

TO:	<b>ENGINEERING INSTRUCTION</b>		
<b>SUPERSEDED BY EI 93-011 EFFECTIVE 5/13/93</b>	NEW YORK STATE DEPARTMENT OF TRANSPORTATION		
	SUBJECT: SPIRAL RIB PIPE		
	Subject Code: 7.27-1-603		
Distribution:	30 Main Office	32 Regions	34 Special
APPROVED:	Code: <u>EI 90-34</u>		Date: <u>9-10-90</u>
<i>J. R. Lambert</i> J. R. LAMBERT, Deputy Chief Engineer (Fac. Des. Div.)	Supersedes:		

The major corrugated metal pipe fabricators offer spirally rolled external ribbed pipe. This pipe develops its rigidity using 3/4" x 3/4" square edged ribs spaced 7 1/2" apart and projecting outward. The interior of the pipe, being free of undulation, is hydraulically smooth. Mannings "n" value of new spiral ribbed pipe has been measured at 0.012. We recommend 0.013 for design purposes.

The pipe is manufactured from either aluminum or zinc coated steel or aluminum. The operation of rerolling the ends, however has damaged the coated steel. The manufacturers are working with the Materials Bureau on a solution to this problem. Until one is found however, only aluminum spiral rib pipe will be allowed. Also, because no pipe-arch has been produced and evaluated only round pipe will be allowed.

Minimum and maximum heights of cover should be as given in the table below:

**SPIRAL RIB ALUMINUM PIPE  
(HS20 Live Loading)**

Minimum/Maximum Cover (Feet)  
Thickness and Specified Gage

Diameter (inches)	(.060") 16	(.075") 14	(.105") 12	(.135") 10
18	*1.0/52	1.0/73		
21	*1.0/44	1.0/62	1.0/101	
24	*1.0/38	1.0/54	1.0/91	
30	*1.5/30	*1.5/43	1.0/72	
36	*1.5/25	*1.5/35	1.0/59	1.0/75
42	2.0/21	*1.5/30	1.5/50	1.0/64
48		*2.0/26	*1.5/43	1.5/55
54		2.0/23	*1.5/38	1.5/48
60			*2.0/33	*1.5/42
66				*2.0/38
72				*2.0/34

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NOTES:

- (1) \* denotes items encoded into the Engineers Estimate Handler. Should other size/guage be required, contact special specification coordinator @ (518) 457-4092.
- (2) Allowable minimum cover is to be measured from top of pipe to bottom of subbase course.

Anticipated service life may be taken as 70+ years. Specifications for the product are attached. They will not be inserted into the proposal by the Main Office. The designer must submit them in the report on design (PS&E package).

Also attached is the specification for a special granular backfill material to be used with the pipe. This is Item 17203.0715, Backfill for Spiral Rib Aluminum Pipe. It's also to be included in the report on design for most projects except for those in some areas of Region 10. There the native soils may conform to the specification requirements for Item 17203.0715. If this is the case, with the approval of the Regional Soils Engineer, the items need not be used when the trenches are to be backfilled under the item for Trench and Culvert Excavation.

If you have material related questions, please contact Richard Obuchowski (518) 457-5956. If you have any other questions, please contact Larry Brown (518) 457-4093.

91603.96XX SPIRAL RIB ALUMINUM PIPE

DESCRIPTION. This work shall consist of the construction or reconstruction of culverts and storm drains in accordance with these specifications and contract plans.

MATERIALS. Materials shall meet the requirements specified below.

The spiral rib aluminum pipe shall conform to the requirements of AASHTO M196, Type IR except as modified herein.

When a gauge number is specified in the contract documents it shall conform to Table 707-1 of the NYSDOT Standard Specifications book. Each pipe end shall be uniquely and indelibly labelled so that pipe may be assembled in the field in the same order it was manufactured.

Pipe shall be field joined using annular corrugated aluminum coupling bands. The bands shall be used by rerolling the ends of the pipe to form two annular corrugations of not less than 2 2/3 inch pitch by 1/2 inch depth. The band shall mesh with at least one full corrugation and shall lap equally on each pipe end. The band width shall be a minimum of seven inches for pipe diameters up to and including thirty inches. The band width shall be a minimum of 10 1/2 inches for pipe diameters greater than thirty inches. The band shall not be more than two nominal sheet thicknesses thinner than the pipe thickness and in no case thinner than 0.048 inches.

BASIS OF ACCEPTANCE. This material will be accepted on the basis of certified documentation issued by a fabrication shop appearing on the Department's Approved List. Certification format and fabrication shop approval shall be in accordance with procedural directives issued by the Materials Bureau. At the option of the Department, this material may be subjected to shop inspection and/or field sampling and testing.

CONSTRUCTION DETAILS. The requirements of 606-3 CONSTRUCTION DETAILS-CULVERTS AND STORM DRAINS shall govern except that the maximum particle size of backfill material shall not exceed 1.5 inches. Pipe sections shall be assembled using the manufacturers labels to reconstruct its order of manufacture to insure good diameter match. Abutting pipe diameters shall not vary more than one-half (1/2) inch.

METHOD OF MEASUREMENT. The pipe shall be measured in linear feet along the bottom centerline as designated on the plans and specifications or as directed in writing by the Engineer.

BASIS OF PAYMENT. The requirements of 603-5 BASIS OF PAYMENT-CULVERTS AND STORM DRAINS shall govern.

Payment will be made under:

Item No.	Item	Pay Unit
91603.9614	Spiral rib aluminum pipe 18 inch diameter, 16 gauge	Linear Foot
91603.9617	Spiral rib aluminum pipe 21 inch diameter, 16 gauge	Linear Foot
91603.9620	Spiral rib aluminum pipe 24 inch diameter, 16 gauge	Linear Foot
91603.9624	Spiral rib aluminum pipe 30 inch diameter, 16 gauge	Linear Foot
91603.9625	Spiral rib aluminum pipe 30 inch diameter, 14 gauge	Linear Foot
91603.9629	Spiral rib aluminum pipe 36 inch diameter, 16 gauge	Linear Foot
91603.9630	Spiral rib aluminum pipe 36 inch diameter, 14 gauge	Linear Foot
91603.9635	Spiral rib aluminum pipe 42 inch diameter, 14 gauge	Linear Foot
91603.9640	Spiral rib aluminum pipe 48 inch diameter, 14 gauge	Linear Foot
91603.9641	Spiral rib aluminum pipe 48 inch diameter, 12 gauge	Linear Foot
91603.9646	Spiral rib aluminum pipe 54 inch diameter, 12 gauge	Linear Foot
91603.9651	Spiral rib aluminum pipe 60 inch diameter, 12 gauge	Linear Foot
91603.9652	Spiral rib aluminum pipe 60 inch diameter, 10 gauge	Linear Foot
91603.9657	Spiral rib aluminum pipe 66 inch diameter, 10 gauge	Linear Foot
91603.9662	Spiral rib aluminum pipe 72 inch diameter, 10 gauge	Linear Foot

ITEM 17203.0715 BACKFILL FOR SPIRAL RIB ALUMINUM PIPE

All of the provisions of Section 203 pertaining to Select Granular Fill shall apply except that the top size of material furnished shall be 1-1/2 inches.