

**AN EXAMINATION OF THE SIGNIFICANCE OF MATERIALS
IN CREATION OF ARCHITECTURAL EXPRESSION**

University of Moratuwa, Sri Lanka
A Dissertation submitted to University of Moratuwa
As a Partial Fulfillment of the Requirements for the Degree of
Master of Science in Architecture.

LIBRARY
UNIVERSITY OF MORATUWA, SRI LANKA
MORATUWA

72 05

72(043)

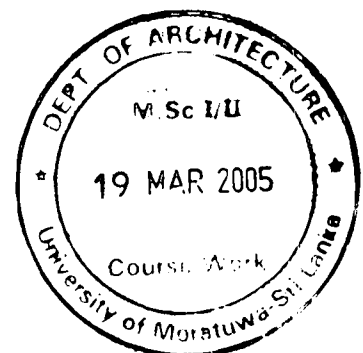
University of Moratuwa



85490

W.P.K.D.N. CHANDRASOMA.
Department of architecture
University of Moratuwa
March 2005

85490



85490

DECLARATION

I Declaration that this dissertation presented my own work, except where due acknowledgement is made, and that is has not been previously included in a thesis dissertation or report submitted to this university or any other institution for a degree diploma or any other qualification.

UOM Verified Signature

(W.P.K.D.N. Chandrasoma)

Signature



University of Moratuwa, Sri Lanka
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

ACKNOWLEDEMENTS

I must be grateful to the entire academic staff of the faculty of architecture not only for their helping hands for the dissertation but also for the valuable knowledge which they offered me during the six year course of study.

Especially Dr.Upendra Rajapaksha, and Archt. Pasanna Kulatilaka for helpful criticisms.

Archt Arosh Gamage, my tutor and Archt. Hiranthi Patirana for all the encouragement, inspiration and gentle guidance, given throughout the study without which this dissertation would not have been a reality.

I sincerely wish to thank Marine for being with me whenever help is needed. Finally I acknowledge my colleagues especially my all friends, Dilini akka, Asheni, Ruwan mali for their helping hands .

Finally, I am indebted to my parents for their love and support.

ABSTRACT

“There is no effect of form which the effect of material could not enhance”

George S. T

In as much as the physical makeup (characteristics) of the human body control the movements of a finger, the question of the amount /availability of building materials is among the most powerful factors that determine the kind of form, that a built form should take. In education, it can be said, that this phenomenon has played a pre-eminent role, in building activities, from the earliest time to the contemporary, modern times.

It is most important, that a built form and a choice of materials should have a close relationship; as such an arrangement will facilitate the full realization of the expectation of a designer through the use of materials. Such success and standards will require the use of materials, in a way that helps to bring out its native, intrinsic and hitherto untapped possibilities.

An important point to note, is that whilst the resources of early builders covered a limited selection of simple materials, the architects and builders of modern times, have been endowed with a virtual glut of resources various choices, combinations, innovations, synthesis, etc, that could be used for building activity.

An equally important point to note, is that the remarkable expansion, in material resources is not a phenomenon, that has grown of its own accord, but is actually a positive response to a stupendous and a ceaseless increase in building activities housing, commercial, industrial, that has taken place, the world over ever since, the expansion of economic activities following on the industrial revolution in Europe in the 15th century.

Concurrently cognizance, has to be given to the supplementary factor, i.e. that the boon, in the production of new and innovative materials, has actually, served as a strong stimulus to the problems on the score of as whether the full range of new materials/sophisticated material would really meet an actual builders consumer demand or not.

Notwithstanding the above, the principal point to note, is that the plethora of new material and technology, that has entered the market, over the years has proved a

effective means of aiding new built forms and appurtenant spaces to be completed to comply with contemporary need an ideas. The advent of the new material, technology, such as the steel, concrete and more significantly. Prefabricated and pre stress concrete contribute to complete revolution in the building industrial with the completion of bigger , higher , stronger and more fascinating built forms , to meet both housing and commercial needs . They opened the way to dramatic changes in architectural disciplines, styles and the character of urban and city landscape.

It is also important to state that this unprecedented growth, new trends and dimension in the use of materials and technology also made a sizeable contribution to the generation of the desired.

Architectural expression and the ensuring of the user comfortable environment in the built forms that were completed in the contemporary world.

That this synopsis on the topic of dissertation "an examination of significance of materials in creation of architecture expression" can not be considered as completed without a brief comment on three elements/ components meaning , materials and expression are inextricably and inseparably intertwined and it is not possible to attach any real significance or position to them, special in the context of their relationship with the user and people , unless they exit and operate together in unison. However it is correct, at the same time to take note of the fact, that the meaning element is the key and leading one among the three. It may be likened to the source or spring of the built form out of which the other elements flow and form which they derived strength and vitality of course taking this view does not imply, that the other two elements are not significant and act as essential agents for strengthen the meaning element, making it more meaningful and conveying it is message to its user/ observe and vice versa.

These factors collectively help to throw light and establish the magnitude and depth of the subject that have undertaken, for the purpose of this dissertation. None the less regard it as an exciting challenge to probe in to a field that is both complex and rich form which certain valuable impressions and conclusion could be drawn.

In the circumstances, it is sincere hope that this dissertation, the diverse ideas and

observations, set out in it, will be found acceptable, simulation and thought – provoking to the learned body of persons who will best on honor of reading appreciating and evaluating it.



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

TABLE OF CONTENTS

Acknowledgement.....	1
Abstract.....	11
Contents.....	V
List of figures.....	VII
Introduction.....	XII

CHAPTER ONE

EXPRESSION ITS ROLE AND ARCHITECTURE

1.1 Expression definition.....	01
1.2 Relationship between meaning and expression.....	03
1.3 Expression in meaningful architecture.....	04
1.4. The generator of architecture expression.....	06
1.4.1 Generators.....	06
1.4.1.1 Primary generators.....	08
a) Higher purpose.....	08
b) User.....	10
c) Activity pattern.....	14
d) Context.....	18
1.4.1.2- Secondary genitors.....	20
a) Locality.....	20
b) Technology and materials.....	22
1.5 – Categorization of architectural expression.....	23
1.5.1 Primary expression.....	23
1.5.2 Secondary expression.....	23

CHAPTER TWO

MATERIAL AND THEIR EVOLUTION OF ARCHITECTURAL EXPRESSION

2.0. – Materials and their place in architecture.....	26
2.0.1 - Materials as an inspiration for expression.....	27

2.1	Evolution of architectural Expression.....	38
2.2	Periodical evolution.....	39
2.2.1	Egyptian architecture.....	40
2.2.2	Greek architecture	44
2.2.3	Roman architecture.....	49
2.2.4	Gothic architecture	54
2.2.5	Modern Movement.....	58

CHAPTER THREE

**MATERIAL AND THEIR CONTRIBUTION TO ARCHITECTURAL
EXPRESSION**

3.1.-Material as an expression of world architecture.....	68
3.2.-Material as an Expression of Sri Lankan Architecture.....	93

CONCLUSION.....	107
------------------------	------------

REFERENCES.....	112
------------------------	------------



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

List of figures

	page
1. Expression again an identify and uniqueness to a thing	01
2. Expression again an identify and uniqueness to a thing	01
3. An expression is always intensified towards a single idea	02
4. An expression is always intensified towards a single idea	02
5. Expression meaning, so strong & inseparable	03
6. Architecture is silent. But its impact on user is enormous	05
7. Meaningful place continues to dialogue with its user	05
8. Place with 'spirit'	06
9. a-Early Egyptian pyramids	09
9. b-Buddhist stupa	09
9. c-Town hall building in Colombo	09
10. a-User generate architecture	10
10. b-User generate architecture	10
11. Street space is used as neighborhood gathering space	11
12. Traditional house forms reflecting the life style of people	12
13. Traditional house forms reflecting the life style of people	13
14. An environment of suitable quality is a pre requisite for purpose Of catering an activity	14
15. Activity pattern generate architecture. A traditional village	15
16. Modern examples generated in responds to activity pattern	15
17. Certain settlement pattern responding to their activity pattern	17
18. Context generator architecture	18
19. Built form created to responding the water front	19
20. Form created to blend with the natural environment	19
21. Various climatic conditions modify the forms of buildings	21
22. Materials and technology modifiers the idea of home	25
23. a-Technology & materials are used to harmonize the built form with the natural environment, Kandalama hotel	24
23. b-Technology is used to achieve higher purpose, Greek Pyramid	24
23. c-Technology is used respond to the user	24
24. Shelter of man in the Stone Age	28
25. Primitive dwellings	28

26. Representation of early man's inner image, expressing the group identity	29
27. Development of agriculture provided a reason for stability and permanence.	29
28. Materials in these structures provided proof of the identity of the person's life styles and social groups.	30
29. Sydney opera house.	33
30. Auditorium building	34
31. Falling water house	34
32. Commercial mall	35
33. The monolith city of reinforced concrete	36
34. Sports hall for IBM England	37
35. a Navajo Indian hut, near the monument Valley Arizona	38
35. b stone henge near salisbury	38
35. c Huts, northern Greece	39
36. example of reed construction materials, used to express their personal identity.	40
37. Funery temple of queen Hatshepsut	41
38. Colonnaded court, temple of Hours	41
39. temple of Amount – khonsu	42
40. Model of hypostyle hall, temple of Amman, karnat , Egypt.	42
41. Valley temple of Chephren, Giza.	42
42. the great Sphinx, Giza	43
43. Simple yet grandest symbols on earth of human aspiration as seen through abstract geometry	44
44. Athenian Treasury, earliest Doric structure to be built entirely of marble.	44
45. Greek painting of Rapt maenod paintings	45
46. Heracles and the infant telethon, fresco Greek painting done on a wall of a houses	45
47. Section of a house at Delos Greece, showing mural decoration	45
48. Stone marble columns painted in different colour.	46
49. Facades, treasury of the siphanians sanctuary of Apollo cut granite and marble stone used in the structure enhances the grand appreance.	47
50. The temple of Zeus at Olympia , materials have been used to maximum	47

51. Temple of Athena, Nike , Acropolis, Athens	48
52. Parthenon, Acropolis the most perfect Doric temple ever built.	49
53. Parthenon –consist of a rotunda, roofed by a dome.	50
54. colloseum most magnificent roman amphitheatre	50
55. Pon du Gard. France	50
56. The roman wealth of building ability.	51
57. Temple of Foruna Virilis	52
58. The temple of the sibyl, Tivoli, Italy	52
59. Atrium house of the silver wedding Pompei	53
60. The typical Gothic construction.	55
61. a significant solution of stone geometry with stained glass artistry.	55
61. b rose window and lancet windows, north transept , cathedral of charters	55
62. Notre dame, France characterizing the Gothic style	55
63. Cathedral of Amine, showing strength of the flying buttresses.	55
64. West façade cathedral of Amiens	57
65. Interior, cathedral of Beauvais , France.	57
66. Charters, cathedral, France.	57
67. Villa Savoy	60
68. Notre Dame du. Haut Ronchamp	61
69. reinforced concrete skeleton in Greece	61
70. Chandigarth (India), Legislative Assembly building	62
71. Falling water	62
72. John son’s wax building	63
73. Robie, house, Chicago, 1968	63
74. a Morris shop Sann Francisco	64
74. b beautiful brick vaults , built like jewel caskets, certainly provides a powerful symbolic image.	64
75. Marine Country House .California	64
76. Guggenheim museum, New York	65
77. Seagram building, New York	66
78. Institute of technology	66
79. Barcelona pavilion	67
80. School in Arizona, Tallisue	67
81. a the remains of a Moki Indian dwelling	69


 University of Moratuwa, Sri Lanka
 Electronic Theses & Dissertations
www.lib.mrt.ac.lk



81. b-Dessert settlements	69
81. c example of typical family shelters in Bangladesh,	70
81. d- a mother and her young child sit outside their grass –thatched,	70
81. e the climate of Mediterranean and North Africa gave birth to the enclosed courtyard house with its massive earth walls and cool interior planting	70
82. Use of four reinforced concrete posts and corrugated iron sheeting for the roof,	71
83. The beauty of the bamboo mats used for walls is stunning and simple.	72
84. a – forms out of mud brick	73
84. b- grass huts in the ten ere region	
Materials used as a means of showing their regional identity	73
84. c- clay structure	73
85. Bamboo and palm leaves being used in these remarkably functional, strangely beautiful structures for their needs.	72
86. Handel residence, Amman, 1975	73
87. Exterior façade of the khoury residence	73
88. court of Justin Niger	73
89. Modern earth-covered home in Australia	74
90. General view of the church,	74
91. School building Syria	75
92. Demir holiday, village Bodrum Turkey	75
93. Pan African institute for development in Africa	75
94. House, Osio, Norway exterior of the house	76
95. Typical house for extended Aboriginal family	77
96. House Mount Wilson, Australia.	78
97. Jonson house	78
98. The building consist of five detached volumes linked by a wall all are built of local piedra mares	78
99. Pavilion complex, Island of Nusa	79
100. Carmelite convent, Norway	80
101. webler Geissier, s Wurzbuing, office building.	80
102. Glass hall of the Tokyo international forum	81
103. Ulura National park cultural centre.	82
104. Bahai house of worship, New Delhi	83
105. Willis, Faber & Dumas head office building	84

106. Zenith Montpellier, France	85
107. Institute due Monde Arabe, Paris	85
108. Grand Louver Paris.	86
109. The Eiffel tower	87
110. The virtual Birthplace of the industrial revaluation	87
111. Pompidou centre-Paris	87
112. Oak park studio (Frank Lloyd Wright	88
113. Talie Sin – home and studio (Frank Lloyd Wright)	89
114. Exterior façade of Telisin West- Arizona (Frank Lloyd Wright)	89
115. Interior of freeman house, Los Angeles, 1923	90
116. Segel House	90
116.a“a home in a Prairie Town, U.S.A (Frank Lloyd Wright)	91
117. House of the rocks, Reykjavik	92
118. The Denver Central Library U.S.A(Michel Graves)	92
119. Finnish Embassy Washington, D.C, USA	92
120. Traditional Sri Lankan peasant dwelling built according to their way of life and their own needs.	93
121. kandyan peasant house, Matale more stable than earlier houses	94
122. Elaborate verandah, with masonry columns and, modern finish. Expressions of stability	94
123. The verandah of the typical Dutch building	94
124. Eknelligoda walawwa.	95
125. top heavy stone pillars, Anuradhapura wood translated in to stone .expression of permanence and superiority.	95
126. Trinity collage chapel, Kandy (1935)	96
127. independence hall Colombo (1953)	97
128. Agrarian Research and Training Institute Colombo 1975	98
129. kandyan art association centenary building (1984) entrance	99
130. Mahaveli new town (1984)	99
131. Ena de Silva house, Colombo	100
132. Polontalawa estate bungalow	100
133. St, Bridgest Montessori School, Colombo	101
134. Steel co-operation office .oruwala	101
135. Details of the main façade of parliament pavilion	102

136. Kandalama hotel	103
137. Indra traders building Colombo	104
138. Brooke Bond office building, Union Place	105
139. bright painted Dutch columns used as a decorative element	106



University of Moratuwa, Sri Lanka
Electronic Theses & Dissertations
www.lib.mrt.ac.lk