

**APPENDIX C
METRIC
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SECTION C-1-DESIGN FEATURES

SAFETY REST AREAS

Design guides for safety rest areas are shown on Figure C-1-5M and Figure C-1-6M. Rest areas along the roadways are functional and desirable elements on heavily traveled roads and on those carrying recreational traffic. They are a part of the complete highway development provided for the safety and convenience of the roadway users. The design and location of rest areas depends much on the character and volume of traffic, type of highway and adjacent land use and should consider the scenic quality of the area, accessibility and adaptability to development. Other essential considerations include an adequate source of water and a means to treat and/or properly dispose of sewage. Site plans should be developed by the use of a comprehensive site planning process that should include the location of ramps, parking areas, buildings, picnic areas, water supply, sewage treatment facilities and maintenance areas. The objective is to give maximum weight to the appropriateness of the site rather than adherence to constant distance or driving time between sites.

Principles of ramp terminal design apply generally at the points of access to or from these areas. The designer is to refer to [IIM LD- 20](#) in the design of ramp terminal and speed change lane criteria. Figures C-1-4M and C-1-7M are to be used as guides for the selection of the parking space arrangement for cars and trucks. Parking spaces and access aisles shall be designed with surface slopes not to exceed 1:50 (2%) in all directions.

PARKING SPACES

Where parking spaces are provided, accessible spaces for persons with mobility impairments should comply with the following table:

Total Parking in Lot	Required Minimum Number Accessible Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
51 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1000	2 percent of total
1001 and over	20 plus 1 for each 100 over 1000

Source: The most recent Americans with Disabilities Act Accessibility Guidelines (ADAAG).

Perpendicular or Angled Parking Spaces

Perpendicular or angled parking spaces that require backing maneuvers within state highway right-of-way shall not be permitted. All off-street parking areas must include on-site maneuvering areas and aisles to permit vehicles to enter and exit the site in forward drive without hesitation.*

Accessible parking spaces shall be at least 2.4 m wide. Access aisles adjacent to accessible spaces shall be 2.4 m wide minimum and shall be provided at street level the full length of the parking space and shall connect to a pedestrian access route serving the space. Access aisles shall be marked so as to discourage parking in them. Two accessible parking spaces may share a common access aisle (See Figure C-1-3M).

The "Universal Parking Space Design" is an acceptable alternative to providing a percentage of spaces with a 1.5 m wide aisle. Under this design all accessible spaces are a minimum of 3.3 m wide with 1.5 m wide access aisles. Since all spaces using this design are van accessible, no additional signage is needed to denote which spaces will accommodate vans. This design allows vehicles to park to one side or the other within the 3.3 m space.

Accessible parking spaces for persons with mobility impairments are to be located and designed to provide the shortest possible route to rest area facilities. If there are curbs between the access aisle and parking perimeter, then curb cut ramps, Standard CG-12, are to be provided. The Location and Design Traffic Engineering Section should be contacted to coordinate the signing and placement of curb cuts. Figure C-1-3M is to be used to provide ample space for the Accessible Parking And Passenger Loading Zones.

* Rev. 7/10

Parked vehicle overhangs shall not reduce the clear width of an accessible route (overhang distance 0.6 m). Accessible parking spaces shall be designated as reserved by a sign showing the symbol of accessibility. Van accessible spaces shall have an additional sign "Van-Accessible" mounted below the symbol of accessibility. Such signs shall be located so they cannot be obscured by a vehicle parked in the space. Provide minimum vertical clearance of 2.8 m at accessible passenger loading zones and along at least one vehicle access route to such areas from site entrance(s) and exit(s).

Parallel Parking Spaces in Central Business Districts (CBD) and Traditional Neighborhood Development (TND) Where Parking Spaces are Stripped and Signed.*

Where the width of the adjacent walkway is 4.3 m or greater an access aisle at least 1.5 m wide shall be provided at street level the full length of the parking space. The access aisle shall connect to a pedestrian access route serving the space. The access aisle shall not encroach on the vehicular travel lane. See Figure C-1-1M.

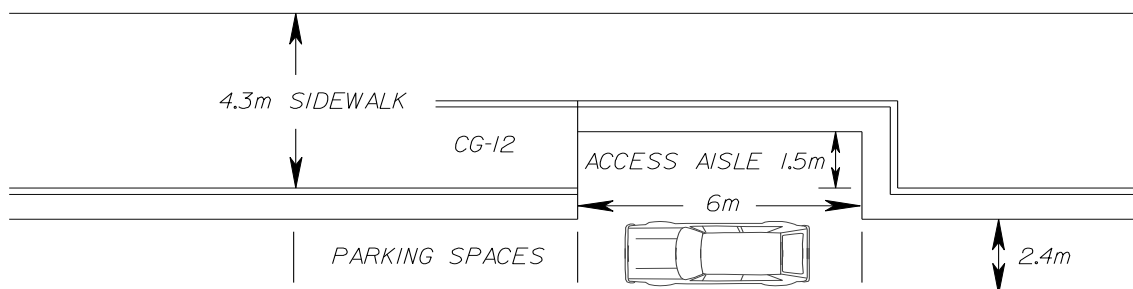


FIGURE C-1-1M DESIGNS FOR PARALLEL PARKING SPACES

EXCEPTION: An access aisle is not required where the width of the sidewalk between the extension of the normal curb and boundary of the public right-of-way is less than 4.2 m. When an access aisle is not provided, the accessible (handicapped) parking space shall be located at the end of the block closest to the CG-12 curb ramp at the street crossing. See Figure C-1-2M.

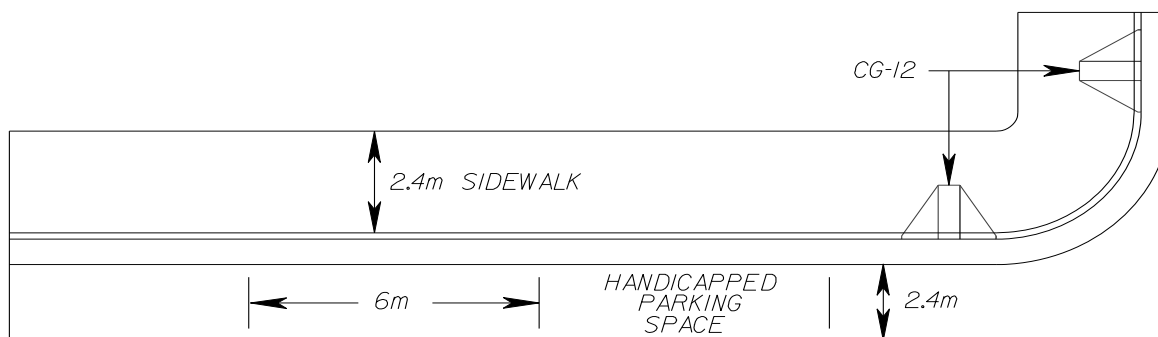


FIGURE C-1-2M DESIGNS FOR PARALLEL PARKING SPACES EXCEPTION

ACCESSIBLE PARKING AND PASSENGER LOADING ZONES

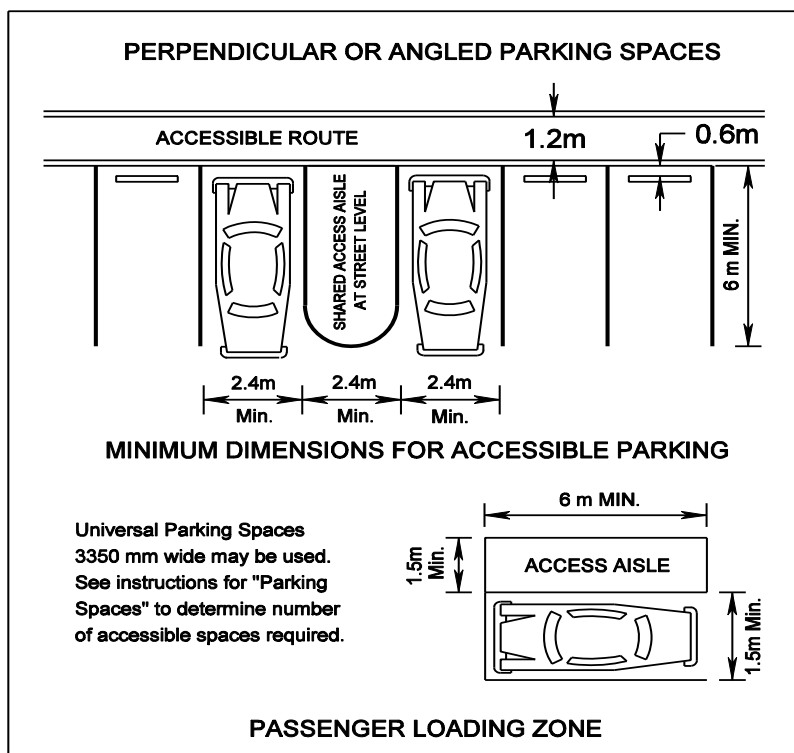


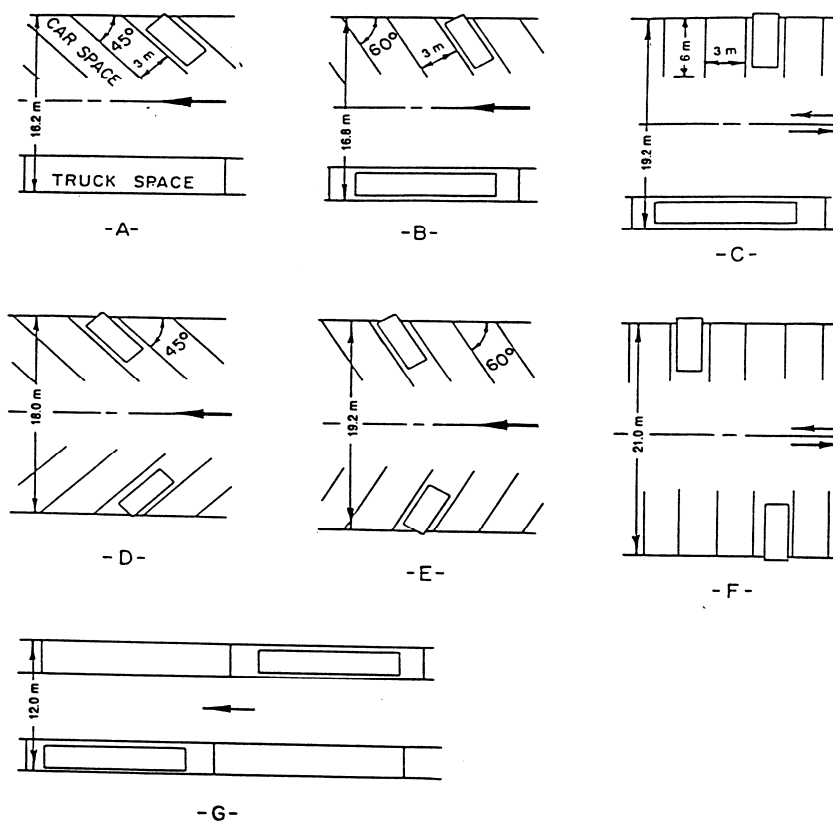
FIGURE C-1-3M ACCESSIBLE PARKING AND LOADING ZONES

Source: The most recent Americans with Disabilities Act Accessibility Guidelines (ADAAG).

PASSENGER LOADING ZONES: Passenger loading zones shall provide a vehicular pull-up space 2.4 m wide minimum and 6 m long minimum. The access aisle serving the vehicle pull-up space shall be 1.5 m wide minimum and adjoin a pedestrian route and shall not overlap the vehicular way. Access aisles shall be marked so as to discourage parking in them.*

NOTES:

LOCATION: Parking spaces for persons with mobility impairments and accessible passenger loading zones that serve a particular building shall be located on the shortest possible accessible circulation route to an accessible entrance of the building. In separate parking structures or lots that do not serve a particular building, accessible parking spaces shall be located on the shortest possible circulation route to an accessible pedestrian entrance of the parking facility.



SUMMARY OF PARKING SPACE ARRANGEMENTS

Central Roadway	Type of Vehicle and Total Width		Number Vehicles Parking Area (meters)	Number Vehicles per 100 meters	
	Left	Right		Left	Right
A One-way	Trucks-parallel	Cars-45 ⁰	16.2	*	23
B One-way	Trucks-parallel	Cars-60 ⁰	16.8	*	28
C Two-way	Trucks-parallel	Cars-90 ⁰	19.2	*	33
D One-way	Cars-45 ⁰	Cars-45 ⁰	18.0	23	23
E One-way	Cars-60 ⁰	Cars-60 ⁰	19.2	28	28
F Two-way	Cars-90 ⁰	Cars-90 ⁰	21.0	33	33
G One-way	Trucks-parallel	Trucks-parallel	12.0	*	*

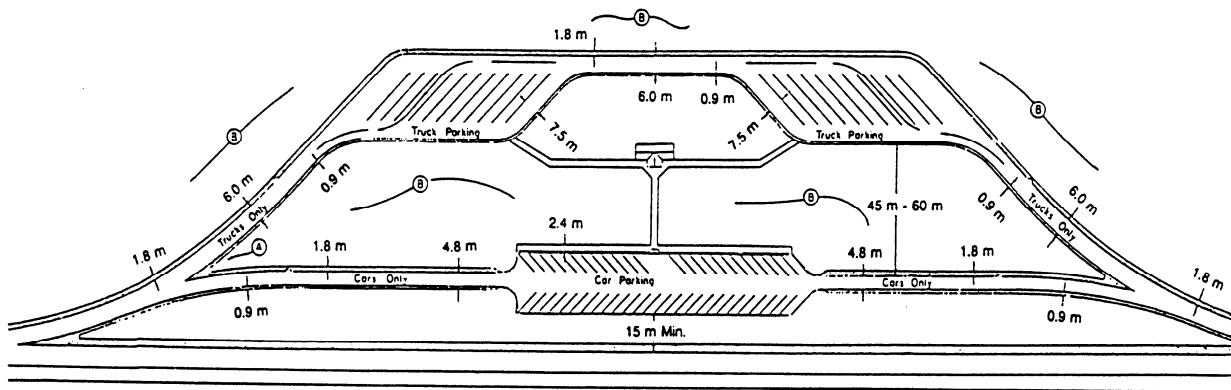
* For a WB-15 Design Vehicle a 20 meter space length is required = 5 spaces per 100 meters
 For a 25 meter Design Vehicle a 30 meter space length is required = 3.3 spaces per 100 meters

DESIGN FOR PARKING SPACES

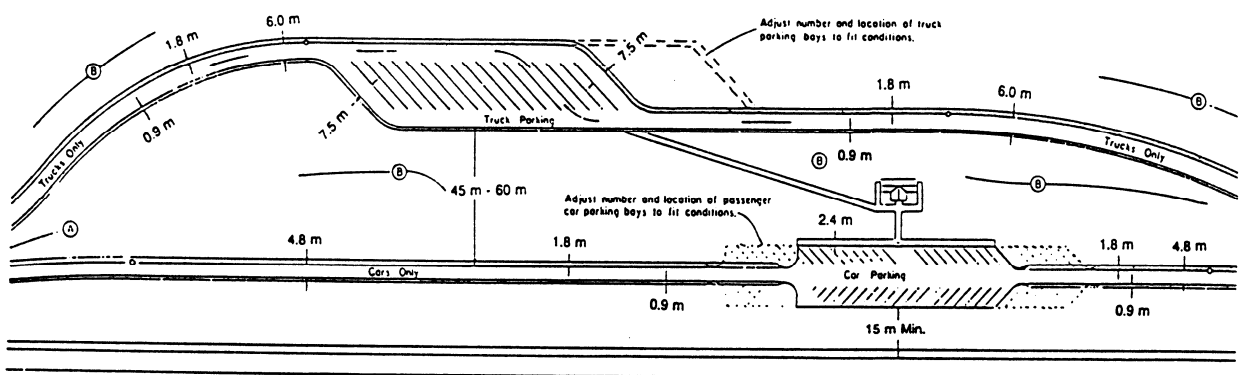
FIGURE C-1-4M

For additional information, see the most recent AASHTO's Guide for the Design of Park-and-ride Facilities.*

EXAMPLE I



EXAMPLE II



A Denotes areas to be cleared, grubbed, graded, topsoiled, and seeded.

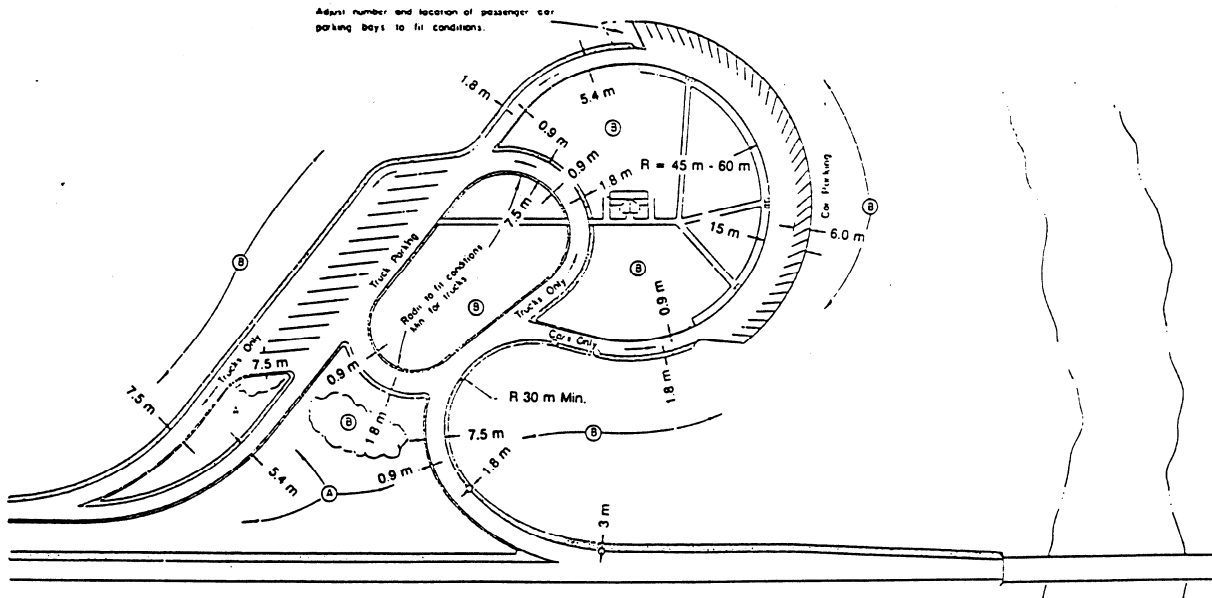
B Denotes areas NOT to be cleared and grubbed except for areas within roadway and parking area construction limits

NOTE: See Figure C-1-12M for additional areas.

DESIGN GUIDE FOR SAFETY REST AREAS

FIGURE C-1-5M

EXAMPLE III



- A Denotes areas to be cleared, grubbed, graded, topsoiled, and seeded.
- B Denotes areas NOT to be cleared and grubbed except for areas within roadway and parking area construction limits

NOTES

Design types are to receive the approval of the Environmental Division.

Individual radii; length of ramps; individual ramp configuration, etc. are to be designed to fit the individual site conditions.

Design and dimensions shown hereon are approximate only.

Well and septic drainage field locations are to be recommended by the District Landscape representative. Testing and approval of soil conditions are to be obtained by the Environmental Division through the appropriate County and State agencies. Additional right of way for drain field should be acquired if necessary.

The proposed right of way limits should be discussed with the Environmental Division after preparation of the plan and grade lines in order that adequate area for required facilities will be obtained.

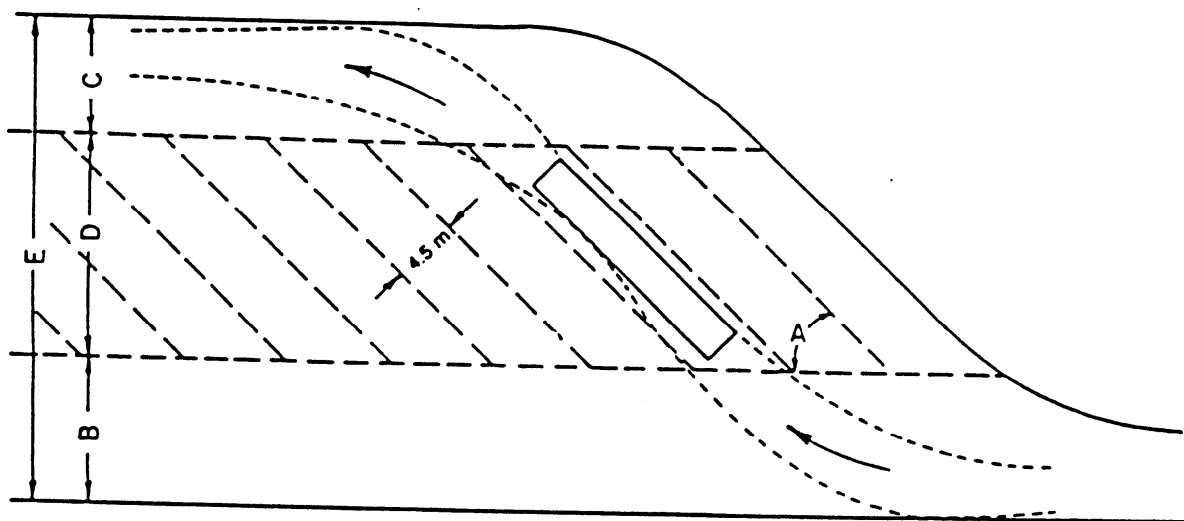
A single line of fence in median is to be specified if opposite rest areas are accessible, or if medians can be readily crossed by pedestrians. This fence should extend between points a minimum of 60 meters (200 feet) beyond ramp noses. Fencing in outer separator may be required because of site requirements.

Perimeter of rest area to be fenced unless otherwise recommended by the field party.

A note similar to the following is to be shown on the rest area detail sheet of all grading and drainage plans:

"No trees or shrub outside the limits of the rest area roadway construction are to be cut without the approval of the Landscape Engineer."

DESIGN GUIDE FOR SAFETY REST AREAS**FIGURE C-1-6M**



LEGEND

- A - ANGLE OF PARKING
- B - ENTRANCE ROADWAY WIDTH
- C - EXIT ROADWAY WIDTH
- D - PARKING WIDTH
- E - TOTAL WIDTH

DIMENSIONS FOR PARKING SPACES

ANGLE OF PARKING (DEGREES)	ENTRANCE ROADWAY WIDTH (METERS)	EXIT ROADWAY WIDTH (METERS)	PARKING WIDTH (METERS)		TOTAL WIDTH PARKING AREA (METERS)		NUMBER OF TRUCKS PARKED (PER HECTARE)	
			16.7 m (WB-15) DESIGN VEHICLE	25 m LENGTH DESIGN VEHICLE	16.7 m (WB-15) DESIGN VEHICLE	25 m LENGTH DESIGN VEHICLE	16.7 m (WB-15) DESIGN VEHICLE	25 m LENGTH DESIGN VEHICLE
A	B	C	D		E			
30	6.0	6.0	12.3	16.5	24.3	28.5	44	38
45	9.0	7.5	15.2	21.0	31.7	37.5	48	41
60	12.0	9.0	16.8	24.0	37.8	45.0	49	42

FIGURE C-1-7M DESIGN FOR ANGLE PARKING OF TRUCKS

For additional information, see the most recent AASHTO's Guide for the Design of Park-and-ride Facilities.*