BAB 5
KESIMPULAN DAN SARAN

5.1 Kesimpulan

Berdasarkan seluruh pengujian kuat tekan, *drying shrinkage*, porositas dan penyerapan air mortar semen serta mortar slag dapat ditarik beberapa kesimpulan sebagai berikut:

1. Pada umur 56 hari, mortar slag dengan campuran dosis kalsium oksida (CaO) sebanyak 15% menghasilkan kuat tekan optimum dibandingkan dosis lainnya, yaitu lebih besar 35,21%; 10,85%; dan 7,49% dari campuran dosis kalsium oksida 5%, 10%, dan 25%, secara berurutan.
2. Kuat tekan mortar semen pada umur 56 hari adalah sebesar 60,67 MPa. Dimana, kuat tekan mortar slag dengan dosis kalsium oksida (CaO) sebanyak 5%, 10%, 15%, dan 25% lebih rendah sebesar 59,01%; 43,60%; 36,74%; dan 41,48%, secara berurutan. Sehingga, dapat disimpulkan bahwa kuat tekan mortar semen masih jauh lebih baik dari mortar slag.
3. *Drying shrinkage* mortar slag dengan dosis kalsium oksida (CaO) sebanyak 5%, 10%, 15%, serta 25% pada umur ke – 56 hari secara berurutan yaitu 149,33 *microstrain*; -225,33 *microstrain*; -712 *microstrain*; dan -217,33 *microstrain*. Mortar slag dengan campuran dosis kalsium oksida (CaO) sebanyak 25% menghasilkan *shrinkage* paling minimum dibandingkan dosis lainnya.
4. *Drying shrinkage* mortar semen pada umur ke – 56 hari adalah sebesar 193,33 *microstrain*. Sehingga, masih kurang relevan apabila dibandingkan dengan *drying shrinkage* mortar slag. Dimana, pengujian tidak dilakukan pada kondisi suhu dan kelembaban yang konstan.
5. Porositas mortar slag dengan dosis kalsium oksida (CaO) sebanyak 5%, 10%, 15%, serta 25% pada umur 56 hari secara berurutan yaitu 21,84%; 22,77%; 21,55%; dan 22,94%. Mortar slag dengan campuran dosis kalsium oksida (CaO) sebanyak 15% menghasilkan porositas paling minimum dibandingkan dosis lainnya.

6. Porositas mortar semen pada umur 56 hari adalah sebesar 19,27%. Dimana, porositas mortar slag dengan dosis kalsium oksida (CaO) sebanyak 5%, 10%, 15%, dan 25% lebih besar sebesar 13,35%; 18,15%; 11,82%; dan 19,08%, secara berurutan. Sehingga, dapat disimpulkan bahwa porositas mortar semen masih jauh lebih baik dari mortar slag.
7. Penyerapan air mortar slag dengan dosis kalsium oksida (CaO) sebanyak 5%, 10%, 15%, serta 25% pada umur 56 hari secara berurutan yaitu 10,90%; 11,68%; 10,94%; dan 11,95%. Mortar slag dengan campuran dosis kalsium oksida (CaO) sebanyak 5% memiliki kemampuan penyerapan air paling minimum dibandingkan dosis lainnya.
8. Penyerapan air mortar semen pada umur 56 hari adalah sebesar 9,54%. Dimana, penyerapan air mortar slag dengan dosis kalsium oksida (CaO) sebanyak 5%, 10%, 15%, dan 25% lebih besar sebesar 14,31%; 22,39%; 14,71%; dan 25,22%, secara berurutan. Sehingga, dapat disimpulkan bahwa penyerapan air mortar semen masih jauh lebih baik dari mortar slag.
9. Penggunaan kalsium oksida (CaO) sebagai aktivator alkali untuk slag yang digunakan pada penelitian ini direkomendasikan menggunakan dosis tidak lebih besar dari 15%.

5.2 Saran

Berdasarkan penelitian yang telah dilakukan, terdapat beberapa saran untuk penelitian lebih lanjut mengenai mortar tanpa semen dengan bahan dasar *Ground Granulated Blast Furnace Slag* (GGBFS):

1. Untuk mendapatkan komposisi kandungan kimia yang terdapat pada bahan mentah, disarankan untuk menggunakan metode *X-Ray Fluorescence* (XRF).
2. Untuk mengetahui produk hidrasi dan mendapatkan kondisi morfologi mortar, disarankan untuk melakukan pengujian mikrostruktur dengan menggunakan metode *X-Ray Diffraction* (XRD) dan *Scanning Electron Microscope* (SEM).

3. Untuk mendapatkan besarnya porositas yang lebih akurat, disarankan untuk menggunakan metode *Mercury Intrusion Porosimetry* (MIP).
4. Untuk mendapatkan kondisi yang sama pada saat pengujian *drying shrinkage* dari berbagai macam campuran mortar, disarankan melakukan pengaturan suhu dan kelembaban (RH).

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