



# PORT OF TACOMA

## GANTRY ARTICULATION - SUMITOMO CRANES 2403 AND 2404 - 1988

### CONTRACT No. 657

#### CONSULTING ENGINEERS

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CHIEF ENGINEER

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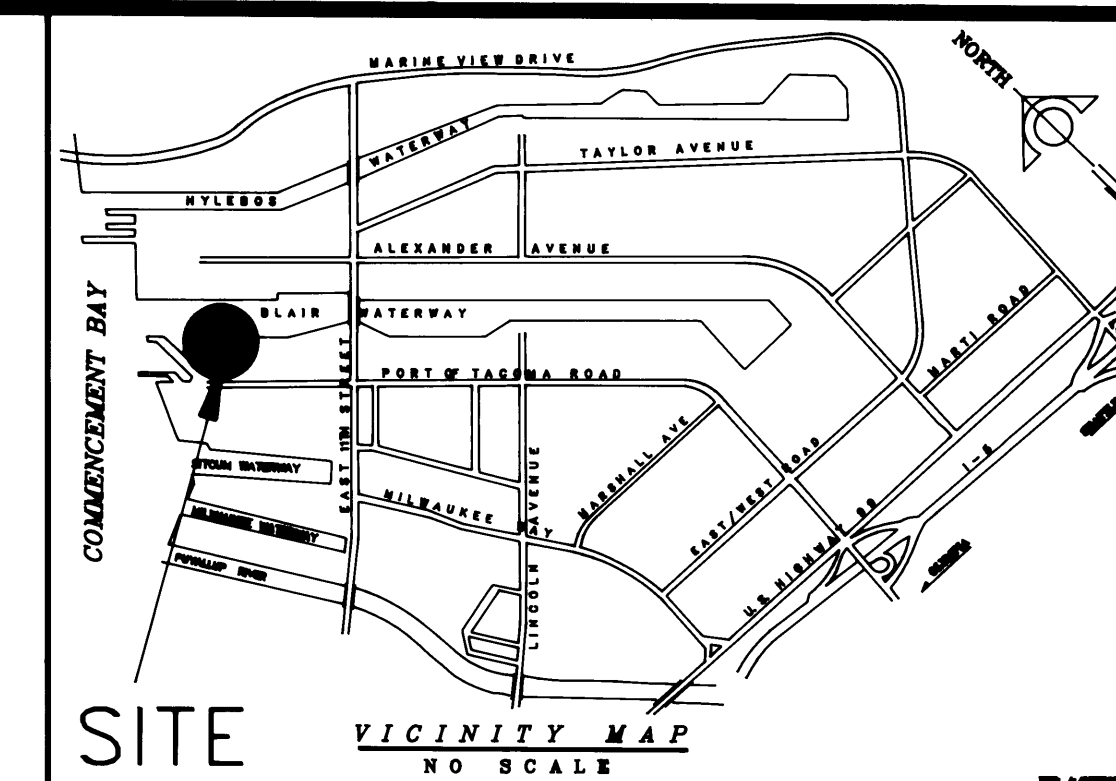


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**SUMITOMO CRANES 2403 & 2404 - 1988**  
**GANTRY ARTICULATION**  
**COVER SHEET**

DRAWING No. **EP-4299-37**  
CONTRACT No. **657**  
SHEET No. **1** OF **19**



## PIER 3

EXIST. PIER 4

### NOTES:

1. IT IS THE PORT'S INTENTION TO SCHEDULE THE SEQUENCING OF THIS WORK SO AS TO MINIMIZE DISRUPTION TO THE DAILY OPERATION OF PORT BUSINESS. IT IS ALSO INTENDED THAT THE CONTRACTOR SHALL COMPLETE AND TEST ONE CRANE IN ITS ENTIRETY PRIOR TO STARTING WORK ON THE SECOND CRANE.

THE FIRST SUMITOMO CRANE (2404) WILL BE MADE AVAILABLE FOR MODIFICATION ON APRIL 1, 1988. THE CONTRACTOR SHALL HAVE 45 CALENDAR DAYS TO COMPLETE THIS MODIFICATION AND TEST TO THE SATISFACTION OF THE ENGINEER. THE SECOND SUMITOMO CRANE (2403) WILL BE MADE AVAILABLE ON MAY 15, 1988. THE CONTRACTOR SHALL HAVE 45 CALENDAR DAYS TO COMPLETE THIS MODIFICATION AND TEST TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR MAY HAVE ACCESS TO THE CRANES AT ANY TIME PRIOR TO THE ABOVE DATES, HOWEVER, ALL TIMES MUST BE SCHEDULED AND APPROVED BY THE PORT BASED ON NON-OPERATION AVAILABILITY.

THE PLANNED WORK SEQUENCE FOR ARTICULATING THE SUMITOMO CRANES IS AS FOLLOWS:

- \* PRIOR TO TAKING CRANES OUT OF SERVICE THE CONTRACTOR IS ENCOURAGED TO INSTALL ELECTRICAL CONDUIT AND WIRING. THIS WORK SHALL BE COORDINATED WITH PORT MAINTENANCE.
- \* MOVE SUMITOMO #2404 TO THE WORK AREA WHERE IT WILL BE TAKEN OUT OF SERVICE FOR A 6 WEEK PERIOD IN ORDER TO ACCOMPLISH THE ARTICULATION MODIFICATIONS AND TESTING.
- \* CONCURRENT WITH THE ARTICULATION WORK THE NEW VERSATILE/KONE CRANES ARE SCHEDULED TO BE IN FINAL COMMISSIONING AND TESTING. PART OF THE VERSATILE TESTING WILL INCLUDE TRANSFERRING BOTH NEW CRANES FROM TERMINAL 3 THROUGH THE S-CURVE TO TERMINAL 4. DURING THE S-CURVE TESTS THE SHARED WORK AREA SHALL BE FULLY AVAILABLE TO VERSATILE.

WHEN NEEDED, VERSATILE SHALL BE GIVEN PREFERENTIAL USE OF THE SHARED AREA UPON 24 HOURS NOTICE BY THE PORT.

- \* UPON COMPLETION OF ARTICULATION WORK ON SUMITOMO #2404 IT SHALL BE MOVED INTO THE SHARED WORK AREA FOR TESTING PROVIDING THE S-CURVE TESTING OF THE VERSATILE CRANES IS COMPLETE. IF VERSATILE IS DELAYED THE CONTRACTOR MAY STILL BE ABLE TO PROCEED WITH TESTING OF #2404 BUT HE CANNOT PLACE #2403 OUT OF SERVICE UNTIL VERSATILE COMPLETES S-CURVE TESTING. THE REASON IS THAT THE SHARED WORK AREA MUST REMAIN AVAILABLE TO VERSATILE FOR TESTING OF BOTH NEW CRANES.

ANY DELAY CAUSED BY WAITING FOR VERSATILE WILL RESULT IN A DAY FOR DAY TIME EXTENSION BUT THAT SHALL BE THE SOLE REMEDY TO THE CONTRACTOR.

- \* WHEN WORK PROGRESS ALLOWS, SUMITOMO #2403 SHALL BE MOVED INTO THE WORK AREA AND TAKEN OUT OF SERVICE FOR COMPLETION OF THE PROJECT.

- \* AS SOON AS #2403 IS TAKEN OUT OF SERVICE THE STRENGTHENING WORK ON TERMINAL 4 WILL COMMENCE AND THE AREA IMMEDIATELY TO THE SOUTH-EAST OF THE WORK SPACE WILL BE UNAVAILABLE FOR CRANE TRAVEL.

2. PRIOR TO JACKING, THE CONTRACTOR SHALL ADJUST THE FRAME TO A SQUARE CONDITION AS DETERMINED BY DIAGONAL MEASUREMENTS BETWEEN CORNERS AND SHALL CENTER PUNCH REFERENCE MARKS AT A KNOWN ELEVATION ABOVE EACH MAIN EQUALIZER PIN.

3. AFTER JACKING, THE REFERENCE MARKS SHALL BE LEVEL RELATIVE TO A BENCH MARK AND THE FIELD MACHINING SHALL BE DONE TO PROVIDE A PLANE, LEVEL WELD SURFACE, AT THE PROPER ELEVATION BELOW THE REFERENCE MARKS, FOR INSTALLATION OF THE NEW MAIN EQUALIZER SADDLES.

4. DESIGN SUPERIMPOSED LOADS TO WORK AREA WHARF STRUCTURE ARE AS FOLLOWS:

UNIFORM LIVE LOAD - 750 PSF

CONCENTRATED LIVE LOADS - 100 KIPS @ 100 PSI MAX SPACED NO CLOSER THAN 8 FEET ON CENTER FOR TWO LOADS AND 8 FEET BY 18 FEET FOR FOUR LOADS

CRANE RAIL LIVE LOAD - 30 KIPS PER FOOT

DRAWINGS OF THE EXISTING DOCK STRUCTURE WILL BE FURNISHED TO THE CONTRACTOR FOR USE IN DESIGNING THE JACKING SYSTEM AND WIND BRACING. THE OLDER PORTION OF TERMINAL 4 IS DESIGNED FOR LESSER LOADS AND SHOULD NOT BE USED FOR CONSTRUCTION LOADS UNLESS PRECEDED BY A STRUCTURAL REVIEW.

5. CRANE LOADING OBTAINED FROM SUMITOMO DESIGN DATA ARE AS FOLLOWS (ALL LOADS IN KIPS):

| LOAD DESCRIPTION | WATERSIDE | LANDSIDE |
|------------------|-----------|----------|
|------------------|-----------|----------|

|                    |           |           |
|--------------------|-----------|-----------|
| DEAD LOAD, BOOM UP | 281 VERT. | 513 VERT. |
|--------------------|-----------|-----------|

|                        |           |           |
|------------------------|-----------|-----------|
| 50 MPH WIND:           | 83 VERT.  | 65 VERT.  |
| PERPENDICULAR TO RAILS | 15 HORIZ. | 12 HORIZ. |
| PARALLEL TO RAILS      | 23 HORIZ. | 26 HORIZ. |

|                        |           |           |
|------------------------|-----------|-----------|
| 90 MPH WIND:           | 270 VERT. | 211 VERT. |
| PERPENDICULAR TO RAILS | 48 HORIZ. | 39 HORIZ. |
| PARALLEL TO RAILS      | 76 HORIZ. | 85 HORIZ. |

THE CONTRACTOR SHALL VERIFY CRANE DEAD LOADS BY FIELD WEIGHING THE CRANE AT EACH CORNER AND BY WEIGHING THE EQUALIZER COMPONENTS AFTER REMOVAL FROM THE CRANE. IF FIELD MEASUREMENTS DEVIATE FROM THE ASSUMPTIONS USED IN CONTRACTOR'S DESIGN OF THE JACKING SYSTEM AND WIND BRACING THEN REDESIGN SHALL BE DONE AND APPROVED PRIOR TO PROCEEDING.

SCALE: 1" = 50'



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APPROVED

CHIEF ENGINEER

11/2/88  
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SUMITOMO CRANES 2403 AND 2404

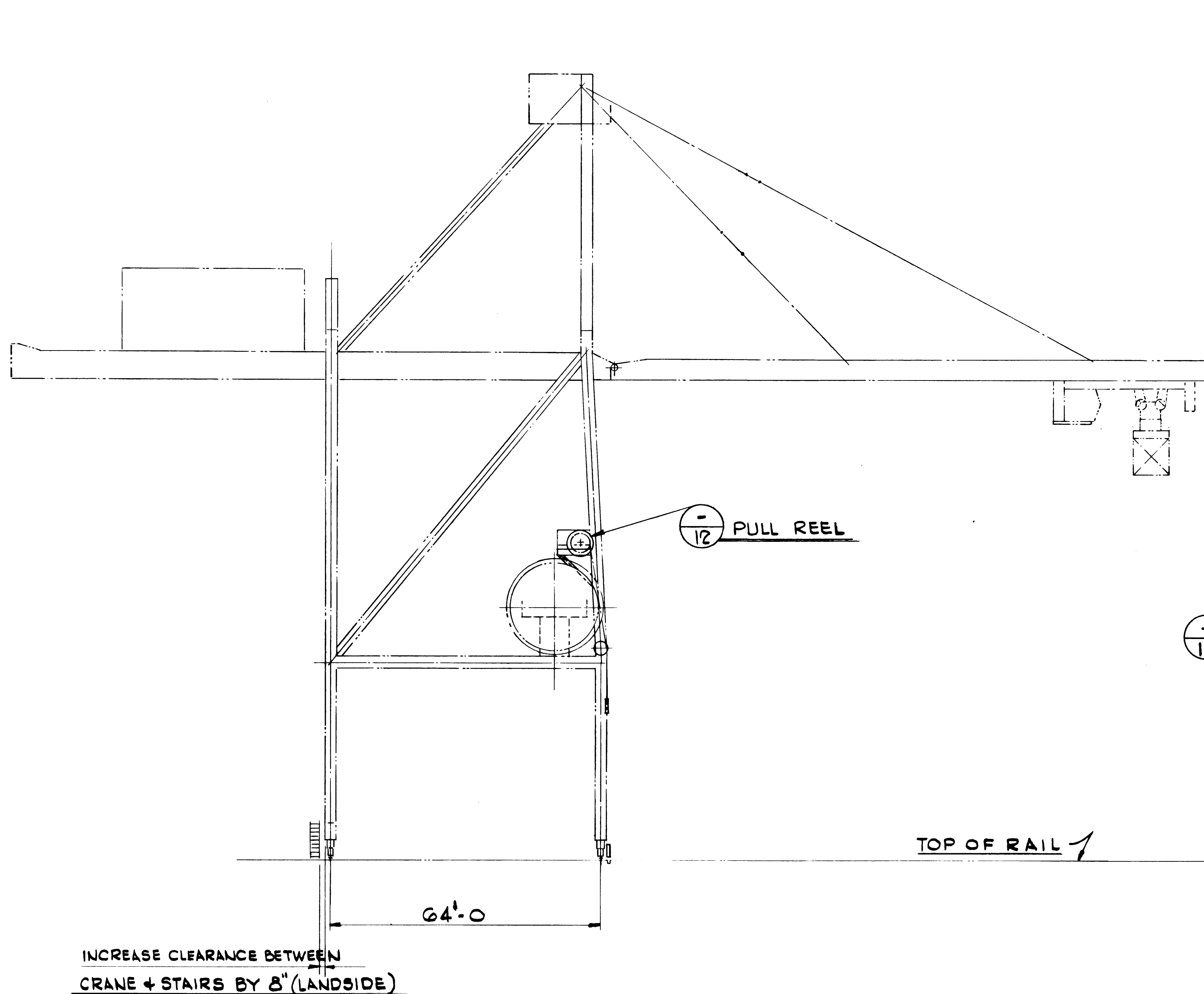
GANTRY ARTICULATION

SITE PLAN

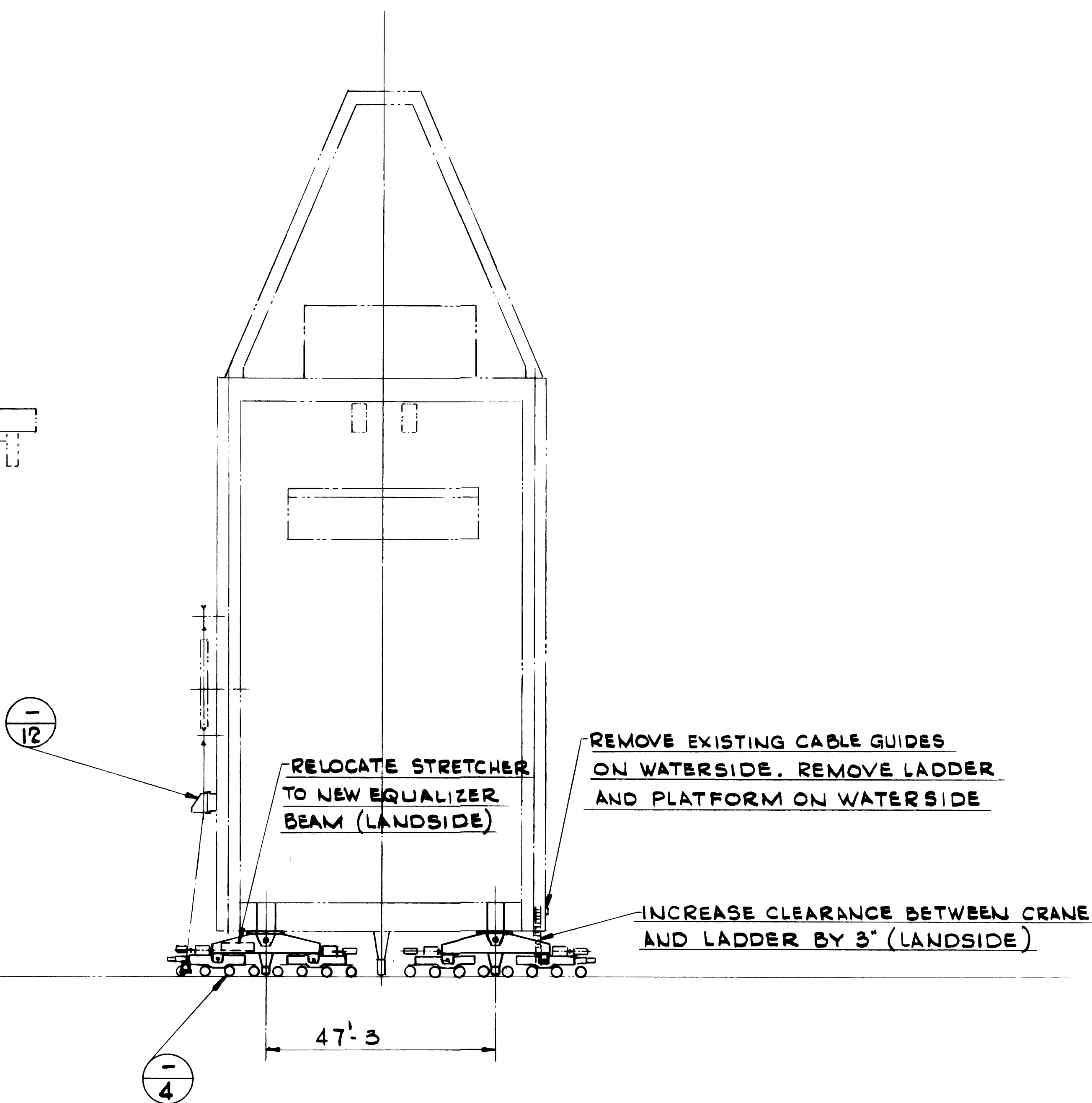
DRAWING No. EP-4299-37

CONTRACT No. 657

SHEET No. 2 OF 19



ELEVATION

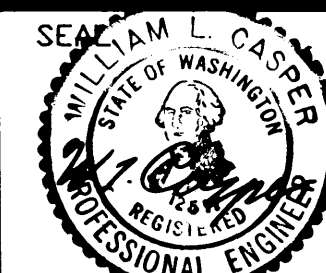


WATERSIDE END VIEW



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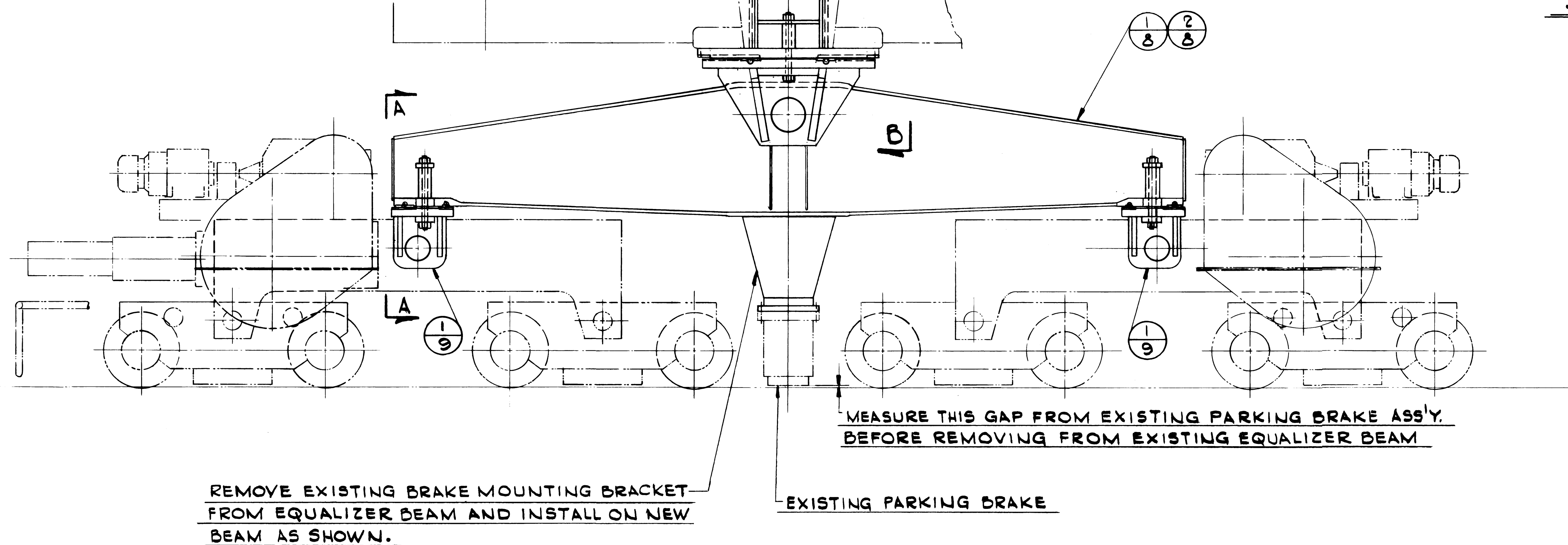
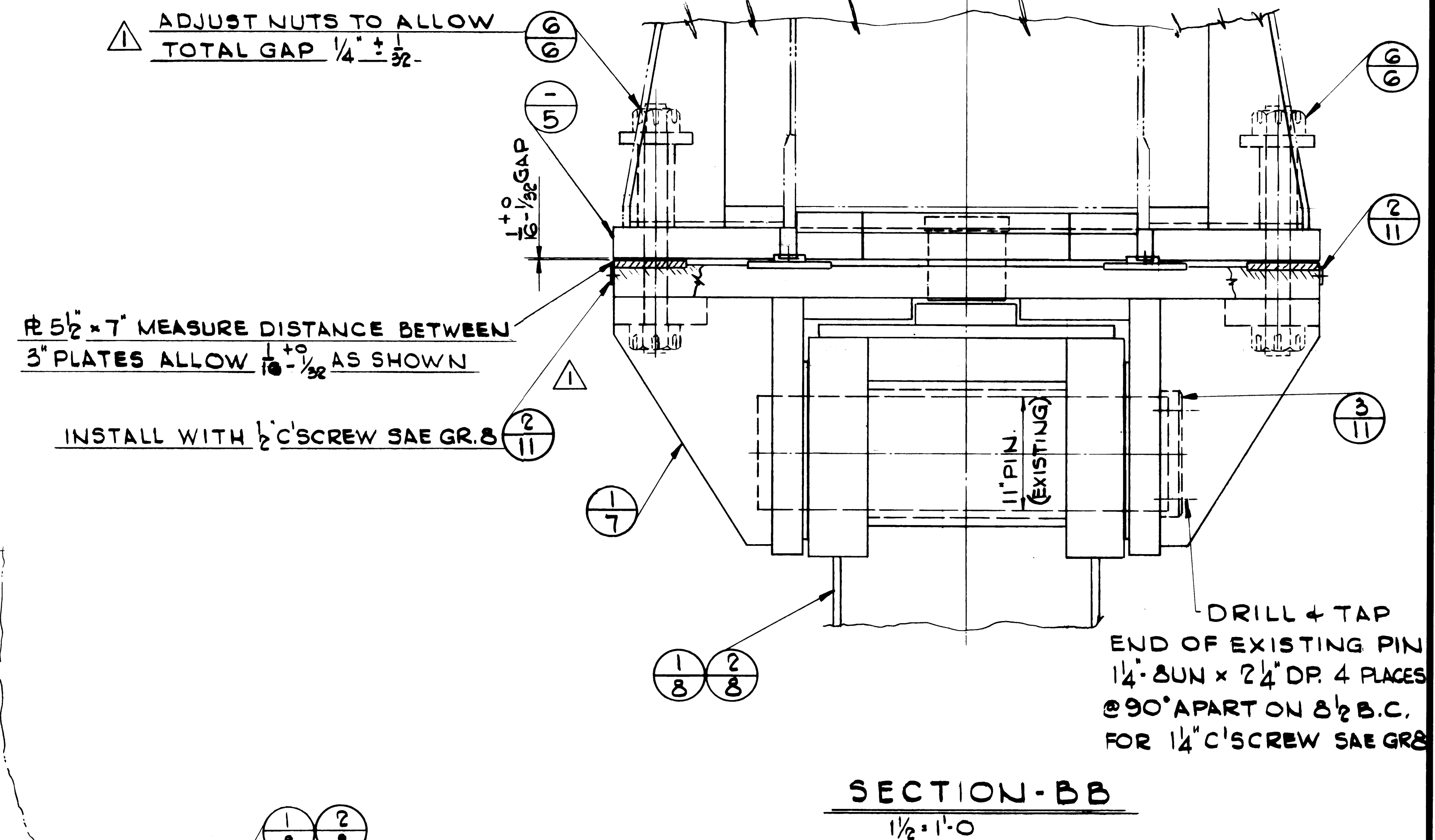
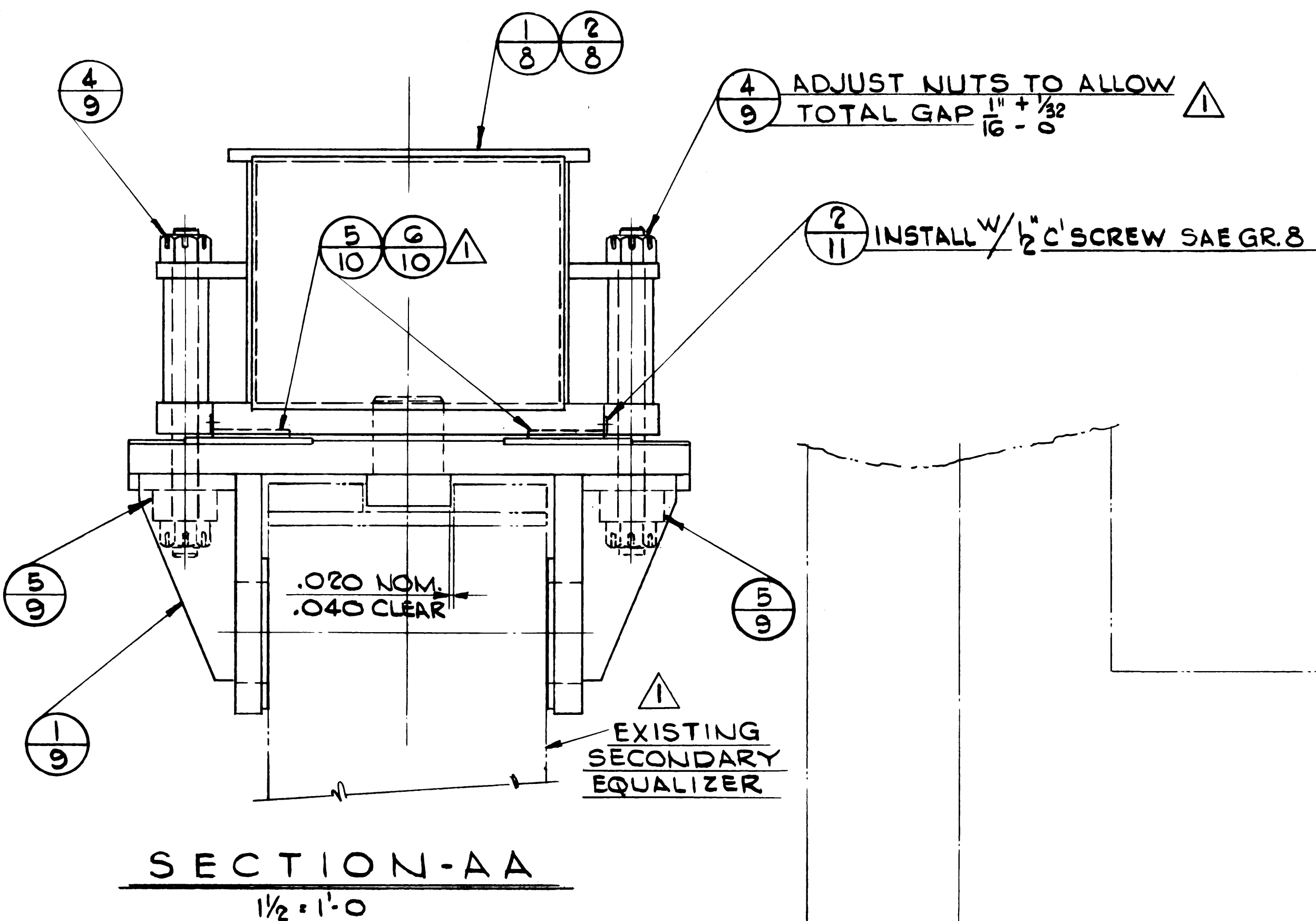
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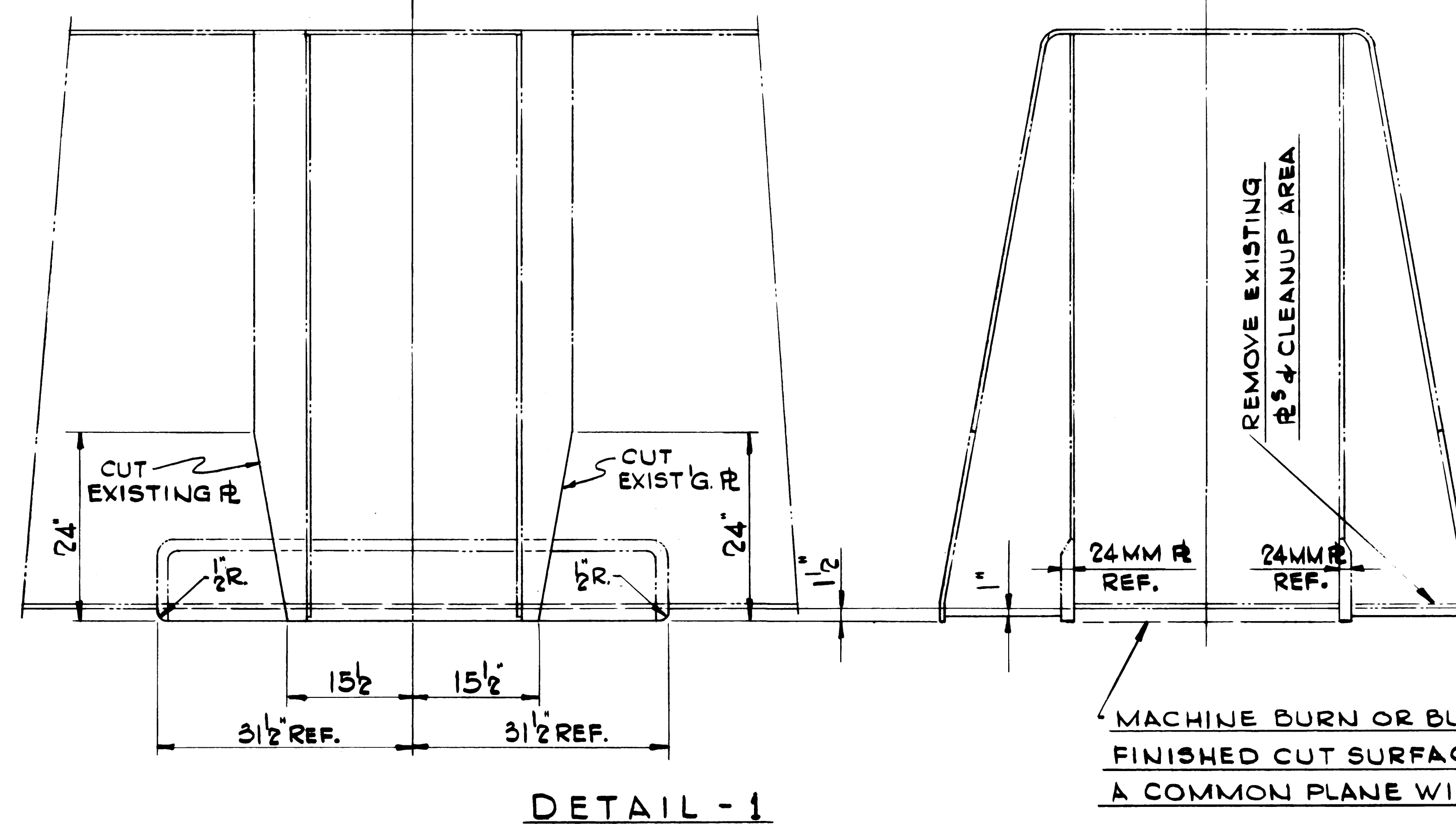
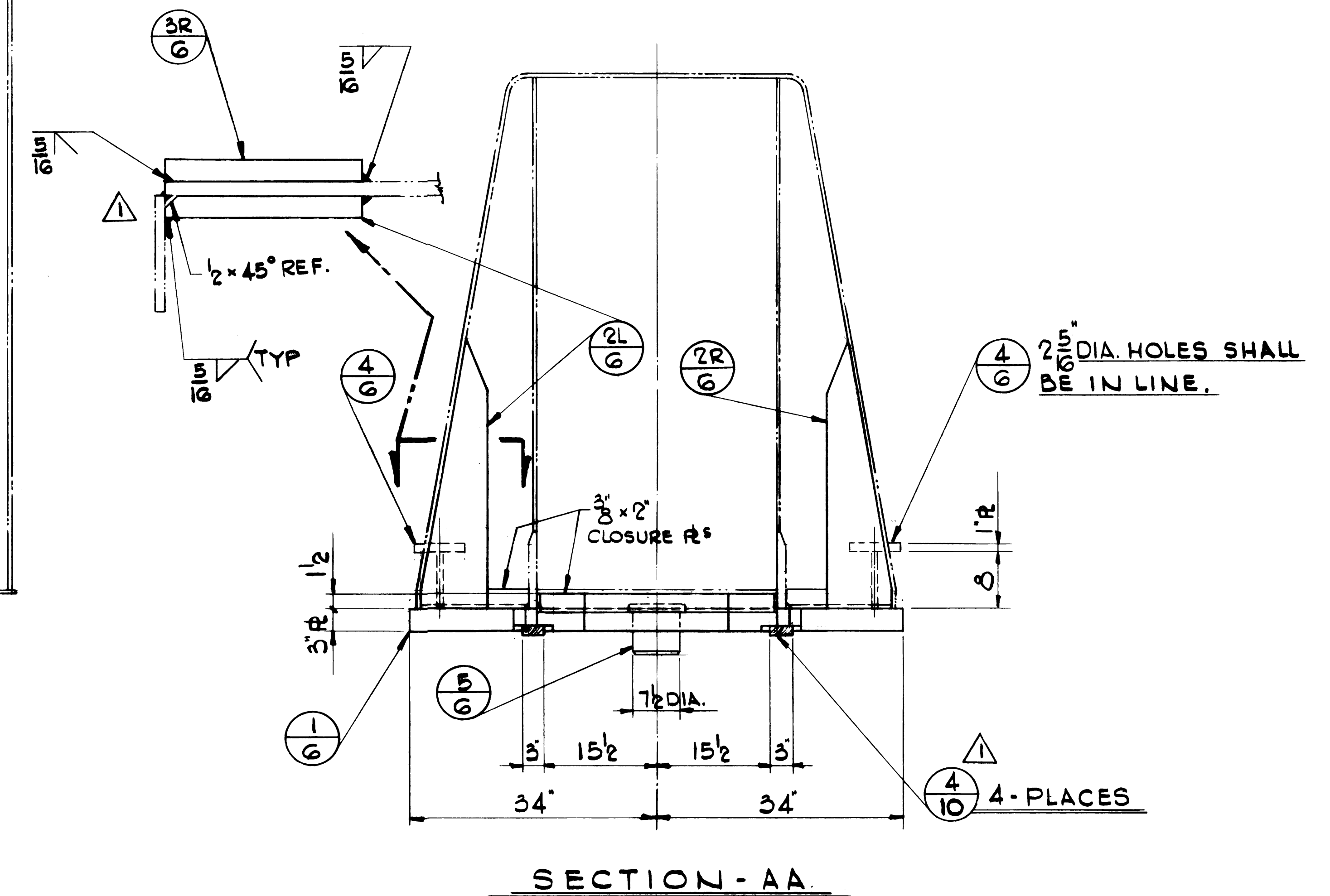
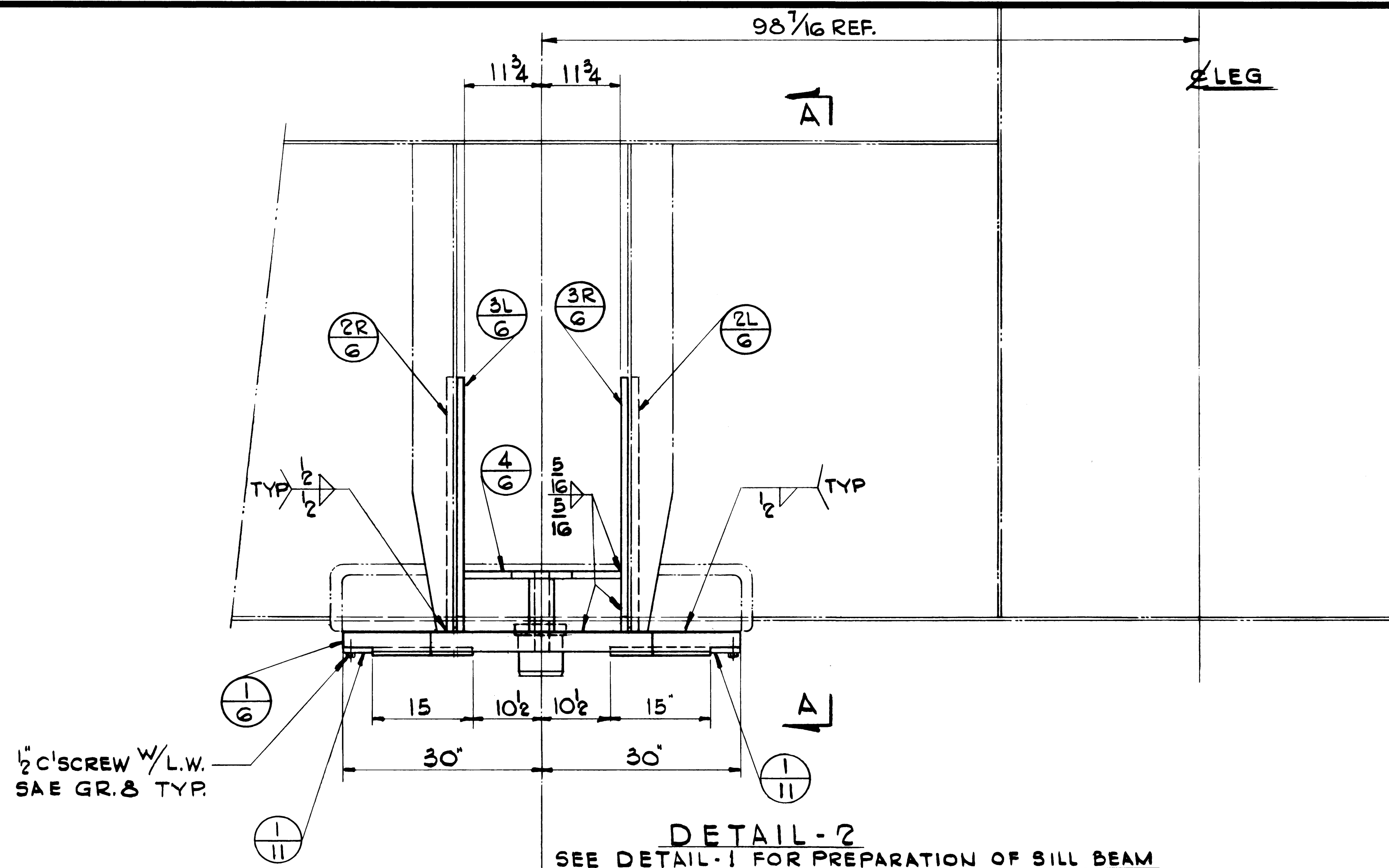
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**SUMITOMO CRANES 2403 AND 2404**  
**GANTRY ARTICULATION**  
**GENERAL ARRANGEMENT**

DRAWING No. **EP-4299-37**  
CONTRACT No. **G57**  
SHEET No. **3** OF **19**





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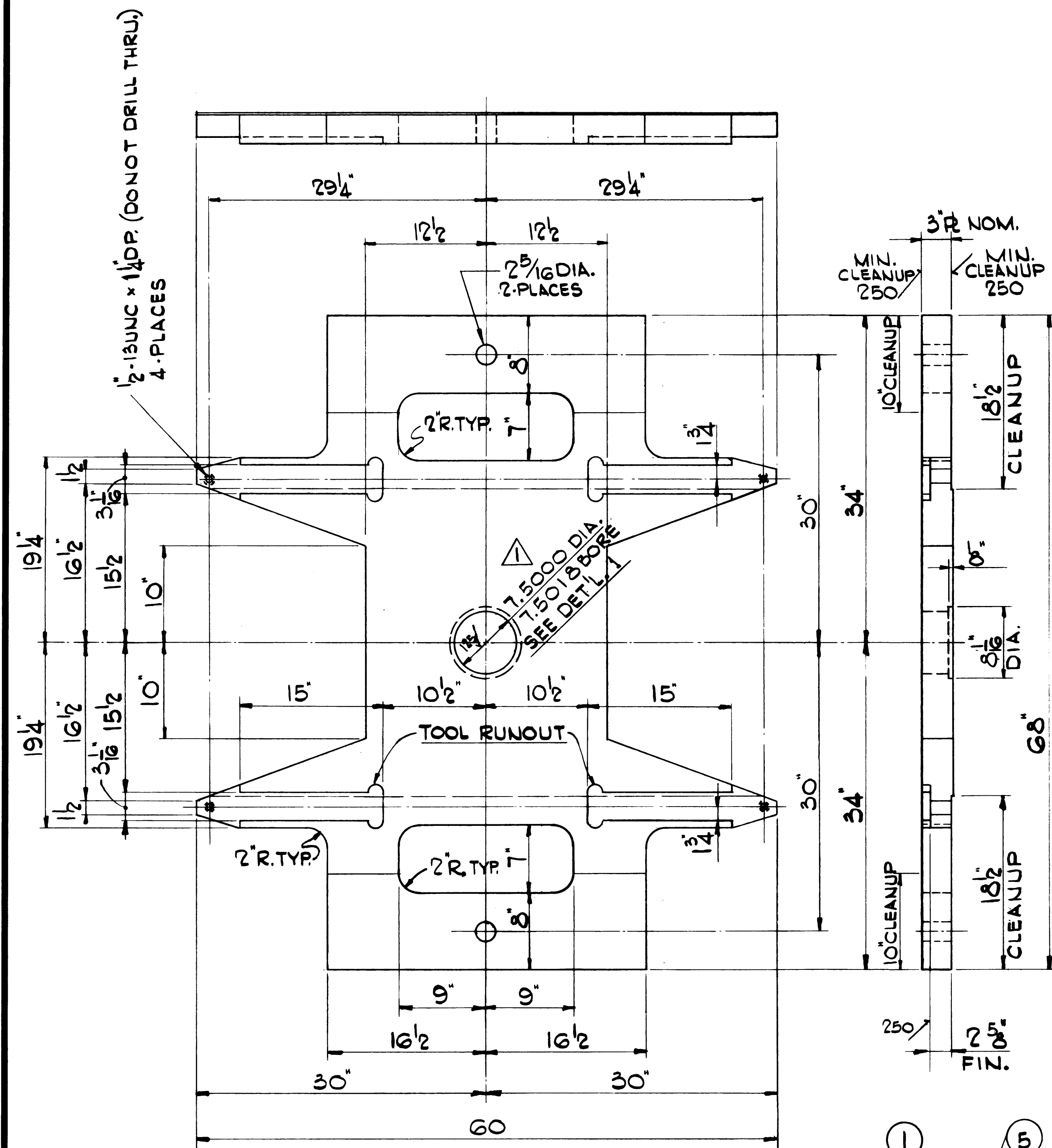
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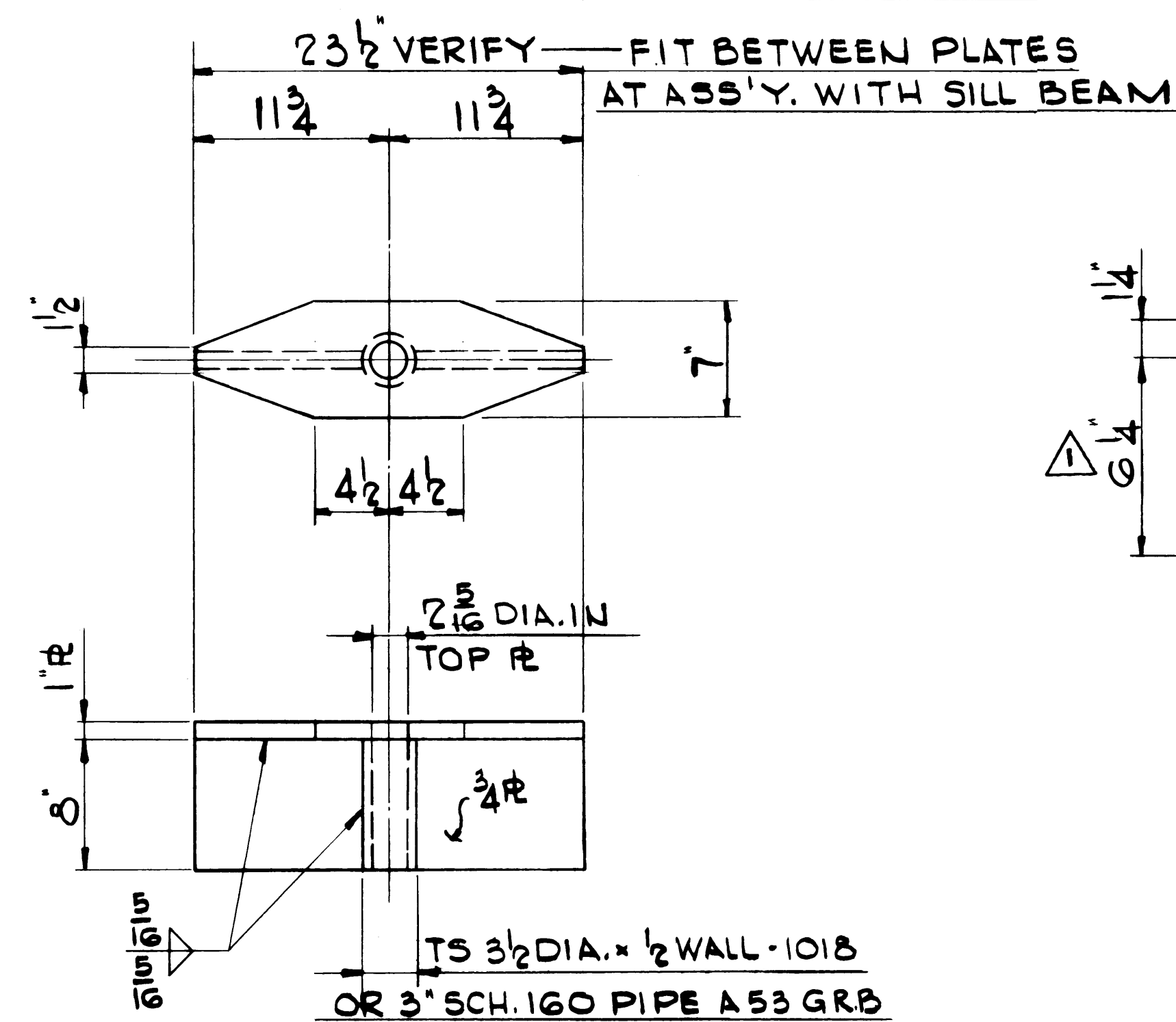
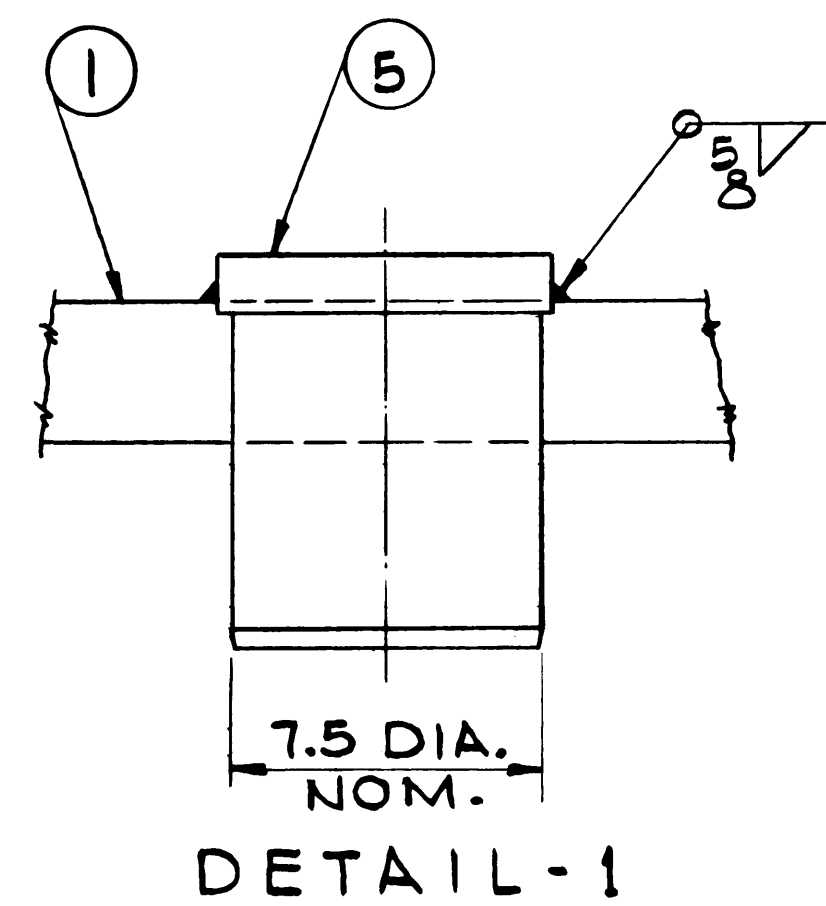
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**SUMITOMO CRANES 2403 AND 2404**  
**GANTRY ARTICULATION**  
**SILL BEAM MODIFICATIONS**

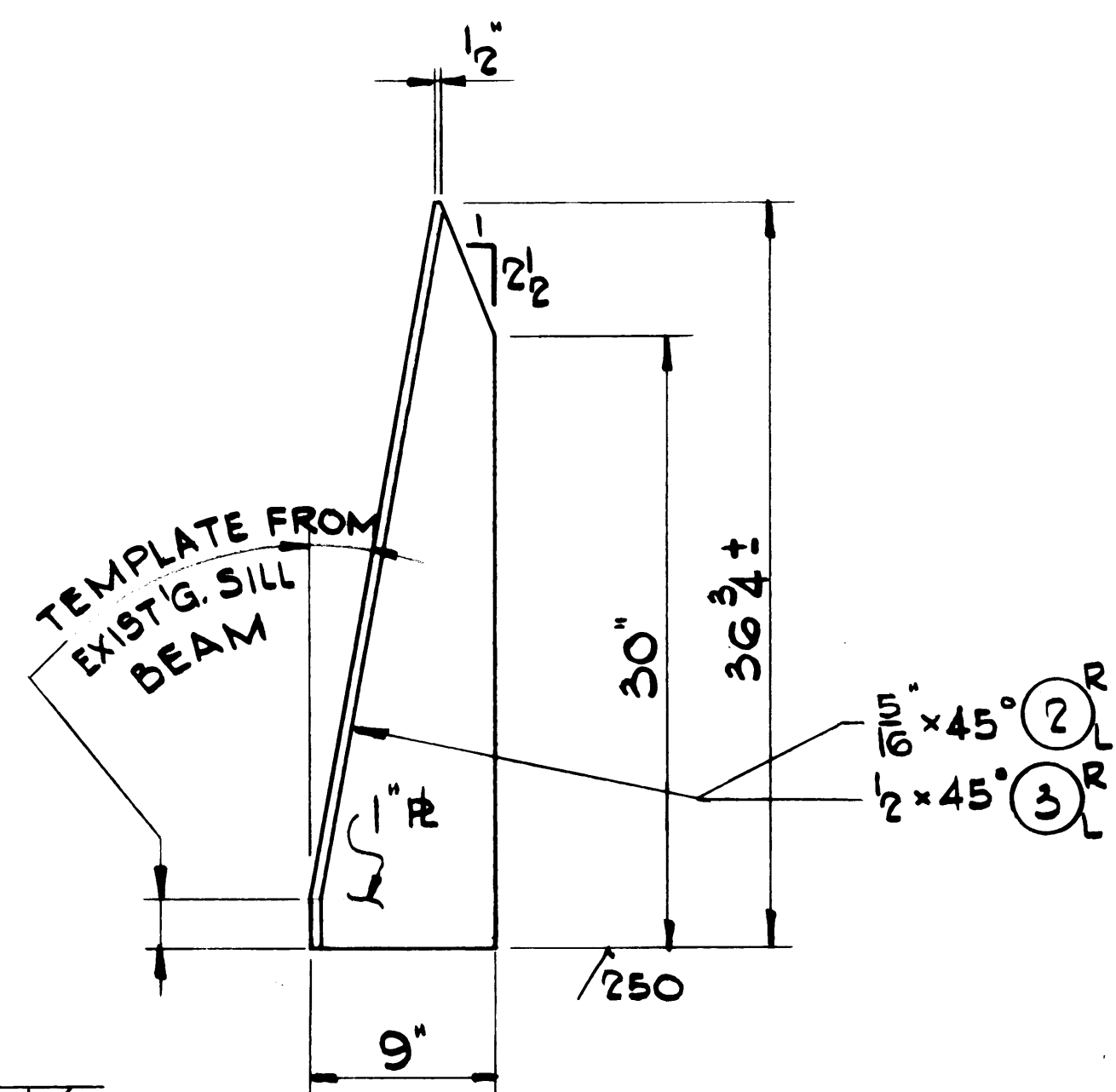
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CONTRACT No. **637**  
SHEET No. **5** OF **19**



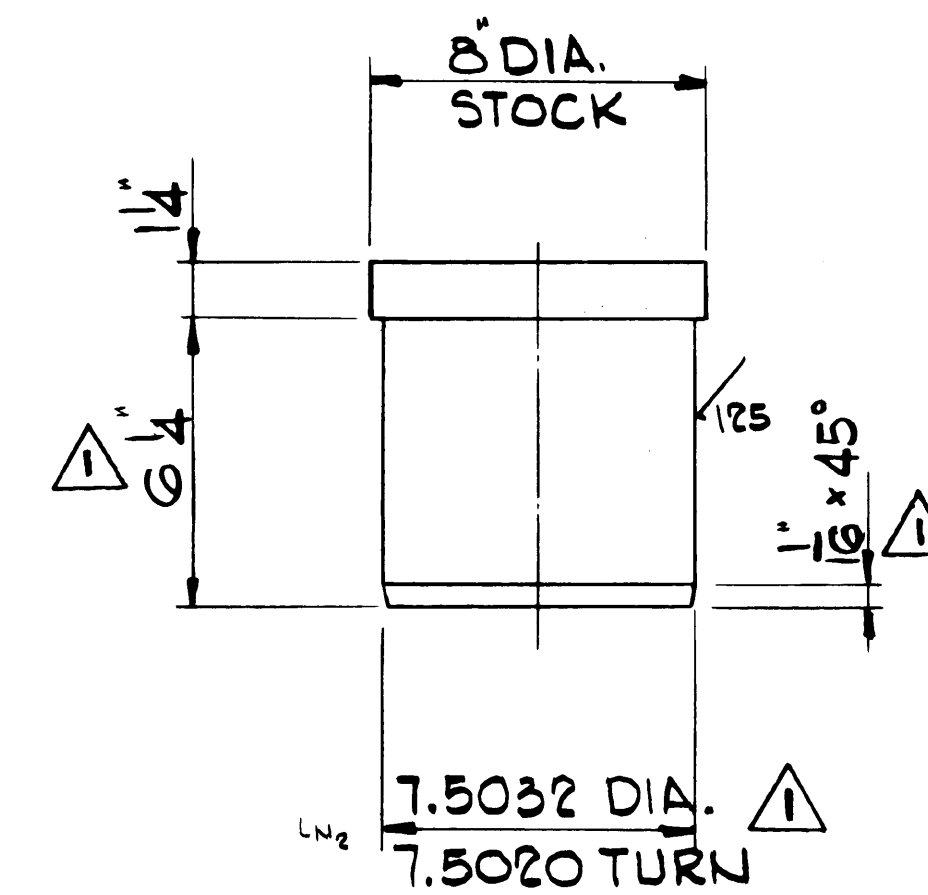
**NOTE!** ① 4-REQ'D. 1,775 LBS EA. MAT'L A36  
PLATE SHALL BE FLAT WITHIN 1/16"  
AFTER BURNING STRESS RELIEVE  
AND/OR PRESS STRAIGHTEN  
BEFORE MACHINING.



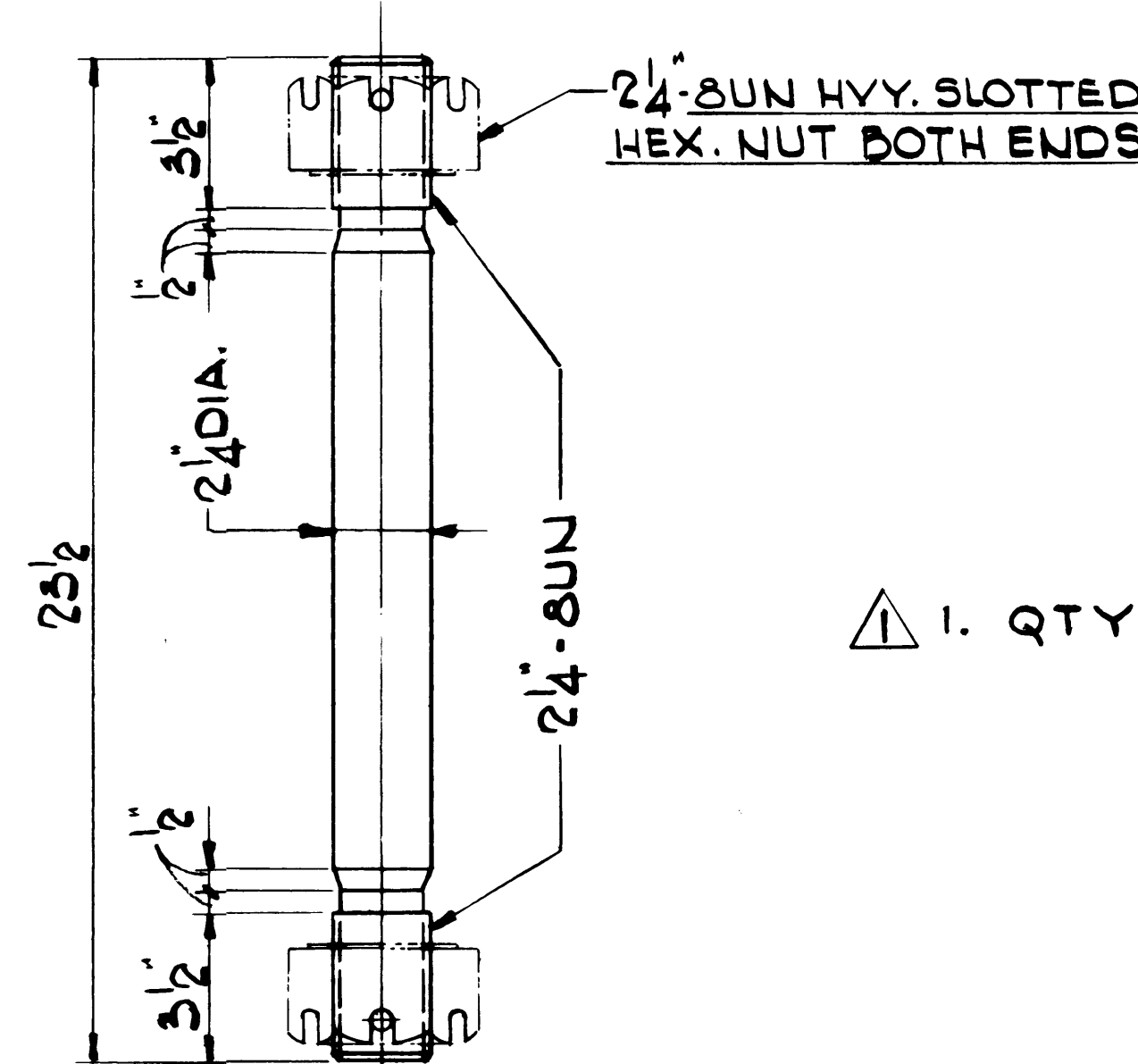
④ 8-REQ'D. 90 LBS. EA.  
MAT'L. A36



② R 8-REQ'D. R.H. 8-REQ'D. L.H.  
③ R 8-REQ'D. R.H. 8-REQ'D. L.H. } A36

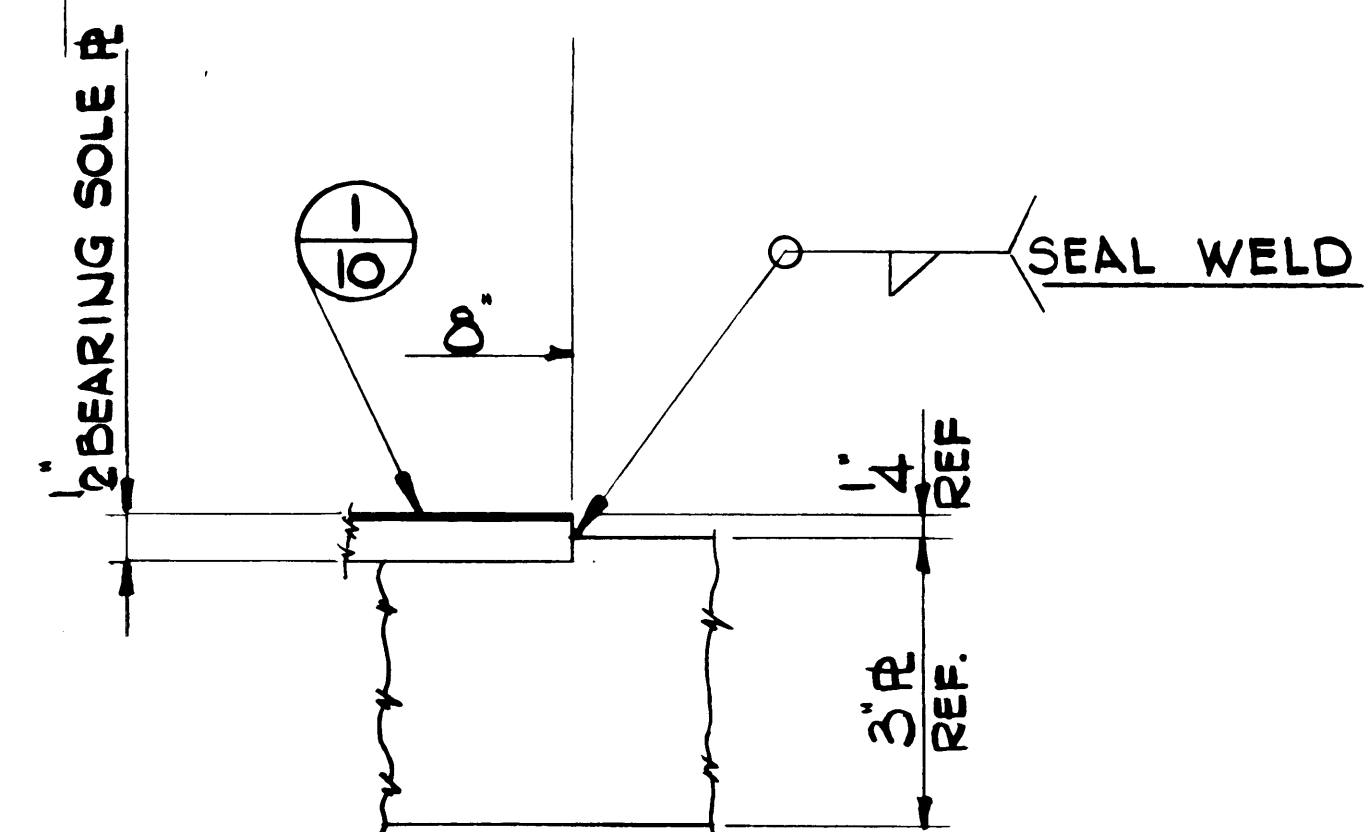
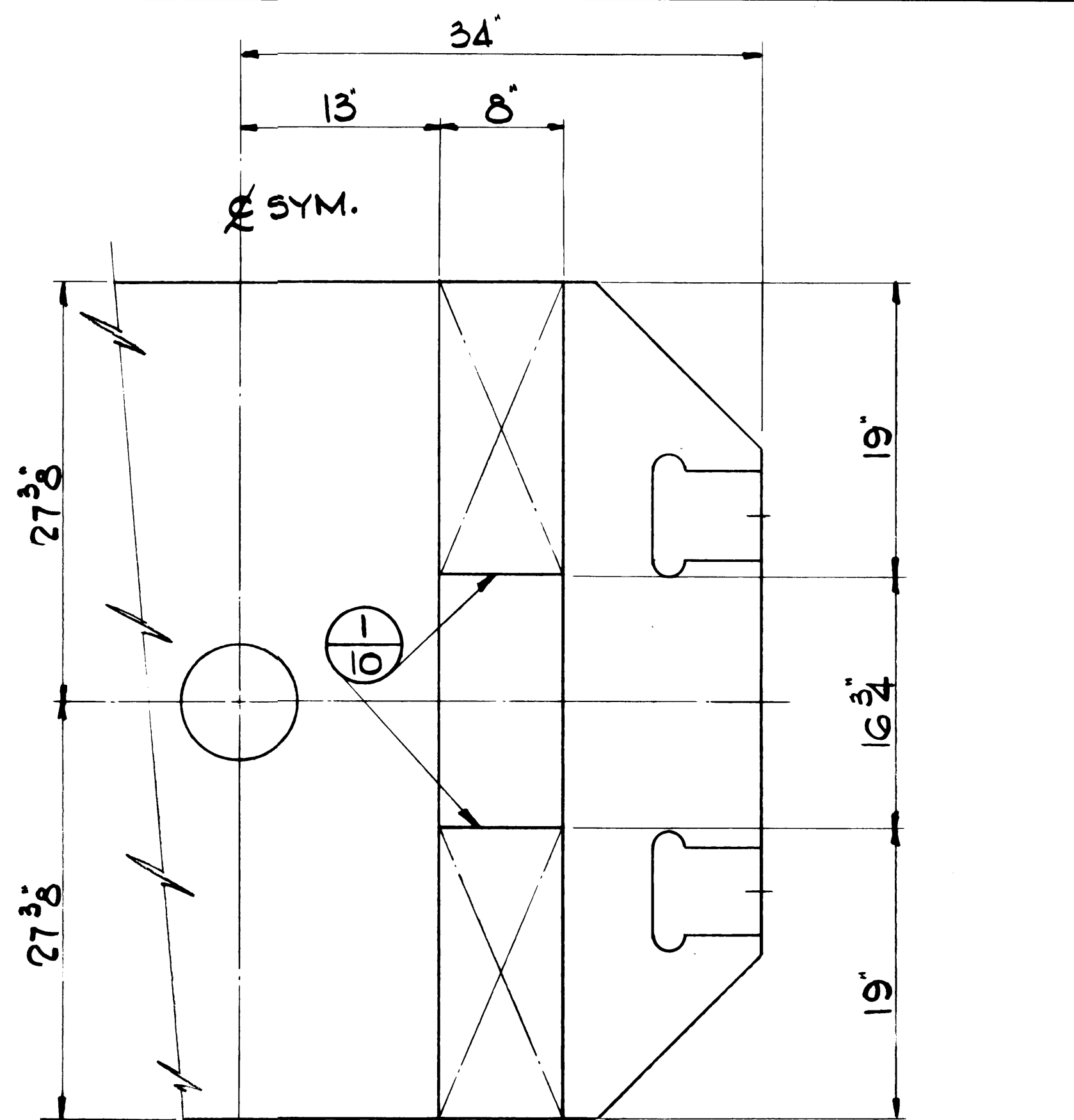


⑤ 4-REQ'D. 80 LBS. EA. MAT'L. 1040  
SEE DETAIL-1



⑥ STUD - 8 REQ'D.  
MAT'L. 4140 H.R. H.T.  
WT. 40 LBS. EA.

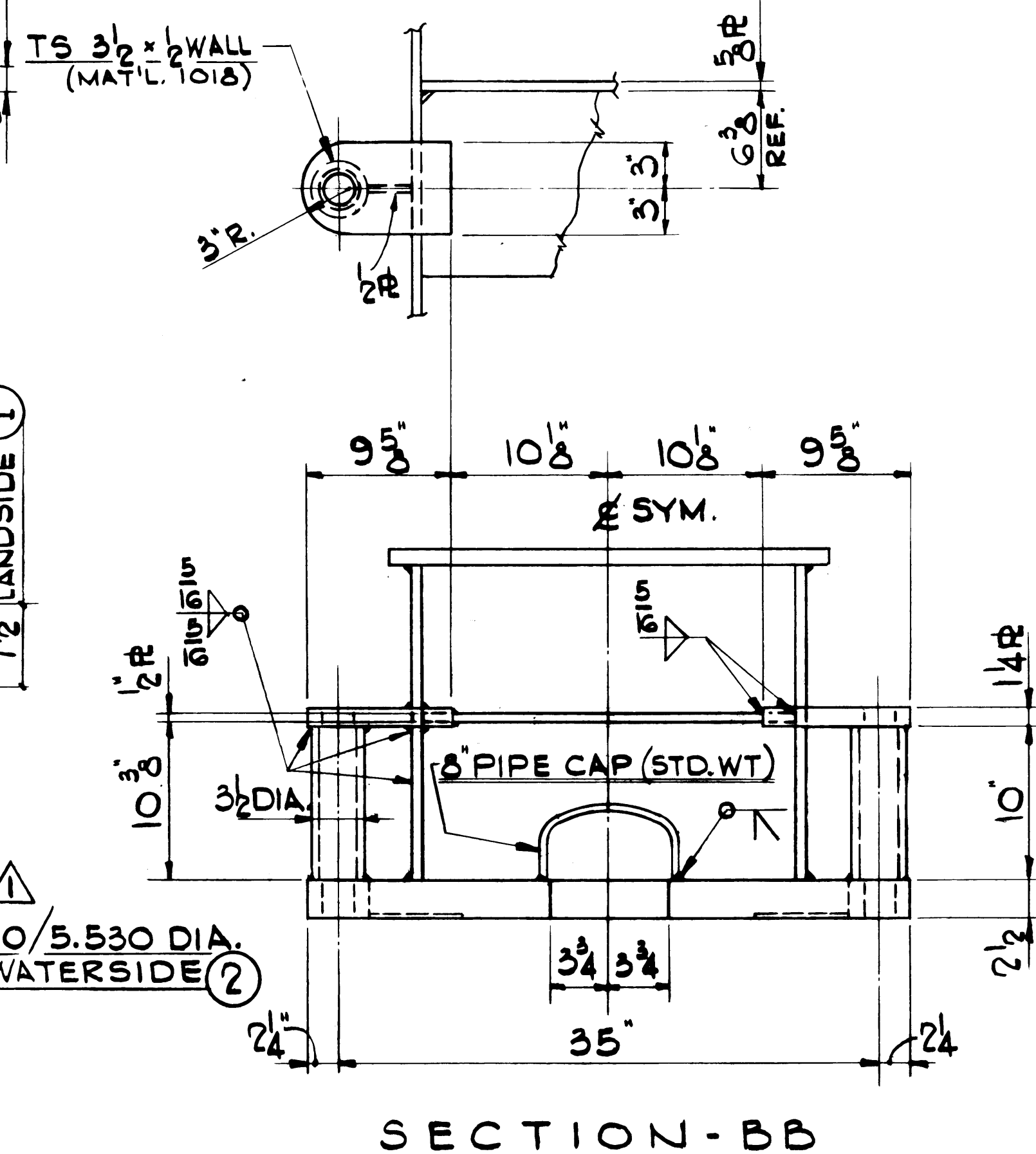
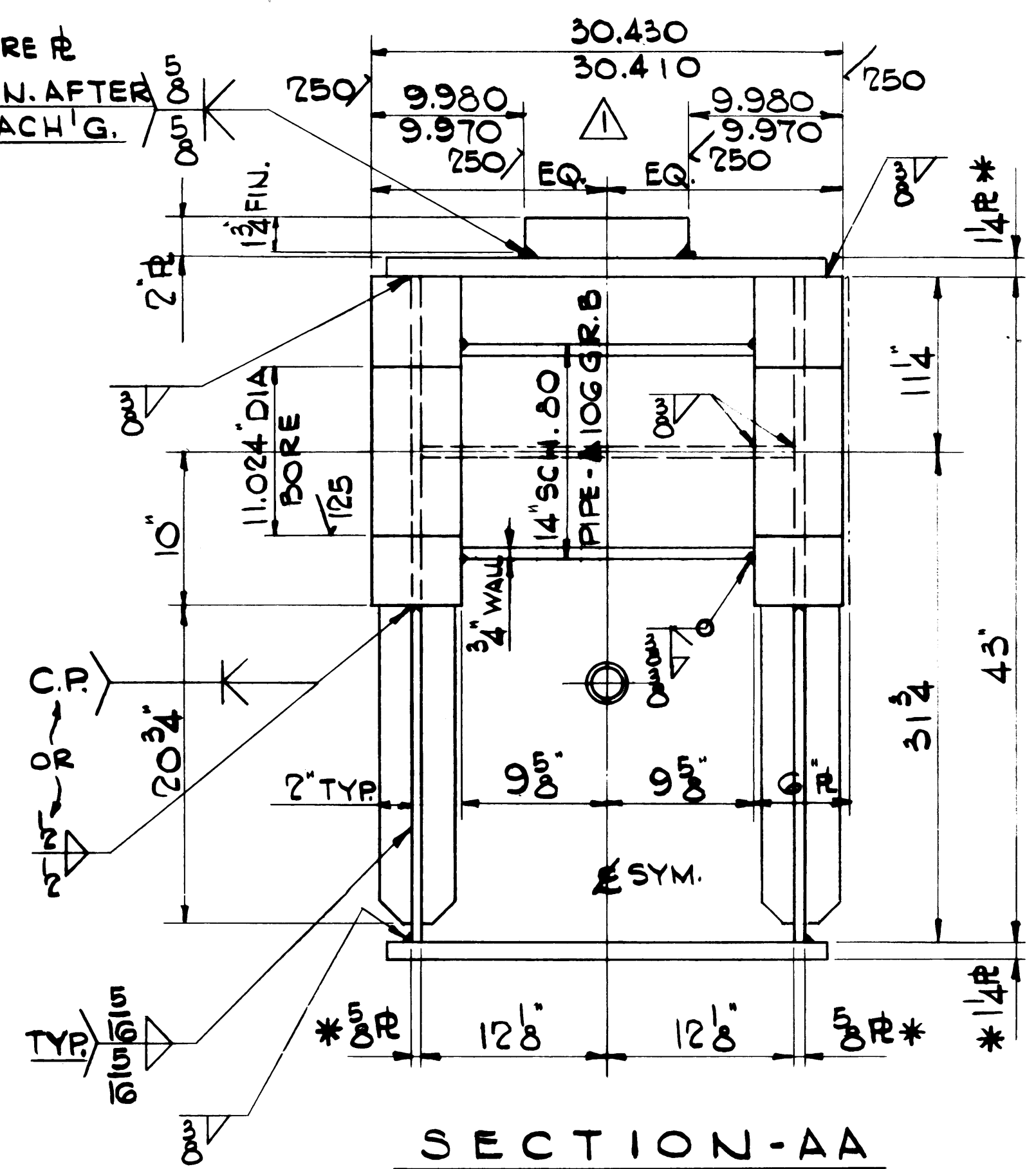
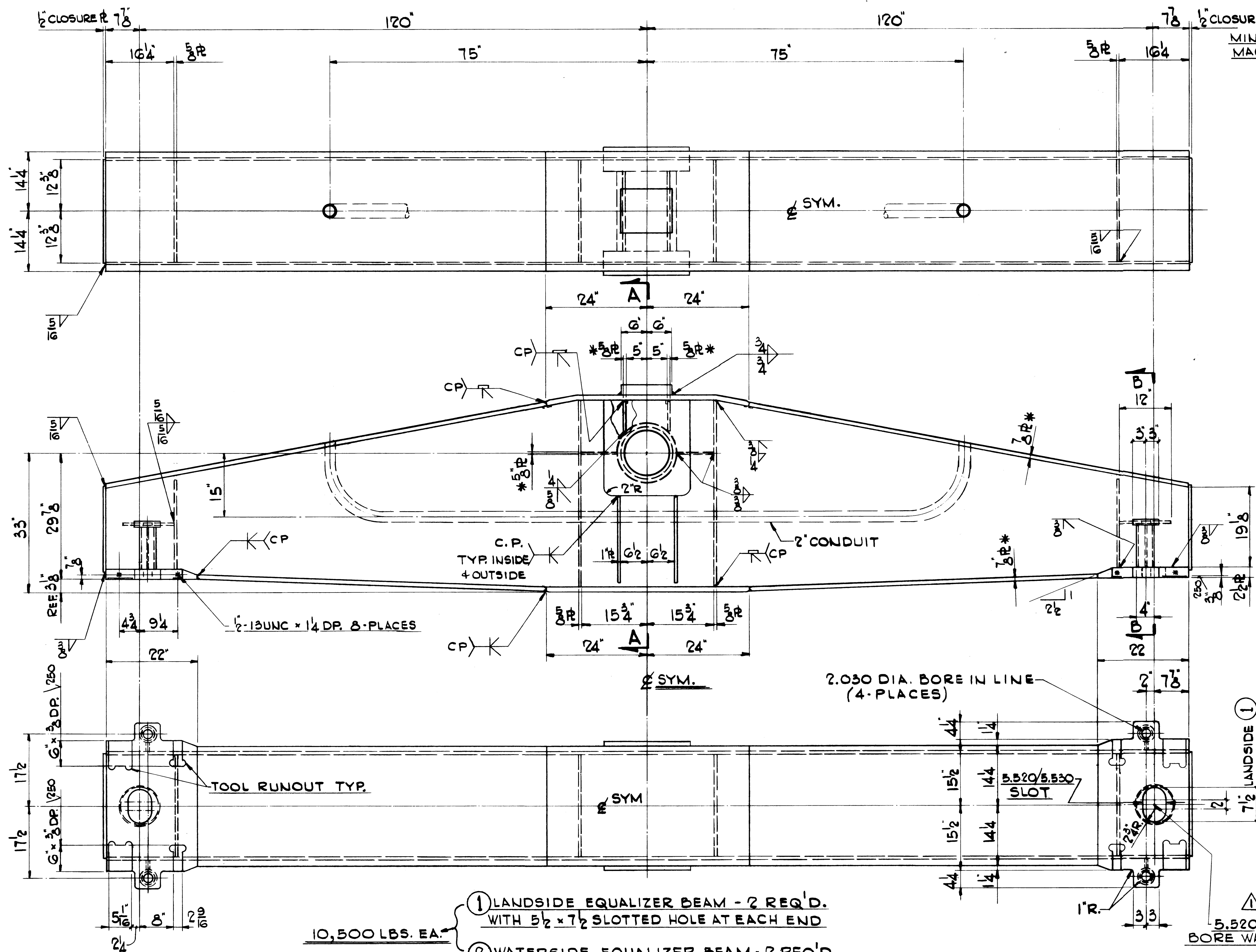
**NOTE**  
① 1. QTY SHOWN FOR ONE CRANE.



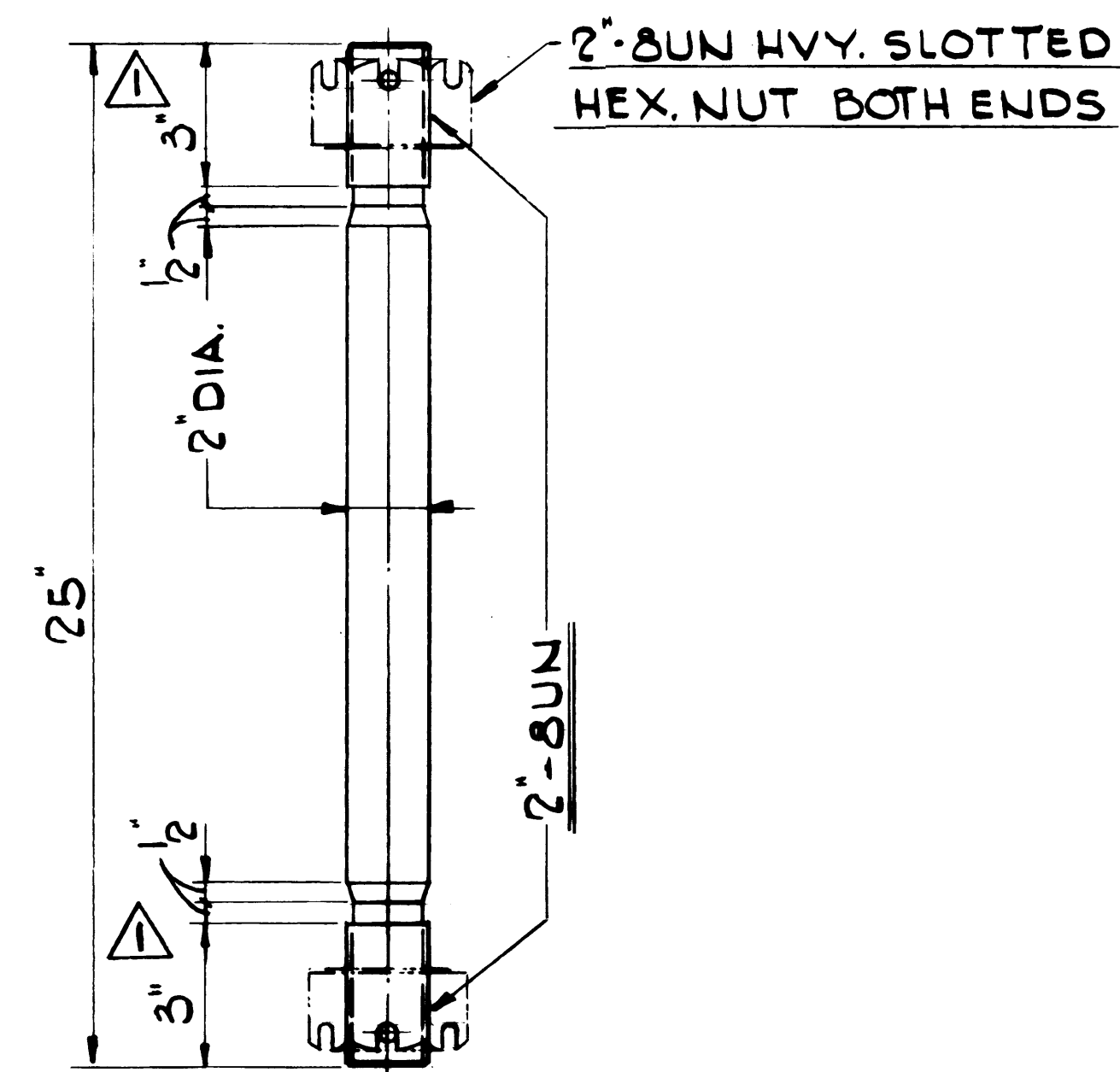
NOTES

1. QTY. SHOWN FOR ONE CRANE
2. STRESS RELIEVE WELDMENT BEFORE FINAL MACHINING.

① SADDLE 4-REQ'D. MAT'L. A36  
WT. 5,500 LBS.



- 10,500 LBS. EA.
- ① LANDSIDE EQUALIZER BEAM - 2 REQ'D. WITH 5 1/2 x 7 1/2 SLOTTED HOLE AT EACH END
  - ② WATERSIDE EQUALIZER BEAM - 2 REQ'D. WITH 5 1/2 DIA. HOLE AT EACH END.
- NOTES**
1. PLATES MARKED THUS \* SHALL BE A572 GR. 50 ALL OTHER PLATES SHALL BE A36 OR A572 GR. 50
  2. QTY. SHOWN FOR ONE CRANE.



Technical drawing of a mechanical part showing front and side views with dimensions.

**Front View (Top):**

- Overall width: 6"
- Overall height: 5"
- Top flange width: 3" (left) and 3" (right)
- Central rectangular feature: 2 1/2" wide and 2 1/2" high
- Central circular feature: 2 1/6" DIA.

**Side View (Bottom):**

- Overall height: 2 3/8"

[illegible]

Technical drawing of a structural connection, likely a column base plate. The drawing includes the following dimensions and callouts:

- Top Dimensions:**
  - Overall width:  $13\frac{9}{16}$  REF.
  - Distance from left edge to centerline:  $7\frac{1}{2}$
  - Distance from centerline to right edge:  $10"$  REF.
- Left Side Dimensions:**
  - Overall height:  $6\frac{1}{4}$
  - Distance from top edge to centerline:  $3\frac{3}{4}$
  - Distance from centerline to bottom edge:  $2\frac{1}{2}$
- Central Features:**
  - A central rectangular section with a width of  $5\frac{1}{2}"$  DIA.
  - A circular feature with a diameter of  $5\frac{1}{2}"$  DIA.
- Right Side Features:**
  - A section labeled "TYP. SEAL WELD".
- Bottom Section:**
  - Two rectangular sections labeled "EQ." (Equal).
  - Dimensions:  $125$  (width),  $6.500$  (height), and  $6.492$  (height).
  - A dimension of  $5\frac{1}{8}$  F (Foot) is shown.
- Callouts:**
  - Callout (2) points to the central rectangular section.
  - Callout (3) points to the circular feature.
  - Callout (1) points to the bottom right corner.

Technical drawing of a square part with chamfers. The part has a square cross-section with a side length of 64 mm. The top and bottom edges are chamfered with a 5x45 chamfer. The chamfer is defined by a 5.5032 diameter circle and a 5.5020 turn. The chamfer angle is 45 degrees. The drawing includes a section line and a dimension line for the chamfer.

7'

7'

7'

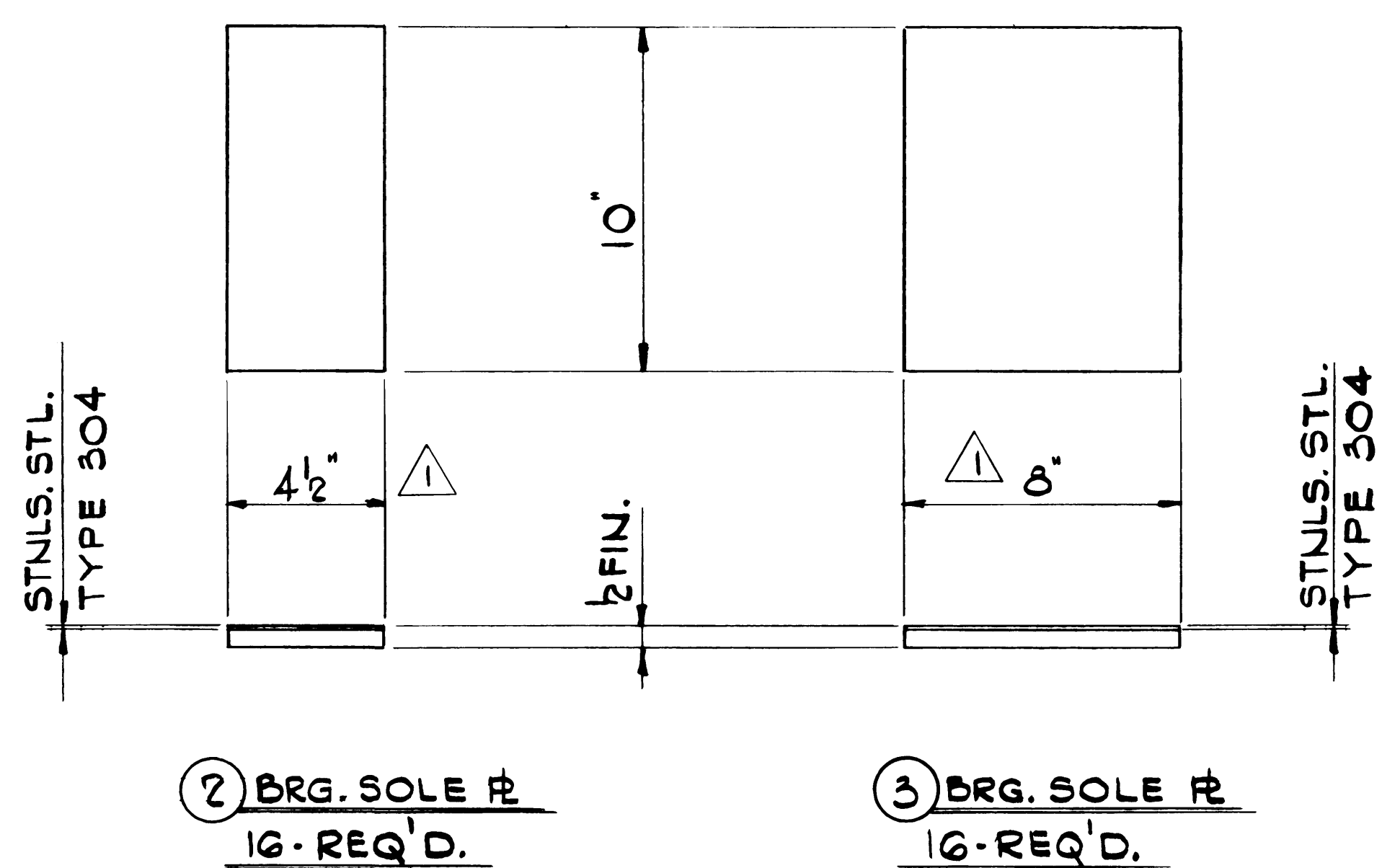
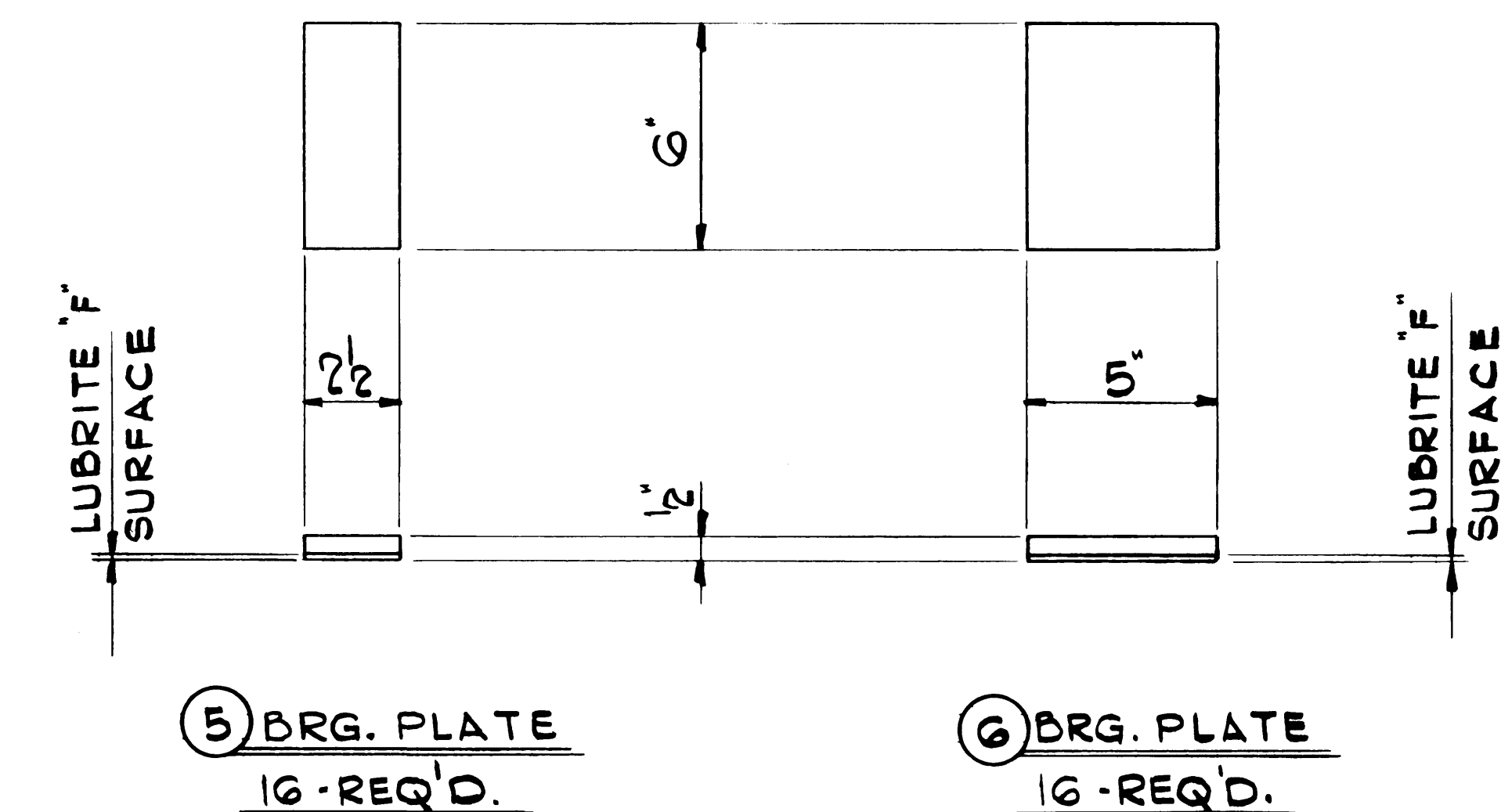
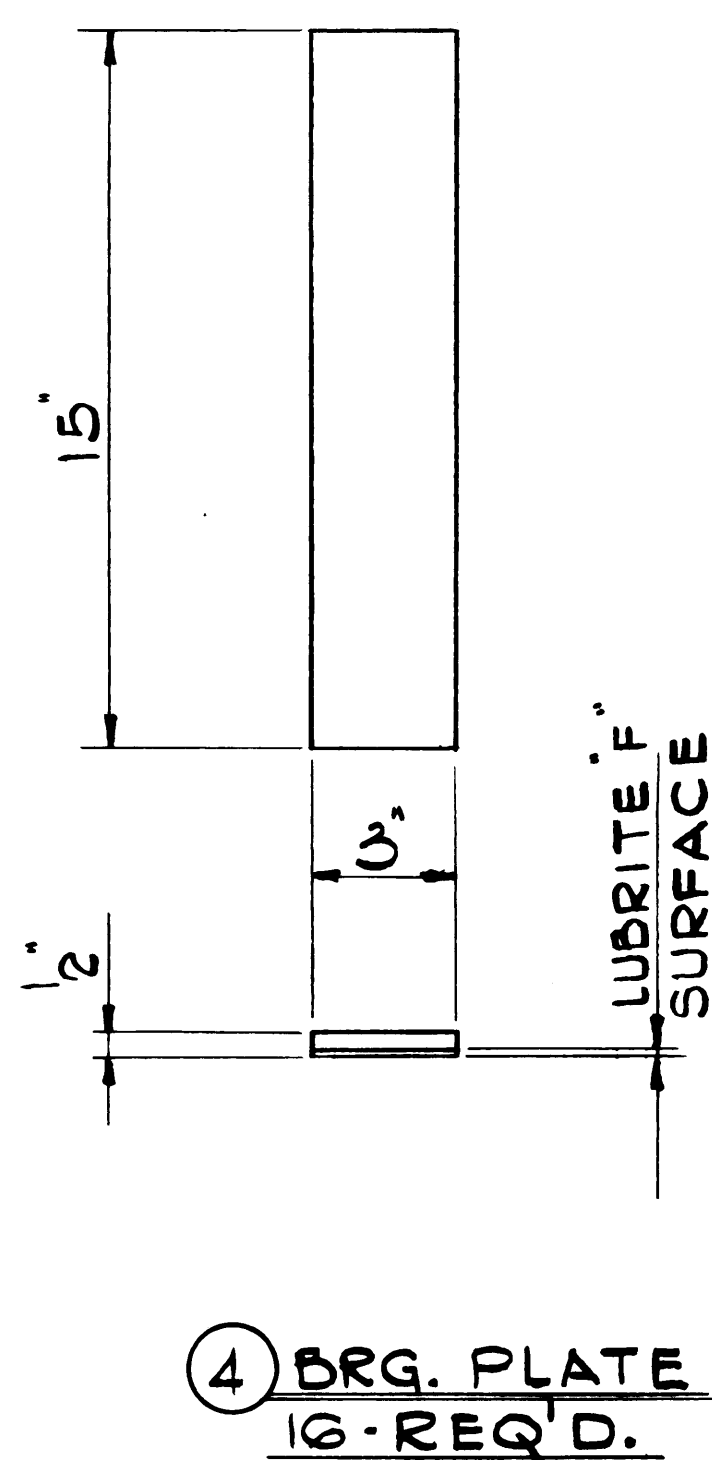
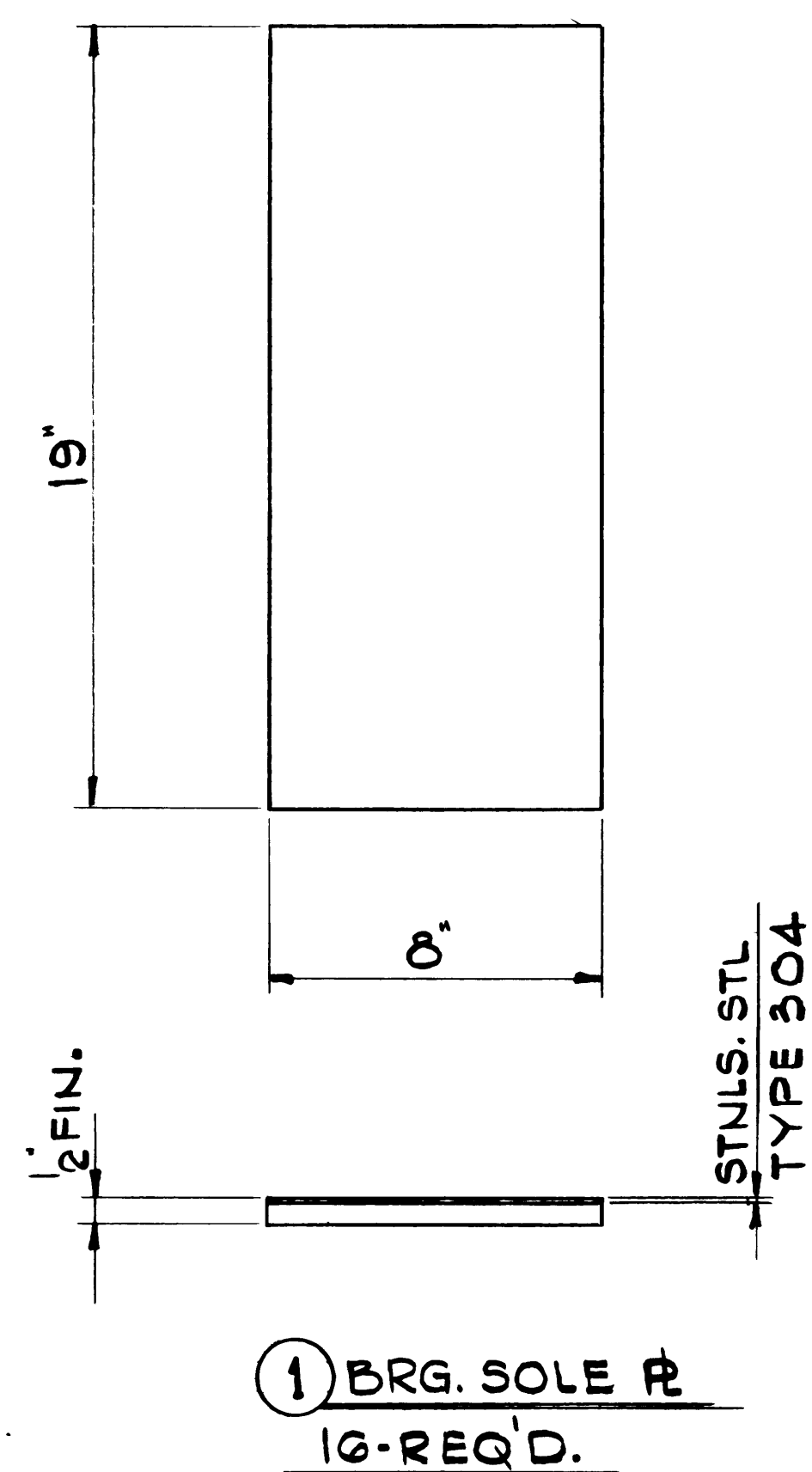
SEE DETAIL - 1

NOTES

1. QTY. SHOWN FOR ONE CRANE.
2. STRESS RELIEVE WELDMENT BEFORE FINAL MACHINING.

## NOTES

DRAWING No. EP-4299-37  
CONTRACT No. 657  
SHEET No. 9 OF 19

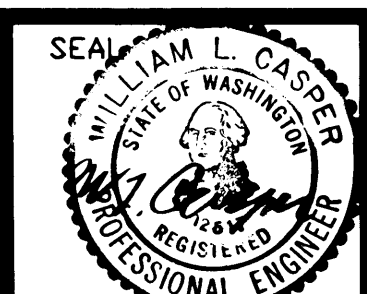


△ NOTES  
1. QTY. SHOWN FOR ONE CRANE



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11/4/88  
DATE

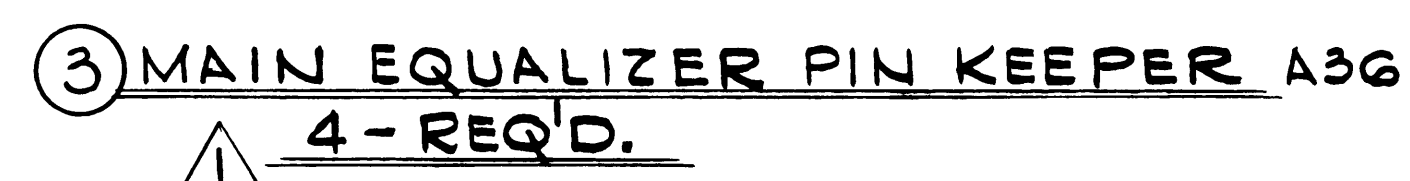
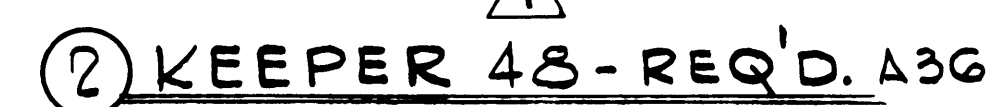
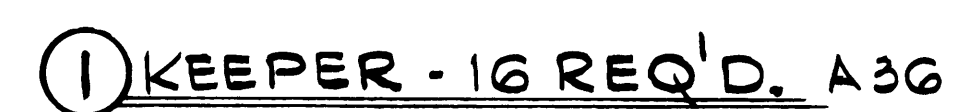
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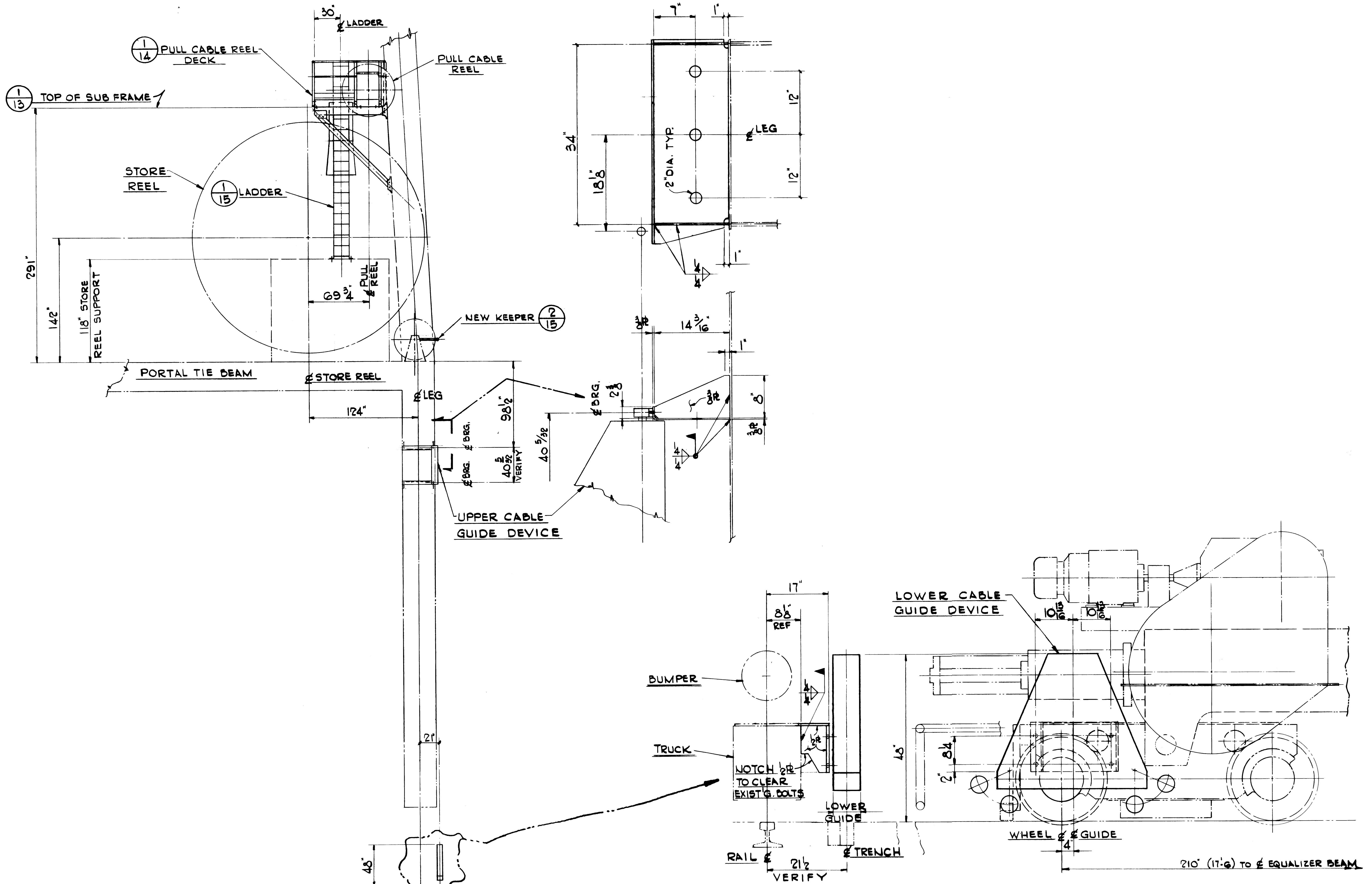
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**SUMITOMO CRANES 2403 AND 2404**  
**GANTRY ARTICULATION**  
**BEARING PLATES**

DRAWING No. **EP-4299-37**  
CONTRACT No. **657**  
SHEET No. **10** OF **19**



1. QTY. SHOWN FOR ONE CRANE.



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11/21/88  
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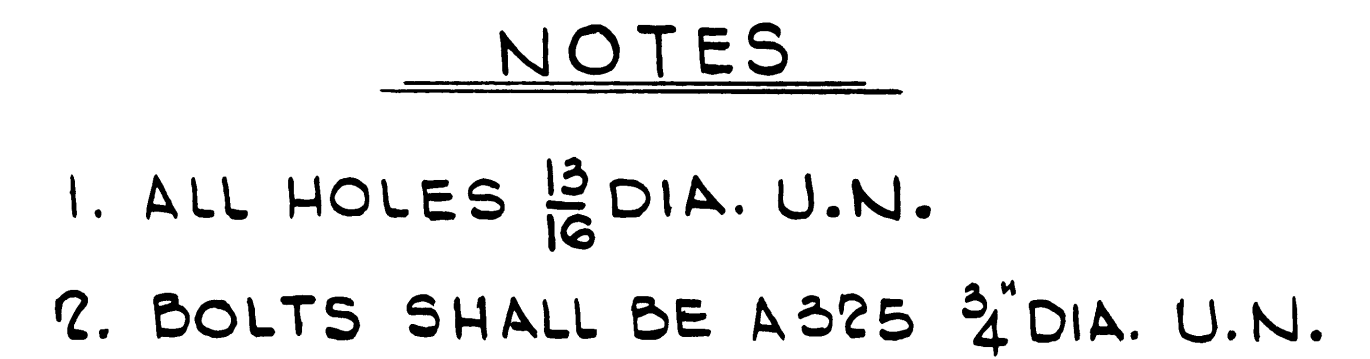
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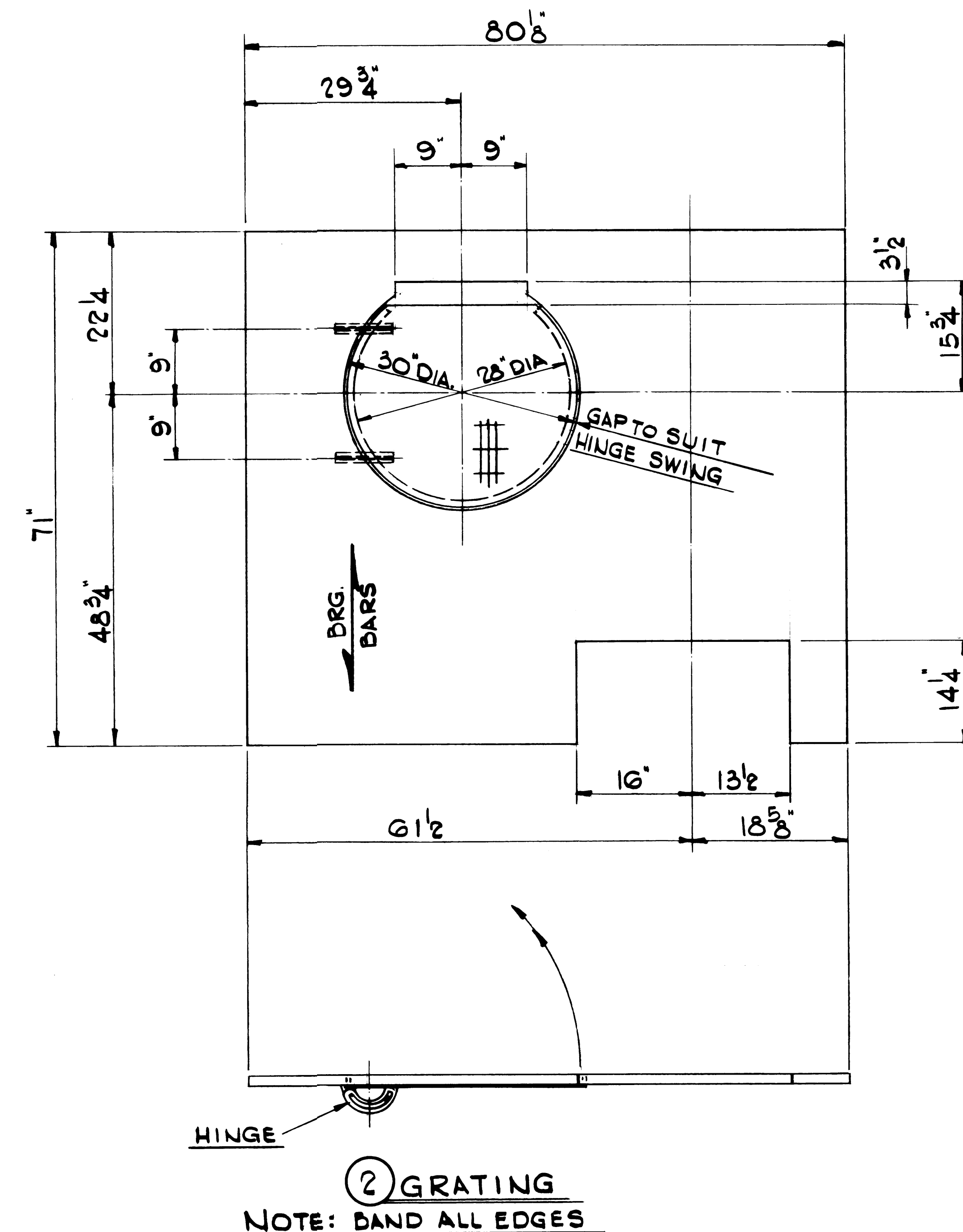
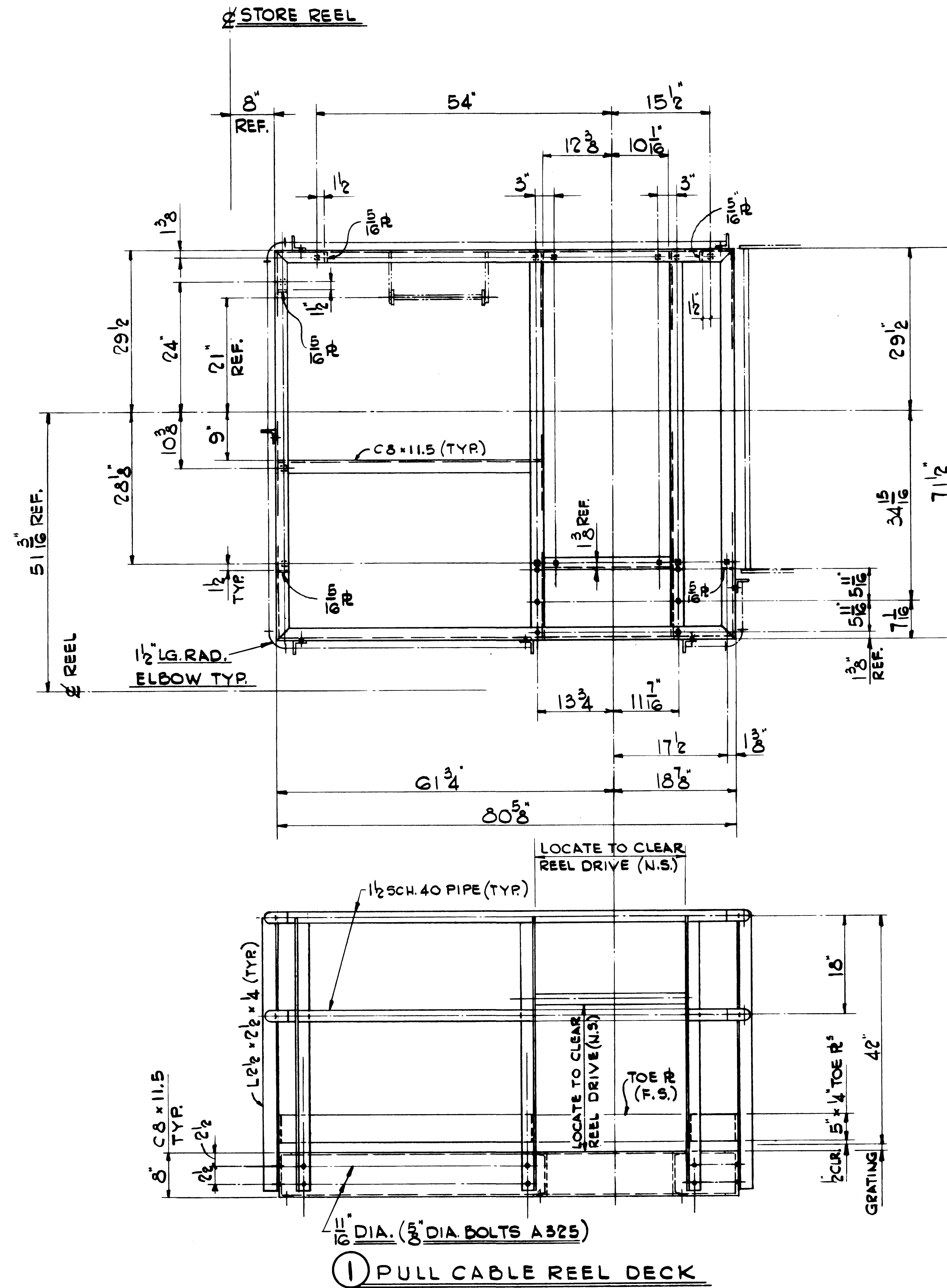
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**SUMITOMO CRANES 2403 AND 2404  
GANTRY ARTICULATION  
CABLE REEL ARRANGEMENT**

DRAWING No. **EP-4299-37**  
CONTRACT No. **657**  
SHEET No. **12** OF **19**





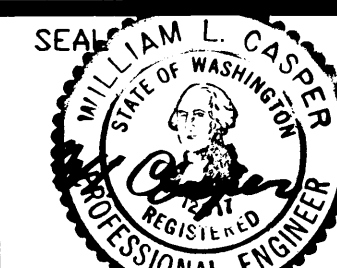
# NOTES

1. ALL HOLES  $\frac{13}{16}$ " DIA. U.N.
2. GRATING SHALL BE SAME STYLE OF EXISTING GRATING ON CRANE.
3. ALL WELDS SHALL BE  $\frac{3}{16}$ " CONT. U.N.



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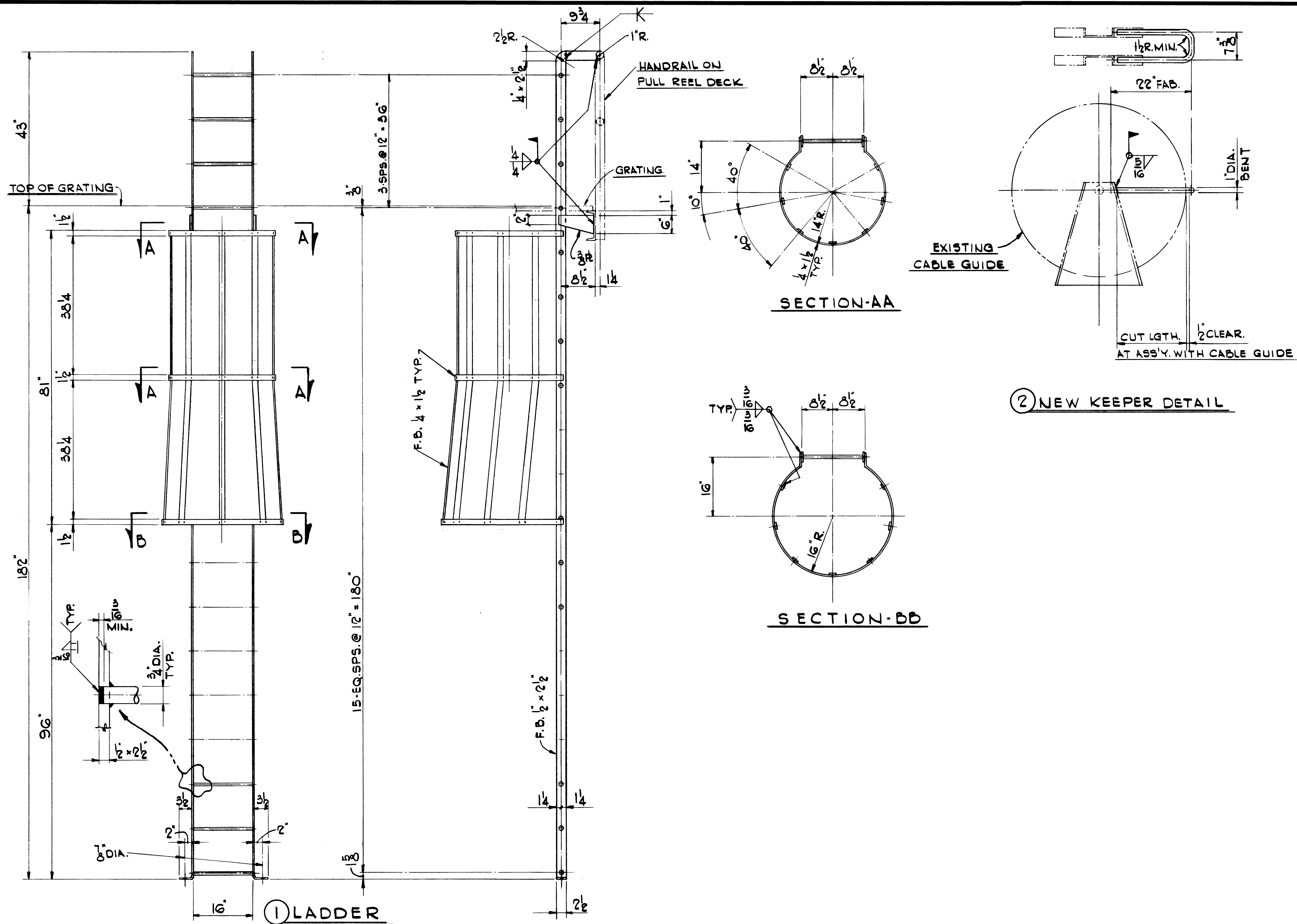
APPROVED  
*William L. Casper*  
CHIEF ENGINEER  
DATE 11/2/88

SWEET 11-2-88  
DRAWN BY DATE CHECKED BY DATE  
AS-BUILT BY DATE PROJENGR. DATE

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**SUMITOMO CRANES 2403 AND 2404**  
**GANTRY ARTICULATION**  
**PULL REEL DECK STRUCTURE**

DRAWING No. **EP-4299-37**  
CONTRACT No. **657**  
SHEET No. **14** OF **19**



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APPROVED  
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11/21/88  
DATE

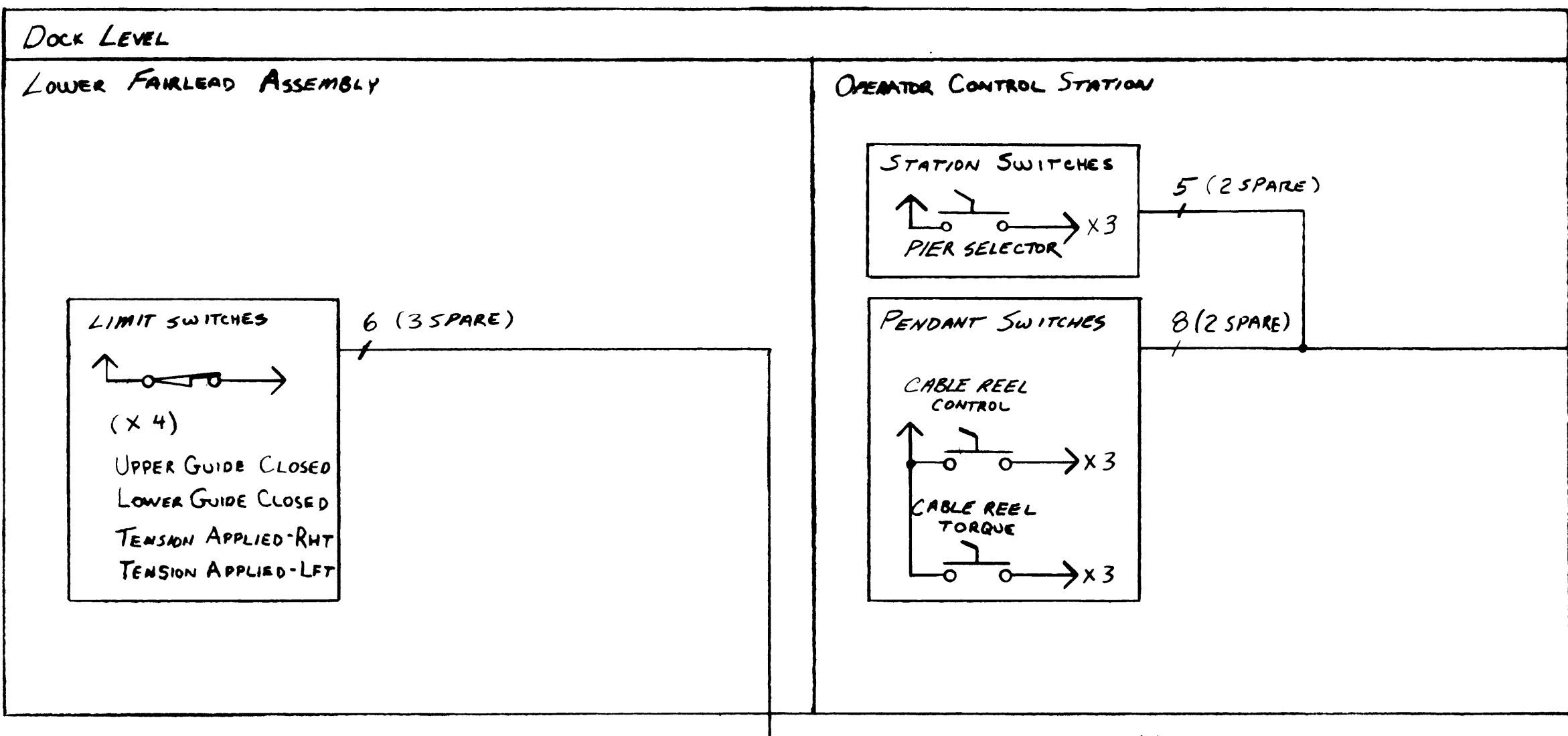
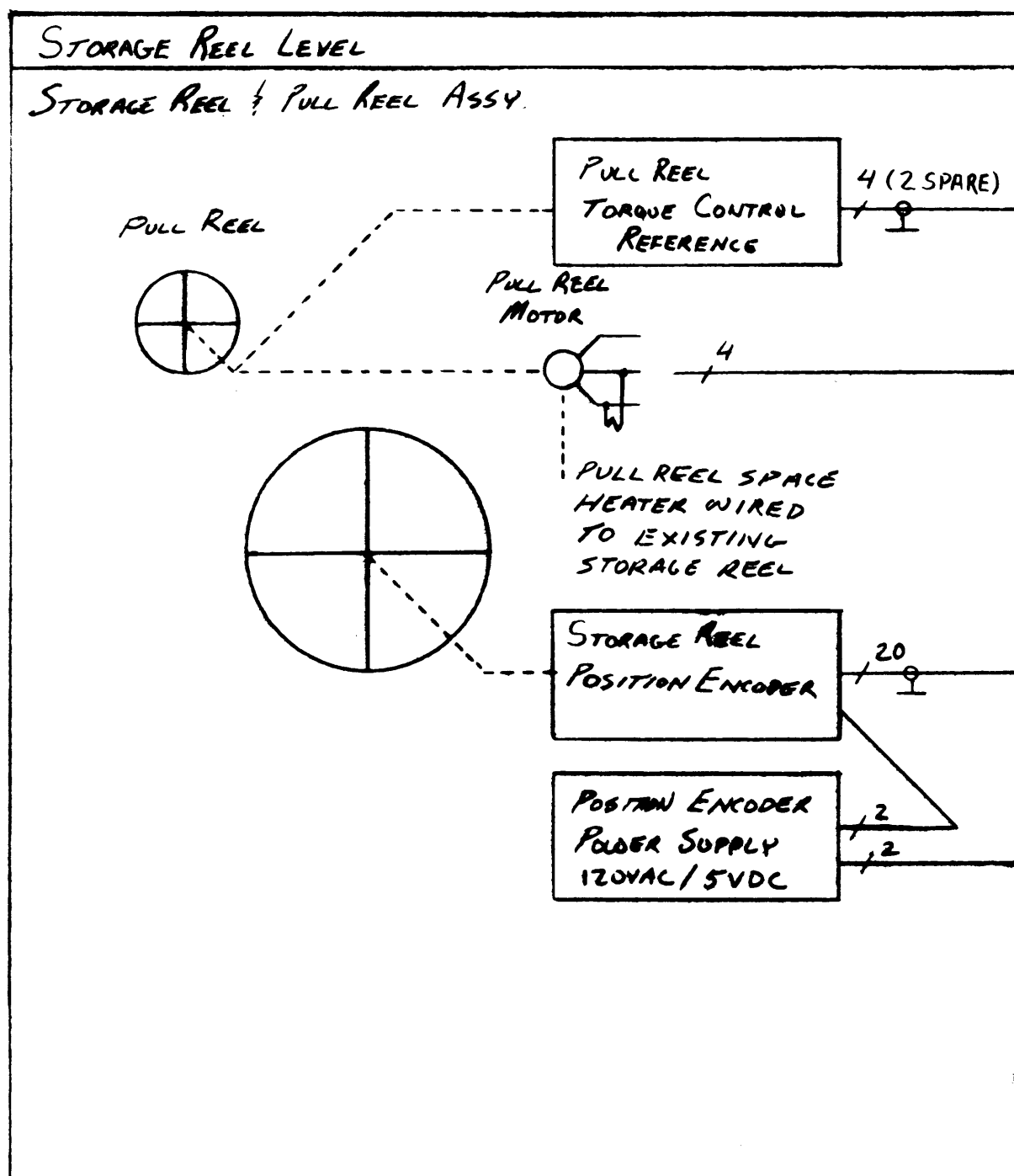
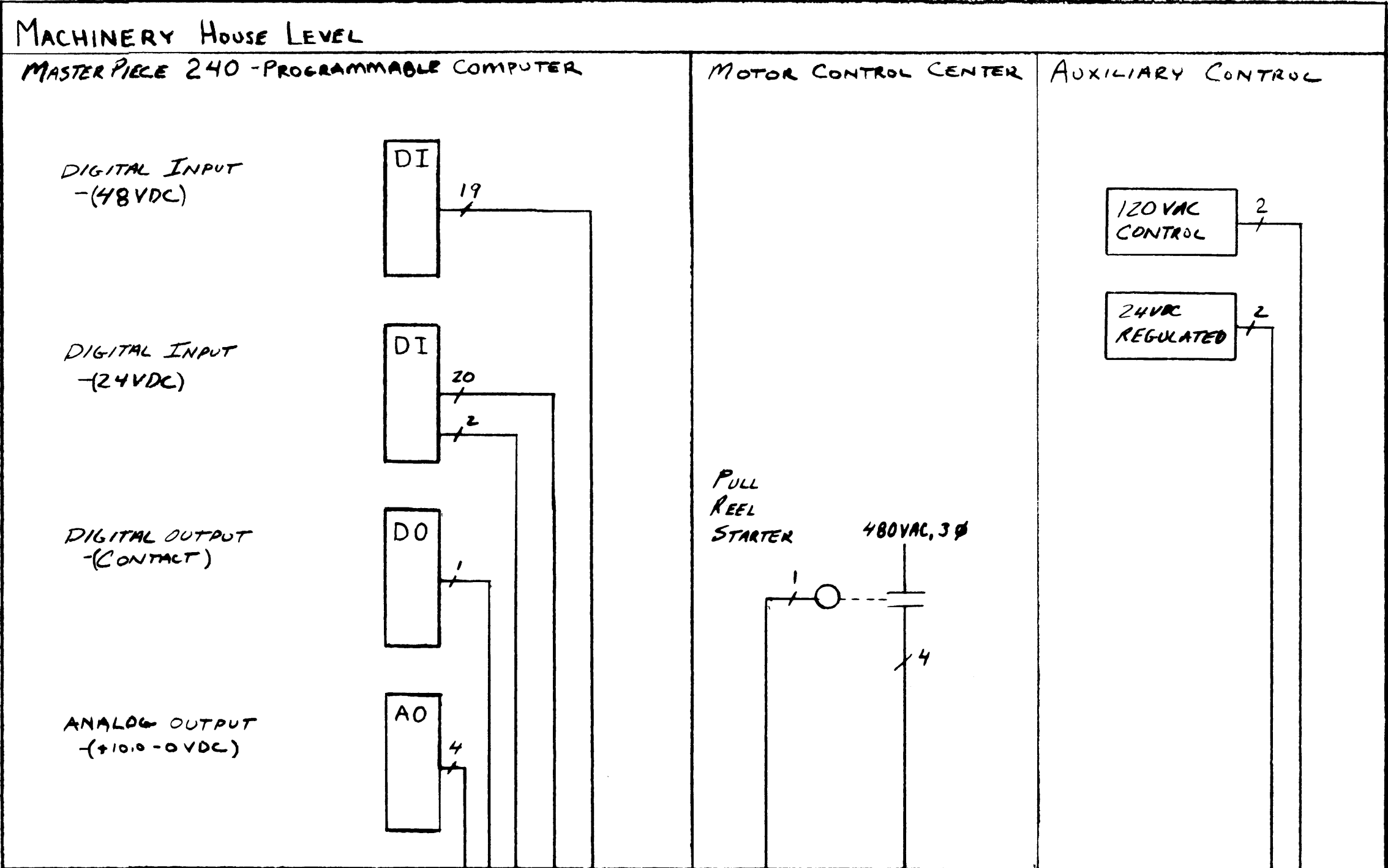
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**SUMITOMO CRANES 2403 AND 2404**  
**GANTRY ARTICULATION**  
**LADDER AND KEEPER DETAILS**

DRAWING No. **EP-4299-37**  
CONTRACT No. **G57**  
SHEET No. **15** OF **19**



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Vancouver, WA 98670 206 543-5238



APPROVED  
*William L. Casper*  
CHIEF ENGINEER  
DATE 4/24/88

B.L. KOCH  
DRAWN BY DATE 11-08-88  
AS-BUILT BY DATE

CHECKED BY DATE  
PROJ. ENGR. DATE

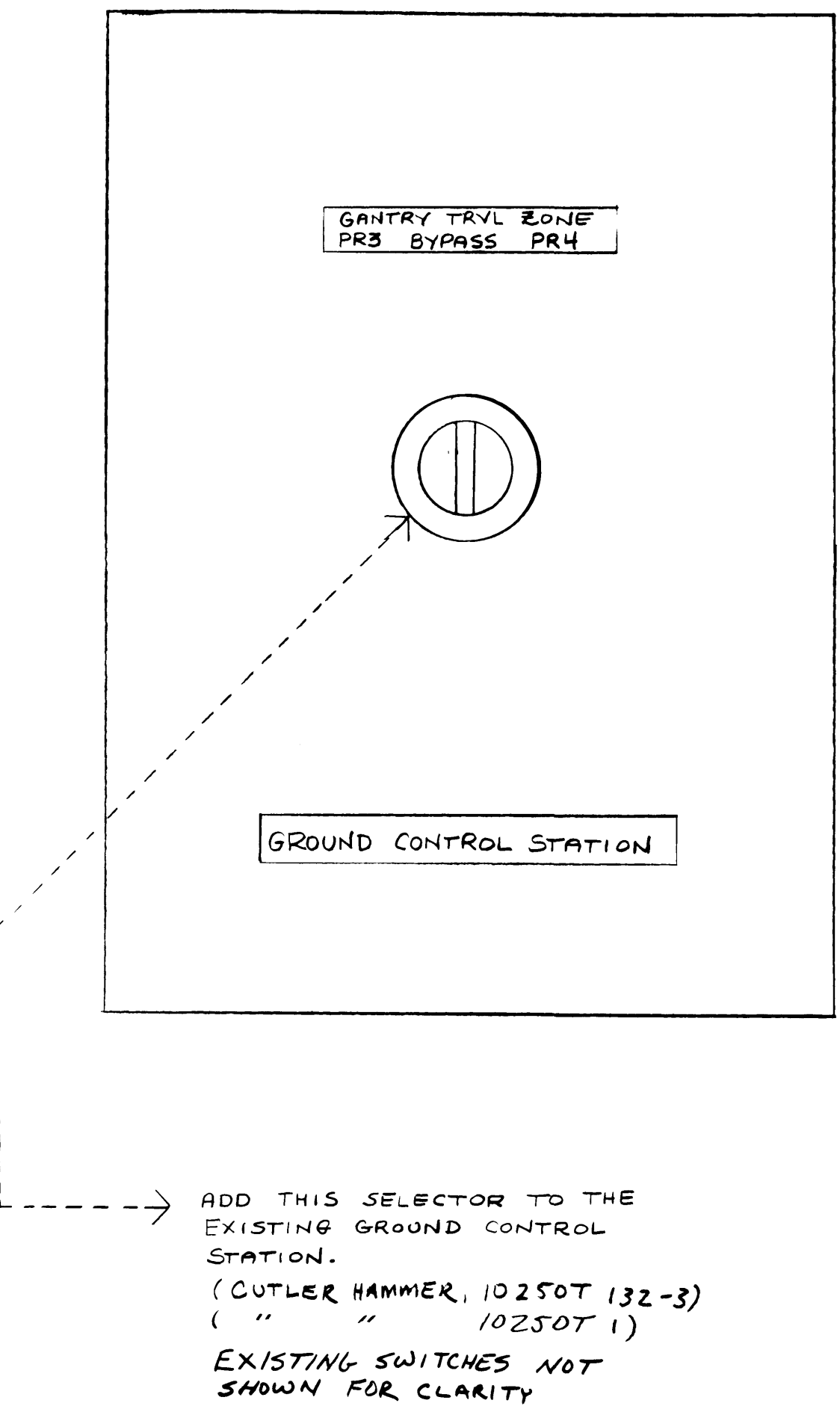
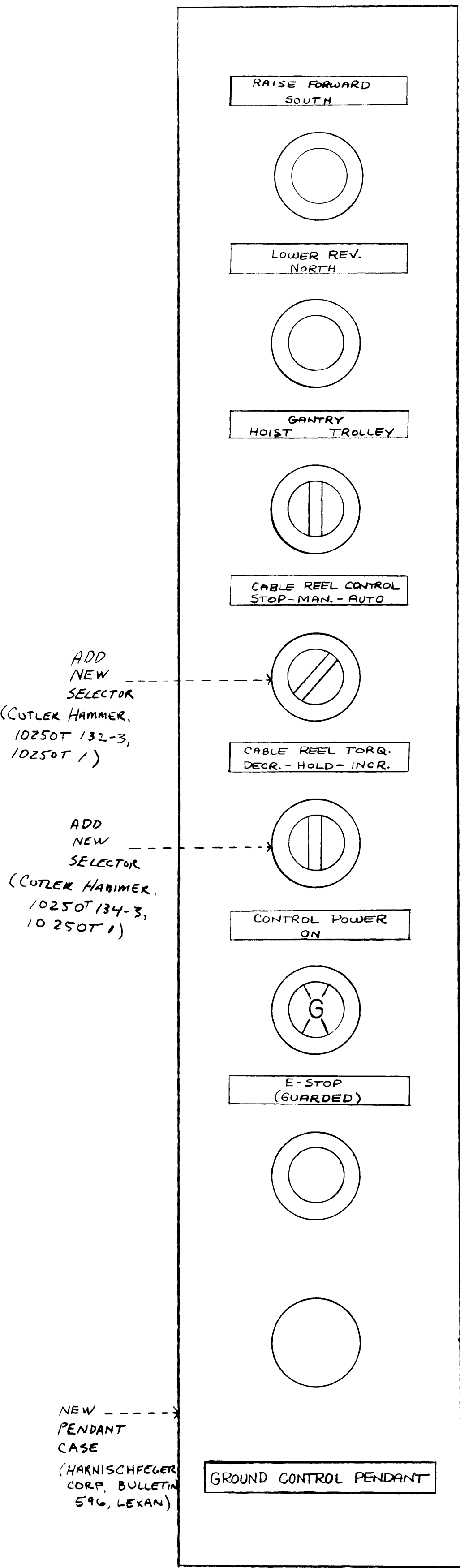
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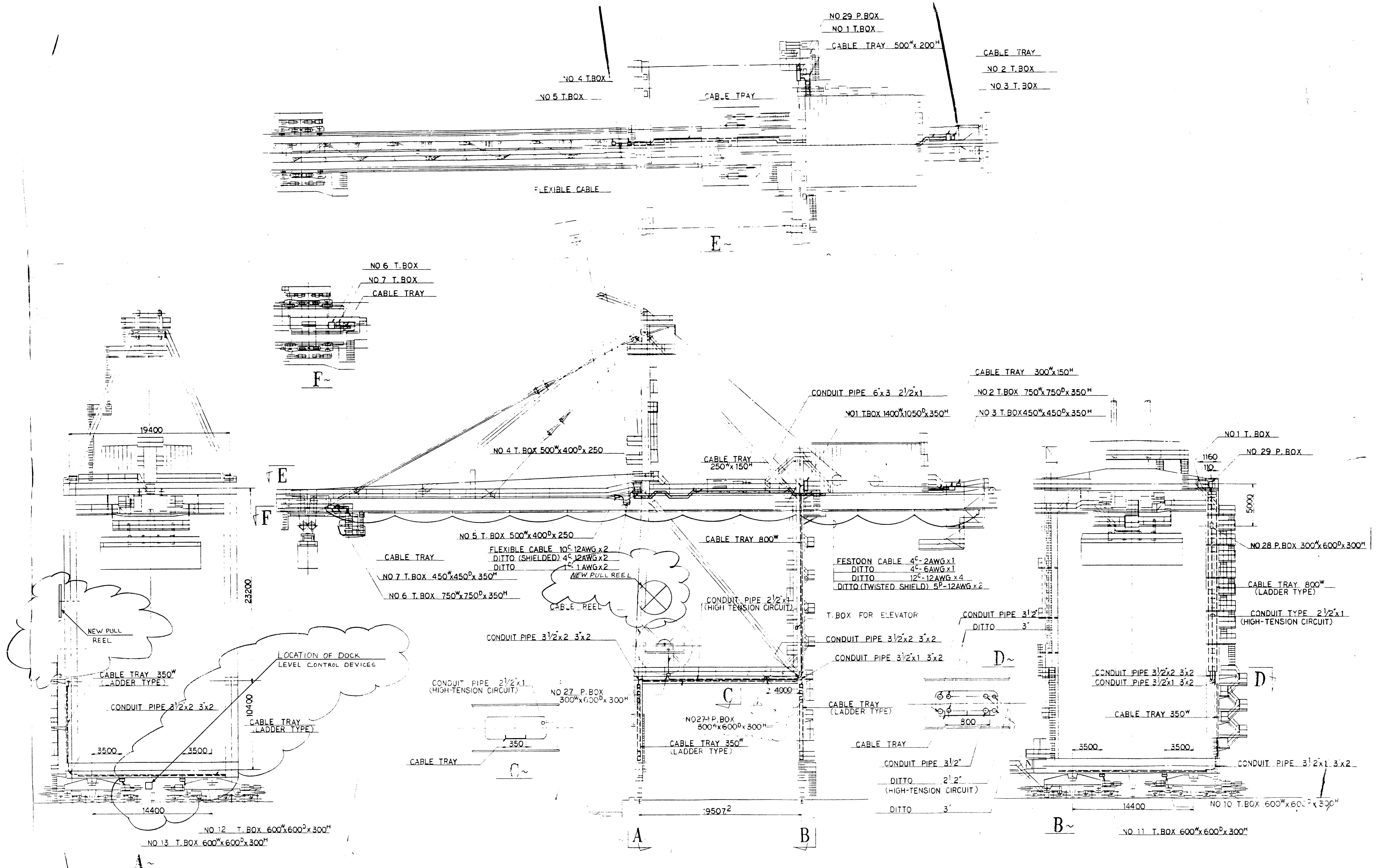
BY APP. DATE

**SUMITOMO CRANES 2403 AND 2404**  
**GANTRY ARTICULATION**  
**GENERAL ELECTRICAL ARRANGEMENT**

DRAWING No. EP 4299-37  
CONTRACT No. 657  
SHEET No. 16 OF 19

REUSE EXISTING  
SWITCHES





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APPROVED  
*William L. Casper*  
CHIEF ENGINEER

DATE 11/15/88

B. L. KOCH  
DRAWN BY DATE 11-15-88

CHECKED BY DATE

AS-BUILT BY DATE

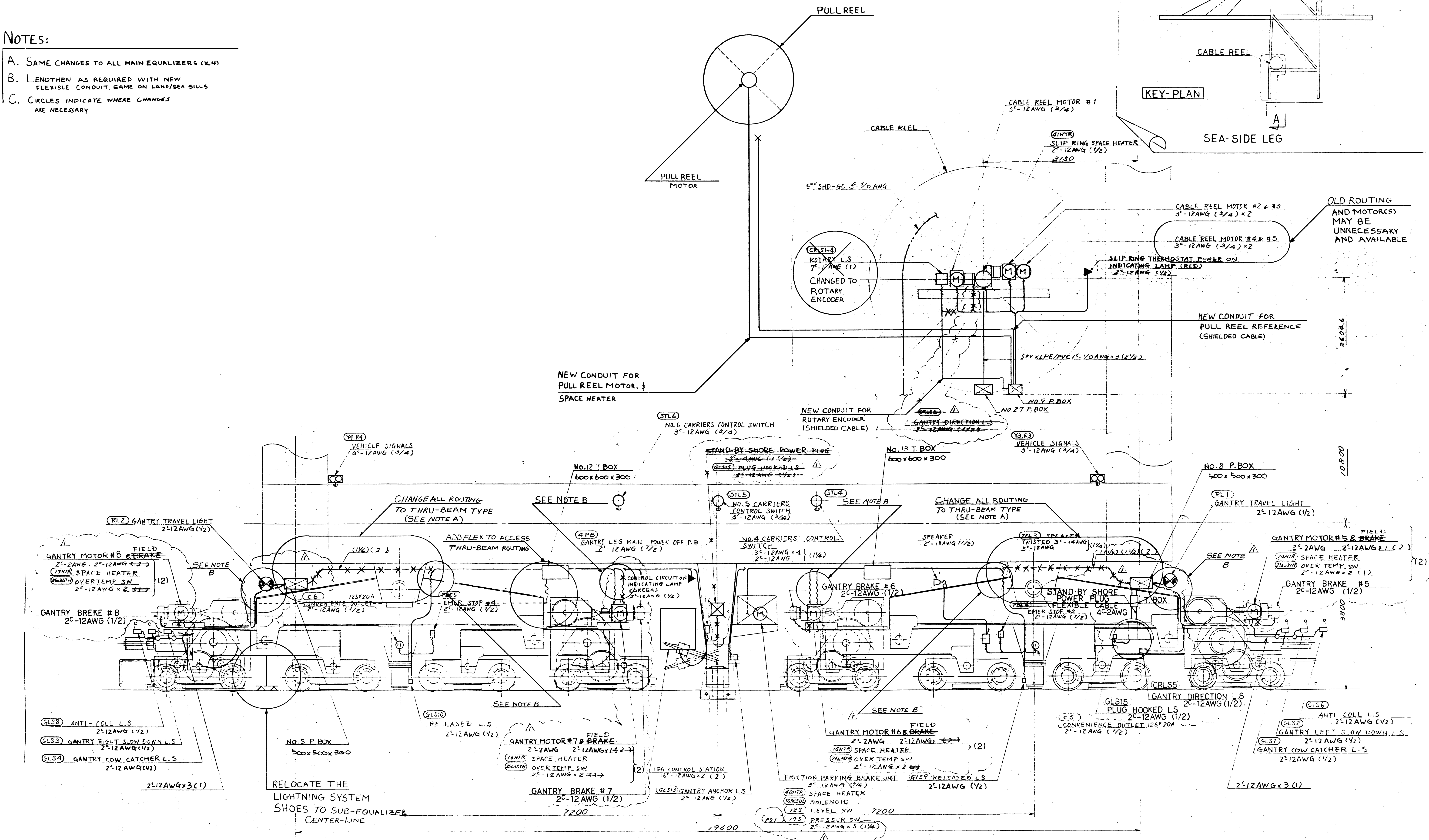
PROJ. ENGR. DATE

**SUMITOMO CRANES 2403 AND 2404**  
**GANTRY ARTICULATION**  
**GENERAL ELECTRICAL ROUTING**

DRAWING No. EP4299-37  
CONTRACT No. 657  
SHEET No. 18 OF 19

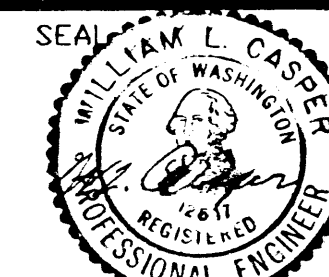
# NOTES:

- SAME CHANGES TO ALL MAIN EQUALIZERS (X4)
- LENGTHEN AS REQUIRED WITH NEW FLEXIBLE CONDUIT, SAME ON LAND/SEA SILLS
- CIRCLES INDICATE WHERE CHANGES ARE NECESSARY



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APPROVED  
*William L. Casper*  
CHIEF ENGINEER  
DATE 1/2/98

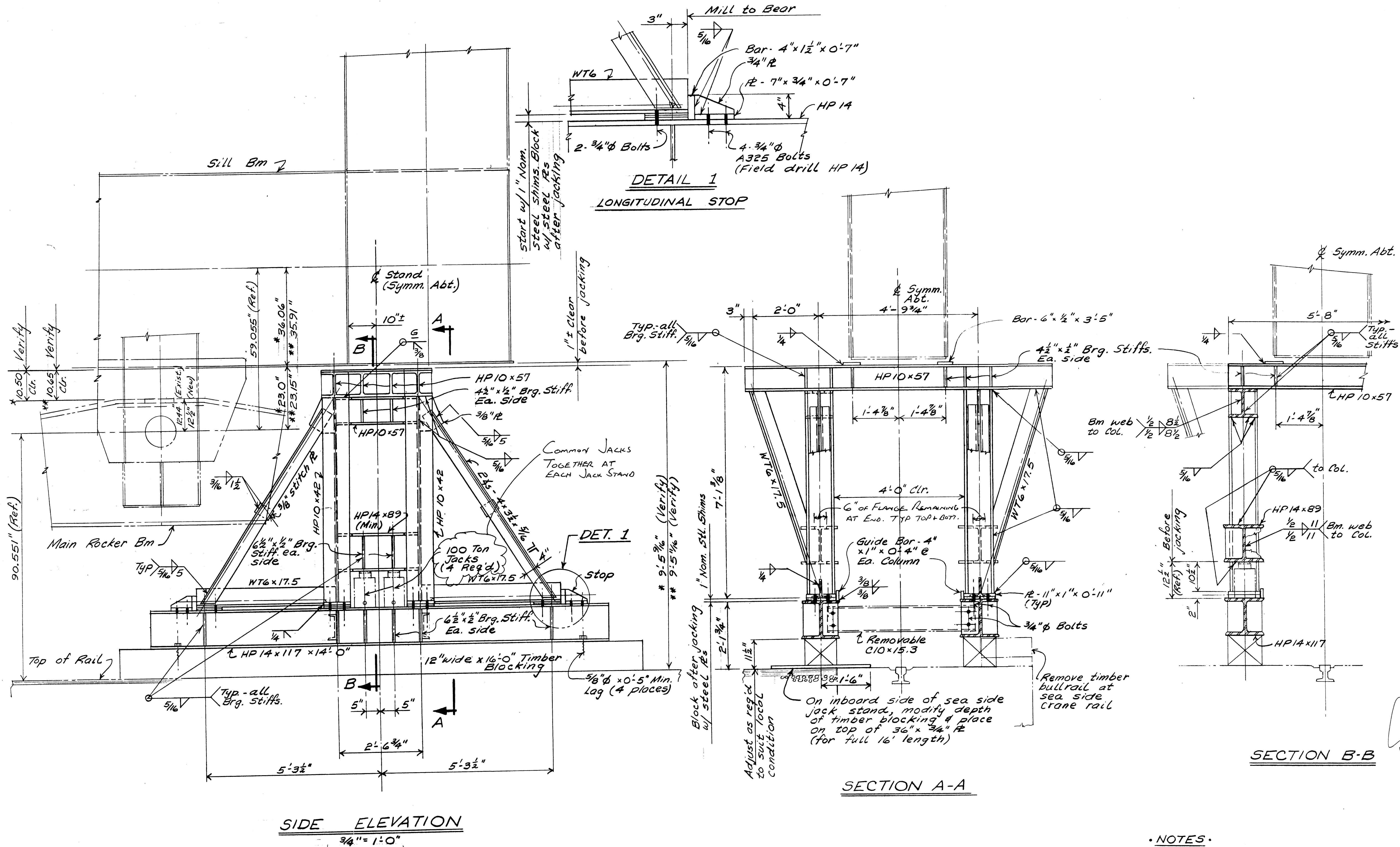
B.L. KOCH 11-15-88  
DRAWN BY DATE  
AS-BUILT BY DATE

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PROJ. ENGR. DATE

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**SUMITOMO CRANES 2403 AND 2404**  
**GANTRY ARTICULATION**  
**ELECTRICAL ROUTING & MISC. DETAILS**

DRAWING No. EP 4299-37  
CONTRACT No. 657  
SHEET No. 19 OF 19



# • NOTES •

All structural steel and plate shall comply with ASTM A36.

All welding shall be in accordance with AWS D1.1.

|                            |                     |                             |                              |                           |
|----------------------------|---------------------|-----------------------------|------------------------------|---------------------------|
| DRAWING NO.<br><b>JS-1</b> | JACK STAND C-159    | PORT OF TACOMA CONTRACT 107 | SUMITOMO CRANE MODIFICATIONS | for COONEY - McHUGH, INC. |
|                            | DESIGNED DATE<br>11 | CHECKED DATE<br>11          | APPROVED DATE<br>11          | APPROVED DATE<br>11       |
|                            | DESIGNED BY<br>KLC  | CHECKED BY<br>KLC           | APPROVED BY<br>KLC           | APPROVED BY<br>KLC        |
|                            | DRAWN BY<br>KLC     | SCALE<br>1/2" = 1'-0"       | PROJECT NO.<br>98199         | SHEET NO.<br>20           |

3522 West government way Seattle, Washington 98199 (206) 284-1181  
 CONSULTING ENGINEERS  
 SUMITOMO CRANE MODIFICATIONS  
 for COONEY - McHUGH, INC.

EP 4299-37  
 Sheet 20