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# APPROVAL REPORT

**Project No:** 3060277

**Class:** 1630

**Product Type:** Steel Pipe for Use With Automatic Fire Sprinkler Systems

**Product Name:** Steel Pipe Manufactured to  
ASTM A53 / A53M Schedule 40  
ASTM A795 / A795M Schedule 40  
ASTM A135 / A135M Schedule 40

**Name of Report Holder:** SeAH Steel America Inc.

**Address of Report Holder:** 2100 Main St. Suite 100  
Irvine, CA 92614  
USA

**Customer ID:** 128860

**Prepared by**



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**Reviewed by**



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**March 28, 2017**

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**Date of Approval**

## 1 INTRODUCTION

1.1 SeAH Steel America Inc. requested an FM Approval examination of their products with rated working pressures in accordance with the following:

Model	Product Type	Sizes, NPS	End Connection	Rated Working Pressure	
				psi	kPa
Schedule 40	ASTM A53	1, 1-1/4, 1-1/2, 2	Plain End	175	1205
		1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 5, 6, 8	Roll or Cut Grooved, Welded, Threaded	300	2070
Schedule 40	ASTM A795	1, 1-1/4, 1-1/2, 2	Plain End	175	1205
		1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 5, 6, 8	Roll or Cut Grooved, Welded, Threaded	300	2070
Schedule 40	ASTM A135	1, 1-1/4, 1-1/2, 2	Plain End	175	1205
		1, 1-1/4, 1-1/2, 2, 2-1/2, 3, 3-1/2, 4, 5, 6, 8	Roll or Cut Grooved, Welded, Threaded	300	2070

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### 1.3 Standards

#### 1.3.1 FM Approvals Standards

Title	Number	Issue Date
Steel Pipe for Automatic Fire Sprinkler Systems	1630	November 2013

### 1.4 Listing

The product(s) will be updated in the Approval Guide, an on-line resource of FM Approvals, as detailed in an attachment at the end of this report. Deletions from any current product listing are shown with strikethroughs and additions to the Approval listing are shown in red text.

## 2 DESCRIPTION

### 2.1 ASTM A53 / A53M Schedule 40 Sprinkler Pipe

Schedule 40 sprinkler pipe manufactured in accordance with the specifications set forth in American Society of Testing and Materials (ASTM) Standard A53 / A53M has nominal wall thicknesses as detailed below. As part of the evaluation, steel manufactured to the requirements of ASTM A53 / A53M Grade A has been considered. The pipe is available in a black or hot dip galvanized surface finish and the end connections are plain end, roll or cut grooved, threaded and welded.

ASTM A53 / A53M Schedule 40 Sprinkler Pipe Dimensions		
Nominal Pipe Size inch	Nominal Outside Diameter inch (mm)	Nominal Wall Thickness inch (mm)
1	1.315 (33.4)	0.133 (3.38)
1-1/4	1.660 (42.2)	0.140 (3.56)
1-1/2	1.900 (48.3)	0.145 (3.68)
2	2.375 (60.3)	0.154 (3.91)

<b>ASTM A53 / A53M Schedule 40 Sprinkler Pipe Dimensions</b>		
<b>Nominal Pipe Size inch</b>	<b>Nominal Outside Diameter inch (mm)</b>	<b>Nominal Wall Thickness inch (mm)</b>
2-1/2	2.875 (73.0)	0.203 (5.16)
3	3.500 (88.9)	0.216 (5.49)
3-1/2	4.000 (101.6)	0.226 (5.74)
4	4.500 (114.3)	0.237 (6.02)
5	5.563 (141.3)	0.258 (6.55)
6	6.625 (168.3)	0.280 (7.11)
8	8.625 (219.1)	0.322 (8.18)

**2.2 ASTM A795 / A795M Schedule 40 Sprinkler Pipe**

Schedule 40 sprinkler pipe manufactured in accordance with the specifications set forth in American Society of Testing and Materials (ASTM) Standard A795 / A795M has nominal wall thicknesses as detailed below. As part of the evaluation, steel manufactured to the requirements of ASTM A795 / A795M Grade A has been considered. The pipe is available in a black or hot dip galvanized surface finish and the end connections are plain end, roll or cut grooved, threaded and welded.

<b>ASTM A795 / A795M Schedule 40 Sprinkler Pipe Dimensions</b>		
<b>Nominal Pipe Size inch</b>	<b>Nominal Outside Diameter inch (mm)</b>	<b>Nominal Wall Thickness inch (mm)</b>
1	1.315 (33.4)	0.133 (3.38)
1-1/4	1.660 (42.2)	0.140 (3.56)
1-1/2	1.900 (48.3)	0.145 (3.68)
2	2.375 (60.3)	0.154 (3.91)
2-1/2	2.875 (73.0)	0.203 (5.16)
3	3.500 (88.9)	0.216 (5.49)
3-1/2	4.000 (101.6)	0.226 (5.74)
4	4.500 (114.3)	0.237 (6.02)
5	5.563 (141.3)	0.258 (6.55)
6	6.625 (168.3)	0.280 (7.11)
8	8.625 (219.1)	0.322 (8.18)

**2.3 ASTM A135 / A135M Schedule 40 Sprinkler Pipe**

Schedule 40 sprinkler pipe manufactured in accordance with the specifications set forth in American Society of Testing and Materials (ASTM) Standard A135 / A135M uses nominal wall thicknesses listed in the American Society of Mechanical Engineers (ASME) Standard B36.10M, which are detailed below. As part of the evaluation, steel manufactured to the requirements of ASTM A135 / A135M Grade A has been considered. The pipe is available in a black or hot dip galvanized surface finish and the end connections are plain end, roll or cut grooved, threaded and welded.

<b>ASME B36.10M Schedule 40 Sprinkler Pipe Dimensions</b>		
<b>Nominal Pipe Size inch</b>	<b>Nominal Outside Diameter inch (mm)</b>	<b>Nominal Wall Thickness inch (mm)</b>
1	1.315 (33.4)	0.133 (3.38)
1-1/4	1.660 (42.2)	0.140 (3.56)
1-1/2	1.900 (48.3)	0.145 (3.68)
2	2.375 (60.3)	0.154 (3.91)
2-1/2	2.875 (73.0)	0.203 (5.16)
3	3.500 (88.9)	0.216 (5.49)
3-1/2	4.000 (101.6)	0.226 (5.74)

<b>ASME B36.10M Schedule 40 Sprinkler Pipe Dimensions</b>		
<b>Nominal Pipe Size inch</b>	<b>Nominal Outside Diameter inch (mm)</b>	<b>Nominal Wall Thickness inch (mm)</b>
4	4.500 (114.3)	0.237 (6.02)
5	5.563 (141.3)	0.258 (6.55)
6	6.625 (168.3)	0.280 (7.11)
8	8.625 (219.1)	0.322 (8.18)

**3 EXAMINATIONS AND TESTS**

- 3.1 Samples were submitted for examination and testing. The samples were considered to be representative of the product line and were examined, tested, and compared to the manufacturer's drawings. All data remains on file at FM Approvals along with other documents and correspondence applicable to this program.
- 3.2 All testing and analysis considered appropriate was conducted and verified to be in compliance with the standards defined in Section 1.3.
- 3.3 Detailed analysis of the examination and testing can be found as an attachment at the end of this Report.

**4 MARKING**

- 4.1 Each length of pipe shall be permanently and continuously marked with the following minimum information:
  - Manufacturer's name or trademark
  - Nominal pipe size and length
  - Schedule or model reference
  - Rated working pressure
  - National or International standard (including grade reference) to which the pipe was manufactured
  - Manufacturing Source code
  - Production test reference
  - Heat number or Run number
  - The FM Approvals Certification Mark
- 4.2 Markings shall be painted, inked or laser printed on the outside surface of each length of pipe at regular intervals. The spacing between the end of one complete marking and the start of the next shall not exceed 12 inches (300 mm).
- 4.3 Each marking described above shall be legible and durable and shall be applied in any of, or any combination of, the above methods.

**5 REMARKS**

- 5.1 The FM Global Property Loss Prevention Data Sheets should be strictly adhered to when installing this product.
- 5.2 Installations shall comply with the latest edition of the manufacturer's instruction manual.
- 5.3 Tampering and/or replacement with non-factory components may adversely affect the safe use of the product.

**6 SURVEILLANCE AUDIT**

The design and manufacturing facilities at the following location are subject to follow-up audit inspections. The facilities and quality control procedures in place have been found to be satisfactory to manufacture product identical to that examined and tested as

described in this Report. A revision request form shall be submitted to FM Approvals for requesting any additional manufacturing facilities which are not listed below. The Products discussed in this Report are FM Approved only when designed and manufactured in the following facility:

**Design and Manufacturing**

SeAH Steel Vina Corporation  
No. 7, 3A Road Bien Hoa II Industrial Zone,  
Dong Nai, Vietnam

**7 MANUFACTURER’S RESPONSIBILITIES**

- 7.1 Documentation considered critical to this Approval is on file at FM Approvals and is listed in the Documentation File, Section 8, of this Report. No changes of any nature shall be made unless notice of the proposed change has been given and written authorization obtained from FM Approvals. The revision request form shall be forwarded to FM Approvals as notice of proposed changes.
- 7.2 The manufacturer is responsible for control of the product marking and installation instructions for the product.
- 7.3 The manufacturer shall provide installation, operating, and maintenance manual(s) with each system.
- 7.4 The manufacturer is responsible for performing the Manufacturing and Production Tests specified in the Standard defined in Section 1.3 of this Approval Report.

**8 DOCUMENTATION FILE**

All pertinent Report documents are outlined in the ATTACHMENTS list below.

**9 CONCLUSION**

The Products described in Section 1 of this Report meet FM Approvals requirements when manufactured at the facility detailed in Section 6 of this Report. Since a duly signed Master Agreement is on file for this manufacturer, Approval is effective the date of this report.

**PROJECT DATA RECORD:** 3060277

**ATTACHMENTS:** Appendix A Approval Guide Listings  
Appendix B Detailed Analysis  
Appendix C Critical Document List (CDL)

**APPROVAL GUIDE LISTING**

**SCHEDULE 40**

Fire Protection – Automatic Sprinkler Systems – Pipes and Fittings for Aboveground – Steel Pipe  
 – Schedule 40 – Normal connections are threaded, welded, rolled or cut groove or plain end

**SeAH Steel America Inc**  
**2100 Main St. Suite 100, Irvine, CA 92614, USA**

<b>Product</b>	<b>Nominal Pipe Size, in.</b>	<b>Rated Working Pressure, psi</b>	<b>Rated Working Pressure, kPa</b>	<b>Listing Country</b>	<b>Certification Type</b>
Schedule 40 a, b, c, d, g, m, p, r, s	1 1-1/4 1-1/2 2	175	1205	United States of America	FM Approved
Schedule 40 a, b, c, d, e, m, p, r, s	1 1-1/4 1-1/2 2 2-1/2 3 3-1/2 4 5 6 8	300	2070	United States of America	FM Approved

- a - FM Approved for use with FM Approved pipe couplings on rolled or cut grooves.
- b - FM Approved for use with FM Approved pipe fittings when threaded.
- c - FM Approved for use in welded systems when supplied with standard bevel on ends.
- d - When hot dip galvanized by factory, the sprinkler pipe is FM Approved for dry pipe systems.
- e - Any FM Approved pipe coupling or fitting suitable for use with Schedule 10 pipe may be used with this product at the lower rated pressure of the pipe or the fitting.
- g - FM Approved for use with plain-end fittings.
- m - FM Approved for use in all steel sprinkler systems composed of uncoated steel pipe.
- p - Manufactured out of ASTM A53 / A53M Grade A steel.
- r - Manufactured out of ASTM A135 / A135M Grade A as an alternate material.
- s - Manufactured out of ASTM A795 / A1795 Grade A as an alternate material.

**DETAILED ANALYSIS**

**1 EXAMINATION**

The manufacturer provided samples of their pipe as detailed below for examination and testing. The samples were considered to be representative of the product line and were examined, tested, and compared to the manufacturer's drawings. All data is on file at FM Approvals along with other documents and correspondence applicable to this program.

<b>FM 1630 Sample Requirements – Steel Pipe</b>			
<b>Test</b>	<b>Pipe Class / Model</b>	<b>NPS, inches</b>	<b>Fitting Model</b>
Hydrostatic Strength	ASTM A53 Schedule 40	2	Threaded Coupling
			Welded Fitting
Hydrostatic Strength / Bending Moment	ASTM A53 Schedule 40	2	SCI 65SR
			Victaulic 005H
			SCI 65SF
			Victaulic 75
		8	SCI 65SR
			Victaulic 005H
			SCI 65SF
			Victaulic 75
Vibration Resistance	ASTM A53 Schedule 40	2	SCI 65SF
			Victaulic 75

**2 DESCRIPTION**

**2.1 Hydrostatic Strength**

Samples as detailed above were filled with water, cleared of all entrapped air, and subjected to four times their rated working pressure for 5 minutes. There were no signs of cracking, rupture or permanent distortion of the assembly as a result of this test. These results are considered satisfactory.

**2.2 Bending Moment Resistance**

Samples as detailed above were filled with water, cleared of all entrapped air, and subjected to their rated working pressure. The assembly was centered in a fixture that provided support at a spacing of 36 inches (0.9 m) and was subjected to the required bending moment. The bending moment was calculated based on water filled schedule 40 steel sprinkler pipe, a maximum hanger spacing of 12 or 15 ft (3.6 or 4.6 m) depending on pipe size, the assumption of a missing hanger and a safety factor of two. There was no observed evidence of leakage, cracking, or rupture as a result of this test. These results are considered satisfactory.

**2.3 Vibration Resistance**

Samples as detailed above were filled with water, cleared of all entrapped air, and subjected to an internal pressure of 80 psi (550 kPa) which was maintained throughout the vibration test sequence. The samples were then subjected to the following vibration conditions:

<b>Amplitude, inch (mm)</b>	<b>Total Displacement, inch (mm)</b>	<b>Frequency, Hz</b>	<b>Time, hours</b>
0.020 (0.51)	0.040 (1.02)	18 – 37 (Variable)	5
0.035 (0.90)	0.070 (1.78)	18 – 37 (Variable)	5
0.010 (0.25)	0.020 (0.51)	28	5

<b>Amplitude, inch (mm)</b>	<b>Total Displacement, inch (mm)</b>	<b>Frequency, Hz</b>	<b>Time, hours</b>
0.020 (0.51)	0.040 (1.02)	28	5
0.075 (1.91)	0.150 (3.81)	28	5

After the completion of the vibration sequence, the samples were subjected to four times their rated working pressure for 5 minutes. There was no observed evidence of leakage, cracking, or rupture as a result of this test. These results are considered satisfactory.

**3** Conclusion

Based on the above results, no additional tests were deemed necessary.



**CRITICAL DOCUMENT LIST (CDL)**

The following drawings describe the aboveground sprinkler pipe detailed in this Approval Report and are filed under Project Identification number 3039459.

<b>Drawing No.</b>	<b>Description</b>	<b>Rev. Level</b>
SSV-Sprinkler-SCH40	Technical Requirement Schedule 40 Steel Sprinkler Pipe	01