

Appendix A: Bridge Widths and Clearances

Table of Contents

A1	General	A-3
A2	Bridge Deck Widths	A-6
A3	Vertical And Horizontal Clearances	A-8
A4	References	A-10

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A1 General

- (a) Typical bridge deck details for various one and two lane situations are illustrated in Figure A1.
- (b) The geometric requirements presented in Tables A1, A2, A3, A4, A5 and Figures A1 and A2 apply to State Highways. Any variation from these requirements shall be at the discretion of the Road Controlling Authority.
- (c) Consideration shall be given to providing for cyclists, on the bridge and on the approaches, especially in urban areas. For guidelines on the design and use of cycle facilities refer to the Austroads *Guide to Traffic Engineering Practice* Part 14: Bicycles, 1993⁽¹⁾.
- (d) **Table A1: Traffic Lanes**

Description	Width (L)
The width of traffic lanes for State Highways shall be as specified in the <i>State Highway Control Manual</i> ⁽²⁾ unless specified otherwise by the Road Controlling Authority. Normal good geometric design practice including curve widening criteria should be applied to determine appropriate bridge and approach traffic lane widths.	3.50m (preferred minimum)

(e) **Table A2: Bridge Cross-Section Elements**

Element	Horizontal Dimension
Internal non-rigid traffic barrier (actual dimension governed by barrier system employed).	390 mm (nominal)
External rigid traffic barrier (e) (actual dimension governed by barrier system employed)	350 to 460 mm (nominal)
Footpath width (f): 1. Behind a non-rigid barrier post: (i) Minimum (ii) Preferred 2. All other situations: (i) Minimum (ii) Preferred	 1.00m 1.70m 1.30m 2.00m
Kerb	500 mm (minimum)
Inside face of pedestrian barrier to edge of deck (top fixing)	240 mm (minimum)
Inside face of non-rigid safety barrier to edge of deck (top fixing)	500mm (minimum)

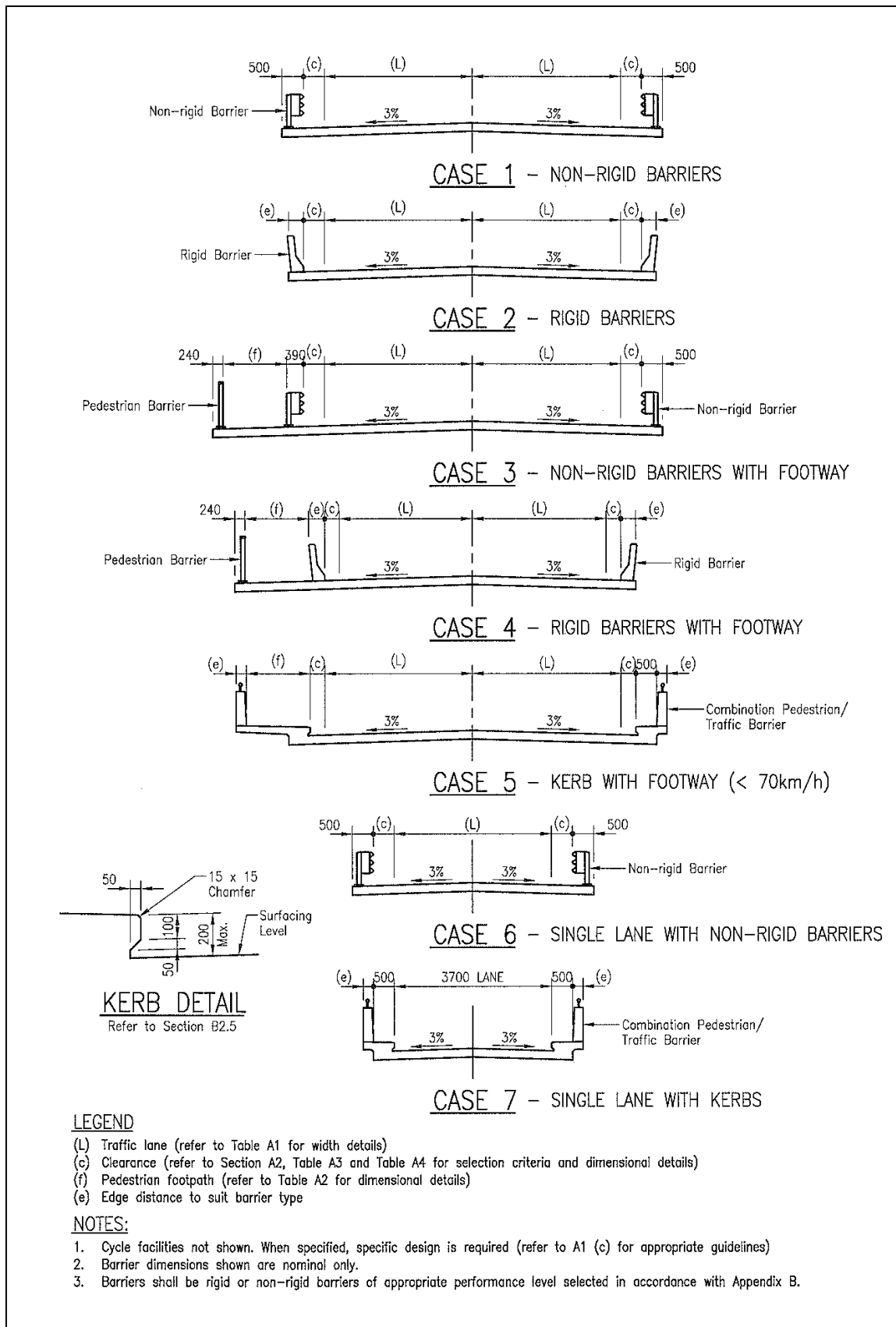


Figure A1: Typical Bridge Deck Details

(f) Table A3: Clearances Between Bridge Kerbs and Adjacent Traffic Lanes

Road Type	Clearance, c
(a) Kerbed approach road	Align bridge kerb with approach road kerb
(b) No approach road kerb	600 mm (minimum)
<u>Note:</u> 1. For cycle facilities refer to A1 (c).	

(g) Table A4: Clearances Between Bridge Safety Barriers and Adjacent Traffic Lanes

Road Type	Clearance, c
(a) Low volume 1 or 2 lane roads (AADT < 500)	600 mm preferred minimum, 300 mm absolute minimum.
(b) Medium volume 2 lane roads: (i) AADT 500 – 2000 (ii) AADT 2000 – 4000	750 mm preferred minimum, 600 mm absolute minimum. 1000 mm preferred minimum, 600 mm absolute minimum.
(c) High volume 2 lane roads (AADT > 4000)	1200 mm preferred minimum, 600 mm absolute minimum.
(d) Divided roads and Motorways	1200 mm preferred minimum, 600 mm absolute minimum.
<u>Notes:</u> 1. Traffic volumes are expected AADT 30 years ahead. 2. Preferred minimum clearances shall apply unless there are compelling reasons to use lesser clearances. Absolute minimum clearances should only be used in extreme conditions, e.g. where it is physically impracticable to provide the normal clearance. 3. For cycle facilities refer to A1(c). 4. Clearances apply to bridge side protection and median barriers. 5. Clearances do not include shy-line requirements to AS/NZS 3845 ⁽³⁾ .	

(h) Notes:

1. Side Protection

The 500 mm distance from the face of a non-rigid traffic barrier is required to accommodate the designed deflection of the barrier under vehicle impact and keep the vehicle wheels on the deck, as described in B8.1. The distance may be reduced to 270 mm for single lane bridges (Case 6), where the slab is sufficiently deep for the barrier posts to be fixed to the side of the deck. This is on the basis that the vehicle angle of attack will usually be smaller due to the restricted width of roadway, resulting in smaller guardrail deflections.

Handrail posts may be fixed to the side of the deck in all cases where the slab is sufficiently deep.

2. Footpath

The need for footpaths on a bridge shall be determined individually according to the pedestrian traffic, generally at scheme plan stage. The normal footpath width shall be between 1.3 m and 2.0 m. A footpath behind a non-rigid barrier may be reduced to be 1.0 m to 1.7 m wide at the posts, on the basis that there is 1.3 m to 2.0 m clearance to the barrier rail.

A2 Bridge Deck Widths

(a) Deck width is the sum of the carriageway width and the individual elements required to make up the desired bridge cross-section. A flowchart to aid in the determination of bridge widths is shown in Figure A3. Bridge carriageway requirements are:

(i) Full Approach Road Carriageway

The full width of the approach traffic lanes and shoulders required for a road carrying the expected AADT 30 years ahead shall be provided across bridges of lengths given in Table A5, except where:

1. The approach road is kerbed or the bridge has a footpath(s), in which case the edge clearance selection criteria A2 (a) (ii) 1 and 2 below shall apply, or
2. The approach road shoulder width is less than the clearance between the barrier and the adjacent traffic lane given in Table A4. In this case the clearance tabulated in Table A4 shall be provided.

Table A5: Length of Bridge Requiring a Full Carriageway Width Deck

Road Type	Bridge Length [m]
Motorway	≤ 75
Divided Road	≤ 30
2-lane road where the expected AADT is:	
> 4000	≤ 30
2000 – 4000	≤ 15
500 – 2000	≤ 9
< 500	≤ 6
<u>Note:</u> Traffic volumes are expected AADT 30 years ahead.	

(ii) All Other Situations

The carriageway width required shall be determined by the minimum traffic lane width given in Table A1 (Note that traffic lanes may need to be widened on curved bridges to accommodate the tracking widths required by large commercial vehicles) and edge clearances selected using the following criteria:

1. Align bridge kerbs with any approach road kerbing;
2. Provide a minimum clearance of 600 mm from the face of a bridge footpath kerb and the edge of the adjacent traffic lane where the approach road is not kerbed;
3. Where there is no kerbing on the approach road and no approach footpath then provide a clearance between a safety barrier and the adjacent traffic lane in accordance with Table A4.

(b) The carriageway widths required for standard, straight, 2 x 3.5 m lane, State Highway bridges, in terms of the traffic volume and bridge length criteria given in A2 (a) (i) and (ii) above, are summarised in Table A6. Note that for AADT < 2,000 vpd, the current standards for carriageway widths may be less than those recommended for bridges widths.

Table A6: 2-Lane State Highway Bridge Carriageway Widths

AADT [vpd]	Bridge Length [m]	Nominal Carriageway Width [m]
>4000	≤30	10.0
	>30	9.4
2000-4000	≤15	10.0
	>15	9.0
500-2000	All	8.5
<500	All	8.2
<p><u>Notes:</u></p> <ol style="list-style-type: none"> 1. Traffic volumes are expected AADT 30 years ahead. 2. Carriageway widths should reflect widening where necessary. 3. For cycle facilities refer to A1 (c). 		

A3 Vertical And Horizontal Clearances

Vertical and horizontal clearances at all overhead obstructions shall conform with Figure A2.

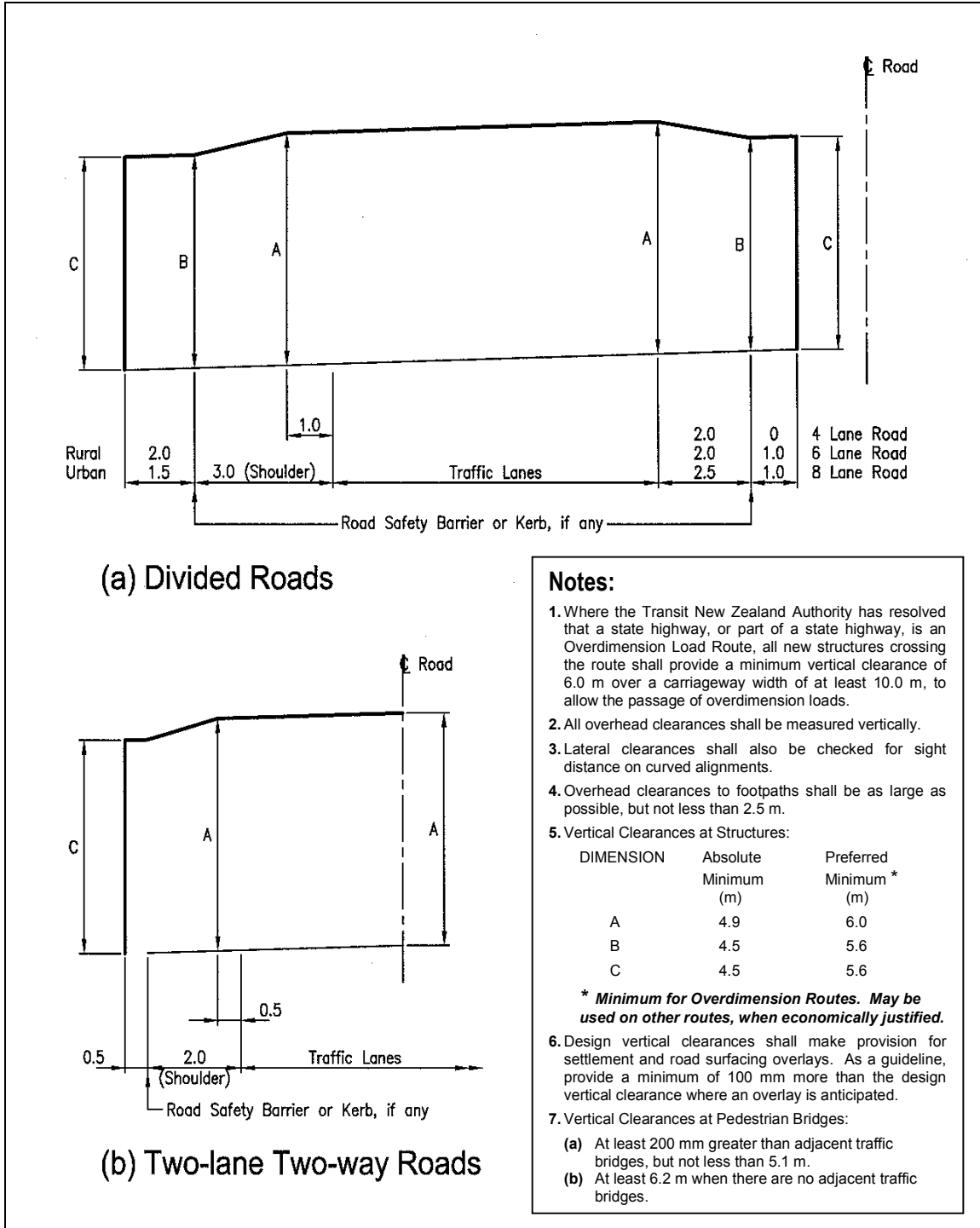


Figure A2: Vertical and Horizontal Clearances

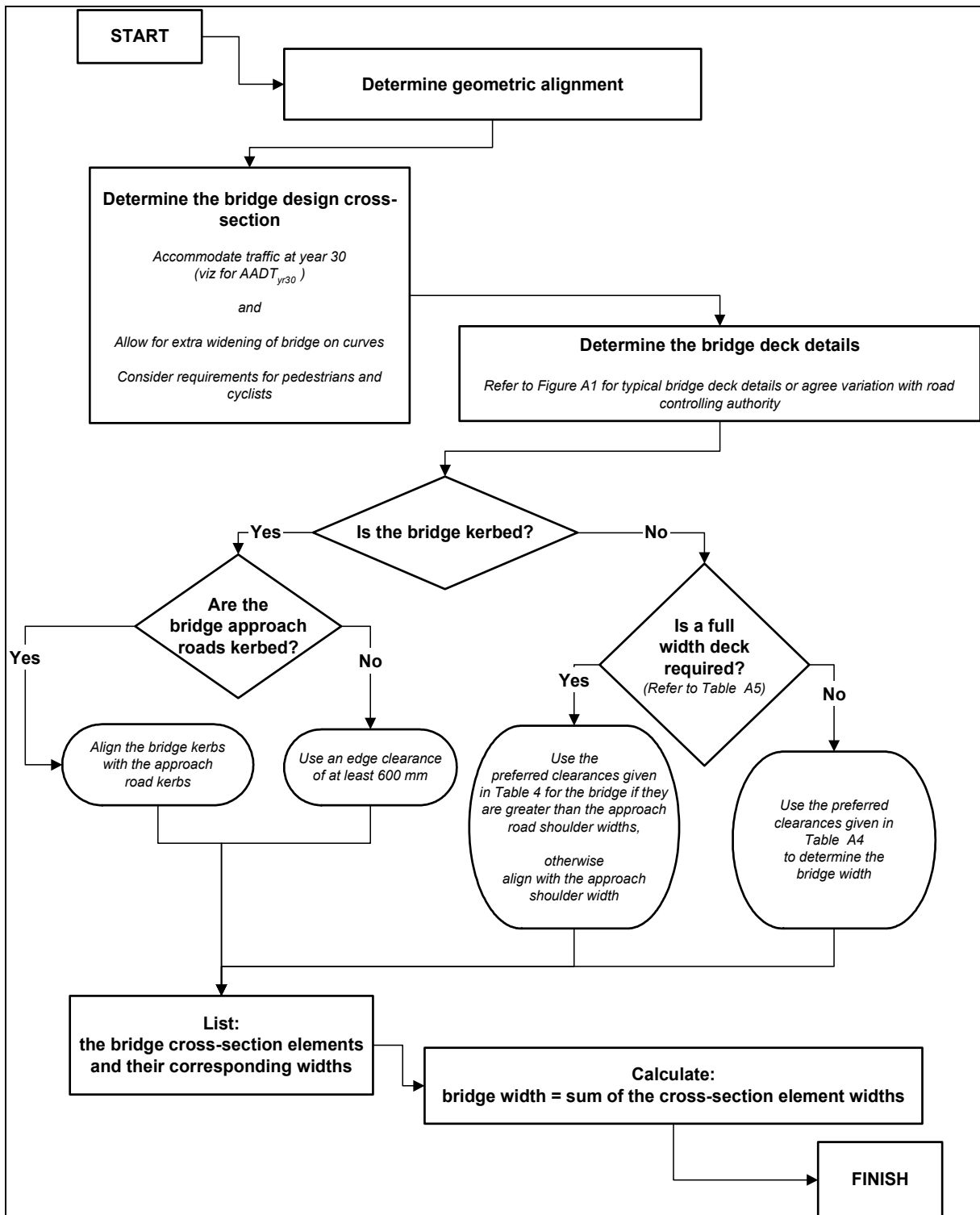


Figure A3: Flow Chart to Determine Bridge Width

A4 **References**

- (1) Austroads, 1999, *Guide to Traffic Engineering Practice – Bicycles*, Part 14, Austroads, Sydney.
- (2) TNZ, 1999, *State Highway Control Manual*, Transit New Zealand, Wellington.
- (3) AS/NZS 3845, 1999, *Road Safety Barrier Systems*, Standards Australia and Standards New Zealand jointly.