Code Compliance Research Report
CCRR-0145

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Valued Quality. Delivered.

DIVISION: 05 - Metals
Section: 05 50 00 – Metal Fabrications

MARSHALL STAMPING COMPANY
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Valencia, Pennsylvania 16059
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REPORT SUBJECT:

- Marshall Extend-O-Column
- Marshall Fixed Length Column

1.0 SCOPE OF EVALUATION

1.1. This research report addresses compliance with the following Codes:

- 2015 International Building Code® (IBC)
- 2015 International Residential Code® (IRC)

1.2. *Marshall Extend-O-Column* and *Marshall Fixed Length Columns* has been evaluated for the following properties (see Table 1):

- Structural
- Corrosion Protection

1.3. *Marshall Extend-O-Column* and *Marshall Fixed Length Columns* have been evaluated for use in supporting loads in wood frame and light steel frame construction.

2.0 STATEMENT OF COMPLIANCE

2.1. *Marshall Extend-O-Column* and *Marshall Fixed Length Columns* comply with the Codes listed in Section 1.1, for the properties stated in Section 1.2 and uses stated in Section 1.3, when installed as described in this report, including the Conditions of Use stated in section 5.

3.0 DESCRIPTION

3.1. *Marshall Extend-O-Column* and *Marshall Fixed Length Columns* are adjustable and fixed columns, respectively, constructed of carbon steel.

3.2. The posts are fabricated from the steel grade listed below:

- Tube - ASTM A 500 Grade B Carbon Steel
- Flange - ASTM A 36 Hot-Rolled Carbon Steel
- Screw - AISI 1117 Carbon Steel

3.3. Corrosion protection - All Marshall Stamping steel column sections are protected with a rust inhibiting enamel applied to all surfaces including the inside of the column.

3.4. Column sizes recognized in this report are listed in Table A through H for standard measurements and Tables A(M) through H(M) for metric equivalents. Refer to Figure 1 for column details.

3.4.1. The columns, both fixed length and adjustable, are produced in three diameters – 3.0" (76 mm), 3.5" (89 mm), and 4.0" (102 mm) – with either an 11 gauge or 0.216 inch (5.5 mm) thickness.

3.4.2. The adjustable columns are available in lengths from six feet (1829 mm) to twelve feet, four inches (3759 mm).

3.4.3. The fixed length columns are available in lengths from five feet, nine inches (1753 mm) to twelve feet (3658 mm).

4.0 INSTALLATION

Marshall Extend-O-Column and *Marshall Fixed Length Columns* must be installed in accordance with the manufacturer's published installation instructions, the applicable Code and this Research Report. A copy of the manufacturer's instructions must be available on the jobsite during installation.

4.1. The *Marshall Extend-O-Column* must be installed with the adjustable screw mechanism on the bottom. The entire adjustment mechanism, including the entire collar nut, shall be encased in minimum 3500 psi (24.1 MPa) concrete.

5.0 CONDITIONS OF USE

5.1. Installation must comply with this Research Report, the manufacturer's published installation instructions and the applicable Code. In the event of a conflict, this report governs.

5.2. The steel columns identified in this report are deemed to comply with the referenced building codes subject to the following conditions.

5.3. Steel column structural elements shall be designed to safely support applicable loads and load combinations in accordance with Chapter 16 of the IBC.

5.4. Design Strengths are applicable to American Institute of Steel Construction (AISC) 360-10, Specification for Structural Steel Buildings (ASD) as identified in Tables A through H for standard measurements and Tables A(M) through H(M) for metric equivalents.

5.5. Use of Marshall Stamping columns shall be accompanied by structural calculations. These calculations shall be signed and sealed by a registered design professional authorized to provide services in the jurisdiction where the project is located. The calculations shall address the following:

5.5.1. The transfer of design loads from the structure to the bearing surface below.

5.5.2. The ability of the column bearing surface to carry the design loads.

5.6. Allowable loads shall be limited to vertical, concentric loadings. The use of these columns to resist lateral loads is outside the scope of this report.

5.7. When Marshall Extend-O-Columns are used, the threaded adjustment rod shall not extend more than four inches (102 mm) from the minimum height.

5.8. Jobsite manufacturing of Marshall Stamping columns is outside the scope of this report.

5.9. Installation outside of the building envelope is outside the scope of this report.

5.10. The Marshall Stamping columns identified in this report are manufactured in Valencia, Pennsylvania in accordance with the manufacturer's approved quality control system with inspections by Architectural Testing (IAS AA-676).

5.11. The *Marshall Extend-O-Column* and *Marshall Fixed Length Column* are manufactured under a quality program with inspections by Intertek ATI Inc. (IAS AA-676).

6.0 SUPPORTING EVIDENCE

6.1. Manufacturer's drawings and installation instructions.

6.2. Engineering calculations in accordance with American Institute of Steel Construction (AISC) 360-10, Specification for Structural Steel Buildings.

6.3. Reports of load testing in accordance with ASTM E 72, as referenced by ICC-ES AC335, Acceptance Criteria for Adjustable Steel Columns, revised March 2014.

6.4. Quality control manual in accordance with ICC-ES AC10, Acceptance Criteria for Quality Documentation, dated June 2014.

7.0 IDENTIFICATION

7.1. Marshall Stamping columns produced in accordance with this report shall be identified with labeling that includes the following information:

7.1.1. The manufacturer's name and/or logo

7.1.2. The product name and model number

7.1.3. Design Thickness of the column

7.1.4. Material Grade, i.e. 42 ksi

7.1.5. The Intertek Mark as shown below, and the code compliance Research Report number (CCRR-0145).

CODE COMPLIANCE
Intertek
CCRR-0145

8.0 OTHER CODES

This section is not applicable.

9.0 CODE COMPLIANCE RESEARCH REPORT USE

9.1. Approval of building products and/or materials can only be granted by a building official having legal authority in the specific jurisdiction where approval is sought.

9.2. Code Compliance Research Reports shall not be used in any manner that implies an endorsement of the product by Intertek.

9.3. Reference to the Intertek website address: whdirectory.intertek.com is recommended to ascertain the current version and status of this report.

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TABLE A · 3" · 11 GA
EXTEND-O-COLUMN

Model No.	Adj. Length	ASD(Ra) (kips)
AC360	6' 0" - 6' 4"	18.7
AC363	6' 3" - 6' 7"	18.2
AC366	6' 6" - 6' 10"	17.8
AC369	6' 9" - 7' 1"	17.3
AC370	7' 0" - 7' 4"	16.8
AC373	7' 3" - 7' 7"	16.3
AC376	7' 6" - 7' 10"	15.8
AC379	7' 9" - 8' 1"	15.3
AC380	8' 0" - 8' 4"	14.8
AC383	8' 3" - 8' 7"	14.2
AC386	8' 6" - 8' 10"	13.8
AC389	8' 9" - 9' 1"	13.3
AC390	9' 0" - 9' 4"	12.8
AC393	9' 3" - 9' 7"	12.3
AC396	9' 6" - 9' 10"	11.8
AC399	9' 9" - 10' 1"	11.3
AC3100	10' 0" - 10' 4"	10.9
AC3103	10' 3" - 10' 7"	10.4
AC3106	10' 6" - 10' 10"	10.1
AC3109	10' 9" - 11' 1"	9.5
AC3110	11' 0" - 11' 4"	9.1
AC3113	11' 3" - 11' 7"	8.7
AC3116	11' 6" - 11' 10"	8.3
AC3119	11' 9" - 12' 1"	8.0
AC3120	12' 0" - 12' 4"	7.6

TABLE A(M) · 76 mm · 11 GA
EXTEND-O-COLUMN

Model No.	Adj. Length (mm)	ASD(Ra) (kN)
AC360	1829 - 1930	83.2
AC363	1905 - 2007	81.0
AC366	1981 - 2083	79.2
AC369	2057 - 2159	77.0
AC370	2134 - 2235	74.7
AC373	2210 - 2311	72.5
AC376	2286 - 2388	70.3
AC379	2362 - 2464	68.1
AC380	2438 - 2540	65.8
AC383	2515 - 2616	63.2
AC386	2591 - 2692	61.4
AC389	2667 - 2769	59.2
AC390	2743 - 2845	56.9
AC393	2819 - 2921	54.7
AC396	2896 - 2997	52.5
AC399	2972 - 3073	50.3
AC3100	3048 - 3150	48.5
AC3103	3124 - 3226	46.3
AC3106	3200 - 3302	44.9
AC3109	3277 - 3378	42.3
AC3110	3353 - 3454	40.5
AC3113	3429 - 3531	38.7
AC3116	3505 - 3607	36.9
AC3119	3581 - 3683	35.6
AC3120	3658 - 3759	33.8

TABLE B · 3.5" · 11 GA
EXTEND-O-COLUMN

Model No.	Adj. Length	ASD(Ra) (kips)
AC3560	6' 0" - 6' 4"	23.8
AC3563	6' 3" - 6' 7"	23.4
AC3566	6' 6" - 6' 10"	22.9
AC3569	6' 9" - 7' 1"	22.5
AC3570	7' 0" - 7' 4"	22.0
AC3573	7' 3" - 7' 7"	21.5
AC3576	7' 6" - 7' 10"	21.0
AC3579	7' 9" - 8' 1"	20.5
AC3580	8' 0" - 8' 4"	20.0
AC3583	8' 3" - 8' 7"	19.5
AC3586	8' 6" - 8' 10"	19.0
AC3589	8' 9" - 9' 1"	18.6
AC3590	9' 0" - 9' 4"	18.1
AC3593	9' 3" - 9' 7"	17.5
AC3596	9' 6" - 9' 10"	17.1
AC3599	9' 9" - 10' 1"	16.6
AC35100	10' 0" - 10' 4"	16.1
AC35103	10' 3" - 10' 7"	15.6
AC35106	10' 6" - 10' 10"	15.1
AC35109	10' 9" - 11' 1"	14.6
AC35110	11' 0" - 11' 4"	14.1
AC35113	11' 3" - 11' 7"	13.7
AC35116	11' 6" - 11' 10"	13.2
AC35119	11' 9" - 12' 1"	12.7
AC35120	12' 0" - 12' 4"	12.2

TABLE B(M) · 89 mm · 11 GA
EXTEND-O-COLUMN

Model No.	Adj. Length (mm)	ASD(Ra) (kN)
AC3560	1829 - 1930	105.9
AC3563	1905 - 2007	104.1
AC3566	1981 - 2083	101.9
AC3569	2057 - 2159	100.1
AC3570	2134 - 2235	97.9
AC3573	2210 - 2311	95.6
AC3576	2286 - 2388	93.4
AC3579	2362 - 2464	91.2
AC3580	2438 - 2540	89.0
AC3583	2515 - 2616	86.7
AC3586	2591 - 2692	84.5
AC3589	2667 - 2769	82.7
AC3590	2743 - 2845	80.5
AC3593	2819 - 2921	77.8
AC3596	2896 - 2997	76.1
AC3599	2972 - 3073	73.8
AC35100	3048 - 3150	71.6
AC35103	3124 - 3226	69.4
AC35106	3200 - 3302	67.2
AC35109	3277 - 3378	64.9
AC35110	3353 - 3454	62.7
AC35113	3429 - 3531	60.9
AC35116	3505 - 3607	58.7
AC35119	3581 - 3683	56.5
AC35120	3658 - 3759	54.3

TABLE C · 4" · 11 GA
EXTEND-O-COLUMN

Model No.	Adj. Length	ASD(Ra) (kips)
AC460	6' 0" - 6' 4"	28.9
AC463	6' 3" - 6' 7"	28.5
AC466	6' 6" - 6' 10"	28.1
AC469	6' 9" - 7' 1"	27.6
AC470	7' 0" - 7' 4"	27.2
AC473	7' 3" - 7' 7"	26.8
AC476	7' 6" - 7' 10"	26.3
AC479	7' 9" - 8' 1"	25.8
AC480	8' 0" - 8' 4"	25.3
AC483	8' 3" - 8' 7"	24.8
AC486	8' 6" - 8' 10"	24.4
AC489	8' 9" - 9' 1"	23.9
AC490	9' 0" - 9' 4"	23.4
AC493	9' 3" - 9' 7"	23.0
AC496	9' 6" - 9' 10"	22.4
AC499	9' 9" - 10' 1"	21.9
AC4100	10' 0" - 10' 4"	21.4
AC4103	10' 3" - 10' 7"	20.9
AC4106	10' 6" - 10' 10"	20.4
AC4109	10' 9" - 11' 1"	19.9
AC4110	11' 0" - 11' 4"	19.5
AC4113	11' 3" - 11' 7"	18.9
AC4116	11' 6" - 11' 10"	18.4
AC4119	11' 9" - 12' 1"	17.9
AC4120	12' 0" - 12' 4"	17.4

TABLE C(M) · 102 mm · 11 GA
EXTEND-O-COLUMN

Model No.	Adj. Length (mm)	ASD(Ra) (kN)
AC460	1829 - 1930	128.6
AC463	1905 - 2007	126.8
AC466	1981 - 2083	125.0
AC469	2057 - 2159	122.8
AC470	2134 - 2235	121.0
AC473	2210 - 2311	119.2
AC476	2286 - 2388	117.0
AC479	2362 - 2464	114.8
AC480	2438 - 2540	112.5
AC483	2515 - 2616	110.3
AC486	2591 - 2692	108.5
AC489	2667 - 2769	106.3
AC490	2743 - 2845	104.1
AC493	2819 - 2921	102.3
AC496	2896 - 2997	99.6
AC499	2972 - 3073	97.4
AC4100	3048 - 3150	95.2
AC4103	3124 - 3226	93.0
AC4106	3200 - 3302	90.7
AC4109	3277 - 3378	88.5
AC4110	3353 - 3454	86.7
AC4113	3429 - 3531	84.1
AC4116	3505 - 3607	81.8
AC4119	3581 - 3683	79.6
AC4120	3658 - 3759	77.4

TABLE D · 3.5" · 0.216"
EXTEND-O-COLUMN

Model No.	Adj. Length	ASD(Ra) (kips)
AC3560216	6' 0" - 6' 4"	41.5
AC3563216	6' 3" - 6' 7"	40.6
AC3566216	6' 6" - 6' 10"	39.9
AC3569216	6' 9" - 7' 1"	39.0
AC3570216	7' 0" - 7' 4"	38.2
AC3573216	7' 3" - 7' 7"	37.3
AC3576216	7' 6" - 7' 10"	36.4
AC357926	7' 9" - 8' 1"	35.5
AC3580216	8' 0" - 8' 4"	34.7
AC3583216	8' 3" - 8' 7"	33.8
AC3586216	8' 6" - 8' 10"	32.8
AC3589216	8' 9" - 9' 1"	31.9
AC3590216	9' 0" - 9' 4"	31.0
AC3593216	9' 3" - 9' 7"	30.0
AC3596216	9' 6" - 9' 10"	29.2
AC3599216	9' 9" - 10' 1"	28.3
AC35100216	10' 0" - 10' 4"	27.4
AC35103216	10' 3" - 10' 7"	26.6
AC35106216	10' 6" - 10' 10"	25.7
AC35109216	10' 9" - 11' 1"	24.8
AC35110216	11' 0" - 11' 4"	23.9
AC35113216	11' 3" - 11' 7"	23.1
AC35116216	11' 6" - 11' 10"	22.3
AC35119216	11' 9" - 12' 1"	21.4
AC35120216	12' 0" - 12' 4"	20.7

TABLE D(M) · 89 mm · 5.5 mm
EXTEND-O-COLUMN

Model No.	Adj. Length (mm)	ASD(Ra) (kN)
AC3560216	1829 - 1930	184.6
AC3563216	1905 - 2007	180.6
AC3566216	1981 - 2083	177.5
AC3569216	2057 - 2159	173.5
AC3570216	2134 - 2235	169.9
AC3573216	2210 - 2311	165.9
AC3576216	2286 - 2388	161.9
AC357926	2362 - 2464	157.9
AC3580216	2438 - 2540	154.4
AC3583216	2515 - 2616	150.3
AC3586216	2591 - 2692	145.9
AC3589216	2667 - 2769	141.9
AC3590216	2743 - 2845	137.9
AC3593216	2819 - 2921	133.4
AC3596216	2896 - 2997	129.9
AC3599216	2972 - 3073	125.9
AC35100216	3048 - 3150	121.9
AC35103216	3124 - 3226	118.3
AC35106216	3200 - 3302	114.3
AC35109216	3277 - 3378	110.3
AC35110216	3353 - 3454	106.3
AC35113216	3429 - 3531	102.8
AC35116216	3505 - 3607	99.2
AC35119216	3581 - 3683	95.2
AC35120216	3658 - 3759	92.1

TABLE E · 3" · 11 GA
FIXED COLUMN

Model No.	Length	ASD(Ra) (kips)
FC359	5' 9"	19.2
FC360	6' 0"	18.7
FC363	6' 3"	18.2
FC366	6' 6"	17.8
FC369	6' 9"	17.3
FC370	7' 0"	16.8
FC373	7' 3"	16.3
FC376	7' 6"	15.8
FC379	7' 9"	15.3
FC380	8' 0"	14.8
FC383	8' 3"	14.2
FC386	8' 6"	13.8
FC389	8' 9"	13.3
FC390	9' 0"	12.8
FC393	9' 3"	12.3
FC396	9' 6"	11.8
FC399	9' 9"	11.3
FC3100	10' 0"	10.9
FC3103	10' 3"	10.4
FC3106	10' 6"	10.1
FC3109	10' 9"	9.5
FC3110	11' 0"	9.1
FC3113	11' 3"	8.7
FC3116	11' 6"	8.3
FC3119	11' 9"	8.0
FC3120	12' 0"	7.6

TABLE E(M) · 76 mm · 11 GA
FIXED COLUMN

Model No.	Length (mm)	ASD(Ra) (kN)
FC359	1753	85.4
FC360	1829	83.2
FC363	1905	81.0
FC366	1981	79.2
FC369	2057	77.0
FC370	2134	74.7
FC373	2210	72.5
FC376	2286	70.3
FC379	2362	68.1
FC380	2438	65.8
FC383	2515	63.2
FC386	2591	61.4
FC389	2667	59.2
FC390	2743	56.9
FC393	2819	54.7
FC396	2896	52.5
FC399	2972	50.3
FC3100	3048	48.5
FC3103	3124	46.3
FC3106	3200	44.9
FC3109	3277	42.3
FC3110	3353	40.5
FC3113	3429	38.7
FC3116	3505	36.9
FC3119	3581	35.6
FC3120	3658	33.8

TABLE F · 3.5" · 11 GA
FIXED COLUMN

Model No.	Length	ASD(Ra) (kips)
FC3559	5' 9"	24.2
FC3560	6' 0"	23.8
FC3563	6' 3"	23.4
FC3566	6' 6"	22.9
FC3569	6' 9"	22.5
FC3570	7' 0"	22.0
FC3573	7' 3"	21.5
FC3576	7' 6"	21.0
FC3579	7' 9"	20.5
FC3580	8' 0"	20.0
FC3583	8' 3"	19.5
FC3586	8' 6"	19.0
FC3589	8' 9"	18.6
FC3590	9' 0"	18.1
FC3593	9' 3"	17.5
FC3596	9' 6"	17.1
FC3599	9' 9"	16.6
FC35100	10' 0"	16.1
FC35103	10' 3"	15.6
FC35106	10' 6"	15.1
FC35109	10' 9"	14.6
FC35110	11' 0"	14.1
FC35113	11' 3"	13.7
FC35116	11' 6"	13.2
FC35119	11' 9"	12.7
FC35120	12' 0"	12.2

TABLE F(M) · 89 mm · 11 GA
FIXED COLUMN

Model No.	Length (mm)	ASD(Ra) (kN)
FC3559	1753	107.6
FC3560	1829	105.9
FC3563	1905	104.1
FC3566	1981	101.9
FC3569	2057	100.1
FC3570	2134	97.9
FC3573	2210	95.6
FC3576	2286	93.4
FC3579	2362	91.2
FC3580	2438	89.0
FC3583	2515	86.7
FC3586	2591	84.5
FC3589	2667	82.7
FC3590	2743	80.5
FC3593	2819	77.8
FC3596	2896	76.1
FC3599	2972	73.8
FC35100	3048	71.6
FC35103	3124	69.4
FC35106	3200	67.2
FC35109	3277	64.9
FC35110	3353	62.7
FC35113	3429	60.9
FC35116	3505	58.7
FC35119	3581	56.5
FC35120	3658	54.3

TABLE G · 4" · 11 GA
FIXED COLUMN

Model No.	Length	ASD(Ra) (kips)
FC459	5' 9"	29.4
FC460	6' 0"	28.9
FC463	6' 3"	28.5
FC466	6' 6"	28.1
FC469	6' 9"	27.6
FC470	7' 0"	27.2
FC473	7' 3"	26.8
FC476	7' 6"	26.3
FC479	7' 9"	25.8
FC480	8' 0"	25.3
FC483	8' 3"	24.8
FC486	8' 6"	24.4
FC489	8' 9"	23.9
FC490	9' 0"	23.4
FP493	9' 3"	23.0
FC496	9' 6"	22.4
FC499	9' 9"	21.9
FC4100	10' 0"	21.4
FC4103	10' 3"	20.9
FC4106	10' 6"	20.4
FC4109	10' 9"	19.9
FC4110	11' 0"	19.5
FC4113	11' 3"	18.9
FC4116	11' 6"	18.4
FC4119	11' 9"	17.9
FC4120	12' 0"	17.4

TABLE G(M) · 102 mm · 11 GA
FIXED COLUMN

Model No.	Length (mm)	ASD(Ra) (kN)
FC459	1753	130.8
FC460	1829	128.6
FC463	1905	126.8
FC466	1981	125.0
FC469	2057	122.8
FC470	2134	121.0
FC473	2210	119.2
FC476	2286	117.0
FC479	2362	114.8
FC480	2438	112.5
FC483	2515	110.3
FC486	2591	108.5
FC489	2667	106.3
FC490	2743	104.1
FP493	2819	102.3
FC496	2896	99.6
FC499	2972	97.4
FC4100	3048	95.2
FC4103	3124	93.0
FC4106	3200	90.7
FC4109	3277	88.5
FC4110	3353	86.7
FC4113	3429	84.1
FC4116	3505	81.8
FC4119	3581	79.6
FC4120	3658	77.4

TABLE H · 3.5" · 0.216"
FIXED COLUMN

Model No.	Length	ASD(Ra) (kips)
FC3559216	5' 9"	42.3
FC3560216	6' 0"	41.5
FC3563216	6' 3"	40.6
FC3566216	6' 6"	39.9
FC3569216	6' 9"	39.0
FC3570216	7' 0"	38.2
FC3573216	7' 3"	37.3
FC3576216	7' 6"	36.4
FC3579216	7' 9"	35.5
FC3580216	8' 0"	34.7
FC3583216	8' 3"	33.8
FC3586216	8' 6"	32.0
FC3589216	8' 9"	31.9
FC3590216	9' 0"	31.0
FC3593216	9' 3"	30.0
FC3596216	9' 6"	29.2
FC3599216	9' 9"	28.3
FC35100216	10' 0"	27.4
FC35103216	10' 3"	26.6
FC35106216	10' 6"	25.7
FC35109216	10' 9"	24.8
FC35110216	11' 0"	23.9
FC35113216	11' 3"	23.1
FC35116216	11' 6"	22.3
FC35119216	11' 9"	21.4
FC35120216	12' 0"	20.7

TABLE H(M) · 89 mm · 5.5 mm
FIXED COLUMN

Model No.	Length (mm)	ASD(Ra) (kN)
FC3559216	1753	188.2
FC3560216	1829	184.6
FC3563216	1905	180.6
FC3566216	1981	177.5
FC3569216	2057	173.5
FC3570216	2134	169.9
FC3573216	2210	165.9
FC3576216	2286	161.9
FC3579216	2362	157.9
FC3580216	2438	154.4
FC3583216	2515	150.3
FC3586216	2591	142.3
FC3589216	2667	141.9
FC3590216	2743	137.9
FC3593216	2819	133.4
FC3596216	2896	129.9
FC3599216	2972	125.9
FC35100216	3048	121.9
FC35103216	3124	118.3
FC35106216	3200	114.3
FC35109216	3277	110.3
FC35110216	3353	106.3
FC35113216	3429	102.8
FC35116216	3505	99.2
FC35119216	3581	95.2
FC35120216	3658	92.1

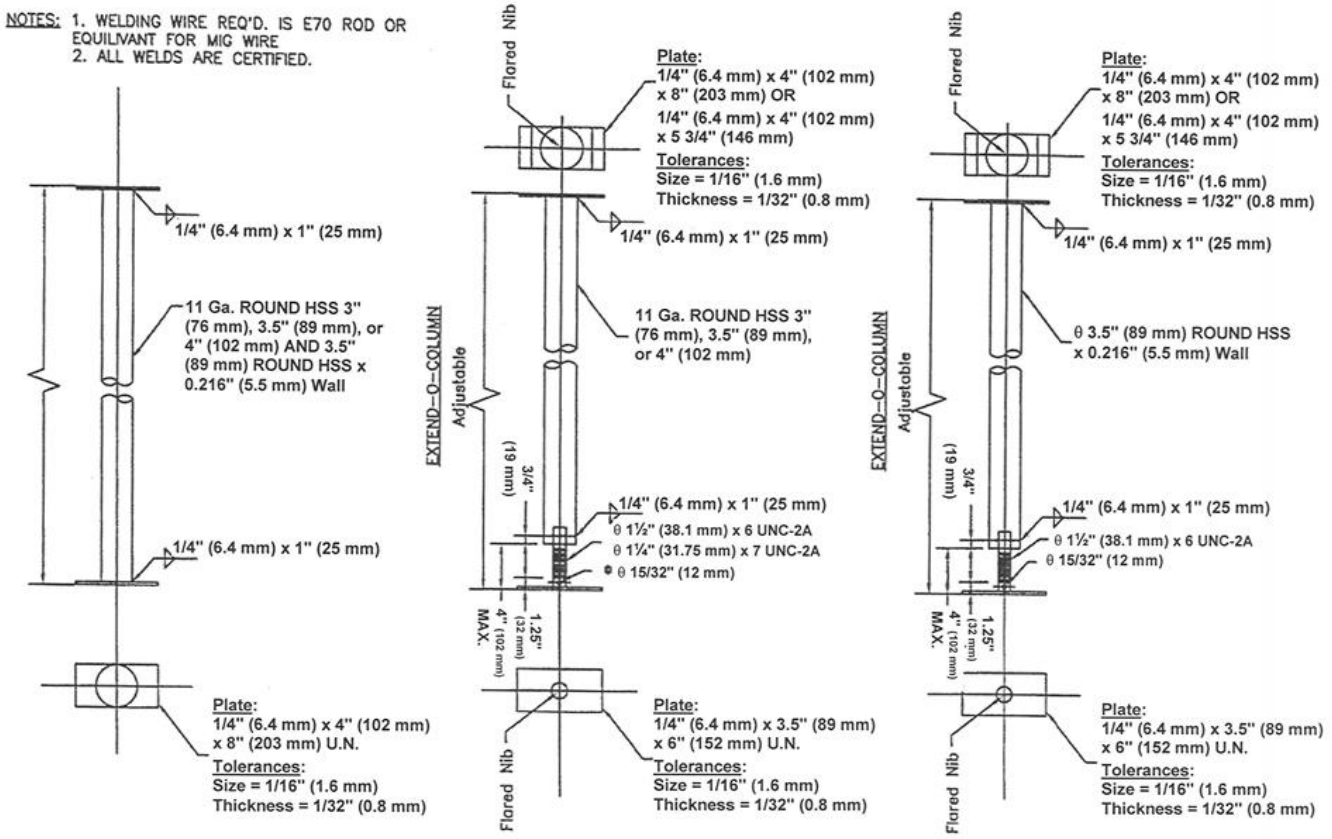


FIGURE 1 - COLUMN DRAWINGS