

# **PUBLIC HIGH RISE HOUSING DESIGN PROBLEMS: "A CASE STUDY OF HOUSING ESTATES CLASSES"**

**Ali Yaran**

**Abstract:** *This paper will promote many questions about the design validity of these exciting blocks. The physical design of these blocks is prone to have social and economical problems, and it is part of the visual pollution and disturbance created on the sky line of Scottish cities special Glasgow. This paper focuses on the necessity to establish a source of initial design for high rise housing design problem classes theory. A thorough research of all the estates in Glasgow area was launched. Thus, a high amount of information was classified, in an attempt to establish a theoretical approach to support the evaluation and appraisal of current blocks problems. The new class's theory in high rise housing design problems is used as a vehicle for conducting this paper analysis. Classification includes physical and social design problems domains. The physical problems domain variables of the numbers of stories, dwellings, entrances, type of corridor, access from the streets and sharing of the site. Furthermore, to the social problems domain variables of graffiti, damage, litter, crime, drugs, child density and health have been examined. Moreover, their interdependent relationships were explored throughout the new classes' theory. The study of the new classes, theory may prove to be extremely vital for future direction in adapting some from of urban design problem solving techniques. It also serves as an evaluation tool for housing design appraisal in the city from Glasgow and similar cities worldwide.*

**Keywords:** *visual pollution, special Glasgow, Classification, dwellings, appraisal*

## **1. Introduction**

In Glasgow the problem of housing appears as an increasingly important subject, invites a significant amount of research. The future, however, remains uncertain, and many questions further rise every day. How can Glasgow solve its public high rise housing problems? Teymur (1993) argues that even if researches research housing to the best of their abilities, the knowledge produced is not always in a form or medium that designers and planners can use. This study, however, disagrees with this notion, thus attempts to presents mediums and forms for future resolutions.

As for the studies in the field of housing, Lawrence (1993), argues that academics and professional practitioners have not been able to important proper research methods, hence they were only traditional and

touched upon the surface of the high rise housing does in fact emanate a range of conflicting images and concepts, which may as a result, reflects a "multi-dimensional" nature.

Recent research in the area of housing reveals that the meanings of housing vary between social groups in one society and across cultures. Successively, this research agrees with this notion, where the principal concept is to establish a design problem classification which typologies and categories are extracted from within the social problems of the city of Glasgow, It is noted that, the new theory of housing class is one of which a wide range of researchers might be able to use in their attempts to survey housing.

On the other hand, another foremost question arise, what are the long term plans of solving these problems? And, how is it possible to accommodations? In an attempt to address these question and some of Glasgow's housing problems, this survey was initiated to hopefully present some theoretical and practical recommendation to the researcher and city of Glasgow, for future implementation.

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## 2. The Background of The Project

In 1950s, the city of Glasgow, which is considered the industrial city of Scotland, had a population of about a million, roughly one-fifth of the population of Scotland. The housing of Glasgow's population had for long been one of the most serious problems facing the city. The great majority of the building types were blocks, from three to five stories in height. The design was similar to rectangular blocks. So, at that time, Glasgow had the worst conditions ever, with the highest death-rate, and the highest number of persons per room. The highest proportion of its population had occupied apartment houses, however the lowest proportion had occupied house of five apartments. After the Second World War, Glasgow had numerous areas of slums and severe housing crises. Escaping from monotony society to diversity society became an ambition. People of Glasgow wished to change their life and escaped from suburban streets corridors to live in parkland with common amenities of air and view. Subsequently, Glasgow tried to flourish its slum clearness areas by building high rise housing. So the high rise blocks were built with 321 stock blocks included over 25000 flats by 1957-1977. By the end of 1960, the problems of Glasgow's high rise have started, initiating two main domains: physical problems or structural problems domain and social problems domain.

## 3. High Rise Public Housing and Physical Problem Domains

The physical problems of these High rise Housing Blocks have been divided into parts: structural problems and design problems.

### 3.1 Structural Problems

The vast majority of high rise Public Housing in Great Britain, particularly in Glasgow, was built by "Package Deals". This type of designing was often considered more as an engineering problem, such as: foundation, sewers, structure. For instance Ronan point in London was one of this victim that collapsed in 1968, and few of them had been deliberately demolished.

### 3.2. Design Problems

The major problem was connected to the poor design inside and outside the blocks. Design problems or Architecture problems are related to social problems (Newman 1980), like safety and security inside and outside the blocks.

For instance, the location of the entrance, access from the street and walkway are considered outside or outdoor problems. Horizontal and vertical routes are considered inside (outdoor) problems. Yet, the horizontal route is a type of corridor that has two criteria of (inside and outside), and vertical routes are lifts and stairs. The physical problems of poor design exist particularly around the base of the blocks, resulted in open and anonymous front entrances. Other

problems are poorly lift approaches and foyers, and environmental problems that were difficult to manage.

### 3.3. Shape of Public High Rise Housing

Variations in the plan shape were developed for the block shape: The: "point" itself (square), "slab" block (rectangular), T-blocks, Y-blocks and Cruciform blocks.

Two main shapes of High Rise Housing have emerged in British cities: the point(square) block and the slab (rectangular).

#### 3.3.1. Point Block

In the point block, the typical floor had four dwellings and sometimes six, where in the slab block plan typical floor may have 12 or more. Still, the standard point block plan with four dwellings per floor was (1) Type "point" occasionally increased from the standard 11 stories to sixteen, seventeen and eighteen stories. Point block or (square shape) usually had four dwellings which were probably located opposite of each other.

The middle of the block location was used for the lifts and stairs. This type of block is much more secure for the neighbors. The length of corridor for this type of block is short and surveillance by the tenants is much more effective and easier.

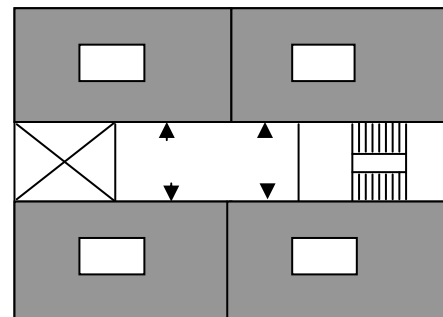
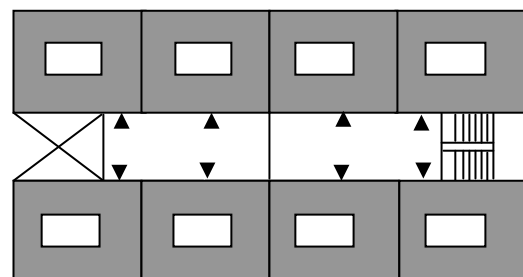


Fig. 1. The plan of typical point block housing associated with the Glasgow Area.

#### 3.3.2. Slab Block

Slab block or (rectangular shape) usually has over six dwellings per floor, and the length of the corridor for this type of the block is long. Usually the location of the lifts and the stairs are in the middle and center of the blocks. Also, surveillance by the tenants is noted to be much weaker.



#### 4. The Social Problems and Their Relation to the Physical Design the Estates

The survey carried out has revealed that there are seven dependent areas that govern the relation between the social problems and the actual physical design of the six estates in Glasgow district. The seven relational areas were used categorically to extract the typologies of the new classes' theory.

##### 4.1. Relation the Number of Stories in the Block

Both types of floor are related to the height or number of stories in housing. The lower block has been much more successful than the higher one for security surveillance.

##### 4.2. Relation to the Number of Dwellings the Block

The number of dwellings in the blocks is related to social problems (Cloeman 1985). When the number of dwellings is lower in the block the rate of problems is lower. The size difference between point block and slab block, housings of the same height may contain different numbers of flats and taller blocks which do not necessarily house more people. The point blocks are characterized by isolation and slabs by greater invasion of privacy.

##### 4.3. Relation to the Number of Dwellings Served by the Same Entrance

The entrance is related to the number of dwellings, and when the number of dwelling is lower the control of the entrance is much safer. The position of the main entrance can be located in the middle of the long or short of facades. One entrance in the short façade is more successful than the long façade and usually the slab block with two entrances makes it difficult to control security surveillance.

##### 4.4. Relation to the Type of Corridor

The type of corridor is related to social problems. If the corridor is short, it is much safer than the long corridor. The tenants who live in short corridor have more chance to identify each other than in the long corridor.

##### 4.5. Relation to the Position of Entrance

The position of the entrance also helps to determine the level of surveillance. Entrances flush with the street are the least vulnerable to crime; those which are set back more vulnerable and those which face away the street are most vulnerable of all.

##### 4.6. Relation to the Access from the Street of the Same Site

For the block which is located in the street site the entrance position is much safer than others.

##### 4.7. Relation to the Number of Blocks Sharing the Same Site

The number of blocks sharing the same site is related to the social problems. Thus, when comparing the one block, two and three blocks estates, the one block on the site seems to be more successful than the other two, as result the security surveillance has more control in this case.

#### 5. Design Recommendation For Social Problem

In view of the seven relational areas presented in section 4.0. The following is a brief description of the suggested recommendations for the elimination of social problems in public high rise housing:

1. Evaluation of the housing types (slab or point) reveal, that in the point block, it is recommended that entries of flats are located opposite of each other, or at least has a view to the corridor.
2. The main corridor in the slab block is most appropriate to be divided into sub corridors for much control security surveillance. The maximum number of flats for each slab block should be divided into three parts: common area and two ventilated areas.
3. The number of stories that should be converted, should not exceed 10-12 stories, and is more likely to be suitable for facilities. For example, shop facilities, leisure, baby sitting, children facilities, and proximity of the flat to facility.
4. In each floor one or two flats in different façade particularly in the slab block are likely to be taken out and extended with glass windows for more day lighting. (Depends on length of floor)
5. It seems suitable in the ground floor to take out the surrounding walls and replace them glass wall, particularly in the foyer area.
6. Main entrance, suitable to be exposed from the facade. The previous six suggested recommendation, will hopefully promote the intended product of this project while they assist in testing the validity of the final software.

#### 6. The Project Description

The project arose out of the need to establish a source of initial class's theory for high rise housing design problem. Originally evolved out of the product of current research undertaking at housing research center involves researching high Rise Housing problems in Glasgow.

A brief background and description of the housing problem were presented earlier. We have been trying to involve as many researchers as we can and from different backgrounds. The city of Glasgow has demonstrated a great sense of responsibility and provided us with the necessary information. We believe this sort of collaboration can cause intuition and better solution to a single problem. Our main problem now is finance, since this study is tall self motivated one; other parties are welcome to join us in the continuation of this study.

## 7. Aims of Project

The interdisciplinary research aims at the development of a class's theory to support the analysis of high rise housing problems appraisal in a controlled area in the city of Glasgow.

The first intention of this project is to develop a theoretical comprehensive typology of Housing problems for other colleagues to expand and develop in other forms or definitions. The need for this typology is to have interchangeability with other typologies that already exist, or thus establish a ground floor for future researches in this area.

When this research started the principal intention was to establish whether or not such a class's theory would actually solve current high rise housing problems, and how to benefit from it? Eventually, we have reached a conclusion that such a theory or one may consider as "direction", can be extremely beneficial in certain areas where housing problems persists. We have conducted a thorough research and have been able to refer to the great amount of knowledge supplied by our current researches in housing.

The prototypical solution in high rise housing has persuaded us to believe, that we can in fact incorporate and exploit this theory in the reconstruction of a typical metaphorical problem in a set of controlled area in Glasgow city.

## 8. Theoretical Assumptions

Several assumptions were made to create a reasonable hypothesis for this project:

1. The design metaphors used in these block houses were a paradox and fallacy. Analogies were made on premature studies as a result of lack of comprehensive understanding of the real social problems. There should have been a prototype project to test for a period of time where social and physical problems are examined beforehand.
2. It is difficult to reconstruct a metaphor of a design process; yet, if successfully identified some aspects of the design analogy will be possible once incorporated in the over all study. Hence most of the social problems in public high rise housing are related to physical design.

## 9. The Criteria For Selecting the Six High Rise Housing Estate

The study has identified six criteria for selecting the six estate of this study, all of which were chosen out of the 71 estates exist in the Glasgow district:

1. The high rise housing estate should include various scale of block of flats. Thus allowing for the testing of the variables: graffiti, vandal damage and litter in different sizes. The criterion then would allow testing for the possible effects of social characteristics of residents and particularly child density.
  2. The field study conducted for investigating high rise housing covered the independent urban form entities in terms of the layout and in relation to the surrounding areas. Thus, minimize the probabilities of children from other areas committing graffiti, vandal damage and litter in the estate. This is a very significant factor to recognize when comparing social characteristics in particularly child density in various estates in relation to graffiti, vandal damage and litter.
  3. The field work estates should include various locations in the city district. The various locations should exhibit different degree of social problem in general and graffiti, vandal, damage and litter in particular.
  4. The field work estates should include two groups of high rise housing estates representing the two types of management, council management and cooperative management. Thus allowing testing for the possible effects of the different systems of management and problems of graffiti, vandal damage and litter. The difference of management within each group should be controlled as much as possible.
  5. The field work included levels of high rise housing conditions. High demand and low demand, Table(1) represents some of the information in this area. The two types of the estate should exhibit a different degree of the social problem in general and graffiti vandal damage and litter in particular. This criterion allows testing the possible effects of design and social characteristics of residents.
- The high rise housing estates should have variation in layout and design. Thus, allowing the testing of variables in relation to the design of the public space and blocks of flats.

**Tab. 1. The General information about the character of the six estates.**

Development (Estate)	Classification	Demand	Shape of Block
Curle Street	Average	Medium	Point
Dundasvale	Successful	High	Point
Iona Court	Average	Medium	Point
Berrynowes Avenue	Successful	High	Point
Norfolk Court	Successful	Medium	Slab
Furge Place& Coll Place	Average	Medium	Point



	Couple	20	Couple	79	Couple	52	Couple	81	Couple	220	Couple	6
	ElderCou	8	ElderCou	6	ElderCou	18	ElderCou	81	ElderCou	146	ElderCou	22
	ElderSing	21	ElderSing	13	ElderSing	36	ElderSing	83	ElderSing	58	ElderSing	58
	Single parents	104	Single parents	11	Single parents	104	Single parents	108	Single parents	26	Single parents	–
No.of storey	20		18		20		23		23		17	
No,of dwelling	120		204		342		552		413		134	
Type & No,of dwelling	2.aprt	40	2.aprt	68	2.aprt	114	2.aprt	276	2.aprt	125	2.aprt	2
	3.aprt	80	3.aprt	136	3.aprt	228	3.aprt	276	3.aprt	288	3.aprt	132

### 11. The structure of the Classes Theory

In order to measure the social problems in the different types of estates, eight categories were selected, as they represent the foremost and common factors amongst the Glasgow district. Table (2), describes the new theory, its typology and categories. Table (3), describes the relationship between the newly established categories and six estates in the Glasgow district. These categories show the rate of different types of population amongst the six estates. The eight categories the structure of the newly established class theory, the following presents a brief description of these categories and their typologies:

1. Blocks: the study has identified various numbers of blocks. For instance, Curle Street has a block, Coll&Forge street have two blocks, Iona court has three blocks, Norfolk court has four blocks, Dunasvale court has three blocks and Berryknowes has one block. The typology used here is No. of Blocks.

2. Type of Block: Generally, the field work has also identified two main types of blocks, slab and point. However, some estates like Norfolk court have also different type, one of which the two slab blocks are adjacent, creating a long rectangular shape of block. Also, another case exists in the one point blocks, where the two point blocks are adjacent, but slightly shifted, these are called the 'double shifted point block'.

3. Population: The typology of population has been identified as the number of population, most of which ranges between 150 to 934, with different household composition.

4. Structure of population: The case study has identified three topologies in this criterion: Male, Female and children

5. Type of Tenants: The case study has identified six typologies for this criterion. Single, Couple& children, Couple, Elderly couple, Elderly single and Single

parents. The study shows that in some estates the concentration of certain types of household is higher than others. However the rate of single tenants ranked the highest throughout the field study.

6. No. of Stories: The study has identified variety of stories numbers though out the blocks. Thus, the topology applied here is Number of stories.

7. No. of Dwelling: The typology applied here is number of dwellings. Generally the number of dwellings in each floor varies between 4 dwellings in the point block, to 6-8 dwellings in the slab block.

8. Type & No. of dwellings: The study has identified two typologies for this criterion: Two bedroom apartment, and three bedroom apartment. Generally, floors have a mixture of these apartments' types.

### 12. The Study variables

This study has identified the following physical and social design problems domains.

- 1.0 The physical problems domain consists of the following variables: the numbers of stories, dwellings, entrances, type of corridor, access from the streets and sharing of the site.
- 2.0 The social problems domain consists of the following variables: graffiti, damage, litter, crime, drugs, child density and health. Moreover, their interdependent relationships were explored and examined throughout the new classes' theory.

physical problems variable, for example, the strongest relation exists in Curle Street estates, between the street pattern and social problems. This indicates that the shape of the street –its width or length has an impact on the social variable. The paper earlier revealed that no recommendations were cited in that area.

Tab. 4. The Relation between the social problems variables and the physical problems variables.

Variables		Physical problems variables									
1. Graffiti	1	2	3								
2. Damage	4	5									
3. Litter											
4. Crime											
5. Drug											
	Estate Names	Street Pattern	Walk Ways	Car park	Landscape	Play area					
1.	Curle Street										
2.	Dundasvale court										
3.	Iona court										
4.	Berryknowes Avcnue										
5.	Norfolk court										
6.	Forge place & Coll place										

Tab. 5. The Relation between the social problems variables and the proposed

Variables				Recommendation:															
1.Graffiti	1	2	3	1.Sharing outdoor															
2.Damage	4	5		2.Sharing of Landscape															
3.Litter				3.Car park features design															
4.Crime				4.Local services features															
5.Drug				5.Presence of children's population															
				Estate and criteria	Outdoor	Landscape	Car park	Services	P.										
1.	Curle Street																		
2.	Dundasvale court																		
3.	Iona court																		
4.	Berryknowes Avcnue																		
5.	Norfolk court																		
6.	Forge place & Coll place																		

### 13. Design Recommendations for Outdoor Public High Rise Housing Estates

In this paper, six main propositions are identified, they represent the main frameworks suggested for the relation between the design feature in outdoor of public high rise housing and the problems of graffiti, damage, and litter (Table 5):

1.0 The extent of shared space outdoor may affect graffiti, damage and litter. Because as the shared responsibility increases, it becomes less defined and increasingly lacks surveillance by residents. Such conditions increase the probabilities of children and teenagers reckless play and irresponsible behavior which may result in graffiti, damage and litter.

2.0 Landscape features of shared space may affect graffiti, damage, and litter thorough encouraging

children play and adults to use it, and subsequently affecting surveillance of such space.

3.0 The design features of areas may affect the problems of graffiti, damage and litter through allowing or preventing surveillance over these areas from dwellings or from passing pedestrian.

4.0 The presence of shops and other services in high rise areas may increase graffiti, damage and litter in the adjacent area, become such services act as magnets group of children and teenagers.

5.0 The absence of children play areas may result in graffiti, damage and litter because such areas could serve children energy which otherwise maybe released in reckless play in areas not designed for such purpose.

6.0 Graffiti and litter increase in the estates where children play areas are provided number of children.

#### 14. Inner and Outer Blocks Area

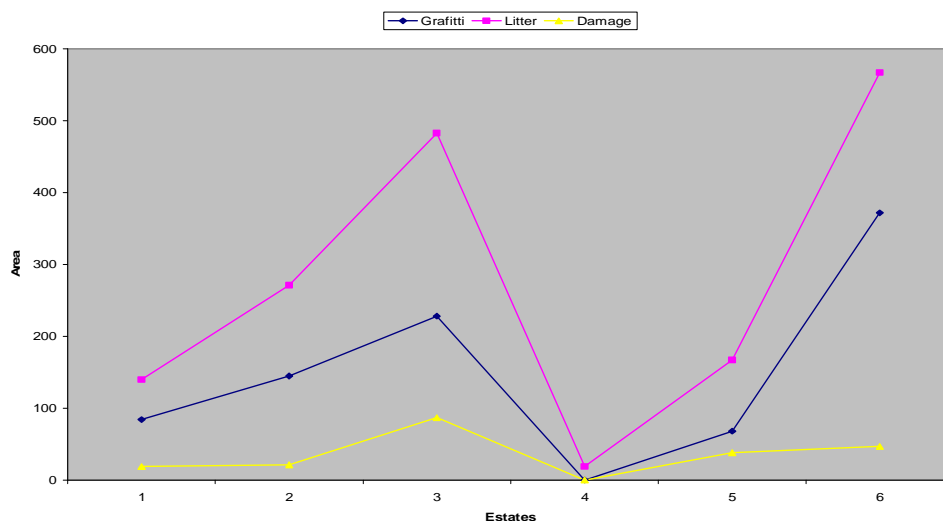
1. Concerning the inner-block area, table (6) describes the selected areas observed through out a considerable length of time. The typology used here is the areas per square meter for each variable. It becomes apparent that the correlation between the number of children in the Berryknows Avenue estate, and the three variables is a linear negative relationship. Other factors (typology) that contribute to this result are the low number in population and blocks. Table (2) provides detailed information of all the data collected

for this study. Where in the Norfolk estate, the correlation between the number of children and the three variables is a linear positive relationship. The brief analysis presented, that the child density variable is a key factor in increasing the rate of damaged, littered and gratified areas. This however applies to the inner area of the block. The argument presented validates a number of the topologies used in this case study; these are presented in table (1), earlier in this paper.

**Tab. 6. Inner blocks areas of Graffiti, Litter and damage per square meter for the six estates in Glasgow.**

Code	Estates Name	Area of Graffiti Square Meter	Area of Litter Square Meter	Area of Damage Square Meter
1	Curle Street	84	140	19
2	Dundas Vale Court	145	271	21
3	Iona Court	228	483	87
4	BerryKnowes Avenue	0	19	0
5	Forge& Coll place	68	167	38
6	Norfolk Court	372	567	47

**Inner-Blocks Areas**



**Fig. 3. Inner-Blocks Area/square Meter**

2. Concerning the Outer-block area, table (7) describes the selected areas observed. The typology used here is also the areas per square meter for each variable. It has also become apparent that the correlation between the number of children in the Berryknows avenue estate, and the three variables is a linear negative relationship. This fact also indicates, that the impact of the variable: child density, is not affected whether it is on the inner or outer block area. However, the rate of area of litter

seems to be exceedingly high in the outer block area, indicating even a stronger positive correlation between child density and litter in the estate No.6. Other factors (typology) that contribute to this result are the low number in population, and blocks. Once more, in the case of the outer area, in the Norfolk estate, the correlation between the number of children and the three variables is a linear positive relationship.

**Tab. 7. Outer blocks area of Graffiti, Litter and Damage per square meter for the six estates in Glasgow.**

Code	Estates Name	Area of Graffiti Square Meter	Area of Litter Square Meter	Area of Damage Square Meter
1	Curle Street	68	214	35
2	Dundas Vale Court	76	234	33
3	Iona Court	385	617	117
4	BerryKnowes Avenue	0	64	0
5	Forge& Coll place	109	243	62
6	Norfolk Court	673	715	209

## Outer-Blocks Areas

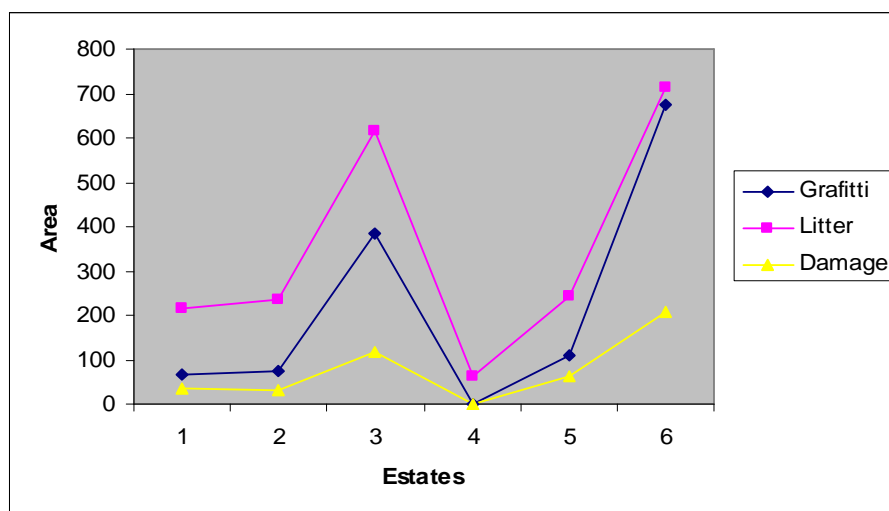


Fig. 4. Outer- Blocks Area/Square Meter

## 15. Discussion

The general analysis represented in the previous tables reveals, that there are evidence of a strong correlation between the rate of child density variable and graffiti variable on the one hand, and litter and damage on the other. This seems to apply to all of the estates, where the rate of child density range differs from one estate to another.

Table (5) shows, that there is significant relationship between the play area and graffiti, damage, litter and child density. If child density rate was extremely low in these estates, then it is more likely that graffiti and damage are neglected.

It is noted that for example, the Forge place & Coll place had the highest rate in almost all of the suggested variables: such as the Graffiti, Damage, Litter, Crime, Drug; when compared with the recommendations' presented earlier, it has been noted that most of the five categories suggested were in fact agreeing with the problem identified and have clearly suggested a proper cause.

The suggested theory of class was tested in different areas by this research; however that most important factor that governs this theory is the eight categories' chosen for the description of the estates. We suggests that a researcher may try to implement those categories in the same from and may as well use the tables presented for the social and physical problem as guide lines.

Table (5&6) presents a checklist for other researcher, as they conduct a research in similar circumstance. One of the aims of this study clearly is to present an easier and systematic method of conducting a thorough research in high rise housing problems. Especially, when conducted throughout a considerable period of time.

These tables present a good method of inquiry in a typical site, in which the data and time can be added during the observation. Another checklist may also be

added to indicate numbers of children, couples...etc., used earlier in the table of typology. All of the pervious tables are needed to evaluate an existing problem in any high rise housing situation. Alteration are probably needed in each particular case, however, we recommend the use of the typologies to start with any case study in this area.

## 16. Conclusion

The initiation of this study evolved out of the need for a prototypical method of inquiry, when conducting a field work study in the area of high rise housing. As we initially attempted to do so, we have encountered extreme and vast numbers of difficulties, thus the need for a systematic approach became immanent. This study has demonstrated more than just a theoretical approach, since it was actually conducted through an extensive field work, consisted of observations and testing in site. The data collected was vast and huge, it is impossible to present it all in this paper. However, we have tired to present the reader with a sense of the research undertaken, and a closer look at some of its findings. It has been clearly noted that the variables were tested and identified had truly influenced the rise of high rise housing problems. The study has concluded that most of the suggested variables are in fact influential, and present the city of Glasgow with a real dilemma.

While the intention of this study is not to present recommendations in the from of any physical design resolution; however, we feel the need to conclude this paper with the following key issues:

1. Although the need for a typology to implement and to solve high rise housing design in highly needed, however this study may after all becomes a paradox, if the city of Glasgow does act seriously to resolve and embrace resolutions from parties and researchers available in this area.

2. The severity of these problems, of which we have been able to identify, indicates that further studies are needed to identify proper solution. However a solution can not be implemented unless architects, and urban designer are all involved along with the experienced researchers under the umbrella of the Glasgow city council.

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