

WALNUT STREET BRIDGE

HARRISBURG

PENNSYLVANIA



1890

WITH FIFTEEN PIN-CONNECTED BALTIMORE THROUGH-TRUSS SPANS, THE WALNUT STREET BRIDGE IS AMONG THE LONGEST SURVIVING BRIDGES BUILT WITH THE PHOENIX BRIDGE COMPANY'S PROPRIETARY WROUGHT IRON COMPRESSION MEMBER KNOWN AS THE "PHOENIX COLUMN" AND PATENTED IN 1862. ERECTED IN 1889-1890, UNDER THE SUPERVISION OF ALBERT LUCIUS, CONSULTING ENGINEER, AND THE DEAN & WESTBROOK BRIDGE COMPANY, GENERAL CONTRACTOR, BOTH OF NEW YORK CITY, THE WALNUT STREET BRIDGE IS THE OLDEST EXTANT BRIDGE OVER THE SUSQUEHANNA RIVER.

THE WALNUT STREET BRIDGE WAS CONCEIVED AND FINANCED BY THE PEOPLE'S BRIDGE COMPANY TO PROVIDE COMPETITION FOR THE THEN-EXISTING MARKET STREET BRIDGE, WHICH WAS OPERATED BY THE HARRISBURG BRIDGE CO. AND ENJOYED A MONOPOLY ON THE SUSQUEHANNA RIVER CROSSING IN HARRISBURG AND CHARGED EXHORBITANT TOLLS. THE HARRISBURG BRIDGE COMPANY FOUGHT THE PEOPLE'S BRIDGE COMPANY BOTH IN THE COURTS AND IN THE PRESS, BUT THE PROJECT WAS GRANTED A STATE CHARTER IN MARCH 1889.

CONSTRUCTION OF THE WALNUT STREET BRIDGE COMMENCED APRIL 12, 1889, AND THE STRUCTURE WAS FORMALLY OPENED ON APRIL 25, 1890. IN 1893, THE PEOPLE'S BRIDGE COMPANY

PERMITTED THE HARRISBURG AND MECHANICSBURG ELECTRIC RAILWAY COMPANY TO CONSTRUCT, OPERATE AND MAINTAIN A STREET RAILWAY LINE ACROSS THE WALNUT STREET BRIDGE. TO ACCOMMODATE THE GREATER LOADS, NEW STEEL STRINGERS AND ADDITIONAL FLOOR-BEAM HANGARS WERE INSTALLED.

OVER THE NEXT TWENTY YEARS, THE PEOPLE'S BRIDGE COMPANY OPERATED THE WALNUT STREET BRIDGE AT A GROWING PROFIT DUE TO CONTINUAL INCREASE IN BOTH VEHICLE AND STREET RAILWAY TRAFFIC. IN 1911, THE PHOENIX BRIDGE COMPANY, ORIGINAL FABRICATOR OF THE BRIDGE, WAS HIRED TO COMPLETELY OVERHAUL THE STRUCTURE, ALLOWING IT TO REMAIN IN FULL USE ANOTHER DECADE. IN 1922, HOWEVER, THE PEOPLE'S BRIDGE COMPANY IMPOSED A 9-TON LOAD LIMIT. TROLLEY SERVICE WAS TERMINATED IN 1936.

THE COMMONWEALTH OF PENNSYLVANIA ACQUIRED THE WALNUT STREET BRIDGE IN 1954. IT REMAINED IN VEHICULAR SERVICE UNTIL JUNE 1972, WHEN FLOOD DAMAGE ASSOCIATED WITH TROPICAL STORM AGNES FORCED ITS CLOSURE TO ALL BUT PEDESTRIAN TRAFFIC.

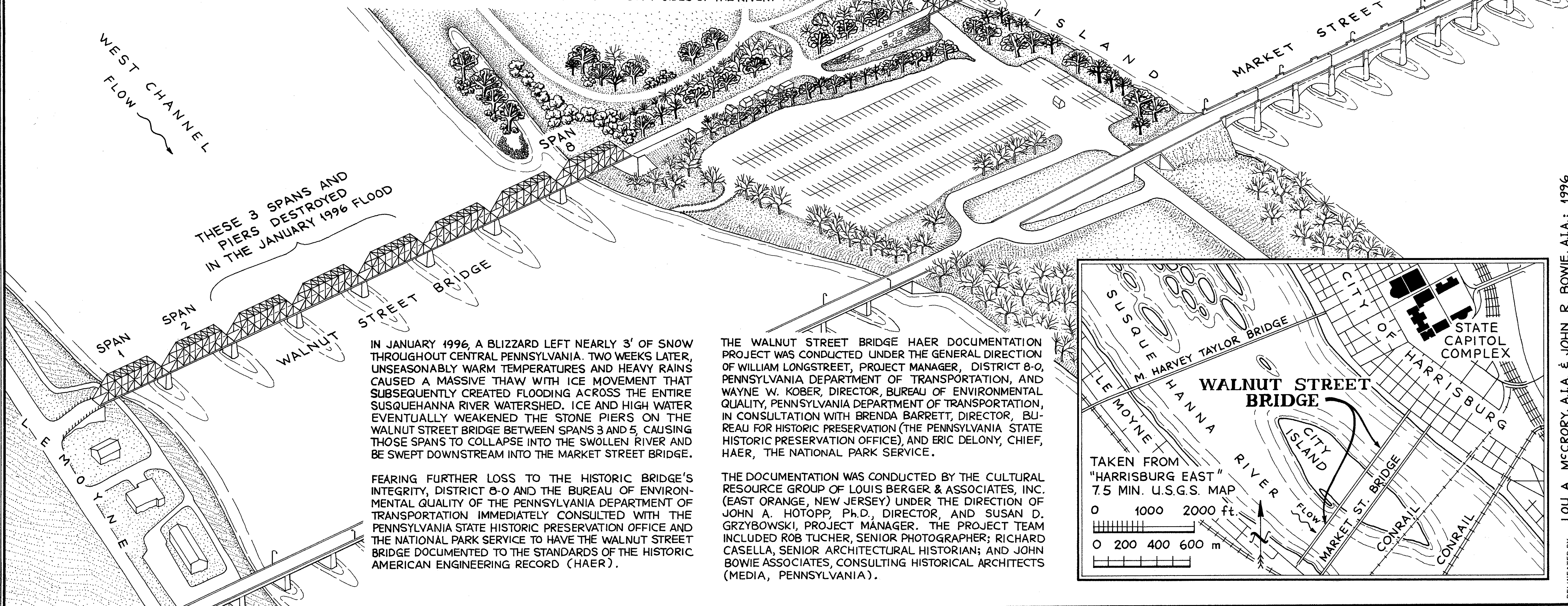
FOR THE NEXT TWO DECADES, THE BRIDGE WAS A POPULAR LOCAL LANDMARK AND PROVIDED A WELL-USED LINK TO THE ATTRACTIONS ON CITY ISLAND FROM BOTH SIDES OF THE RIVER.

IN JANUARY 1996, A BLIZZARD LEFT NEARLY 3' OF SNOW THROUGHOUT CENTRAL PENNSYLVANIA. TWO WEEKS LATER, UNSEASONABLY WARM TEMPERATURES AND HEAVY RAINS CAUSED A MASSIVE THAW WITH ICE MOVEMENT THAT SUBSEQUENTLY CREATED FLOODING ACROSS THE ENTIRE SUSQUEHANNA RIVER WATERSHED. ICE AND HIGH WATER EVENTUALLY WEAKENED THE STONE PIERS ON THE WALNUT STREET BRIDGE BETWEEN SPANS 3 AND 5, CAUSING THOSE SPANS TO COLLAPSE INTO THE SWOLLEN RIVER AND BE SWEEPED DOWNSTREAM INTO THE MARKET STREET BRIDGE.

FEARING FURTHER LOSS TO THE HISTORIC BRIDGE'S INTEGRITY, DISTRICT 8-0 AND THE BUREAU OF ENVIRONMENTAL QUALITY OF THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION IMMEDIATELY CONSULTED WITH THE PENNSYLVANIA STATE HISTORIC PRESERVATION OFFICE AND THE NATIONAL PARK SERVICE TO HAVE THE WALNUT STREET BRIDGE DOCUMENTED TO THE STANDARDS OF THE HISTORIC AMERICAN ENGINEERING RECORD (HAER).

THE WALNUT STREET BRIDGE HAER DOCUMENTATION PROJECT WAS CONDUCTED UNDER THE GENERAL DIRECTION OF WILLIAM LONGSTREET, PROJECT MANAGER, DISTRICT 8-0, PENNSYLVANIA DEPARTMENT OF TRANSPORTATION, AND WAYNE W. KOBER, DIRECTOR, BUREAU OF ENVIRONMENTAL QUALITY, PENNSYLVANIA DEPARTMENT OF TRANSPORTATION, IN CONSULTATION WITH BRENDA BARRETT, DIRECTOR, BUREAU FOR HISTORIC PRESERVATION (THE PENNSYLVANIA STATE HISTORIC PRESERVATION OFFICE), AND ERIC DELONY, CHIEF, HAER, THE NATIONAL PARK SERVICE.

THE DOCUMENTATION WAS CONDUCTED BY THE CULTURAL RESOURCE GROUP OF LOUIS BERGER & ASSOCIATES, INC. (EAST ORANGE, NEW JERSEY) UNDER THE DIRECTION OF JOHN A. HOTOPP, Ph.D., DIRECTOR, AND SUSAN D. GRZYBOWSKI, PROJECT MANAGER. THE PROJECT TEAM INCLUDED ROB TUCHER, SENIOR PHOTOGRAPHER; RICHARD CASELLA, SENIOR ARCHITECTURAL HISTORIAN; AND JOHN BOWIE ASSOCIATES, CONSULTING HISTORICAL ARCHITECTS (MEDIA, PENNSYLVANIA).



DELINEATED BY: LOU A. MCCRORY, AIA & JOHN R. BOWIE, AIA; 1996

WALNUT STREET BRIDGE
RECORDING PROJECT
UNITED STATES DEPARTMENT OF THE INTERIOR

HARRISBURG

WALNUT STREET BRIDGE, 1890
WALNUT STREET SPANNING THE SUSQUEHANNA RIVER
DAUPHIN COUNTY

PENNSYLVANIA

SHEET
1 of 5

HISTORIC AMERICAN
ENGINEERING RECORD
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GENERAL TRUSS DETAILS

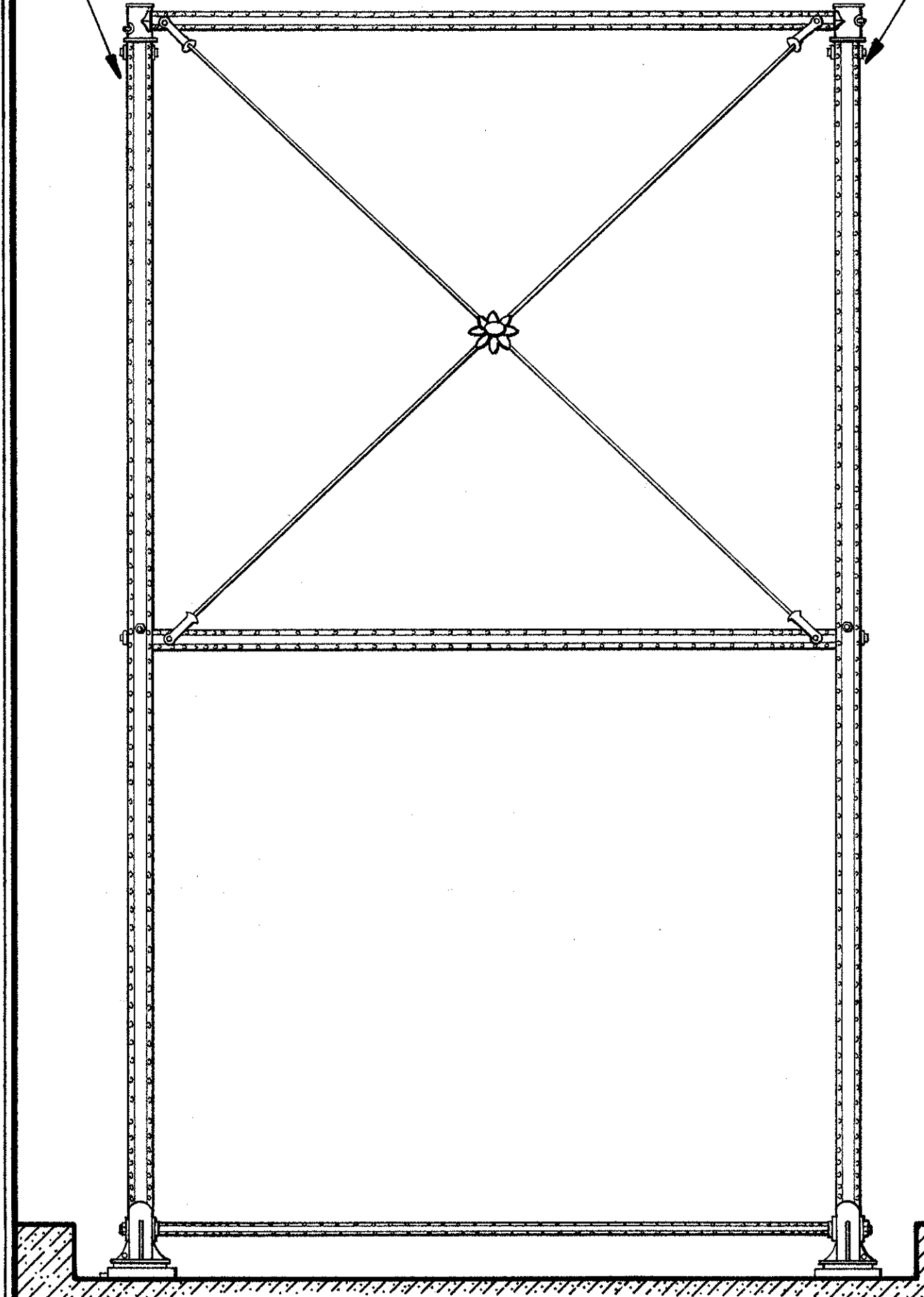
(TYPICAL FOR SPANS 1 - 12)

SCALE: $\frac{1}{4}" = 1'-0"$

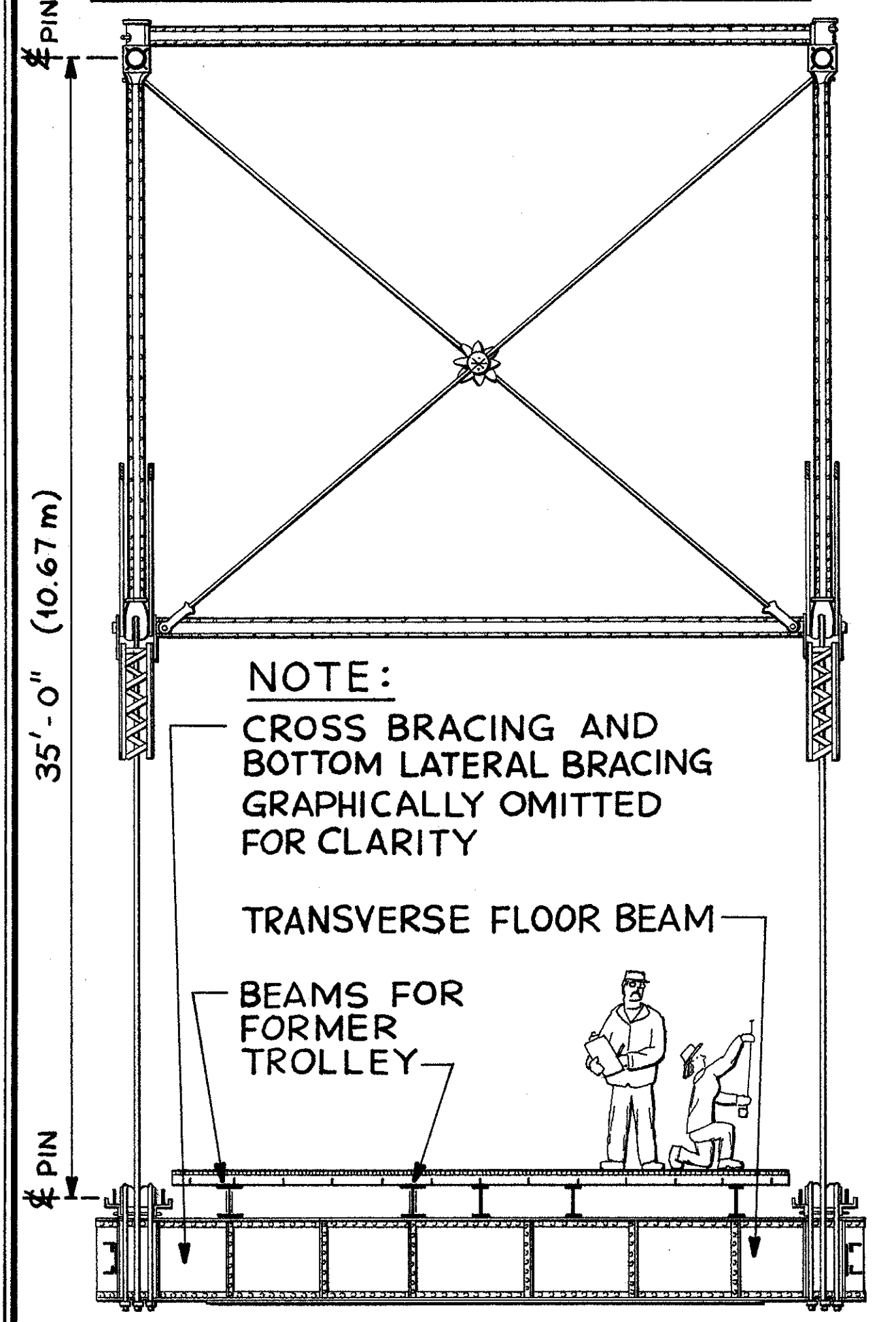
0 1 2 4 8 16 FT.

0 1 2 3 4 m

NOTE: DIAGONAL MEMBERS GRAPHICALLY OMITTED FOR CLARITY



PORTAL ELEVATION/SECTION B-B

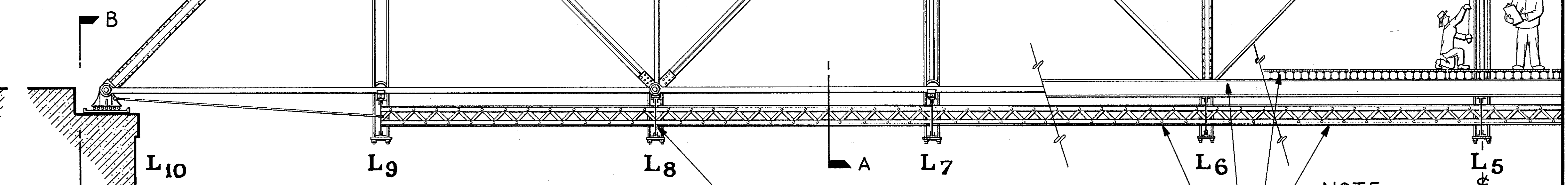


NOTE:
CROSS BRACING AND
BOTTOM LATERAL BRACING
GRAPHICALLY OMITTED
FOR CLARITY

TRANSVERSE FLOOR BEAM

BEAMS FOR
FORMER
TROLLEY

SECTION A-A



COMPOSITE
SECTION/
ELEVATION

TRANSVERSE
FLOOR BEAM

CROSS BRACING
FOR TRANSVERSE
FLOOR BEAMS

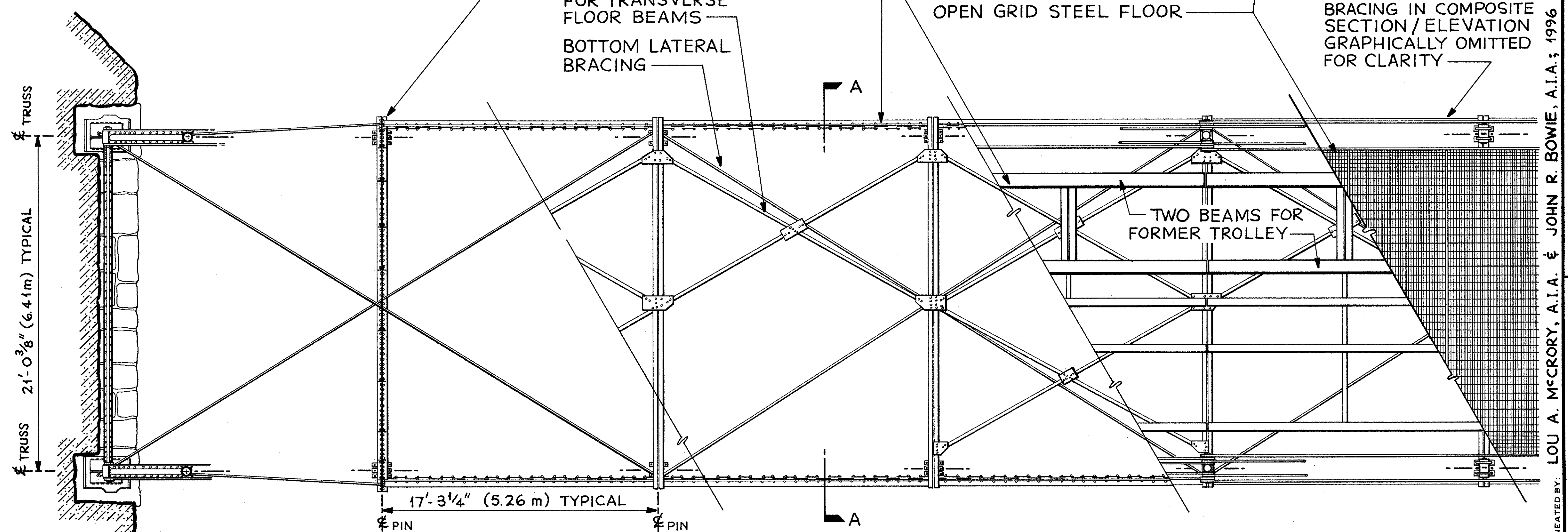
BOTTOM LATERAL
BRACING

EDGE STIFFENER
(BOTTOM LATTICE MEMBER)

FLOOR/DECK BEAMS

OPEN GRID STEEL FLOOR

NOTE:
EDGE STIFFENER IN
COMPOSITE PLAN AND
CROSS BRACING &
BOTTOM LATERAL
BRACING IN COMPOSITE
SECTION/ELEVATION
GRAPHICALLY OMITTED
FOR CLARITY



COMPOSITE FRAMING/FLOOR PLAN

17'-3 1/4" (5.26 m) TYPICAL

TWO BEAMS FOR
FORMER TROLLEY

21'-0 3/8" (6.41m) TYPICAL

TRIM LINE

PIN OF MOVABLE JOINT CONNECTED TO TRANSVERSE STRUT (PHOENIX COLUMN)

OIL PORT

BOTTOM LATERAL BRACING ROD BOLTED THROUGH FLANGE OF JOINT BASE (TYP. FOR FIXED AND MOVABLE JOINTS)

ORIGINAL CONDITION OF FIXED JOINT PIN HAS BEEN ALTERED (DATE UNKNOWN). PIN END IS FIXED IN MODERN CONCRETE SLAB (POURED ON TOP OF ORIGINAL PIER—GRAPHICALLY OMITTED FOR CLARITY).

DETAIL AT TYPICAL PIER

SAME SCALE AS OTHER DETAILS

NOTE: THIS DRAWING (AND SHEET 4) DOCUMENT THE BASIC TRUSS STRUCTURE. DETAILS RELATING TO THE DECK SYSTEM ARE OMITTED FOR GRAPHIC CLARITY. SEE SHEET 2 FOR DECK CONSTRUCTION DETAILS.

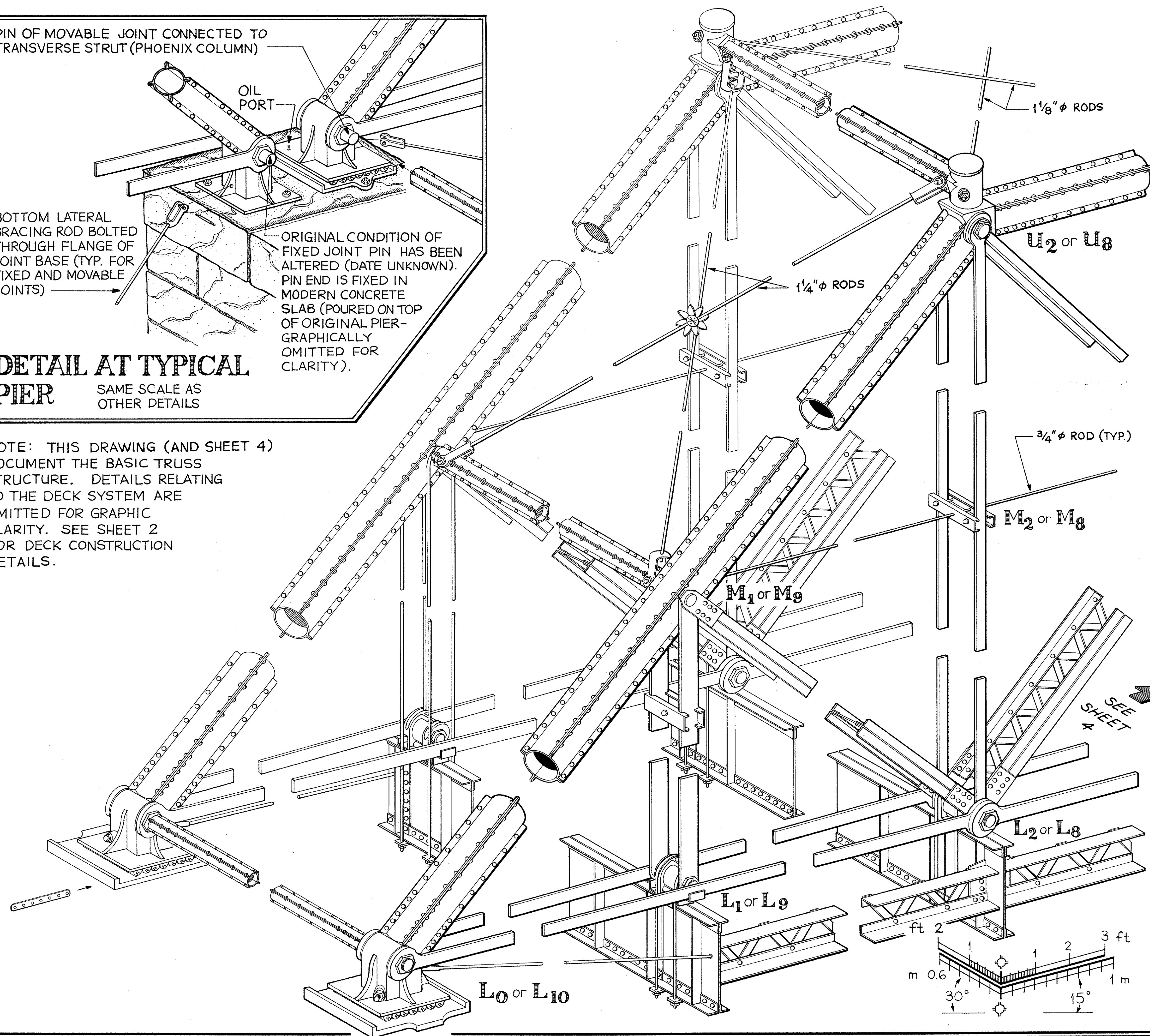
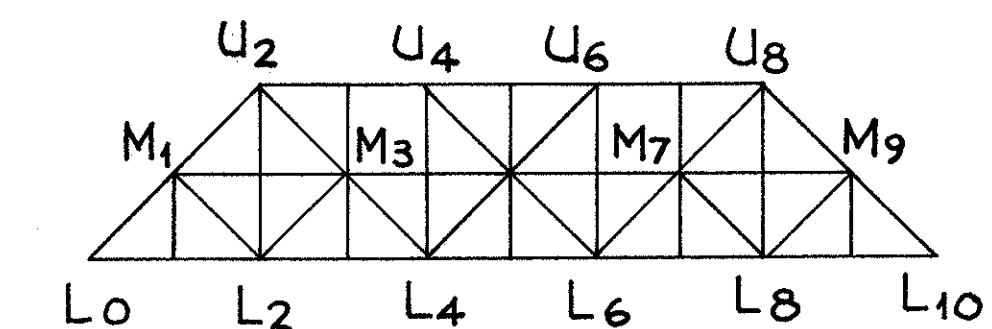
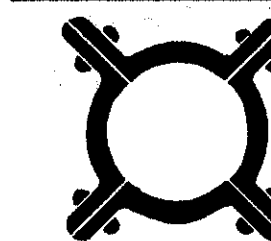


TABLE OF MEMBER SECTIONS



• INCLINED END POSTS AND UPPER CHORDS •

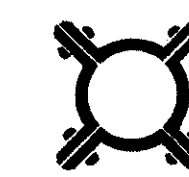


$R = 2.97$ in.
 $A = 16.0$ in.²

L_0-U_2 , $L_{10}-U_8$, U_4-U_5 , U_5-U_6

NOTE: FOR U_2-U_3 , U_3-U_4 , U_6-U_7 , AND U_7-U_8 :
 $R = 2.93$ in., $A = 14.1$ in.²

• FULL VERTICALS AND UPPER TRANSVERSE STRUTS •



$R = 1.95$ in.
 $A = 6.4$ in.²

L_4-U_4 , L_6-U_6 , M_1-M_1 , M_9-M_9 , U_2-U_2 , U_3-U_3 , U_4-U_4 , U_5-U_5 , U_6-U_6 , U_7-U_7 , U_8-U_8

• UPPER VERTICALS AND LOWER TRANSVERSE STRUTS •



$R = 1.45$ in.
 $A = 3.8$ in.²

L_0-L_0 , $L_{10}-L_{10}$, M_3-U_3 , M_5-U_5 , M_7-U_7

• VERTICALS •

(2) FLATS - $6" \times \frac{11}{16}"$
NORTH SIDE

(4) RODS - $1\frac{3}{8}" \phi$
SOUTH SIDE

$\frac{1}{2}"$ STIFFENER PLATES AT MID-HEIGHT (WELDED)
 L_1-M_1 , L_9-M_9

(2) FLATS - $3" \times \frac{11}{16}"$
 L_2-U_2 , L_8-U_8

• CONTINUED NEXT SHEET •

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SHEET
3 of 5

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TRIM LINE

TRIM LINE

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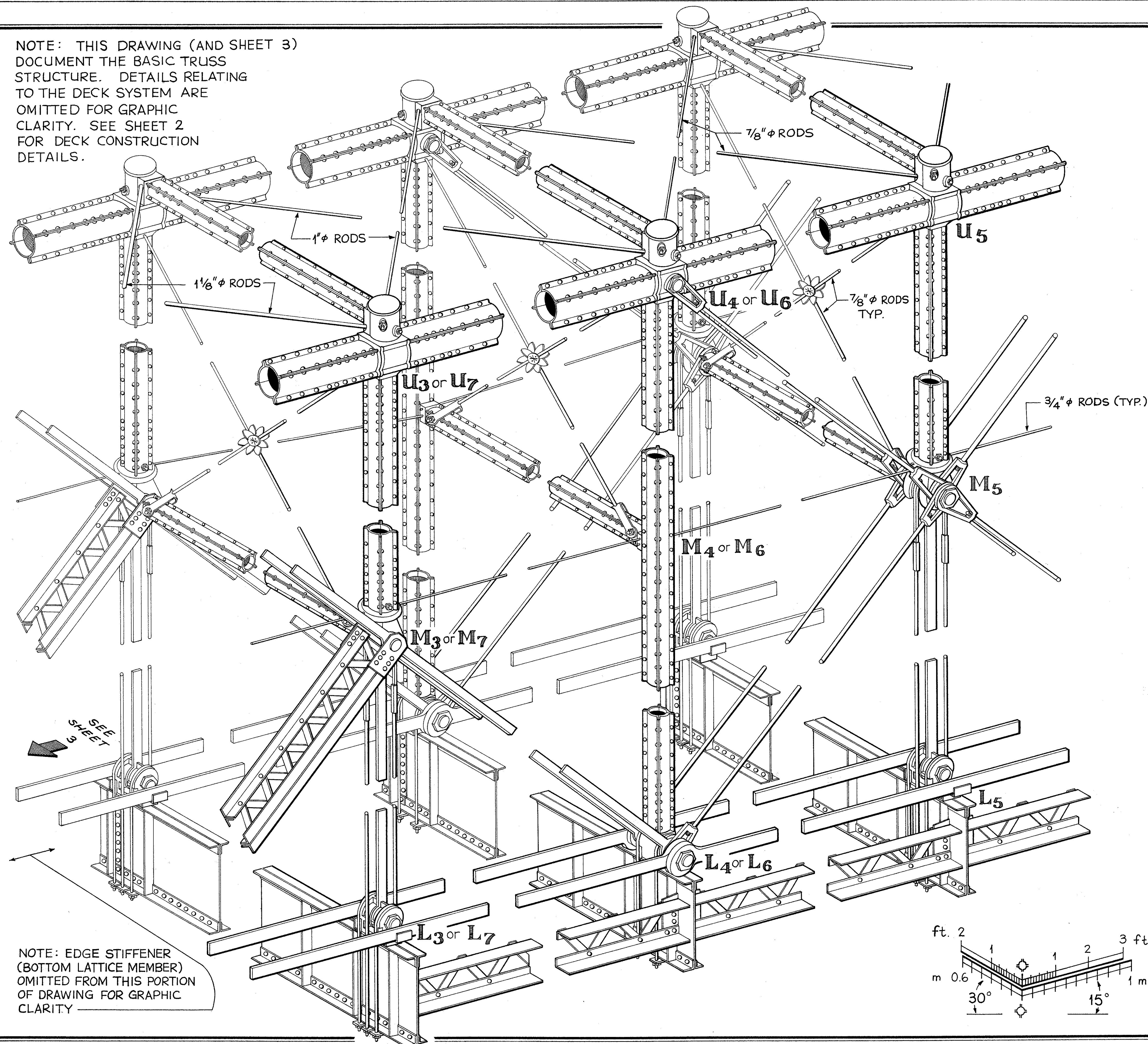
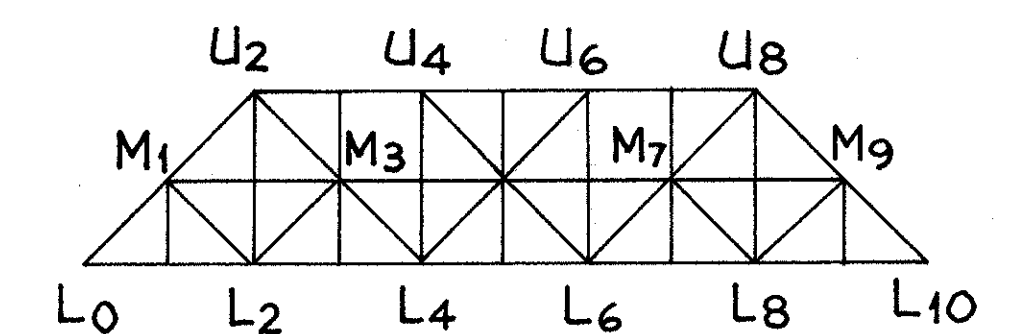


TABLE OF MEMBER SECTIONS (CONTINUED...)



• VERTICALS - (CONTINUED) •

(2) RODS - $1\frac{1}{4}$ " ϕ
(1) FLAT - $3\frac{3}{8}$ " x $1\frac{1}{16}$ "
 $\frac{1}{2}$ " STIFFENER PLATE AT MID-HEIGHT (WELDED)
L3-M3, L5-M5, L7-M7

• LOWER CHORDS •

(2) FLATS - $4\frac{1}{8}$ " x 1"
L0-L2, L2-L4, L6-L8, L8-L10
(2) FLATS - $4\frac{1}{8}$ " x $1\frac{1}{4}$ "
L4-L6

• DIAGONALS •

(4) ANGLES - 3 " x $2\frac{1}{2}$ " x $\frac{5}{16}$ "
(2) PLATES - $7\frac{1}{2}$ " x $\frac{5}{16}$ "
LATTICE - 2 " x $\frac{5}{16}$ "
L2-M1, L2-M3, L8-L7, L8-M9

(2) PLATES - 3 " x 1"
M3-U2, M7-U8

(2) PLATES - 3 " x $\frac{13}{16}$ "
L4-M3, L6-M7

(2) RODS - $1\frac{1}{4}$ " ϕ
L4-M5, L6-M5

(2) RODS - $1\frac{1}{2}$ " ϕ
M5-U4, M5-U6

NOTE: SIZES OF MEMBERS SHOWN HERewith (ON DRWGS. 3 & 4) TAKEN FROM "REPORT ON WALNUT ST. BRIDGE..." BY BROOKHART & TYO, ENGINEERS (OCT. 1950) AND FIELD CHECKED (1996).

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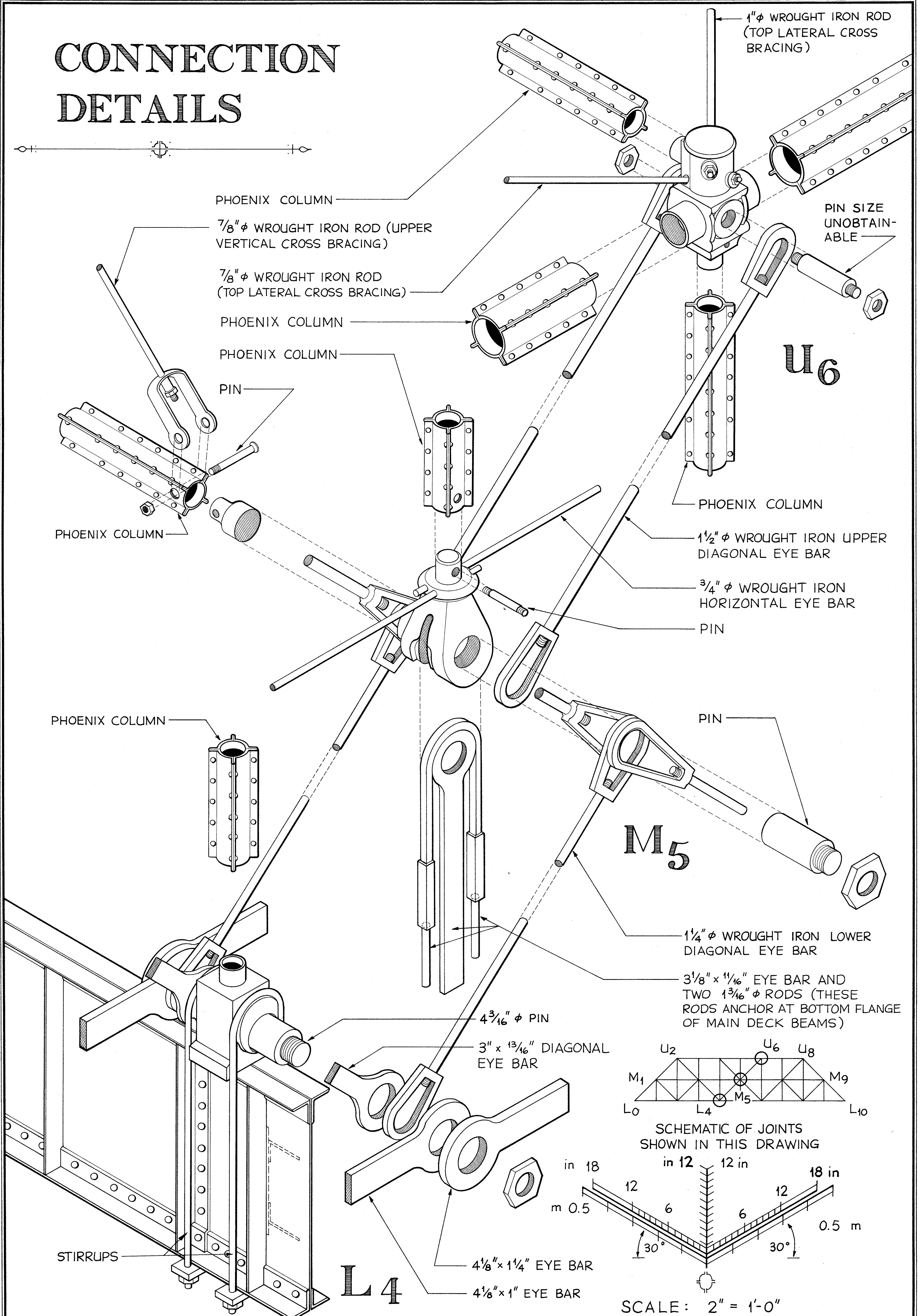
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SHEET 4 of 5

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CONNECTION DETAILS



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5 of 5

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