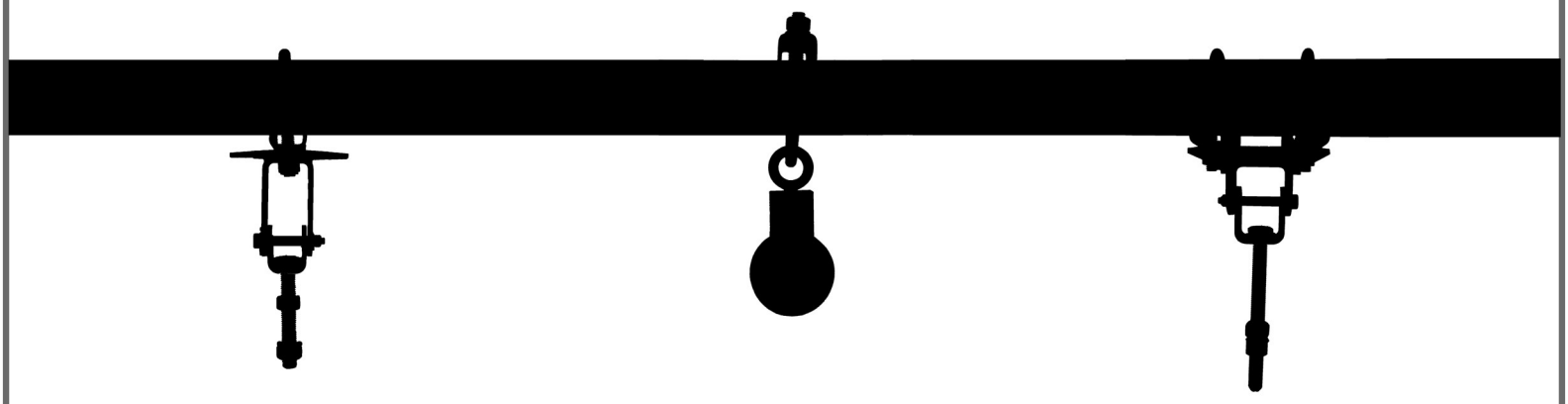
# BACKSTOP COMPONENT TESTING GUIDE

## LOAD RATING DATA



# Product Integrity

The integrity of the Porter product line is something that we take very seriously. The trust you place in Porter when selecting our product is something that we must earn every day in gymnasiums and athletic facilities around the world. The materials, manufacturing methods and engineering that go into each custom basketball backstop determine the quality and longevity of the product.

Porter's long-time commitment to state-of-the-art innovation and research and development has enabled us to continue in our tradition of producing products of the highest quality, durablilty, functionality and adaptability. All of Porter's welders are certified to meet the Structural Welding Code - Steel Standards of the American Welding Society.

In keeping with Porter's commitment to provide the safest equipment in the industry, Porter has ensured that all of our Hex Cap Screws and Carraige Bolts are a minimum of Grade 5. All plated hex Cap Screws and Carriage Bolts are mechanically plated rather than electroplated. Mechanical plating is porous, allowing the hydrogen to escape, minimizing the potential for hydrogen embrittlement.

# Structural Load Testing

To substantiate the integrity built into the Porter line of overhead supported backstops, we retained an independent testing lab to perform destructive tests on selected critical backstop components. The results of these tests have proven the superior structural integrity of these fittings as used in overhead support systems. Examples are given for each fitting to approximate an "in-use" safety factor for each assembly as incorporated in the backstop support/hoist systems.

Should you have any questions as to how the tests were performed, or questions regarding the Porter product line, do not hesitate to contact Porter or your Porter representative.

See pg. 3

See pg. 7

See pg. 5

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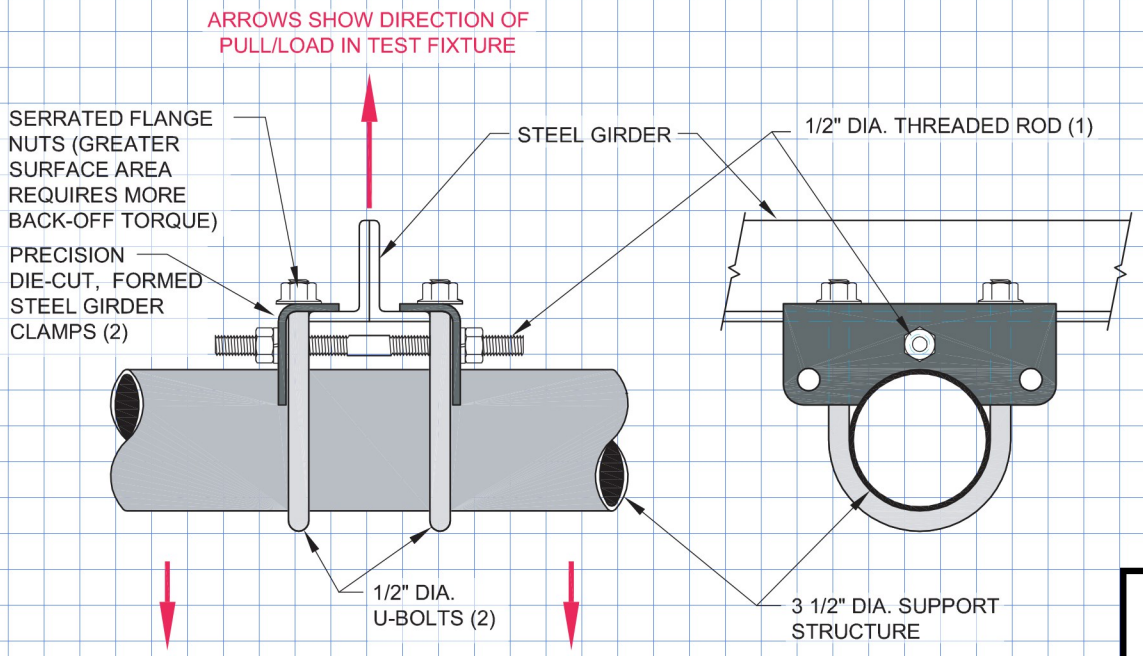
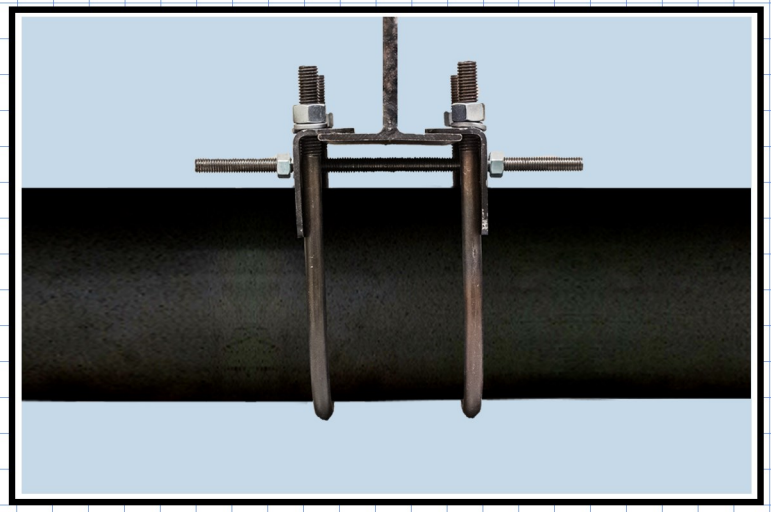
# STANDARD GIRDER CLAMP TESTING DATA

This clamp assembly is utilized for clamping to Joist and "I"-Beam lower flanges, to support backstop (and curtain) superstructures provided by Porter.



## EXPLANATION OF GIRDER CLAMP TESTING AND USAGE

GIRDER CLAMP ASSEMBLY SUPPORTED A DEAD LOAD OF 10,700 POUNDS BEFORE THE FLANGE OF THE TEST GIRDER SAMPLE DEFORMED TO A POINT THAT THE TESTING WAS HAULTED.

NORMAL BACKSTOP SUPPORT STRUCTURES ARE DESIGNED WITH A MINIMUM OF FOUR ATTACHMENT POINTS (GIRDER CLAMP ASSEMBLIES) WHICH WOULD RESULT IN A MINIMUM SUPPORT LOAD OF 42,800 POUNDS. A NORMAL BACKSTOP INSTALLATION AT A 25' ATTACHMENT HEIGHT WOULD WEIGH A MAXIMUM OF 700 POUNDS, WHICH WOULD RESULT IN A MINIMUM **60-to-1 SAFETY FACTOR**

JOHN O. BLOODSWORTH 062-046128 REGISTERED PROFESSIONAL ENGINEER OF STATE OF ILLINOIS

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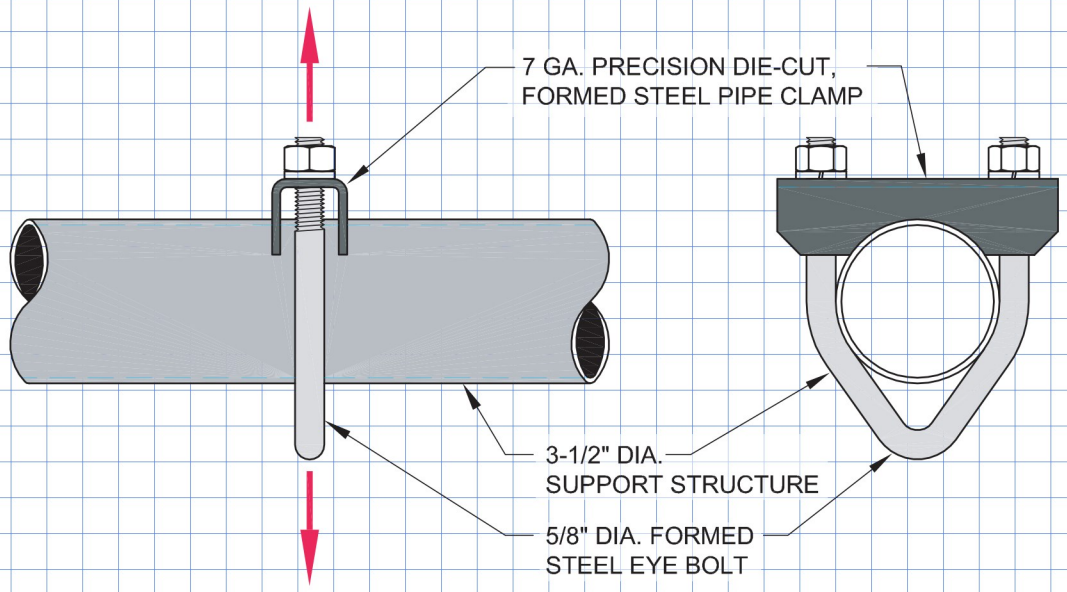
Tested By: Q.C. Metallurgical Laboratory, Inc.
Report No.: 8897
Test Date: March 26, 1993
Tested For: Porter Athletic Equipment Company

## No. XCLP 58001 002 GIRDER CLAMP LOAD TESTING DATA

DRAWING BY JW
CHECKED BY ES
PAGE NO. 3

# PIPE EYE CLAMP TESTING DATA

This clamp assembly is utilized for clamping to pipe superstructure, securing a swivel pulley utilized to hoist backstop. Superstructure is provided by Porter.




ARROWS SHOW DIRECTION OF PULL/LOAD IN TEST FIXTURE

## EXPLANATION OF PIPE EYE CLAMP TESTING AND USAGE

PIPE DEFORMATION AT 11,000 POUNDS. TEST DISCOUNTINUED AT THE STROKE LIMIT OF TEST MACHINE - 13,500 POUNDS. ADDITIONAL TEST PERFORMED WITH A REINFORCED 3-1/2" DIA. SUPPORT STRUCTURE - TESTED TO 16,500 POUNDS AT WHICH TIME THE TEST BRACKET (NOT ILLUSTRATED) FAILED. INSPECTION OF EYE CLAMP SHOWED NO VISIBLE EVIDENCE OF DEFORMATION.
HOIST LOAD ON A BASKETBALL BACKSTOP FRAME RARELY EXCEEDS 700 POUNDS, WHICH RESULTS IN A NMINIMUM **23.5-to-1 SAFETY FACTOR**

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Tested By: Q.C. Metallurgical Laboratory, Inc.
Report No.: 9277
Test Date: June 28, 1993
Tested For: Porter Athletic Equipment Company

## No. XCLP 97001 PIPE EYE CLAMP LOAD TESTING DATA

DRAWING BY JW
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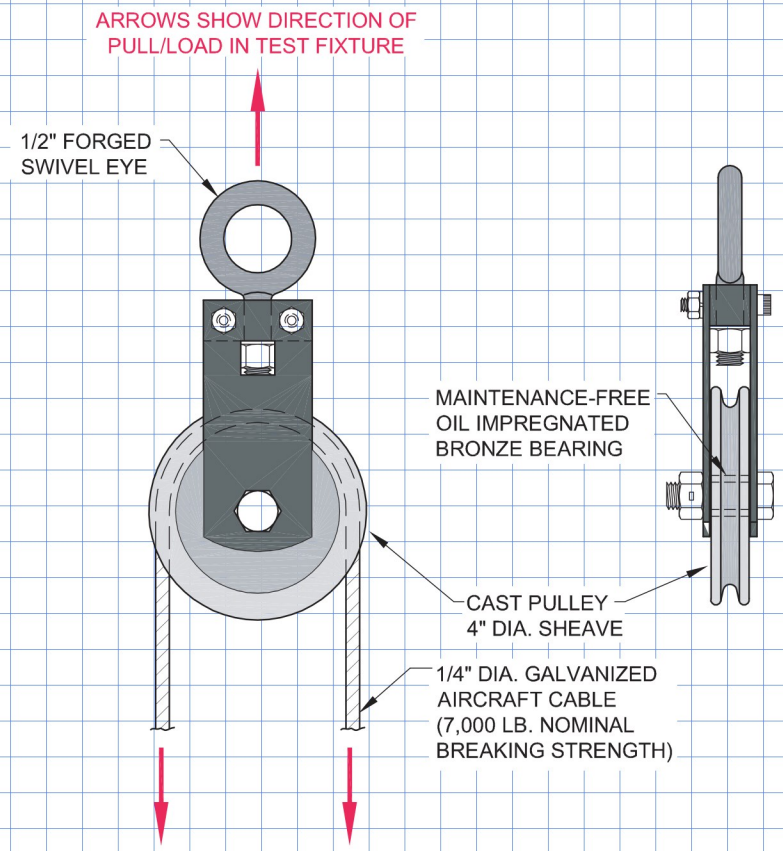
PAGE NO. 4

# STANDARD SWIVEL PULLEY TESTING DATA

This swivel pulley is utilized to hoist backstops via a 1/4" diameter (7 wire, 19 strands per) galvanized aircraft cable.




## EXPLANATION OF SWIVEL PULLEY TESTING AND USAGE

SWIVEL PULLEY WAS PULLED IN A TEST FIXTURE WITH A 1/4" CABLE IN PLACE OVER THE PULLEY SHEAVE TO A LOAD OF 9,500 POUND LOAD, AT WHICH TIME THE SIDE PLATES SHEARED AT THE TWO TOP ASSEMBLY BOLT HOLES. THIS LOAD EXCEEDS THE NORMAL BREAKING STRENGTH (7,000), OF THE 1/4" HOIST CABLE BY 2,500 POUNDS, OR 36%.

THE HOIST LOAD ON A BASKETBALL BACKSTOP FRAME RARELY EXCEEDS 700 POUNDS, WHICH RESULTS IN A MINIMUM **13.5-to-1 SAFETY FACTOR**

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Tested By: Q.C. Metallurgical Laboratory, Inc.
Report No.: 9277
Test Date: June 28, 1993
Tested For: Porter Athletic Equipment Company

## No. XPUL 57401 002 CLAMP LOAD TESTING DATA

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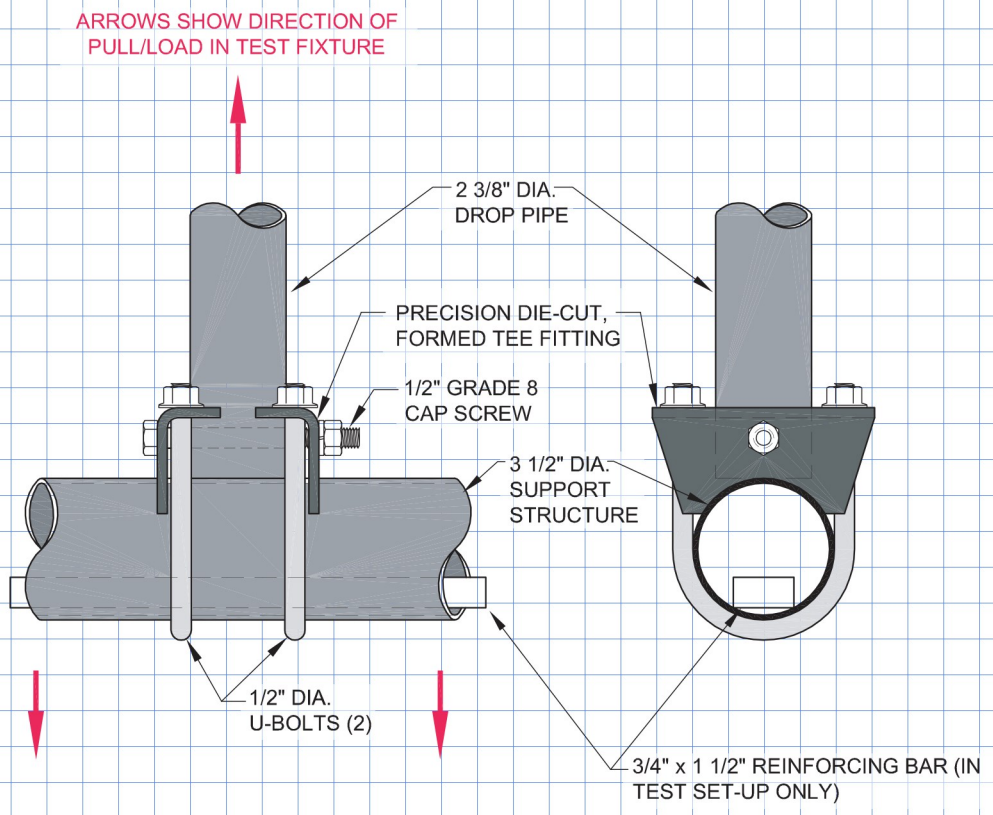
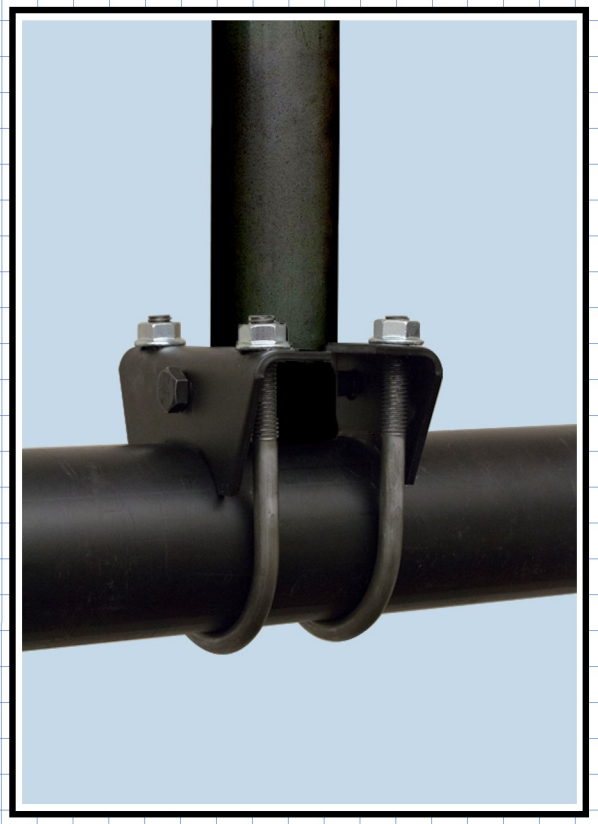
PAGE NO. 5

# 3 1/2” To 2 3/8” TEE ASSEMBLY TESTING DATA

This clamp assembly is utilized ofr connecting 2 3/8” O.D. support (drop) pipes to 3 1/2” O.D. span pipes in a sypical superstructure. Superstructure is provided by Porter.



## EXPLANATION OF 3 1/2” TO 2 3/8” TEE ASSEMBLY TESTING AND USAGE

THE TEE ASSEMBLY WAS SECURED TO A 2 3/8” DROP (VERTICAL) PIPE AND A 3 1/2” DIA. SUPPORT (HORIZONTAL) PIPE, AND PULLED IN THE DIRECTION AS INDICATED BY THE ARROWS (SEE DRAWING ABOVE) UNTIL THE BOLT WHICH EXTENDS THROUGH THE DROP PIPE DEFORMS TO A POINT THAT THE TEST WAS DISCONTINUED AT A MAXIMUM LOAD OF 10,400 POUNDS. DEPENDING ON THE USE OF THE TEE ASSEMBLY (HALF OR FULL CRADLES), THE SAFETY FACTOR OF THIS ASSEMBLY WOULD BE EQUIVALENT TO THE GIRDER CLAMP ASSEMBLY (PART NO. XCLP 58001 002).

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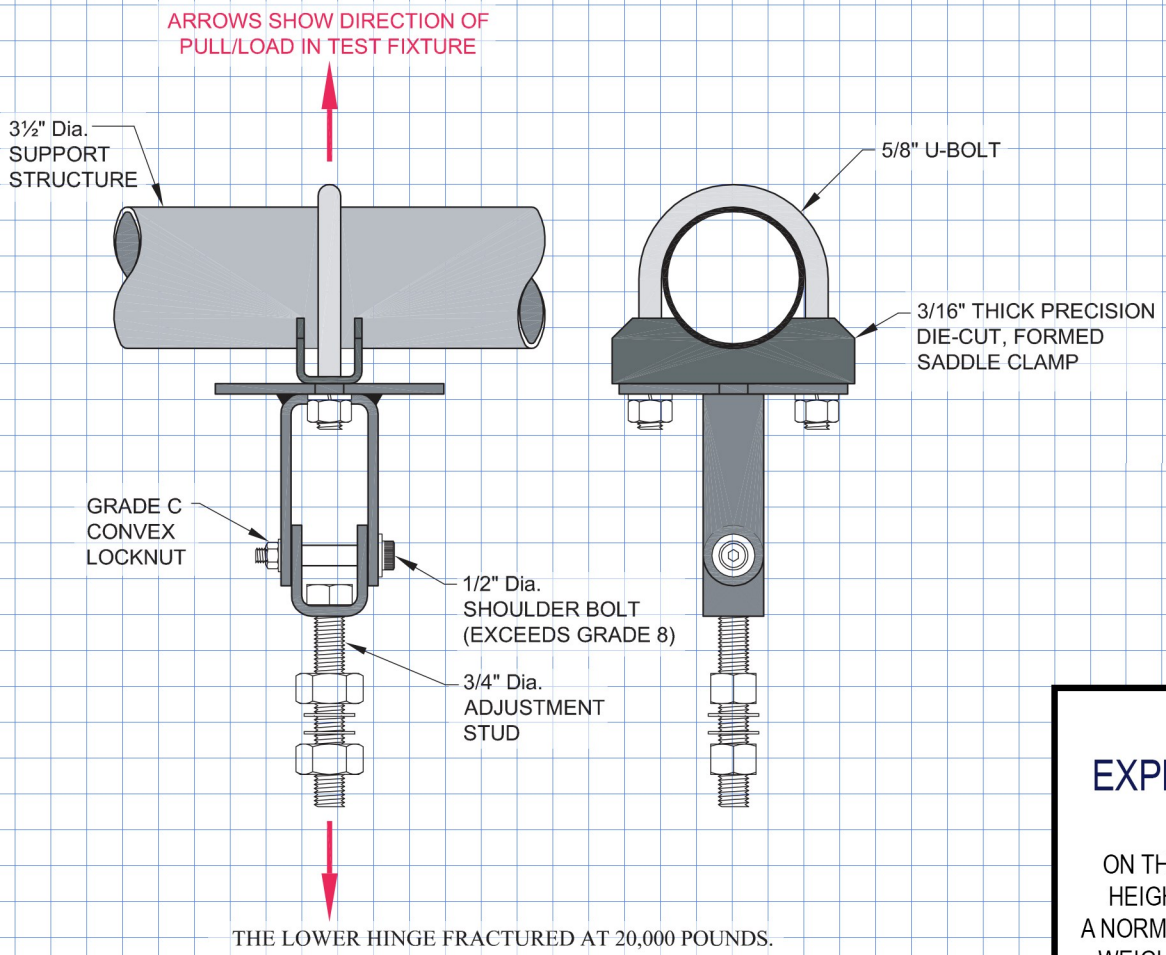
Tested By: Q.C. Metallurgical Laboratory, Inc.
Report No.: 9277
Test Date: June 28, 1993
Tested For: Porter Athletic Equipment Company

## No. XTEE 79001 002 3 1/2” TO 2 3/8” TEE LOAD TESTING DATA

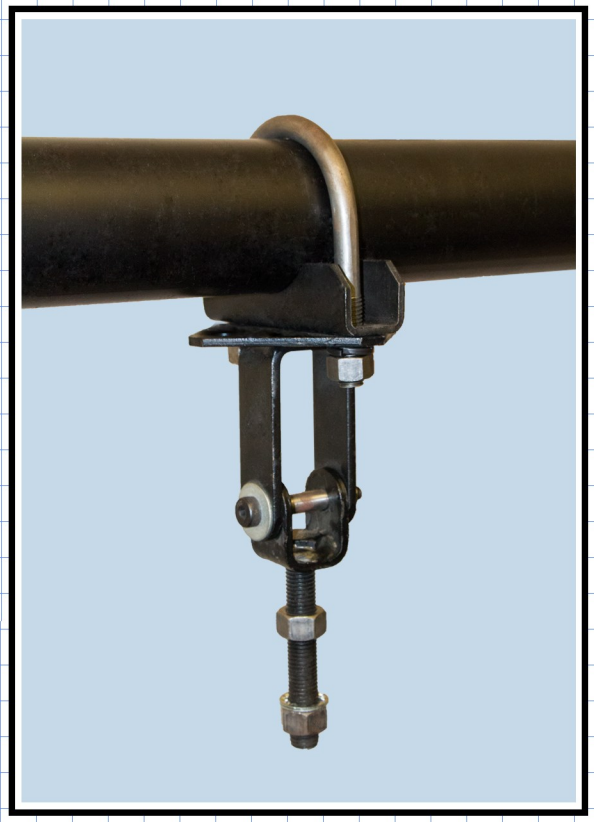
DRAWING BY JW
CHECKED BY ES

# ADJUSTABLE MAST HANGER ASSEMBLY TESTING DATA

This hanger assembly is utillized to secure a backstop mast frame (to attachment heights of 32') to 3 1/2" dia. support structure.




THE LOWER HINGE FRACTURED AT 20,000 POUNDS.



## EXPLANATION OF MAST HANGER TESTING AND USAGE

ON THE NO. 900 LINE MASTS, TWO HANGERS ARE USED ON ATTACHMENT HEIGHTS UP TO 28'-0", AND THREE HANGERS BETWEEN 28'-0" AND 32'-0". A NORMAL BACKSTOP INSTALLATION AT A 28'-0" ATTACHMENT HEIGHT WOULD WEIGH A MAXIMUM OF 800 POUNDS, WHICH WOULD RESULT IN A MINIMUM

**50-to-1 SAFETY FACTOR**

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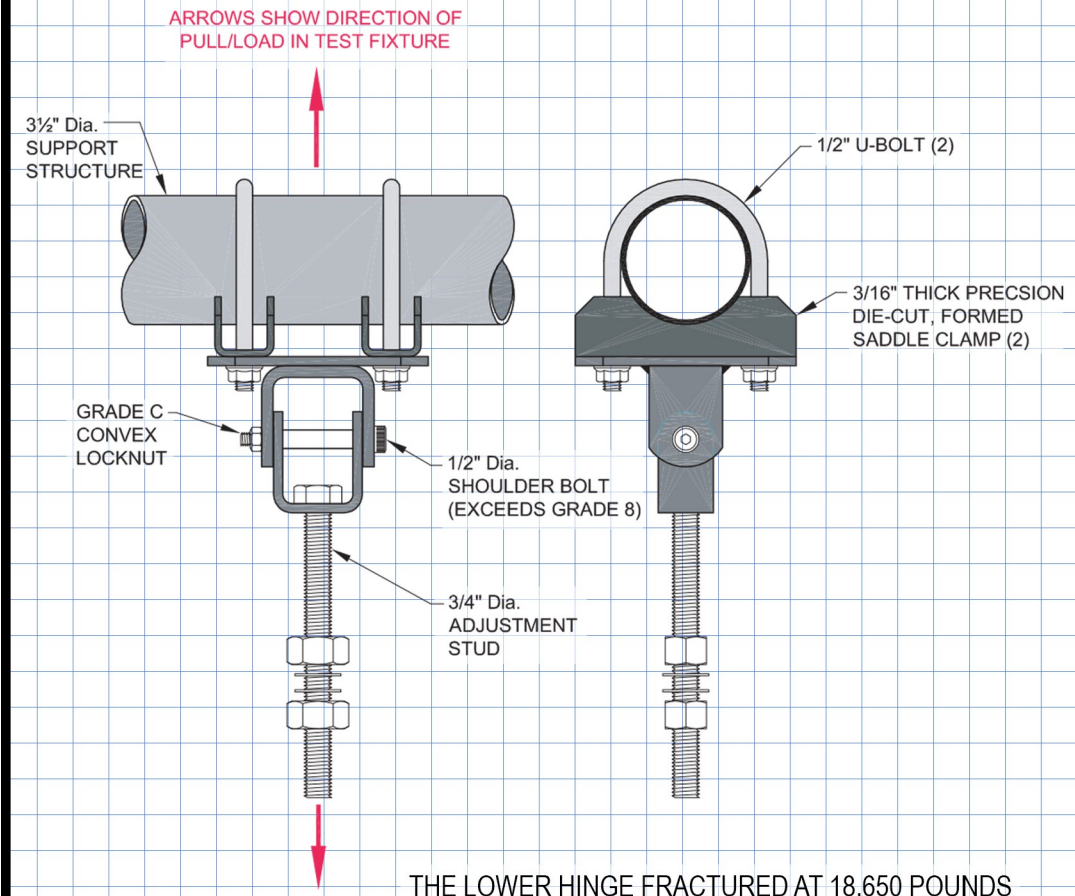
Tested By: Q.C. Metallurgical Laboratory, Inc.
Report No.: 16972
Test Date: July 22, 1999
Tested For: Porter Athletic Equipment Company

## No. XCLP 50405 002 MAST HANGER LOAD TESTING DATA

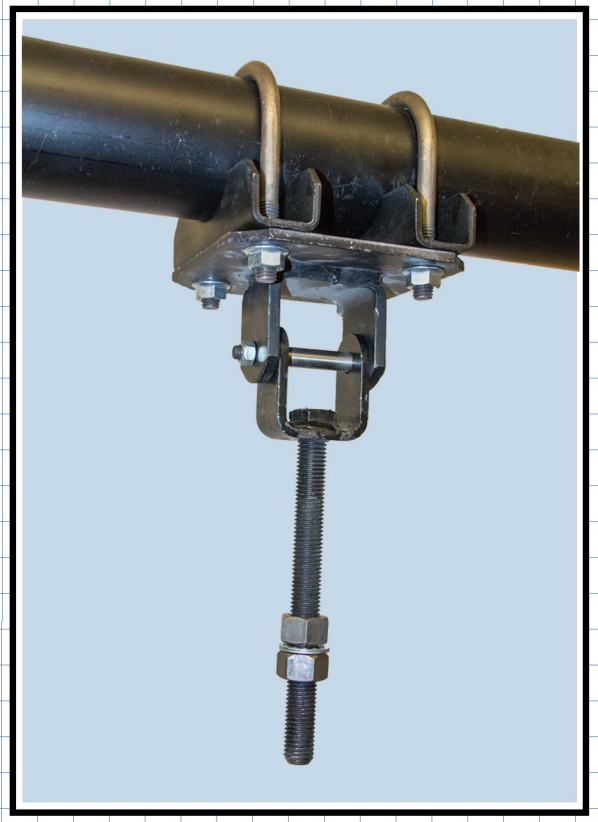
DRAWING BY JW
CHECKED BY ES
PAGE NO. 7

# "W" SERIES ADJUSTABLE MAST HANGER ASSEMBLY TESTING DATA

This hanger assembly is utilized to secure a backstop mast frame (greater than 32' attachment height) to a 3 1/2" dia. support structure.




THE LOWER HINGE FRACTURED AT 18,650 POUNDS



## EXPLANATION OF MAST HANGER TESTING & USAGE

ON THE No. 900 "W" LINE MAST, AT 32'-0" to 40'-0" ATTACHMENT HEIGHTS, THREE HANGERS ARE UTILIZED. A NORMAL BACKSTOP INSTALLATION AT A 32' ATTACHMENT HEIGHT WOULD WEIGH A MAXIMUM OF 1200 POUNDS, WHICH WOULD RESULT IN A MINIMUM **46-to-1 SAFETY FACTOR**

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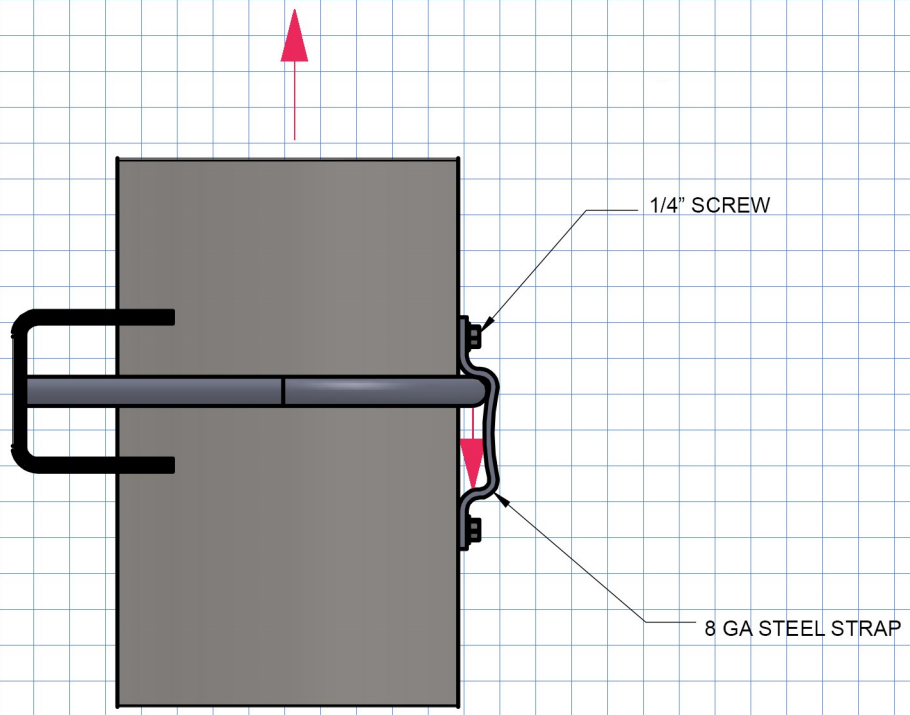
Tested By: Q.C. Metallurgical Laboratory, Inc.
Report No.: 17182
Test Date: October 11, 1999
Tested For: Porter Athletic Equipment Company

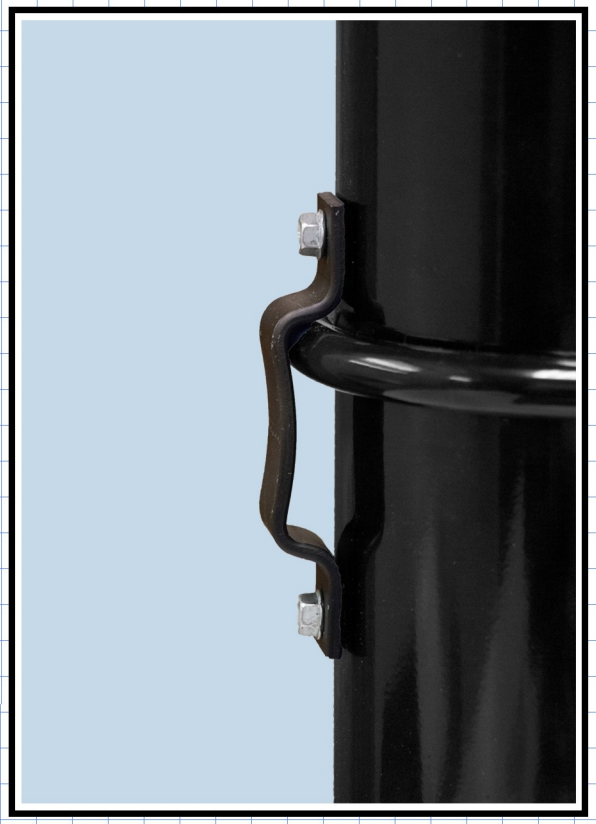
## No. XHNG 50401 002 MAST HANGER LOAD TESTING DATA

DRAWING BY JW
CHECKED BY ES
PAGE NO. 8

# MAST SAFETY CLAMP TESTING DATA

The indicator strap is intended to alert maintenance staff of shifts of the backboard attachment on the mast before a potentially catastrophic failure could occur.



## EXPLANATION OF GIRDER CLAMP TESTING AND USAGE

THE INDICATOR STRAP IS INTENDED TO ALERT MAINTENANCE STAFF OF SHIFTS OF THE BACKBOARD ATTACHMENT ON THE MAST BEFORE A POTENTIALLY CATASTROPHIC FAILURE COULD OCCUR. THE CLAMP IS NOT INTENDED TO SUPPORT THE U-BOLT ATTACHMENT FOR EXTENDED PERIODS OF TIME. A BACKBOARD, HEIGHT ADJUSTER UNIT, AND RIM INSTALLATION WOULD IMPOSE A DEAD LOAD OF 375 LBS. A VERTICAL LIVE LOAD OF 500 LBS IS ADDED TO SIMULATE A PLAYER DUNKING. THE TOTAL DESIGN VERTICAL LOAD IS 875LBS BASED ON THE ALLOWABLE STRENGTH DESIGN LOAD COMBINATION OF D+L. **4-to-1 SAFETY FACTOR**

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Tested By: Q.C. Metallurgical Laboratory, Inc.
Report No.: 42443
Test Date: December 18, 2017
Tested For: Porter Athletic, Inc.

## No. 90093 MAST SAFETY CLAMP LOAD TESTING DATA

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