

8.4.1.7 Road Structure Data List

name [Road Structure Data List]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	B1		A Sequence of Road Structure Data Records		

8.4.1.7.1 Road Structure Data Record

Records are created according to the number of road structure data records in the basic distribution header.

name [Road Structure Data Record]

No.	offset	Data length	Data type	Item name	Remarks	Classification
1	0	2	B:B:N:B:B:	Road Structure Attribute Header	(1)	a
2	2	2	B:N:N	Distance Information		c
3	4	2	B:N:	Offset Distance		c
4	6	2	B:N:N	Height Information		c
5	8	2	B:B:	Intersection Information		c
6	10	2	D	Offset to the Character String Data	(7)	c

(1) Road Structure Attribute Header

(1) Road Structure Attribute Header					
No.	bit	Description			
1	15 to 12	Classification Code in the type (2)			
2	11 to 10	Link Direction (3)	bit11	bit10	Meaning
			0	0	All directions
			0	1	Forward direction (same as the node record storage order)
			1	0	Backward direction (backward of the node record storage order)
			1	1	Both directions (no direction attribute)
3	9	Distance Information Existence Flag	Bit9	Meaning	
			0	No distance information	
			1	Distance available	
4	8 to 7	Offset Distance Flag (4)	bit8	bit7	Meaning
			0	0	No offset
			0	1	Offset in the forward direction
			1	0	Offset in the backward direction
			1	1	(RESERVED)
5	6	Height Information Existence Flag (5)	bit6	Meaning	
			0	No height information	
			1	Height information available	
6	5	Intersection Information (6)	bit5	Meaning	
			0	No intersection information existence flag	
			1	Intersection information available	
7	4	Character String Data Existence Flag	bit9	Meaning	
			0	No character string data offset information	
			1	Character string data offset information available	
8	3 to 0	(RESERVED)			

(2) Classification Code in the Type

The classification codes in the type have the following meanings:

Values of bits 15 to 12	Meaning
0(16)	Bridge
1(16)	Tunnel
2(16)	Gallery (underground passage)
3(16)	Railroad crossing
4(16)	Overpass 1 (banking)
5(16)	Overpass 2 (bridge)
6(16)	Tollgate
7(16)	Traffic signal
8(16)	Auxiliary sign

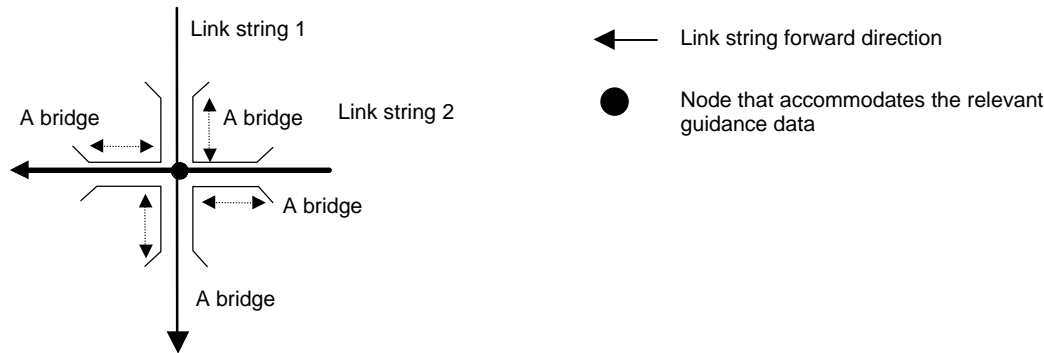
The name of the auxiliary sign is stored as character string data.

(3) Link Direction

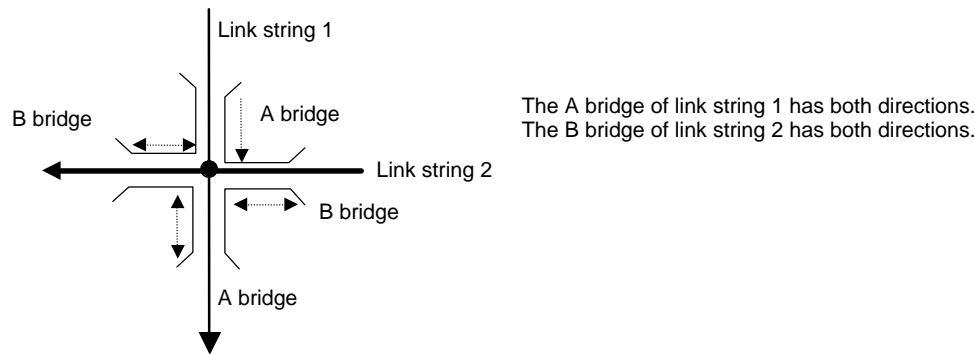
The link direction has the following meaning for the data type:

Data type	Meaning
Road Structure Data	Indicates the link direction that is applicable to the structure setup range.

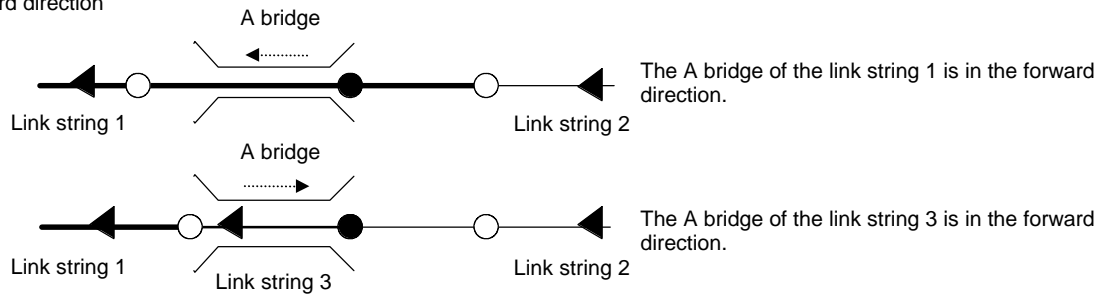
a) All directions



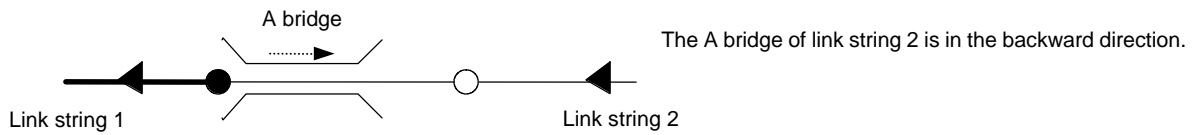
b) Both directions



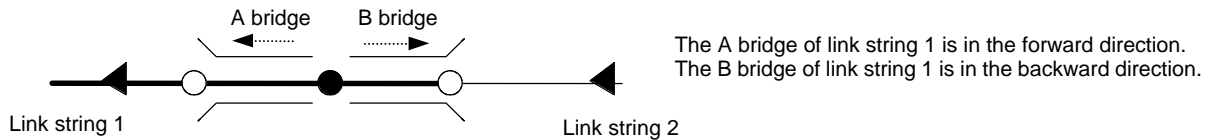
c) Forward direction



d) Backward direction



e) Forward direction and backward direction



(4) Offset Distance Flag

This flag indicates the offset distance e field setting status. For 01(2) and 10(2), two bytes are acquired. For 00(2), the accommodation field does not exist.

(5) Height Information Existence Flag

This flag indicates the height information field setting status. For 1(2), two bytes are acquired. For 0(2), the accommodation field does not exist.

(6) Intersection Information Existence Flag

This flag indicates the intersection information field setting status. For 1(2), two bytes are acquired. For 0(2), the accommodation field does not exist.

(7) Offset to the Character String Data

This field exists when the character string data existence flag indicates that the character string data offset information is available. It indicates the storage location of the character string data record corresponding to the relevant road structure data record. It represents the displacement from the beginning of the character string data frame to the beginning of the character string data record. The string indicates the name of the structure (XX bridge, YY tunnel, etc.)

8.4.1.7.1.1 Distance Information

The distance information indicates the forward direction distance and backward direction distance from the relevant node.

No.	bit	Description			
1	15 to 14	Distance Unit Flag	bit15	bit14	Meaning
			0	0	Unit for each bit (type 1)
			0	1	Unit for each bit (type 2)
			1	0	Unit for each bit (type 3)
			1	1	Unit for each bit (type 4)
2	13 to 7	Forward Direction Distance (1)			
3	6 to 0	Backward Direction Distance (1)			

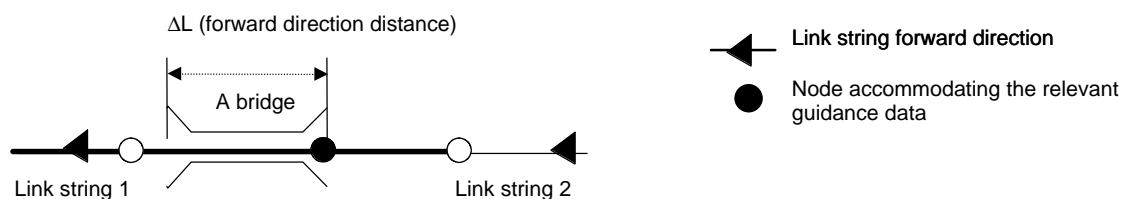
(1) Distance

For the forward direction, the distance indicates the length of the structure configured from the relevant node in the forward direction (node record accommodation order). For the backward direction, the distance indicates the length of the structure configured from the relevant node in the backward direction (backward of the node record accommodation order).

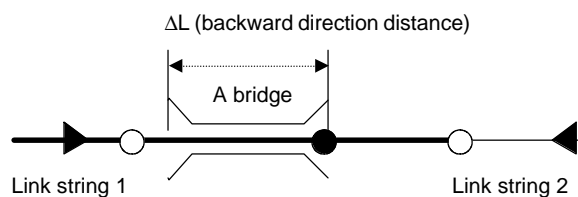
The handling is as follows:

Distance unit flag (bit15,bit14)	(0,0)	(0,1)	(1,0)	(1,1)
	Type 1	Type 2	Type 3	Type 4
Unit	5m	10m	50m	100m
Range of the values to be used	0 to 630m	0 to 1260m	0 to 6300m	0 to 12600m

For the distance, fractions less than the specified unit are rounded off. The distance is invalidated for 7F(16).



The A bridge of link string 1 is in the forward direction.



The A bridge of link string 1 is in the backward direction.

8.4.1.7.1.2 Offset Distance

The following offset distances are set when the offset distance flag is 01(2) or 10(2):

No.	bit	Description			
1	15 to 14	Distance Unit Flag	bit15	bit14	Meaning
			0	0	Unit for each bit (type 1)
			0	1	Unit for each bit (type 2)
			1	0	Unit for each bit (type 3)
			1	1	Unit for each bit (type 4)
2	13 to 7	Offset (1)			
3	6 to 0	(RESERVED)			

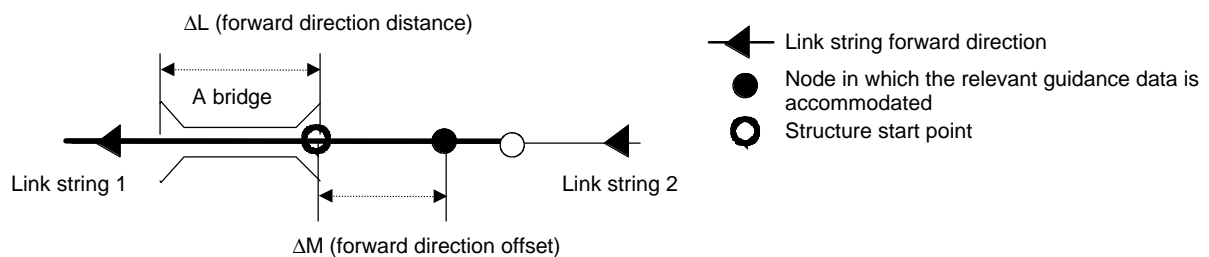
(1) Offset

If the offset distance flag indicates the offset in the forward direction, the start point of the structure is represented by the length that goes in the forward direction (node record accommodation order) from the relevant node. If the flag indicates the offset in the backward direction, the start point of the structure is represented by the length that goes in the reserve direction (backward of the node record accommodation order).

The handling is as follows:

Distance unit flag (bit15,bit14)	(0,0) Type 1	(0,1) Type 2	(1,0) Type 3	(1,1) Type 4
Unit	5m	10m	50m	100m
Range of the value to be used	0 to 630m	0 to 1260m	0 to 6300m	0 to 12600m

For the distance, a fraction less than the specified unit is rounded off. The distance is invalidated for 7F(16).



The A bridge of link string 1 is in the forward direction.

8.4.1.7.1.3 Height Information

If the height information existence flag is 1(2), the information is as follows:

No.	bit	Description			
1	15 to 14	Distance Unit Flag	bit15	bit14	Meaning
			0	0	Unit for each bit (type 1)
			0	1	Unit for each bit (type 2)
			1	0	Unit for each bit (type 3)
			1	1	Unit for each bit (type 4)
2	13 to 7	Distance from the surface of the earth to the surface of the road [h1] (1)			
3	6 to 0	Distance from the surface of the road to the highest position of the structure [h2] (2)			

(1) Distance from the surface of the earth to the surface of the road [h1]

The handling is as follows:

Distance unit flag (bit15,bit14)	(0,0) Type 1	(0,1) Type 2	(1,0) Type 3	(1,1) Type 4
Unit	0.1m	1m	2m	10m
Range of the value to be used	0 to 12.6m	0 to 126m	0 to 252m	0 to 1260m

For the distance, a fraction less than the specified unit is rounded off. The distance is invalidated for 7F(16).

[h1] has the following meaning for each classification code in the category:

Classification code in the category	Meaning
0 (16) Bridge	(Undefined)
1 (16) Tunnel	h1=0
2 (16) Gallery (underground passage)	Depth from the surface of the ground to the surface of the road
3 (16) Railroad crossing	(Undefined)
4 (16) Overpass 1 (banking)	Height of the banking from the surface of the earth
5 (16) Overpass 2 (bridge)	Height of the Overpass from the surface of the earth (height of the bridge legs)

(2) Distance from the surface of the road to the highest position of the structure [h2]

The handling is as follows:

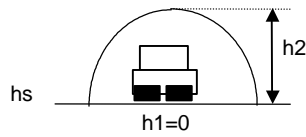
Distance unit flag (bit15,bit14)	(0,0) Type 1	(0,1) Type 2	(1,0) Type 3	(1,1) Type 4
Unit	0.1m	1m	2m	10m
Range of the value to be used	0 to 12.6m	0 to 126m	0 to 252m	0 to 1260m

For the distance, a fraction less than the specified unit is rounded off. The distance is invalidated for 7F(16).

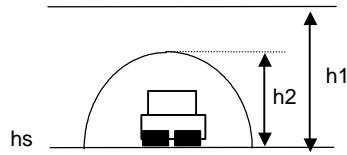
[h2] has the following meaning for each category code in the type:

Classification code in the category	Meaning
0 (16) Bridge	(Undefined)
1 (16) Tunnel	Height of the tunnel from the surface of the road
2 (16) Gallery (underground passage)	Height of the gallery from the surface of the underground passage
3 (16) Railroad crossing	(Undefined)
4 (16) Overpass 1 (banking)	h2=0
5 (16) Overpass 2 (bridge)	h2=0

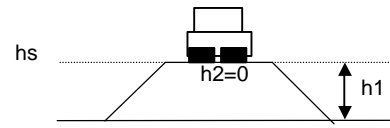
Example 1: Tunnel



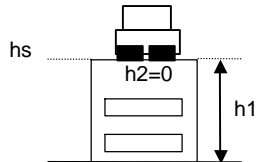
Example 2: Gallery (underground passage)



Example 3: Overpass 1 (banking)



Example 4: Overpass 2 (bridge)



hs is the height information (altitude) to be set in the link string data record constituting the road data list.

8.4.1.7.1.4 Intersection Information

If the intersection information existence flag is 1(2), the information listed below is obtained.

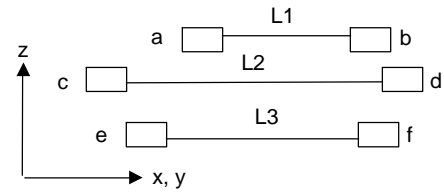
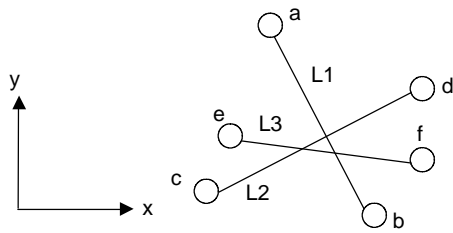
The intersection information in the forward direction and the intersection information in the backward direction indicates the link intersection status (overpass or underpass).

The height represented with the intersection information indicates the relative height relationship between roads, and is the information for the section from the relevant nodes to the next node that will appear. The status is invalid for 111(2).

No.	bit	Description				
1	15 to 13	Intersection Information in the Forward Direction	bit15	bit14	bit13	Meaning
			0	0	0	Lowermost vertical position
			0	0	1	Overpass a (above the lowermost vertical position)
			0	1	0	Overpass b (above Overpass a)
			0	1	1	Overpass c (above Overpass b)
2	12 to 10	Intersection Information in the Backward Direction	bit12	bit11	bit10	Meaning
			0	0	0	Lowermost layer link
			0	0	1	Overpass a (above the lowermost vertical position)
			0	1	0	Overpass b (above Overpass a)
			0	1	1	Overpass c (above Overpass b)
3	9 to 0	(RESERVED)				

Example of the Intersection Information Storage

L3: Lowermost vertical position link
 L2: Overpass a (above the lowermost vertical position)
 L1: Overpass b (above Overpass a)



Information to be contained in the node

- Only the forward direction data can be contained in the link string start point
- The forward direction data and backward direction data can be contained in the link string intermediate point.
- Only the backward direction data can be contained in the link string end point.

