Developing Country Studies
ISSN 2224-607X (Paper) ISSN 2225-0565 (Online)
Vol.5, No.21, 2015

Containerisation, Portable Architecture and the Image of Ghanaian Cities

Oppong, R.A., Essel, C. and Quagraine, V.
Department of Architecture – College of Art and Built Environment
Kwame Nkrumah University of Science & Technology, Kumasi-Ghana

Abstract
The gains of the urban development strategies have served as pull factors of rural dwellers to the urban centres with negative consequent effect on urban open spaces and corridors in most Ghanaian cities. Owing to the lack of formal employment opportunities, any available space in the cities of Ghana has been taken over by emigrants and residents who hawk around the urban spatial corridors and eventually build Container structures (container architecture) to carry out their commercial activities in more permanent manner. Through a mixed methods and strategies, seven major cities and eight other settlements were explored to better understand and appreciate the spatial and regulatory requirements for planning and design of Container for use in a city/built environment and the design of Containers in Ghanaian socio-cultural and socio-economic milieu. Amongst the key findings is that Ghanaian city-authorities have commoditised the container structures through official registrations for daily collection of fees/taxes without making containerization processes as part of the overall regional/national planning and physical development strategies.
Keywords: Architecture, Containerisation, Ephemeralization, Container structures, Commoditisation, Ghanaian cities.

1. Introduction

Urban centers have become the epicenters of economic development and they contribute an estimated 70 percent of Gross Domestic Product (GDP) according to the Cities Alliance (2013). In Ghana, urban development strategies introduced and implemented by successive governments have created a sharp urban-rural divide. The gains of the urban development strategies have served as pull factors for migration to the urban centres at a rate of 33% (Ghana Statistical Service, 2008) with negative consequent effect on urban open spaces and corridors in most Ghanaian cities. Owing to the lack of formal employment opportunities, any available space in the cities of Ghana has been taken over by the emigrants and residents who hawk around the urban spatial corridors as well as along main arterial roads of cities and eventually build Container structures to carry out their commercial activities in more permanent manner (King and Sumbo, 2015). Container architecture is not new (Vijayalaxmi, 2010; Powell, 2006). Container structures for human habitation and usage is also known as portable architecture/buildings, caravan architecture, mobile house architecture (Kronenburg, 2008) and nomadic architecture (Prussin, 1987) in developed countries as well as in architectural discourses. Frampton (2001) noted that in 1960, Le Corbusier - a pioneering architectural modernist remarked that "we have become "nomads" living in houses which will be equipped with communal services; we will change our apartments according to the evolution of our families; from time to time we will change our neighborhoods as well". Also, Kronenburg (2008) prescriptively asserted that 'all portable buildings should be judged by the same criteria as other architecture in terms of fitness for purpose, appropriateness for context, beautiful in form and economy in use'. Containers serve as accommodation in cities and shelter for survival and development of emigrants as pertains in the Caribbean and the Americas as well as Africa (Abrasheva et al., 2012; Nelson, 2011; Cowen, 2010; Grose, 2008). The spatial impact of containers in a developed economy such as France has been recently highlighted by Guerrero (2014).

Containerization appears to have positively impacted on the socio-economic status of emigrants in some countries (Guerrero, 2014). However, the containerization processes have continuously marred the physical images of Ghanaian cities. That is evidenced in the poor and abysmal quality design of the containers and apparent lack of basic services and legally connected infrastructural facilities such as water and electricity as well other essential amenities. Guerrero and Rodrigue (2014) support the economic importance of containerization that "after more than half a century since its introduction, containerization has diffused to an extensive array of locations and supports a wide variety of supply chains, from retail goods, parts and commodities. However, Guerrero and Rodrigue (2014) argued that "such diffusion is far from uniform, on par with the changes in the commercial geography of the global economy. And, in light of these economic and

technological changes, economic cycles are offering a relevant perspective to investigate the spatiotemporal evolution of containerization".

As noted earlier, Containerization as an architectural system and its economic potentialities for human development is not new. Le Corbusier introduced the Dom-ino in 1914 for mass production and quick erection of buildings. Le Corbusier perceived a house to be less expensive, affordable and a tool for human existence as the motor car (Powell, 2006). Richard Buckminster Fuller (1895-1983), probably the best-known American thinker, innovator, inventor, social engineer and philosopher developed the anti-Malthusian concept of Ephemeralization - 'doing much more with much less' (Fuller, 1938). Buckminster Fuller envisioned strong economic potentials with ephemeralization for human civilization and development (Fuller, 1981). Similarly, Walter Gropius (1883-1969) - a German architectural modernist and founder of the post-war Bauhaus School and Konrad Wachsmann (1901-1980) a born Frankfurt an der Oder modernist architect known for his contribution to mass production of building components, together developed the idea of the "packaged house" (containerized houses) when new homes were desperately needed in the post-war period especially in the U.S.A (Powell, 2006). Richard Rogers, a functional-modernist and high-tech architect has been influenced by the inherent economic potentials of ephemeralization and methods-engineering to develop high technological architecture by lowering costs but increased reliability and functionality (Sadler, 2005). Shigeru Ban - Japanese architect and the 37th recipient of the Pritzker Architecture Prize in 2014 used shipping containers to form the walls of Cathedral building rising 21 metres above the altar; together with other materials including 60-centimetre diameter cardboard tubes, timber and steel in Christchurch, New Zealand (Madigan, 2012).

The foregoing sections have endeavoured to highlight the architectural and economic pedigree of Containers for human habitation. However, the containerization which emanates from the shipping container (a typical container is 6 - 12 metre-long and 2.5 metre-square) invented in 1956 by the American haulage operator Malcolm McLean appears to mar the physical images of Ghanaian cities and streetscapes (Figures 1 and 2) as compared to the innovative and poetic use of the shipping container elsewhere (Ward, 2013, Kronenburg, 2008) as shown in Figure 3. Containerization in Ghana lacks the 'sustainability and greenness'. Containerization is apparently perceived hazardous to the cityscape and environments by authors including Qin et al. (2014), Parker (2013), Cavanah (2012) and Amin (2012).

Figure 1: Map showing a typical situation of spaces of indiscriminate sitting of Container structures along main Kumasi – Accra road near the Kwame University of Science and Technology (KNUST) Junction, Kumasi, Ghana (Source: Adapted from Google earth, 2015).

Figure 2: Indiscriminate sitting of poorly designed Container structures along main road in Ayeduase township near the University of Science and Technology, Kumasi, Ghana (Source: Authors', 2015).

Figure 3: A poetic use of Shipping Containers Starbucks for store designs (Source: Jao, 2014)

It is a noticeable phenomenon to any cursory observer that, containerization has become part and parcel of the Ghanaian city ensemble and doing away with it, is akin to killing the Goose that laid the golden eggs for the large middle and lower income individuals in Ghana (Figure 4). Notwithstanding, it is a worrisome situation for a country like Ghana that has publically declared to be the gateway to West Africa. This paper generally aims to present containerisation as an urban phenomenon to better understand the spatial and regulatory requirements for planning and design of Container for use in a city/built environment. And; better appreciate the design of Containers in Ghanaian socio-cultural and socio-economic milieu.

Figure 4: A Container structure as footwear shop at Abuakwa-Kumasi along the Kumasi-Sunyani main arterial road (Source: Authors', 2015).

2. Methods and Approaches

The mixed methodology of quantitative and qualitative research strategies was used. Seven hundred (700) semi-structured questionnaires were sent into the field and Five hundred and fifty (550) were responded to by users of containers. The 550 response rate constituted 78.6% of the total semi-structured questionnaires with representation from all the ten regions of the country. The responses were taken from major cities including Accra (8.5%), Tema (10.5%), Kumasi (8.6%), Bolgatanga (14.7%), Koforidua (18.2%) and eight other major settlements including Cape Coast and across the country represented the remaining 39.5%. The selection of the cities and settlements was based on convenience. Since the main data collection was to better understand the spatial and regulatory requirements for planning and design of Container for use in a city/built environment and better appreciate the sustainability of the Container design in Ghanaian socio-cultural and socio-economic milieu, the assistance of six Master of Architecture students and one National Service person of Department of Architecture in Kwame Nkrumah University of Science (KNUST) were employed in the data collection and analysis. The individual backgrounds of the six Master of Architecture students as residents/natives of the respective selected cities/settlements informed their involvement in the data collection exercise. A Mobile Telephone Technique (MTT) was used to assist in the data collection (see, Homer, 2008) for the use of mobile services and applications as methodological technique). The data collection exercise took three months: from December 2013 to February 2014. Statistical Package for Social Scientists (SPSS) was used to generate descriptive frequencies for analysis. The next sections present some discussions and analysis of the results from the data collection supplemented with literature reviews.

3. Discussion and Analysis of Results

Five hundred and fifty (550) open-ended questionnaires were responded to by users of containers; this being a response rate of 78.6% with representation from all the ten regions of the country. As indicated earlier in this paper, the responses were taken from major cities including Accra (8.5%), Tema (10.5%), Kumasi (8.6%), Bolgatanga (14.7%), Koforidua (18.2%) and eight other major settlements across the country representing the remaining 39.5%. Out of the total number of container users who responded to the questionnaires, 176 (31.2%) were males with the majority 374 (68.8%) being females. This was primarily because the purpose of these containers was mainly non-housing, but particularly, vendor-based activities which mostly involved women.

3.1 Age distribution and Educational Background of Container Users

The ages of the respondents ranged between 12 to 81 years of which majority in the 21-30 year group representing up to 40% of the sample. An older same ranged group, i.e. 31-40 also accounted for 28.5% of the sample. The remaining number of respondents include individuals less than 20 representing 6.4% and

individuals over 40 years also representing slightly more than a quarter of the sample as in Table 1.

Table 1: Age of Respondents

Years	Frequency	Percent (%)	Cumulative %
Less than 20	35	6.4	6.4
21-30	220	40.0	46.4
31-40	157	28.5	74.9
41-50	90	16.4	91.3
More than 50	48	8.7	100.0
Total		**100.0**	

Source: Authors' Field Survey, 2015.

The literacy level of the container users varied from basic through technical to the university level with as little as 5.2% having had no form of formal education. More than half of the container users had high school education (either Junior or Secondary High school) representing 65.4% with up to 15.7% attaining the tertiary level of education. There were others with Middle School Leaving Certificate (MSLC), technical institute and primary education with representation of 4.6%, 4% and 5.8% respectively (Table 2).

Table 2: Educational background of Container Operators

	Question: Do you own the Container?			
Educational Background	**Yes (Owner)**	**No (Renter)**	**No (Caretaker)**	**Total**
Primary School	26	3	3	32 (5.8%)
Junior High School	161	19	12	192 (34.9%)
Senior High School	103	34	31	168 (30.5)
Training College	13	5	0	18 (3.3%)
Technical Institute	17	2	3	22 (4%)
Polytechnic	21	2	0	23 (4.2%)
University	29	9	3	41 (7.5%)
No formal Education	23	2	4	29 (5.2%)
MSLC	24	0	1	25 (4.6%)
Total	**417**	**76**	**57**	**550**

Source: Authors' Field Survey, 2015.

3.2 Marital, Dependence and Employment Statuses of Respondents

The survey featured more married individuals than any other category with a representation of 51.5%. There were also 44.1% of the sampled individuals who were single and a small percentage of up to 4.4% who were either widowed or divorced as summarized in Table 3. Also, the crosstabulation in Table 3 shows a significant 35.7% of the container users had no children and up to 50.4% having 3 children or less. The remaining 13.9% had more than 3 children. Employment of container users/operators was diverse. About three percent were employed with Non-Governmental Originations (NGOs) and 28.8% were government employees. This meant that there were more unemployed container users totaling an alarming 68.2% as the study revealed.

Table 3: Marital Status of Respondents

Number of Children	Single	Married	Divorced	Widowed	Total
One child	41	59	3	0	103
Two children	23	66	4	5	98
Three children	4	68	2	2	76
Four Children	3	39	3	1	46
Five children and above	0	23	3	5	31
No child	169	26	0	1	196
Total	**240**	**281**	**15**	**14**	**550**

Source: Authors' Field Survey, 2015.

3.3 Design of Containers for Commerce and the Image of the City

The results from the data collected indicate that 417 (75.8%) of the container users were owners with those who did not own containers accounting for the remainder 133 (24.2%) comprising 79(13.8%) who had rented the space and 57 (10.4%) who were caretakers for their owners. A Chi-square test of independence between the level of education and ownership of containers result as shown in Table 4, seemingly, showed a strong evidence that the educational level of container users has some association with ownership status of the container users without considering whether those who do not own it being renters or caretakers. Reflexively, that provides basis for hypothesis testing to ascertain the reliability of the evidence. However, this paper defers the issue of hypothesis testing to a much more ongoing quantitative analysis of the research. The acquisition of land for sitting containers ranged from diverse categories as shown in Table 5.

Table 4: Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	36.168[a]	8	.000
Likelihood Ratio	37.649	8	.000
Linear-by-Linear Association	.011	1	.916
N of Valid Cases	521		

a. 2 cells (11.1%) have expected count less than 5. The minimum expected count is 3.92.
Source: Authors' Field Survey, 2015.

Table 5: How did you acquire the land to locate the Container?

	Frequency	Percent	Cumulative %
Bought from land owner	83	15	15
Permission from City Authorities	213	38.8	53.8
Open space in front of personal residence	128	23.3	77.1
Open space (No Man's Land)	7	1.2	78.3
Rented from land owner	107	19.4	97.7
Other (Own land)	13	2.3	100
Total	**550**	**100**	

Source: Authors' Field Survey, 2015.

Up to 372 (67.6%) indicated that the containers were suitable for commercial activities and good for the image of a city's development with 77 (14%) disagreeing and the remaining 101 (18.4%) respondents "not sure" whether containers are good for the image of a city's development or commercial purposes (Table 6). These results may stem from the apparent fact that more than half (65.4%) of the container users had only up to high school education (either Junior or Secondary High school) who were unemployed (see, Table 2). Arguably,

economic issues remain important for livelihood more than aesthetics/image issues. 447 respondents representing (81.3%) preferred the container to be portable so that it could be moved from one place to another (Table 7); and that is akin to Buckminster Fuller's (1981) ephemeralization for human economic progress and development. And, Kronenburg (2008) also asserted that "building structures that move from place to place have been designed and used since time immemorial".

Table 6: Suitability of Container

Are Containers good for the image of the Cities' Development and Commerce?			
	Frequency	**Percent**	**Cumulative %**
Yes	372	67.6	67.6
No	77	14	81.6
Not Sure	101	18.4	100
Total	**550**	**100**	

Source: Authors' Field Survey, 2015.

Table 7: Would you prefer containers to be designed to be movable?

	Frequency	**Percent**	**Cumulative %**
Yes	447	81.3	81.3
No	70	12.8	94.1
Not Sure	32	5.9	100
Total	**550**	**100**	

Source: Authors' Field Survey, 2015.

Apart from power supplied by the Electricity Company of Ghana (ECG), 14.8 percent of the sampled containers lacked water and electricity in them (Table 8). Majority of the respondents (380) representing 69 percent opinionated that the container for commerce in the cities should be designed by welders (Table 9). A Container costs 1,000 - 3,000 Ghana Cedis to be manufactured by a welder.

Table 8: Utilities/services available in Container

Construct	**Frequency**	**Percent**	**Cumulative %**
Water from public mains	2	0.4	0.4
Electricity from public mains	453	82.4	82.7
Sanitary facilities (water closet and bath rooms)	1	0.2	82.9
None of the above	80	14.8	97.7
Both water and electricity from public mains	10	1.7	99.4
Electricity and Sanitary facilities	2	0.4	99.8
Other (Solar Energy)	1	0.2	100
Total	**550**	**100**	

Source: Authors' Field Survey, 2015.

Table 9: Who in your opinion should design/build Containers?

	Frequency	Percent	Cumulative %
Architect	60	11	11
Engineer	19	3.5	14.5
Welder	380	69	83.4
Mechanic	3	0.6	84
Any body	19	3.5	87.5
No idea	59	10.8	98.3
Architect and Welder	7	1.3	99.6
Engineer and Welder	2	0.4	100
Total	**550**	**100**	

Source: Authors' Field Survey, 2015.

The respondents generally perceived the design of containers as the work of welders and not architects. The respondents' perception seemingly results from the notion that welders are capable of designing good containers because they appear to have genuine knowledge of Containers as objects for commerce in the city environment; in the sense that, perception caused by objects are capable of giving genuine knowledge and a strong and irresistible conviction and belief (Reid, 1983). 166 respondents (30.1%) preferred to locate container structures on any available space along street or road whilst 172 respondents representing 31.2% preferred any open space of land for the location of container structures (Table 10). A study by King and Sumbo (2015) confirms that '23% of properties along the Suame-Buoho – Kumasi-Techiman road was visible and accessible metal containers and Kiosks mainly used for commerce'.

Table 10: How much space of land should a Container have for design?

Construct	Frequency	Percent	Cumulative %
Normal building plot (80' X 80')	14	2.5	2.5
Half plot of normal building plot (40' X 40')	16	2.9	5.4
Any available space along street or road	166	30.1	35.5
Any open space of land	172	31.2	66.7
No idea	138	25	91.7
Depends on the Container's size	38	6.9	98.7
Quarter plot of normal building plot (20'X20')	7	1.3	100
Total	**550**	**100**	

Source: Authors' Field Survey, 2015.

3.4 Registration of Containers and Miscellaneous Issues

Population growth and rapid urbanisation in Ghanaian towns and cities like in most African countries have been noted as a challenge to infrastructure development. Kihato (2012) has noted that, the pressures of rapid urban growth are constantly creating greater demands on infrastructure development. Although, urbanisation does have its advantage in promoting cheaper infrastructure provision due to greater concentration of people especially in the developed world, it is, however, putting pressure on the need for large-scale infrastructure development in developing Africa because of the hiatus between planning and population growth. This study revealed that city authorities of the cities and towns studied have commoditised urban spaces along main arterial routes through formal registration of the Container structure for economic activities with no considerations for infrastructure and essential utilities such as water and sanitary facilities; as well as no recourse to cities' physical layout in most

cases. The study, again, revealed that registered Containers pay tolls to the city authorities (Tables 11 and 12). The amount paid for registered Container structures mainly ranged from Gh₵ 50 (49.6%) to Gh₵ 100 (35.1%) per month. The remaining respondents paid Gh₵ 100 to 150 (7.4%), Gh₵ 150-200 (4.9%), Gh₵200-300 (2.2%) and above Gh₵ 300 (0.8%). The city authorities in Kumasi confirmed the foregoing and added that containers located on site considered "prime" pay more. The materials used for the construction of the containers are apparently not controlled for sustainable building designs and construction.

Table 11: Registry by City Authorities

	Frequency	**Percent**	**Cumulative %**
Yes	493	89.6	89.6
No	35	6.4	95.9
Not Aware	23	4.1	100
Total	**550**	**100**	

Source: Authors' Field Survey, 2015.

Table 12: Do you pay money to the City Authorities or any other?

	Frequency	**Percent**	**Cumulative %**
Yes	514	93.5	93.5
No	20	3.6	97.1
Not Aware	16	2.9	100
Total	**550**	**100**	

Source: Authors' Field Survey, 2015.

Gadgets that were found for permanent keeps in the Containers surveyed included: Kitchen Appliances (electric/gas stove, deep freezer/fridge, kettle, electric blender, microwave or toaster, etc. (27.5%); Living Area Appliances (Television, radio/stereo set, etc.) (14.4%); Both Kitchen and Living area Appliances (17.8%); None of Appliances (32.2%); Office equipment (computers, photocopy machines, printers, etc) (4.9%) and other (Sewing equipment) (3.2%). Even though, electrical appliances were found in the Containers, 526 respondents representing whooping 95.6 percent did not have fire extinguishers (Table 13); in spite of the rampant fire outbreaks in the commercial setups in Ghana in recent times.

Table 13: Do you have fire extinguisher in the Container?

	Frequency	**Percent**	**Cumulative %**
Yes	22	4	4
No	526	95.6	99.6
Not Sure	2	0.4	100
Total	**550**	**100**	

Source: Authors' Field Survey, 2015.

4. Recommendations and Conclusions

Perhaps, this is a novel research in Ghana with results obtained through mixed methodology. The study observed amongst others that the design of the container structures is not based on standards and yet they have taken advantage of frontages of buildings along arterial streets within the cities. Therefore, the following recommendations are put forward to address the design challenges: (i) the Departments of Architecture, Planning

and the Mechanical Engineering of Kwame Nkrumah University of Science & Technology, Kumasi-Ghana should collaborate on a prototype Container designs that can be integrated into streetscapes of Ghanaian cities and; (ii) Container structures should be designed based on the principles of prefabrication and ephemeralization for easy demountability, mobility and assemblage.

Following the above, this paper concludes that containerization processes in Ghanaian cities have been commoditised by city authorities where the container structures are officially registered for daily collection of fees/taxes without making containerization processes as part of the overall regional/national planning and physical development strategies. Again, The literacy level of the container users varied from basic through technical to the university level: more than half of the container users had high school education (either Junior or Secondary High school) representing 65.4% with up to 15.7% attaining the tertiary level. That hints on the perceived high unemployment in Ghana. This paper is of the view that the findings of this research is likely to contribute to the body of knowledge to address the problem of haphazard citing of registered and certified Container structures in Ghanaian cities and the sub-Saharan Africa cities in general where urbanization is a daily occurrence due to population growth.

Acknowledgements

Authors are particularly grateful to the following: Patrick Azoeya Anyedina, Prince Osei Tutu, Emmanuel Owusu Banahene, Gregory Mbawine Lamusah, Andrews Amon Kotei, Omar Afful -2014/2015 Master of Architecture students of the Department of Architecture in the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi for their assistance in the data collection exercise. Miss Ayisah Ida Haruna - a Teaching Assistant of Department of Architecture (KNUST), assisted in the data collection in Tema in the Greater Accra of Ghana and single-handedly did SPSS data inputting for analysis in this paper.

References

Abrasheva, G.; Senk, D. and Häubling, R. (2012). "Shipping containers for a sustainable habitat perspective", *Revue de Métallurgie*, Vol. 109 Issue 5, pp.381-389.

Amin, A. M. (2012). "Sustainable Urban Landscape: An Approach for Assessing and Appropriating Indicators. *ArchNet-IJAR,* Vol. 6 Issue 2, pp.101-117.

Cavanah, J. Z. (2012). "Dangerous Goods Liability in the Age of Containerization-- WARNING: This Comment May (or May Not) Self-Destruct", Tulane *Maritime Law Journal,* Vol. 37 Issue 1, pp.147-173.

Cities Alliance (2013). "Knowledge Platform- Urbanisation", Policy brief prepared for the World Bank. [Accessed 21November 2015].

Cowen, A. (2010). "Shelter as container for healthy human development", *Journal of Integral Theory and Practice,* 5(3):102-117.

Frampton, K. (2001): *Le Corbusier,* Thames and Hudson Inc., London, p.67.

Fuller, R. B. (1981). *Critical Path*, London: Hutchinson & Co. Publishers Ltd.

Fuller, R. Buckminster (1938). *Nine Chains to the Moon: An Adventure Story of Thought* (First Ed.), Philadelphia: Lippincott.

Ghana Statistical Service (2008). Ghana Living Standards Survey: Report of the Fifth Round, Ghana Statistical Service, Accra.

Grose, T. K. (2008). "Contain Yourself", *Time International (South Pacific Edition)*, Issue 6, pp.63-63.

Guerrero, D. (2014). "Deep-sea hinterlands: Some empirical evidence of the spatial impact of containerization", *Journal of Transport Geography,* Vol. 35, pp.84-94, DOI: 10.1016/j.jtrangeo.2014.01.010.

Guerrero, D. and Rodrigue, J-P. (2014). "The waves of containerization: shifts in global maritime transportation", *Journal of Transport Geography,* Volume 34 Issue 1, pp.151-164. DOI: 10.1016/j.jtrangeo.2013.12.00.

Homer, P. (2008). "Mobile data services usage - a methodological research approach", Communications *of the IBIMA*, Volume 1.pp. 118-127.

Jao, C. (2014). "Local flavor", *Entrepreneur,* Vol. 42 Issue 8, pp.22-23.

Kihato, M. (2012). Infrastructure and Housing Finance: Exploring the Issues in Africa. Centre for Affordable

Housing Finance in Arica.

King, R. and Sumbo, D. K. (2015). "Implications of Compulsory acquisition and compensations in Ghana: A case study of land acquisition for Suame-Buoho road reconstruction in Kumasi", *Journal of Science and Technology,* Vol. 35, No. 2, pp.100-113.

Kronenburg, R. (2001). *Portable Architecture – Design and Technology*, Basel: Berkhäuser Verlag AG, pp. 10, 14.

Madigan, D. (2012). "Prefabricated Housing and the implications for Personal Connection", in: 18th Annual Pacific-Rion Real Estate Society Conference, Adelaide, Australia, 15-18 January, 2012.

Nelson, L. P. (2011). "The architectures of black identity: buildings, slavery, and freedom in the Caribbean and the American South", *Winterthur Portfolio,* Volume 45 Issue: 2/3 pp.177-193.

Parker, M. (2013). "Containerisation: Moving Things and Boxing Ideas containers can contain anything", *Mobilities,* Vol. 8, No. 3, pp. 368-387.

Powell, K. (2006). "Container architecture", *The Architects' Journal*, Volume: 223 Issue: 20, pp.27-37.

Prussin, P. (1987). "Gabra Containers", *African Arts,* Vol. 20, No. 2, pp. 36-45+81-82, UCLA James S. Coleman African Studies Center, http://www.jstor.org/stable/3336600.

Qin, H.; Zhang, Z.; Lim, A.; Qi, Z. (2014). "The freight consolidation and containerization problem", European Journal of Operational Research, Vol. 234, No.1, pp.37-48.

Reid, T. (1983). "Essays on the Intellectual Powers of Man" in: Epistemology Contemporary Readings, Michael Huemer (ed.), with an introduction by Robert Audi pp. 131-141, Routledge Taylor and Francis Group, London and New York, 2002.

Sadler, S. (2005). *Archigram: Architecture without Architecture,* Massachusetts: The MIT Press, p.106.

Vijayalaxmi, J. (2010). "Towards sustainable architecture-a case with Greentainer", *Local Environment*, Vol. 15 Issue 3, pp.245-259.

Ward, D. (2013). "The Space of Poetry: Inhabiting Form in the Ghazal", *Canadian Journal of the Humanities,* Volume 82, No.1, pp. 62-71.