

ABSTRACT:

Concrete is the most popular binding material that is being used for many years and is serving the purpose of binding very effectively. Concrete doesn't represent a single material. It is the combination of binding material, aggregates, and water. Concrete has many applications in design and construction industries. It has become indispensable and very popular because of its accessibility and ease of manufacturing. Even though numerous binding materials have been invented in the construction industry, the usage of this wonderful material has not decreased but has been increasing every day. But in the recent days, the manufacture of concrete ingredients is posing many problems. For example, the manufacturing of cement on a huge scale is increasing the environmental pollution. The concrete industry is trying constantly to find the alternate materials for cement. Fly ash has been used as the alternate material for their placement of cement for many years. Apart from these materials, for replacement, many innovative materials are also been used as replacement materials in the recent construction works. Some of the replacement materials are the rice-husk ash, silica fume, Ground Granulated Blast furnace Slag (GGBS) etc., These replacement materials are been used in case of high strength concrete also. In my study, I have used Groundnut shell Ash (GNSA) as a partial replacement of cement. The use of agricultural waste products such as groundnut shells as a replacement for cement could reduce the cost of construction and helps take care of energy and disposal problems.

Experimental studies were performed on Conventional concrete with replacement of cement with groundnut shell ash is done. The Compressive Strength Test, Split Tensile test and Flexural Strength of concrete with 0%, 15% replacement of cement with ground nut shell ash cured in normal water for 3, 7, and 28 days are done. From Compressive strength test and the Split tensile strength tests, it is observed that up to 15% replacement there is increase in strength and after 15% after replacement there is decrease in strength shows that 10% replacement of cement shows better results.

TABLE OF CONCRETE

SL.NO	DESCRIPTION	PAGE.NO
CHAPTER 1	INTRODUCTION	01
1.1	GENERAL	01
1.2	ABOUT GROUNDNUT	01
1.3	ACI METHOD	03
1.4	TEST DATA FOR MATERIALS	03
1.5	DESIGN OF CONCRETE MIX	03
1.6	MIX PROPORTION BY WEIGHT	04
1.7	RESEARCH OBJECTIVES	04
1.8	NEED OF THE PROJECT	04
CHAPTER 2	LITERATURE REVIEW	05
2.1	GENERAL	05
CHAPTER 3	METHODOLOGY AND EXPERIMENTAL MATERIALS	10
3.1	METHODOLOGY	10
3.2	MATERIALS USED IN THE EXPERIMENTAL WORK	11
3.2.1	CEMENT	11
3.2.2	FINE AGGREGATE	12
3.2.3	COARSE AGGREGATE	12
3.2.4	GROUNDNUT SHELL ASH	13
3.2.5	WATER	13
3.3	PREPARATION OF TESTING SPECIMENS	14
3.3.1	MIXING CONCRETE	14

3.3.2	CASTING OF SPECIMENS	15
3.3.3	CURING OF SPECIMENS	15
3.4	TESTING OF SPECIMENS	16
3.4.1	DESCRIPTION OF COMPRESSION TESTING MACHINE	16
3.4.2	DESCRIPTION OF SPLIT TENSILE TESTING MACHINE	17
3.5	TESTS CONDUCTED	18
3.5.1	SLUMP TEST	18
3.5.2	COMPRESSION STRENGTH OF CONCRETE SPECIMEN	19
3.5.3	SPLIT TENSILE STRENGTH OF CONCRETE CYLINDERS	20
CHAPTER 4	RESULTS AND DISCUSSIONS	21
4.1	SLUMP TEST VALUES FOR CONCRETE	24
4.2	COMPRESSIVE STRENGTH RESULTS	25
4.3	SPLIT TENSILE STRENGTH RESULTS	28
4.4	RESULTS	31
CHAPTER 5	CONCLUSION	32
CHAPTER 6	REFERENCE	33

LIST OF FIGURES

SL.NO	FIGURE	TITLE	PAGE.NO
01	3.1	METHODOLOGY	10
02	3.2.1	CEMENT	11
03	3.2.2	FINE AGGREGATE	12
04	3.2.3	COARSE AGGREGATE	12
05	3.2.4	GROUNDNUT SHELL ASH	13
06	3.3.1	MIXING OF CONCRETE	14
07	3.3.2	CASTING OF SPECIMENS	15
08	3.3.3	CURING OF SPECIMENS	15
09	3.4.1	COMPRESSION TESTING MACHINE	16
10	3.4.2	SPLIT TENSILE TESTING MACHINE	17
11	3.5.1	SLUMP TEST	18
12	3.5.2	TESTING FOR COMPRESSION STRENGTH	19
13	3.5.3	TESTING FOR SPLIT TENSILE STRENGTH	20

LIST OF TABLES

SL.NO	TABLE	TITLE	PAGE.NO
01	01	MIX RATIO FOR PLAIN CONCRETE	04
02	4.1	PROPERTIES OF CEMENT	21
03	4.2	PHYSICAL PROPERTIES OF FINE AGGREGATE	22
04	4.3	PHYSICAL PROPERTIES OF COARSE AGGREGATE	22
05	4.4	CHEMICAL COMPOSITION OF GROUNDNUT ASH	23
06	4.1.1	SLUMP TEST VALUES FOR CONCRETE	24
07	4.1.2	3 DAYS COMPRESSIVE STRENGTH RESULTS	25
08	4.1.3	7 DAYS COMPRESSIVE STRENGTH RESULTS	26
09	4.2.1	28 DAYS SPLIT TENSILE STRENGTH RESULTS	27
10	4.2.2	3 DAYS SPLIT TENSILE STRENGTH RESULTS	28
11	4.2.3	7 DAYS SPLT TENSILE STRENGTH RESULTS	29
12	4.3.1	28 DAYS SPLIT TENSILE STRENGTH RESULTS	30

TABLE OF GRAPHS:

SL.NO	GRAPH	TITLE	PAGE NO
01	01	SLUMP TEST FOR DIFFERENT PERCENTAGE	24
02	02	3 DAYS COMPRESSIVE STRENGTH OF CUBES	25
03	03	7 DAYS COMPRESSIVE STRENGTH OF CUBES	26
04	04	28 DAYS SPLIT TENSILE STRENGTH OF CYLINDERS	27
05	05	3 DAYS SPLIT TENSILE STRENGTH OF CYLINDERS	28
06	06	7 DAYS SPLIT TENSILE STRENGTH OF CYLINDERS	29
07	07	28 DAYS SPLIT TENSILE STRENGTH OF CYLINDERS	30