Parking Lot Maneuverability Analysis

THE CITY OF KEY WEST
Post Office Box 1409 Key West, FL 33041-1409 (305) 809-3700

MAY 1 6 2010
MONROE COUNTY

To: Amy Kimball-Murley, City of Key West; Planning Director

From: Gary W. Bowman, City of Key West; Director of Engineering

Date: May 13, 2010 (revised May 18, 2010)

Reference: 512 Greene Street
Vehicular Maneuverability Observation Report

The City of Key West conducted a site visit on May 13, 2010; the purpose was to observe the ability of compact automobiles to operate safely within a given parking configuration that is not described in Key West Code Section 108-941. The following information shall include observation statements of the Engineering Director for the City of Key West in regards to the above mentioned project.

By Definition:

Current compact car size, for US and international models respectively, is approximately 4,100 mm (161 in) and 4,450 mm (175 in) long for hatchbacks, or 4,400 mm (173 in) and 4,750 mm (187 in) long for convertibles, sedans (saloon) or station wagons (estate car). Multi-purpose vehicles and sport utility vehicles based on small family cars (often called compact MPVs and compact SUVs) have similar sizes, ranging from 4,200 mm (165 in) to 4,500 mm (177 in) in the U.S., and from 4,400 mm (173 in) to 4,700 mm (185 in) in international-based models.

Site Conditions:

Compact Parking Spaces were configured as 9'6" by 15' providing for 23'3" of an isle for maneuvering in and out of the designed parking spaces. Also in the parking area, there is a sidewalk installed, that runs parallel to the parking isle. The compact car was able to maneuver into the parking spaces without multiple stops and adjustments.

Conclusions:

Backing the vehicle out to exit the parking lot, provided no concerns and the vehicle did not breach the vertical plain of the adjacent sidewalk, therefore based on compact car being used there are no concerns as to maneuverability with the parking lot configured as during the observation process conducted on this date. Therefore, staff recommends that the City Commission approve the proposed reduced aisle width and

parking stall sizes. Staff recommends the installation of a "Stop Sign", "No Right Turn" and signage indicating "Parking for Compact Cars Only".

MEMORANDUM

TREPANIER
&ASSOCIATES INC
LAND USE PLANNING
DEVELOPMENT CONSULTANTS

PLANNING DEPT.
MAY 1 1 2010
MONROE COUNTY

Date: 5/5/2010

To: Owen Trepanier

From: Mehdi Benkhatar

Re: **512 Greene Street - Parking Lot Standards**

This memo analyzes the parking standards of Ramsey & Sleeper's *Architectural Graphic Standards* as they relate to the City of Key West's own standards with special attention to parking lot aisle-widths. The memo then applies the analysis and methodology of Ramsey & Sleeper to the Key West LDRs as they relate to the proposed modifications to 512 Greene Street.

The LDRs anticipate modifications to parking lot standards and lay out a process for evaluation. The LDRs call for the City Commission to evaluate modifications using the Ramsey & Sleeper *Architectural Graphic Standards* as a guide. This analysis compares the City's standards with those of Ramsey & Sleeper and draws conclusions based on the results. Our analysis revealed that the proposed aisle widths at 512 Greene Street conform to the standard *space width : aisle width* and *space length : aisle width* ratios of the Key West Code using the Ramsey & Sleeper standards as a guide.

The City of Key West has standard aisle widths for parking lots. The widths are based on a standard parking space of 9ft x 18ft accommodating a standard size automobile. The LDRs also anticipate the use of compact spaces for smaller cars requiring a space of only 7.5ft x 15ft. The LDRs do not layout aisle widths for compact car spaces. Space widths and aisle widths are proportional to each other. That is parking space widths and lengths, and aisle widths are a function of the vehicle size and turning radii. Put simply, smaller cars need smaller spaces and smaller aisle widths.

ANALYSIS:

Ramsey & Sleeper Methodology:

> According to Ramsey & Sleeper[1], a 9ft x 18ft wide parking space (i.e. standard car) configured at a 90-degree angle from the aisle requires a 30ft wide aisle.
>
> An 8ft x 15ft wide parking space (i.e. compact car) configured at a 90-degree angle from the aisle requires a 26ft wide aisle.
>
> Ramsey & Sleeper parking space width: aisle width ratio is as follows:

[1] Please see attachment.

Standard Car Space Width : Aisle Width ratio: 0.30
Compact Car Space Width: Aisle Width ratio: 0.30

Ramsey & Sleeper parking space length : aisle width ratio is as follows:

Standard Car Space length : Aisle Width ratio: 0.60
Compact Car Space length: Aisle Width ratio: 0.60

Key West LDR parking space width: aisle width ratio is as follows:

Standard Car Space Width: Aisle Width ratio: 0.38

Key West LDR parking space length: aisle width ratio is as follows:

Standard Car Space length: Aisle Width ratio: 0.80

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The above analysis reveals that the Key West standards follow[2] the Ramsey & Sleeper rationale for a *parking space width : aisle width* and *parking space length : aisle width* ratios, though the Key West ratios are larger[3].

Key West Compact Car Aisle Width

Unlike Ramsey & Sleeper, Key West does not layout aisle widths for compact spaces, however, using Ramsey & Sleeper as a guide and applying the Key West ratios calculated above, we can calculate both the standard aisle widths for compact cars and test the conclusion by applying both the Witdh : Width ratio and the Length : Width ratio. If the methodology is correct the aisle widths of both calculations should be same.

KW Space Width : Aisle Width Ratio: 0.38

Compact space is 7.5ft wide therefore using the Width to Width ratio we find: 7.5ft / 0.40 = **19ft**

Thus the aisle width required for a compact car space 7.5ft wide must be at least **19ft wide**

KW Space Length : Aisle Width Ratio: 0.80

Compact space is 15ft long therefore using the Length to Width ratio we find: 15ft / 0.80 = **19ft**

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[2] It is not uncommon to customize parking standards from the Ramsey & Sleeper guidelines: Key West, along with the city of Marathon, Monroe County, and City of Miami all have particular guidelines. Additionally, the latest version of SmartCode encourages *not* requiring additional parking for existing buildings which have been rehabilitated or restored. (See sections 4.6.6 and 5.2.6 in SmartCode version 9.2)

[3] The difference is easily understood when we consider Ramsey-Sleeper is a nation-wide standard where the norm is likely sub-urban environments with less constricted spaces than found in traditional neighborhood developments such as historic Key West.

Thus the aisle width required for a compact car space 15ft long must be at least **19ft wide**

Greene Street Proposed Aisle Widths

When we apply the above standards to the proposed parking lot layout at 512 Greene Street we find that proposed aisle width is greater than that required when using the Ramsey & Sleeper methodology and applying it to the Key West standards. The minimum aisle width for an 8.5ft x 15ft parking space is 18.75ft. The proposed plan provides for both wider spaces and a wider aisle. The plans provide for a 9.5ft wide parking spaces and a 21.3ft aisle width.

CONCLUSIONS:

Using Ramsey & Sleeper as a guide and applying the existing LDR Width to Width and Length to Width ratios we are able to determine the minimum aisle width required for a compact car parking lot. In this case we found a compact space of 7.5ft x 15ft requires an aisle width of 18.75ft. The Greene Street project provides a 21.3ft wide aisle therefore exceeding the minimum requirement. In addition the Greene Street project provides for a much wider space than necessary, which provide even greater maneuverability than required under the code. The Greene Street project meets the minimum requirements for aisle widths for the compact spaces.

RECOMMENDATIONS:

Following Ramsey & Sleeper, I recommend the parking lot be properly signed to allow compact cars only. While the lot can accommodate a larger vehicle, Ramsey & Sleeper recommends lots designed under the compact car methodology are restricted to compact cars.

THE AMERICAN INSTITUTE OF ARCHITECTS

RAMSEY/SLEEPER

ARCHITECTURAL GRAPHIC STANDARDS

SEVENTH EDITION

ROBERT T. PACKARD, AIA
EDITOR

MAY 1 1 2010

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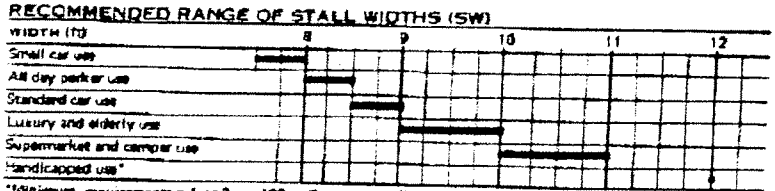
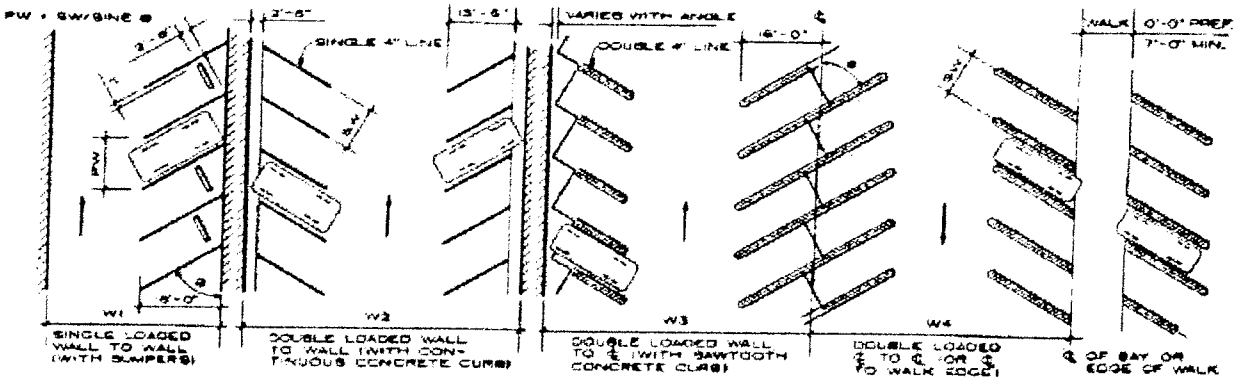
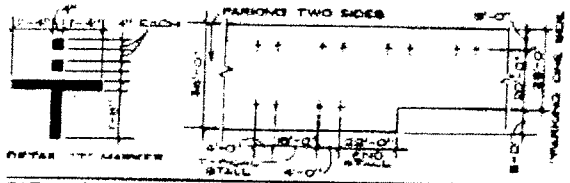
NOTE: Small car dimensions should be used only in lots designated for small cars or with entrance controls that admit only small cars. Placing small car stalls into a standard car layout is not recommended. Standard car parking dimensions will accommodate all normal passenger vehicles. Large car parking dimensions make parking easier and faster and are recommended for luxury, a high turnover, and use by the elderly. When the parking angle is 90° or less, it may be necessary to add 3 to 6 ft to the bay width to provide aisle space for pedestrians walking to and from their parked cars. Local zoning laws should be reviewed before proceeding.

RECOMMENDED RANGE OF STALL WIDTHS (SW)



*Minimum requirements = 1 or 2 per 100 stalls or as specified by local, state, or federal law; place convenient to destination.





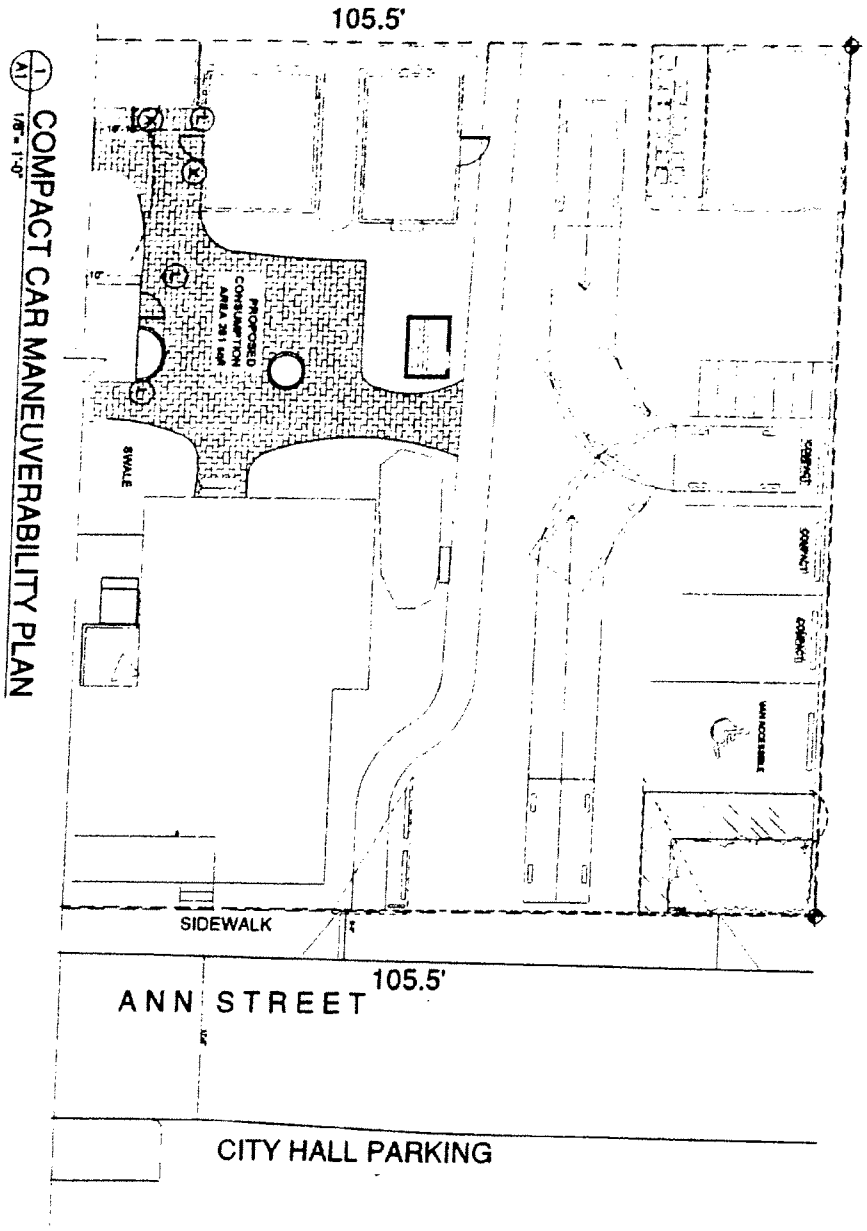
PARALLEL PARKING STALLS AND "T" MARKER DETAIL

PARKING DIMENSIONS IN FEET AND INCHES

	SW	W	ANGLE OF PARK 45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
Group I: small cars	8'-0"	1	25'-9"	26'-8"	27'-2"	28'-4"	31'-8"	34'-0"	36'-2"	38'-2"	40'-0"	41'-8"
		2	40'-10"	42'-0"	43'-1"	45'-8"	48'-2"	50'-6"	52'-7"	54'-4"	55'-11"	57'-2"
		3	38'-9"	40'-2"	41'-5"	44'-2"	47'-0"	49'-6"	51'-10"	53'-10"	55'-8"	57'-2"
		4	36'-8"	38'-3"	39'-8"	42'-9"	45'-9"	48'-6"	51'-1"	53'-4"	55'-5"	57'-2"
Group II: standard cars	8'-6"	1	32'-0"	32'-11"	34'-2"	36'-2"	38'-5"	41'-0"	43'-6"	45'-8"	46'-11"	48'-0"
		2	49'-10"	51'-9"	53'-10"	56'-0"	58'-4"	60'-2"	62'-0"	63'-6"	64'-9"	66'-0"
		3	47'-8"	49'-4"	51'-6"	54'-0"	56'-6"	59'-0"	61'-2"	63'-0"	64'-6"	66'-0"
		4	45'-7"	46'-10"	49'-0"	51'-8"	54'-8"	57'-10"	60'-0"	62'-6"	64'-3"	66'-0"
	9'-0"	1	32'-0"	32'-9"	34'-0"	35'-4"	37'-6"	39'-8"	42'-0"	44'-4"	46'-3"	48'-0"
		2	49'-4"	51'-0"	53'-2"	55'-8"	57'-10"	60'-0"	61'-10"	63'-4"	64'-9"	66'-0"
		3	48'-4"	48'-10"	51'-4"	53'-10"	56'-0"	58'-6"	61'-0"	63'-0"	64'-6"	66'-0"
		4	44'-8"	46'-6"	49'-0"	51'-6"	54'-0"	57'-0"	59'-8"	62'-0"	64'-2"	66'-0"
	9'-6"	1	32'-0"	32'-8"	34'-0"	35'-0"	36'-10"	38'-10"	41'-6"	43'-8"	46'-0"	48'-0"
		2	49'-2"	50'-6"	51'-10"	53'-8"	55'-4"	58'-0"	60'-6"	62'-8"	64'-6"	66'-11"
		3	47'-0"	48'-2"	49'-10"	51'-6"	53'-11"	57'-0"	59'-8"	62'-0"	64'-3"	66'-11"
		4	44'-8"	45'-10"	47'-6"	49'-10"	52'-8"	55'-9"	58'-9"	61'-6"	63'-10"	66'-11"
Group III: large cars	9'-0"	1	32'-7"	33'-0"	34'-0"	35'-11"	38'-3"	40'-11"	43'-8"	45'-5"	46'-9"	48'-0"
		2	50'-2"	51'-2"	53'-3"	55'-4"	58'-0"	60'-4"	62'-9"	64'-3"	65'-6"	66'-0"
		3	47'-9"	49'-1"	52'-3"	53'-8"	56'-2"	59'-2"	61'-11"	63'-9"	65'-2"	66'-0"
		4	45'-5"	46'-11"	49'-0"	51'-8"	54'-9"	58'-0"	61'-0"	63'-2"	64'-10"	66'-0"
	9'-6"	1	32'-4"	33'-8"	33'-10"	34'-11"	37'-2"	39'-11"	42'-8"	45'-0"	46'-8"	48'-0"
		2	49'-11"	50'-11"	52'-2"	54'-0"	56'-8"	59'-3"	61'-9"	63'-4"	64'-6"	66'-0"
		3	47'-7"	48'-9"	50'-2"	52'-4"	55'-1"	58'-4"	60'-11"	62'-10"	64'-6"	66'-0"
		4	45'-3"	46'-8"	48'-5"	50'-8"	53'-9"	57'-0"	59'-10"	62'-2"	64'-1"	66'-0"
	10'-0"	1	32'-4"	32'-8"	33'-10"	34'-11"	37'-2"	39'-11"	42'-5"	45'-0"	46'-6"	48'-0"
		2	49'-11"	50'-11"	52'-2"	54'-0"	56'-8"	59'-3"	61'-9"	63'-4"	64'-6"	66'-0"
		3	47'-7"	48'-9"	50'-2"	52'-4"	55'-1"	58'-4"	60'-11"	62'-10"	64'-6"	66'-0"
		4	45'-3"	46'-8"	48'-5"	50'-8"	53'-8"	57'-0"	59'-10"	62'-2"	64'-1"	66'-0"

NOTE: ⊕ angles greater than 70° have aisle widths wide enough for two-way travel.

William T. Mahan, AIA, Santa Barbara, California



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MAY 11 2010

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