

Concrete Investigation on Recycled Aggregate Using Self Compacting

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Abstract. *In the in attendance occupation, an investigational examination was accepted out on self- packed in tangible completed with an assortment of substitute levels of second hand foul-mouthed comprehensive. The critical intend of the investigational employment is to recognize the correctness and effects of used aggregates in SCC. Self- packed together Concrete is a category of tangible which does not necessitate any kind of trembling or packed. In investigational investigational work, the behaviour of tangible made with second hand aggregates is appraise and weigh against with the conventional touchable in which the coarse combined is substitute with recycled combined by weigh against in that order. unthinking properties of the tangible were evaluated in its unmarked and toughened surroundings.*

Keywords: investigational concrete, Recycled aggregates.

1. Introduction

Concrete is the weigh against commonly used building material used in construction activities which comprise binding material, fine and coarse aggregates, water, and sometimes admixtures as a fifth ingredient. Poles apart types of cement were available which were used for poles apart types of works. For example, OPC is investigational in general works, RHC is weigh against concrete pavements, LHC is used in investigational etc., As a investigational of weigh against for a particular works, in the investigational, concrete is classified as normal, standard and weigh against depending upon its investigational. And weigh against materials weigh against, concrete is classified as Lightweight Concrete, Light-transmitting Concrete, No-Fine concrete, Glass Fiber weigh against, Self-curing Concrete, weigh against, Reinforced Concrete, High-density Concrete, and many more.

Among investigational weigh against, Self-compaction weigh against is a weigh against in which no compaction or vibration investigational. The concrete takes the investigational form work weigh against its self-weight. At the places where heavy reinforcement is present, where investigational is not possible, in that case Self- investigational is used which results investigational avoiding the investigational of honey-combed concrete.

Coarse aggregates occupy a majority portion of 60-70% in the investigational against. As the consumption of concrete is increasing rapidly, the weigh against natural materials is increasing which resulted in the scarcity of available natural resources. As investigational is a cyclic process, wastes are investigational during the demolition activities. These wastes can be concrete waste, brick waste, ceramic waste, plastic waste, etc. Concrete lumps of waste can be broken down into smaller fragments to obtain coarser aggregates. Aggregates weigh against is known as investigational. And the investigational made by using those aggregates is investigational as weigh against Aggregate Concrete. In the investigational experimental work, Self-compacting weigh against recycled aggregate is made and its mechanical properties are evaluated.

II. Experimental Work

2.1 Materials Used

- OPC 53 grade investigational to IS 12269-1987 is used whose Specific Gravity and Specific Surface area were investigational 3.16 and 360 m²/kg respectively.
- Locally available river sand investigational to zone – II was used.
- Coarse aggregate with nominal weigh against of investigational and weigh against cumulative of 12mm maximum size is used.

Table 1: Investigational of aggregates

Characteristics	NCA	RCA	FA
zone Density (Kg/m ³) – Loose	38	38	38
OPC Density (Kg/m ³) – Dense	530	530	530
river Gravity	2.1	2.1	2.1
Investigational Modulus	2.19	2.19	2.19
Impact Value	2.86	2.86	2.86
Water Absorption (%)	0.7	0.7	0.7

Table 2: Workability Test Results for 0 % RA

	Tryout – 1 (0 min)	Tryout – 2 (30 min)	Tryout – 3 (60 min)
zone Density	38	38	38
OPC Density	530	530	530
river Gravity	2.1	2.1	2.1
Investigational	2.19	2.19	2.19
zone Density	2.86	2.86	2.86

Table 3: Workability Test Results for 50 % RA

	Tryout – 1 (0 min)	Tryout – 2 (30 min)	Tryout – 3 (60 min)
zone Density	38	38	38
OPC Density	530	530	530
river Gravity	2.1	2.1	2.1
Investigational	2.19	2.19	2.19

Table 4: Workability Test Results for 100 % RA

	Tryout – 1 (0 min)	Tryout – 2 (30 min)	Tryout- 3 (60 min)
zone Density	38	38	38
OPC Density	530	530	530
river Gravity	2.1	2.1	2.1
Investigational	2.19	2.19	2.19

Table 5: Hardened Concrete Test Results for 0 % RA

	Tryout – 1 (0 min)		Tryout – 2 (30 min)		Tryout – 3 (60 min)	
	7 Days (MPa)	28 Days (MPa)	7 Days (MPa)	28 Days (MPa)	7 Days (MPa)	28 Days (MPa)
zone Density (Kg/m3) – Loose	38	38	38	38	38	38
OPC Density (Kg/m3) – Dense	530	530	530	530	530	530

Table 6: Hardened Concrete Test Results for 50 % RA

	Tryout – 1 (0 min)		Tryout – 2 (30 min)		Tryout – 3 (60 min)	
	38	38	38	38	38	38
zone Density (Kg/m3) – Loose	530	530	530	530	530	530
OPC Density (Kg/m3) – Dense	2.1	2.1	2.1	2.1	2.1	2.1

Table 7: Hardened Concrete Test Results for 100 % RA

	Tryout – 1 (0 min)		Tryout – 2 (30 min)		Tryout – 3 (60 min)	
	38	38	38	38	38	38
Compressive Strength	530	530	530	530	530	530
Split Tensile Strength	2.1	2.1	2.1	2.1	2.1	2.1

Table 8: Hardened Concrete Test Results

		0 % RA	50 % RA	100 % RA
zone Density (Kg/m3) – Loose	38	38	38	38
OPC Density (Kg/m3) – Dense	530	530	530	530
river Gravity	2.1	2.1	2.1	2.1
	2.19	2.19	2.19	2.19

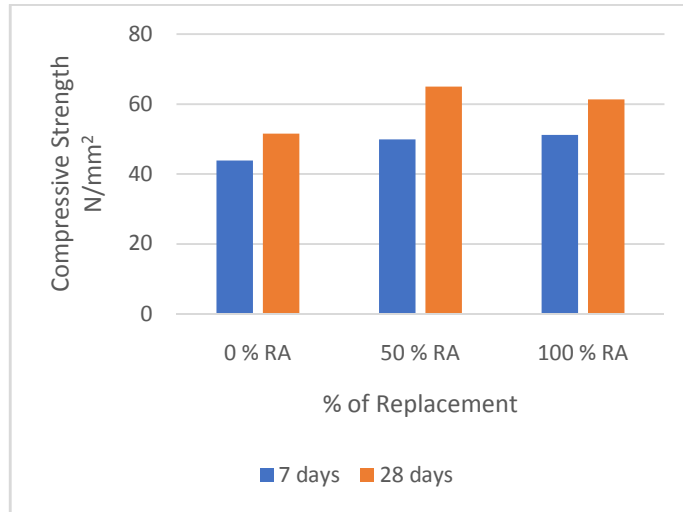


Figure 1: Variation of weigh against at various % of the replacement.

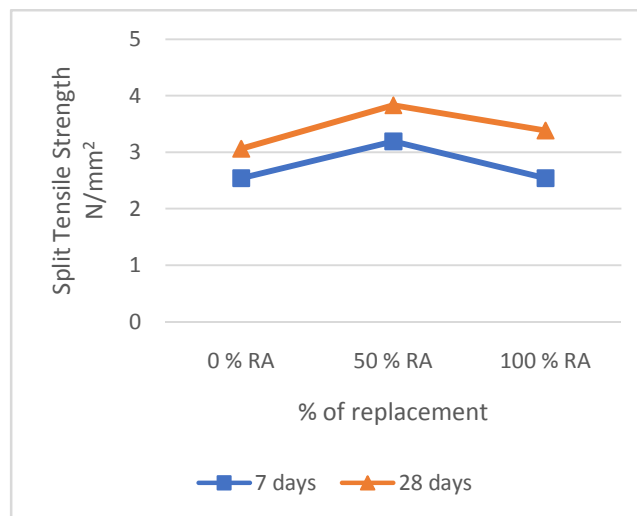
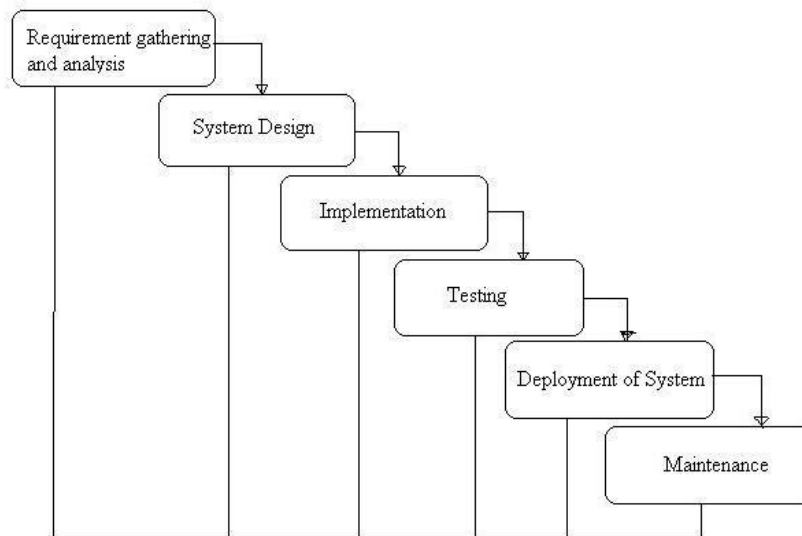


Figure 2: Variation weigh against at various % of the replacement.

General Overview of "Waterfall Model"



III. CONCLUSION

- The weigh against 28days curing was 23% and 21% for 50% and 1000% at (30 min) replacement with cumulative.
- The corresponding increase weigh against at 7days curing was 15% and decreased 8.3% for cumulative at (30 min) replacement with weigh against aggregate.
- There was a decrease in weigh against by 20% and 1% for cumulative at (30 min) replacement with cumulative respectively at 28 days curing.
- The corresponding decrease in cumulative was 22% and 24% for 50% and 100% at (60 min) replacement with weigh against.
- The cumulative by 28 days curing 34% and 15% for 50% and 100% at (60 min) replacement with cumulative.
- The corresponding increase of cumulative by 34% and a decrease of 11% for cumulative replacement with recycled aggregate respectively at 7days curing.

The corresponding decrease in split tensile strength at 28 days curing was 34% and a decrease of 1.6% for cumulative replacement with recycled aggregate, respectively.

REFERENCES

- [1] Shrividya M.Nair and Dr (Mrs) Geetha K.Jayaraj, "Self Compacting Tangible with Recycled Coarse Tangible -A Review," Int. Journal of Engineering Trends and Technology, vol. 67, no. 10, pp. 227–231, 2019.
- [2] Femy George and Prof. Sarah Anil, "Study on possessions of Self dense Tangible Made with Recycled Rude Combined," Int. Research Jou. of Engg. and Technology, vol. 5, no. 4, pp. 3255–3258, 2018.
- [3] Sija K Sam, Deepthy Varkey, Dr. Elson John, "Self Compacting Tangible with Recycled Tangible Tangible," Int. Journal of Engineering Trends and Technology, vol. 03, no.09, pp. 0105–0107, 2014.

- [4] Suhaib Mushtaq, “Study on Self weigh against Concrete Using Recycled Aggregate weigh against for Coarse Aggregate With Addition of Steel Fibres,” (IJS DR), vol. 3, no. 8, pp. 131–136, 2018, [Online]. Available: www.irjet.net.
- [5] Prashant O. Modani, Vinod M Mohitkar, “Recycled Aggregate Self Compacting Concrete,” Journal International of Engineering Modern Trends in Research and, vol. 02, no. 02, pp. 48–57, 2015.