan lebih lanjut dalam kondisi aliran *upper regime* dan bentuk penampang yang berbeda.

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