

संयंत्र और उपकरण (पी एंड ई) प्रभाग,  
संचालन प्रशासनिक भवन, प्रथम तल,  
चिरंजीबपुर, पीओ: हल्दिया, जिला: पुरबा मेदिनीपुर,  
पश्चिम बंगाल, भारत, पिन - 721604

Plant and Equipment (P&E) Division,  
Operations Administrative Building, First Floor,  
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संख्या/No.: SDM(P&E)-III/ 1086/ ENQ/ Budgetary Offer/ 96

दिनांक/Date : 28.04.2022

सेवा में/To,

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Dear Sir,

विषय/Sub.: Budgetary offer for the work of "Repairing of Caisson Gate No. 1 (and other allied work) kept at Intermediate Camber at Lock Entrance of Haldia Dock Complex, Syama Prasad Mookerjee Port, Kolkata".

Haldia Dock Complex (HDC), Syama Prasad Mookerjee Port, Kolkata (SMP, Kolkata) intends to repair the Caisson Gate No. 1 (and other allied work) kept at Intermediate Camber at Lock Entrance of HDC, SMP, Kolkata.

Budgetary offers for the subject work is invited from experienced / reputed firms based on the attached documents as mentioned below :-

- Technical Estimate
- Scope of Work and Technical Specifications
- Special Conditions of Contract
- Price Schedule
- Drawings

**GENERAL CONDITIONS OF CONTRACT** : The contract will be governed by our General Conditions of Contract (available at the official website of Syama Prasad Mookerjee Port, Kolkata: [www.smpportkolkata.shipping.gov.in](http://www.smpportkolkata.shipping.gov.in) ).

It is requested to arrange to send the budgetary offer, for the subject work, within 21 (Twenty One) days, by mail at [koushikm.hdc@kolkataporttrust.gov.in](mailto:koushikm.hdc@kolkataporttrust.gov.in) . The firm may also send hard copy of their budgetary offer, by post etc., at the address mentioned above.

For any clarification, feel free to contact with the under named, through e-mail, phone etc., details of which have been mentioned above.

आपका धन्यवाद/ Thanking you,

आपका आभारी/ Yours faithfully,

(क. मुखोपाध्याय)/(K.MUKHOPADHYAY)

वरिष्ठ उप प्रबंधक (पी एंड ई)/Sr. Dy. Manager (P&E)

कृते महाप्रबंधक (इंजीनियरिंग)/ For General Manager (Engineering)

हल्दिया गोदी परिसर/ Haldia Dock Complex

श्यामा प्रसाद मुखर्जी पोर्ट, कोलकाता/Syama Prasad Mookerjee Port, Kolkata

संलग्न/Encl.: As stated above.

### **TECHNICAL ESTIMATE**

Sl. No	Description of work	Drg. No	Estimated quantity for execution of work
1.	STEEL MATERIALS		
i.	Renewal / replacement of "A" deck Plate, Skin Plate, Valve box & walkway (Including fair lead & mooring ring)	110.076, 110.010, etc.	60 MT
ii.	Renewal / replacement of Stiffener and cross Girder of "A" deck.	53-1-10-2002 B, Sheet-1 of 1, 110.076 etc.	30MT
iii.	Renewal / replacement of additional MS levelling Plate fitting throughout the length of Quoin and Cill both "V" & "W" side	110.034 sheet-1	22 MT
iv.	Renewal / replacement of additional Rubber seal Retaining Plate fitting throughout the length of Quoin and Cill both "V" & "W" side		
v.	Renewal / replacement of removable Base plates, Mud plough & Guide Plates and Sole Plates	110.073	25 MT
vi.	Renewal / replacement of Probe wheel Structure	110.051	2 MT
vii.	Renewal / replacement of Bulk Head Gate at B & C Deck	-----	2MT
viii.	Renewal / replacement of bracing at B deck level	110.052	60 MT
ix.	Renewal / replacement of steel plate including stiffener and angle of access Tank	-----	8 MT
x.	Renewal / replacement of holding frame of guide plate	-----	3 MT
xi.	Renewal / replacement of all Ladder	110.025	3 MT
xii.	Renewal / replacement of manhole cover	118/6808-04nos on "A" deck	10 MT
xiii.	Renewal / replacement of Skin Plates from "A" deck to "B" deck, "B" deck to "C" deck, "C" deck to "D" deck, "D" deck to "E" deck, "E" deck to "F" deck and "F" deck to top of the Sole Plates	110.002 & 110.001	193 MT
xiv.	Renewal / replacement of "B" Deck Structure	110.052	115 MT
xv.	Renewal / replacement of plates of "C" Deck, "D" Deck, "E" Deck and "F" Deck	120.036 SH-1 of 2	198 MT
xvi.	Renewal / replacement of Built up Tee in between "A" & "C" deck, "C" & "D" deck, "D" & "E" deck and "E" & "F" deck.	110.005	90 MT

xvii.	Renewal / replacement of "D" deck structure, "E" deck structure, "F" deck structure and BALLAST Boxes	110.055, 110.048	-----
xviii.	Renewal / replacement of Caisson FRAME repairing	110.067, 118/76996	-----
xix.	Renewal / replacement of Caisson JACKING Pad repairing	110.006	-----
xx.	Renewal / replacement of Longitudinal wash Board	118/93550B	-----
xxi.	Renewal / replacement of GRILLS FOR PEN STOCK OPENING, 16" DIA SUMP INLET & 10" DIA SCOUR PIPE	118/71462C & 118/71448G	-----
2.	Replacement of heavy duty GI Pipe 80 mm nominal bore for vent and sounding	110.014	400 mtrs
i.			
ii.	Replacement of heavy duty GI Pipe 3" mm nominal bore for 386 Sluice Valve spindle & 10 hp Pump	120.040	700 mtrs
iii.	Replacement of heavy duty GI Pipe 4" mm nominal bore 450 Gate Valve spindle	120.036 & 120.025	400 mtrs
iv.	Replacement of heavy duty GI Pipe 2 ½" mm nominal bore for 5" SD Valve spindle	110.079 & 118/93550 B	100 mtrs
v.	Replacement of heavy duty GI Pipe 150 mm nominal bore for jetting header & 20 hp Pump	-----	300 mtrs
vi.	Replacement of heavy duty Scouring GI Pipe 18" to 30"(approx.) mm nominal bore	-----	100 mtrs
3.	Replacement of Penstock (including headstock, handwheel, shaft, bush, sleeve, Gate, Seal etc)	Drg No.-110-024	04 Nos
i.			
ii.	Repairing / Overhauling of Penstock (including headstock, handwheel, shaft, bush, sleeve, Gate, Seal etc.) & replacement of defective spares (new spares to be supplied by the contractor)	Drg No.-110-024	02 nos
4.	Replacement of quoins & Cills	110.034 & H.SC/G-127	104 nos (52 nos each side)
5.	Rubber Seal fixing on Caisson quoins & Cills	Drg. No-120.016 & 120.019	200 mtrs
6.	Replacement of 386 mm Valve including all accessories & holding attachment	Drg. Nos.- 120.025	20 Nos
i.			
ii.	Repairing/overhauling of 386 mm Valve & replacement of defective spares (new spares	120.023 120.038	7 Nos

	to be supplied by contractor) including Valve operating Wrench, holding attachment etc(to be supplied/replaced by contractor)		
iii.	Replacement of 450 mm Valve including all accessories & holding attachment	Drg. Nos- 120.023, 120.038, 120.039 & 120.025	15 Nos
iv.	Repairing/overhauling of 450 mm Valve & replacement of defective spares (new spares to be supplied by contractor) including Valve operating Wrench, holding attachment etc(to be supplied/replaced by contractor)		07 Nos
v.	Replacement of 150 mm Valve including all accessories & holding attachment	Drg. No.-120.025	04 Nos
vi.	Replacement of 14" Valve including all accessories & holding attachment	-----	01 No
vii.	Replacement of 5" surface drainage Valve including all accessories & holding attachment	110.030	09 Nos
7. i.	Overhauling of Spur Gear Box & replacement of defective spares (new spares to be supplied by contractor)	110.046	11 Nos
ii.	Overhauling of Bevel gear Box & replacement of defective spares (new spares to be supplied by contractor) Bevel gear Box	110.041	10 Nos
8. i.	10 HP, 3Ph 415 $\pm$ 10% V, 50 Hz AC vertical submersible de-watering pumps	06 Nos	06 Nos
ii.	Supply, delivery, installation & commissioning of 20 hp horizontal centrifugal reciprocating pump including motor	02 Nos	02 Nos
iii.	Supply, delivery, installation & commissioning of 50/40 HP Vertical Turbine pump	03 Nos	03 Nos
9. i.	TIMBER FENDER BOTH "V" & "W" SIDE AT "A","B","C" DECK	110.054	614.392 CFT
ii.	Wooden Plank on walkway		161.25 CFT
10.	Grit blasting, painting of Old structure		500 sq. mtr.
11.	Old structure Surface preparation to be done by using power tools failing which by using hand tools (like Scraper, Wire Brush and Pig Hammer etc.),where Grit blasting not possible, painting of Old structure		1500 sq. mtr.

**NOTE :**

Above estimated quantities are tentative only. However, the contractor shall be required to measure the quantity based on the relevant drawings and actual site conditions, as detailed in the Special Conditions of Contract. Finally, the contractor will have to take necessary approval of the drawings etc. from the Engineer of the Contract before taking necessary procurement action for different items / materials including steel materials.

## **SCOPE OF WORK AND TECHNICAL SPECIFICATIONS**

### **Part-A (Structural and other allied Mechanical Work)**

#### **6.1 Introduction:**

Haldia Dock Complex is a riverine port with Impounded Dock System, has been provided with Lock Entrance having 3 (three) Nos. Sliding Caisson installed at Outer, Intermediate and Inner position across lock barrel. The Caissons are identical in all respect and are interchangeable with one another. These Caisson Gates were commissioned in the year 1977.

The Caisson Gate No.1, which is at present at Intermediate Camber, was in operation for more than 25 years and thereby the structures, seals and various other vital components have been deteriorated. It has been decided to carry out overhauling / repairing / revamping / modification / painting of the Caisson Gate No. 1, kept at Intermediate Camber covering structural, mechanical, painting, electrical, automation and sealing accessories including renewal of various parts.

#### **6.2 Constructional Features of the Caisson:**

The Caisson is a very complicated structural body consisting of various sizes of MS Plates, Angles, Channels, Beams, etc. and having various mechanical accessories like Pumps, Valves, Pipelines, etc. installed inside the Caisson, with sealing accessories made of special type of iron casting machined with very high accuracy and fitted with precession alignment. The three sliding Caisson have a length of 141 ft. – 6 inch at one side and 134 ft. – 8 inch at the other side with a molded width of 24 ft. and a total depth of 61ft. – 7½ inch. It is designed to withstand a transverse differential head of 54.63 ft. in either direction and are built of mild steel of weld able quality. There are total 6 (six) decks inside the Caisson (A to F) and are installed vertically. Each Caisson has been divided into several watertight compartments between ‘C’ and ‘E’ decks to form the following air chambers and tanks:

<b>Sl. No.</b>	<b>Qty.</b>	<b>Designation of tank</b>	<b>Total capacity in full water condition</b>
1.	4	End Buoyancy Tanks ( <b>EBT</b> )	136 tons
2.	2	Upper Scuttle Tanks ( <b>UST</b> )	450 tons
3.	2	Preponderance Adjustment Tanks ( <b>PAT</b> )	300 tons
4.	1	Lower Air Chamber ( <b>LAC</b> )	419 tons
5.	1	Pressure Sump ( <b>PS</b> )	59 tons

Besides, there is a chamber enclosed between ‘A’ to ‘C’ decks which forms the main buoyancy chamber and this, under normal working condition remains freely flooded through open penstocks (6 Nos.) at the end of the Caissons. In the closed position of the penstocks, this chamber can be pumped dry for additional buoyancy as may be required to float the Caissons out. Space between ‘E and ‘F’ decks are always open to river. The

water tightness of the Caisson on Cill and on each Quoin is achieved by special Meehanite castings fixed on Caisson within close tolerance. Along the top deck of the Caisson a gangway is provided with handrails at each side and a folding stair at each end. There are 3 (three) Nos. electric motor driven pump of 50 HP capacity installed at the mid position on the 'D' deck of the Caisson, for adjusting water level of various tanks as well as for jetting/flushing purpose. There are 02 (two) Nos. electric motor driven centrifugal pump of 20 HP capacity installed at the two corner position on the 'D' deck of the Caisson and 02 (two) nos 10 H.P submersible pump installed into the UST tank for adjusting water level of UST tanks. 02(two) numbers 10 H.P submersible pump installed into the LAC tank for adjusting water level as well as dewatering the seepage water of different tanks. 02 nos 10 hp Pump installed at MBT for de-siltation of "C" deck. One subsidiary power & control panel (start & stop, reset, indication and safety facility) for controlling each type of motors is fixed at the suitable position on the "A" deck. The power being supplied by means of a flexible cable connected from a motorized cable reeling drum supported on a frame 20 ft. away from quay wall. At the bottom most point of the Caisson two row sole plates are welded on two sides along the longitudinal direction and two row removable base plates (48 nos.) are bolted up with the sole plate at the two sides of the Caisson longitudinally. Over this base plate the Caisson is sliding on the sliding way while it is in running condition.

Jets are provided at each bottom end of the Caisson for removing of deposited silt from sliding way and can be operated during Caisson movement by means of electric motor driven pumps installed in the Caisson. Mud ploughs are also built into the bottom of the Caisson over each sliding way. Scour pipes and its valves are situated below "E" deck in the open sea for cleaning of silt from side of gate by allowing flow of water through gate. There are total 69 nos. valves inside the Caisson.

### **6.3 Scope of Work:**

#### **6.3.1. Structural Steel Work :**

- 6.3.1.1** Replacement of 'A' (Top) Deck accessories. Replacement of 'A' Deck Plates, Stiffeners (Drg. No-110.076) and Transverse Girders (Drg. No-53-1-10-2002, Sheet 1 of 1). Replacement of steel frame of Caisson's walk ways including angle legs and stiffeners (Drg. No-110.010 & Drg. No-110.013,118/76808) for both 'V' and 'W' sides. Replacement of Caisson Penstocks & its Base, valve deck boxes and Cable Tray with stands etc.
- 6.3.1.2** Replacement of Billet, Billet Pin & Brackets only Caisson side (Drg. No.-110.017 ).
- 6.3.1.3** Renewal/replacement of 06 Nos. Transverse Bulk Head Gates and allied structures at 'B' and 'C' Decks.
- 6.3.1.4** Renewal /replacement of steel plates including stiffeners, angles etc. of Access Trunk (Drg. No.-120.036 SH1 of 2, No part drg).

- 6.3.1.5** Renewal/replacement of all Grills and allied structures for Scouring pipe inlets and Sump inlets on both 'V' and 'W' sides and Lower Scuttle Tank (LST) inlets (4 Nos.).
- 6.3.1.6** Renewal /replacement of bracing at 'B' deck level (Drg. No.-110.052).
- 6.3.1.7** Replacement of all ladders of Caisson Gate (Drg. No.-110.025).
- 6.3.1.8** Replacement of removable Base plates & Sole plates including Holding Bolts (Drg. No.-110.073)
- 6.3.1.9** Replacement of manhole covers including allied structures *and Fixing Bolts* of various tanks (19 Nos.). [Non water tight on "A" deck 118/76808 = 04 nos)
- 6.3.1.10** Replacement of Grills between 'E' and 'F' Deck level.
- 6.3.1.11** Renewal /replacement of holding frame of Guide Plates (Drg. No.-118/71446H).
- 6.3.1.12** Replacement of Frame-15 side Probe Wheel structures (Drg. No.-110.051) **(2 Nos.)**
- 6.3.1.13** Repairing/replacement of 2 Nos. Longitudinal Wash Boards, which makes 9 (nine) small compartments in 'C' Deck (Drg. No.-118/93550 B ).
- 6.3.1.14** Renewal/replacement of Skin Plate (Drg. No.-110.001 to 110.005.).
- 6.3.1.15** Replacement of existing 2 Nos. Draft Marking Scales including its base plates at V side of Frame 1 and W side of Frame 15. Another one Draft Marking Scale including its base plate is to be provided at 'W' side of Frame 1 of the Caisson (Drg. No.-118/90970,118/93551C).
- 6.3.1.16** Renewal/replacement of Sole Plates and allied stiffeners (Drg. No.-118/71446H).

### **6.3.2 Work pertaining to Sealing Accessories and Water Parts:**

- 6.3.2.1** Repairing /Replacement of the existing Quoin and Cill and its base Plate including holding down bolts (Drg. No.-110.034).
- 6.3.2.2** Re-alignment of Quoin and Cill line.
- 6.3.2.3** Replacement of Rubber Seals including fixing plates, with screws, washer etc. (Drg. No.-120.019,120.016'110.034).
- 6.3.2.4** Replacement of 06 Nos. Guide Plates including Back Plates, fixing Nuts and Bolts etc.
- 6.3.2.5** Replacement of 04 Nos. Mud Plough assembly including Rubber parts etc.
- 6.3.2.6** Replacement of Jetting Header pipes line on Frame – 1, and Frame 15 side of the sliding Caisson starting from pump room to end of the jet.

- 6.3.2.7** Additional Plate fitting throughout the length of Quoin and Cills .
- 6.3.2.8** Replacement of 03 nos. 50 HP Caisson pump sets with drive Motor.
- 6.3.2.9** Supply, delivery, installation, testing & commissioning of 02 (two) Nos. electric motor driven Horizontal Centrifugal pump of 20 HP capacity along with all accessories and pipe line (Suction & delivery pipe up to "A" deck) at Pump room on the 'D' deck of the Caisson for water adjustment of UST.
- 6.3.2.10** Replacement of 3" dia. Intake pipelines (4 Nos.) including all accessories (i.e. 06 Nos. 3" dia. SS Gate valve, valve-operating spindle, wheel etc.) as per existing arrangement of UST1&UST15.
- 6.3.2.11** Replacement of 3" dia. Discharge/water adjustment line (2Nos.) along with the discharge (10 HP Submersible) Pump, containing capacity of each pump 1000LPM of UST1&UST15, as per existing arrangement.
- 6.3.2.12** Replacement / new installation of LAC Discharge 3" dia. Pipeline along with two (02) numbers 10 HP submersible pump.

### **6.3.3 Work pertaining to Pipe Lines, Valve and Valve Accessories:**

- 6.3.3.1** Total replacement of all Vent Pipes, Sounding Pipes (Drg. No.-110.014), and Valve Spindle Casing Pipes. Necessary strengthening arrangement of the floor to be made by fitting additional plates for holding of flanges, clamps, gaskets etc.
- 6.3.3.2** Replacement of 09 Nos. [V54, V55, V56, V57V58, V59, V60, V61 and V62] existing 5 inches' surface drainage valves including valve seats with newer one. The Contractor shall have to supply, deliver, installation and commissioning of all 09 Nos. valves along with other accessories as per Drg. No-110.030.
- 6.3.3.3** Replacement of 09 Nos. [V54, V55, V56, V57V58, V59, V60, V61 and V62] 5 inches surface drainage valves (Drg. No.-110.079,110.075-Sheet No.-1,2&3) along with accessories like spur gear boxes (3 nos.), spindle casing pipes, valve driving wrench, valve boxes, situated on 'A' Deck, spindle, socket, jib head keys, pins, stuffing boxes, bush, gasket packing, split pins, grease packing, grommet, adaptor, spacers, casing, indicator assembly including screw and nut, collar hemp grease packing, keep plate, oil plug, key, pad pack, shaft seat, spring washers etc. by new one (valve and other accessories are to be supplied by the Contractor). Supply and delivery of all items as per relevant drawings and 100% dismantling, checking and refitting with proper alignment and sealing are to be carried out by the Contractor.
- 6.3.3.4** Replacement of 09 Nos. 10 Nos. 386 mm Valve [ V33, V43, V44, V26, V27,V48, V49, V50, V51, V52] ( as per Drg. No.-120.025,120.023,120.038) along with accessories like spur gear boxes



(3 nos.), spindle casing pipes, valve driving wrench, valve boxes, situated on 'A' Deck, spindle, socket, jib head keys, pins, stuffing boxes, bush, gasket packing, split pins, grease packing, grommet, adaptor, spacers, casing, indicator assembly including screw and nut, collar hemp grease packing, keep plate, oil plug, key, pad pack, shaft seat, spring washers etc. by new one (valve and other accessories are to be supplied by the Contractor). Supply and delivery of all items as per relevant drawings and 100% dismantling, checking and refitting with proper alignment and sealing are to be carried out by the Contractor.

- 6.3.3.5** Repairing / overhauling of 02 Nos. 386 mm Valve [V41, V18] ( as per Drg. No.-120.025,120.023,120.038) along with all accessories are to be carried out by the Contractor. The spares, which will be found / detected as defective / faulty, shall have to be provided by the Contractor and replacement of the same are to be done accordingly.
- 6.3.3.6** Replacement of 04 Nos. 386 mm Valve [ V17, V38, V25, V28, ] ( as per Drg. No.-120.025,120.023,120.038) along with accessories like spur gear boxes, spindle casing pipes, valve driving wrench, valve boxes, situated on 'A' Deck, spindle, socket, jib head keys, pins, stuffing boxes, bush, gasket packing, split pins, grease packing, grommet, adaptor, spacers, casing, indicator assembly including screw and nut, collar hemp grease packing, keep plate, oil plug, key, pad pack, shaft seat, spring washers etc. by new one (valve and other accessories are to be supplied by the Contractor). Supply and delivery of all items as per relevant drawings and 100% dismantling, checking and refitting with proper alignment and sealing are to be carried out by the Contractor.
- 6.3.3.7** Repairing / overhauling of 03 Nos. 386 mm Valve [V42, V46, V47,] ( as per Drg. No.-120.025,120.023,120.038) along with all accessories are to be carried out by the Contractor. The spares, which will be found / detected as defective / faulty, shall have to be provided by the Contractor and replacement of the same are to be done accordingly.
- 6.3.3.8** Replacement of 10 Nos. 450 mm Valve [ V1, V3, V5, V7, V16,V20, V24, V22, V29,V38 ] ( as per Drg. No.-120.025,120.023,120.038 , 120.39) along with accessories like spur gear boxes, spindle casing pipes, valve driving wrench, valve boxes, situated on 'A' Deck, spindle, socket, jib head keys, pins, stuffing boxes, bush, gasket packing, split pins, grease packing, grommet, adaptor, spacers, casing, indicator assembly including screw and nut, collar hemp grease packing, keep plate, oil plug, key, pad pack, shaft seat, spring washers etc. by new one (valve and other accessories are to be supplied by the Contractor). Supply and delivery of all items as per relevant drawings and 100% dismantling, checking and refitting with proper alignment and sealing are to be carried out by the Contractor.

- 6.3.3.9** Repairing / overhauling of 04 Nos. 450 mm Valve [V40, V36, V14,V31] ( as per Drg. No.-120.025,120.039) along with all accessories are to be carried out by the Contractor. The spares, which will be found / detected as defective / faulty, shall have to be provided by the Contractor and replacement of the same are to be done accordingly.
- 6.3.3.10** Replacement of 10 Nos. 450 mm Valve [ V2, V4, V6, V8, V13,V30, V32, V35, V23,V21 ] ( as per Drg. No.-120.025,120.023,120.038 , 120.39) along with accessories like spur gear boxes, spindle casing pipes, valve driving wrench, valve boxes, situated on 'A' Deck, spindle, socket, jib head keys, pins, stuffing boxes, bush, gasket packing, split pins, grease packing, grommet, adaptor, spacers, casing, indicator assembly including screw and nut, collar hemp grease packing, keep plate, oil plug, key, pad pack, shaft seat, spring washers etc. by new one (valve and other accessories are to be supplied by the Contractor). Supply and delivery of all items as per relevant drawings and 100% dismantling, checking and refitting with proper alignment and sealing are to be carried out by the Contractor.
- 6.3.3.11** Replacement of 06 Nos. 3" dia, SS Gate Valve along with all accessories by new one (valve and other accessories are to be supplied by the Contractor).
- 6.3.3.12** Repairing / overhauling of 04 Nos. 450 mm Valve [V39, V37, V15,V19] ( as per Drg. No.-120.025,120.039) along with all accessories are to be carried out by the Contractor. The spares, which will be found / detected as defective / faulty, shall have to be provided by the Contractor and replacement of the same are to be done accordingly.
- 6.3.3.13** Servicing of different sizes (viz. 450-mm. 386 mm. 150 mm and 14 inch) and Non-Return Valves (386 mm). Supply of all required materials shall be under the scope of Contractor. If any valve is required to be replaced by new valve, the same has to be done by the Contractor. All pipes etc. are to be provided by the Contractor.
- 6.3.3.14** The following types of Gear Boxes are to be either replaced or serviced & painted as per the relevant drawings by the Contractor and the same will be finalized during job inspection for job identification after placement of LOI/LOA/Work Order :
- 4.3.3.6.1 Spur Gear Boxes:** Servicing of 11 Nos. Spur Gear Boxes by replacing all internals. If required, Gear Box Housing is also to be replaced by new Housing.
- 4.3.3.6.2 Bevel Gear Boxes (with new Gears and Pinions):** Servicing of all 10 Nos. Bevel Gear Boxes by replacing all internals including Gears and Pinions. New Gears and Pinions and all other internals are to be provided by the Contractor. If

required, Gear Box Housing is also to be replaced by new Housing.

**6.3.3.15** Replacement of valve pipes for 450 mm, 386 mm, 150mm, \*14 inch dia., 6 inch & 3" dia. valves and 30" pipe dia. for scouring line.

**6.3.3.16** Replacement of different sizes of hand wheels for operating the valves.

**6.3.3.17** Replacement of different sizes of wrench for operating the valves.

#### **6.3.4 Work pertaining to Caisson Penstocks:**

**6.3.4.1** Supply, delivery of new Pen Stock, dismantling of old/defective Pen stock, servicing/repairing the pen stock seating area, repairing/replacement the pen stock holding structure, installation of new Pen Stock, testing & commissioning – 04 Nos. ( Drg. No.- 110.024, 110.033 etc).

**6.3.4.2** Repairing/overhauling of Pen stock, replacement of defective spares [defective spares to be supplied by the Contractor] including repairing/replacement of pen stock seating area and holding attachment & commissioning – 02 Nos( Drg. No.-110.024, 110.033 etc). If required renewal/replacement of following items shall have to be carried out by the Contractor:

- a) Spindles.
- b) Extended shafts.
- c) Gunmetal square threaded Bush.
- d) Gunmetal Bush.
- e) Hydraulic Packing.
- f) Sleeves.
- g) Brass Fasteners.
- h) Seals
- i) Other allied items as per existing one.

**6.3.4.3** Replacement of Grills and holding structure for 06 Nos. Caisson penstocks.

#### **6.3.5 Work pertaining to Fender and other wooden parts and Probe Wheels:**

**6.3.5.1** Replacement of Wooden Fender at 'A', 'B' and 'C' deck level along with holding attachment at both 'V' and 'W' side including complete alignment etc.

**6.3.5.2** Replacement of End Wooden Buffer at 'A' and 'B' Deck level both V and W side of Frame 15.

**6.3.5.3** Replacement of wooden planks of the walkways (both 'W' and 'V' sides) on 'A' Deck.

**6.3.5.4** Replacement of Probe Wheel including bracket structure, pin, Gunmetal bush and Nut and Bolts.

**6.3.6 Work pertaining to replacement of entire old Base Plates & Sole plates including Holding Bolts at Caisson Gate No. 1 :**

At each side, Base Plates of Caisson Gate slide over the said sliding ways. Base Plates are the bottommost part of Caisson Gate. There are 24 nos. Base Plate at each side (i.e. total 48 nos.) of each Caisson Gate. At the bottom of Caisson Gates, at about 63 ft. below, Base Plates are bolted with Sole Plates and the Sole Plates are welded with the Skin Plates of Caisson Gates.

The contractor has to replace entire (48nos.) old and damaged Base Plates of Caisson Gate No. 1, on which Caisson Gate No. 1 is presently resting on the sliding ways at Intermediate Camber of Lock Entrance, HDC, SMP, Kolkata, with new Base Plates. For the said purpose, Caisson Gate No. 1 is required to be lifted inside the Intermediate Camber at Lock Entrance, HDC, SMP, Kolkata. Lifting, holding at elevated position & lowering of Caisson Gate No. 1, after replacement of its Base Plates, inside the Intermediate Camber at Lock Entrance, HDC, SMP, Kolkata.

**6.3.6.1 Lifting, holding at elevated position and lowering of Caisson Gate No. 1 inside the Intermediate Camber to facilitate complete replacement of Base Plates (48nos.) of Caisson Gate No. 1 :**

The Contractor has to carry out the work as per the following :

6.3.6.1.1 Mobilize all required men & materials, including all equipment, tools & tackles, transport facilities, safety gears etc. at the worksite at Lock Entrance of HDC, SMP, Kolkata.

6.3.6.1.2 After mobilising all required men & materials at the worksite at Lock Entrance of HDC, SMP, Kolkata, the Contractor has to lift the Caisson Gate No. 1 inside the intermediate camber at Lock Entrance HDC to a suitable / workable height from the top surface of sliding way of Intermediate Camber, on which the Caisson Gate No. 1 is resting at present. For the purpose of lifting of Caisson Gate No. 1, the contractor may use 20 jacking pads (10 jacking pads on each side) of the Caisson Gate and corresponding 20 jacking points (10 jacking points on each side) on the floor of Intermediate Camber. However, if felt necessary, for the purpose of lifting the contractor may use more jacks/lifting devices, without damaging the Caisson Gate No. 1.

- 6.3.6.1.3 After lifting of Caisson Gate No. 1 inside the Intermediate Camber, replacement of old/damaged base plates (24 nos. on each side. i.e. total 48 nos.) from the bottom of Caisson Gate No. 1 would be carried out by the contractor. During this period of replacement of old/damaged base plates, Caisson Gate no. 1 must have to be kept in elevated condition by the contractor, to a suitable / workable height from the top surface of sliding way of Intermediate Camber.
- 6.3.6.1.4 Thereafter Caisson Gate No. 1 would have to be lowered to rest on the sliding ways of Intermediate Camber and all the materials of the contractor including jacks/lifting devices etc. must have to be taken out from Intermediate Camber at the earliest possible from the date of completion of replacement of all old/damaged base plates.
- 6.3.6.1.5 During execution of work (i.e. lifting, holding at elevated position and lowering of Caisson Gate No. 1) the Contractor must have to deploy competent technical personnel for overall supervision, control and monitoring the entire work.
- 6.3.6.1.6 In regard to lifting of holding at elevated position and lowering of Caisson Gate No. 1 inside the Intermediate Camber to facilitate replacement of base plates, drawing nos. H. SC/G – 131, H. SC/G – 132 & H. SC/G – 670<sup>J</sup> may be referred to. However, the instant work has to be executed based on actual site conditions including actual dimensions to be taken at site. Softcopies of the above drawings are attached for ready reference.

#### **6.3.6.2 Complete replacement of Sole Plates of Caisson Gate No. 1 :**

The Contractor has to carry out this work as per the following:

- 6.3.6.2.1 Dismantling and removing of old/damaged sole plates on each side from the bottom of Caisson Gate No. 1.
- 6.3.6.2.2 The scrap materials would have to be handed over to HDC, SMP, Kolkata outside the Intermediate Camber within the Lock Entrance area.
- 6.3.6.2.3 The drawing nos. 110-073 is given only for reference purpose. The Contractor would have to carry out the entire work including manufacturing of Sole Plates as per the actual measurement to be taken from site.
- 6.3.6.2.4 All required materials including steel plates, fasteners (i.e. nuts, bolts, washers etc.), consumables etc. would have to be supplied by the contractor. The materials will be as per the drawing no. 110-073.
- 6.3.6.2.5 Newly manufactured Sole Plates, if passed through inspection(s) by HDC, SMP, Kolkata are to be fitted at the bottom most position of the Caisson Gate No. 1.
- 6.3.6.2.6 Welding to be done as per drawing no. 110-073.

**6.3.6.3 Complete replacement of Base Plates (48 nos.) of Caisson Gate No. 1 :**

The Contractor has to carryout this work as per the following:

- 6.3.6.3.1 Dismantling and removing of old/damaged base plates (24 nos. on each side. i.e. total 48 nos.) from the bottom of Caisson Gate No. 1.
- 6.3.6.3.2 The scrap materials would have to be handed over to HDC, SMP, Kolkata outside the Intermediate Camber within the Lock Entrance area.
- 6.3.6.3.3 Cleaning and antirust coating to be applied at the bottom surface of the existing Sole Plates (i.e. the plates which are welded with the Skin Plates of Caisson Gate with which Base Plates are fixed by means of bolting) including the holes, meant for fixing of Base Plates.
- 6.3.6.3.4 The drawing nos. 110-073 is given only for reference purpose. The Contractor would have to carry out the entire work including manufacturing of Base Plates as per the actual measurement to be taken from site.
- 6.3.6.3.5 All required materials including steel plates, fasteners (i.e. nuts, bolts, washers etc.), consumables etc. would have to be supplied by the contractor. The materials will be as per the drawing no. 110-073.
- 6.3.6.3.6 Newly manufactured Base Plates, if passed through inspection(s) by HDC, SMP, Kolkata are to be fitted at the bottom most position of the Caisson Gate No. 1.
- 6.3.6.3.7 Painting to be done as per drawing no. 110-073.

**6.3.7 Painting:**

**Panting to be done in accordance with Clause Nos. 7.8, 7.10 and 7.11.**

**6.3.8 Methodology:**

- 6.3.9.1 The contractor must have competent technical personnel having adequate experience in structural repairing job so that proper scaffolding is done for carrying out the said repair at a depth of 65 ft. (approx.) below the ground level.
- 6.3.9.2 The contractor must have to comply with **Clause No. 13.11 and 13.12**, for the workmen are to be engaged by them during execution of contract.
- 6.3.9.3 The contractor must have to comply with **Clause No. 13.13**, for the equipment's, tools-tackles, lifting appliances; different vehicular facilities etc. are to be engaged by them during execution of contract.

**6.3.9.4** Upon progress of work, the same to be inspected and certified in accordance with **Clause No. 13.18**.

**6.3.9.5** In case of any modification work, prior approval of "Engineer of Contract" is to be obtained by the contractor.

**6.3.9 Supply of items under the scope of HDC, SMP, Kolkata :**

Only Camber De-watering Pump (CDP) for de-watering of intermediate camber. Any other pumps, required for de-watering purpose, shall have to be arranged by the Contractor.

**6.3.10 Supply of items under the scope of the contractor:**

- i) All structural steel materials.
- ii) All types of pipe.
- iii) Steel materials other than structural steel.
- iv) Paints, thinners, primers etc.
- v) Timbers for fender.
- vi) Wooden Planks.
- vii) Guide plates.
- viii) Rubber seals & other rubber items.
- ix) Ladders.
- x) 03 Nos. 50 HP Caisson Pump with drive Motor as per Technical Specifications.
- xi) 06 Nos. New 10 HP submersible pump containing discharge capacity 1000LPM each.
- xii) 02 numbers 20 HP centrifugal pump with motors for water adjustment of UST.
- xiii) Any valve, which will be detected beyond use, during joint inspection.
- xiv) All tools and tackles required for execution of the work including hand winch, snatch blocks, slings, shackles, all type of Jacks.
- xv) All consumables including Electrodes, Nuts, Bolts, Washers, Gaskets, etc.
- xvi) 02 numbers rubber probe wheel.
- xvii) Submersible Pumps for de-watering Intermediate Camber.
- xviii) Unless otherwise specified, all other materials required for execution of work is under the scope of the contractor.

**6.3.11** All Material Handling Equipment and transportation facility of men and materials should be arranged by the contractor.

## **TECHNICAL SPECIFICATION**

- 7.1** All structural steel shall conform to IS: 2062, high tensile steel IS: 8500, Cast Iron IS: 210 and Stainless Steel IS: 6911, wherever applicable, as per the latest amendment, if any.
- 7.2** All threaded fasteners should be galvanized by hot dip process conforming to IS:1367 (Part 13).
- 7.3** Mechanical properties of all fasteners including Bolts, Screws, Studs and Nuts etc. shall conform to relevant BIS Standards.
- 7.4** All ladders shall be galvanized by hot dip process.
- 7.5** Plain washer shall conform to IS 2016.
- 7.6** Fits and tolerance shall be as per IS 919 (Part – II & I) and IS 2709.
- 7.7** All deck plates will be of thickness 12mm, 16mm and 20mm. The thickness of guide plates and removable base plate will be 50mm. *The thickness of the Sole Plate will be 25mm.*
- 7.8** All Primers, Thinners and Paints shall be supplied of following preferred makes -  
M/s. Barger, Shalimar, Asian, Jenson & Nicholson, ICI only.
- 7.9** All pipes including Vent pipes up to 150 mm nominal bore, shall conform to IS 1239 (Part – 1). All pipefitting etc. shall conform to IS 1239 (Part – 2). All such pipes including Vent pipes and all pipefitting etc. should be galvanized conforming to IS 4736.  
  
Pipe with larger OD, shall conform to IS 3589, Fe450 grade of 6.3 mm thickness. These pipes should have suitable protective outside and inside coating compatible with saline and muddy water.
- 7.10** Surface preparation (pre-treatment), Painting etc. :
- 7.10.1 Surface preparation:**  
Before painting, surface preparation is to be done as follows:
- a) Grit blasting shall be carried out for the New Fabricated Structural Steel Members, which would be utilized for replacement of old steel members / structures.
  - b) All surfaces of the Structural Steel Members, to be replaced, shall be Grit blasted and then be painted.
  - c) The Grit blasting should be done during day time and in dry weather using Grit materials of appropriate size.
  - d) The Grit blasting should be done to achieve a gray or near – white surface.



Wherever Grit blasting is not possible for any structure or surface due to lack of access etc., the same surface can be cleaned by using power tools up to Grade ST 3 of Swedish Standard SIS 05 5900 (equivalent BIS Standard IS: 9954) failing which by using hand tools (like Scraper, Wire Brush and Pig Hammer etc.) up to Grade ST 2 of Swedish Standard SIS 05 5900 (equivalent BIS Standard IS: 9954).

#### 7.10.2 Painting:

For painting, IS: 1477 (Part – 2) and IS: 14177 are to be followed. Painting to be carried out by means of air-less spray. Primer should be applied immediately after surface preparation for painting. It must be ensured that the surface is cleaned and dried before application of primer.

If primer is not applied within 02 (two) hours after preparation of surface, due to any reasons whatsoever, the same surface shall have to be prepared once again before application of primer, by adopting the same procedure (including Grit Blasting, wherever applicable) which has been followed earlier.

Areas required to be welded, **must not** be painted before completion of welding operations. Wherever welding has to be carried out after fabrication and erection at site, the shop coat of paint shall be removed thoroughly before welding and the adjoining steel surface including welding area shall have to be repainted after proper surface preparation as specified above.

Inspection and Testing to be carried out as per IS: 1477 (Part – 2).

**Primer, Intermediate and Finish Paint must be of same manufacturer.**

#### 7.10.3 Application of Primer, Intermediate and Finish Paint at different zones:

The painting for different areas is required to be carried as per the following:

- 7.10.3.1** For the **Splash zone** i.e. from top of the Caisson to 'C' Deck, excluding 'C' Deck (4000 sq. mtr. approx.). Subsequent to surface preparation following types of primer, intermediate and finish paint are to be applied.

Type	Description	DFT per Coat (in micron)	No. of Coat	Over coating interval
Primer	Inorganic zinc silicate coating. (Berger make ZINC ANODE 304 or equivalent grade, in line with Clause No. 7.8	65 – 75	One	As specified by the manufacturer
Intermediate	Polyamide cured high build	75 – 100	One	As specified by

Type	Description	DFT per Coat (in micron)	No. of Coat	Over coating interval
	epoxy with MIO and TiO <sub>2</sub> pigment. (Berger make EPILUX 4 HB MIO or equivalent grade, in line with Clause No. 7.8			the manufacturer
Finish paint	Modified Specially formulated Polyamide Cured High Build Coal Tar Epoxy. (Berger make EPILUX 64 CTE Super Black or equivalent grade, in line with Clause No. 7.8	100 – 125	Two	As specified by the manufacturer

**7.10.3.2** For the **zone fully submerged under water** i.e. from 'C' Deck to bottom of the Caisson, including 'C' Deck (7000 sq. mtr. approx.). Subsequent to surface preparation following types of primer, intermediate and finish paint are to be applied.

Type	Description	DFT per Coat (in micron)	No. of Coat	Over coating interval
Primer	Inorganic zinc silicate coating. (Berger make ZINC ANODE 304 or equivalent grade, in line with Clause No. 7.8	65 – 75	One	As specified by the manufacturer
Intermediate	Polyamide cured high build epoxy with MIO and TiO <sub>2</sub> pigment. (Berger make EPILUX 4 HB MIO or equivalent grade, in line with Clause No. 7.8	75 – 100	One	As specified by the manufacturer
Finish paint	High Build Coal Tar Epoxy cured with Amine Adduct suitably pigmented for	125 – 200	Two	As specified by the manufacturer

Type	Description	DFT per Coat (in micron)	No. of Coat	Over coating interval
	immersion.  (Berger make EPILUX 555 High Build Black CTE Special Grade or equivalent grade, in line with Clause No. 7.8			

- 7.10.4 Surfaces, which do not require painting, should be covered or otherwise protected during painting on adjacent surfaces. Immediately after painting of the machine finished, non-ferrous parts and surfaces, which do not require further, painting, should be quoted with suitable corrosion preventives.
- 7.10.5 Welding should be done as per the relevant IS specification. Welders should be certified by the competent authority like IRS, LRS, etc. the same is required to be furnished in Annexure – C.
- 7.10.6 Welding work, casting, forging, etc. shall be subjected to radiographic / ultrasonic testing as per approved Quality Assurance Plan (QAP). The reports of radiographic testing along with the film and / or the reports of ultrasonic testing are to be submitted at the time of inspection before the “Engineer of Contract” or his authorized representative. The “Engineer of Contract” has reserved the right to carry out any radiographic / ultrasonic test from any Govt. / Govt. approved Testing Laboratory, which was carried out earlier by the contractor, in such case the Test Report from Govt. / Govt. approved Testing Laboratory engaged by the “Engineer of Contract” shall govern and binding to the contractor. After completion of each work, the contractor should adopt suitable means to identify each radiographically tested joints with the concerned radiographic films and the same to be furnished before the “Engineer of Contract” after completion of pertaining work for documentation. Minimum 300 millimeters for each 1000 millimeters length of welding joints shall be radiographically tested in case the major load carrying members are made of more than one piece to make up the dimensions by welding. The “Engineer of Contract” reserves the right to test radiographically about 3% length of any other welding joints. If any of the tests shows that the welding is defective, the same should be rectified and further test shall be carried out. All such tests shall be at the contractor’s cost.
- 7.10.7 If material specification of any item/part is not identified properly, sample of raw material of existing item should be collected and tested in the Govt./Govt. Approved Test Laboratory for identification and the same will be applicable for replacement. The cost for the same will be borne by the contractor.
- 7.10.8 Timber to be supplied as per the existing size and shall be seasoned Sal Wood having moisture content 14% max. It shall be properly treated and free

from cracks, cap wood, wane, shakes, twist, wrap, dry or wet rots, live insect attacks and knots.

7.10.9 Wood and rubber seals shall be cut to suit as per the existing size. Waste generated may be taken out after completion of the work in all respects by the contractor.

7.10.10 Joints for the rubber flap should be vulcanized or layer bonded.

7.10.11 Shore hardness (Durometer) of rubber flap shall be 45 – 50A.

7.10.12 The rubber compound shall not absorb more than 10% by weight of water in a 7 days' test.

7.10.13 All quoin and cill plates will be heavy-duty cast iron, Grade – 35 (Meehanite Casting). The finished bearing faces of the cill and quoin castings shall be within 10/1000 of an inch of the vertical plane of the faces of the bottoms of each pair of quoins. The Meehanite faces of the caisson structure must be soundly matched with the sealing face of the quoins and Meehanite casings to form watertight joints in every part under all conditions of water level.

**7.10.14 Description of different Valves and allied Gearboxes of Caisson Gate:**

Description of different valves and allied gearboxes are given in Table – 1 and Table – 2.

**TABLE: 1**

**Description of Different Valves, Allied Gear Boxes and Valve Accessories**

Sl. No	Valve Identification No.	Description	Remarks	Ref. Drawing Number
		Type of Gear box fitted with		
A	Type of Valves: 5” Surface Drainage Valve. Situated ON ‘C’ Deck and operated from ‘A’ Deck.			
1	V-54, V-55, V-56	Spur Gear Box [Ref. Drg. No. - 110.077, 110.078, 110.075 (Sheet No. 1)]	--	110.030 110.036 (Sheet No. 2 of 2) 110.075 (Sheet Nos. 1, 2 & 3) 110.077 110.078 110.079
2	V-57, V-58, V-59, V-60, V-61, V-62	--	--	
B-1	Type of Valves: 450 mm Valve. Situated ON ‘E’ Deck and operated from ‘A’ Deck.			110.009 110.015
1	V-14, V-29	Spur Gear Box [Item-1 of Drg No. 110.046 Ref. Drg. No. 120.023, 110.072]	Difference in bottom stuffing box arrangement (Item – 25 of Drg. No. 110.072)	110.036 (Sheet No. 2 of 2) 110.038 110.039 110.041 110.046
2	V-16, V-31, V-20, V-36, V-40	Bevel Gear Box [Item No. 1 of 120.024,	--	110.047 (Sheet No. 2)

		Ref. Drg No. -120.038, 110.041]		110.070 (Sheet No. 1) 110.072 120.022 120.023 (Sheet No. 2) 120.024 120.025 (Sheet No. 1) 120.040
3	V-38	Bevel Gear Box [Item-1B of Drg No. 120.022. Ref. Drg. No. 120.038, 110.041]	--	
4	V-22, V-24	Bevel Gear Box [Item-1C of Drg No. 120.022. Ref. Drg. No. 120.038, 110.041]	--	
B-2	Type of Valves: 450 mm Valve. Situated BELOW 'E' Deck and operated from 'A' Deck.			
4	V-1, V-3, V-5, V-7		--	
B-3	Type of Valves: 450 mm Valve. Situated BELOW 'E' Deck and operated from 'E' Deck.			
1	<u>V-1, V-2, V-3, V-4, V-5,</u> <u>V-6, V-7, V-8</u>	--	--	
B-4	Type of Valves: 450 mm Valve. Situated ON 'E' Deck and operated locally.			
1	V-13, V-15, V-30, V-32, V-23, V-39, V-19, V-35, V-21, V-37	--	--	

Sl. No	Valve Identification No.	Description	Remarks	Ref. Drawing Number
		Type of Gear box fitted with		
C-1	Type of Valves: 386 mm Valve. Situated ON 'E' Deck and operated from 'A' Deck.			110.009 110.015 110.036 (Sheet No. 2 of 2) 110.038 110.039 110.041 110.046 110.047 (Sheet No. 2) 110.070 (Sheet No. 1) 110.072 120.022 120.023 (Sheet No. 2) 120.024 120.025 (Sheet No. 1) 120.040
1	V-41	Bevel Gear Box [Item-1A of Drg. No. 120.024 Ref. Drg. No. 120.038, 110.041]	--	
2	V-26, V-27	Spur Gear Box [Item-1A of Drg No. 110.046 Ref. Drg. No. 110.072, 120.023]	With special Stuffing Box.	
3	V-43	--	Difference in type of Universal Coupling Casing (Drg. No. 110.009)	
4	V-18, V-33	--	--	
C-2	Type of Valves: 386 mm Valve. Situated ON 'D' Deck and operated from 'A' Deck.			
1	V-50, V-51, V-52	Spur Gear Box [Item-1 of Drg No. 110.046 Ref. Drg. 110.072, 110.023]	--	
2	V-49	Spur Gear Box [Item-1 of Drg No. 110.046 Ref. Drg. 110.072, 110.023]		
3	V-48	Bevel Gear Box [Item-1A . 120.024 Ref. Drg. No. 110.041, 120.038]	--	
C-3	Type of Valve: 386 mm Valve. Situated ON 'E' Deck and operated locally.			
1	V-25, V-28, V-44, V-42, V-17, V-34	--	--	
C-4	Type of Valve: 386 mm Valve. Situated ON 'D' Deck and operated locally.			
1	V-46, V-47,	--	--	
D-1	Type of Valve: 150 mm Valve. Situated ON 'E' Deck and operated from 'A' Deck.			
1	V-9, V-12	--	--	
D-2	Type of Valve: 150 mm Valve. Situated ON 'E' Deck and operated locally.			
1	V-10, V-11	--	--	
E	Type of Valve: 14 inch Valve. Situated ON 'D' Deck and operated locally.			
1	V-63	--	--	
F	Type of Valve: 386 mm Non-Return Valve. Situated ON 'D' and 'E' Decks.			
1	V-45, V-53	--	--	
G1	Type of Valve 3" dia. Gate valve (Matl. SS 316) situated on 'C' Deck and operated from 'A' Deck			
1	04 Nos.			
G2	Type of Valve 3" dia. Gate valve (Matl. SS 316) situated on 'D' Deck & operated locally.			

**7.10.15 10 HP vertical Submersible de-watering pump :**

10 HP, 3Ph 415  $\pm$  10% V, 50 Hz AC vertical submersible de-watering pumps shall be operated upto bottom level, minimum submergence shall not be more than 200 mm complete with 30 m suitable cable.

**MOC SHALL BE AS UNDER:**

Casing: Cast Iron, IS 210:FG260 NI 2 (Minimum)

Impeller: SS 304

Shaft: ASTM A276 Gr. 410, Sleeve/Ring (Guiding elements) etc.: SS304/CF8M, Diffuser (if any): SS304/CF8M

Max. Head: 25 Minimum head-7M Discharge: 1000 LPM at 25 m head (considering specific gravity water as 1.3) Insulation Class: 'F' Class

Degree of protection: IP 68

Method of starting: Star delta Winding of the motor should be with PVC coated copper wire.

Others: Lifting lug to be provided for transportation / Shifting.

Outlet: 80 mm/6"

**7.10.16 20 HP Horizontal Centrifugal Pump :**

20 HP Horizontal Centrifugal Pump having Input voltage 415  $\pm$  10% V, Input frequency - 50 Hz AC, Maximum 25 Mtrs. head and same diameter of inlet and outlet 6" can be used for high rise pressurized water supply with all accessories.

**7.10.17 50 HP Vertical Turbine (i.e. Caisson) Pump :**

**7.10.17.1 Pump :**

- 1) Discharge outlet size: 300 mm
- 2) Speed: 1465 rpm
- 3) Capacity: 680 cubic mtrs/hrs.
- 4) Total bowl head: 11.6MWC (Meter water Column)
- 5) Bowl efficiency: 80%
- 6) Length from bottom of the strainer to the pump floor: 5400mm
- 7) Centre height of the discharge line from the pump floor level: 381 mm
- 8) Floor to motor top height: 1800mm
- 9) Liquid handle: Saline, muddy water with sand
- 10) Specific gravity: 1.02
- 11) Type of lubrication: self-water
- 12) No. of stage: 1(one)
- 13) Min submerge over bottom of bell: 760mm

- 14) Column setting length: 4 mtrs
- 15) Discharge head type: Surface
- 16) Column pipe diameter: 300mm
- 17) Strainer type: Basket
- 18) Surface discharge head: 510x305
- 19) Column assembly: 300x38

**7.10.17.2 Motor :**

- 1) Type: 3 phase squirrel cage induction vertical hollow shaft motor
- 2) KW/HP: 37KW/50HP
- 3) Supply voltage: 415
- 4) No. of pole: 4
- 5) RPM: 1470
- 6) Connection: Star delta



## **PART-B (ELECTRICAL WORK)**

### **8.0 Scope of Work :**

#### **8.1 General :**

- 8.1.1 All the materials required for the Electrical work are to be supplied as per the “Technical Specification”, specified hereinafter.
- 8.1.2 Materials required for the instant work and different specifications pertaining to the instant work should be as per latest Indian Standard (IS) [issued by Bureau of Indian Standard] / latest International Standard issued by International Electrotechnical Commission (IEC), as applicable, if not specified otherwise.
- 8.1.3 The work is to be carried out by an Electrical Contractor, holding a valid licence [issued by the competent authority (in line with The Indian Electricity Rules, 1956)] in this behalf.

The work is to be executed at site, under direct supervision of a person holding a valid certificate of competency [atleast for Underground Cable upto 1100 V] issued or recognised by the competent authority (in line with The Indian Electricity Rules, 1956).
- 8.1.4 Entire electrical work should be done in accordance with the relevant Indian Standard (IS), Indian Electricity Rules & Act and Code of Practice.
- 8.1.5 Contractor's personnel with respect to physical execution of the contract at site level:

The Contractor may authorise their personnel for the activities in connection with execution of the contract, at site level. Signature of such persons should be attested by an authorized official / representative [as indicated in GCC] of the Contractor.
- 8.1.6 The contractor should arrange, at their own cost, necessary tools, tackles, lifting machineries, scaffolding arrangement, vehicular transport, etc., as required, for execution of the entire work.
- 8.1.7 All the power & control panels required for Electrical job, shall be designed such a way so that there will be gap (not less than 7 inch) in between top portion (including canopy, if applicable) of panel and bottom portion of foot bridge and it can be lifted up (by means of manually operated Mechanical Drive) during flooding of 'A' deck at the time high-tide.
- 8.1.8 To have a clear idea about scheme & existing operation, the prospective bidder may visit at site before submission of budgetary offer.

#### **8.2 The “Scope of Work” includes following work :**

- 8.2.1 Design, manufacturing, supply, deliver, installation/fixing, testing & commissioning of PCRD Structure along with Motor, Slip Ring and Break Unit.
- 8.2.2 Supply, delivery, laying, testing & commissioning of ATC Conductor, EPR Insulated, PCP Inner & Outer Sheathed 1.1 kV Grade CRD Cable (Reeling & Unreeling Duty), confirming to IS: 9968/Part-1/1988 [with latest amendment, if any].

- 8.2.3 Supply, delivery, installation, testing & commissioning of Switch Disconnect Fuse Unit with all side enclosure type: FN 400 TPN Rated Current: 400 Amps. Volt: 660V, 3 Phase, 50 Hz along with suitable fuse for receiving 3 phase power supply at Caisson Gate via PCRD.
- 8.2.4 Design, manufacturing, supply, delivery, installation, testing & commissioning of power distribution panel with facility of suitable busbar.
- 8.2.5 Design, manufacturing, supply, delivery, installation, testing & commissioning of Motor Circuit Panel (MCC) / Pump starter Panel along with all accessories & safety protection for 50 HP Vertical Turbine (Caisson) Pump, 20 HP Horizontal Centrifugal Pump and 10 HP Submersible Pump.
- 8.2.6 Design, manufacturing, supply, delivery, testing & commissioning of local operation panel with facility for control on/off selector switch, start & stop push button and on, off, trip & overload indication.
- 8.2.7 Supply, delivery, laying, testing & commissioning of following 1.1 kV grade XLPE insulated, Aluminium Conductor, galvanized armoured cable, conforming to IS 7098 (Part-1) [with latest amendment, if any] :
  - i) 3½ C X 50 sq. mm for providing power supply from Power Distribution Panel to 3 Nos. Vertical Turbine (Caisson) Pump Panel and Vertical Turbine (Caisson) Pump Panel to Motor Junction Box. Job includes supply & delivery of Junction Box for 3 nos. Motor.
- 8.2.8 Supply, delivery, laying, testing & commissioning of following 1.1 kV grade PVC insulated and PVC sheathed round copper, ISI marked (conforming to IS- 694) [with latest amendment, if any] :
  - i) 4 C X 16 sq. mm for providing power supply from Motor Junction box to motor terminal of 3 Nos. Vertical Turbine (Caisson) Pump.
  - ii) 4 C X 10 sq. mm for Horizontal Centrifugal Pump Starters and lighting.
  - iii) 4 C X 4 sq. mm for providing power supply to SU Pump.
- 8.2.9 Supply, delivery, wiring, testing & commissioning of 6Cx1.5 sq. mm, LT 1.1 KV grade, PVC Flexible copper cable should conform to IS- 694.
- 8.2.10 Supply, delivery, installation, testing & commissioning of 40 Watt LED tube light, 250 Watt HPSV & 125 Watt HPMV fittings along with all accessories.
- 8.2.11 Supply, delivery, installation of lighting switch board (having 6 Amp Switch-6 nos. and 5 Amp Plug-1 no). [ 4 nos. on A deck + 2 nos. at LAC room + 1 no at Pressure Sump room).
- 8.2.12 Dismantling & shifting of existing electrical panels/starters/junction box/switch board/PCRD unit/luminaries/cable etc.

## **9.0 Technical specification :**

### **9.1 Power Cable Reeling Drum (PCRD) assembly :**

PCRD assembly shall have supported with all accessories viz. drum body, base frame, carbon brass holder, cable guide assembly, cable reeling drum motor, motor base plate, slip ring assembly, slip ring enclosure, control panel, brake unit etc .

Total travel : 80 Mtrs. Cable size : 5 Core [ 3C x 120 + 2C x 70 SQ.MM ], Overall diameter of the cable – 70 mm (approx.), ID (Inner dia) of drum – 84 mm and OD (Outer dia) of drum– 88 mm.

Motor : KW/HP-3.75/5, Volt-420 V, Amp. -7.35, RPM-500, 3ph, Connection - star

**9.2 ATC Conductor, EPR Insulated, PCP Inner & Outer Sheathed 1.1 kV Grade CRD Cable (Reeling & Unreeling Duty) :**

5 Core [ 3C x 120 + 2C x 70 SQ.MM ] , Voltage - 1100 V, Elastomeric Flexible CRD Cable (Reeling & Unreeling Duty), Insulation : EPR Type IE-2 to IS : 6380/84

Conductor : Material : Annealed Tinned Copper Class-5 to IS : 8130/13  
Nominal Cross Sectional Area of Power Core - 120 sq. mm  
Nominal Cross Sectional Area of Earth Core – 70 sq. mm

Inner Sheath :  
Material - PCP Type SE-3 to IS : 6380/84  
Minimum Thickness - 2.80 mm

Outer Sheath :  
Material - PCP Type SE-3 to IS : 6380/84  
Minimum Thickness – 4.50 mm

Continuous Current Rating in Air at 30 °C (Power Cores) – 346 Amps.

Short Circuit Rating of Conductor for 1 sec.(Power Cores) - 17.16 Ka

Max. Permissible Conductor Temperature for (i) Continuous Operation 30 °C & (ii) During Short Circuit 250 °C.

BIS Specification: Generally to IS: 9968/Part-1/1988

This cable is to be fitted with supplied PCRD.

**9.3 Power distribution panel :**

- 9.3.1 The power distribution panel shall be wall /walkway structure mounted type (with top canopy), IP 65 compliant and dust, damp, vermin & weather proof, fabricated from SS316 grade sheet (2 mm thick), angle & flat. It shall be provided with double shutter, handle with lock and key system. The power distribution panel shall be designed in such a way that it should be spacious for easy maintenance. The design & drawing of power distribution panel should be got approved from the Engineer-in-charge, prior to manufacture.

9.3.2 The power distribution panel shall be provided with PVC sleeved (with colour code) electrolytic grade copper tinned busbar (for 3 Phases and Neutral) of suitable size and following items :

➤ Incomer :

Front operated 400 A Switch – Disconnecter – Fuse Unit - 01 no.

➤ Distribution :

PVC sleeved (with colour code), suitable size Electrolytic grade copper tinned busbar (for 3 Phases and Neutral) :: 01 set

TPN, 125 A , 415 V, MCCB (10kA breaking capacity)-03 nos. [for Vertical Turbine (Caisson) Pump]

TPN, 63 A , 415 V, MCB (10kA breaking capacity)- 14 nos. [2 nos. for 20 HP Horizontal Centrifugal Pump, 6 nos. for 10 HP SU Pump, 2 nos. for Lighting, 1 no. for Automation , 1 nos. for Welding Purpose and 2 nos. for spares].

9.3.3 The power distribution panel should be erected on the “A” deck of walkway structure of caisson gate. Fixing arrangement shall be under the scope of the Contractor.

9.3.4 Connection of incoming and outgoing cables with the Switch – Disconnecter – Fuse Unit / MCCB /MCB shall be under the scope of the Contractor.

**9.4 Motor Circuit Panel (MCC) / Pump Starter Panel for 50 HP Vertical Turbine (Caisson) Pump, 20 HP Horizontal Centrifugal Pump and 10 HP Submersible Pump :**

Motor Circuit Panel (MCC) / Pump Starter Panel shall be outdoor type and equipped with Ammeter, Voltmeter, Indicating lamps, protection for overload, under voltage and Single phasing, Auto Manual Selector switch, Fuse unit switch, Incoming & Outgoing Terminal. Protection against Oil contamination, Dry running, High temperature, phase reversed phasing etc. All housed in sheet steel box complete with wiring.

Degree of protection: IP 55.

Float switch shall be dedicatedly provided for 10 HP SU Pump.

Motor Circuit Panel (MCC) / Pump Starter Panel shall be erected/installed on the “A” deck of walkway structure of caisson gate. Fixing arrangement shall be under the scope of the Contractor.

Connection of incoming and outgoing cables shall be under the scope of the Contractor.

**9.5 Power Cable:**

**9.5.1 1.1 kV grade , Cross Linked Polyethylene (XLPE) Power Cable :**

**The** cables should be generally compliance with IS 7098 (Part-1) [with latest amendment, if any] with following specifications:

- 9.5.1.1 Voltage grade: 1.1 kV
- 9.5.1.2 Size : 3 ½ C X 50 sq. mm
- 9.5.1.3 Conductor materials : Aluminum stranded conductor complying with IS: 8130 - 1984 with latest amendment, if any.
- 9.5.1.4 Shape : Stranded Compacted Shaped.
- 9.5.1.5 Insulation : Cross Linked Polyethylene (XLPE).
- 9.5.1.6 Armouring : Single layer, Galvanised steel flat strip
- 9.5.1.7 Inner Sheath: Wrapped / Extruded with thermoplastic materials
- 9.5.1.8 Outer Sheath: Polyvinyl Chloride (PVC),

#### **9.5.2 1.1 kV grade , PVC insulated and PVC sheathed round copper cable :**

The cables should be generally compliance with **ISI marked (conforming to IS- 694)** [with latest amendment, if any] with following specifications:

- 9.5.2.1 Voltage grade : 1.1 kV.
- 9.5.2.2 Size : 4 C X 16 sq. mm/ 4 C X 10 sq. mm / 4 C X 4 sq. mm
- 9.5.2.3 PVC insulated and PVC sheathed round copper cable
- 9.5.2.4 ISI marked (conforming to IS- 694).

#### **9.6 Control Cable :**

- 9.6.1.1 PVC Flexible copper cable.
- 9.6.1.2 Voltage grade : 1.1 kV.
- 9.6.1.3 Core : Six (6),
- 9.6.1.4 Nominal cross section area of conductor (Copper) : 1.5 sq. mm.
- 9.6.1.5 Flexible PVC insulated and PVC sheathed cable.
- 9.6.1.6 ISI marked (conforming to IS- 694).

#### **9.7 Laying of 1.1 kV grade, XLPE Cable**

Laying of cables is to be executed by a Cable Jointer [holding a valid permit for 1.1 kV grade cable laying and jointing, issued or recognised by the competent authority (in line with The Indian Electricity Rules, 1956)], under direct supervision of the Contractor's Engineer(s) / Supervisor(s) [holding a valid certificate of competency for (atleast for Underground Cable upto 1100 V), issued or recognised by the competent authority (in line with The Indian Electricity Rules, 1956)].

Cable shall be laid on existing trench/supporting structure and necessary support & clamping arrangement shall be under the scope of Contractor. Before laying, cable schedule for Electrical work shall be prepared by Contractor and get approved by the Engineer of HDC.

All cables will be identified close to their termination points by Cable Number / Equipment Number, which will be punched on Aluminium Straps (approx. 2 mm thick) securely fastened to the cable and wrapped around it. Type and size of the cable also to be punched on the Aluminium Straps.

#### **9.8 List of Preferred Manufacturers /Makes :**

<b>Sl. No.</b>	<b>Items</b>	<b>Name of the Manufactures</b>
i)	Switch – Disconnect – Fuse Unit /MCCB/MCB	L&T / LEGRAND / SIEMENS / SCHNEIDER / ABB
ii)	L T Cable (XLPE)	UNISTAR/ FINOLEX / HAVELLS/ RPG/ APAR INDUSTRIES/ POLYCAB/ KEI / TORRENT
iii)	PVC insulated (1.1 kV grade) single / multi-core copper flexible conductor.	
iv)	Luminaire	PHILIPS / WIPRO / BAJAJ / CROMPTON/GE

Bidders shall submit makers list for all items during submission of Techno-Commercial bid. In case bidders fails to submit the list, it would be presumed that the bidder would strictly adhere to the preferred makes as indicated in the tender.

After placement of LOA, successful bidder shall be required to comply the following during engineering stage of the project:-

Any new make, other than preferred make mentioned in the tender, may be accepted by the engineer, if the same meets the following criteria:-

- Shall meet technical specification of the tender.
- Shall be from OEM [original equipment manufacturer].
- Shall submit at least 3 Nos. Work order and performance certificate from Central Govt./ State Govt./ PSU/other reputed organisation for offered equipment.
- Shall have valid type test certificates for the offered equipment from CPRI /ERDA /ERTL /Gov. Labs.

In case, the new make offered by the bidder does not meets above mentioned criteria, the bidder should be required to adhere to the preferred make list of the tender.

## **PART-C (AUTOMATION WORK)**

### **10.0 Scope of Work :**

#### **10.1 General :**

- 10.1.1 All the materials required for the Automation work are to be supplied as per the "Technical Specification", specified hereinafter.
- 10.1.2 Materials required for the instant work and different specifications pertaining to the instant work should be as per latest Indian Standard (IS) [issued by Bureau of Indian Standard] / latest International Standard issued by International Electrotechnical Commission (IEC), as applicable, if not specified otherwise.
- 10.1.3 Entire electrical work should be done in accordance with the relevant Indian Standard (IS), Indian Electricity Rules & Act and Code of Practice.
- 10.1.4 The contractor should arrange, at their own cost, necessary tools, tackles, lifting machineries, scaffolding arrangement, vehicular transport, etc., as required, for execution of the entire work.
- 10.1.5 All the power & control panels required for Electrical job, shall be designed such a way so that there will gap (not less than 7 inch) in between top portion (including canopy, if applicable) of panel and bottom portion of foot bridge and it can be lifted up (by means of manually operated Mechanical Drive) during flooding of 'A' deck at the time high-tide.
- 10.1.6 To have a clear idea about scheme & existing operation, the prospective bidders are requested to visit at site before submission of budgetary offer.

#### **10.2 The "Scope of Work" includes following work :**

- 10.2.1 Supply, installation, testing and commissioning of Motorised Actuator for UST Tank Intake Line of Intermediate Caisson Gate.
- 10.2.2 Supply, installation, testing and commissioning of Insertion type level transmitter for Tanks of Intermediate Caisson Gate.
- 10.2.3 Supply, installation, testing & commissioning of seal detection sensor for "W" & "V" side of Intermediate Caisson gate.
- 10.2.4 Design, manufacturing, fabricate, supply, installation, testing & commissioning of Automatic Ladder including motor & gear box arrangement and VFD Panel of Intermediate Caisson Gate.
- 10.2.5 Supply, installation, testing & commissioning of Wireless Antenna & Communication Device for communication in between filled instruments/devices & PLC of Intermediate Caisson.
- 10.2.6 Design, manufacturing, fabricate, supply, wiring, installation, testing & commissioning of Motor Relay Junction Box to convert 110V to 24V for field instruments/devices of Intermediate Caisson gate.

- 10.2.7 Design, manufacturing, fabricate, supply, wiring, installation, testing & commissioning of Input Outer (IO) control panel of Intermediate Caisson Gate, as per "Technical Specification & Scope of Work". Job includes supply of required DI, DO, AI & AO Module and Relay (Schneider Make).
- 10.2.8 Design, manufacturing, fabricate, supply, wiring, installation, testing & commissioning of power distribution panel for Automation work of Intermediate Caisson Gate.
- 10.2.9 Supply, laying, testing & commissioning of 4Cx6 sq. mm, LT 1.1 KV grade, Copper Armoured Cable should conform to IS:7098 (Part-I) with latest amendment, if any for providing power supply to filled instruments/devices to be installed at Caisson Gate.
- 10.2.10 Supply, wiring, testing & commissioning of 3Cx1.5 sq. mm, LT 1.1 KV grade, PVC Flexible copper cable should conform to IS- 694 for providing control supply.
- 10.2.11 Supply, wiring, testing & commissioning of all special cables (Ethernet cables, communication cable) required for Automation Work of Intermediate Caisson.
- 10.2.12 Necessary suitable mechanical & electrical arrangement including cable laying through trench, if required, shall be under the scope of successful contractor to complete the Automation job in all respect.

## **11.0 Technical Specification :**

### **11.1 Motorised Actuator :**

Motorised Actuator shall have high stall torque to operate and seat the valve. 3 Phase squirrel cage induction motor, high torque low inertia as per IS 325 (pertaining to IS 9334). Pull out torque available at speed (50-70% of synchronous) which allows the motor to reach full speed with maximum available torque before the drive is applied to the valve, ensuring unseating in all condition except jammed valves.

Embedded thermostats in all winding for protection.

Class F insulation.

S2-15 min. duty at average load.

Actuator shall filled with premium quality oil, suitable & tested for life.

Enclosure- IP 68 rating.

Motorised Actuator shall have remote & local operation facility.

### **11.2 Insertion Type Level transmitter :**

#### **Technical Specifications :**

SI No	General Specification	
1	Measuring ranges	+0.1 ... +60 bar/+10 ... +6000 kPa, Minimum 0...+2.5 bar (0...+250 kPa)
		(+1.45 ... +870.2 psig)
2	Deviation characteristics in	0.10%



3	Process fitting	Straining clamp, threaded fitting unassembled from G1 (ISO 228-1) or from 1 NPT, thread G1½ (ISO 228-1) or from 1½ NPT on the housing
4	Process temperature	-20 ... +80 °C (-4 ... +176 °F)
5	Ambient, storage and transport temperature	-40 ... +80 °C (-40 ... +176 °F)
6	Operating voltage	8 ... 35 V DC
7	Material of Construction	PVDF/Duplex(1.4462)
8	Suspension Cable	Suspension cable PUR / -20...+80°C
9	Cable Length	30 Mtr (Minimum)
10	Process seal	Single / FKM (VP2/A)
11	Electronics	Two-wire 4 ... 20 mA/HART + Four-wire PT100

### 11.3 Seal Detection Sensor :

#### Technical Specifications:

1	Switching function	Normally open (NO)
2	Output type	Two-wire
3	Rated operating distance	10 mm
4	Installation	flush
5	Output polarity	DC
6	Assured operating distance	0 8.1 mm
7	Actual operating distance	9 ... 11 mm typ.
8	Operating voltage	5 ... 60 V
9	Switching frequency	0 ... 150 Hz
10	Hysteresis	1 ... 10 typ. 5 %
11	Reverse polarity protection	reverse polarity tolerant
12	Short-circuit protection	pulsing
13	Voltage drop	≤ 5 V

14	Operating current	2 ... 100 mA
15	Lowest operating current	2 mA
16	Off-state current	0 0.5 mA typ.
17	Time delay before availability	≤
18	Switching state indicator	all direction LED, yellow
19	Connection type	cable PVC , 2 m
20	Core cross-section	0.34 sq. mm
21	Housing material	brass, nickel-plated
22	Sensing face	PBT
23	Degree of protection	IP67

#### **11.4 Automatic Ladder system:**

##### **11.4.1 System Overview :**

02 nos. ladder are to be installed at Intermediate gate (one at F1 side & another at F15 side). The contractor has to make suitable arrangement so that ladder shall be placed on footbridge/concrete automatically at both working [F1] & non-working zone [F15] of each gate after closing of caisson gate. Before opening of caisson gates, the ladder shall be removed from footbridge/concrete and reposition on wooden walkway automatically at both working & non-working zone of caisson gate.

##### **11.4.2 Technical Specification :**

- It shall have motor and gear box arrangement and shall be driven by VFD. All operational data have to be transmitted to existing SCADA via PLC for remote operation facility from central control station.
- It should have facility to take feedback to Automation system with 24V DC / 230V AC. It should also have siren & blinking light facility during operation.
- Horizontal / Vertical movement during travel of Gate operation.
- System should be outdoor type and corrosion free.
- It shall have provision for manual operation, in case of failure of Automation system.

Necessary suitable mechanical & electrical arrangement shall be under the scope of successful contractor to complete the job in all respect.

#### **11.5 Wireless Antenna & Communication Device :**

### Technical Specifications:

1	Frequency band	2.412 GHz to 2.462 GHz (FCC)			
2	(Varies by country)	2.412 GHz to 2.472 GHz (ETSI/NTRA)			
		5.150 GHz to 5.250 GHz (FCC/ETSI/NTRA)			
		5.260 GHz to 5.350 GHz (NTRA)*			
		5.260 GHz to 5.580 GHz (FCC/ETSI)*			
		5.660 GHz to 5.700 GHz (FCC/ETSI)*			
		5.725 GHz to 5.850 GHz (FCC/ETSI Series C only)			
		* DFS channels with RADAR detection			
3	Wireless standards	802.11n, 802.11a, 802.11g,			
		802.11h (DFS), 802.11i (Security), 802.11e (QoS)			
		802.112Q (VLAN), 802.113af (PoE), IGMPv2			
4	Transmit power (Programmable)	22 dBm @ MCS0, MCS8 (802.11an/gn)			
	*Subject to regional regulatory limits	17 dBm @ MCS7, MCS15 (802.11an/gn)			
		22 dBm @ 6 Mbps (802.11a/g)			
		17 dBm @ 54 Mbps (802.11a/g)			
		*Max power in NTRA model is 20 dBm in both 2.4 GHz and 5 GHz			
5	Antenna Impact:	3 Antennas/MIMO: Use values above			
		2 Antennas: Subtract 2 dB from values above			
		1 Antenna: Subtract 5 dB from values above			
6	Channel data rates 802.11n	MCS0 through MCS15,			

		1 Channel or 2 Channels with 1 Stream or 2 Streams			
		1 Channel	2 Channels	Rate	Streams
		6.5 Mbps	13.5 Mbps	MCS0	1 Stream
		65 Mbps	150 Mbps	MCS7	
		13 Mbps	27 Mbps	MCS8	2 Streams
		130 Mbps	300 Mbps	MCS15	
		802.11b	11, 5.5, 2, 1 Mbps		
		802.11a/g	54, 48, 36, 24, 18, 12, 11, 9, 6, 5.5, 2, 1 Mbps		
7	Receiver sensitivity (Typical)	-92 dBm @ MCS0, MCS8 (802.11an/gn)			
		-70 dBm @ MCS7, MCS15 (802.11an)			
		-74 dBm @ MCS7, MCS15 (802.11gn)			
		-92 dBm @ 6 Mbps (802.11an/gn)			
		-74 dBm @ 54 Mbps (802.11a)			
		-78 dBm @ 54 Mbps (802.11g)			
8	Security	WPA2 Personal/Enterprise – 802.11i AES			
		WPA2 Personal – 802.11i AES w/ Passphrase			
		Legacy WPA TKIP, WEP support			
		MAC ID filter			
	<b>Physical</b>				
9	Enclosure	Extruded aluminum with DIN rail mount			
10	Shock	IEC 60068 2-27 (20G, 3-Axis)			
11	Vibration	IEC 60068 2-6 (5G, 10 to 150 Hz)			
12	Ethernet Port	(1) 10/100/1000 Base-T connector, shielded RJ45			
		IEEE 802.3, 802.3u, 802.3x			
13	Antenna Port	(3) RP-SMA connectors			

	Environmental				
14	Operating Temperature	-40°F to +167°F (-40°C to +75°C)			
15	Humidity	Up to 100% RH, with no condensation			
16	External Power	10 to 24 VDC			
17	PoE Injector	802.3af PoE Powered Device			

### 11.6 Input Outer (IO) control panel :

IO control panel shall be wall mounted type (with top canopy), IP 65 compliant and dust, damp, vermin & weather proof, fabricated from SS316 grade sheet (2 mm thick), angle & flat. It shall be provided with double shutter, handle with lock and key system. The power distribution panel shall be designed in such a way that it should be spacious for easy maintenance. The design & drawing of power distribution panel should be got approved from the Engineer-in-charge, prior to manufacture.

IO control panel shall be provided with 24 V incomer and required DI, DO, AI & AO Module and Relay (Schneider Make) for Automation system.

### 11.7 Power distribution panel for Automation system :

11.7.1 The power distribution panel shall be wall mounted type (with top canopy), IP 65 compliant and dust, damp, vermin & weather proof, fabricated from SS316 grade sheet (2 mm thick), angle & flat. It shall be provided with double shutter, handle with lock and key system. The power distribution panel shall be designed in such a way that it should be spacious for easy maintenance. The design & drawing of power distribution panel should be got approved from the Engineer-in-charge, prior to manufacture.

11.7.2 The power distribution panel shall be provided with PVC sleeved (with colour code) electrolytic grade copper tinned busbar (for 3 Phases and Neutral) of suitable size and following items :

- Incomer : TPN, 63A, MCB (10kA breaking capacity) – 1 No.
- Distribution :  
PVC sleeved (with colour code), suitable size Electrolytic grade copper tinned busbar (for 3 Phases and Neutral) :: 01 set

TPN, 10A, MCB (10kA breaking capacity) : 2 Nos. for Ladder.

TPN, 6A, MCB (10kA breaking capacity) : 5 Nos. (including 1 spare)

SP, 6A, MCB (10kA breaking capacity) : 1 No.

11.7.3 The power distribution panel should be erected / installed on the “A” deck of walkway structure of caisson gate. Fixing arrangement shall be under the scope of the Contractor.

11.7.4 Connection of incoming and outgoing cables with the MCB shall be under the scope of the Contractor.

**11.8 1.1 kV grade , Power Cable :**

The cables should be generally compliance with IS 7098 (Part-1) [with latest amendment, if any] with following specifications :

11.8.1 Voltage grade: 1.1 kV

11.8.2 Core : 4 (four)

11.8.3 Nominal cross section area of conductor: 6 sq. mm.

11.8.4 Conductor materials : Copper

11.8.5 Shape : Stranded Compacted Shaped.

11.8.6 PVC insulated and PVC sheathed cable.

11.8.7 Armouring : Single layer, Galvanised steel flat strip

Make—HAVELLS/FINOLEX/GLOSTER/UNISTAR/RPG/APAR INDUSTRIES (UNIFLEX) /POLYCAB.

**11.9 Control Cable :**

11.9.1 PVC Flexible copper cable.

11.9.2 Voltage grade : 1.1 kV.

11.9.3 Core : 3 (three).

11.9.4 Nominal cross section are of conductor (Copper) : 1.5 sq. mm.

11.9.5 Flexible PVC insulated and PVC sheathed cable.

11.9.6 ISI marked (conforming to IS- 694).

Make—HAVELLS/FINOLEX/GLOSTER/UNISTAR/RPG/APAR INDUSTRIES (UNIFLEX)/POLYCAB.

**11.10 Laying of 1.1 kV grade, XLPE Cable**

Laying of cables is to be executed by a Cable Jinter [holding a valid permit for 1.1 kV grade cable laying and jointing, issued or recognised by the competent authority (in line with The Indian Electricity Rules, 1956)], under direct supervision of the Contractor's Engineer(s) / Supervisor(s) [holding a valid certificate of competency for (atleast for Underground Cable upto 1100 V), issued or recognised by the competent authority (in line with The Indian Electricity Rules, 1956)].

Cable shall be laid existing trench/supporting structure and necessary support & clamping arrangement shall be under the scope of Contractor. Before laying, cable schedule for Electrical work shall be prepared by Contractor and get approved by the Engineer of HDC. All cables will be identified close to their termination points by Cable Number / Equipment Number, which will be punched on Aluminium Straps (approx. 2 mm thick) securely fastened to the cable and wrapped around it. Type and size of the cable also to be punched on the Aluminium Straps.

**Part-D (Removing and repositioning of one set (6 units) of camber stoplog and Interchanging of repaired Caisson Gate No. 1 with Inner)**

**12.0 SCOPE OF WORK**

**12.1 The contractor has to carry out the work with their resources as per the following :**

- 12.1.1 Placement of suitable floating crane at Barrel side for removing of one set (6 units) of camber stoplog. Suitable floating crane shall have to be arranged by contractor at their cost and risk.
- 12.1.2 Removing of foot bridge of Intermediate Camber.
- 12.1.3 Removing of one set (6 units) of camber stoplog (having a varying weight from 13T to 19T) one after another. If required, hydraulic jack as well as hose shall have to be arranged by the Contractor at their cost and risk.
- 12.1.4 Laying & winding up of steel wire rope (in haul & out haul) on Intermediate winches.
- 12.1.5 Closing of repaired Caisson Gate No. 1 with the help of HDC's existing electro hydraulic system.
- 12.1.6 Dismantling of probe wheel structure and draw bar of repaired Caisson Gate No. 1.
- 12.1.7 Disconnection of main power cable from repaired Caisson Gate No. 1.
- 12.1.8 Providing of temporary power supply to repaired Caisson Gate No. 1. Suitable power cable shall be arranged by HDC.
- 12.1.9 Floating of repaired Caisson Gate No. 1.
- 12.1.10 Shifting & parking of repaired Caisson Gate No. 1. Necessary support for shifting such as Tug / Mooring Boat shall be provided by HDC.
- 12.1.11 Removing of Inner footbridge and CRD Structure from Inner Camber.
- 12.1.12 Dismantling of probe wheel (along with structure) and draw bar from Inner Caisson.
- 12.1.13 Disconnection of main power cable from Inner Caisson.
- 12.1.14 Providing of temporary power supply to Inner Caisson. Suitable power cable shall be arranged by HDC.
- 12.1.15 Floating of Inner Caisson.
- 12.1.16 Shifting & parking of Inner Caisson. Necessary support for shifting such as Tug / Mooring Boat shall be provided by HDC.
- 12.1.17 Shifting of repaired Caisson Gate No.1 to Inner and angling in into Inner groove.
- 12.1.18 Sinking of repaired Caisson Gate No.1 on cill.
- 12.1.19 Repositioning of Inner footbridge and CRD Structure at Inner Camber.
- 12.1.20 Refitting of probe wheel (along with structure) and draw bar at Caisson Gate, placed into Inner groove.
- 12.1.21 Providing power supply to Caisson Gate, placed into Inner groove.
- 12.1.22 Readiness of Caisson Gate for opening operation.
- 12.1.23 Shifting of old Inner Caisson Gate to Intermediate groove for Angling in.
- 12.1.24 Sinking into Intermediate sliding way.
- 12.1.25 Laying & winding up of steel wire rope (in haul & out haul) on Intermediate winches.

- 12.1.26 Repositioning of draw bar at old Inner Caisson Gate.
- 12.1.27 Providing power supply to old Inner Caisson Gate for opening operation and putting into Intermediate Camber.
- 12.1.28 Repositioning of one set (6 units) of camber stoplog one after another at Intermediate Camber with the help of floating crane.
- 12.1.29 Unwinding of wire ropes from cross head winch drum of Intermediate Caisson. Winding up the wire ropes after cleaned & dressed by suitable lubricants.

**12.2 The job also includes the following:**

- 12.2.1 Watching of draft continuously and accordingly, operation of submersible pump for adjustment of preponderance of caisson Gates at parking location.
- 12.2.2 Troubleshooting of electrical panel & SU pump starter fault.
- 12.2.3 Thorough servicing / repairing of existing hand winch, required for the subject job. Replacement of wire rope of existing hand winch.
- 12.2.4 Underwater checking & inspection, as & when required for smooth execution of subject job. However, as per request of the Contractor, Port Diving Unit of HDC may carry out the said work, on chargeable basis.

**12.3 Special Note :**

The following shall be strictly adhered by the Contractor for smooth execution of job :

- 12.3.1 During angling out & angling in of the Gate winching operation is to be done very cautiously and as per the instruction of the Head/Master of the operation only.
- 12.3.2 It is the responsibility & accountability to deploy a dedicated trained rigging group for winch operation to avoid confusion amongst the working group and mal operation which may lead to an accident.

**12.4 Scope of HDC :**

- 12.4.1 Existing hand winch.

However, requirement w.r.t. above shall have to be intimated to HDC by the Contractor well in advance in writing.

- 13.0 Integration with existing Mechanical / Electrical / Instrumentation / Automation system of HDC and successful & satisfactory operation of the Caisson Gate, duly repaired, at Inner position shall be under the scope of the Contractor.



## **SPECIAL CONDITIONS OF CONTRACT**

### **13.1 Definition and Interpretation :**

For definitions of different words used in this tender document, SMP, Kolkata's General Conditions of Contract, 1993 are to be followed.

### **13.2 Assignment and Sub-Contracting :**

**13.2.1** The contractor shall not sub-contract the whole work directly or indirectly, transfer or assign or sublet the contract or any part thereof, without written permission from HDC, SMP, Kolkata.

**13.2.2** Such permission, if any, shall not relieve the contractor from any liability or obligations under the contract. Even if such permission be granted, the contractor shall remain responsible,

- (a) for the acts, defaults and neglect of any sub-contractor, his agents, servants or workmen as fully as if these were the acts, defaults or neglects of the contractor himself or his agents, servants or workmen, and
- (b) for his full and entire responsibility of the contract and for active superintendence of the works by him despite being sublet.

**Provided that** the Contractor shall not be required to obtain such permission for:-

- i) the provision of labour engaged on piecework basis / daily rate basis.
- ii) the purchase of materials which are in accordance with the standards specified in the contract , or
- iii) the subcontracting of any part of the works for which the subcontractor is named in the contract

**13.2.3** In the event of the Contractor contravening this condition, HDC, SMP, Kolkata. shall be entitled to terminate the contract forthwith and award a fresh contract to some other parties at risk and cost of the Contractor, who shall be liable for any loss or damage, which HDC, SMP, Kolkata may sustain in consequence to arising out of such replacement of the Contractor.

**13.2.4** The contractor shall not assign his right and interest in these presents nor assume a fresh partner or partners, dissolve, the partnership existing between him in reference to this contract without the written permission of HDC, SMP, Kolkata.

### **13.3 Patent Rights :**

**13.3.1** The contractor shall fully indemnify HDC, SMP, Kolkata against any action, claim or demand, costs or expenses arising from or incurred by reason of any infringement or alleged infringements of letters, patents, design, trademark or name, copyright or other protected rights in respect of any machine, plant, work,

materials or things, system or methods of using, fixing working or arrangement used for fixed or supplied by the contractor in India, or elsewhere.

**13.3.2** All payments, or otherwise shall be deemed to be included by the contractor in the prices named in the tender and shall be paid by him to whom they may be payable.

**13.3.3** In the event of any claim being made or action brought against HDC, SMP, Kolkata in respect of any such matter as aforesaid, the contractor shall be immediately notified thereof and he shall with the assistance, if he so requires of HDC, SMP, Kolkata but at the sole expense of the contractor conduct all negotiations for the settlement of the same or any litigation that may arise there from provided that the conduct of such negotiations or litigations shall be conditional upon the contractor giving to HDC, SMP, Kolkata such security as shall from time to time by reasonably required by HDC, SMP, Kolkata to recover the ascertained or agreed amount as the case may be of any compensation, damages, expenses and cost, which might be payable by the Trustees in respect of or as a result of any such negotiation or litigation.

#### **13.4 Additions and Alternations :**

**13.4.1** HDC, SMP, Kolkata shall have power and authority from time to time, and at all times to make amendments or additions or alterations or changes in the Scope of Work and Technical Specification and give such further instructions and directions as may appear necessary and proper to HDC, SMP, Kolkata for the guidance of the contractor and good & efficient execution of the works.

**13.4.2** The contractor shall receive, obey and be bound by the same according to the true intent and meaning thereof as if the same had been mentioned or referred to in the Scope of Work and Technical Specification etc.

**13.4.3** HDC, SMP, Kolkata may also vary or alter the levels or positions of any of the works contemplated by approved specification or may order any of the works contemplated thereby to be omitted, with or without substitution of any other works in lieu thereof, or may order any work or any portion of works executed or partially executed , to be removed, changed or altered, if required.

**13.4.4** HDC, SMP, Kolkata may order that other work shall be substituted in lieu thereof and any difference in the cost occasioned by any such diminution or alteration so ordered and directed shall be added to or deducted from the amount specified by the contractor and where the rates are not specified, then a suitable rate backed up by rate analysis shall be submitted by the contractor and agreed upon between the contractor and HDC, SMP, Kolkata.

In the event of disagreement, HDC, SMP, Kolkata shall fix such rates or prices as shall in their opinion, be reasonable and proper having regard to the circumstances.

#### **13.5 Extras :**

Any extra expenses incurred in connection to the works by HDC, SMP, Kolkata in the performance of the works owing to the neglect or omission on the part of the contractor in

any of the case mentioned in this contract shall be deducted from any sum due or which may thereafter become due to the contractor or from any amount lying with them or under their control or he may be called upon to pay the amount of such extra expense to such person or persons as HDC, SMP, Kolkata may appoint to receive the same and in the event of the contractor failing to make such payment, the said amount shall be recoverable from them in such manner as HDC, SMP, Kolkata may determine.

### **13.6 Use of Ground :**

For the purpose of setting up a site office to carry out the activities in connection with the contract, land as available, may be allotted to the firm by HDC, SMP, Kolkata, on chargeable basis, at applicable rate, at the nearby area of the Lock for which the firm will have to submit written application. It is emphasized that the construction of such site office, if required, shall in no way hinder any other operation inside the dock or elsewhere. On completion of works or termination of the contract, the contractor shall clear away all their tools, plants, rubbish and other materials within a fortnight and hand over vacant and peaceful possession of the same to HDC, SMP, Kolkata in a tidy and clean condition. The contractor shall be allowed to erect any temporary structures on this land for office, store, workshop etc. and make all suitable arrangement for water supply, electricity supply and sanitary arrangements for the same, at their own cost.

### **13.7 Power Supply & Water :**

#### **13.7.1 Supply of Power :**

Power supply for office, store, workshop, etc. will be on chargeable basis during the entire period of repairing/overhauling of Caisson Gate No. 1, as per applicable electricity tariff of HDC, SMP, Kolkata, which may vary time to time. For constructional /repair work in connection with the instant work electricity will be supplied free of cost. The contractor will provide cables, switch gears etc. to receive electricity from HDC's nearest electric supply source. For use of electricity, all supply regulations including Indian Electricity Rules to be abide by the contractor.

**Electricity charges** will be determined on the basis of **Chargeable Unit (kWh)** [actual **Unit (kWh)** consumed (recorded through Energy Meter) **plus 3%** on actual Unit consumed] and applicable rate of **West Bengal State Electricity Distribution Company Limited (WBSEDCL)**. Billing will be done on the basis of **Electricity charges** and overhead charges @ 19.25% [on the aforesaid **Electricity charges**] as per the notifications of **Tariff Authority of Major Ports (TAMP)**.

The **Electricity consumption charges** [based on the prevalent rates of **WBSEDCL**, as may be amended from time to time] shall have to be paid by the Contractor immediately, on receipt of the bill from the office of Finance Division, Haldia Dock Complex. All payment on this account should be updated, otherwise the pending bill amount, along with late payment surcharge, will be recovered from the Contractor's bill(s).

#### **13.7.2 Supply of water :**

Fresh Water / Drinking Water for use of the Contractor at their site office will be provided on chargeable basis by HDC, SMP, Kolkata. Necessary arrangement like flow meter, pipe & pipe fittings etc. to be arranged by the contractor.

Billing against supply of water will be done on the basis of actual consumption recorded through water meter at the rate **INR 38.65 (including overhead charges @ 19.25%) per KL of Fresh Water** [As directed by **TAMP (Tariff Authority for Major Ports)**], with **escalation @ 5% per annum**.

The **water consumption charges** [based on the prevalent rates of HDC, SMP, Kolkata, as may be amended from time to time] shall have to be paid by the Contractor immediately, on receipt of the bill from the office of the Finance Division, Haldia Dock Complex. All payment on this account should be updated, otherwise the pending bill amount, along with late payment surcharge, will be recovered from the Contractor's bill(s).

**13.7.3** No residential accommodation, transport and canteen facility can be provided by HDC.

**13.7.4** HDC's toilet can be used by the contractor.

### **13.8 Access to Site :**

The contractor shall have to abide by the rules and regulations of Haldia Dock Complex in respect of entry / exit and movement in the premises. Necessary **Gate Pass** for entering into the Dock area will be issued to the personnel of the contractor directly connected with the works on chargeable basis, as per prevailing rate of HDC, on receipt of a formal written request as per rules. The contractor will be fully responsible for any injury (whether fatal or otherwise) to himself or his representative(s), for any loss or damage of property, or for any other loss, damage, costs and expenses whatsoever caused which but for the granting of such permission would not have arisen. The Contractor will be liable to indemnify HDC, SMP, Kolkata against any loss or damage to the property of HDC, SMP, Kolkata or neighboring property, which may be caused due to any act of the contractor or his representative(s).

### **13.9 Contract Document Mutually Explanatory :**

**13.9.1** The several documents forming the contract are to be taken as mutually explanatory of one another and should anything appear in one, which is not described in the other, no advantage shall be taken of any such omission.

**13.9.2** In case, any discrepancies or inconsistencies however appear or should any misunderstandings arise as to the meaning and of the specifications or drawings or as to the dimensions or the quality of the materials or the due and proper execution of the works or as to the measurement or quality and valuation of the works executed under this contract or as extra thereupon, the same shall be explained by the Engineer or his authorised representative.

**13.9.3** The explanation of Engineer or his authorised representative shall be final and binding upon the contractor and the contractor shall execute the works according to such explanations, and without extra charge or deductions to/from the prices specified in the Bill of Quantities and do all such works and things as may be necessary for the proper completion of the work as implied by the specification and drawings, even though such work and things are not specifically shown and described therein.

### **13.10 Existing Services :**

**13.10.1** Drains, pipes, cables, overhead wires and similar services whether above or below the ground which may be encountered in the course of the works shall be saved and kept harmless from injury and/or loss or damages by the contractor at their own costs and expenses so that they continue to be in full and uninterrupted use to HDC, SMP, Kolkata.

**13.10.2** The contractor shall not store any materials or otherwise occupy any part of the site in a manner likely to hinder the operation of such services. The contractor shall at his own costs and expenses and without any delay repair and make good, to the satisfaction of the employer, any injury and/or loss or damage caused by the contractor to the same.

**13.11 Labour :**

**13.11.1** The contractor shall make their own arrangements for the engagement of all labour for doing the work at site or in respect of or in connection with the execution of work as also for the transport, housing/residential accommodation, medical treatment, feeding/canteen facility and payment thereof. Since time is the essence of this contract, adequate strength of labour force has to be deployed, so as to complete the repairing/revamping, testing and commissioning and acceptance/performance test of the Caisson Gate No.1 within the completion period as stipulated in the tender.

**13.11.2** In the event of any outbreak of illness or an epidemic nature, the contractor shall comply with and carry out such regulations, orders and requirements as may be made by the Government, or the local medical or sanitary authorities for the purpose of dealing with and overcoming the same.

**13.11.3** Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his employees and for the preservation of peace and protection of persons and property in the neighbourhood of the works against the same.

**13.11.4** Contractor shall at all times during the continuance of the contract comply fully with all existing Acts, Regulations and Byelaws including all statutory amendments and re-enactment of state or Central Government and other local authorities and any other enactments and acts that may be passed in future either by the State or the Central Government or local authority, including Indian Workmen's Compensation Act, Labour Laws and Equal Remuneration Act, 1976, Factories Act, Minimum Wages Act, The Contract Labour (Regulation & Abolition) Act, 1970; Employees' Provident Fund & Miscellaneous Provision Act, 1952; Employees' State Insurance Act, 1948; Dock Workers, (Safety, Health and Welfare) Act, 1986 etc.

**13.11.5** If as a result of contractor's failure, negligence, omission, default or non-observance of any provisions of any laws, HDC, SMP, Kolkata is called upon by any authority to pay or reimburse or required to pay or reimburse any amount, HDC, SMP, Kolkata shall be entitled to deduct the same from any moneys due or that become due to the contractor under this contract or any other contract or other wise recover from the contractor any sums, which HDC, SMP, Kolkata is required or called upon to pay or reimburse on behalf of the contractor. All

registration and statutory inspection fees in respect of his work pursuant to the contract shall be paid by the contractor.

- 13.11.6** The contractor shall pay the labourer engaged by him on the work not less than a fair wage, under the Minimum Wages Act for corresponding workforce working in Haldia, West Bengal, India.

**13.11.7 Labour Licence :**

Before commencement of the work at site (within Dock area), the Contractor shall have to apply for **Labour Licence** for the maximum number of workers proposed to be deployed for the work of **Major Repairing/revamping of Caisson Gate No. 1**. In case of maximum number of worker required for **repairing of Caisson Gate No. 1**, during **Defect Liability Period**, is matching with the existing **Labour Licence**, the contractor shall have to keep the said Licence valid for the entire contract period to provide repairing service. Otherwise, the Contractor shall have to apply for a Separate **Labour Licence** for the maximum number of workers required for **repairing of Caisson Gate No. 1**, during **Defect Liability Period**. Necessary certificate shall be issued by the Engineer against a request from the contractor.

Photocopy of the application shall have to be furnished to the Engineer. However, payment except against the supply items will be released only on furnishing the copy of the **Labour Licence** to the Engineer.

**13.11.8 Report of Accident :**

The contractor shall, **within 24-hours** of the occurrence of any accident, at or near the site or in connection with the execution of the work under the contract, report the accident to the Engineer or his representative(s) and shall make every arrangement to render all possible assistance to the victim(s) of such accident. The contractor shall also report such accident to the competent authority whenever such a report is required by law. For any accident occurred within the entire operational area covered under the contract, the contractor shall ensure prompt investigation into the matter through recording of statement of the personnel witnessing the accident. The report containing the findings along with the statements so recorded will then be forwarded by the contractor to the Engineer at the earliest. At the first instance, an "**Accident Report**" shall be prepared (in triplicate) by the concerned **Supervisor / Engineer** on duty **engaged by the Contractor** and a copy of the same to be forwarded immediately to the Engineer.

**13.11.9 Employees' Provident Fund (EPF) :**

All intending pre-qualified bidders shall have to submit the proof of registration of their establishment under the provision of **Employees' Provident Fund & Miscellaneous Provision Act, 1952** in their respective techno-commercial offer.

As per the provision of the Act, the contractor is liable for remittance of monthly subscription contribution with respect to **Employees' Provident Fund (EPF)** for the workers engaged by them, wherever applicable. The contractor shall submit the authenticated copy of the challans with respect to subscription / contribution of **Employees' Provident Fund** (against their respective Code Numbers issued by the **Employees' Provident Fund Authority**) by 7<sup>th</sup> day of every English

Calendar Month during execution of contract, along with the list of labourers for whom such deposits have been made.

**13.11.10 Employees' State Insurance (ESI) :**

All intending pre-qualified bidders shall have to submit the proof of registration of their establishment under the provision of **Employees' State Insurance Act**, in their respective techno-commercial offer. All intending pre-qualified bidders shall have to submit necessary documents along with their techno-commercial offer as to whether they are covered under ESI Act or not.

In case they are covered under ESI Act, they have to furnish the details of registration along with their techno-commercial offer, failing which their tender would be liable for cancellation.

In case they are not covered under ESI Act or exempted, they would furnish necessary documents along with an **affidavit** affirmed before a **First Class Judicial Magistrate** to that effect, such affidavit(s) will be examined by KoPT and the bidder(s) must abide the observation/recommendation of KoPT in this regard.

If the contractor is not under ESI Act, then the contractor must additionally indemnify KoPT against all damage and accident occurring to his/their labour.

If the contractor is covered under ESI Act, as per the provision of the Act the contractor is liable for remittance of monthly subscription contribution with respect to **Employees' State Insurance (ESI)** for the workers engaged by them. The contractor shall submit the authenticated copy of the challans with respect to subscription / contribution of **Employees' State Insurance** (against their respective Code Numbers issued by the **Employees' State Insurance Authorities**) by 7<sup>th</sup> day of every English Calendar Month during execution of contract, along with the list of labourers for whom such deposits have been made.

**13.11.11** Payment except against the supply items will be held up if the Up-to-Date **Employees' Provident Fund** and **Employees' State Insurance** remittance challan is not submitted in time.

**13.12 Safety Gears, etc. :**

During the execution of contract, the contractor shall have to ensure safety of all their working personnel to the fullest compliance of the provisions of **general safety rules/ regulations** including **Dock Workers, (Safety, Health and Welfare) Act, 1986 along with associated Rules & Regulations.**

The Contractor shall be solely responsible for consequences arising out of non-compliance or violation of safety rules / regulation.

The contractor shall at his own expenses and arrangement provide all required **Personal Protective Equipments (PPE)** and **Safety Gears** for all personnel and labours engaged during the execution of contract.

The contractor shall maintain **hygiene** at working area and site office, if any, at their own expenses and arrangement.

### **13.13 Plant and Equipment :**

**13.13.1** During execution of contract, the contractor shall be responsible for supply, use and maintenance of all the equipments, including Cranes, tools-tackles, lifting appliances, different vehicular transport etc. and the contractor shall ensure that those are suitable for the work and are maintained in such a manner, to ensure their efficient working. The contractor must have to comply with **Dock Workers, (Safety, Health and Welfare) Act, 1986 along with associated Rules and Regulations and other safety rules** (as applicable) in this regard.

**13.13.2** To execute the contract, the contractor shall at their own costs and expenses provide all labour, plant, haulage, transportation of plant and equipment, all materials, stores, etc. required for efficiently carrying out and completing the work to the satisfaction of Engineer. The above excludes the hand-operated winches, which will be provided by HDC.

### **13.14 Equipment / Machinery etc. to be provided by HDC, KoPT :**

HDC will provide only the hand-operated winches at free of cost. However, thorough servicing / repairing along with replacement of wire rope of hand-operated winches shall be under the scope of Contractor.

### **13.15 Shutdown Notice :**

Caisson Gate No. 1 is required to be shifted from Intermediate Camber, after successful repairing, to carry out the Performance Test, in accordance with **14.17.14**. During such movement of Caisson Gate(s) vessel movement through Lock Entrance will not be possible, for which HDC, SMP, Kolkata will arrange for shutdown at Lock Entrance. In order to enable HDC to make proper planning for Shutdown, the contractor must have to give a written intimation to HDC **positively, not less than 1 month in advance**.

### **13.16 Operation/Business of HDC, SMP, Kolkata must not be hampered :**

**13.16.1** During the continuance of the contract, the contractor has to execute the work (including repair work within the defect liability period, if any) such a manner, so that, vessel movement through Lock Entrance and/or any other business/work of HDC, SMP, Kolkata must not be hampered in any way.

**13.16.2** During the continuance of the contract (including repair work within the defect liability period, if any), in case of stopping of vessel movement through Lock Entrance and/or stopping of other business/work of HDC, SMP, Kolkata due to any activity of the contractor, the contractor will be held responsible for such hindrance, if proper notice for shutdown is not given as per **Clause 14.15**.

**13.16.3** The work shall be carried out in such a manner so as to enable the other contractors, if any, or the departmental employees to work.

**13.16.4** Should any damage be done by the contractor to any property the contractor must make good or bear the cost of making good the same without delay to the satisfaction of the Engineer of the Contract or his authorized representative.

### **13.17 Inspection and Testing :**

#### **13.17.1 Third Party Inspection Agency (TPIA) :**

HDC, SMP, Kolkata at its discretion will engage **Third Party Inspection Agency** for design appraisal, inspection and certification of entire work, where ever and



whenever is required, on behalf of HDC, SMP, Kolkata at the cost of HDC, SMP, Kolkata. Based on the approved **Quality Assurance Plan (QAP) & Field Quality Assurance Plan (FQAP)** the **Third Party Inspection Agency** will carry out stage-wise inspection and certification of quantum of executed work which includes but not limited to **inspection and testing of materials, welding, surface preparation, painting, hydraulic system, electrical system, automation system** etc. The **Third Party Inspection Agency** shall produce the necessary certificates to “**Engineer of Contract**” or his authorized representative. In such case the contractor shall have to send the inspection call letter to the “**Engineer of Contract**” with a copy to **Third Party Inspection Agency, 7 (seven) days** before of such inspection. Contractor should co-operate in all respect in TPIA’s inspection.

- 13.17.2** The contractor must afford all facilities for inspection to the “Engineer of Contract” or his authorized representative(s) or **Third Party Inspection Agency (TPIA)**, at their premises/subcontractor’s premises (as the case may be) for different parts manufactured or for bought out items, before dispatch to the site. Such inspection will be carried out within **7 (seven) days** from the date of receipt of Inspection Call from the contractor.

The “Engineer of Contract” reserves the right to waive inspection at Manufacturer’s premises (for witnessing tests) and to inspect (physically) the materials at site, after delivery, against Manufacturer’s Internal Test Certificate(s), as applicable.

For fabrication work/repairing, surface preparation, painting etc. inspection to be carried out at the worksite. The contractor will arrange for such inspections at their own cost, for which clear **7 (seven) days** time from the date of receipt of Inspection Offer (**in writing**) should be provided.

**13.17.3 Quality Assurance Plan (QAP) :**

Inspection of supplied items are to be carried out on the basis of **Quality Assurance Plan (QAP)**. The contractor shall have to submit QAP, based on the Scope of work, Technical Specification and other terms & conditions stipulated in the bidding documents, for approval by “**Engineer of Contract**” within a month from the date of placement of order, which shall be examined by the Third Party Inspection Agency before approval of the same. In this regard, any observation/recommendation of the Third Party Inspection Agency shall have to be considered. Accordingly necessary change(s)/modification(s) in the QAP shall have to be done by the contractor for final approval.

**13.17.4 Field Quality Assurance Plan (FQAP) :**

The contractor shall have to submit FQAP, based on the Scope of work, Technical Specification and other terms & conditions stipulated in the bidding documents, for approval by “**Engineer of Contract**”. The job of installation and commissioning will be inspected by the **Engineer or his authorized representative(s) or TPIA in different stages** and also after completion of the job. For this, the contractor shall have to submit a **Field Quality Assurance Plan (FQAP)**, which will be subsequently approved by the “**Engineer of Contract**” and the inspection will be carried out in accordance with the said approved FQAP.

**13.17.5** In all cases where tests are required, within the purview of QAP & FQAP, whether at the premises of the Contractor or any Sub-contractor or elsewhere, the Contractor, except where otherwise specified, shall provide free of charges such labour, materials, electricity, fuel, water, stores, apparatus and instruments, as may reasonably be demanded, to carry out sufficiently such tests and shall, at all times, facilitate the Engineer or his Representative and the Third Party Inspection Agency, to accomplish such testing.

**13.17.6** The cost of all tests and/or analyses, within the purview of QAP & FQAP, effected at the Contractor's or Sub-contractor's works and on the site, shall be borne by the Contractor. The Contractor will be called upon to pay all expenses incurred by the Employer in respect of any work found to be defective or of inferior quality, adulterated or otherwise unacceptable.

**13.17.7** If, during inspection by the **Third Party Inspection Agency [appointed by SMP, Kolkata]**, any material or test [within the purview of QAP & FQAP] fails to fulfil the contract conditions for **more than 2 (two) times, any additional amount charged by the Third Party Inspection Agency towards inspection of the same from the 3<sup>rd</sup> time onwards shall have to be borne by the Contractor**. If the Contractor fails to make such payment to the **Third Party Inspection Agency**, the same shall be deducted from the bill(s) of the Contractor and paid to the **Third Party Inspection Agency**.

**13.17.8** The **"Engineer of Contract"** or his representative shall have, at all reasonable time, access to the contractor's premises / work site and shall have the power at all reasonable time to **inspect, examine and test the materials and/or workmanship** of the work during its execution (manufacture of parts at contractor's premises / repairing of Caisson Gate at site) as well as on other premises if a part of the work is being manufactured there.

Only such work will be accepted and paid for, which the **"Engineer of Contract"** or his authorized representative may certify to be in accordance with the specification of the contract.

**13.17.9** The **"Engineer of Contract"** or his authorized representative, on giving seven days' notice in writing to the contractor, setting out any ground of objections, in respect of the work, shall be at liberty to reject all or any materials or workmanship in the subject of any of the said grounds of objection, which are not in accordance with the contract.

In case of sub-letting to other contractors or manufacturers or suppliers by the contractor, the **"Engineer of Contract"** will reserve the right as follows:

- i) that inspection and / or testing may be carried at the sub-contractor's works;  
or
- ii) that inspection may be carried out at site; or
- iii) that inspection may be waived subject to the contractor furnishing a certificate of compliance with specification by a competent authority recognized by national / international institutes.

- 13.17.10** In all cases where the tests/analysis are required, whether at the premises of the contractor or any sub-contractor or elsewhere, the contractor, except where otherwise specified, shall provide free of charges such labour, materials, electricity, fuel, water, stores, apparatus and instruments as may reasonably be demanded, to carry out sufficiently such tests and shall at all times facilitate the **“Engineer of Contract”** or his representative whether HDC officials or any Third Party Inspection Agency employed by **“Engineer of Contract”**, to accomplish such testing/ analysis.
- 13.17.11** The cost of all tests and / or analysis effected at the contractor's or sub-contractor's works and on the site shall be borne by the contractor. The cost of independent test and / or analysis, which the **“Engineer of Contract”** or his authorized representative may cause to be made and which prove satisfactory shall be borne by the contractor and also the contractor will be called upon to pay all expenses incurred by the employer in respect of any work found to be defective or of inferior quality, adulterated or otherwise unacceptable.
- 13.17.12** If any portion of work fails under the tests to fulfill the contract conditions, tests of the faulty portion shall, if required by the **“Engineer of Contract”** or by the contractor, be repeated within reasonable time upon the same terms and conditions.
- 13.17.13** If Performance Tests on completion cannot be carried out successfully by the contractor within one month after the time fixed by the contractor and if in opinion of the **“Engineer of Contract”** the tests are being unduly delayed, the **“Engineer of Contract”** may, in writing, call upon the contractor, with seven days' notice to make such tests, failing which the **“Engineer of Contract”** may proceed to make such tests himself, at the contractor's risk and expense. In the above eventuality, the employer shall nevertheless have the right of using the installations at the contractor's risk until the **Performance Test** are successfully carried out.
- 13.17.14** Notwithstanding the fact that the materials or part of Caisson Gate No. 1 or the whole Caisson Gate No. 1 has passed the inspection, the contractor is not relieved from his obligations to conform to the quality, workmanship, guaranteeing the performance, etc. as per the contract.
- 13.17.15 Custodian Certificate :**  
After inspection of materials (to be supplied and / or manufactured by the contractor) to be despatched at site. After delivery at site, the supplied materials are to be verified by HDC officials and the **Custodian Certificate** is to be issued by the contractor in this regard, for consumption of such materials in the instant work.
- 13.17.16 Grit Blasting to be done after acceptance in the inspection of fabricated items and Painting to be done after inspection of grit blasted surface.**
- 13.17.17 Performance Test :**  
After completion of repair/revamping work inside the Intermediate Camber in every respect by the contractor and passing through each and every inspection, the Caisson Gate No. 1 shall have to be interchanged by the Contractor with another Caisson Gate, presently which is being used at Inner Gate position. After

interchanging the Caisson Gates, the Performance Test of Caisson Gate No. 1 shall have to be carried out by Contractor at the Inner barrel / camber position, in actual condition with full load.

Prior to interchanging of Caisson Gates for carrying out Performance Test of Caisson Gate No. 1 at Inner barrel / camber position, Water Penetration Test of Caisson Gate No. 1 is to be carried out by the contractor for not less than 36 hours inside the Intermediate Camber.

If any defect found during such Water Penetration Test, the Contractor shall have to rectify that defect and repeat the Water Penetration Test after such necessary rectification work.

#### **13.18 Progress of Work :**

The Contractor shall have to furnish Scheme of Work including detail Bar/Gantt Chart for the entire work. After placement of order, the contractor has to intimate the “Engineer of Contract” in writing within the 1<sup>st</sup> week of each month about the progress of work, the said report should contain Bar/Gantt Chart showing actual progress of work vis-à-vis scheduled work.

#### **13.19 Completion Period :**

Completion period will be **12 months** from the date of placement of LOA/LOI/Work Order, for total execution of the work in every respect including Performance Test of Caisson Gate No. 1.

In pursuant to **Clauses Nos. 13.15 and 13.17.17** the contractor shall have to notify HDC, SMP, Kolkata for carrying out **Performance Test**. Before commencement of activity for carrying out **Performance Test** (i.e. interchanging of Caisson Gates etc.), the contractor shall have to intimate HDC, SMP, Kolkata **in writing** that, they have completed the repairing/revamping of the Caisson Gate No. 1 **in every respect**, such letter should be supported by relevant documents like stage wise Inspection Report(s) etc. After completion of successful **Performance Test**, the date of receipt of such letter of the contractor will be treated as the date of completion of the work.

If the Caisson Gate No. 1 is not passed through the **Performance Test**, in such case the actual date of completion of necessary rectification job/repairing of Caisson Gate No. 1 [duly certified by “Engineer of Contract” or his authorised representative(s)] will be treated as the date of completion work, subject to satisfactory **Performance Test**.

#### **13.20 Defect Liability Period :**

**13.20.1 Defect Liability Period'** shall mean a period, which starts from the date of completion of work (as mentioned in **Clause No. 13.19**) and will end after expiry of 24 months. During this period (including extension, if any), the Contractor must have to send competent, experienced and responsible Technical Person(s), to co-ordinate and execute all works to be attended by the contractor, within 24 hours on intimation form HDC as per contractual obligations, without any extra cost to HDC, SMP, Kolkata. In case of default, the Trustees' will be at liberty to get the repair done at the cost and risk of the contractor.

The contractor should mention the contact address nearby Kolkata / Haldia for such repairs within defect liability period.

**13.20.2** The contractor shall be responsible for making good, with all possible effort, at his expense any defect in or damage to any portion of the works, which may appear or occur within the **Defect Liability Period** (including extension, if any) and which arises either :-

- a) From any defective materials supplied by the contractor, workmanship or,
- b) From any act or omission of the contractor done or omitted during the said period.

**13.21 Defects after Taking Over :**

**13.21.1** If any such defects may appear or damage occur, the “Engineer of Contract” shall forthwith inform the contractor thereof stating in writing the nature of defect or damage. The provision of this clause shall apply to all replacements and/or renewals carried out by the contractor to rectify defects and damage as if the said replacements and renewals had been taken over on the date they were completed to the satisfaction of “Engineer of Contract”. The Defect Liability Period for this contract shall be extended by a period equal to the sum of any period after the completion of the contract, during which the Caisson Gate No. 1, can not be used, for the purposes for which they are intended, by the reason of a defect or damage. If only a portion of the Caisson Gate No. 1 is affected, the Defect Liability Period shall be extended only for that portion, provided the Caisson Gate No. 1 remains in operation fulfilling contract conditions. In neither case shall the Defect Liability Period be extended beyond 36 months from the date of completion.

**13.21.2** If any such defect or damage is not remedied within a reasonable time, HDC may proceed to do the work at the contractor's risk and expense, but without prejudice to any other rights, which HDC may have against the contractor in respect of such defects.

**13.21.3** In order to reduce the down time, in case of any breakdown occurs within the Defect Liability Period the contractor may use the required spares, from HDC, SMP, Kolkata's account on loan basis, as per availability. However, the contractor will have to replenish the same at the earliest. However non-availability of spares at HDC's store shall not be an excuse for completion of job in time.

**13.21.4** All inspection, adjustments, replacement or renewal carried out by the contractor during the period referred in this clause shall be subject to the conditions of this contract, which shall be binding on the contractor in all respects during the Defect Liability Period and its extension, if any.

**13.22 Extension of Completion Period and Liquidated Damage :**

**13.22.1 Extension of Completion Period :**

Should the quantum of **extra or additional work** of any kind or **delayed availability of the Trustees' materials** to be supplied as per contract or **Force Majeure condition** (as per **Clause No. 13.40**) cause delay in completing the work, the contractor shall apply to the “Engineer of Contract” in writing for suitable extension of completion time within 7 days from the date of occurrence of the reason and the “Engineer of Contract” shall thereupon consider the stated reasons in the manner deemed necessary and shall either reject the application or determine and allow in writing the extension period as he would deem proper for completion of the work, with or without the imposition of “**Liquidated Damage**” (**Clause No. 13.22.2** hereof) on the Contractor and his decision shall

be binding on the Contractor. If an extension of completion time is granted by the "Engineer of Contract", the "**Liquidated Damage**" (**Clause No. 13.22.2**) shall apply from its date of expiry, if the work is not completed within the extended time, unless stated otherwise in the decision communicated by the "Engineer of Contract", as aforesaid.

**13.22.2 Liquidated Damage :**

- a) If the Contractor fails to complete the work within the stipulated dates or such extension thereof as communicated by the Engineer in writing, the Contractor shall pay as compensation (Liquidated Damage) to the Trustees and not as a penalty, ½% (half percent) of the total value of work (contract price) as mentioned in the letter of acceptance of the tender/offer, for every week or part thereof the work remains unfinished. Provided always that the amount of such compensation shall not exceed 10% of the said value of work.
- b) Without prejudice to any of their legal rights, the Trustees shall have the power to recover the said amount of compensation/damage in Sub-clause (a) of this clause, from any money due or likely to become due to the Contractor. The payment or deduction of such compensation/damage shall not relieve the Contractor from his obligation to complete the work or from any of his other obligations/liabilities under the contract and in case of the Contractor's failure and at the absolute discretion of the Engineer, the work may be ordered to be completed by some other agency at the risk and expense of the Contractor, after a minimum three days notice in writing has been given to the Contractor by the Engineer or his Representative.

**13.23 Rejection of Defective Work :**

- 13.23.1** After complete repairing of Caisson Gate No. 1 at site, if the total work or any portion thereof, before being taken over, will found defective or fail to fulfill the requirements of the contract, the "Engineer of Contract" shall give notice to the contractor setting forth particulars of such defects and the contractor shall forthwith make the defective supply / plant / installation good, or alter the same to make it comply with the requirements of the contract.
- 13.23.2** If contractor fail to do so within a reasonable time, HDC, SMP, Kolkata may reject and replace the same at the cost of contractor, the whole, or any portion of the work, as the case may be, which is defective or fails to fulfill the requirements of the contract. The contractor's full and extreme liability under this clause shall be satisfied by the payment to HDC, the extra cost, if any, of such replacement delivered and erected. Such extra cost being ascertained shall be deducted from the contractor's bill.
- 13.23.3** If any supply of defective items shall have caused delay in the completion of the contract so as to give rise to a claim for damage on the part of HDC under **Clause No. 13.23** nothing contained in this clause shall interfere with or prejudice any rights of the Trustees with respect to such claim.

**13.24 Price Basis :**

- 13.24.1** The quoted price **shall be inclusive of all charges for carrying out contract work, as per specified Scope of Work, Technical specification & BoQ except GST.**
- 13.24.2** The tenderer shall fill in 'Unit Rate' and 'Amount' for the item, as described in the '**Bill of Quantities**', as per the required break-up.
- 13.24.3** The prices quoted shall be exclusive of **GST** as well as any statutory levies and/or other charges levied by any Central/State/local authorities, which shall be paid extra, at applicable rates, at the time of execution of work. As such, details thereof, as applicable, are to be furnished clearly in the offer.
- 13.24.4** The prices should be firm and no variation, except towards statutory duties, levies and taxes, shall be payable.
- 13.24.5** Any new statutory levies, taxes, duties, cess, etc. imposed by the Central/State/local authorities, by way of fresh notifications, subsequent to the issue of Work Order, shall be paid extra.

**13.25 General terms & conditions related to GST:**

- 13.25.1** Supplier to confirm that the GST amount charged in invoice is declared in its returns and payment of taxes is also made.
- 13.25.2** The Supplier agrees to comply with all applicable GST laws, including GST acts, rules, regulations, procedures, circulars & instructions hereunder applicable in India from time to time and to ensure that such compliance is done within the time prescribed under such laws. Supplier should ensure accurate transaction details, as required by GST laws, are timely uploaded in GSTN. In case there is any mismatch between the details so uploaded in GSTN by Supplier and details available with SMP, Kolkata, then payments to Supplier to the extent of GST relating to the invoice/s under mismatch may be retained from due payments till such time SMP, Kolkata is not sure that accurate tax amount is finally reflected in the GSTN to SMP, Kolkata's Account and is finally available to SMP, Kolkata in terms of GST laws and that the credit of GST so taken by SMP, Kolkata is not required to be reversed at a later date along with applicable interest.
- 13.25.3** SMP, Kolkata has the right to recover monetary loss including interest and penalty suffered by it due to any non-compliance of tax laws by the supplier. Any loss of input tax credit to SMP, Kolkata for the fault of supplier shall be recovered by SMP, Kolkata by way of adjustment in the consideration payable.
- 13.25.4** Supplementary invoices/debit note/credit note for price revisions to enable SMP, Kolkata to claim tax benefit on the same shall be issued by you for a particular year before September of the succeeding Financial Year.
- 13.25.5** The purchase order/work order shall be void, if at any point of time you are found to be a black listed dealer as per GSTN rating system and further no payment shall be entertained.

**13.26 Extra Claim :**

No claim for any detention / idle charges for labours, materials, equipments and machines organized by the contractor in connection with the work under the contract shall be payable by HDC, SMP, Kolkata to the contractor under any circumstances whatsoever.

**13.27 Modification/Alteration :**

The existing design, dimensions along with the modification suggested, should be adhered to and shall not be altered without the Prior approval of “Engineer of Contract”. Any addition during execution, if felt necessary, should be accepted subject to the approval of “Engineer of Contract”, in writing, without imposing any additional cost.

**13.28 Dewatering and slit & other dirt / debris free Intermediate Camber to facilitate job identification before commencement of work at site :**

After placement of LOA/LOI/Work Order, the Contractor shall have to take necessary action, at their cost, risk & arrangement, for dewatering and slit & other dirt / debris free Intermediate Camber to facilitate job identification. Removal and collection of deposited slit and other dirt / debris from the slit trap of Intermediate Camber shall be under the scope of contractor. This activity shall have to be completed within 2 (two) months from the date of placement of LOA/LOI/Work Order.

**13.29 Joint Inspection for Job Identification and preparation & submission of drawing :**

**13.29.1 Joint Inspection for Job Identification :**

The quantity, indicated in the price schedule (i.e. BOQ), and area / description of work, indicated in Technical Estimate, is purely tentative in nature. The same has been furnished with intention to give an idea to the prospective bidders regarding nature & quantum of work. However, the Contractor shall have to carry out and complete Joint Inspection with the representative of “Engineer of Contract” within 30 days from the date of full dewatered and slit & other dirt / debris free Intermediate Camber, in line with Clause No. 13.28, for assessing the actual quantum of work and the same has to be vetted from the “Engineer of Contract” before commencement of work at site. HDC reserve all rights to alter the same during execution at site based upon site conditions.

**13.29.2 Preparation & submission of drawing :**

The contractor should prepare detailed drawings for fabrication & replacement work. These G.A. Drawings & detailed fabrication drawings to be submitted to “Engineer of Contract”, HDC within 15 days after completion of above Joint Inspection for necessary approval. Drawings /datasheets for Electrical & Automation work are also to be submitted to “Engineer of Contract”, HDC within 15 days after completion of above Joint Inspection for necessary approval. However, this approval of the Sr. Dy. Manager (P&E) will not relieve the contractor of their responsibility in connection with execution, proper fitting of different steel and satisfactory performance of the work.

**13.30 Variation in final Quantity :**

In case of variation in quantities **Clause No. 7.0 of GCC** is to be followed. The contractor should maintain close monitoring regarding total executed quantity of the job and intimate the same from time to time to HDC, SMP, Kolkata to avoid any excess work beyond the quantity finalized after joint inspection. No additional compensation will be paid for variation in the executed quantity (up to +10%) with respect to the finalized Quantity, as mentioned in the Enquiry Document, which means that the executed excess



quantity (over and above indicated Quantity), if any, will be paid at the same accepted rates. However, no extra / additional work than the finalized quantity, after joint inspection, are to be carried out without the permission of "Engineer of Contract" or his authorized representative in writing.

**13.31 Job Certification:**

The finish weight / measurement will be finalized depending upon the weight per running meter and weight per sq. meters in case of plates as applicable as per relevant latest BIS specification. Job certification will be based on actual quantity to be executed / installed / erected at site.

**13.32 Keeping the Intermediate Camber in dewatered and silt & other dirt / debris free condition :**

It will be the responsibility and accountability of the contractor w.r.t. keeping Intermediate Camber in dewatered and silt free condition during entire period of the contract for smooth execution of repairing/revamping work within schedule completion period and extension thereof, if any, at the risk, cost and arrangements of the Contractor. The contractor must check all the Camber Stop Log units after removal of the same from the mouth of Intermediate Camber and must take necessary corrective measure (if required), at their own risk, cost and arrangement to ensure the satisfactory performance of all the Camber Stop Log units after placing the same within the camber grooves.

**13.33 Extended Stay Compensation :**

Extended Stay Compensation for delay in execution of the contract will not be paid.

**13.34 Storage of material :**

The safe storage of material shall be the responsibility of the contractor. Any kind of damage (including due to atmospheric condition), theft, pilferage etc. shall be on contractors account.

**13.35 Removal of Materials on Completion :**

The contractor shall, on completion of the works or as and when directed by the Employer, remove all plant, equipment, tools, materials, temporary constructions, etc. which may have accumulated during the execution of the work at their own cost and arrangement, other than those permanently used into the works, at employer's site.

**During execution of work any type of scrap generated inside the HDC's premises is to be returned to HDC. If some structural steel materials are required to be machined / fabricated at the contractor's / contractor's vendor(s) / sub-contractor(s) works/premises, in such case the scrap material need not be returned by the contractor to HDC, the contractor should have to quote their price accordingly.**

**13.36 Keeping the Site Clean :**

The contractor shall maintain the site such a manner so that, pollution may not be caused due stacking of any scrap/surplus materials, rubbish and offensive materials etc. and hindrance in movement of man/equipment may not be happened due to stacking of such type of materials.

**13.37 Photography inside the Dock Zone is prohibited :**

Without taking any written permission from the appropriate authority of HDC, SMP, Kolkata any kind of photography whether **still or video/movie** inside the **Dock Zone** is prohibited.

In compliance to the above, the contractor must ensure that, any photograph of the work or any part thereof or plant employed by the contractor shall not be taken either by the contractor or by any of the sub-contractor(s) employed by the contractor, without the approval of HDC, SMP, Kolkata and no such photograph shall be published or otherwise circulated in any manner without the approval of HDC, SMP, Kolkata.

The contractor will be held responsible in case of violation of this clause.

**13.38 Advertisement :**

Without the written permission of HDC, SMP, Kolkata the contractor shall not advertise in news paper and/or in electronic media and/or shall not display on any hoarding, fencing, building etc. in connection with this contract.

**13.39 Payment Terms :**

Payment to the Successful Bidder will be made stage-wise as indicated below :-

**A) PART –A (Structural and other allied Mechanical Work) :**

**1) Against structural work :**

- i) Payment for 10% amount will be made against design & drawing approval.
- ii) Payment for 80% amount will be made against supply of steel structure at site & erection of newly fabricated structure and submission of bills along with Custodian Certificate and other relevant documents like Inspection Reports, Challans, etc.
- iii) Balance 10% amount will be paid after obtaining certificates from HDC for successful Performance Test of Caisson Gate No.1 on completion of work in every respect in accordance with Scope of Work.

The finish weight / measurement will be finalized after fabrication & erection depending upon the weight per running meter of the structural steel / Sq. Mtrs. (in case of MS Plates for different thickness) as per the relevant latest IS / BIS specifications.

Payment will be made as per the Bill of Quantity and on finished weight, actually erected and duly certified by the authorized representative of the "Engineer of Contract". No payment against item sl. no. 1 (ii) & 1 (iii) will be released until the fabricated materials are erected and certified.

**2) Other allied Mechanical Work (i.e. repairing / revamping / servicing work :**

- i) Payment for 10% amount will be made against design & drawing / datasheet approval.
- ii) Payment for 60% amount will be made against supply of respective item at site and submission of bills along with Custodian Certificate and other relevant documents like Inspection Reports, Challans, etc.

- iii) Payment for 20% amount of each item will be made against installation and testing of the respective item and submission of bills along with Installation Certificate and testing certificate.
- iv) Balance 10% amount will be paid after obtaining certificates from HDC for successful Performance Test of Caisson Gate No.1 on completion of work in every respect in accordance with Scope of Work.

**B) PART –B & C (Electrical and Automation work) :**

- i) Payment for 10% amount will be made against design & drawing / datasheet approval.
- ii) Payment for 60% amount will be made against supply of respective item at site and submission of bills along with Custodian Certificate and other relevant documents like Inspection Reports, Challans, etc.
- iii) Payment for 20% amount of each item will be made against installation of the respective item and submission of bills along with Installation Certificate.
- iv) Balance 10% amount will be paid after obtaining certificates from HDC for successful Performance Test of Caisson Gate No.1 on completion of work in every respect in accordance with Scope of Work.

**C) PART –D (Removing and repositioning of one set (6 units) of camber stoplog and Interchanging of repaired Caisson Gate No. 1 with Inner) :**

Payment for 100% amount will be made against successful completion of Interchanging of Caisson and submission of bills along with completion certificate.

The payment will be made on the exact quantity to be executed by the Contractor. No project surplus materials will be retained by HDC, SMP, Kolkata.

**13.39.1 Time of Payment :**

The contractor shall have to submit unambiguous/clear **bills in triplicate** to the "Engineer of Contract" for stage-wise payments. In normal circumstances, payment of the bills, accompanied by **Inspection Certificates** and other relevant documents, duly recommended by the "Engineer of Contract", are passed within 30 days from the date of receipt of such bills, if found in order.

**13.39.2 Mode of Payment :**

Payment will be made in Indian Rupees through the banker of the contractor i.e. through ECS. During submission of bill(s), the following information must be submitted by the Contractor regarding their banker:

- (i) Savings/Current Account Number:
- (ii) Name of the Bank:
- (iii) Name of the Branch and address thereof:
- (iv) RTGS Code of the Branch

**13.39.3 Income Tax Deduction :**

Income Tax, if any, as per the relevant provision of the Income Tax Act shall be deducted at source from any payment payable to the contractor.

**13.39.4 No Interest on account of Delayed Payments :**

Any claim for interest will not be entertained by HDC with respect to any payment or balance which may be in their hands owing to any disputes between HDC and the contractor or with respect to any delay on the part of HDC in making payment.

**13.40 Force Majeure :**

In the event of either party being rendered unable by Force Majeure to perform any obligations required to be performed by them under the Contract, the relative obligation of the party affected by such Force Majeure shall upon notification to the other party be suspended for the period during which Force Majeure event lasts. The cost and loss sustained by either party shall be borne by respective parties. The term FORCE MAJEURE as employed herein shall mean acts of God, Earthquake, War, Revolt, Riot, Fire, Floods, Sabotage and Hurricane/Cyclone, Strike excluding that of Contractors' Suppliers or Sub-contractor's Employees.

Upon the occurrence of such case and upon its termination the party alleging that it has been rendered unable as aforesaid, shall notify the other party in writing immediately but not later than 48 (forty eight) hours of the alleged beginning and ending thereof giving full particulars and satisfactory evidence in support of its claim.

**13.41 Performance Guarantee :**

**13.41.1 Amount of Performance Guarantee and mode of submission :**

Within **twenty-eight (28) days** of issuance of "Letter of Acceptance (LOA)", the Contractor shall have to provide an irrevocable and unconditional Bank Guarantee, as per **Annexure-A** (draft Bank Guarantee format), towards guaranteeing the performance of the contractor in execution of work as indicated in Scope of Work of this Tender Document and guaranteeing the performance of Caisson Gate No. 1 during defect liability period, from a Nationalized Bank/Scheduled Bank in India, in the amount, **3 %** of the contract value excluding GST, in the form Banker's Cheque or by Demand Draft of a **Nationalized Bank of India** drawn in favour of 'Syama Prasad Mookerjee Port Trust, **Kolkata, Haldia Dock Complex**' and payable at **Haldia** – with Sr. Dy. Manager (Finance), HDC, SMP, Kolkata. This shall be valid for periods of 24 months beyond the date of completion (in accordance with **Clause No 13.19**) of the **Caisson Gate No. 1**, with a claim period of 3 months thereafter. In all cases, any dispute regarding Bank Guarantee will be adjudicated under the jurisdiction of Kolkata High Court.

**13.41.2 Termination of Contract and Forfeiture of EMD :**

Failure of the successful Tenderer to submit the required Bank Guarantee shall constitute sufficient grounds for termination of the contract and forfeiting the Earnest Money Deposit.

**13.41.3** In the event of extension of **Defect Liability Period** (as per **Clause No. 13.19**) the contractor shall have to revalidate the Bank Guarantee suitably to cover the extended Defect Liability Period, with a claim period of 3 months thereafter.

In the event of failure of contractor to ensure the performance of the **Caisson Gate No. 1**, during the **Defect Liability Period** (including its extension, if any) and not responded to the requirement of the situation as indicated in **Clause**

**Nos. 13.20 and 13.21** of this Document and if the employer forced to encash the Bank Guarantee to meet the situation, the contractor shall revalidate the said Performance Guarantee for the suitable period as agreed by the employer.

**13.41.4** The Bank Guarantee submitted by the contractor towards the performance of the contract and performance of the equipment during Defect Liability Period (including its extension, if any), will be returned to the contractor after successful completion of the Defect Liability Period (including its extension, if any), to the satisfaction of the employer and on making an application thereof, along with “**No Claim Certificate**” as per **HDC, SMP, Kolkata’s format** given in **Annexure-B**.

**13.41.5** **Cost of obtaining and keeping the Performance Guarantee valid to be borne by Contractor :**

The cost of obtaining this or any other Bank Guarantee and / or the revalidation thereof whenever required has to be borne by the Contractor and it shall be his sole responsibility to arrange for timely revalidation of such Bank Guarantee , failing which and for non-fulfillment of any contractual obligation by the Contractor , HDC, SMP, Kolkata shall be at liberty to raise claim / demand under the Performance Guarantee and / or enforce the same unilaterally.

No interest / charge of whatsoever in nature shall be paid by the Employer on the amount of Performance Guarantee held by the Employer, at any stage.

**13.41.6 Forfeiture of Performance Guarantee :**

The Performance Guarantee shall be liable to be forfeited at the option of the Employer, if the Contractor fails to carry out the work or to perform / observe any of the conditions of the Contract. The Employer shall be at liberty to deduct / recover any of their dues from the Performance Guarantee. All compensation or any other sums of money payable by the Contractor to the Employer under the terms of Contract may be deducted from or paid by encashment of a sufficient part of the Performance Guarantee or from any sum due or may become due to the Contractor by the Employer on any account whatsoever and in the event of his Contract Performance Guarantee being reduced by reason of any such deduction or encashment as aforesaid, the Contractor shall within fifteen days thereafter, make good the amount so reduced, in the form of Bank Guarantee in the prescribed format.

**13.42 Indemnity :**

**13.42.1** Notwithstanding that all reasonable and proper precautions may have been taken by the contractor at all times during the progress of the work, the contractor shall nevertheless be wholly responsible for all damages, whether to the works themselves or to any other property of HDC, SMP, Kolkata or to the lives, persons, property of others during the progress of the work.

**13.42.2** In case any damage occurs to the existing structure due to the contractor's operation, the same shall be made good by the contractor at his own risk and cost. The areas, which are likely to be unsafe for use, shall be barricaded and all necessary precautionary measures, like displaying notices, shall be taken by the contractor, during commissioning and testing of equipment at site.

**13.42.3 Indemnity Bond :**

In case of any material is required to be taken out side the **Dock Boundary** for repairing/servicing etc. the contractor shall have to submit an '**Indemnity Bond**' (duly notarized) as per SMP, Kolkata's format before taking over the same from HDC, SMP, Kolkata. The contractor shall have to submit such '**Indemnity Bond**' for the structural steel material which is required to be machined / fabricated at the contractor's/contractor's vendor(s)/sub-contractor(s) works/premises. All necessary legal formalities to be done by the contractor at their own cost (including the cost of Stamp Paper, Dummy Paper, etc.) and arrangement.

**13.43 Insurance of Work and Third Party Insurance :**

**13.43.1** The contractor may, so far as reasonably practicable, insure against the contractor's liability in respect of any loss or damage occurring whilst the contractor is on site for the purpose of making good a defect or carrying out the '**Performance Test**' during the defects liability period or for the purpose of completing any outstanding work and against any loss or damage arising during the defects liability period from a cause occurring prior to taking over.

**13.43.2** Before commencing the execution of work, the contractor shall insure, in the joint names of HDC and the contractor, covering **Third Party Liability ( TPL)** against **any damage or loss or injury**, which may occur during repairing/revamping and commissioning of Caisson Gate No. 1 to **any property** or to **any person / persons** (including property and employees of the employer), by or arising out of the execution of the works or temporary works in carrying out of the contract, for a value not less than **Rs. 1 Cr.**

**13.43.3** For all practical purposes, such insurance shall be from any of the Nationalized Indian Insurance Companies who had not been de-listed/debarred by any Govt. Organization/Agency in India.

Such insurance shall be effected with an insurer and as per terms to be approved by the employer and the contractor shall, from time to time, when so required by the "Engineer of Contract", produce the policy and receipts for the premium or premiums or satisfactory evidence of insurance cover. Any amount of money received against any such policy, shall be applied in or towards the replacement and repair of the Works lost, damaged or destroyed but this provision shall not affect the contractor's liabilities under the contract.

**13.44 Workmen's Compensation :**

The contractor shall indemnify HDC, SMP, Kolkata in the event of HDC, SMP, Kolkata being held liable to pay compensation for injury to any contractor's servants or workmen under the Indian Workmen's Compensation Act, 1923, as amended from time to time, and shall take out an insurance policy covering all risks under the Act and shall keep the same renewed, from time to time as necessary, for the duration of the contract and produce the same before commissioning of. Caisson Gate No. 1 to the "Engineer of Contract".

**13.45 HDC's Lien :**

HDC shall have a lien on and over all or any money that may become due and payable to the contractor under this contract or any other contract or from any amount lying with them or under their control and in respect of any debt or sum that may become due and payable by HDC to the contractor, either alone or jointly with another or other and either

under this contract or under any other contracts or transaction of any nature whatsoever HDC and the contractor.

**13.46 Employer's Entitlement to Terminate :**

**13.46.1** The Employer shall be entitled to terminate the Contract, at the Employer's convenience, at any time after giving 56 days prior notice to the Contractor, with a copy to the Employer's Representative, and returning the performance security.

**13.46.2** In the event of such termination, the Contractor shall :

- a) cease all further work, except for such work as may be necessary and instructed by the Employer's Representative for the purpose of making safe or protecting those parts of the Works already executed and any work required to leave the site in a clean and safe condition.
- b) hand over all Construction Documents, Plant and Materials for which the Contractor has received payment.
- c) hand over those other parts of the Works executed by the Contractor up to the date of termination and
- d) remove all Contractor's Equipment, which is on the Site and repatriate all his staff and labour from the site.

Any such termination shall be without prejudice to any other right of the Contractor under the Contract.

**13.46.3** In the event of such termination, the Employer's Representative shall determine the value of the work done and :

- a) The amounts payable for any work carried out for which a price is stated in the Contract;
- b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery; such Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer and the Contractor shall place the same all the Employer's disposal;
- c) any other Cost or liability, which in the circumstances was reasonably incurred by the Contractor in the expectation of completing the Works;
- d) the reasonable Cost of removal of Temporary Works and Contractor's Equipment from the site and the return of such items to the Contractor's works (or to any other destination at no greater cost) and
- e) the reasonable cost of repatriation of the Contractor's staff and labour employed wholly in connection with the Works at the date of such termination;
- f) return of HDC's plant, equipment, crane(s), machineries tools and tackles etc. which are deployed for the execution of work in good running condition and make payment accordingly.

### **13.47 Settlement of Disputes :**

#### **13.47.1 Engineer's Decision :**

If a dispute of any kind whatsoever arises between the Employer and the Contractor in connection with, or arising out of, the contract or the execution of the works, whether during the execution of the works or after their completion and whether before or after repudiation or other termination of the contract, including any dispute as to any opinion, instruction, determination certificate or valuation of the Engineer, the matter in dispute shall, in the first place, be referred in writing to the Engineer within 30 days, with a copy to the other party. Such reference shall state that it is made pursuant to this Clause. No later than the thirty days after the day on which he received such reference, the Engineer shall give notice of his decision to the Employer and the Contractor. Such decision shall state that it is made pursuant to this clause.

Unless the Contract has already been repudiated or terminated, the Contractor shall, in every case, continue to proceed with the works with all due diligence and the Contractor and the Employer shall give effect forthwith to every such decision of the Engineer unless and until the same shall be revised, as hereinafter provided, in an amicable settlement or an arbitral award.

If either the Employer or the Contractor be dissatisfied with any decision of the Engineer, or if the Engineer fails to give notice of his decision on or before the thirtieth day after the day on which he received the reference, then either the Employer or the Contractor may, on or before the seventieth day after the day on which he received notice of such decision, or on or before the seventieth day after the day on which the said period of thirty days expires, as the case may be, give notice to the other party, with a copy for information to the Engineer, of his intention to commence arbitration, as hereinafter provided, as to the matter in dispute. Such notice shall establish the entitlement of the party giving the same to commence arbitration, as hereinafter provided, as to such dispute and, subject to **Clause No. 13.47.4**, no arbitration in respect thereof may be commenced unless such notice is given.

If the Engineer has given notice of his decision as to a matter in dispute to the Employer and the Contractor and no notice of intention to commence arbitration as to such dispute has been given by either the Employer or the Contractor on or before the seventeenth day after the day on which the parties received notice as to such decision from the Engineer, the said decision shall become final and binding upon the Employer and the Contractor.

#### **13.47.2 Amicable Settlement :**

Where notice of intention to commence arbitration as to a dispute has been given in accordance with **Clause No. 13.47.1**, the parties shall attend to settle such dispute amicably before the commencement of arbitration. Provided that, unless the parties otherwise agree, arbitration may be commenced on or after the fifty-sixth day after the day on which notice of intention to commence arbitration of such dispute was given, even if no attempt at amicable settlement thereof has been made.

#### **13.47.3 Arbitration :**

Any dispute in respect of which



- a) the decision, if any, of the Engineer , has not become final and binding pursuant to **Clause No. 13.47.1** and
- b) amicable settlement has not been reached within the period stated in Clause No. 13.47.2

shall be finally settled under the Rules of Indian Arbitration and Conciliation Act, 1996 or any statutory modification or re-enactment thereof and rules made there under and for the time being in force. The Arbitration Tribunal shall be composed of three arbitrators and they will be appointed as per provision of the Act.

Neither party shall be limited in the proceedings before such arbitrators to the evidence or arguments put before the Engineer for the purpose of obtaining his said decision pursuant to **Clause No. 13.47.1** No such decision shall disqualify the Engineer from being called as a witness and giving evidence before the arbitrators on any matter whatsoever relevant to the dispute.

Arbitration may be commenced prior to or after completion of the works, provided that the obligations of the Employer, the Engineer and the Contractor shall not be altered by reason of the arbitration being conducted during the progress of the works.

**13.47.4 Failure to comply with Engineer's Decisions :**

Whether neither the Employer nor the Contractor has given notice of intention to commence arbitration of dispute within the period stated in **Clause No. 13.47.1** and the related decision has become final and binding, either party may, if the other party fails to comply with such decisions, and without prejudice to any other rights it may have, refer the failure to arbitration, in accordance with **Clause No. 13.47.3**. The provision of **Clause Nos. 13.47.1 and 13.47.2** shall not apply to any such reference.

**13.47.5 Progress of work not to be interrupted :**

The Contractor must at all the times fulfill his obligations under the Contract and shall not slow down or stop the progress of work during the period any dispute is under settlement either through reference to the Engineer or through arbitration pursuant to the last preceding clause. Even if the works to be carried out during such a period involve matters under dispute, the Contractor shall nevertheless proceed with the works as per direction of the Engineer, pending settlement of the dispute. Failure of the Contractor in this respect shall constitute default on his part and render him liable to actions under the provisions of **Clause No. 8.3 of General Conditions of Contract (GCC) of Kolkata Port Trust**.

**13.47.6 Venue of Arbitration Proceedings:**

The venue of arbitration sittings will be either Kolkata or Haldia, West Bengal , India.

**13.47.7 Fees and Expenses :**

The fees and expenses of the arbitrator and all other expenses of the arbitration shall be initially borne and paid by the respective parties subject to determination by the arbitrator. The fees of the third arbitrator, if applicable, are to be equally borne by both the parties. The arbitrator may provide in the arbitral award for the reimbursement to the prevailing party or the defending party, as the case may

be, of its cost and expenses in bringing or defending arbitration claim, including legal fees and expenses incurred by the party.

**13.48 Labour Laws :**

**13.48.1** The contractor shall comply with all the provisions of the Labour Laws and the rules and regulations made there under as amended from time to time and as applicable from time to time with regard to the employees to be deployed by the contractor for repairing/revamping, testing, commissioning of Caisson Gate No.1.

**13.48.2** The contractor shall have to furnish half-yearly return on the labours engaged by the contractor for this work in accordance with Contract Labour (Regulation & Abolition) Act, 1970.

**13.49 Outbreak of War :**

If during the continuance of the contract, there shall be an outbreak of war (whether war is declared or not) in any part of the world which, whether financially or otherwise materially affects the execution of the works, the contractor shall, unless and until the contract is terminated under the provision in this clause contained use his best endeavours to complete the execution of the works provided always that either the Employer or the Contractor shall be entitled at any time after such outbreak of war to terminate this Contract by giving notice in writing to the other and upon such notice being given this contract shall terminate but without prejudice to the rights of either party in respect of any antecedent breach.

**13.50 Applicability of Laws on the Contract :**

The contract shall be governed by all relevant Indian Acts as applicable only within the jurisdiction of the Honorable Calcutta High Court, India, including the following Acts.

- i) The Indian Contract Act, 1872.
- ii) The Major Port Trust Act, 1963.
- iii) The Workmen's Compensation Act, 1923.
- iv) The Minimum Wages Act, 1948.
- v) The Contract Labour (Regulation & Abolition) Act, 1970.
- vi) Dock Workers (Safety, Health & Welfare) Act 1987.
- vii) The Indian Arbitration Act (1940) (in the case of definite Arbitration Agreement only).
- viii) Indian Arbitration and Conciliation Act, 1996
- ix) Indian Electricity Rules, 1956 with latest amendments.
- x) Other Acts/Rules/Regulations which may be applicable to the contract during execution of the same.

**13.51 Evaluation criteria and selection of Successful Bidder :**

Evaluation with respect to Priced Bill of Quantities (BoQ) :

**13.51.1** While evaluating the Price Bid, the unit rates quoted by the Bidders against all items, including all other charges except GST, shall be considered for evaluation.

The unit rates, quoted by the Bidders, against each item will be multiplied by the respective quantity indicated in the BoQ to obtain the amount against each item.

While evaluating the Price Bids, the Price quoted by the Bidders against all items of the Price Schedule shall be taken into account and the TOTAL PRICE, which would be arrived at, by adding quoted prices of all items of the Price Schedule, will be considered for evaluation. Selection of the successful bidder will be made on the basis of the "lowest TOTAL PRICE" thus arrived.

**13.51.2** In case it is found that the quoted "TOTAL PRICE" is same for two or more bidders and their bids become the lowest, the respective bidders will be given chance to submit their fresh Price Bid, subject to the condition that the fresh rate so quoted must be less than the rate quoted by the respective bidders earlier. Selection of the successful bidder will be made on the basis of the revised "lowest TOTAL PRICE" thus obtained.

**13.51.3** The total prices will be evaluated based on price quoted at Part-A (Mechanical & Structural work), Part-B (Electrical work), Part-C (Automation Work) and Part-D (Removing and repositioning of one set (6 units) of camber stoplog and Interchanging of repaired Caisson Gate No. 1 with Inner).

**13.52 Good Conduct:**

If a bidder has had previous history of "defined misconduct" (such as banning from/ by any government sector, premature termination of a contract solely on bidder's fault, criminal case pending against the company or its owner/ current director filed by a government entity etc.), his offer is liable to be rejected.

**13.53 Other Terms and Conditions :**

Notwithstanding anything contained herein, the contract will generally be guided by the **General Conditions of Contract (GCC) of Kolkata Port Trust**, duly approved by the Board of Trustees in May, 1993, as well as the Major Port Trust Act, 1963, and subsequent amendments thereof, if any, unless otherwise specified.

The copy of **General Conditions of Contract (GCC) of May, 1993**, is available in the website of SMP, Kolkata ( <https://www.kolkataporttrust.gov.in/> ), **a copy of which is to be signed on each page of the same with official Seal of the tenderer and to be submitted along with the offer.**

**PRICE SCHEDULE**

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST)	Amount (in Rs.)(excluding GST)
<b>Part-A (Structural and other allied Mechanical Work)</b>					
<b>1</b>	<b>Structural Steel Work :</b>				
	Supply, delivery of steel material, fabrication, grit blasting, painting (including supply of Paints, Primers, Thinners etc.), dismantling of old structures, erection of newly fabricated structure, touch up painting and commissioning, as per sl. no. 1. i. to xxi. of Technical Estimate, Scope of Work & Technical Specifications.	<b>MT</b>	<b>700</b>		
<b>2</b>	<b>Caisson Penstock :</b>				
(i)	Supply, delivery of new Penstock, dismantling of old/defective Penstock, servicing/repairing the penstock seating area, repairing/replacement the penstock holding structure, installation of new Penstock, painting, testing & commissioning, as per sl. no. 3. i. of Technical Estimate, Scope of Work & Technical Specifications.	<b>Sets.</b>	<b>4</b>		
(ii)	Repairing/overhauling of Penstock, replacement of defective spares including repairing/replacement of penstock seating area and holding attachment, painting, testing & commissioning, as per sl. no. 3. ii. of Technical Estimate, Scope of Work & Technical Specifications. Job includes supply of defective parts.	<b>Sets.</b>	<b>2</b>		
<b>3</b>	<b>Valves :</b>				
(i)	Supply, delivery of new 5 inches Surface Drainage Valve including valve seats, valve operating wrench and all other accessories, dismantling of old valves and replacement of old /defective 5 inch. surface drainage valves by new one, testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications.	<b>Sets.</b>	<b>9</b>		
(ii)	Supply, delivery of new 450 mm valve with all accessories and replacement of old/defective 450 mm valve (V1,V3,V5,V7, V16, V20, V24, V22, V29, V38) with all accessories by new one, testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications.	<b>Sets.</b>	<b>10</b>		
(iii)	Supply, delivery of new 450 mm valve with all accessories and replacement of old/defective 450 mm valve (V2,V4, V6, V8, V13, V30, V32, V35, V23, V21) with all accessories , by new one, testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications.	<b>Sets.</b>	<b>10</b>		

**PRICE SCHEDULE**

<b>Sl. No.</b>	<b>Description of work</b>	<b>Unit</b>	<b>Estimated Qty.</b>	<b>Unit rate (in Rs.)[excluding GST]</b>	<b>Amount (in Rs.)[excluding GST]</b>
(iv)	Repairing/overhauling of 450 mm valve, replacement of defective spares (V40,V36, V14, V31), testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications. Job includes supply of defective spares.	<b>Sets.</b>	<b>4</b>		
(v)	Repairing/overhauling of 450 mm valve, replacement of defective spares (V39,V37,V15,V19), testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications. Job includes supply of defective spares.	<b>Sets.</b>	<b>4</b>		
(vi)	Supply, delivery of new 386 mm valve with all accessories and replacement of old/defective 386 mm valves with all accessories (V33,V43,V44,V26, V27, V48, V49, V50, V51, V52) by new one, testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications.	<b>Sets.</b>	<b>10</b>		
(vii)	Supply, delivery of new 386 mm valve with all accessories and replacement of old/defective 386 mm valves with all accessories (V17,V38,V25,V28) by new one, testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications.	<b>Sets.</b>	<b>4</b>		
(viii)	Repairing/overhauling of 386 mm valve, replacement of defective spares (V41, V18), testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications. Job includes supply of defective spares.	<b>Sets.</b>	<b>2</b>		
(ix)	Repairing/overhauling of 386 mm valve, replacement of defective spares (V42, V46, V47), testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications. Job includes supply of defective spares.	<b>Sets.</b>	<b>3</b>		
(x)	Supply, delivery of new 150 mm valve with all accessories and replacement of old/defective 150 mm Gate Valves (V9,V12) with all accessories by new one , testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications.	<b>Sets.</b>	<b>2</b>		
(xi)	Supply, delivery of new 150 mm valve with all accessories and replacement of old/defective 150 mm Gate Valves (V10,V11) with all accessories by new one, testing and commissioning, as per sl. no.6 of Technical Estimate, Scope of Work & Technical Specifications.	<b>Sets.</b>	<b>2</b>		

**PRICE SCHEDULE**

<b>Sl. No.</b>	<b>Description of work</b>	<b>Unit</b>	<b>Estimated Qty.</b>	<b>Unit rate (in Rs.)(excluding GST)</b>	<b>Amount (in Rs.)(excluding GST)</b>
(xii)	Supply, delivery of new 14" valve with all accessories and replacement of old/defective 14" Valves (V63) with all accessories by new one, testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications.	<b>Set.</b>	<b>1</b>		
(xiii)	Repairing/overhauling & replacement of defective spares of C.I. non return Valve(V53 &V45), as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications. Job includes supply of defective spares including valve operating hand wheel & holding attachment.	<b>Sets.</b>	<b>2</b>		
(xiv)	Supply, delivery of new 3" SS Gate Valve with all accessories and replacement of old/defective 3" SS Gate Valve with all accessories by new one, testing and commissioning, as per sl. no. 6 of Technical Estimate, Scope of Work & Technical Specifications.	<b>Sets.</b>	<b>6</b>		
<b>4</b>	<b>Different type hand wheel &amp; wrench :</b>				
(i)	Supply, delivery of new hand wheel and replacement of hand wheels for 450 mm Valves, testing and commissioning, as per Scope of Work.	<b>Nos.</b>	<b>10</b>		
(ii)	Supply, delivery of new hand wheel and replacement of hand wheels for 386 mm Valves, testing and commissioning, as per Scope of Work.	<b>Nos.</b>	<b>10</b>		
(iii)	Supply, delivery of new hand wheel and replacement of hand wheels for 150 mm Valves, testing and commissioning, as per Scope of Work.	<b>No.</b>	<b>1</b>		
(iv)	Supply, delivery of new hand wheel and replacement of hand wheels for 14" Valves, testing and commissioning, as per Scope of Work.	<b>No.</b>	<b>1</b>		
(v)	Supply, delivery of new hand wheel and replacement of valve operating wrench for 5" surface drainage Valves, installation, testing and commissioning, as per Scope of Work.	<b>Nos.</b>	<b>4</b>		

**PRICE SCHEDULE**

<b>Sl. No.</b>	<b>Description of work</b>	<b>Unit</b>	<b>Estimated Qty.</b>	<b>Unit rate (in Rs.)(excluding GST)</b>	<b>Amount (in Rs.)(excluding GST)</b>
(vi)	Supply, delivery of new valve operating wrench and replacement of valve operating wrench for 450 mm, 386mm, 150mm Valves etc., installation, testing and commissioning, as per Scope of Work.	<b>Nos.</b>	<b>22</b>		
5	<b>Different type pipe :</b>				
	Material specification [ for sl. No. (i) to (v) ] : For pipes IS – 1239 (part – 1). For pipe fittings IS – 1239 (part – 2) Galvanization should be as per IS – 4736.				
(i)	Supply, delivery of 80 mm nominal bore heavy duty new GI Pipe, dismantling of old/defective pipe, erection of new pipe with all attachment in place of vent pipes, sounding pipes etc, testing & commissioning, as per sl. no. 2. i. of Technical Estimate, Scope of Work & Technical Specifications.	<b>Mtrs.</b>	<b>400</b>		
(ii)	Supply, delivery of 4 inch nominal bore heavy duty new GI Pipe, dismantling of old/defective pipe, erection of new pipe with all attachment in place of valves spindle casing and other points of Caisson, testing & commissioning, as per sl. no. 2. iii. of Technical Estimate, Scope of Work & Technical Specifications.	<b>Mtrs.</b>	<b>400</b>		
(iii)	Supply, delivery of 3 inch nominal bore heavy duty new GI Pipe, dismantling of old/defective pipe, erection of new pipe with all attachment in place of valves spindle casing and other points of Caisson, testing & commissioning, as per sl. no. 2. ii. of Technical Estimate, Scope of Work & Technical Specifications.	<b>Mtrs.</b>	<b>700</b>		
(iv)	Supply, delivery of 2.5 inch nominal bore heavy duty new GI Pipe, dismantling of old/defective pipe, erection of new pipe with all attachment in place of valves spindle casing and other points of Caisson, testing & commissioning, as per sl. no. 2. iv. of Technical Estimate, Scope of Work & Technical Specifications.	<b>Mtrs.</b>	<b>100</b>		
(v)	Supply, delivery of 6 inch nominal bore heavy duty new GI Pipe, dismantling of old/defective pipe, erection of new pipe with all attachment for 20 HP pump and other points of Caisson, testing & commissioning, as per sl. no. 2. v. of Technical Estimate, Scope of Work & Technical Specifications.	<b>Mtrs.</b>	<b>300</b>		

**PRICE SCHEDULE**

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST]	Amount (in Rs.)(excluding GST]
(vi)	Supply, delivery of new Jetting header pipe with all fittings, dismantling of old/damaged existing pipe, replacement of Jetting header pipes with all fittings etc from Pump room to end of jet on both frame – 1 and frame -15 sides, as per Scope of Work & Technical Specifications. Material: Pipes as per IS 3589 with suitable liner and coating.	Mtrs.	100		
(vii)	Supply, delivery, fixing / installation of flange, clamps, gaskets, additional plates etc. for pipe fitting.	LS			
(viii)	Supply, delivery of new scouring pipes with all fittings, dismantling of old/damaged existing scouring pipes, replacement of scouring pipe with all fittings etc. on both frame – 1 and frame -15 sides, as per Scope of Work & Technical Specifications.	Mtrs.	100		
6	<b>Grills :</b>				
	Fabrication and supply of new GRILL along with allied structure, dismantling of old/defective Grill & allied structure, erection of new Grill with all attachment, testing & commissioning, as per sl.no. 1. xxxviii of Technical Estimate, Scope of Work & Technical Specifications. Job includes supply of steel materials, fabrication, grit blasting, painting (including supply of Paints, Primers, Thinners etc.).				
(i)	For 10” dia Scouring pipe inlet.	Sets.	24		
(ii)	For 16” dia Sump inlet on both “V” & “W” side	Sets.	2		
(iii)	For Pen Stock	Sets.	2		
(iv)	For Lower Scuttle Tank	Sets.	4		
7	<b>Probe Wheel :</b>				
	Supply, delivery of new fabricated Probe Wheel assembly (including 15” rubber wheel) as per Drg. No-110.051, dismantling of old/defective existing probe wheel assembly, erection of of new supplied probe wheel assembly, testing and commissioning, as per Scope of Work & Technical Specifications.	Sets.	2		



**PRICE SCHEDULE**

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST]	Amount (in Rs.)(excluding GST]
8	<b>Draft marking scale :</b>				
	Fabrication & supply of new Draft Board and replacement of existing 2 Nos. Draft Marking Scales including its base plates at V side of frame 1 and W side of frame 15, testing & commissioning, as per Technical Specifications and scope of work. One additional Draft Marking Scale including its base plate is to be fabricated & erected at 'W' side of frame 1 of the Caisson. Job includes supply of steel materials, fabrication, grit blasting, painting (including supply of Paints, Primers, Thinners etc.).	MT	10		
9	<b>Quoin seal :</b>				
(i)	Supply, delivery of new Quoin seal along with levelling plate , removal of all old Quoin seals along with base plate from their existing position, installation, alignment and commissioning of the new one at their existing position, as per sl. no. 4 of Technical Estimate, Scope of Work and Technical Specifications.	Nos.	104		
(ii)	Supply, delivery of new rubber seal along with retainer plate for Quoin & Cills ,fixing on the Quoin & Cills , alignment and commissioning at their respective position, as per sl. No. 5 of Technical estimate, Scope of Work and Technical Specifications.				
a)	Rubber seal	Mtrs.	400		
10	<b>Spar and Bevel gear boxes :</b>				
	Servicing/overhauling of spar gear boxes ( for 5" vlave, 450 mm valve,386 mm valve etc.) and bevel gear boxes (for 450 mm valve, 386 mm valve), replacement of deferective spares, testing and commissioning, as per Scope of Work and Technical Specifications. Job includes supply of defective spares.	Nos.	10		
11	<b>Billet bracket including pin &amp; bracket holding structure</b>				
	Fabrication, supply, delivery of new billet bracket including pin & bracket holding structure, erection of new fabricated billet bracket with bracket holing new structure, as per drg. No. 110.064, 110.017 & 110.076, Scope of Work and Technical Specifications.	MT	2		

**PRICE SCHEDULE**

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST]	Amount (in Rs.)(excluding GST]
<b>12</b>	<b>Universal Coupling</b>				
(i)	Servicing/overhauling of universal coupling of different size valves (450mm, 386mm, 150mm etc.), testing and commissioning, as per Scope of Work and Technical Specifications. Job includes supply of defective spares.	Nos.	10		
(ii)	Replacement of universal coupling of different size valves (450mm, 386mm, 150mm etc.), testing and commissioning, as per Scope of Work and Technical Specifications	Nos.	10		
<b>13</b>	<b>Staffing box :</b>				
(i)	Servicing/overhauling of staffing box of different size valves (450mm, 386mm, 150mm, 14", 5" etc.), testing and commissioning, as per Scope of Work and Technical Specifications. Job includes supply of defective spares.	Nos.	20		
(ii)	Replacement of staffing box of different size valves (450mm, 386mm, 150mm, 14", 5" etc.), testing and commissioning, as per Scope of Work and Technical Specifications.	Nos.	20		
<b>14</b>	<b>SAL wooden fender and plank :</b>				
(i)	Supply, delivery of new SAL wooden fender along with keeper plate, dismantling of old/damaged wooden fender and keeper plate from 'A', 'B' and 'C' Deck of both 'V' and 'W' side of Caisson, installation, testing and commissioning of new Wooden fender with keeper plate at their respective position, as per Drg. No.-110.054, Scope of Work & Technical Specifications.	CFT.	700		

**PRICE SCHEDULE**

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST)	Amount (in Rs.)(excluding GST)
(ii)	Supply, delivery of new SAL wooden plank along with fixing clamp for “A” deck walkway, both “V” & “W” side , installation, testing and commissioning of new Wooden planks at their respective position, as per Scope of Work & Technical Specifications.	CFT.	200		
(iii)	Supply, delivery of new SAL wooden buffer along with keeper plate, dismantling of old/damaged end wooden buffers at ‘A’ and ‘B’ deck level both ‘V’ and ‘W’ side of frame – 15, installation, testing and commissioning of new Wooden buffer with keeper plate at their respective position, as per Scope of Work & Technical Specifications.	Nos.	4		
15	<b>Painting of old structure :</b>				
(i)	Grit blasting, painting of Old structure, as per Technical Specifications and Scope of Work. Job includes supply of Paints, Primers, Thinners etc.	Sq. m	5500		
(ii)	Old structure Surface preparation to be done by using power tools failing which by using hand tools (like Scraper, Wire Brush and Pig Hammer etc.),where Grit blasting not possible, painting of Old structure, as per Technical Specifications and Scope of Work. Job includes supply of Paints, Primers, Thinners etc.	Sq. m	1500		
16	<b>Submersible Pump along with all accessories :</b>				
	Supply, Delivery, Installation, Testing & Commissioning of 10 HP Electric open well/Submersible Pump sets with all accessories, as per Technical Specification & Scope of Work.				
(i)	Supply	Sets.	6		
(ii)	Installation, Testing & commisioning	Sets.	6		
17	<b>Horizontal centrifugal pump along with all accessories :</b>				
	Supply, Delivery, Installation, Testing & Commissioning of 20 HP horizontal centrifugal pump along with all accessories, as per Technical Specification & Scope of Work.				
(i)	Supply	Sets.	2		
(ii)	Installation, Testing & commisioning	Sets.	2		

## PRICE SCHEDULE

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST)	Amount (in Rs.)(excluding GST)
<b>18</b>	<b>Vertical Turbine Pump along with all accessories :</b>				
	Supply, Delivery, Installation, Testing & Commissioning of 50 HP Vertical Turbine (Caisson) Pump along with all accessories, as per Technical Specification & Scope of Work.				
(i)	Supply	Sets.	3		
(ii)	Installation, Testing & commisioning	Sets.	3		
<b>19</b>	<b>Replacement of Base Plate &amp; Sole Plate along with its holding bolts :</b>				
(i)	Lifting, holding at elevated position and lowering of Caisson Gate No. 1 inside the Intermediate Camber, as per drawing no. H. SC/G – 131,H. SC/G – 132 & H. SC/G – 670J, Scope of Work and other terms and conditions.	LS			
(ii)	Replacement of 2 rows of Sole Plates (approx. weight 5 MT) at Caisson Gate No. 1 as per Drg. nos. 110-073, Scope of Work and Technical Specification.	LS			
(ii)	Replacement of entire old Base Plates at Caisson Gate No. 1 as per Drg. nos. 110-073 , Scope of Work and Technical Specification.	Nos.	48		
<b>Total of Part-A (Structural and other allied Mechanical Work) {in Rs.} [excluding GST]</b>					
<b>Part-B (Electrical Work)</b>					
<b>1</b>	<b>PCRD Structure along with Motor, Slip Ring and Break Unit</b>				
	Design, Manufacturing, supply, deliver, installation/fixing, testing & commisioning of Power Cable Reeling Drum (PCRD) aassembly with all accessories viz. drum body, base frame, carbon brass holder, cable guide assembly, cable reeling drum motor, motor base plate, slip ring assembly, slip ring enclosue, control panel, brake unit etc. for caisson gate, as per Technical Specification & scope of Work.				
(i)	Supply	Set.	1		
(ii)	Installation/fixing, Testing & commisioning	Set.	1		

## PRICE SCHEDULE

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST)	Amount (in Rs.)(excluding GST)
2	<b>ATC Conductor, EPR Insulated, PCP Inner &amp; Outer Sheathed 1.1 kV Grade CRD Cable (Reeling &amp; Unreeling Duty)</b>				
	Supply, delivery, laying, testing & commissioning of ATC Conductor, EPR Insulated, PCP Inner & Outer Sheathed 1.1 kV Grade CRD Cable (Reeling & Unreeling Duty), confirming to IS: 9968/Part-1/1988 [with latest amendment, if any], as per the enclosed "Technical Specification & Scope of Work".				
(i)	Supply	Mtrs.	100		
(ii)	Laying, testing & Commissioning	Mtrs.	100		
3	<b>Supply, delivery, installation, testing &amp; commisiioning of Switch Disconnecter Fuse Unit with all side enclosure type: FN 400 TPN Rated Current: 400 Amps. Volt: 660V, 3 Phase , 50 Hz along with suitable fuses for receiving 3 phase power supply at Caission Gate via PCRD , as Technical Specification &amp; Scope of Work.</b>				
(i)	Supply	Set.	1		
(ii)	Installation, Testing & commisisioning	Set.	1		
4	<b>Power Distribution Panel :</b>				
	Design, Manufacturing, supply, delivery, installation, testing & commissioning of power distribution panel with facility of suitable busbar, as per Technical Specification & Scope of Work.				
(i)	Supply	Set.	1		
(ii)	Installation, Testing & commisisioning	Set.	1		

## PRICE SCHEDULE

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST)	Amount (in Rs.)(excluding GST)
5	<b>Motor Circuit Panel (MCC) / Pump starter Panel :</b>				
	Design, Manufacturing, supply, delivery, installation, testing & commissioning of Motor Circuit Panel (MCC) / Pump starter Panel along with all accessories & safety protection, as per Technical Specification & Scope of Work.				
<b>A.</b>	<b>For 50 HP Vertical Turbine (Caisson) Pump :</b>				
(i)	Supply	Sets.	3		
(ii)	Installation, Testing & commissioning	Sets.	3		
<b>B.</b>	<b>For 20 HP Reciprocating Pump :</b>				
(i)	Supply	Sets.	2		
(ii)	Installation, Testing & commissioning	Sets.	2		
<b>C.</b>	<b>For 10 HP Submersible Pump :</b>				
(i)	Supply	Sets.	7		
(ii)	Installation, Testing & commissioning	Sets.	7		
6	<b>Local Operational Panel :</b>				
	Design, Manufacturing, supply, delivery, testing & commissioning of local operation panel with facility for control on/off selector switch, start & stop push button and on, off, trip & overload indication, as per Technical Specification & Scope of Work.				
<b>A.</b>	<b>For 3 nos. Vertical Turbine Pumps</b>				
(i)	Supply	No.	1		
(ii)	Installation, Testing & commissioning	No.	1		

**PRICE SCHEDULE**

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST)	Amount (in Rs.)(excluding GST)
<b>B.</b>	<b>For 2 nos. Reciprocating Pumps</b>				
(i)	Supply	No.	1		
(ii)	Installation, Testing & commisioning	No.	1		
<b>C.</b>	<b>For 7 nos. Submersible Pumps</b>				
(i)	Supply	No.	1		
(ii)	Installation, Testing & commisioning	No.	1		
<b>7</b>	<b>Power Cableing work :</b>				
	Supply, delivery, laying, testing & commissioning of following 1.1 kV grade XLPE insulated, Aluminium Conductor, galvanized armoured cable, conforming to IS 7098 (Part-1) [with latest amendment, if any], as per "Technical Specification & Scope of Work".				
	3½ C X 50 sq. mm. for providing power supply from Power Distribution Panel to 3 Nos. Vertical Turbine (Caisson) Pump Panel and Vertical Turbine (Caisson) Pump Panel to Motoe Junction Box. Job includes supply & delivery of Junction Box for 3 nos. Motor.				
(i)	Supply	Mtrs.	250		
(ii)	Laying, testing & Commissioning	Mtrs.	250		
<b>8</b>	Supply, delivery, laying, testing & commissioning of following 1.1 kV grade PVC insulated and PVC sheathed round copper, ISI marked (conforming to IS- 694) [with latest amendment, if any], as per "Technical Specification & Scope of Work".				
<b>A.</b>	<b>4 C X 16 sq. mm. for for providing power supply from Motor Junction box to motor terminal of 3 Nos. Vertical Turbine (Caisson) Pump.</b>				
(i)	Supply	Mtrs.	80		
(ii)	Laying, testing & Commissioning	Mtrs.	80		
<b>B.</b>	<b>4 C X 10 sq. mm. for &amp; reciprocating Pump Starters and lighting</b>				
(i)	Supply	Mtrs.	100		
(ii)	Laying, testing & Commissioning	Mtrs.	100		

**PRICE SCHEDULE**

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST)	Amount (in Rs.)(excluding GST)
<b>C.</b>	4 C X 4 sq. mm. for providing power supply to SU Pump				
(i)	Supply	Mtrs.	200		
(ii)	Laying, testing & Commissioning	Mtrs.	200		
<b>9</b>	<b>Control Cableing Work :</b>				
	Supply, delivery, wiring, testing & commissioning of 6Cx1.5 sq. mm., LT 1.1 KV grade, multicore copper armoured cable should conform to IS:7098 (Part-I) with latest amendment, if any, as per "Technical Specification & Scope of Work".				
(i)	Supply & delivery of 6 C X 1.5 sq. mm. for control wiring.	Mtrs.	200		
(ii)	Wiring, testing & commissioning of 6Cx1.5 sq. mm. for control wiring	Mtrs.	200		
<b>10</b>	<b>Luminaries :</b>				
	Supply, delivery, installation, testing & commissioning of 40 Watt LED tube light, 250 Watt HPSV & 125 Watt HPMV fittings along with all accessories, as per "Technical Specification & Scope of Work".				
(i)	Supply & delivery of 40 Watt LED tube light fittings along with all accessories	Nos.	20		
(ii)	Supply & delivery of 250 Watt HPSV fittings along with all accessories.	Nos.	6		
(iii)	Supply & delivery of 125 Watt HPMV fittings along with all accessories.	Nos.	6		
(iv)	Installation, testing & commisioning of (i) to (iii) at Caisson Gate.	LS			



## PRICE SCHEDULE

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)[excluding GST]	Amount (in Rs.)[excluding GST]
11	Lighting Switch Board :				
	Supply, delivery, installation of lighting switch board (having 6 Amp Swich-6 nos. and 5 Amp Plug-1 no). [ 4 nos. on A deck + 2 nos. at LAC room + 1 no at Pressure Sump room)				
(i)	Supply	No.	7		
(ii)	Installation	No.	7		
12	Dismantling & shifting of existing electrical panels/starters/junction box/switch board/PCRD unit /luminaries/cable etc.	LS			
Total of Part-B (Electrical Work) {in Rs.} [excluding GST]					
Part-C (Automation Work)					
1	Motorised Actuator :				
	Supply, installation, testing and commissioning of Motorised Actuator for UST Tank Intake Line of Caission Gate No. 1, as per “Technical Specification & Scope of Work”.				
(i)	Supply	Sets.	4		
(ii)	Installation, testing and commissioning	Sets.	4		
2	Insertion type level transmitter :				
	Supply, installation, testing and commissioning of Insertion type level transmitter for Tanks of Caission Gate No. 1, as per “Technical Specification & Scope of Work”.				
(i)	Supply	Sets.	9		
(ii)	Installation, testing and commissioning	Sets.	9		
3	Seal detection sensor :				
	Supply, installation, testing & commissioning of seal detection sensor for "W" & "V" side of Intermediate Caisson gate seal detection & monitoring in each gate as per “Technical Specification & Scope of Work”.				
(i)	Supply	Sets.	2		
(ii)	Installation, testing and commissioning	Sets.	2		

## PRICE SCHEDULE

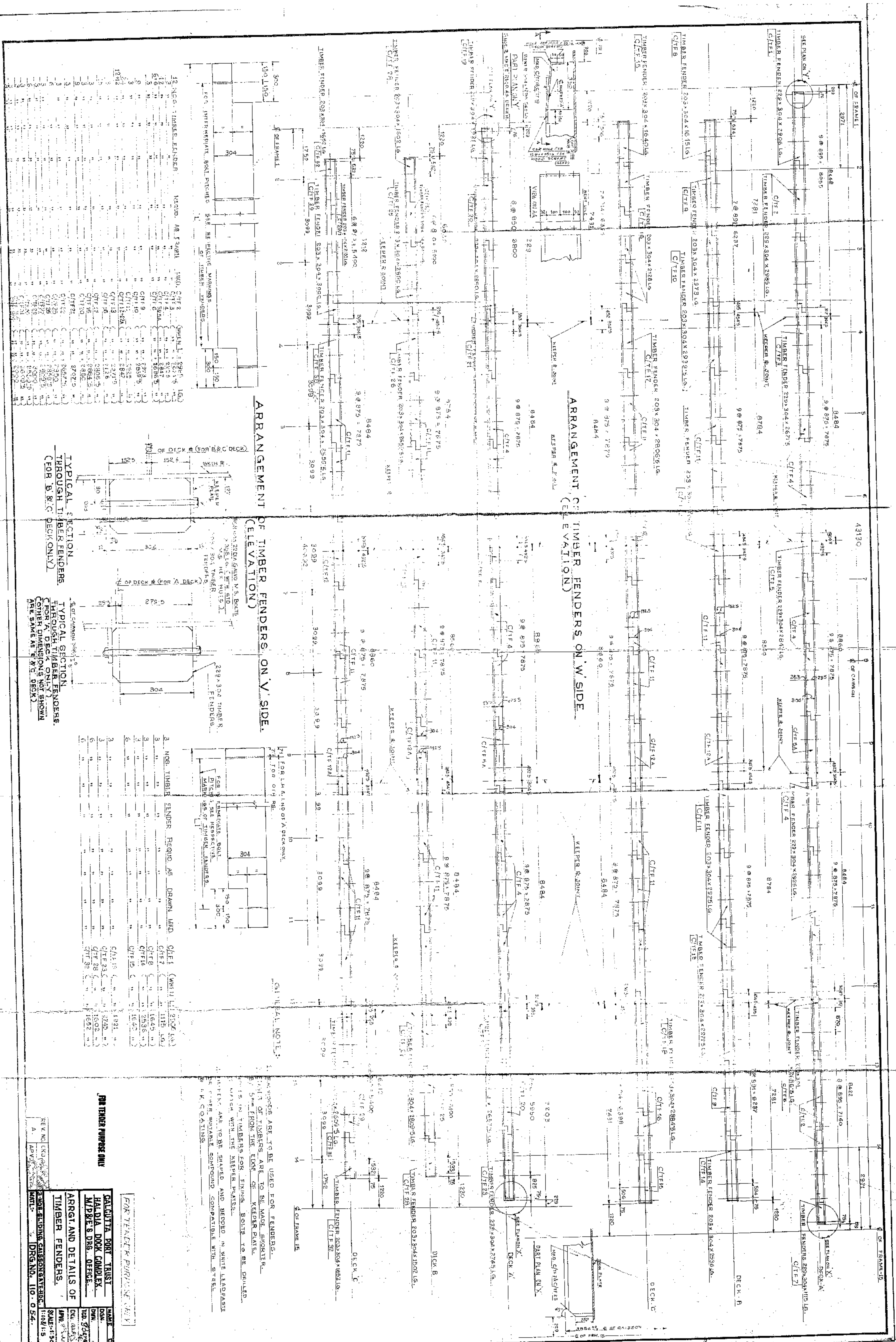
Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST)	Amount (in Rs.)(excluding GST)
4	<b>Automatic Ladder :</b> Design, Manufacturing, fabrication, supply, installation, testing & commissioning of Automatic Ladder including motor & gear box arrangement and VFD Panel of Intermediate Caisson Gate, as per "Technical Specification & Scope of Work".				
(i)	Supply	Sets.	2		
(ii)	Installation, testing and commissioning	Sets.	2		
5	<b>Wireless Antenna &amp; Communication Device :</b> Supply, installation, testing & commissioning of Wireless Antenna & Communication Device for communication in between filled instruments/devices & PLC of Intermediate Caisson, as per "Technical Specification & Scope of Work".				
(i)	Supply	Set	1		
(ii)	Installation, testing and commissioning	Set	1		
6	<b>Motor Relay Junction Box :</b> Design, Manufacturing, fabrication, supply, wiring, installation, testing & commissioning of Motor Relay Junction Box to convert 110V to 24V for field instruments/devices of Intermediate Caisson gate, as per "Technical Specification & Scope of Work".				
(i)	Supply	Set	1		
(ii)	Installation, testing and commissioning	Set	1		
7	<b>Input Output (IO) Control Panel :</b> Design, Manufacturing, fabricate, supply, wiring, installation, testing & commissioning of Input Outer (IO) control panel of Intermediate Caisson Gate, as per "Technical Specification & Scope of Work". Job includes supply of required DI, DO, AI & AO Module and Relay (Schneider Make).				
(i)	Supply	Set	1		
(ii)	Installation, testing and commissioning	Set	1		
8	<b>Power distrbution Panel :</b> Design, Manufacturing, fabricate, supply, wiring, installation, testing & commissioning of power distribution panel for Automation work of Intermediate Caisson Gate, as per "Technical Specification & Scope of Work"				

**PRICE SCHEDULE**

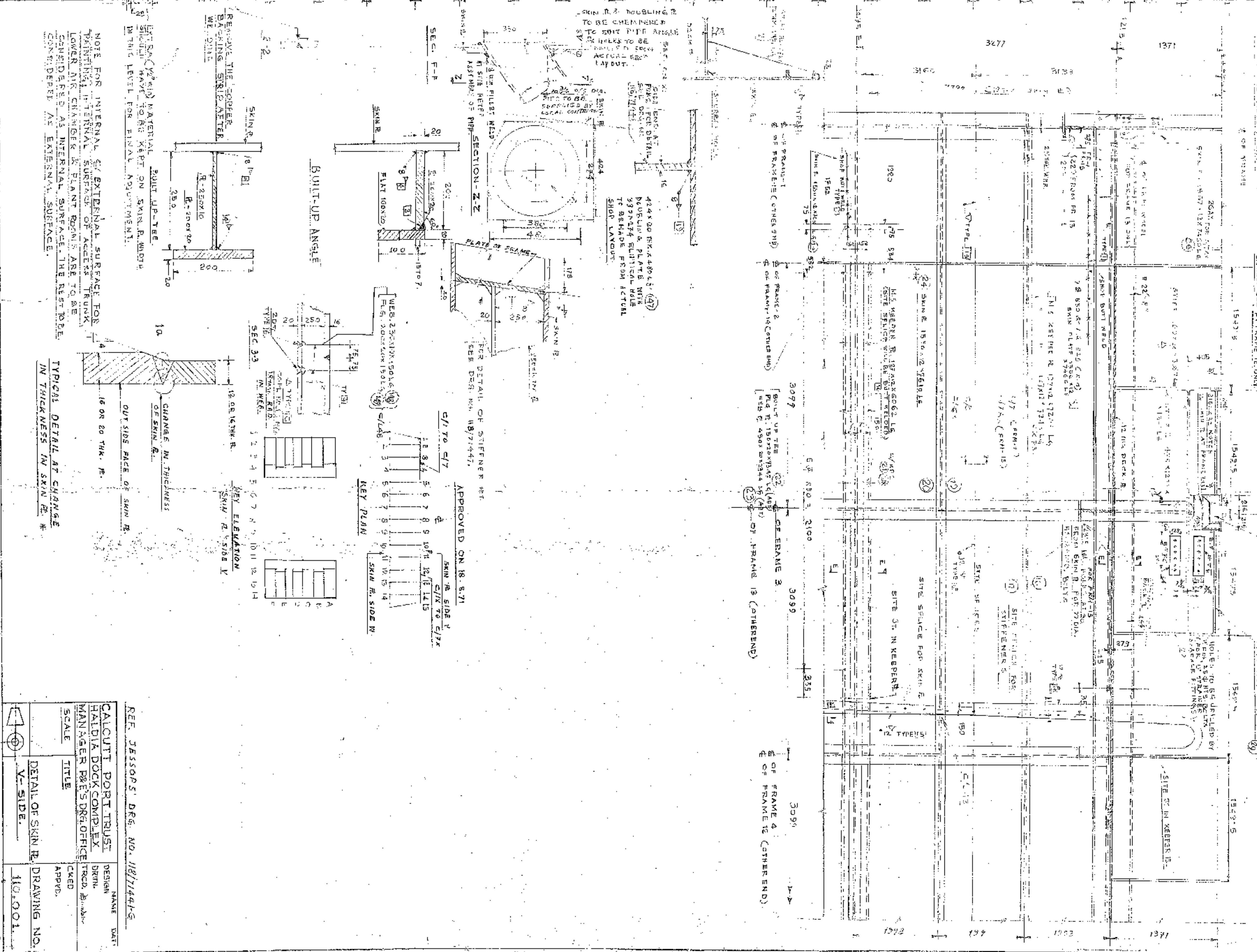
Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)(excluding GST]	Amount (in Rs.)(excluding GST]
(i)	Supply	Set	1		
(ii)	Installation, testing and commissioning	Set	1		
9	<b>Power cable for field instruments/devices :</b>				
	Supply & laying of 4Cx 6sqmm , LT 1.1 KV grade, multicore copper armoured cable should conform to IS:7098 (Part-I) with latest amendment, if any, as per "Technical Specification & Scope of Work".				
(i)	Supply	Mtrs.	250		
(ii)	Laying, testing and commissioning	Mtrs.	250		
10	<b>Control cable for field instruments/devices :</b>				
	Supply & laying of 3Cx1.5 sqmm, LT 1.1 KV grade, multicore copper armoured cable should conform to IS:7098 (Part-I) with latest amendment, if any, as per "Technical Specification & Scope of Work".				
(i)	Supply	Mtrs.	1100		
(ii)	Laying, testing and commissioning	Mtrs.	1100		
	Special cables (Ethernet cables, communication cable)				

**PRICE SCHEDULE**

Sl. No.	Description of work	Unit	Estimated Qty.	Unit rate (in Rs.)[excluding GST]	Amount (in Rs.)[excluding GST]
11	Supply & laying of all special cables (Ethernet cables, communication cable) required for Automation Work of Caisson Gate No. 1.				
(i)	Supply	Mtrs.	30		
(ii)	Laying, testing and commissioning	Mtrs.	30		
Total of Part-C (Automation Work) {in Rs.} [excluding GST]					
Part-D ( Removing and repositioning of one set (6 units) of camber stoplog and Interchanging of repaired Caisson Gate No. 1 with Inner)					
1	Removing and repositioning of one set (6 units) of camber stoplog, one after another, from and at Intermediate Camber with the help floating Crane, as per Scope of Work. Job includes arranging of suitable floating crane, hydraulic jack as well as hose required for the job.	LS			
2	Interchanging of repaired Caisson Gate No. 1 with Inner Caisson, as per Scope of Work. In case of emergency, the repaired Caisson Gate No. 1 may intechnge with Outer Caisson.	LS			
Total of Part-D ( Removing and repositioning of one set (6 units) of camber stoplog and Interchanging of repaired Caisson Gate No. 1 with Inner) {in Rs.} [excluding GST]					
Total of Part-A + Part-B + Part-C + Part - D {in Rs.} [excluding GST]					








EXTRA (1/2 MO) MATERIAL SHOULD HAVE TO  
BE KENT CSM IN G. WITH H/TUF LEVEL  
FOR FINAL ADJUSTMENT. MOLES FOR 3/1 DIA GUTS  
TO SUIT TO BE DRILLED BY HAND  
ON ASSEMBLY AT FRAME PLANT.

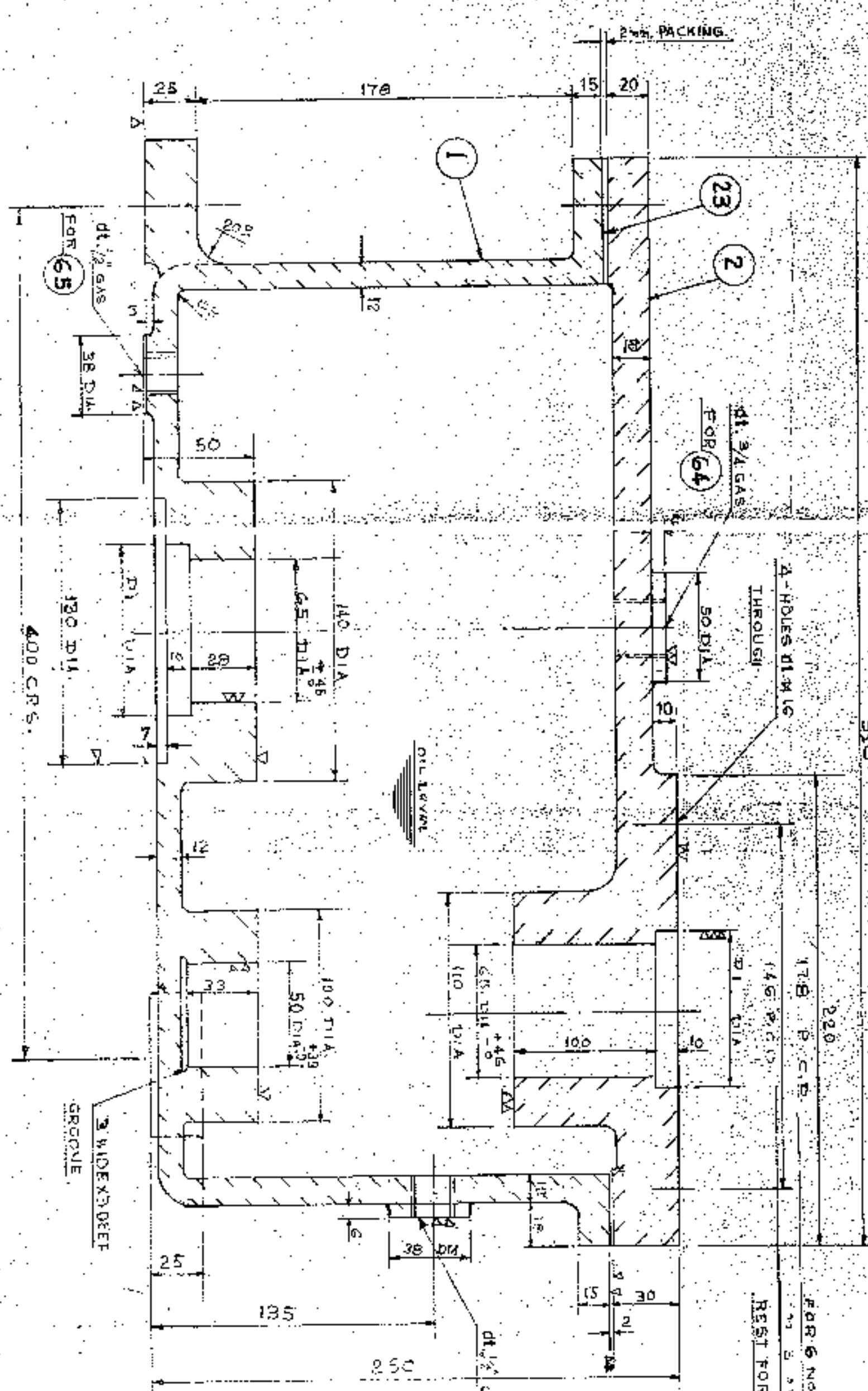
FOR DETAIL OF FAIRLEAD AND MODERN'S KIN & SEE DRAWING 11073  
 NITE 10073 11073 (109)

REF. JESSOP'S DRG. NO. 118/71441-3

NAME	DATE
DESIGN	
DRAWN	
TRCD BY	
CHECKED	
ADDRESS	

	DETAIL OF SKIN FL.	DRAWING NO.
	Y-SIDE.	110.001.

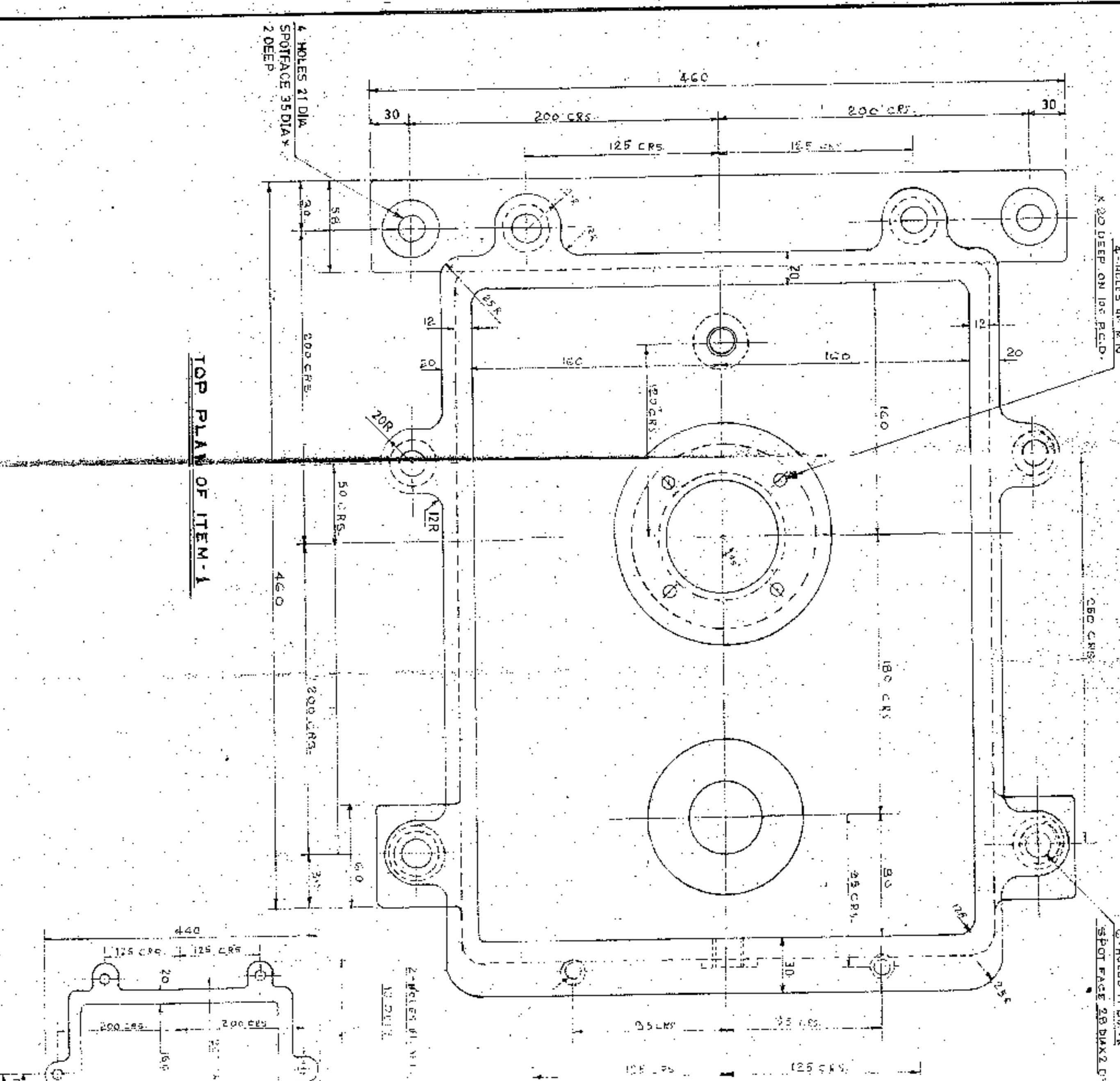
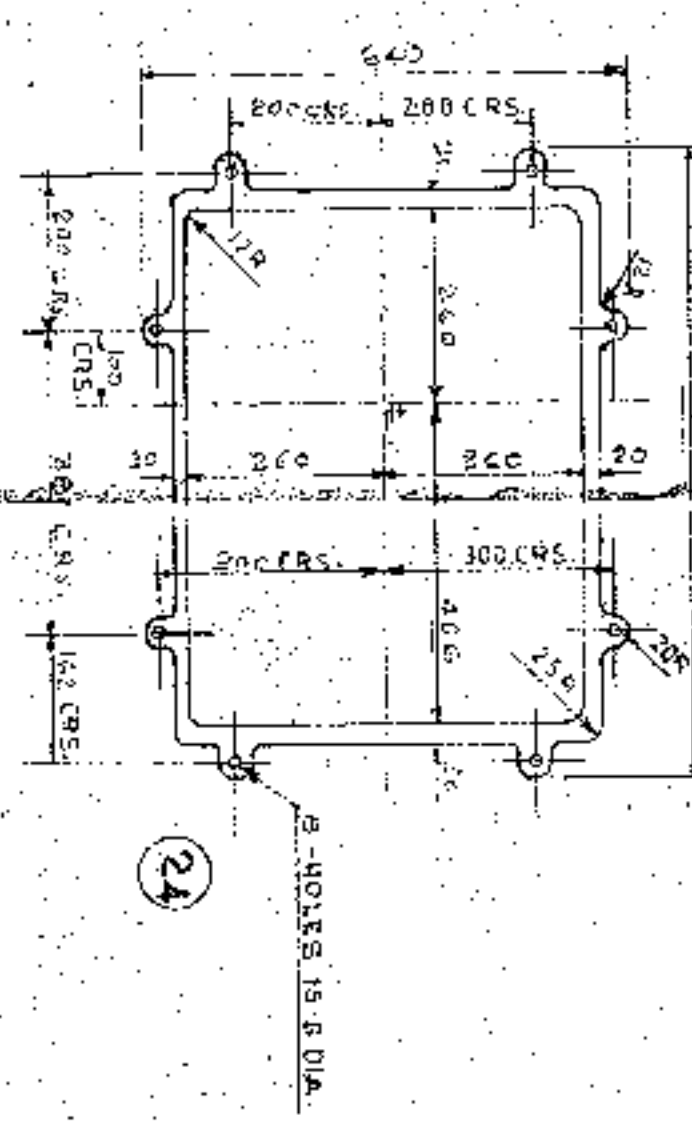




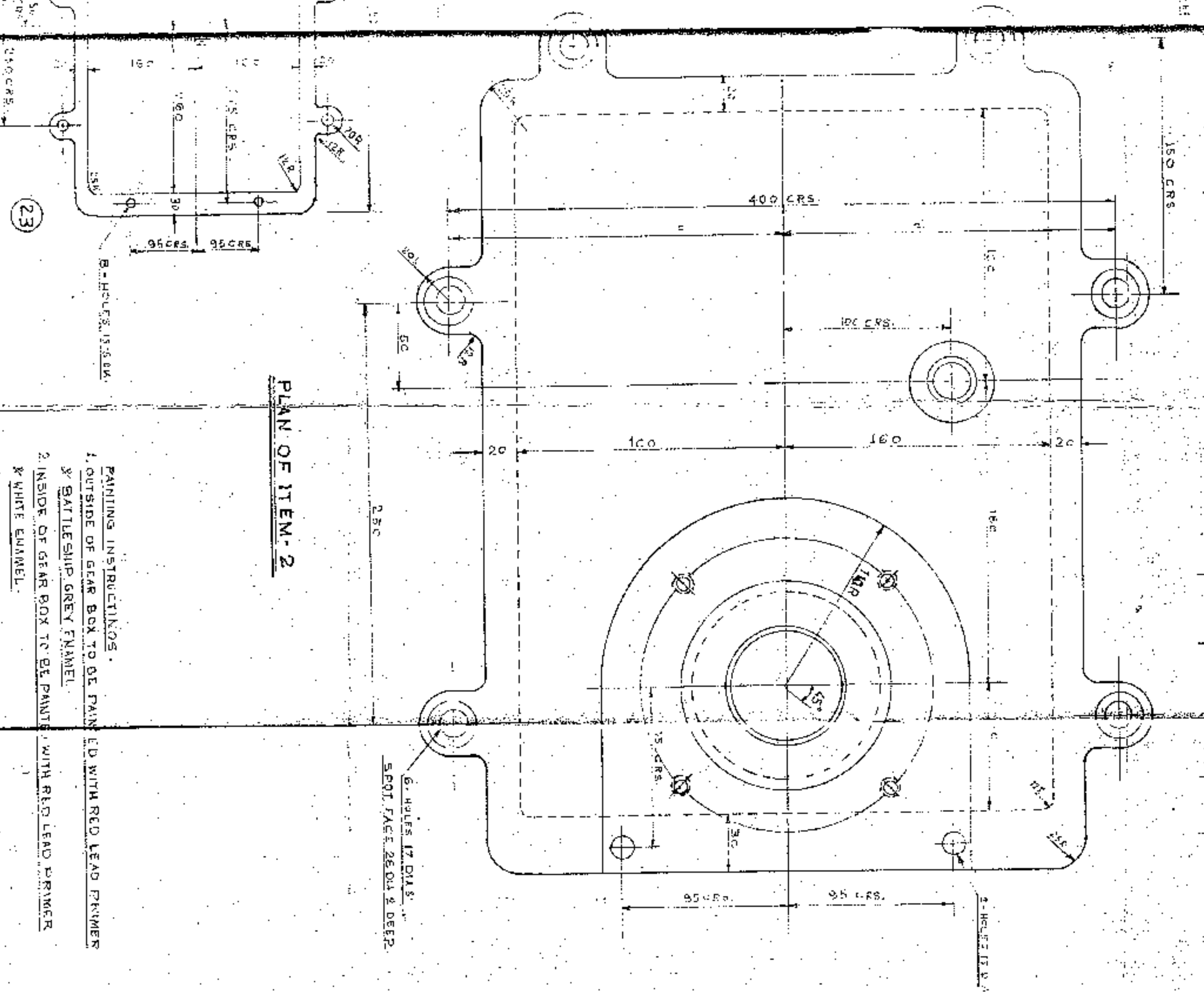
FOR 6 NO. 1  
S. BOX (N 14 1/2 X 22 1/2 - 400 SIZE)  
ITEM 17 OF DRG. NO. 110-072.

ITEM NO	QTY	UNIT	PARTICULARS
1	18	18.00	SPUR GEAR BOX
2	6	11.75	COVER
3	18	11.75	COVER
4	6	11.75	COVER
5	18	11.75	COVER
6	18	11.75	COVER
7	18	11.75	COVER
8	18	11.75	COVER
9	18	11.75	COVER
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94	18	11.75	COVER
95	18	11.75	COVER
96	18	11.75	COVER
97	18	11.75	COVER
98	18	11.75	COVER
99	18	11.75	COVER
100	18	11.75	COVER

SPINDLE DIA.	PL DIA	NO OFF
44 (FOR 356)	72 1/4"	12
50 (FOR 450 VALVE)	80 1/2"	6



TOP PLAN OF ITEM-1



PLAN OF ITEM-2

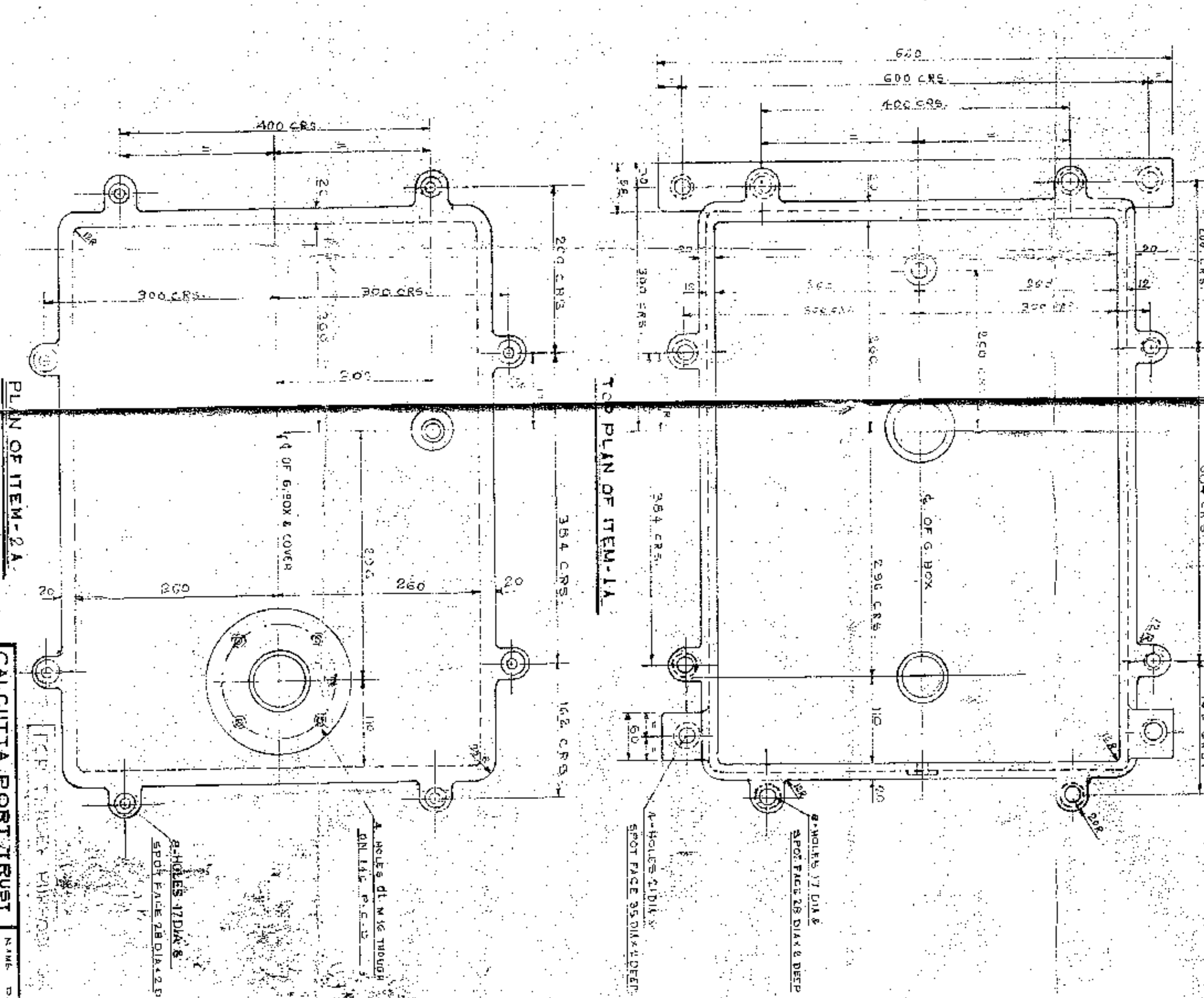
PAINTING INSTRUCTIONS.

1. OUTSIDE OF GEAR BOX TO BE PAINTED WITH RED LEAD PRIMER.

X BATTLESHIP GREY ENAMEL.

2. INSIDE OF GEAR BOX TO BE PAINTED WITH RED LEAD PRIMER.

X WHITE ENAMEL.



TOP PLAN OF ITEM-1A

PLAN OF ITEM-2A

**FOR TENDER PURPOSE ONLY**

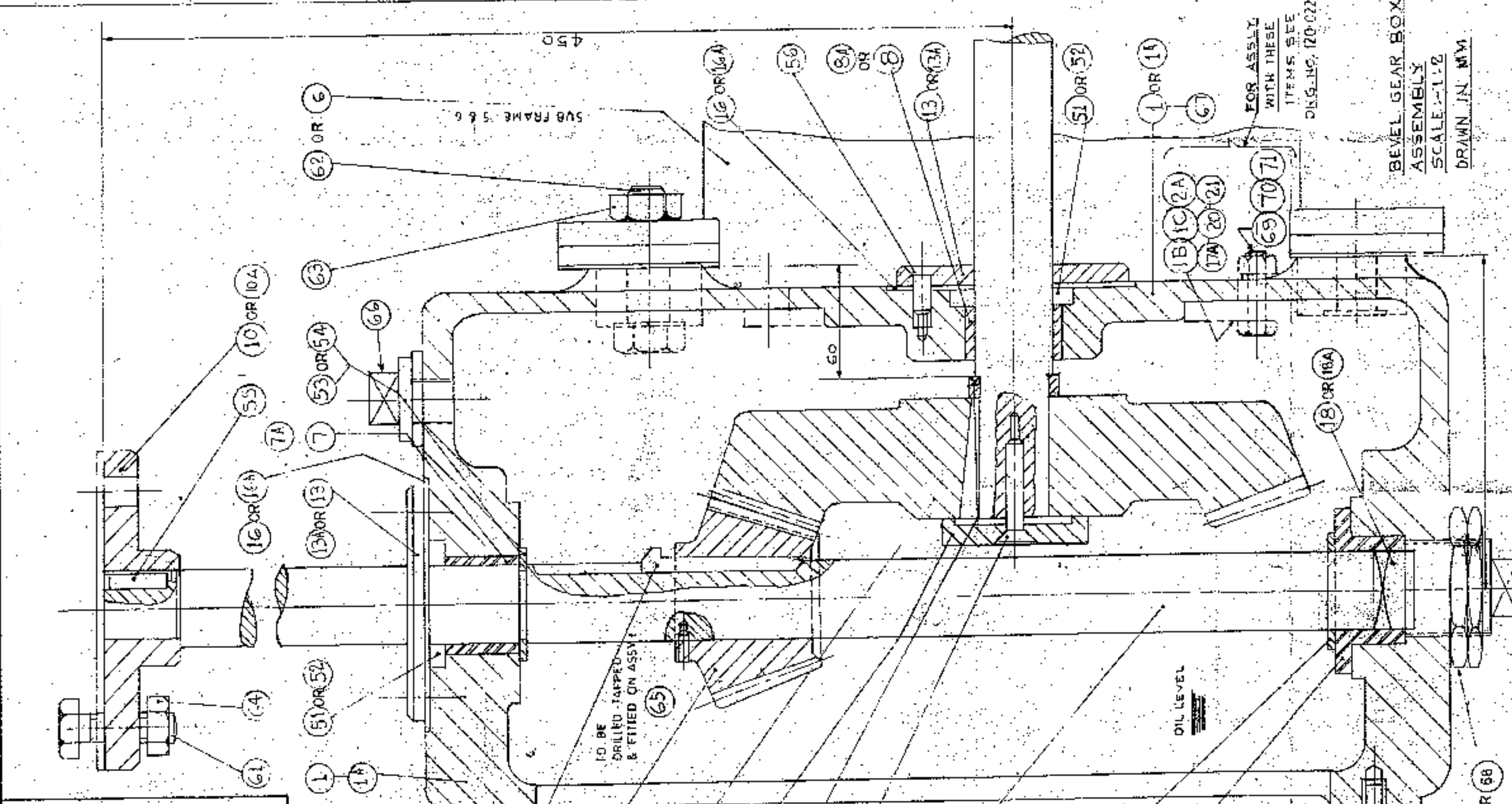
NAME	DRUG	DATE	TIME
CALCUTTA PORT TRUST			
HALDIA DOCK COMPLEX			
M.P.E.'S DRG. OFFICE			
SPUR GEAR BOX.			
3 NOS. SLIDING CALSON GATES.			
DRG. NO. 410-044			



ITEM NO. 12 & 13 GASKET

ITEM	QTY.	UNIT	REMARKS
12	1	EA	GASKET FOR GEAR BOX
13	1	EA	GASKET FOR GEAR BOX

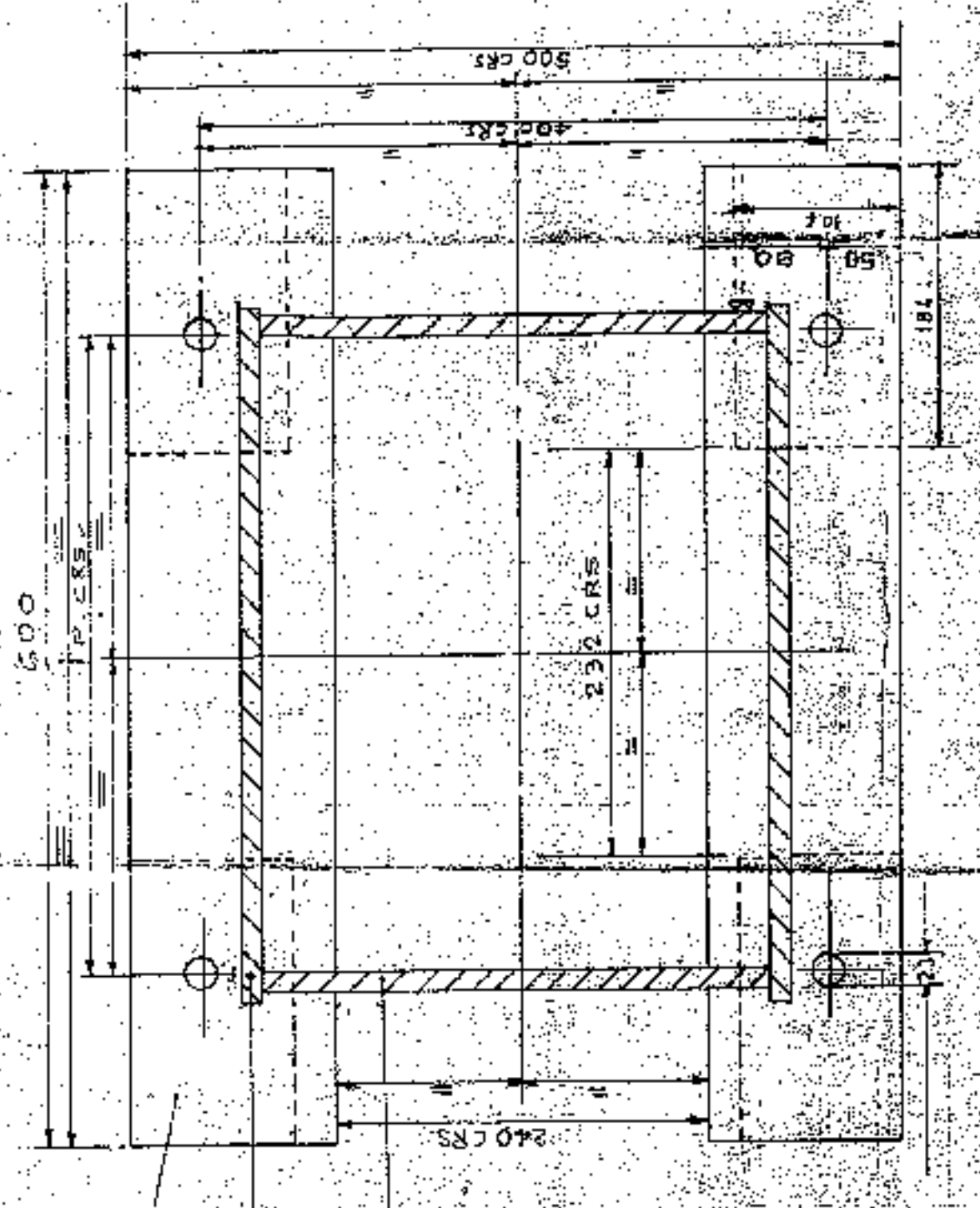
SCALE: 1:1  
MATERIAL: RUBBER  
2mm THICK



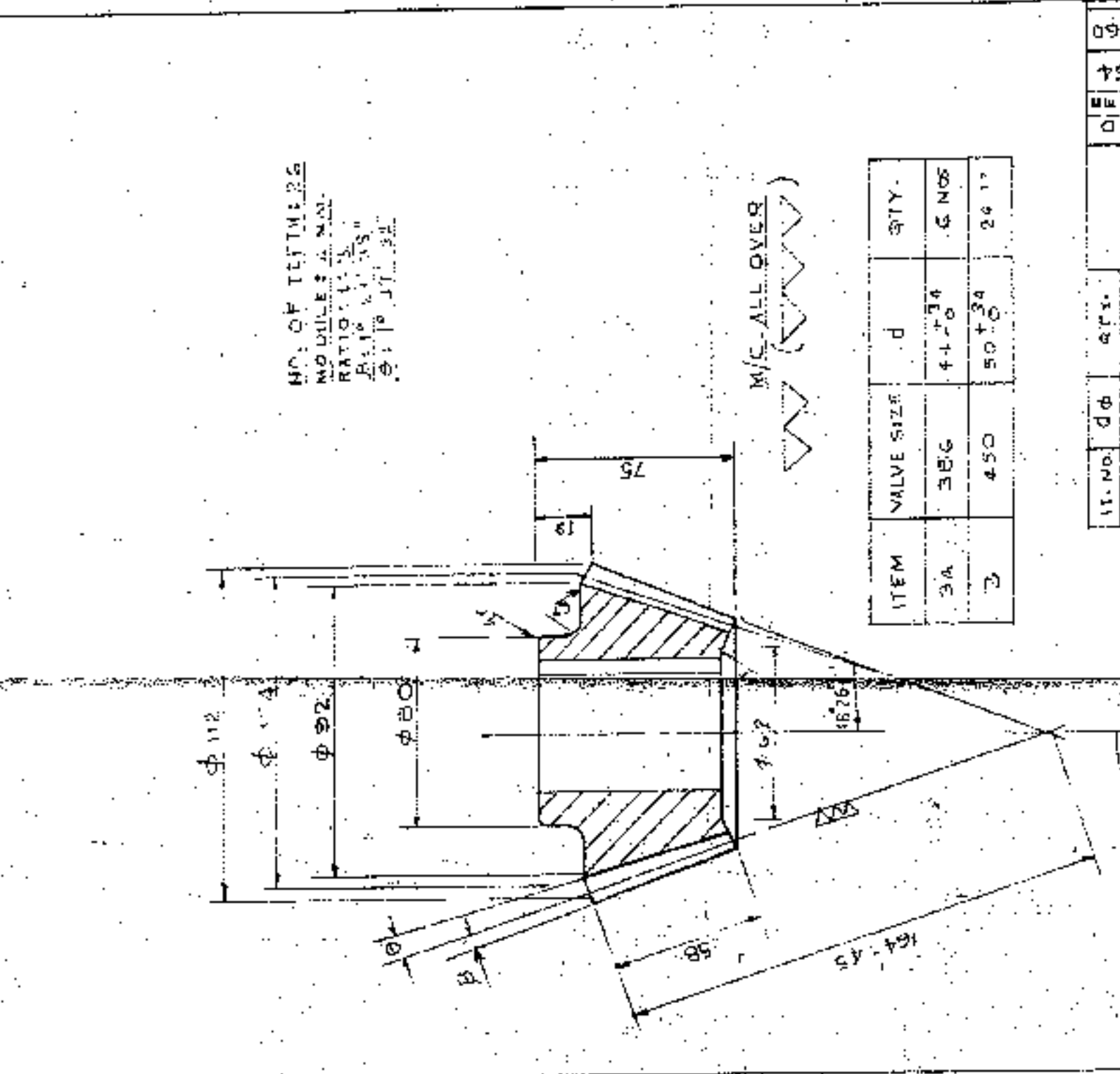
ITEM NO. 14 GASKET

ITEM	QTY.	UNIT	REMARKS
14	1	EA	GASKET FOR GEAR BOX

SCALE: 1:1  
MATERIAL: RUBBER  
2mm THICK



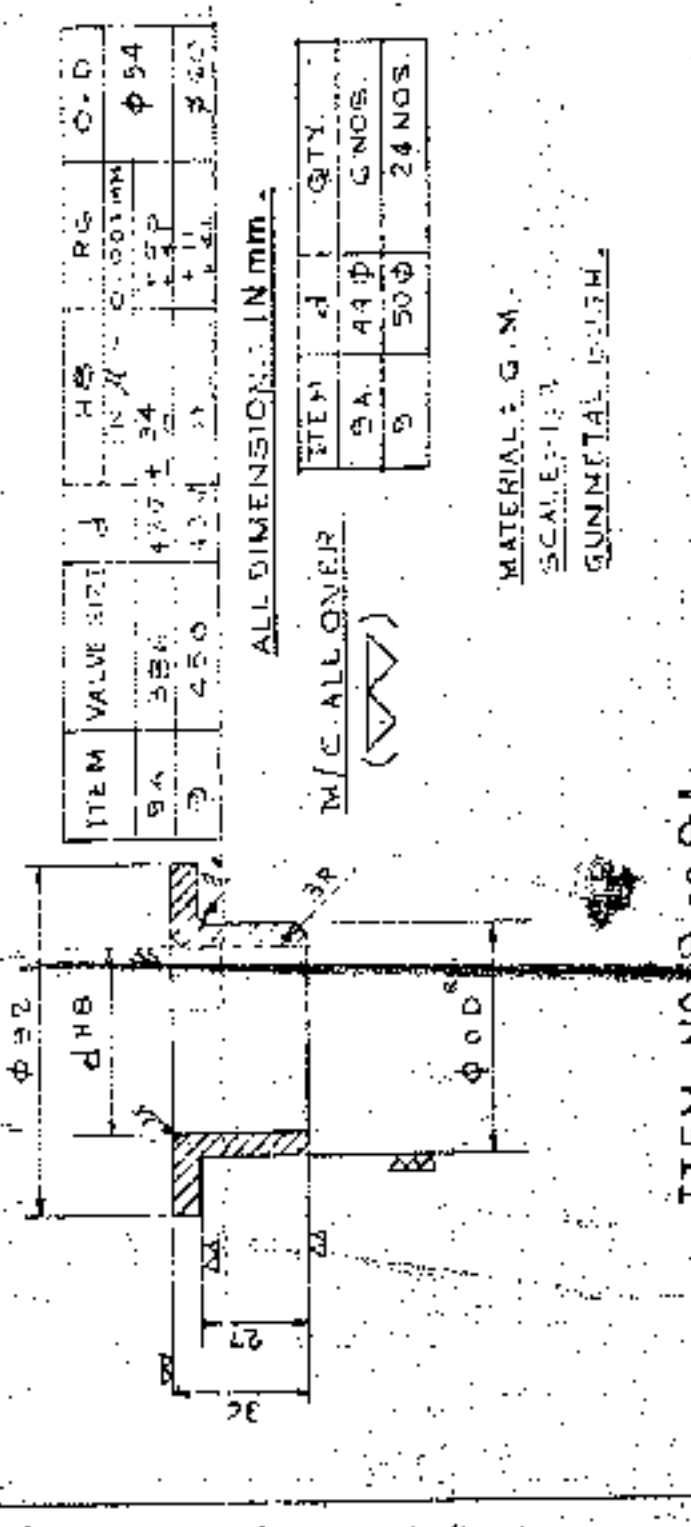
SECTION A-A



ITEM NO. 16 GEAR

ITEM	QTY.	UNIT	REMARKS
16	1	EA	GEAR FOR GEAR BOX

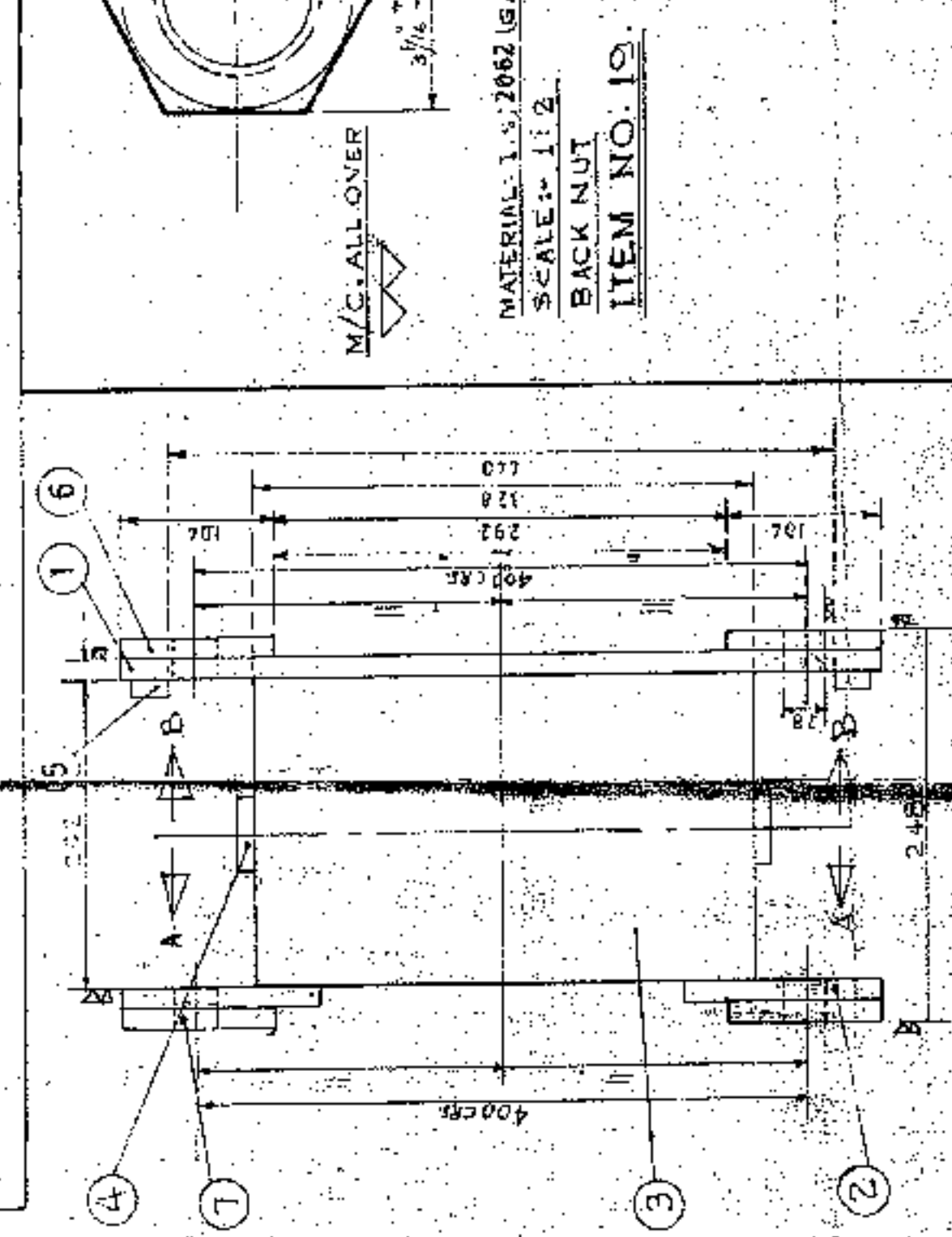
SCALE: 1:1  
MATERIAL: STEEL



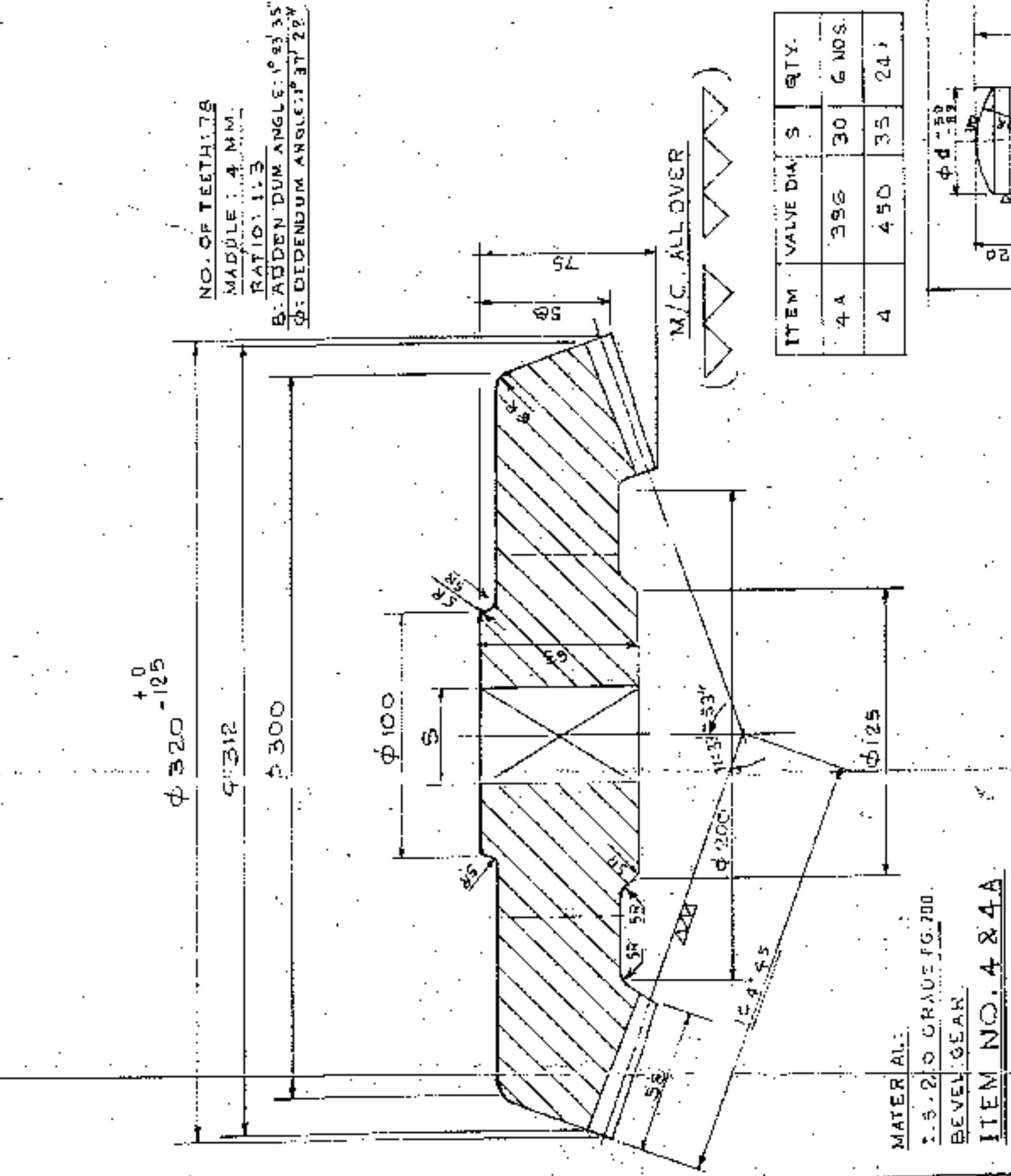
ITEM NO. 18 GEAR

ITEM	QTY.	UNIT	REMARKS
18	1	EA	GEAR FOR GEAR BOX

SCALE: 1:1  
MATERIAL: STEEL



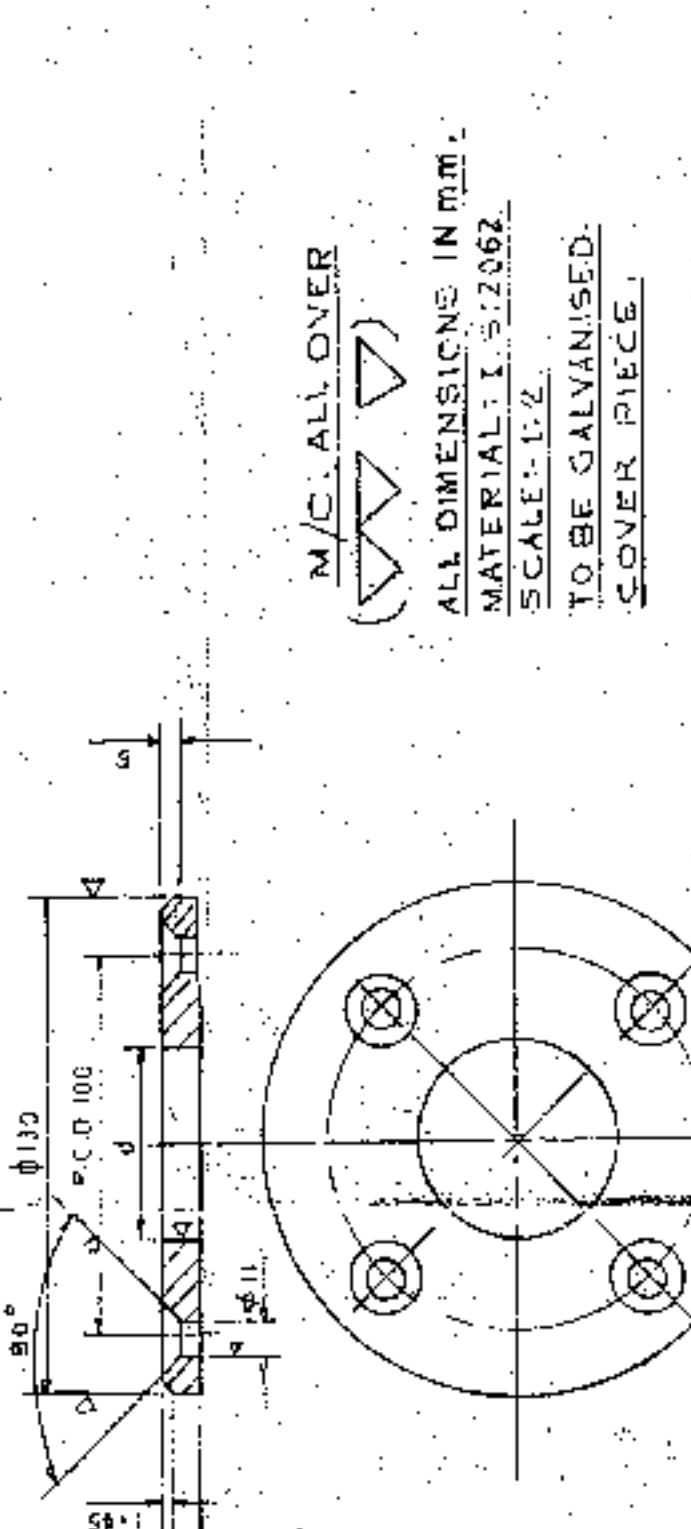
ITEM NO. 19



ITEM NO. 21 BEVEL GEAR

ITEM	QTY.	UNIT	REMARKS
21	1	EA	BEVEL GEAR FOR GEAR BOX

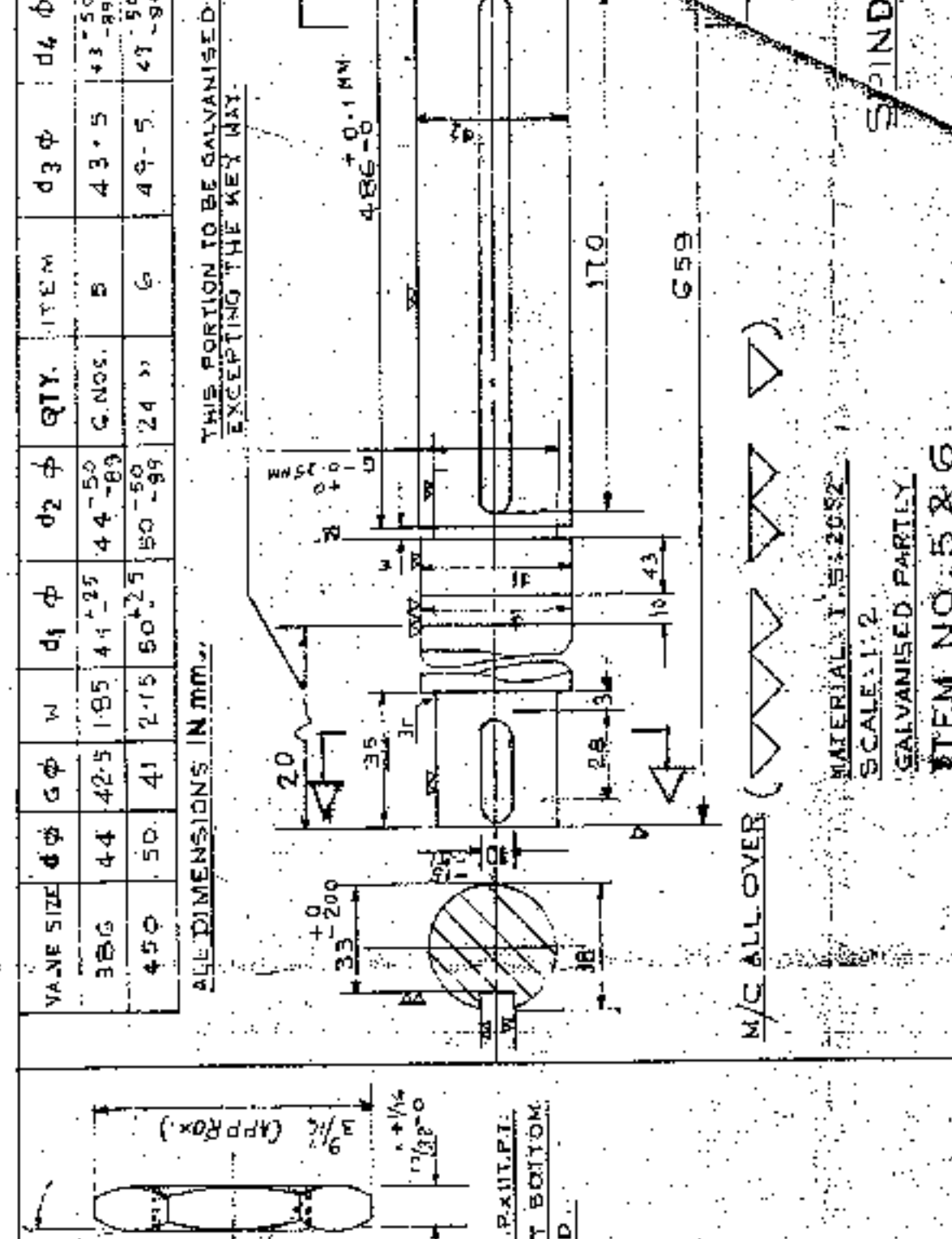
SCALE: 1:1  
MATERIAL: STEEL



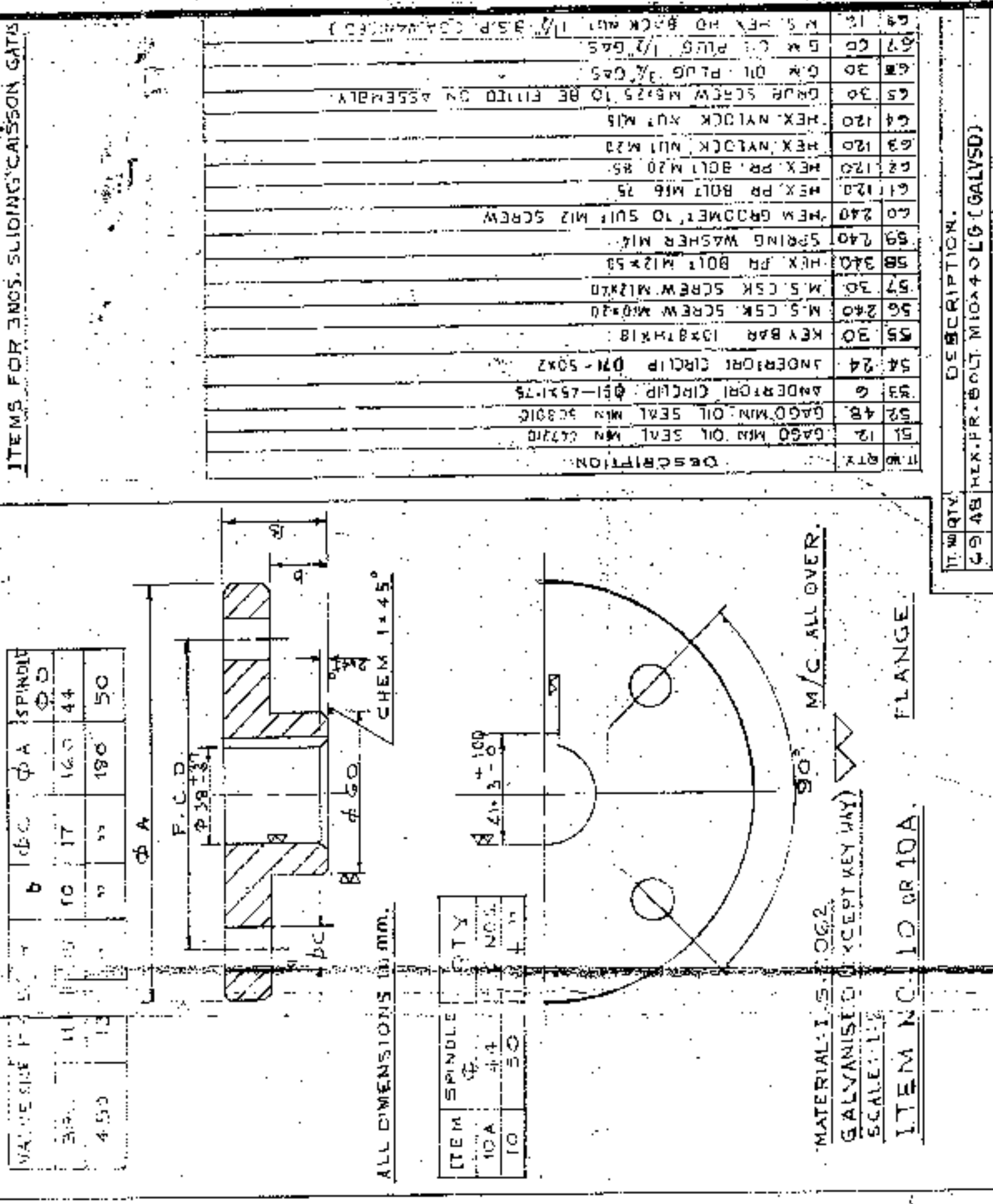
ITEM NO. 23 BEVEL GEAR

ITEM	QTY.	UNIT	REMARKS
23	1	EA	BEVEL GEAR FOR GEAR BOX

SCALE: 1:1  
MATERIAL: STEEL



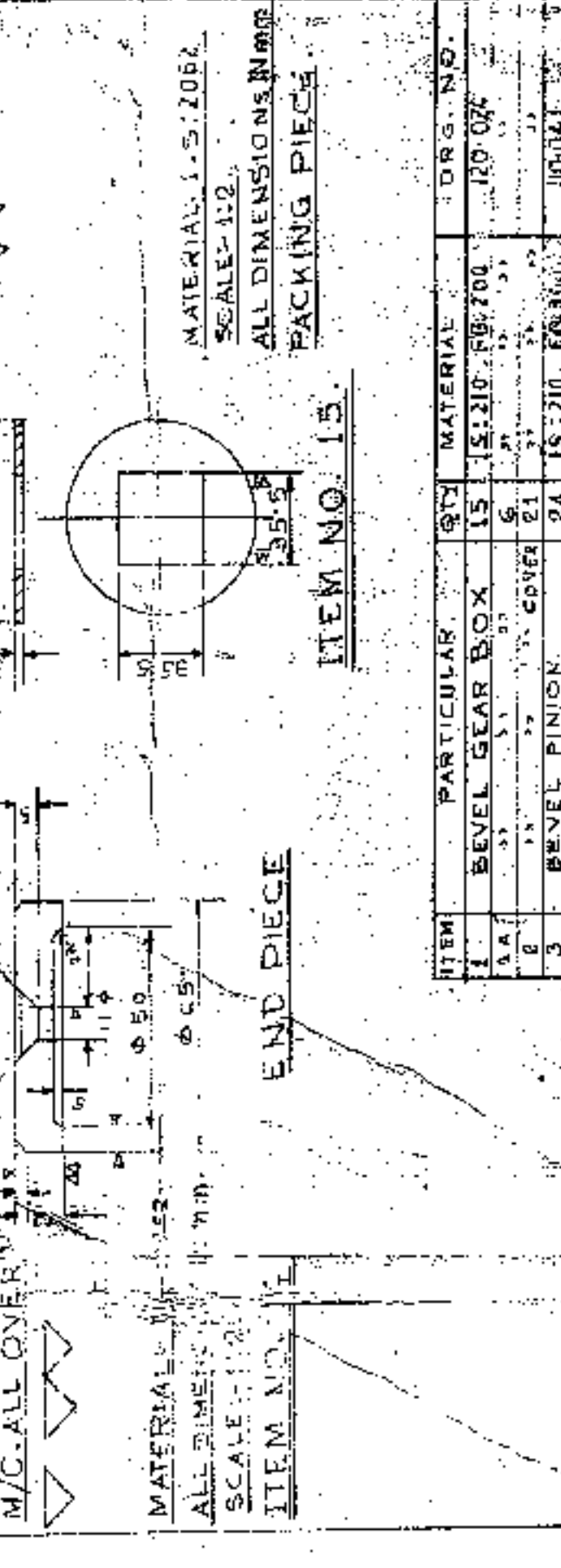
ITEM NO. 24



ITEM NO. 26 BEVEL GEAR

ITEM	QTY.	UNIT	REMARKS
26	1	EA	BEVEL GEAR FOR GEAR BOX

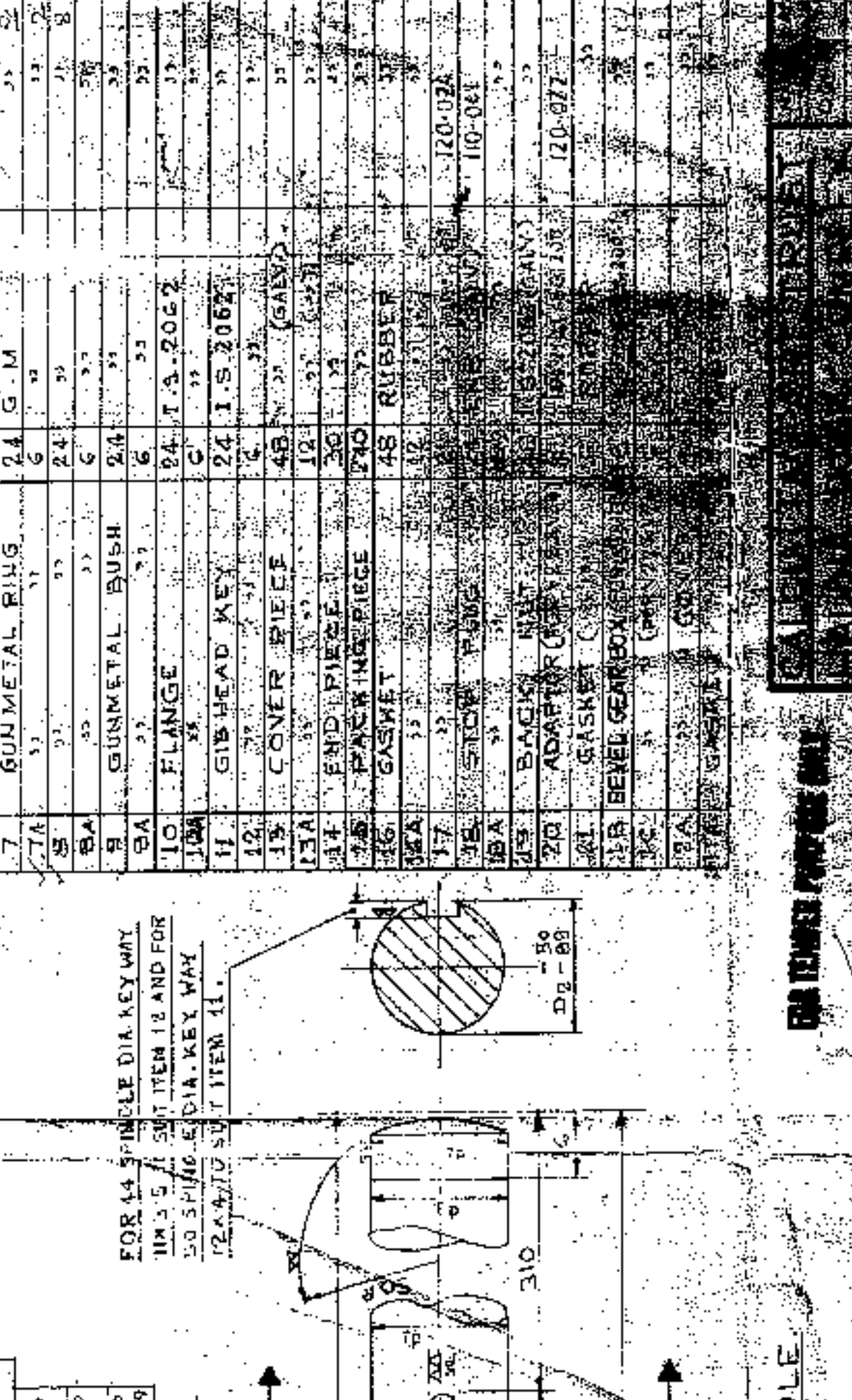
SCALE: 1:1  
MATERIAL: STEEL



ITEM NO. 28 BEVEL GEAR

ITEM	QTY.	UNIT	REMARKS
28	1	EA	BEVEL GEAR FOR GEAR BOX

SCALE: 1:1  
MATERIAL: STEEL

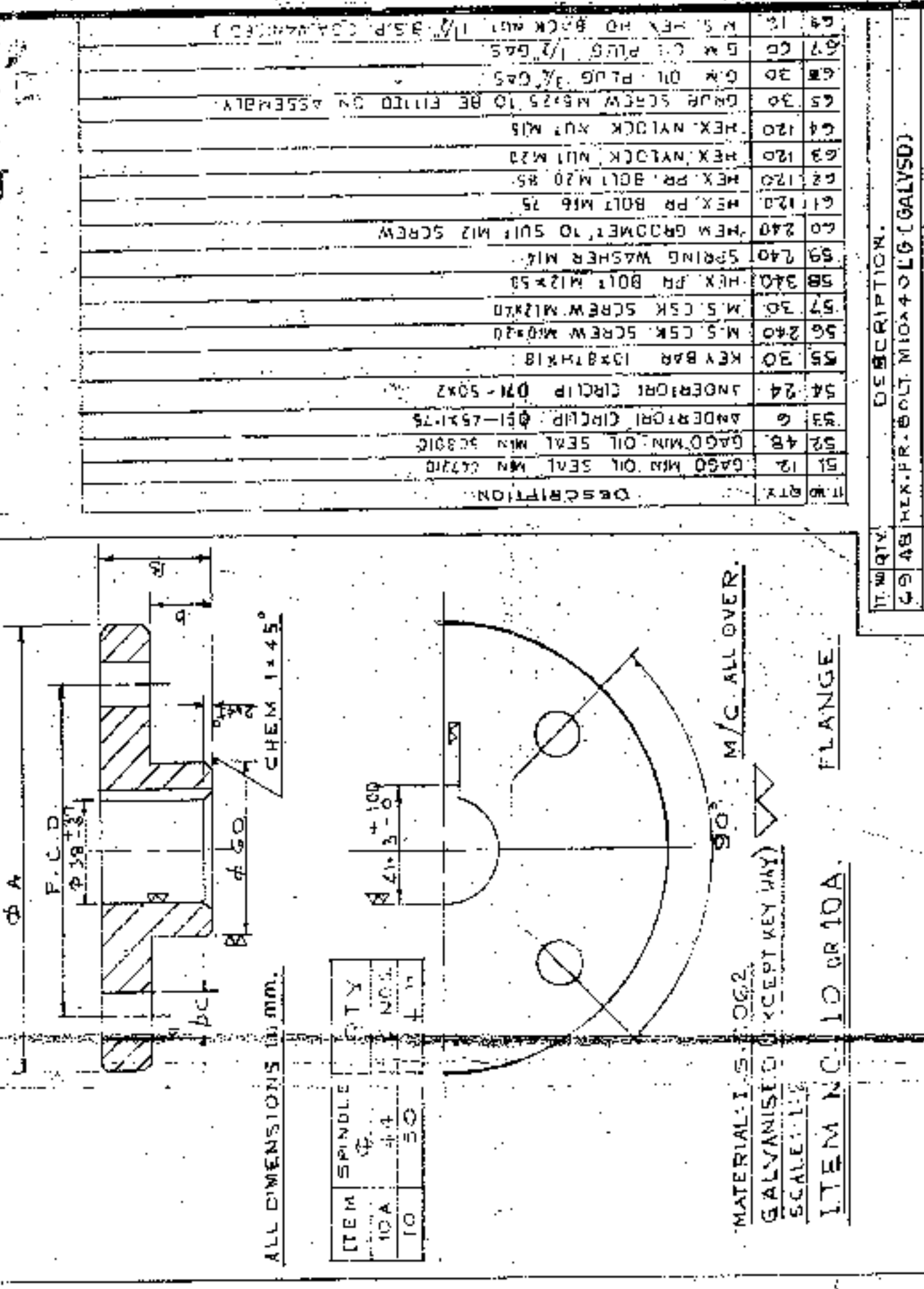


ITEM NO. 29

ITEM NO. 30 BEVEL GEAR

ITEM	QTY.	UNIT	REMARKS
30	1	EA	BEVEL GEAR FOR GEAR BOX

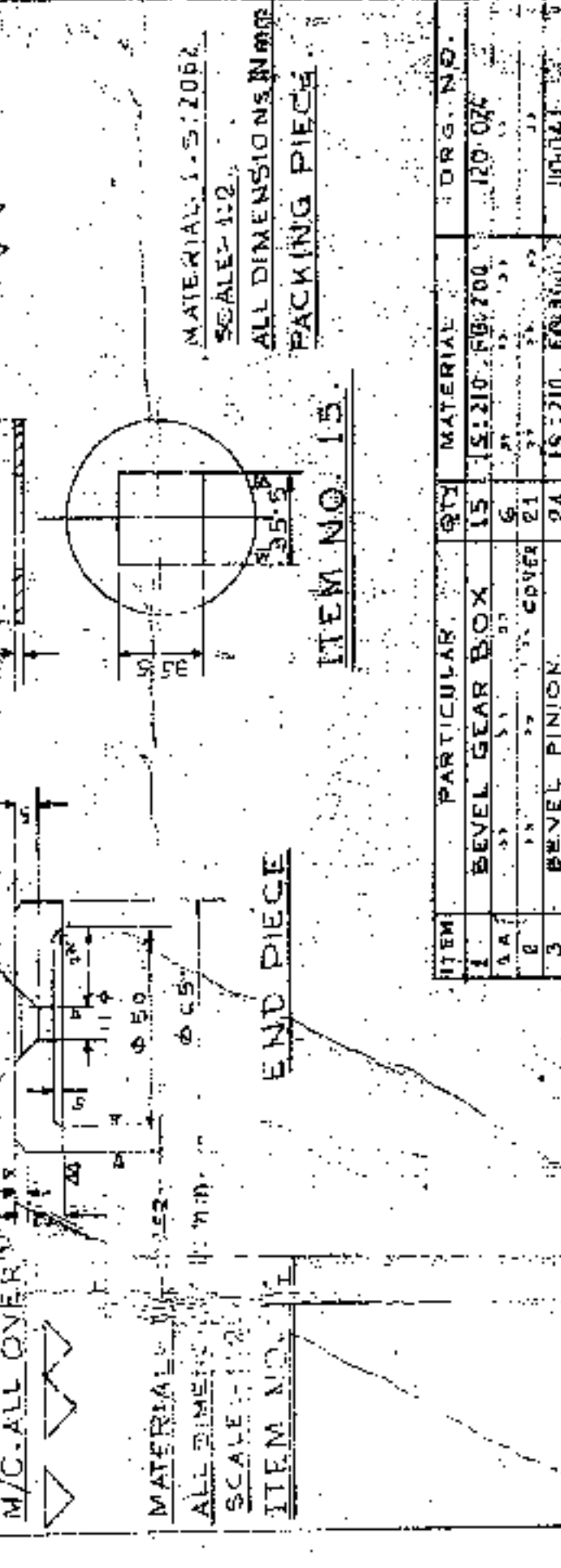
SCALE: 1:1  
MATERIAL: STEEL



ITEM NO. 32 BEVEL GEAR

ITEM	QTY.	UNIT	REMARKS
32	1	EA	BEVEL GEAR FOR GEAR BOX

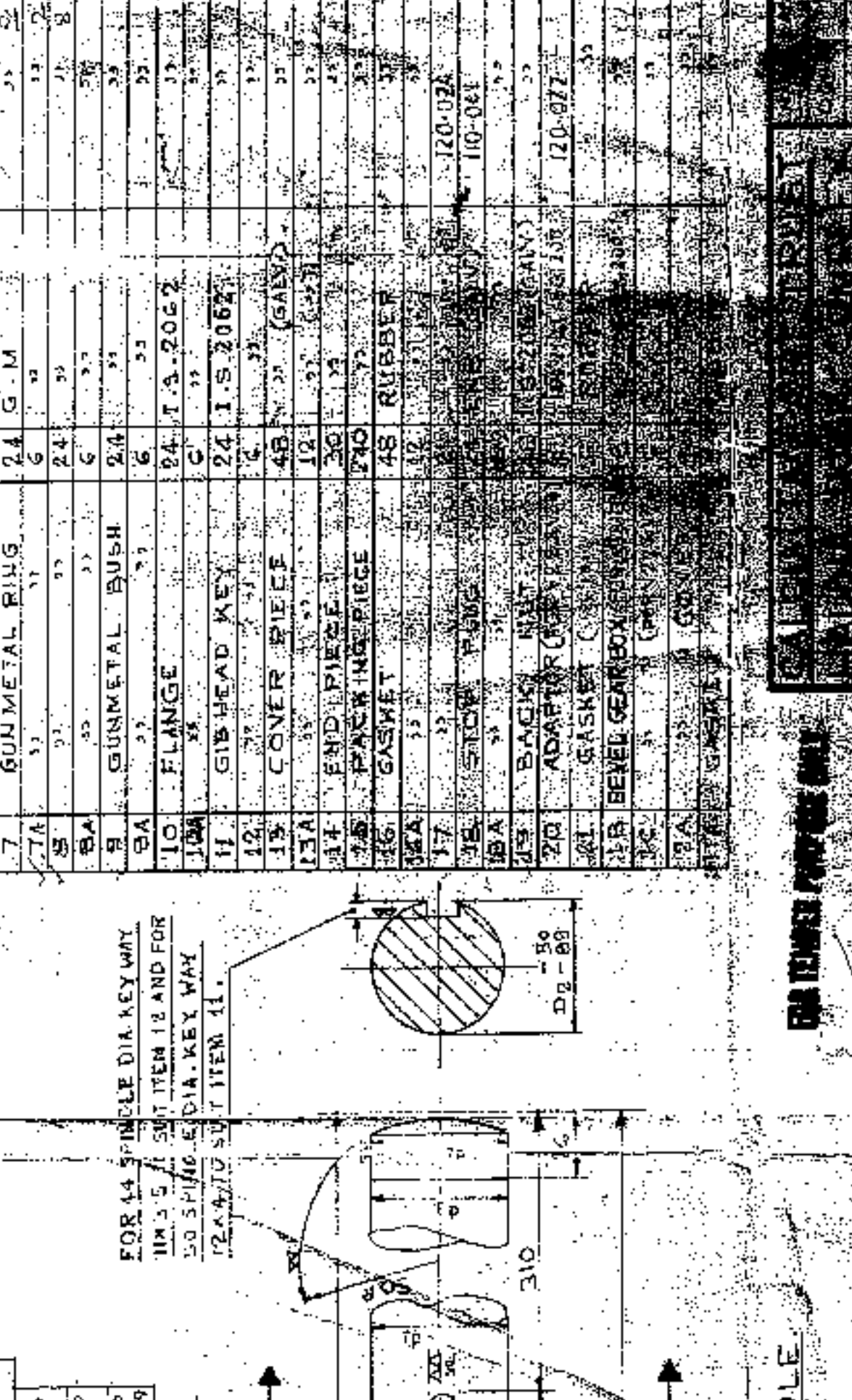
SCALE: 1:1  
MATERIAL: STEEL



ITEM NO. 34 BEVEL GEAR

ITEM	QTY.	UNIT	REMARKS
34	1	EA	BEVEL GEAR FOR GEAR BOX

SCALE: 1:1  
MATERIAL: STEEL



ITEM NO. 35

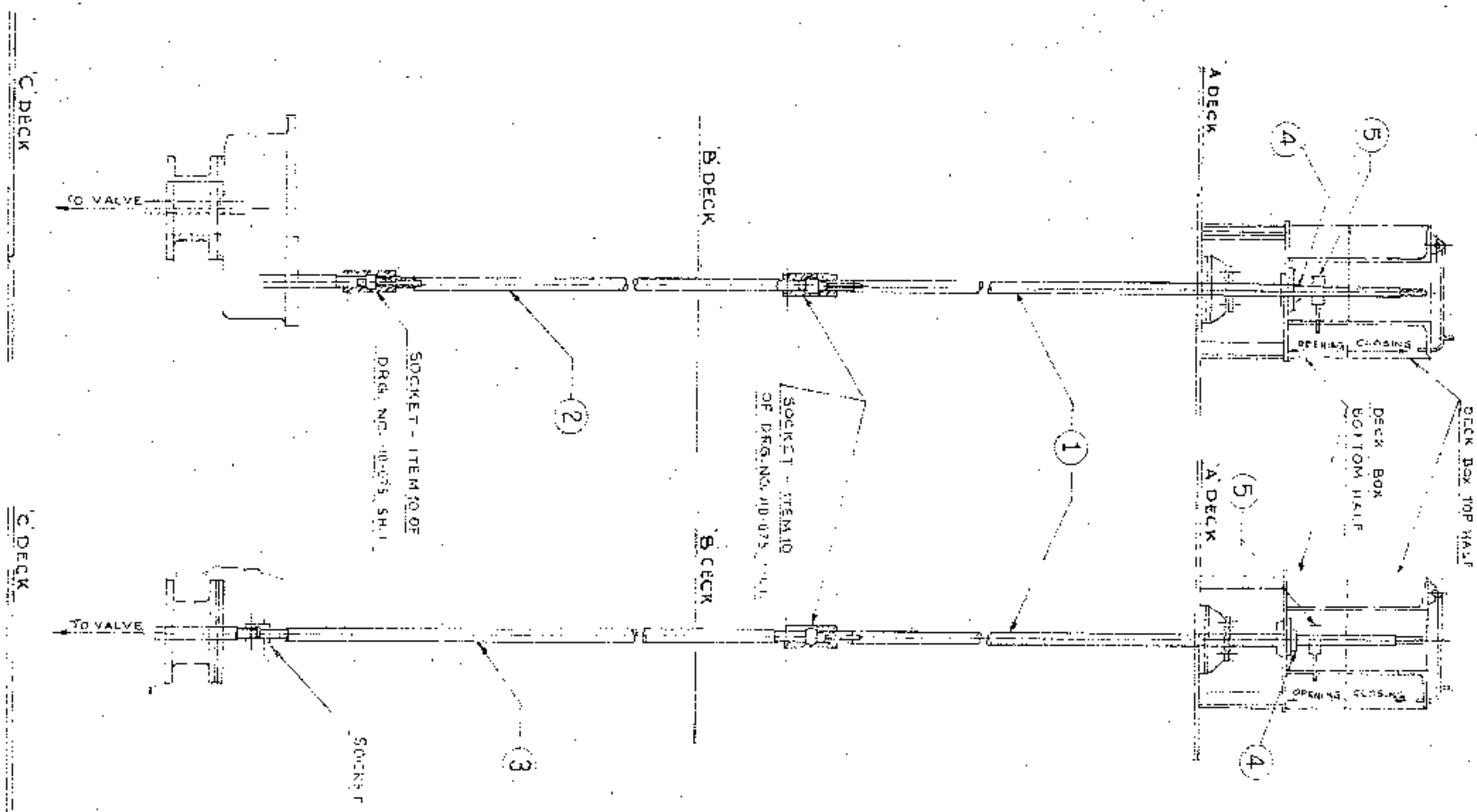
FOR TENDER PURCHASE ONLY

16

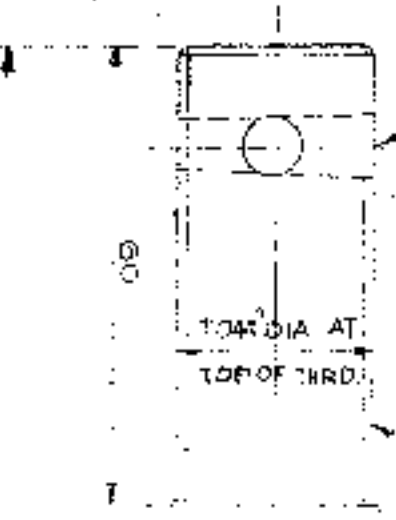


ARRANGEMENT OF SPINDLES  
FOR VALVE NOS. V5A, V5B & V5C  
(SPUR GEAR OPERATION)

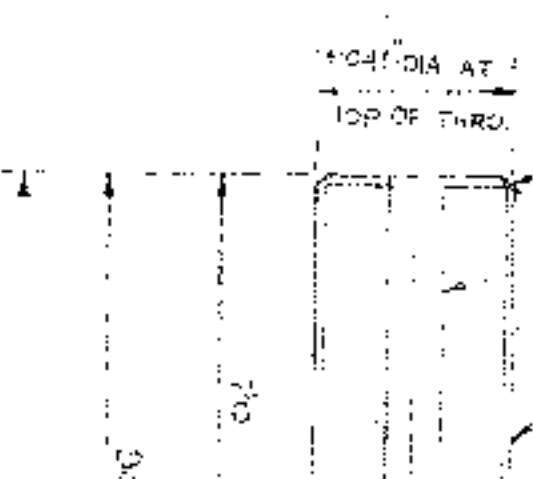
ARRANGEMENT OF SPINDLES  
FOR VALVE NOS. V57 TO V58  
(STRAIGHT OPERATION)



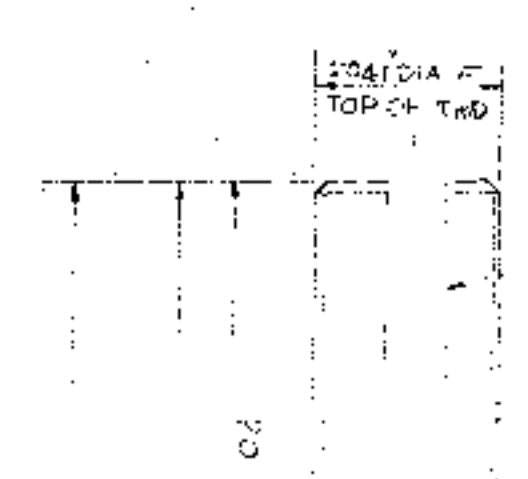
NOTE: HOLE FOR SO. DIA. 1/2" IN SOCKET & STEM OF BSG NO. 110-075 SH.



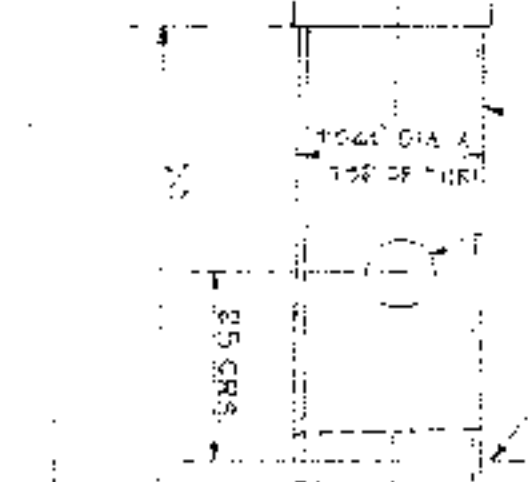
WIDE X 39 DEEP ALONG TO SUIT ITEM 1 OF L.S. 19 CM Ø 45 (BOTH ENDS) 52 CM Ø 45 B.S.



WIDE X 39 DEEP ALONG TO SUIT ITEM 1 OF L.S. 19 CM Ø 45 (BOTH ENDS) 52 CM Ø 45 B.S.



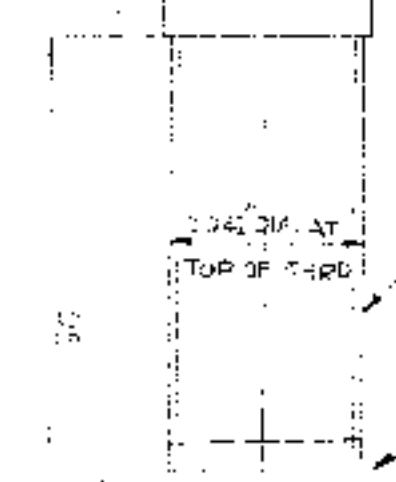
2.1 PER NO. 55 AT 90° ANGLES FOR 50 CM DIA. DIA. 19 CM Ø 45 (BOTH ENDS) 52 CM Ø 45 B.S.



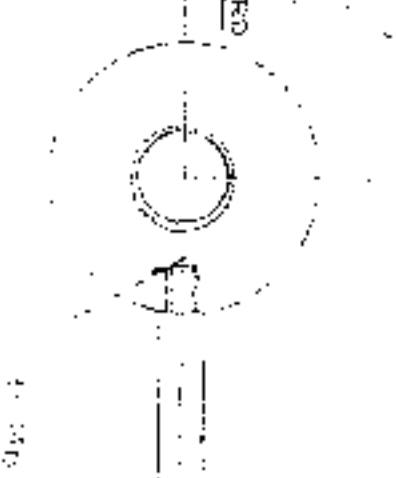
WIDE X 39 DEEP ALONG TO SUIT ITEM 1 OF L.S. 19 CM Ø 45 (BOTH ENDS) 52 CM Ø 45 B.S.



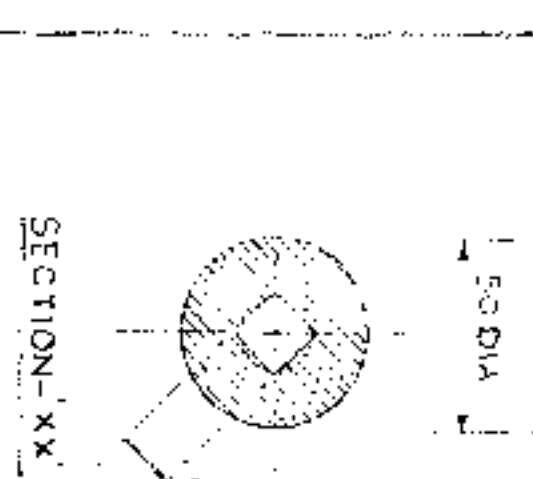
NOTE: HOLE FOR SO. DIA. 1/2" IN SOCKET & STEM OF BSG NO. 110-075 SH.



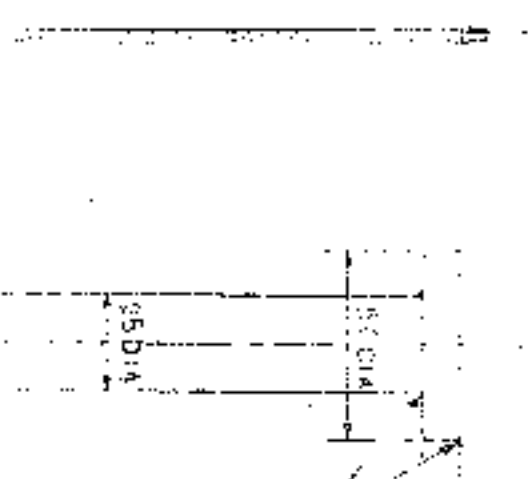
NOTE: HOLE FOR SO. DIA. 1/2" IN SOCKET & STEM OF BSG NO. 110-075 SH.



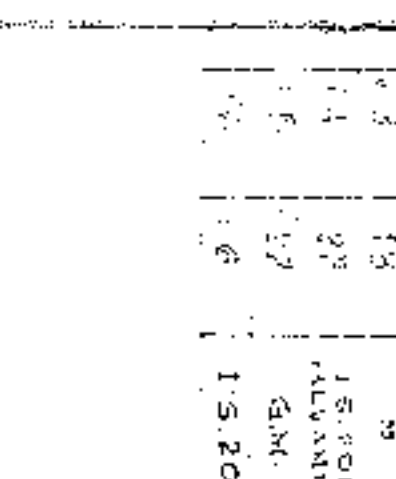
WIDE X 39 DEEP ALONG TO SUIT ITEM 1 OF L.S. 19 CM Ø 45 (BOTH ENDS) 52 CM Ø 45 B.S.



WIDE X 39 DEEP ALONG TO SUIT ITEM 1 OF L.S. 19 CM Ø 45 (BOTH ENDS) 52 CM Ø 45 B.S.



NOTE: HOLE FOR SO. DIA. 1/2" IN SOCKET & STEM OF BSG NO. 110-075 SH.



ITEM NO.	MATERIAL	SPINDLE	PARTICULARS
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98	1000	1000	1000
99	1000	1000	1000
100	1000	1000	1000

NOTE: 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED. 2. VALVE NOS. V5A TO V58 ARE MARKED WITHIN NOS. 5.

FOR TENDER PURPOSE ONLY

KOLKATA PORT TRUST  
HALLA PORT TRUST  
MIDDELS DRG. OFFICE

5" SURFACE DRAIN VALVES  
DETAILS OF VALVE OPERATING SPINDLES

REV NO. 1  
SHEET NO. 1  
3000, SHIPING CASSON GATES  
DRG. NO. 110-075

DATE: 10/10/75

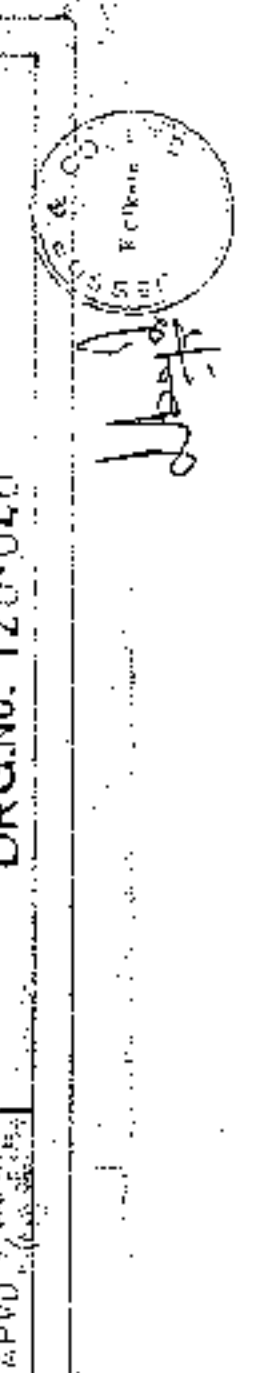
BY: [Signature]

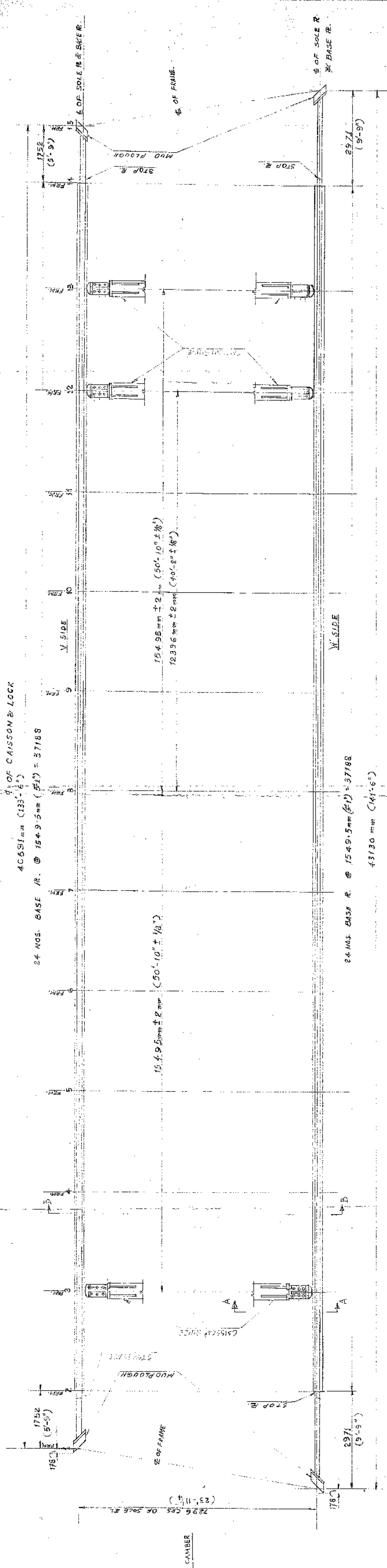
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APPROVED: [Signature]

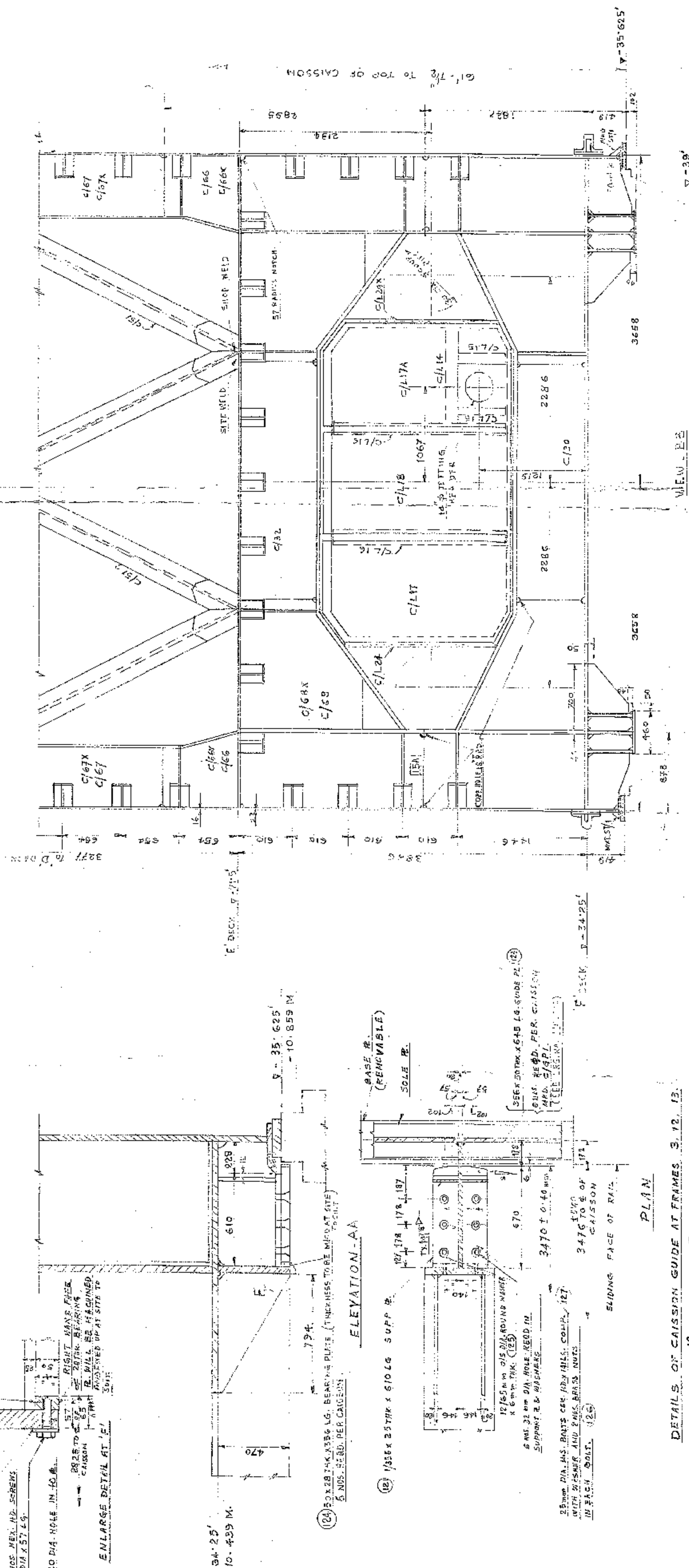








PLAN OF CAISSON BELOW F DECK



DETAILS OF CAISSON GUIDE AT FRAMES 3, 12, 13.  
18 SETS. RECD. THIS  
(6 SETS PER CAISSON)

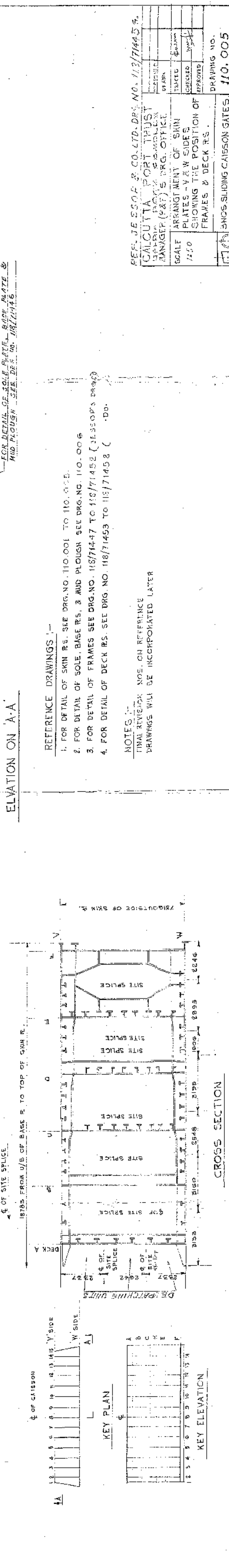
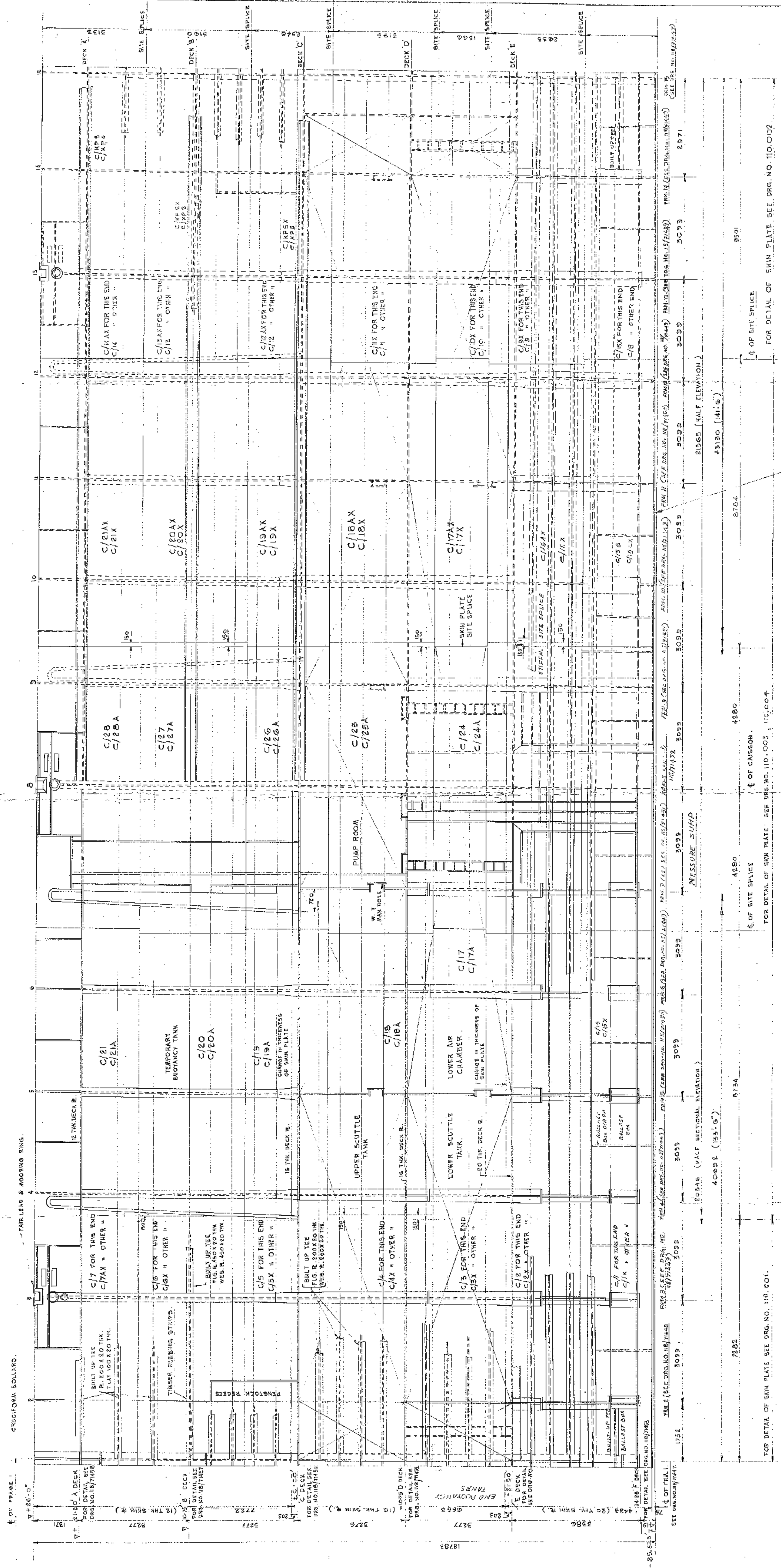
REF. JESSOPS DPG. NO. 1872446H	DATE OF
CALCUTTA PORT TRUST	DESIGN
HALDIA DOCK COMPLEX	DESIGN
MANAGER P.W.E. OFFICE	TO: J.P.P.
SCALE	TITLE
1:100	PLAN BELOW F DECK & FRAME
1:100	FOLLOW F DECK SHIMMING UNDER
1:100	PLATE & JACKING PAD DETAIL
1:100	DRG. NO.
1:100	110.006





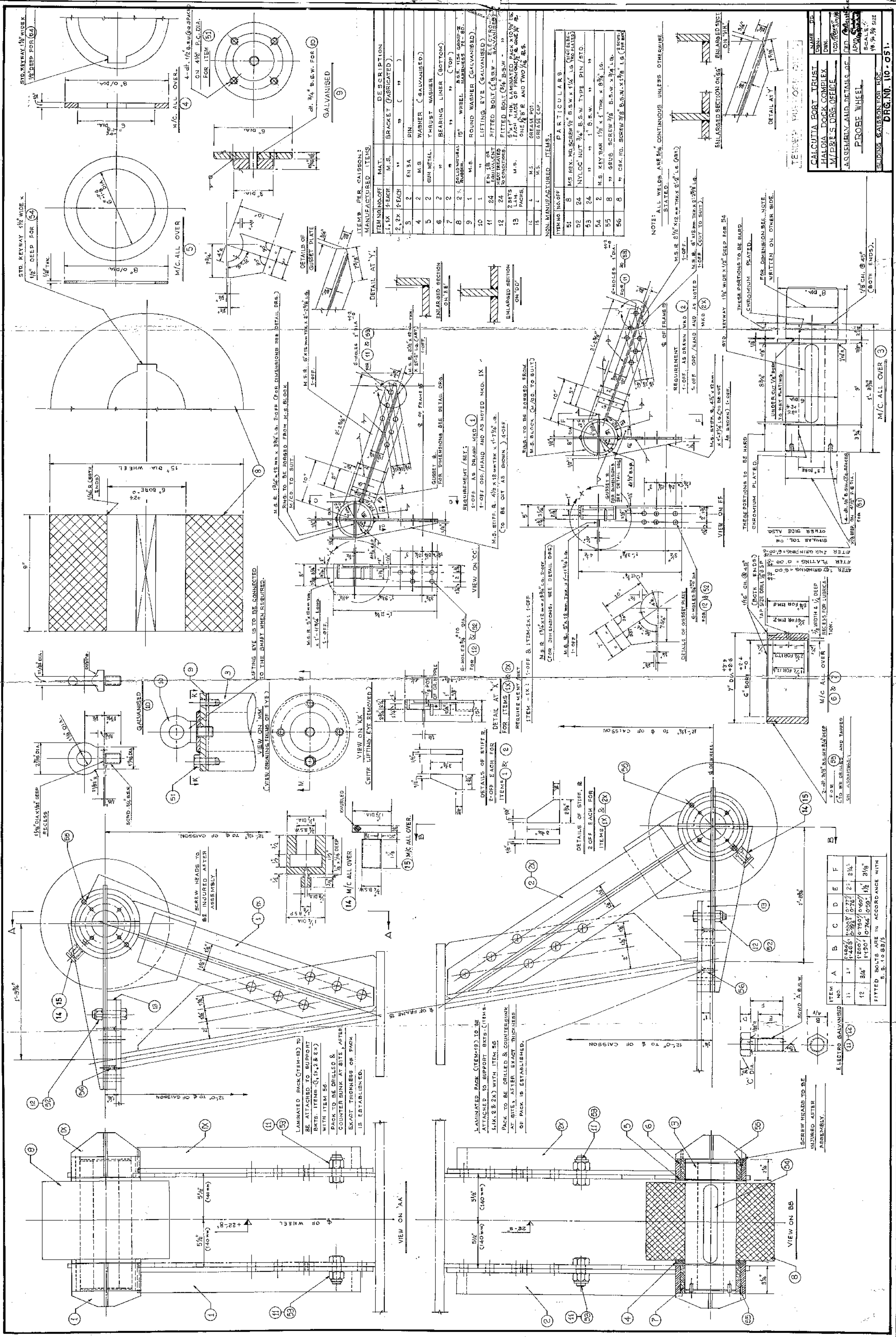






PER: JESSOP & CO. LTD. DRG. NO. 118/71445-54.	
CALCUTTA, PORT TRUST	
MANAGER (S.S.)'S OFFICE	
SCALE	ARRANGEMENT OF SKIN
1:10	PLATES - V & W SIDE
	SHOWING THE POSITION OF
	FRAMES & DECK RS.
	SKIN'S SLIDING CAISSON GATES
	DRAWING NO.
	110.005



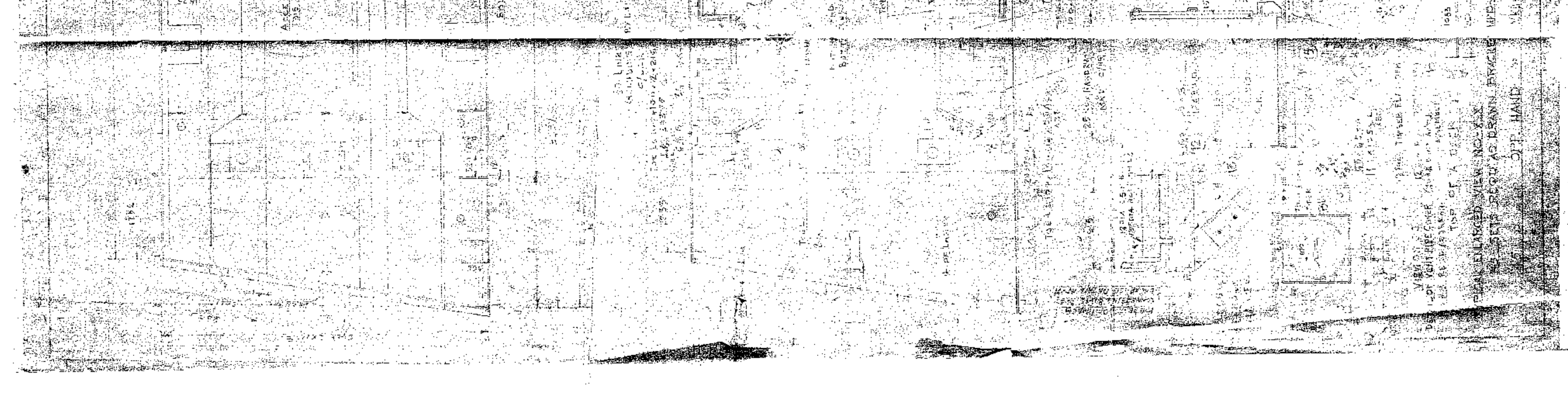
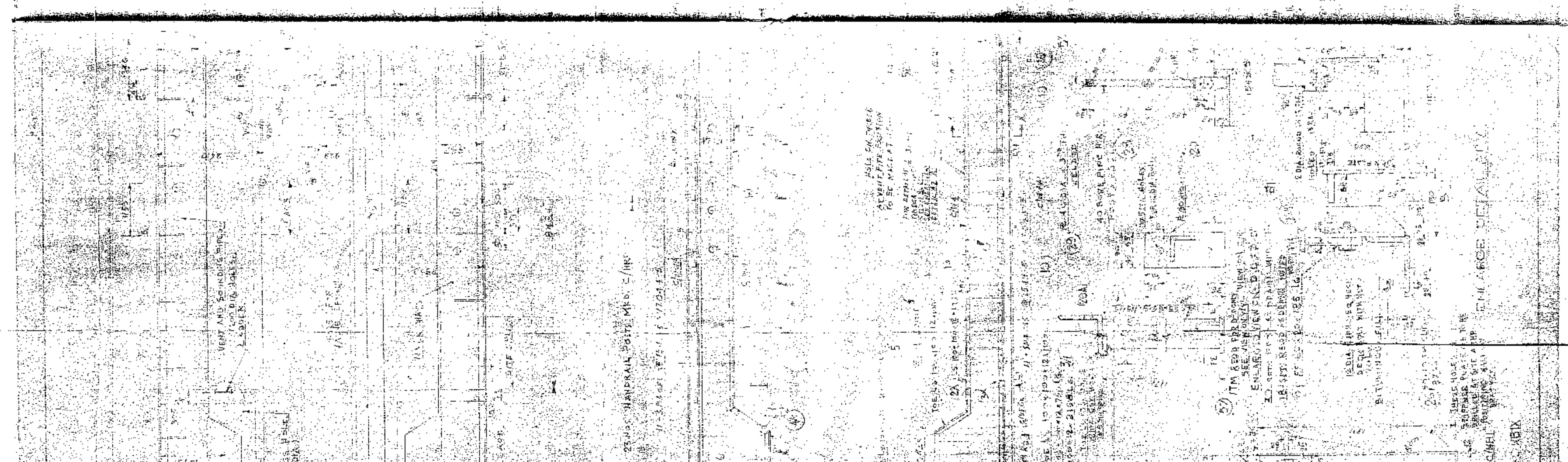
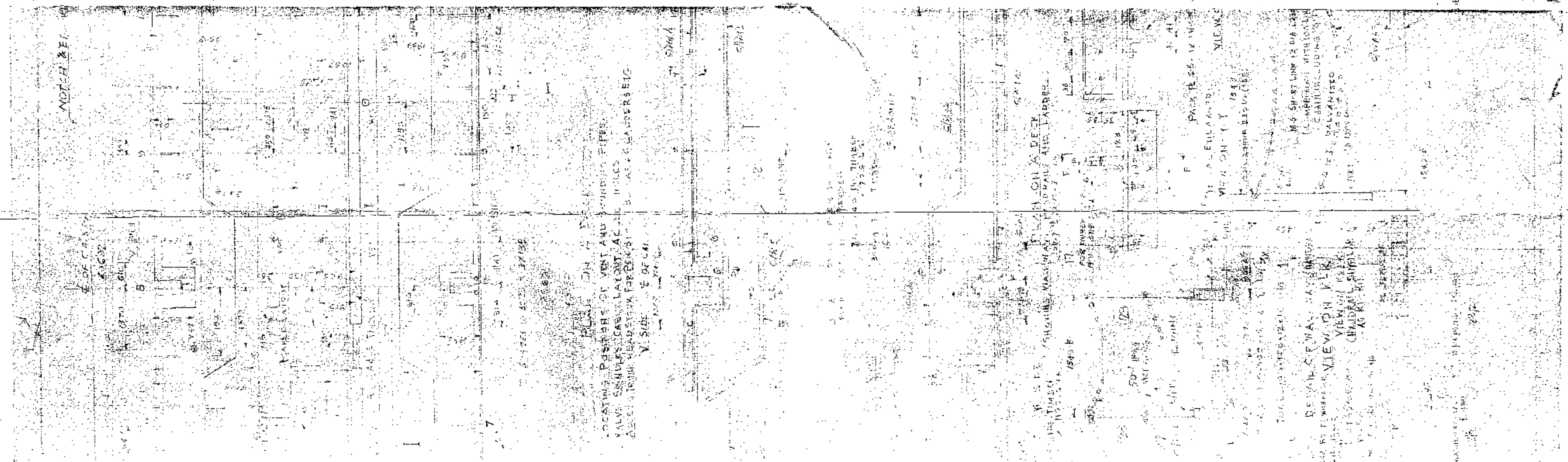
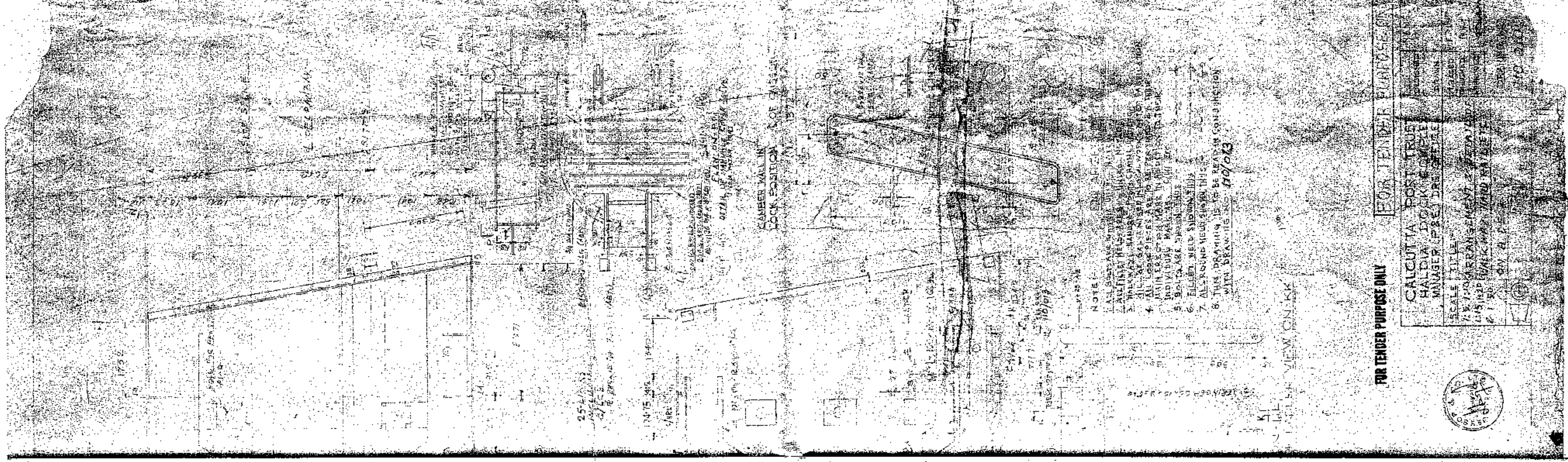


NAME OF	CALCUTTA PORT TRUST
OWN	HALOA DOCK COMPLEX
TCD	M/PB'S DRG.OFFICE
APPROVED BY	ASSEMBLY AND DETAILS OF
SCALE	PROBE WHEEL
1/4" = 1' 0" SIZE	ENDING SAISON FOR HDE
	DRG NO. 110-0-051

ITEM NO.	A	B	C	D	E	F
11	1" 1/2	1' 10"	1' 10"	0' 7 1/2"	2'	2 1/4"
12	3/4"	1' 20"	0' 7 1/2"	0' 6 1/2"	1 1/2'	3/8"

FITTED BOLTS ARE IN ACCORDANCE WITH  
B. S. 1983/5





FOR TENDER PURPOSE ONLY

CALCUTTA POST OFFICE  
HALLWAY  
NUMBER 100  
SCALE 1/4" = 1'-0"

1. ALL WORK TO BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS AND CONDITIONS OF THE TENDER.  
2. ALL MATERIALS TO BE USED SHALL BE OF THE BEST QUALITY AND SHALL BE SUBJECT TO INSPECTION AND TESTS BY THE ENGINEER.  
3. ALL WORKMANSHIP SHALL BE TO THE SATISFACTION OF THE ENGINEER.  
4. ALL WORK TO BE COMPLETED WITHIN THE SPECIFIED TIME.  
5. ALL WORK TO BE DONE IN ACCORDANCE WITH THE DRAWINGS AND SPECIFICATIONS.

10/10/00

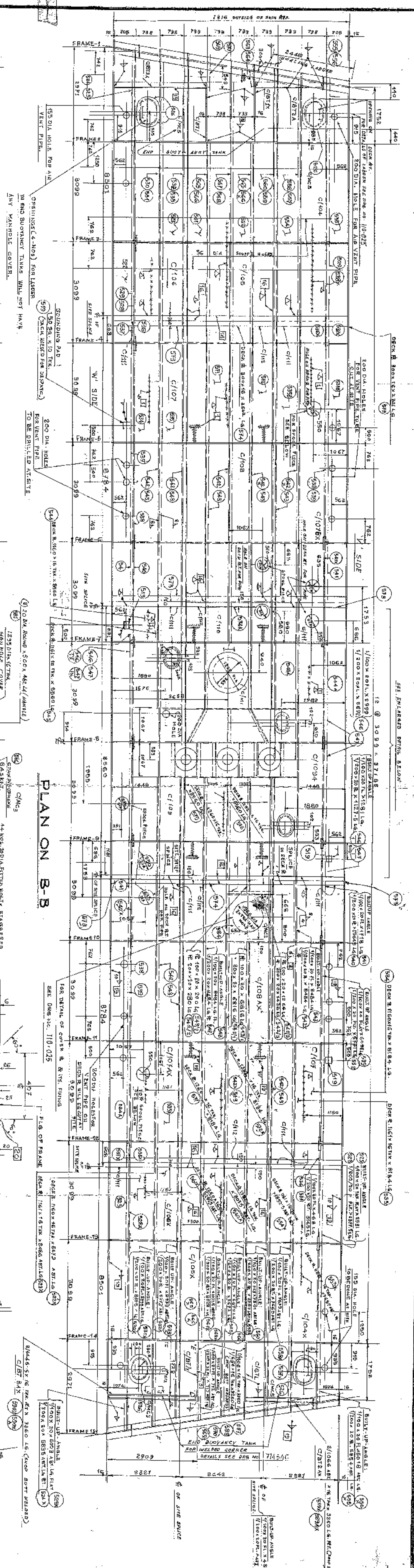
DETAIL OF WALKWAY / HALLWAY  
VIEW ON E.L.

DETAIL OF WALKWAY / HALLWAY  
VIEW ON E.L.

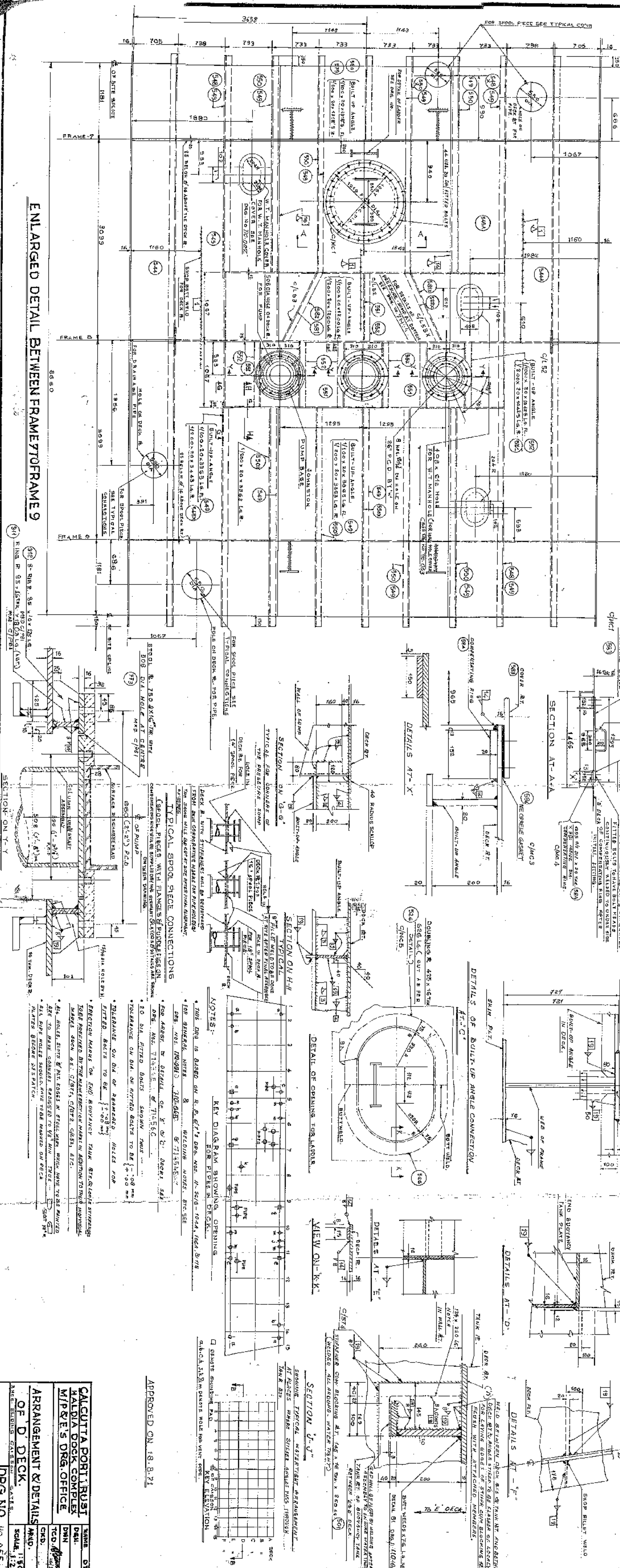
DETAIL OF WALKWAY / HALLWAY  
VIEW ON E.L.

DETAIL OF WALKWAY / HALLWAY  
VIEW ON E.L.





PLAN ON B-B



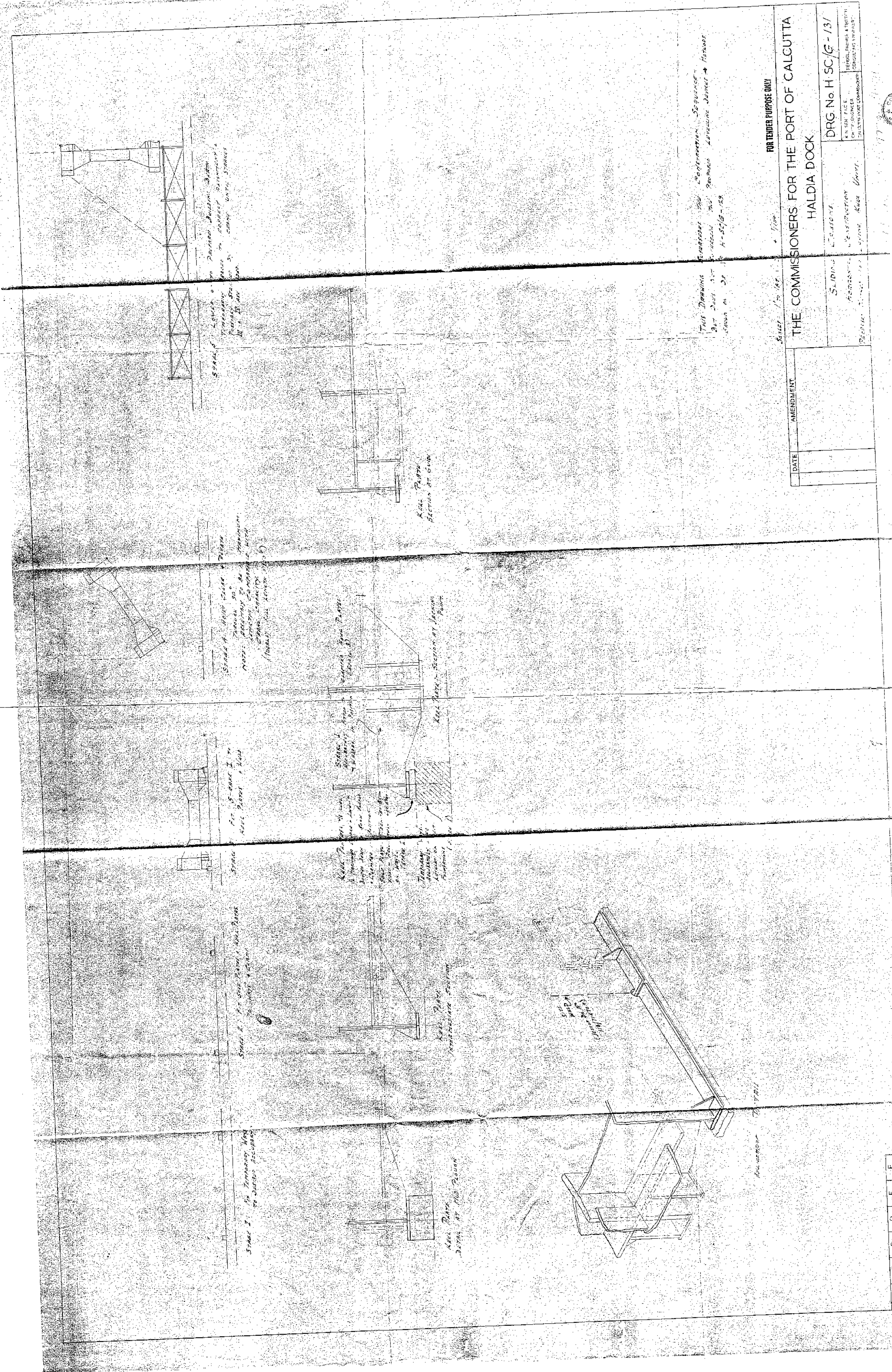
ENLARGED DETAIL BETWEEN FRAME 7 TO FRAME 9

APPROVED ON 18.8.71

ARRANGEMENT & DETAILS  
OF D DECK

SCALE: 1/8\"/>





THIS DRAWING IS A PRELIMINARY DESIGN AND IS NOT TO BE USED FOR CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE USER TO VERIFY THE ACCURACY OF THE INFORMATION PROVIDED.

FOR TENDER PURPOSE ONLY

DATE: \_\_\_\_\_ AMENDMENT: \_\_\_\_\_

THE COMMISSIONERS FOR THE PORT OF CALCUTTA

HALDIA DOCK

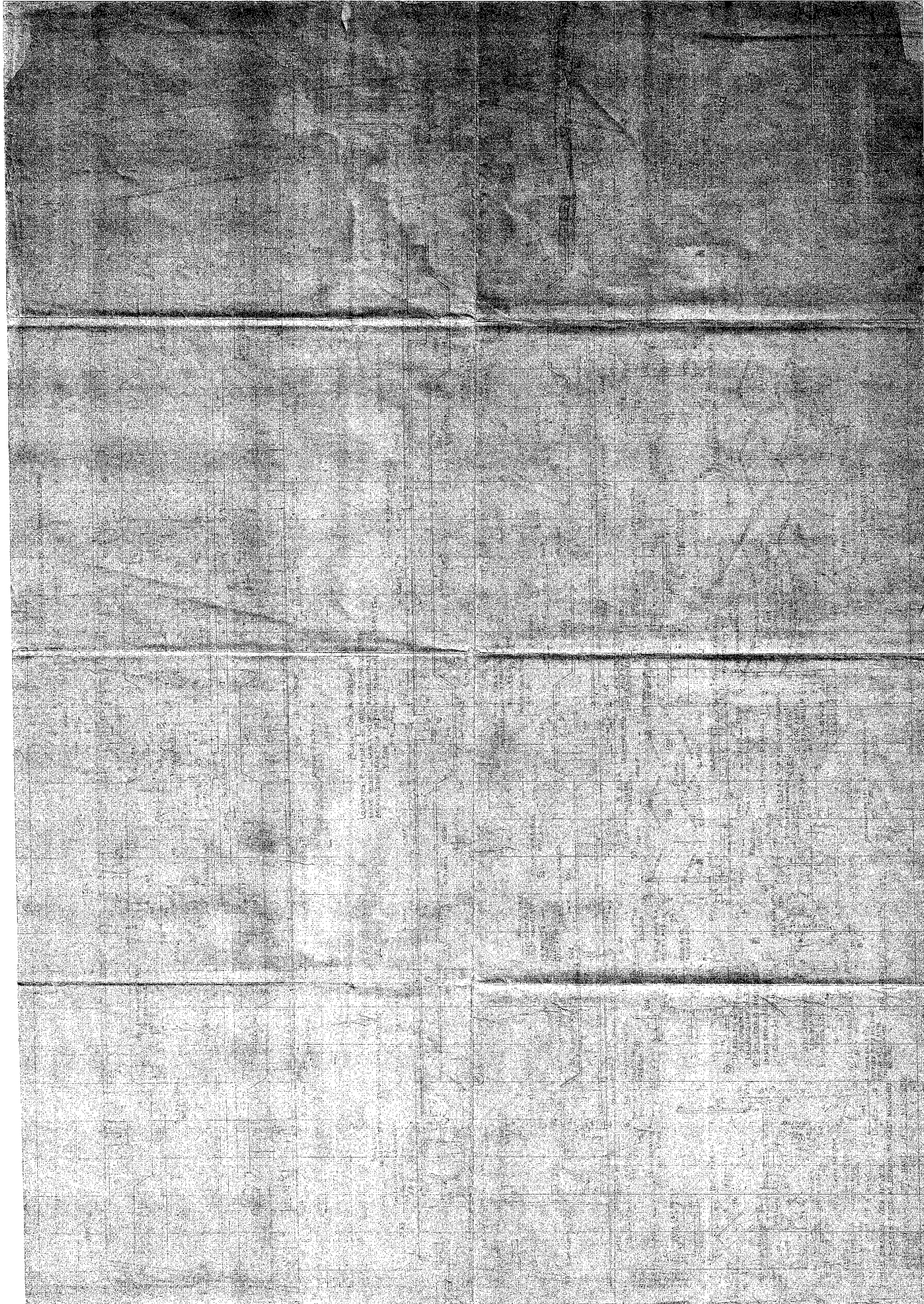
DRG No H SC/E-131

SCALE: 1" = 10'

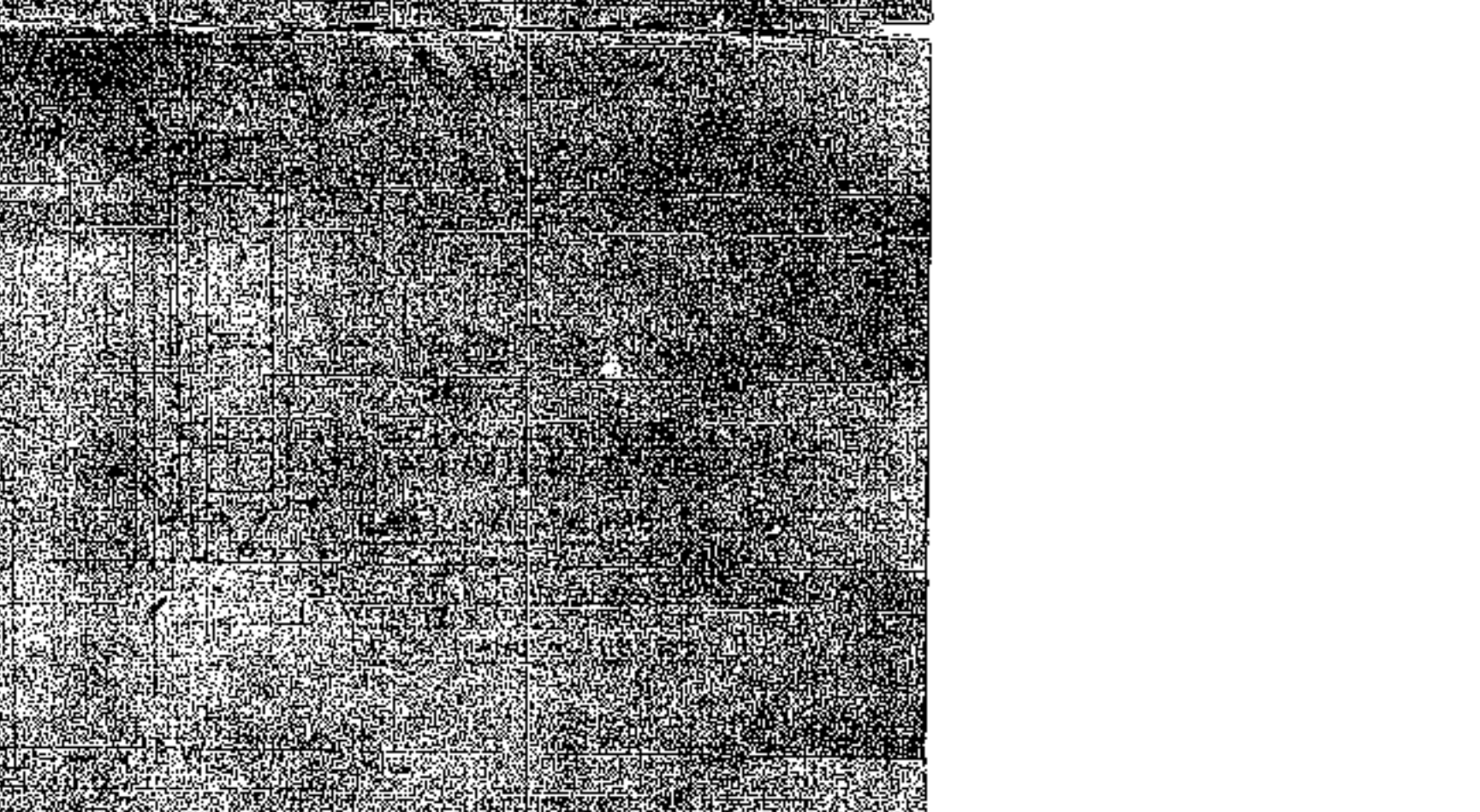
REVISIONS:

NO.	DATE	DESCRIPTION
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2		







[illegible]







A	B	C	D	E	F
1	2	3	4	5	6

DATE	AMENDMENT	DRG No H-30/6-127
THE COMMISSIONERS FOR THE PORT OF CALCUTTA HALDIA DOCK		DRG No H-30/6-127 HALDIA DOCK



ACAL DETAIL OF NAKA  
BOLARD POSITION  
-1 FRAME 30 2

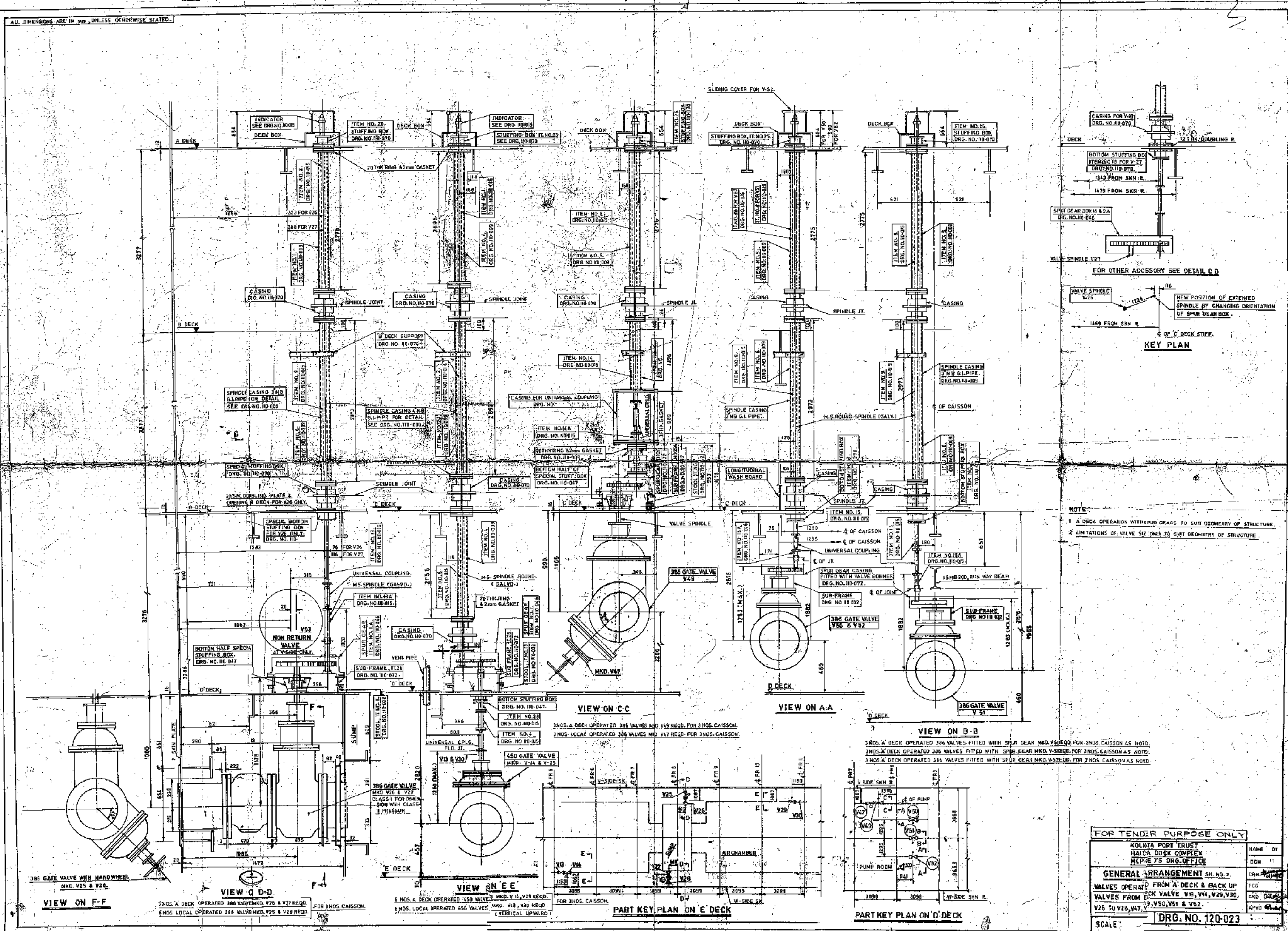




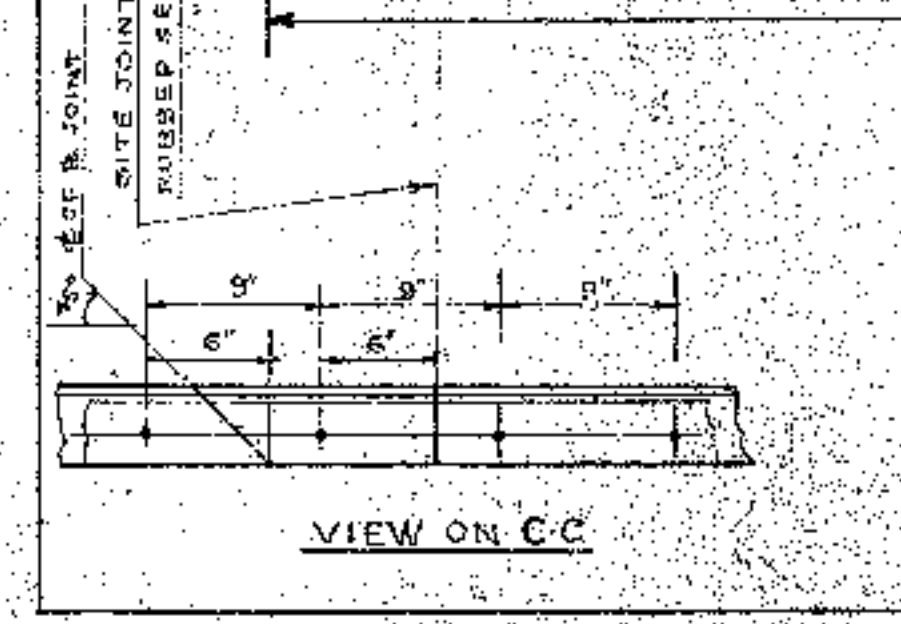
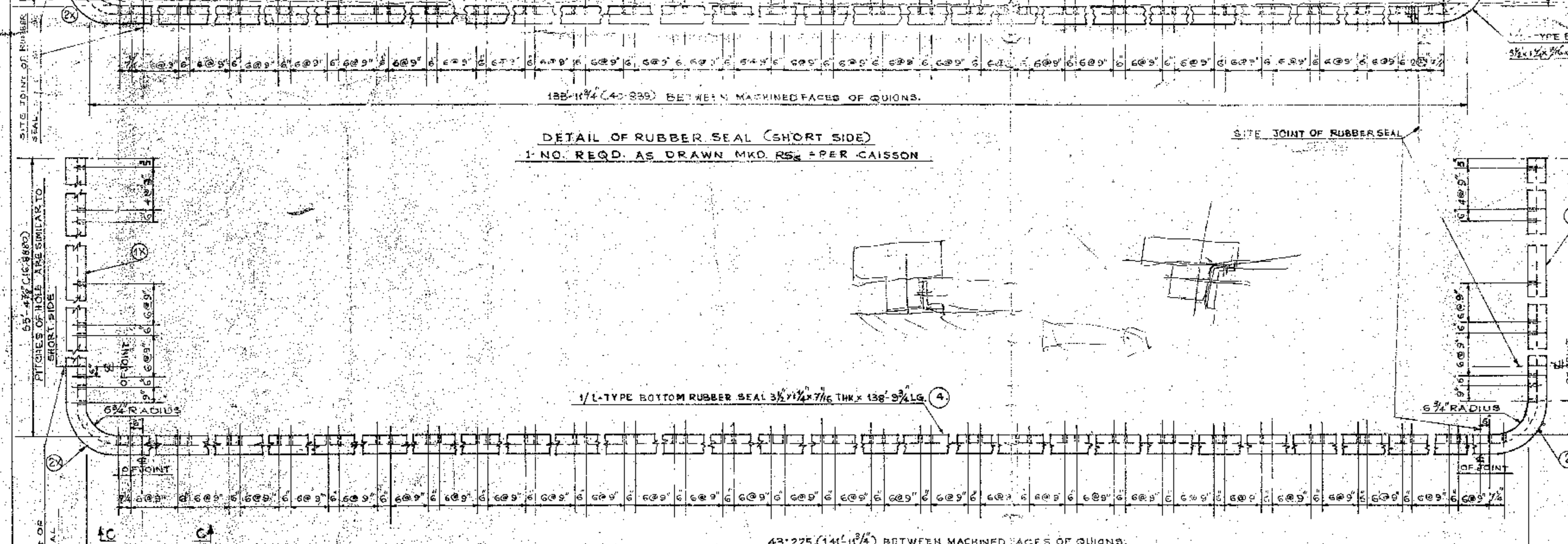
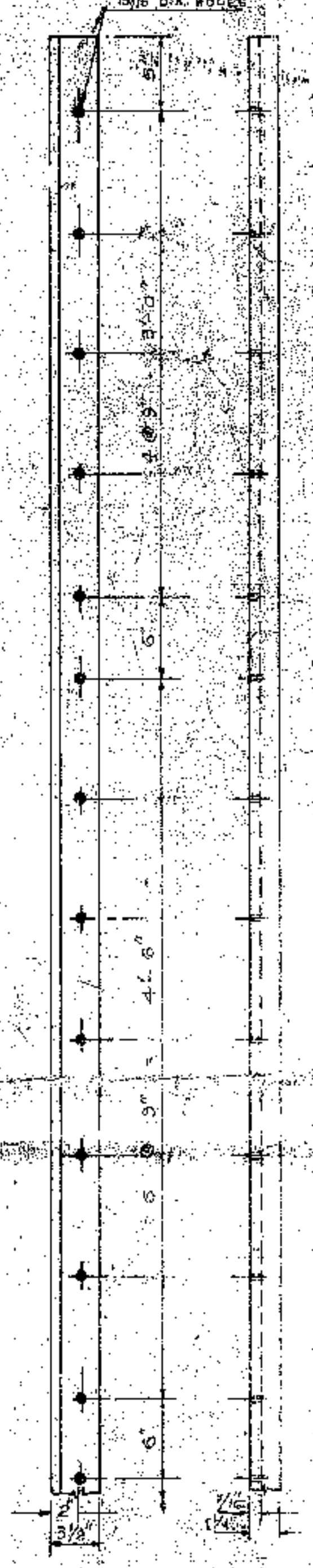
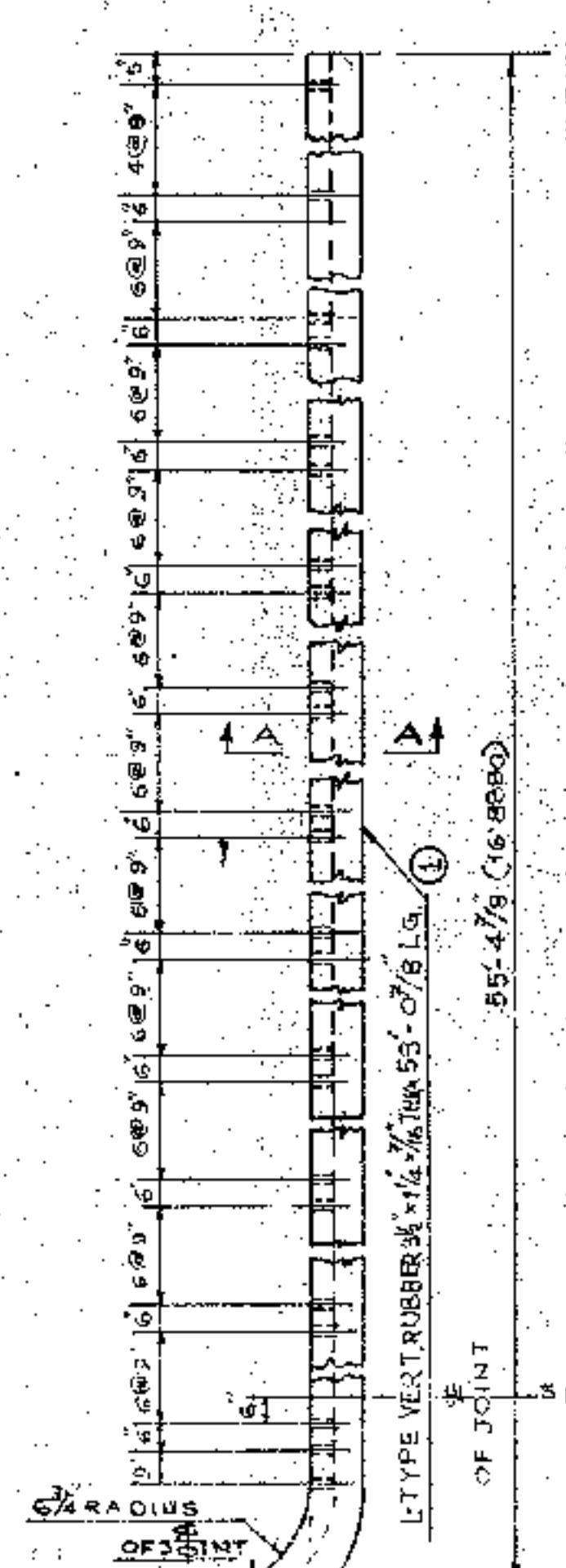
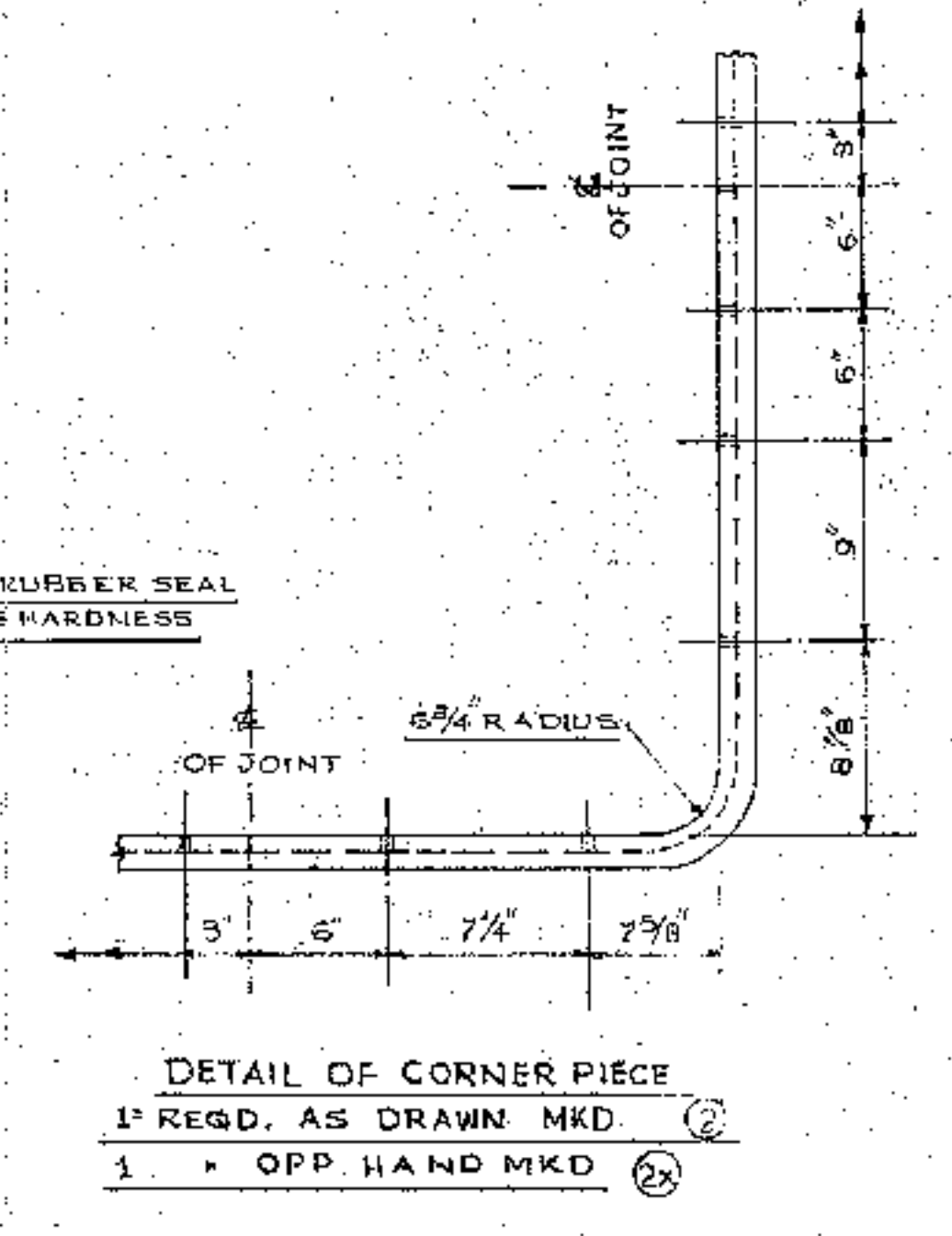
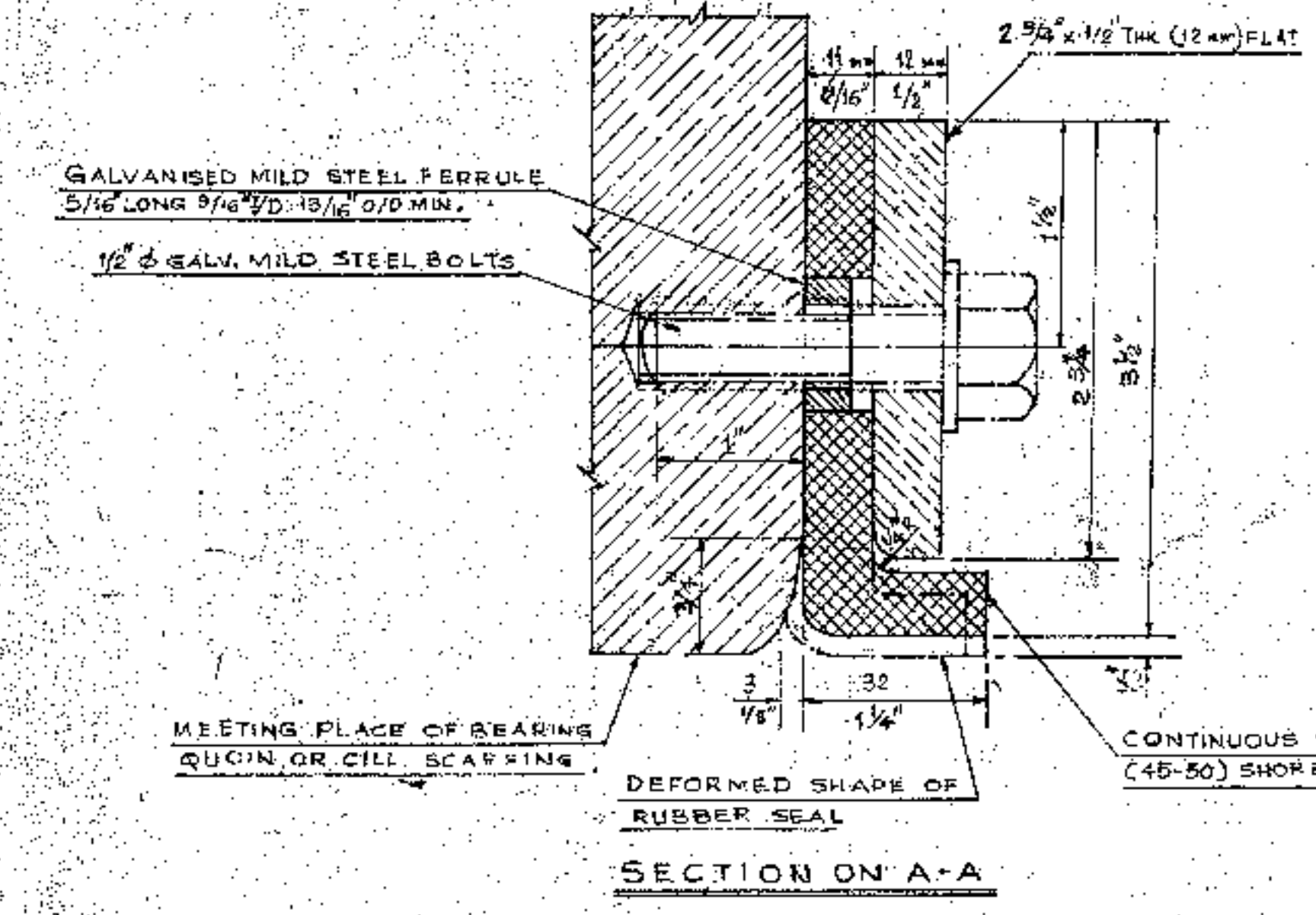
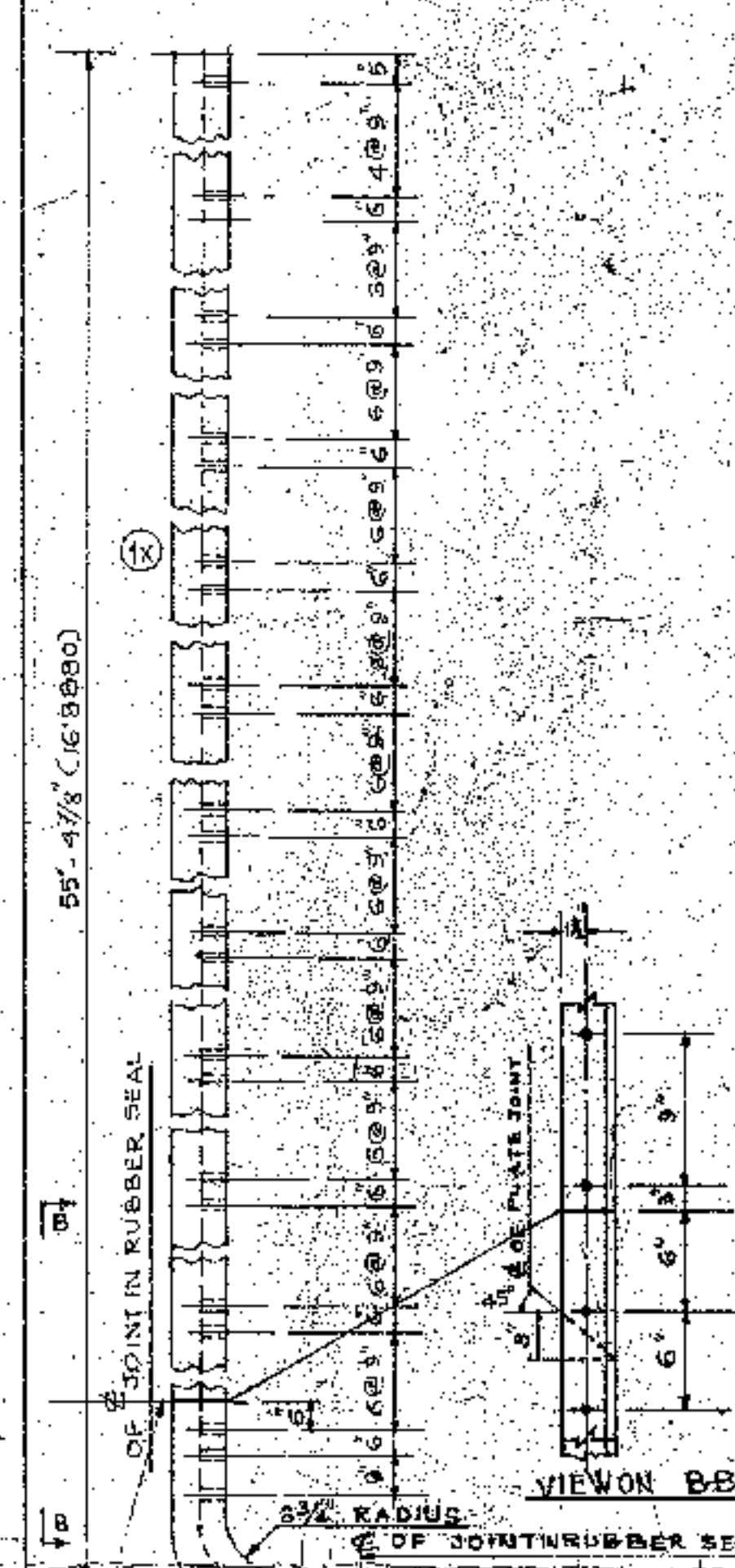












DETAIL OF RUBBER SEAL (SHORT SIDE)  
1- NO. REQD. AS DRAWN MKD. RSL PER CAISSON

DETAIL OF RUBBER SEAL (LONG SIDE)  
1- NO. REQD. AS DRAWN & NOTED MKD. RSL PER CAISSON

IMPORTANT NOTE:-  
POSITION OF HOLES SHOWN IN THIS DRAWING ARE APPROXIMATE. ACTUAL HOLE POSITIONS ARE TO BE MEASURED FROM THE EXISTING QUOINS & CILLS FITTED ON THE CAISSONS AND THEN TO BE MARKED OFF ACCORDINGLY ON RUBBER SEALS & SEAL RETAINER PLATES.

NOTES:-  
ALL HOLES ARE 13/16\"/>

FOR TENDER PURPOSE ONLY

CALCUTTA PORT TRUST  
HALDIA DOCK COMPLEX  
M/P&E'S DRG. OFFICE

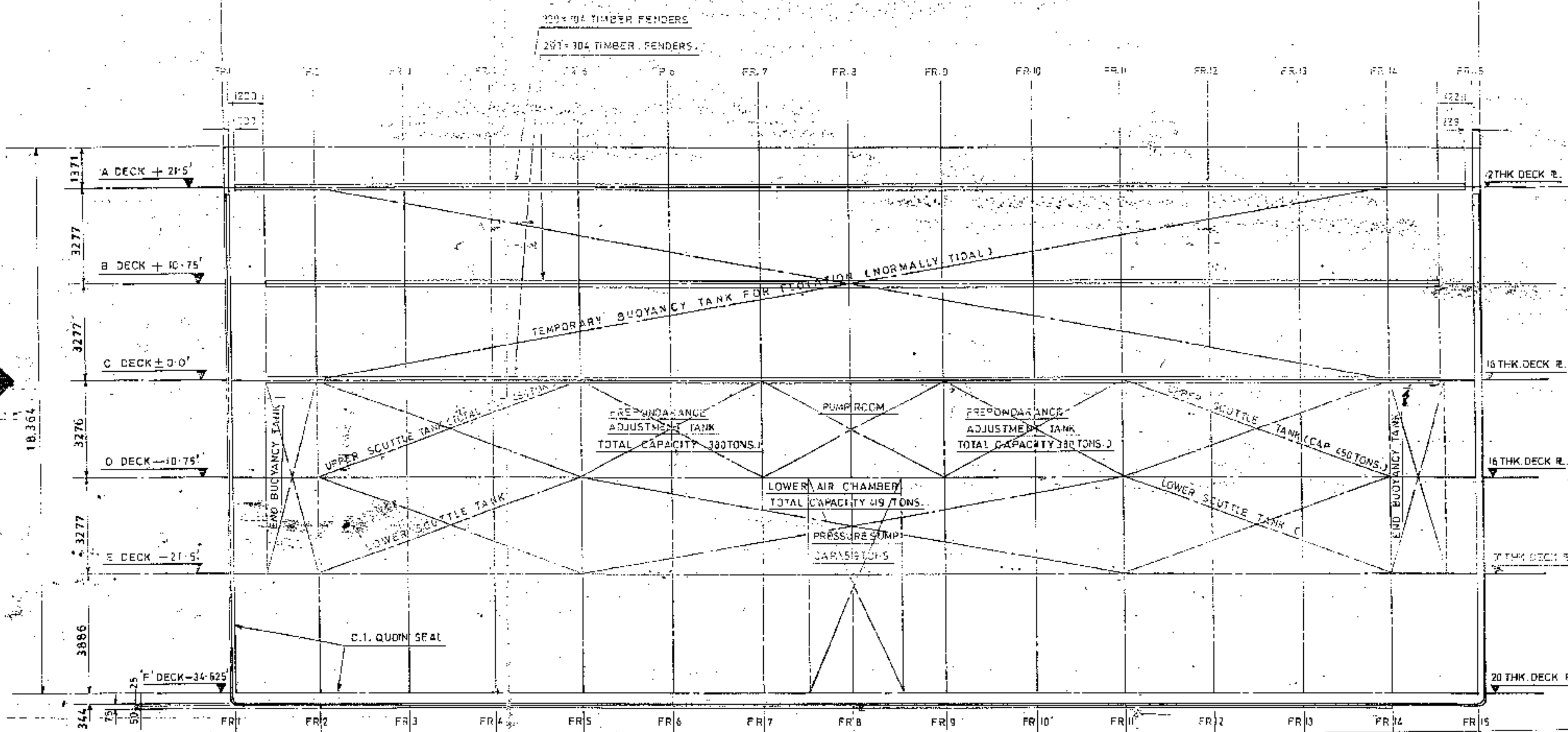
SCALE: 3/8\"/>

DETAILS OF RUBBER SEALS FOR QUOIN SEALS

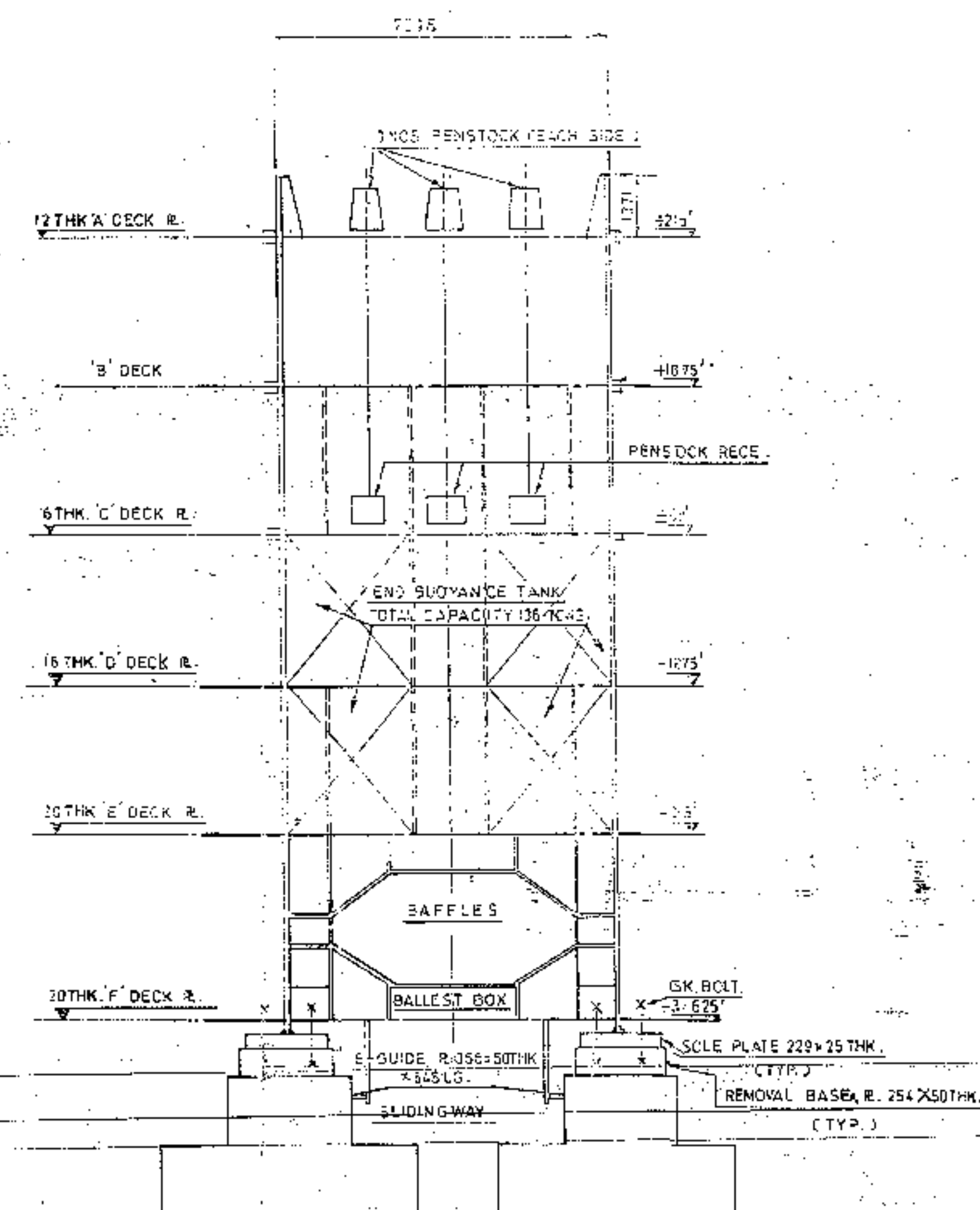
3 NOS. SLIDING CAISSON

NAME	DESIGN
DATE	REVISED
BY	CHKD.
APPD.	DRG. NO.
120.018	

43,486



W-SIDE  
ELEVATION



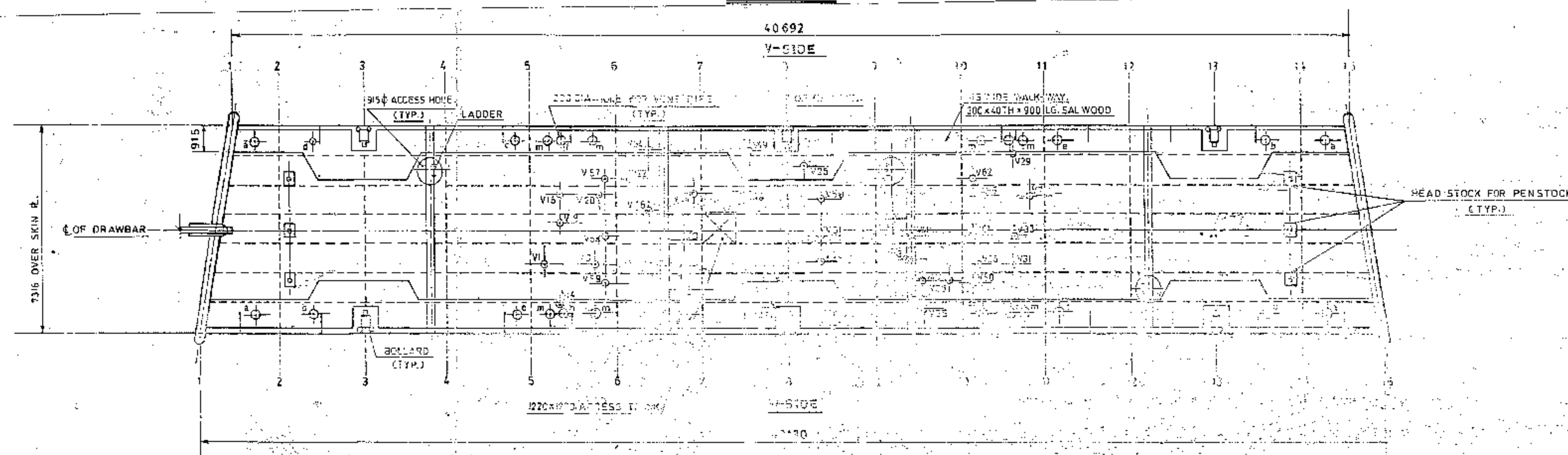
SIDE VIEW

SYMBOLS & NOTES FOR AIRVENTS:

- ALL AIRVENT & SOUNDING PIPES ARE 75mm DIA.
- A. AIRVENT & SOUNDING PIPES FROM END BUOYANCY TANK.
- B. AIRVENTS FROM LOWER SCUTTLE TANK.
- C. AIRVENT & SOUNDING PIPES FROM LOWER SCUTTLE TANK.
- D. AIRVENTS FROM UPPER SCUTTLE TANK.
- E. AIRVENT & SOUNDING PIPES FROM UPPER SCUTTLE.
- F. AIRVENTS FROM PREPONDERANCE TANKS.
- G. AIRVENT & SOUNDING PIPES FROM PREPONDERANCE TANK.
- H. AIRVENT FROM LOWER AIR CHAMBER.
- I. AIRVENT & SOUNDING PIPES FROM LOWER AIR CHAMBER.
- J. AIRVENT FROM PRESSURE TANK.
- K. AIRVENTS FROM 75mm DIA. SILENCE PIPES.

SYMBOL & NOTES FOR VALVES:

- ① V1, V2, V3 ETC OPERATED FROM A DECK.



PLAN ON A DECK

KATA PORT TRUST		NAME DT
KATA DOCK COMPLEX		CGN
P & E'S DRG OFFICE		DRN 10/10/00
3NOS SLIDING CAISSON		TCO
GATES		CHK 10/10/00
IONS OF VENT & SOUNDING PIPES, VALVE		APVD 10/10/00
ESS TRUNK HEAD STOCK FOR PENSTOCK		SCALE 1:100
LADDERS & BOLLARDS ETC.		SH. 1 OF 2
120-036		









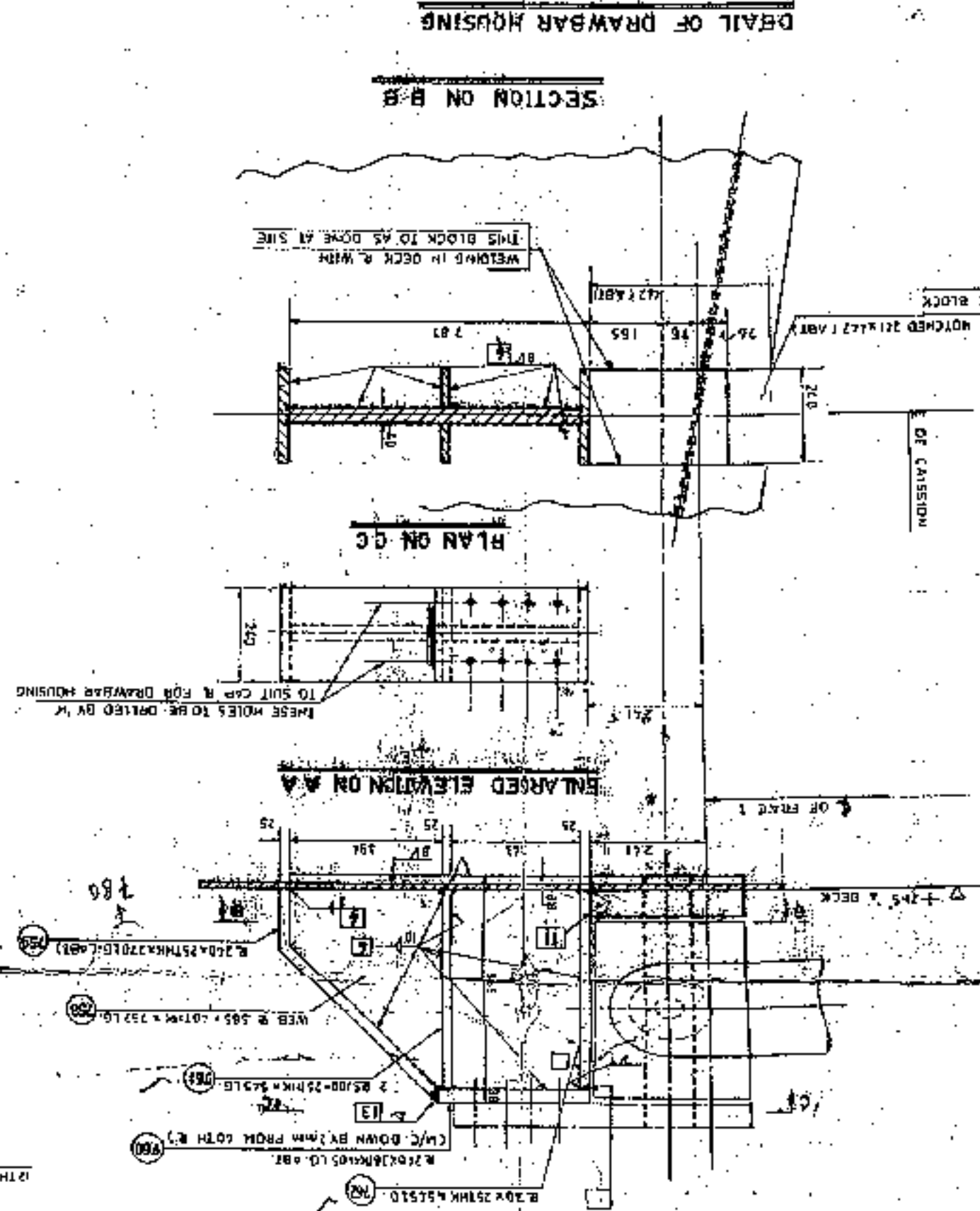




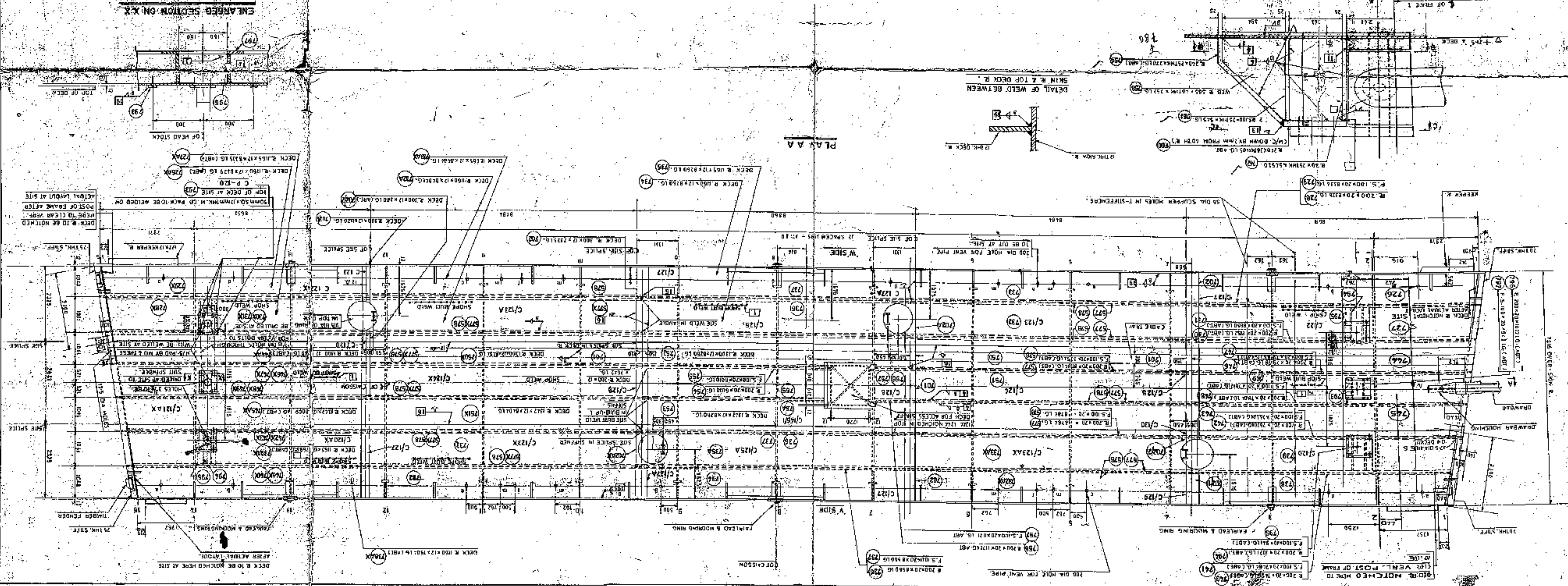
SCALE: 1/8" = 1'-0" DRG. NO. 110-076  
 ARRANGEMENT & DETAIL OF A DECK  
 HALDIA DOCK COMPLEX  
 100' x 200' DOCK  
 FOR TENDER PURPOSE ONLY

KEY ELEVATION

DECK A	100.0
DECK B	101.0
DECK C	102.0
DECK D	103.0
DECK E	104.0
DECK F	105.0



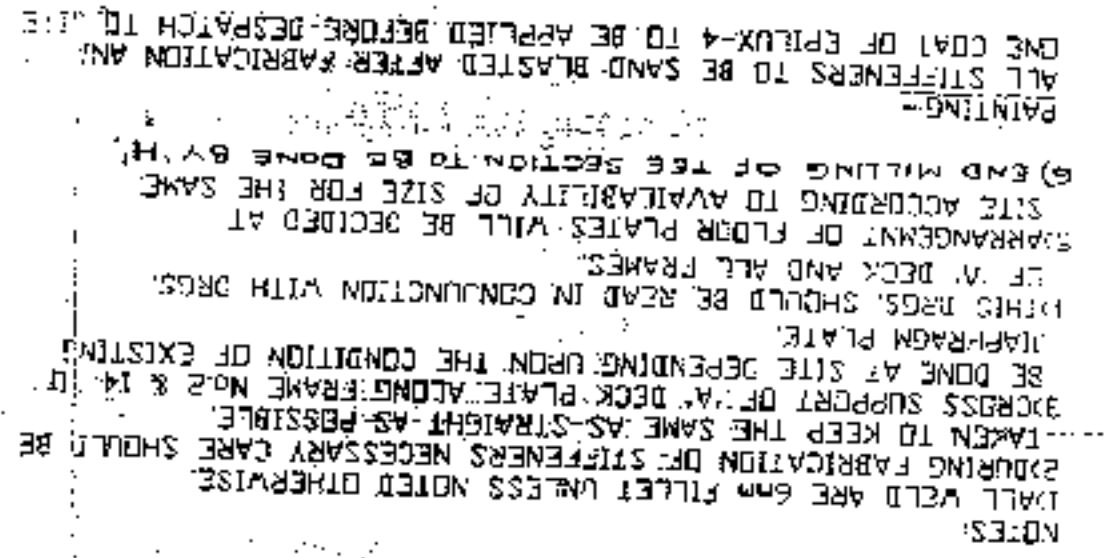
- SYMBOLS & NOTES FOR AIR VENTS
- ALL AIR VENTS & SOUNDING PIPES FROM 25mm DIA.
  - a. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - b. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - c. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - d. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - e. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - f. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - g. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - h. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - i. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - j. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - k. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - l. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.
  - m. AIR VENTS & SOUNDING PIPES FROM LOWER TANK.



85 to  
 100 to  
 110 to  
 120 to  
 130 to  
 140 to  
 150 to  
 160 to  
 170 to  
 180 to  
 190 to  
 200 to

GIRDER KENDRAL NO. 2		WE B		FLANGE		WEIGHT	
11	1	1	1	1	1	1	1
12	1	1	1	1	1	1	1
13	1	1	1	1	1	1	1
14	1	1	1	1	1	1	1
15	1	1	1	1	1	1	1
16	1	1	1	1	1	1	1
17	1	1	1	1	1	1	1
18	1	1	1	1	1	1	1
19	1	1	1	1	1	1	1
20	1	1	1	1	1	1	1

PLAN

[illegible]

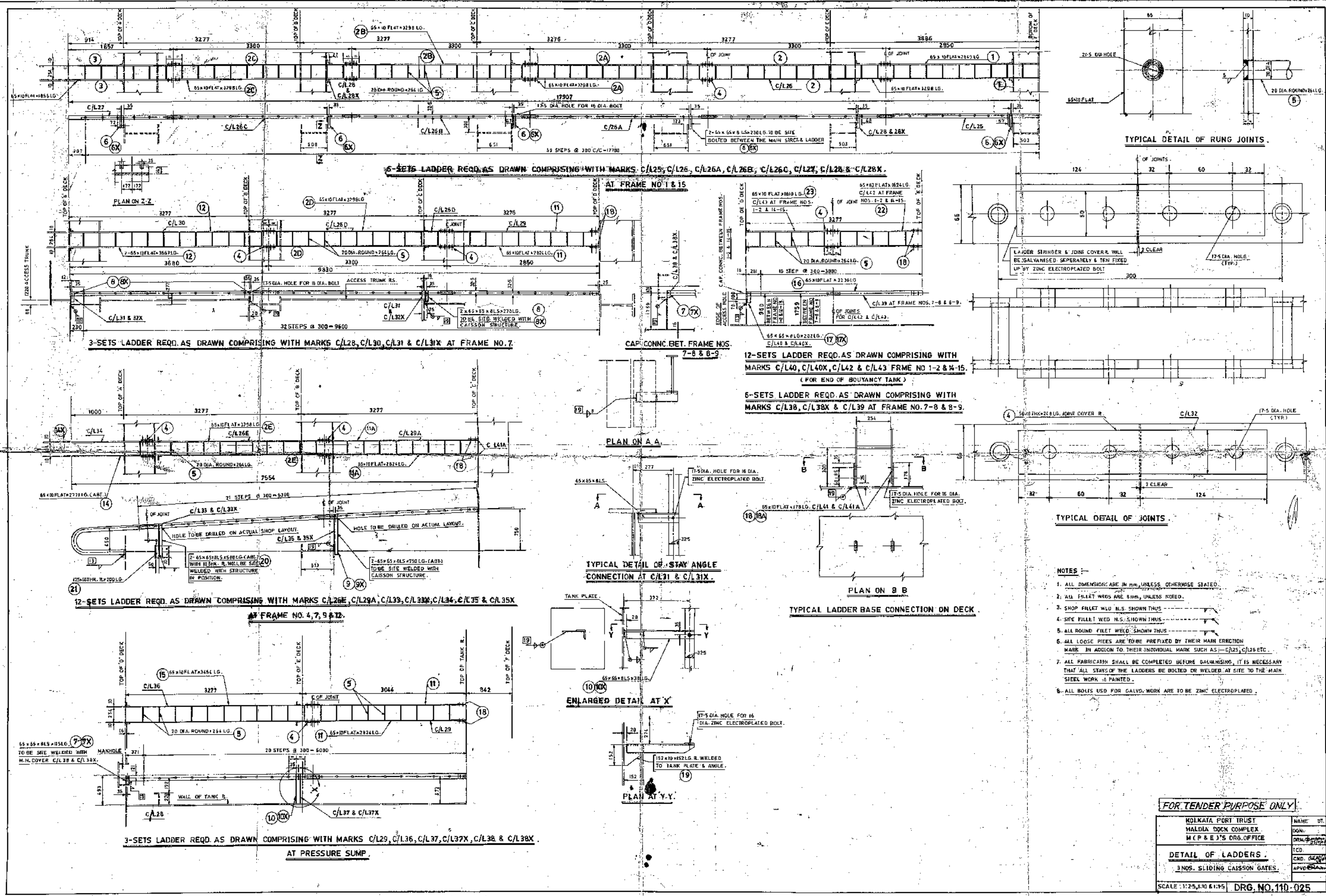




GATEWAY

GATEWAY

GATEWAY



- NOTES :-**
1. ALL DIMENSIONS ARE IN mm, UNLESS OTHERWISE STATED.
  2. ALL FILLET WELDS ARE 8mm, UNLESS NOTED.
  3. SHOP FILLET WLD N.S. SHOWN THUS
  4. SITE FILLET WLD N.S. SHOWN THUS
  5. ALL ROUND FILET WELD SHOWN THUS
  6. ALL LOOSE PEECS ARE TO BE PRE-FIXED BY THEIR MAIN ERECTION MARK IN ADDN TO THEIR INDIVIDUAL MARK SUCH AS - C/L25, C/L26 ETC.
  7. ALL FABRICATHN SHALL BE COMPLETED BEFORE GALVANISING, IT IS NECESSARY THAT ALL STAYS OF THE LADDERS BE BOLTED OR WELDED AT SITE TO THE MAIN STEEL WORK & PAINTED.
  8. ALL BOLTS USED FOR GALV. WORK ARE TO BE ZINC ELECTROPLATED.

**FOR TENDER PURPOSE ONLY**

KOLKATA PORT TRUST HALDIA DOCK COMPLEX M (P & E)'S DRG. OFFICE		NAME: DT.
DETAIL OF LADDERS.		DGN:
3 NOS. SLIDING CAISSON GATES.		DRN: 110-025
SCALE: 1:25, 1:10 & 1:5		TCO:
DRG. NO. 110-025		CMO: 04/04/05
		APVD: 04/04/05



VIEW ON C.C.

ENLARGED DETAIL

VIEW ON A.A.

DETAIL OF WAREHOUSE  
NON-WATER TIGHT  
12 NOS. REIN. TUBES

JESSOP & CO  
LIMITED  
3 NOS. SLIDING GATED GATES  
FOR RAILWAY TUNNELS & C.C.  
ARRANGEMENT AND DETAILS OF  
WATER-TIGHT WAREHOUSE  
SCALE 1/16" = 1'-0"  
DATE NOV. 1914  
REVISED  
APPROVED BY  
JESSOP & CO  
LIMITED

NOTE: ARE 10 NOS. 3 IN. DIA. WATER TIGHT  
TUNNELS TO BE BUILT IN  
THE WAREHOUSE. SHOWING  
THE ARRANGEMENT OF  
THE TUNNELS AND THE  
WATER TIGHT WAREHOUSE  
SCALE 1/16" = 1'-0"

VIEW ON E.E.

1.01 x 75 x 10 x 3/16 IN.

SHOWING ARRANGEMENT OF RAILWAY

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

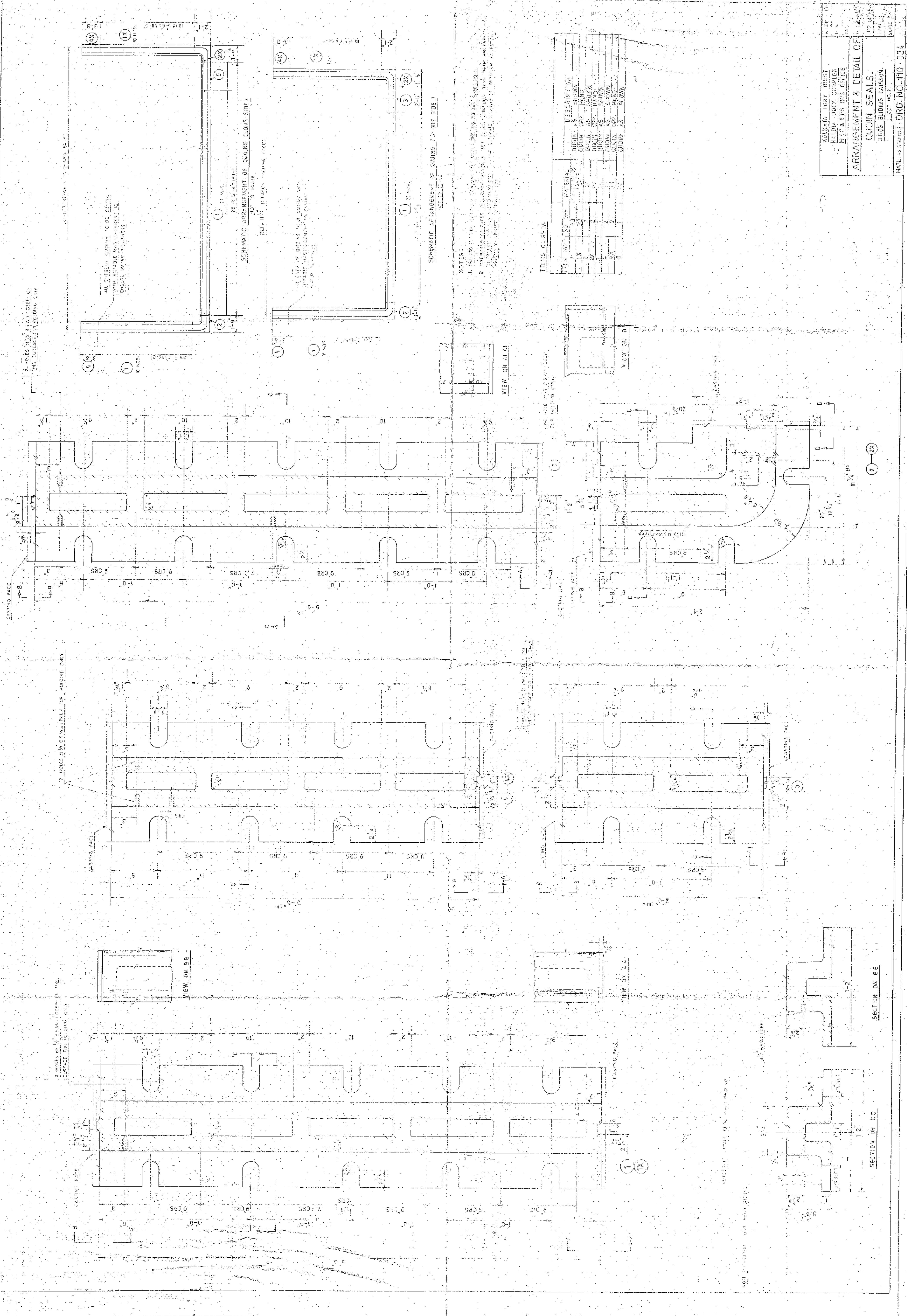
1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.

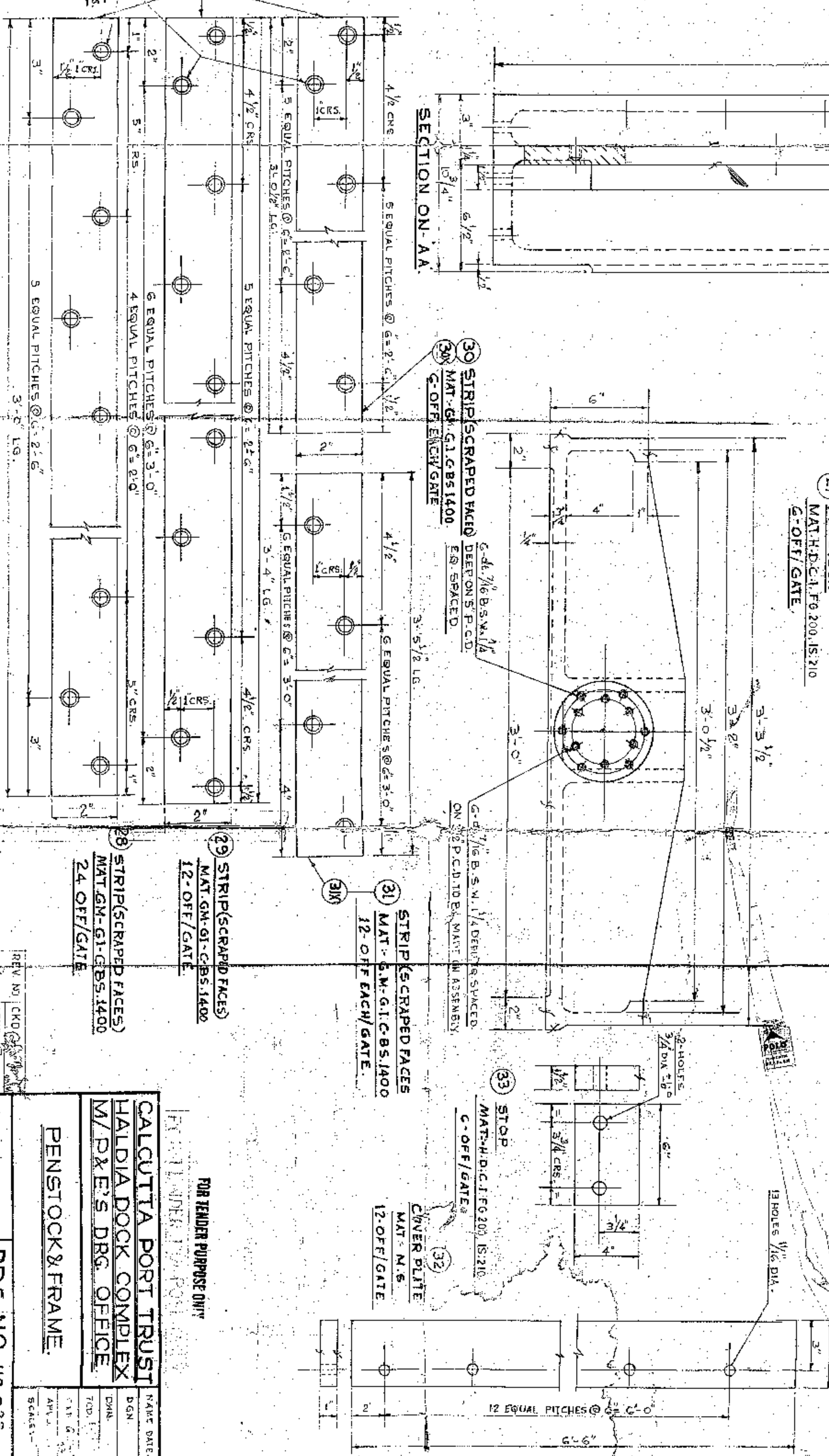
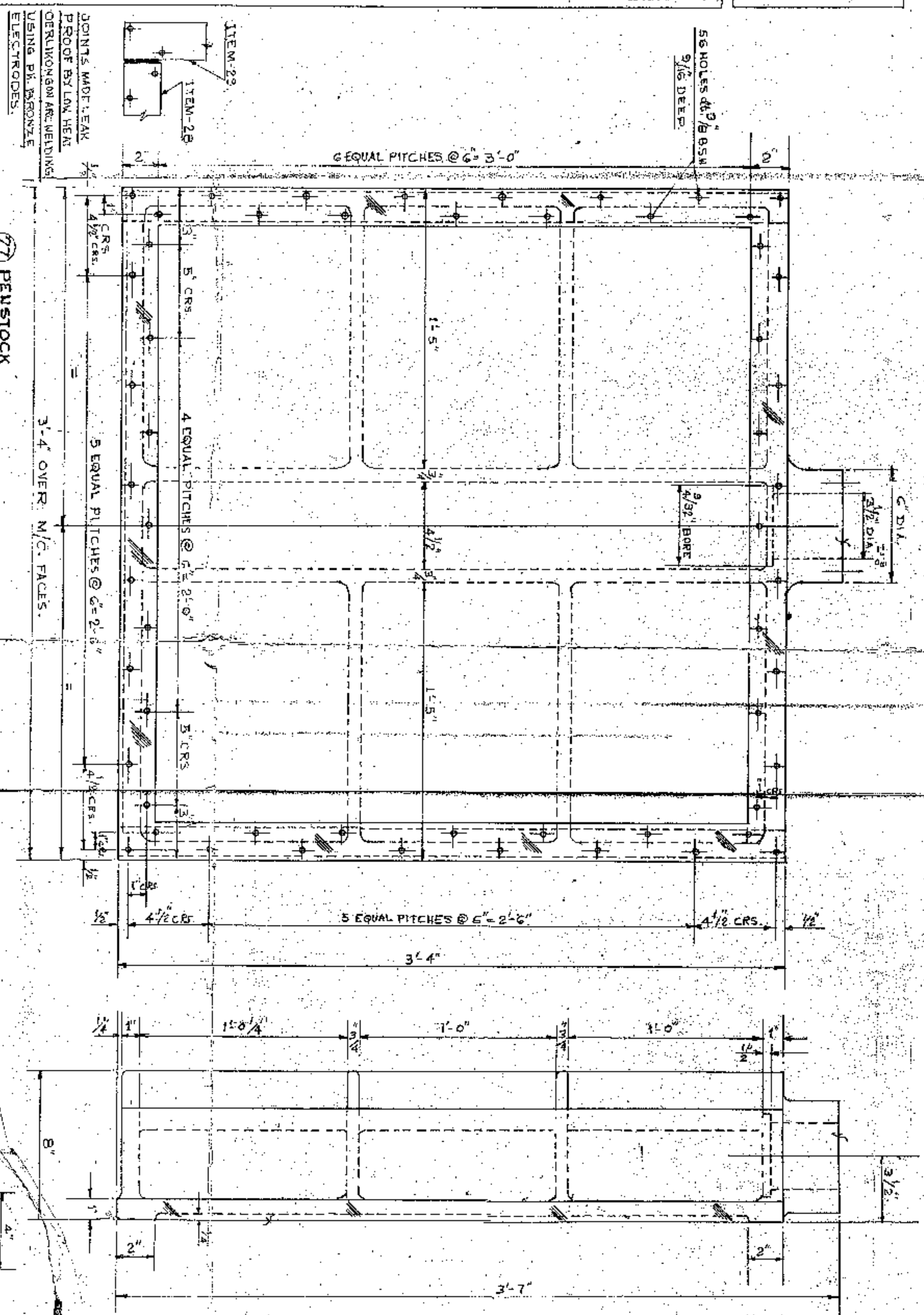
1.01 x 75 x 10 x 3/16 IN.

1.01 x 75 x 10 x 3/16 IN.









1. THIS DRG. TO BE READ IN CONJUNCTION WITH DRG. NO. 110-02
2. ALL W/C FACES COATED WITH WHITE LEAD & TALLOW.
3. ALL M/C FACES COATED WITH WHITE LEAD & TALLOW.
4. UNLESS OTHERWISE NOTED C. 1 & M. 5. TO BE PAINTED AS MAIN STEEL WORK i.e. PITCH EPOXY PAINT.

C. 3/8" HOLES FOR  
3/8" B. 5 M. CSK BRASS  
SCREWS 3/4" LG. B. C. NO.

28 STRIP (SCRAPED FACES)  
MAT. GM-G1-CBS. 1400  
24 OFF/GATE

HALDIA DOCK COMPLETION  
M/ P&E'S DRG. OFFICE

**FOR TENDER PURPOSE ONLY**

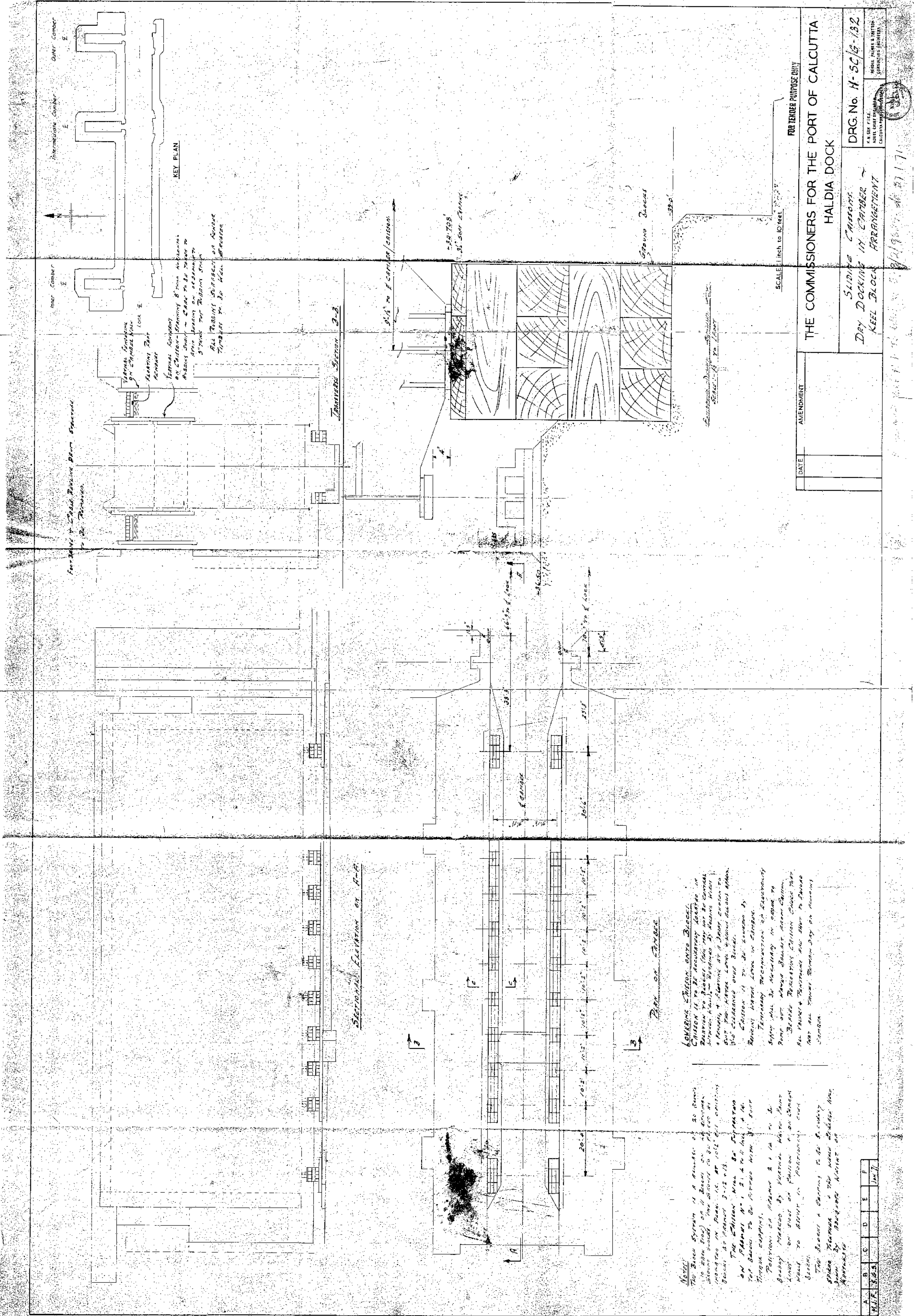
DRG. NO. 119.035	APVD 6-7-68	CKD 6-7-68	REV. NO. 1
------------------	-------------	------------	------------

**PENSTOCK & FRAME.**

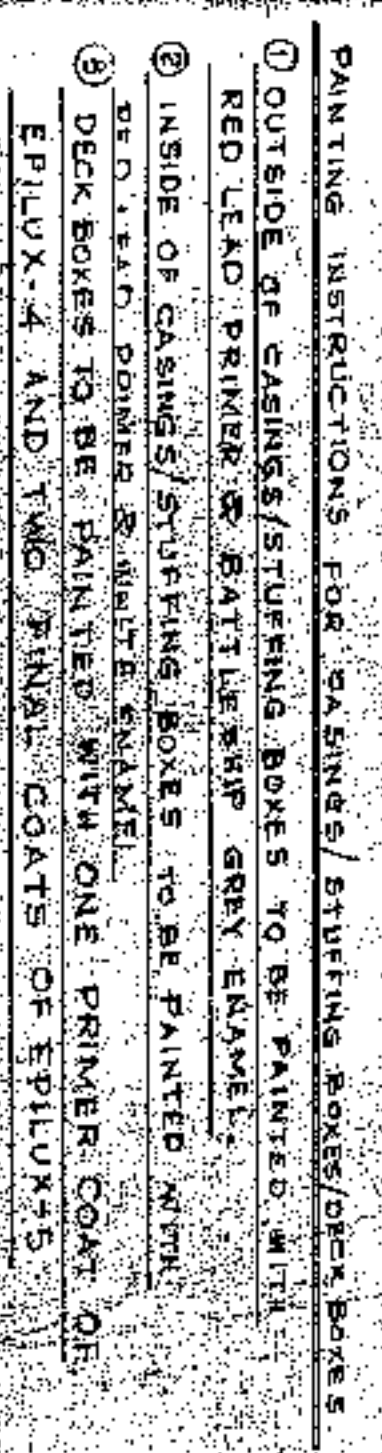
DGN.	
CMR.	
700.	
500.	

1. *Chlorophyll a* (Chl *a*)









**FOR TENDER PURPOSE ONLY**

[illegible]

92.188 (48031)  
Juncus sp.  
92/188A

5

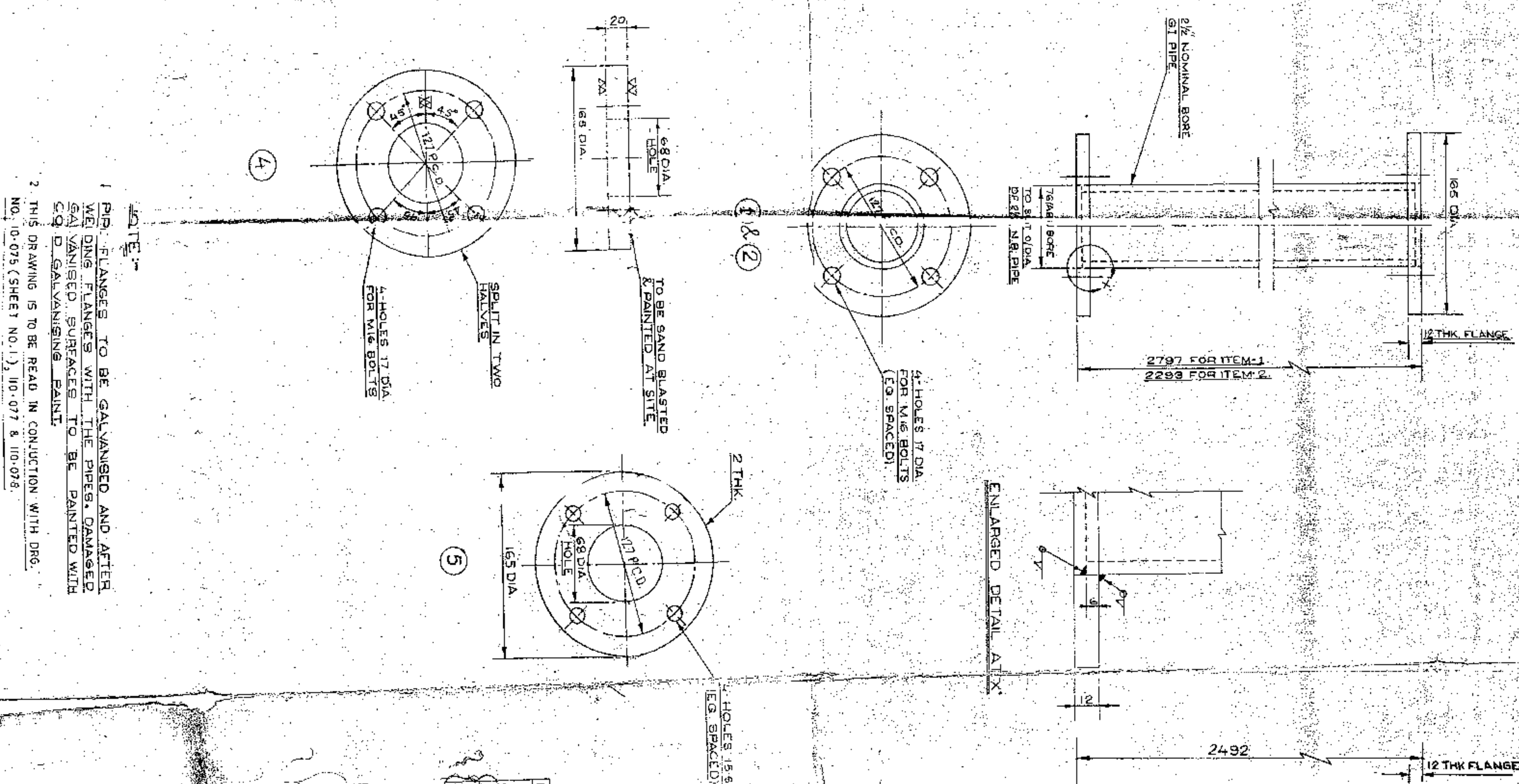
7

4 Cops



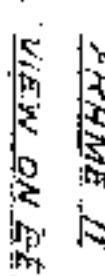
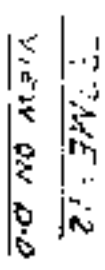
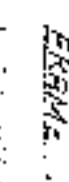
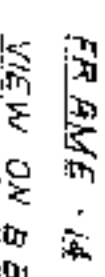
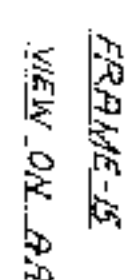




[illegible]

NAME	DR. K. K. K.
DATE	10/10/10
TIME	10:10
CLINICAL	DR. K. K. K.
AP	DR. K. K. K.

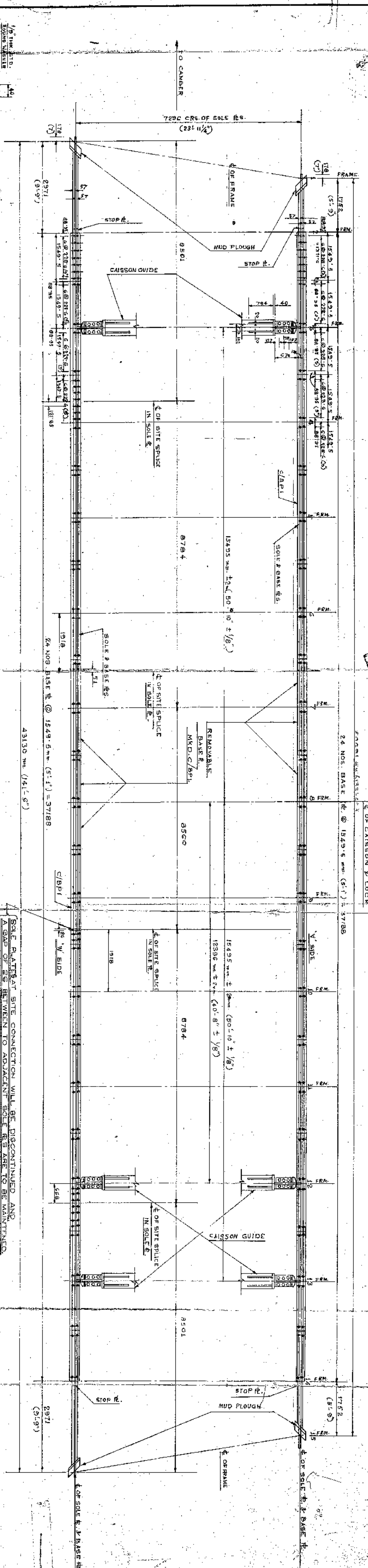




CUN REFNO044441 OF 10 SIZE 24X18 P21E SET DRG 40,41,42,43  
 V. 5.02C SEE DRG 40,41,42,43  
 COMMENTS: 1.443  
 PARTS 4,7,8,9,10 1.41,14,25  
 2.15,7 4.8,8,10  
 4.16,25  
 4.16,25

JESSOP & Co<sup>tes</sup>  
 105, 107, 109, 111, 113, 115, 117, 119, 121, 123, 125, 127, 129, 131, 133, 135, 137, 139, 141, 143, 145, 147, 149, 151, 153, 155, 157, 159, 161, 163, 165, 167, 169, 171, 173, 175, 177, 179, 181, 183, 185, 187, 189, 191, 193, 195, 197, 199, 201, 203, 205, 207, 209, 211, 213, 215, 217, 219, 221, 223, 225, 227, 229, 231, 233, 235, 237, 239, 241, 243, 245, 247, 249, 251, 253, 255, 257, 259, 261, 263, 265, 267, 269, 271, 273, 275, 277, 279, 281, 283, 285, 287, 289, 291, 293, 295, 297, 299, 301, 303, 305, 307, 309, 311, 313, 315, 317, 319, 321, 323, 325, 327, 329, 331, 333, 335, 337, 339, 341, 343, 345, 347, 349, 351, 353, 355, 357, 359, 361, 363, 365, 367, 369, 371, 373, 375, 377, 379, 381, 383, 385, 387, 389, 391, 393, 395, 397, 399, 401, 403, 405, 407, 409, 411, 413, 415, 417, 419, 421, 423, 425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 445, 447, 449, 451, 453, 455, 457, 459, 461, 463, 465, 467, 469, 471, 473, 475, 477, 479, 481, 483, 485, 487, 489, 491, 493, 495, 497, 499, 501, 503, 505, 507, 509, 511, 513, 515, 517, 519, 521, 523, 525, 527, 529, 531, 533, 535, 537, 539, 541, 543, 545, 547, 549, 551, 553, 555, 557, 559, 561, 563, 565, 567, 569, 571, 573, 575, 577, 579, 581, 583, 585, 587, 589, 591, 593, 595, 597, 599, 601, 603, 605, 607, 609, 611, 613, 615, 617, 619, 621, 623, 625, 627, 629, 631, 633, 635, 637, 639, 641, 643, 645, 647, 649, 651, 653, 655, 657, 659, 661, 663, 665, 667, 669, 671, 673, 675, 677, 679, 681, 683, 685, 687, 689, 691, 693, 695, 697, 699, 701, 703, 705, 707, 709, 711, 713, 715, 717, 719, 721, 723, 725, 727, 729, 731, 733, 735, 737, 739, 741, 743, 745, 747, 749, 751, 753, 755, 757, 759, 761, 763, 765, 767, 769, 771, 773, 775, 777, 779, 781, 783, 785, 787, 789, 791, 793, 795, 797, 799, 801, 803, 805, 807, 809, 811, 813, 815, 817, 819, 821, 823, 825, 827, 829, 831, 833, 835, 837, 839, 841, 843, 845, 847, 849, 851, 853, 855, 857, 859, 861, 863, 865, 867, 869, 871, 873, 875, 877, 879, 881, 883, 885, 887, 889, 891, 893, 895, 897, 899, 901, 903, 905, 907, 909, 911, 913, 915, 917, 919, 921, 923, 925, 927, 929, 931, 933, 935, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 957, 959, 961, 963, 965, 967, 969, 971, 973, 975, 977, 979, 981, 983, 985, 987, 989, 991, 993, 995, 997, 999, 1001, 1003, 1005, 1007, 1009, 1011, 1013, 1015, 1017, 1019, 1021, 1023, 1025, 1027, 1029, 1031, 1033, 1035, 1037, 1039, 1041, 1043, 1045, 1047, 1049, 1051, 1053, 1055, 1057, 1059, 1061, 1063, 1065, 1067, 1069, 1071, 1073, 1075, 1077, 1079, 1081, 1083, 1085, 1087, 1089, 1091, 1093, 1095, 1097, 1099, 1101, 1103, 1105, 1107, 1109, 1111, 1113, 1115, 1117, 1119, 1121, 1123, 1125, 1127, 1129, 1131, 1133, 1135, 1137, 1139, 1141, 1143, 1145, 1147, 1149, 1151, 1153, 1155, 1157, 1159, 1161, 1163, 1165, 1167, 1169, 1171, 1173, 1175, 1177, 1179, 1181, 1183, 1185, 1187, 1189, 1191, 1193, 1195, 1197, 1199, 1201, 1203, 1205, 1207, 1209, 1211, 1213, 1215, 1217, 1219, 1221, 1223, 1225, 1227, 1229, 1231, 1233, 1235, 1237, 1239, 1241, 1243, 1245, 1247, 1249, 1251, 1253, 1255, 1257, 1259, 1261, 1263, 1265, 1267, 1269, 1271, 1273, 1275, 1277, 1279, 1281, 1283, 1285, 1287, 1289, 1291, 1293, 1295, 1297, 1299, 1301, 1303, 1305, 1307, 1309, 1311, 1313, 1315, 1317, 1319, 1321, 1323, 1325, 1327, 1329, 1331, 1333, 1335, 1337, 1339, 1341, 1343, 1345, 1347, 1349, 1351, 1353, 1355, 1357, 1359, 1361, 1363, 1365, 1367, 1369, 1371, 1373, 1375, 1377, 1379, 1381, 1383, 1385, 1387, 1389, 1391, 1393, 1395, 1397, 1399, 1401, 1403, 1405, 1407, 1409, 1411, 1413, 1415, 1417, 1419, 1421, 1423, 1425, 1427, 1429, 1431, 1433, 1435, 1437, 1439, 1441, 1443, 1445, 1447, 1449, 1451, 1453, 1455, 1457, 1459, 1461, 1463, 1465, 1467, 1469, 1471, 1473, 1475, 1477, 1479, 1481, 1483, 1485, 1487, 1489, 1491, 1493, 1495, 1497, 1499, 1501, 1503, 1505, 1507, 1509, 1511, 1513, 1515, 1517, 1519, 1521, 1523, 1525, 1527, 1529, 1531, 1533, 1535, 1537, 1539, 1541, 1543, 1545, 1547, 1549, 1551, 1553, 1555, 1557, 1559, 1561, 1563, 1565, 1567, 1569, 1571, 1573, 1575, 1577, 1579, 1581, 1583, 1585, 1587, 1589, 1591, 1593, 1595, 1597, 1599, 1601, 1603, 1605, 1607, 1609, 161

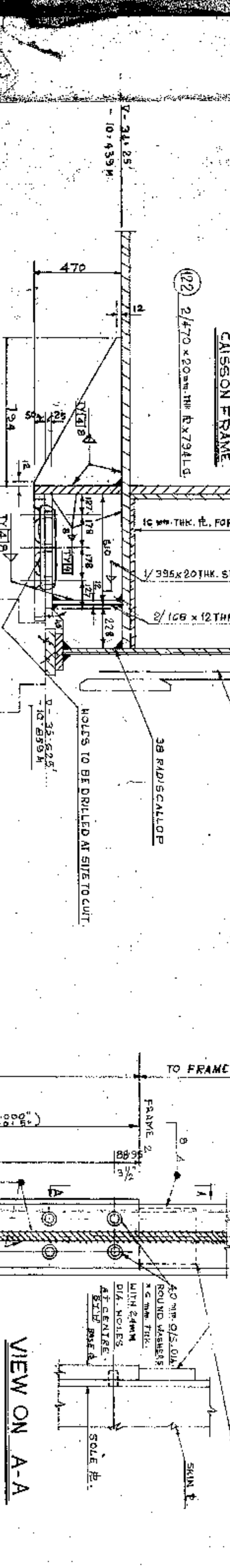




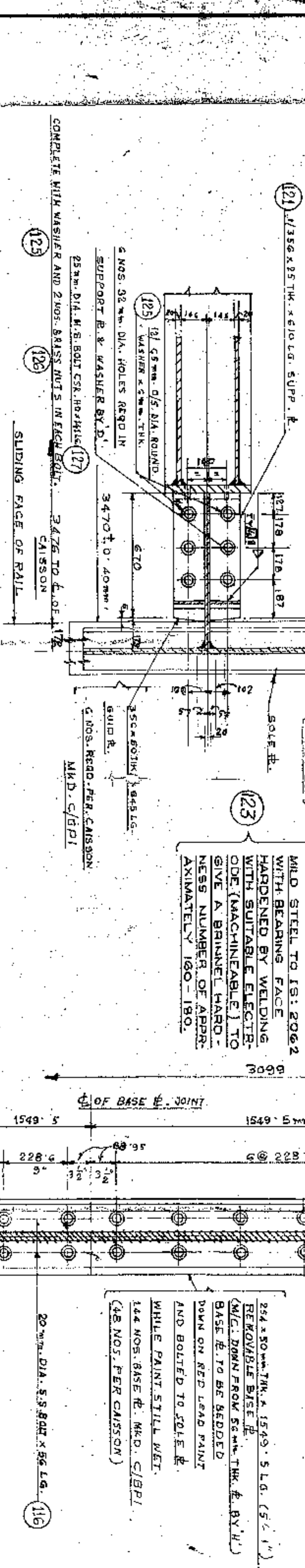
PLAN OF CAISSON BELOW 'F' DECK.



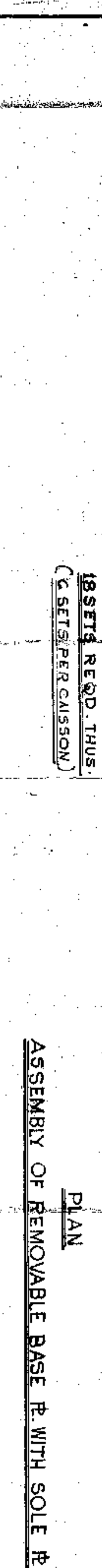
CROSS SECTION



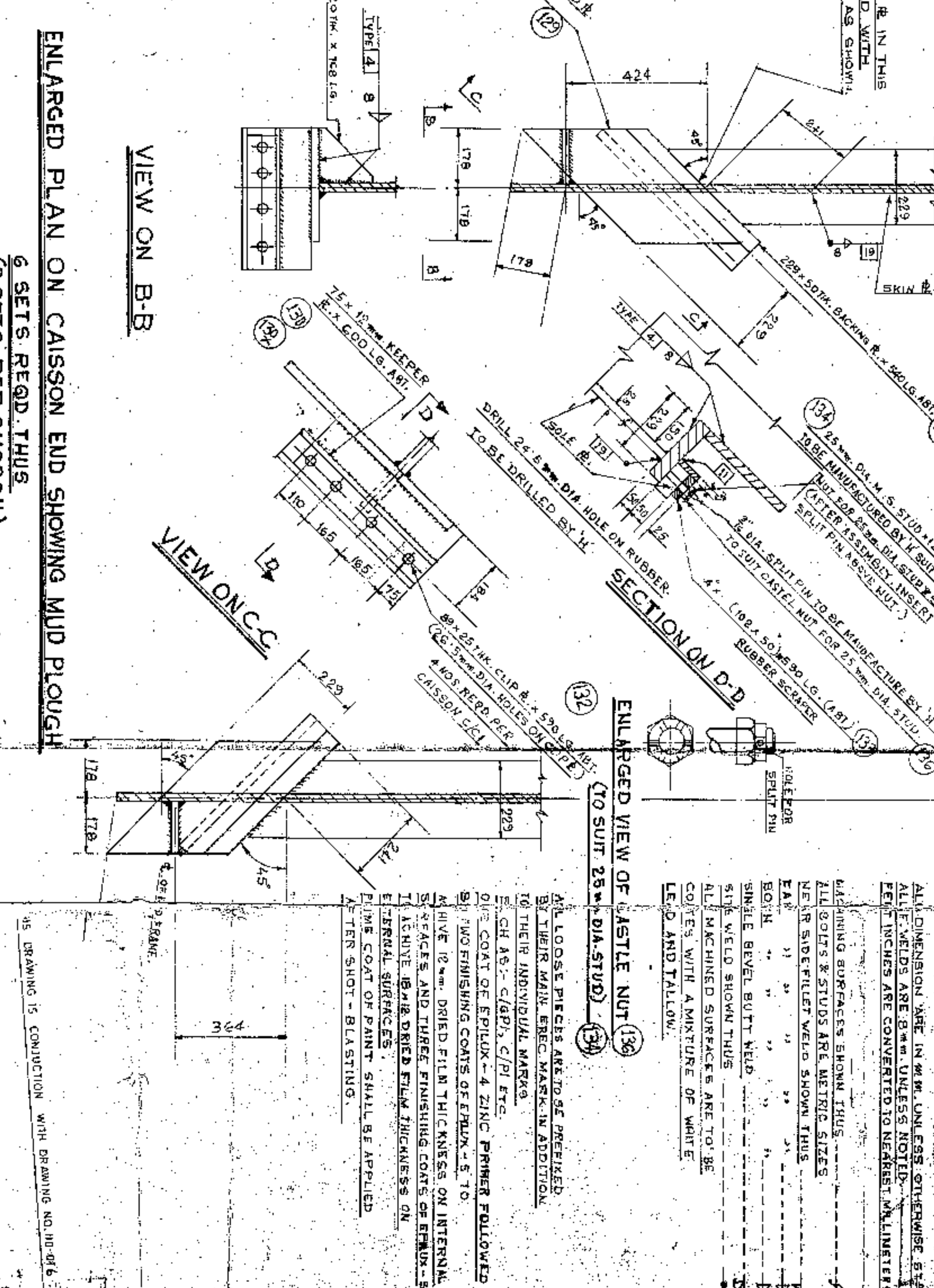
ELEVATION



DETAILS OF CAISSON GUIDE AT FRAMES 3, 12 & 13.



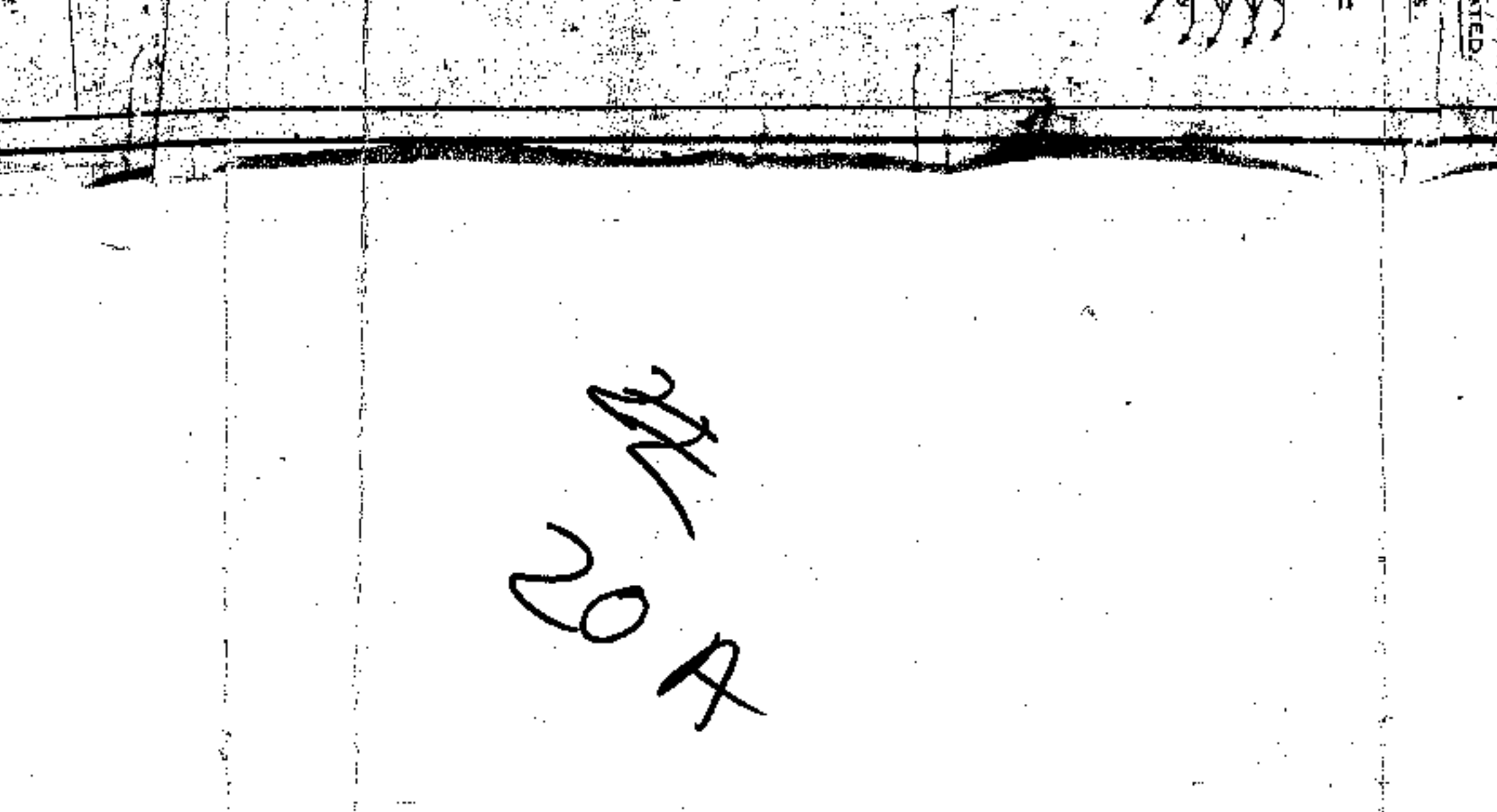
PLAN



ENLARGED PLAN ON CAISSON END SHOWING MUD PLOUGH



VIEW ON A-A



VIEW ON B-B



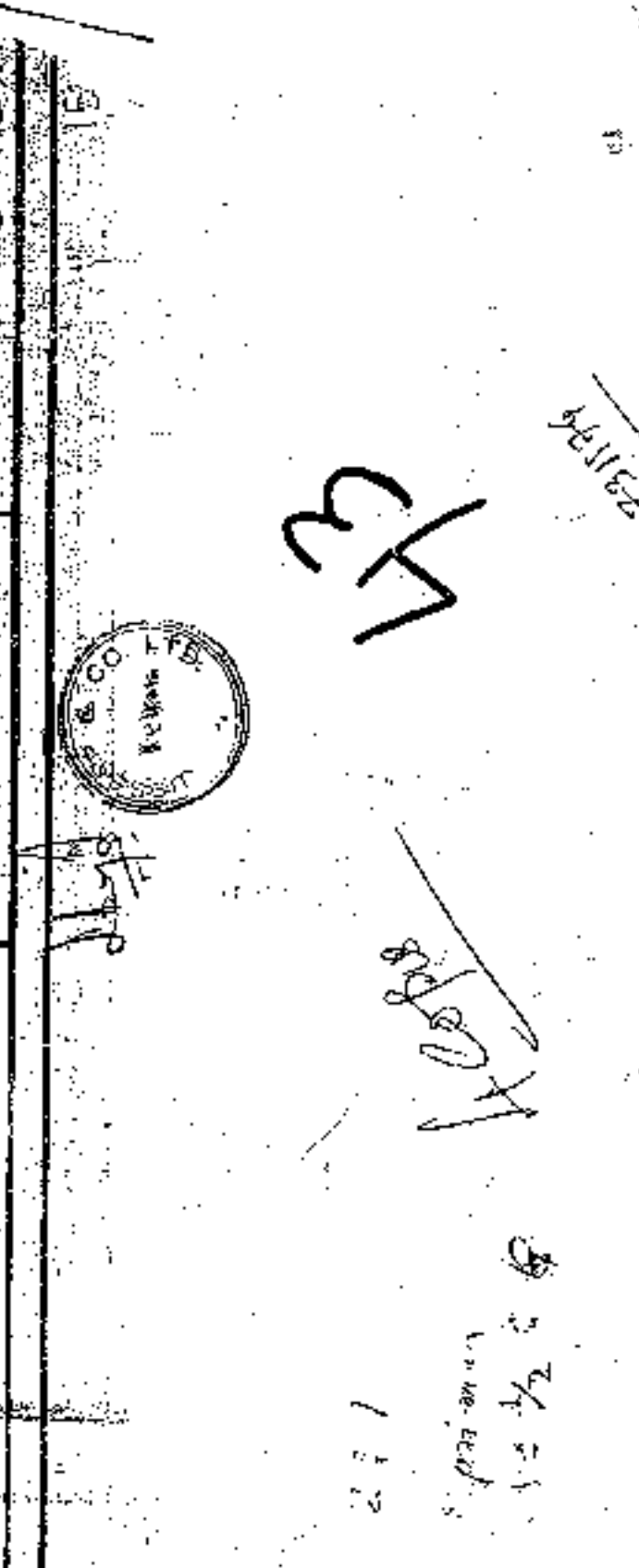
VIEW ON C-C

FOR TENDER PURPOSE ONLY  
CALCULATED PORT TRUST  
HABDIA DOCK OFFICE  
H/P & E'S DRG. OFFICE  
ARRANGEMENT & DETAILS OF  
SOLE PLATE, REMOVABLE BASE  
PLATE & MUD PLOUGH.

DRG. NO. 140-0726

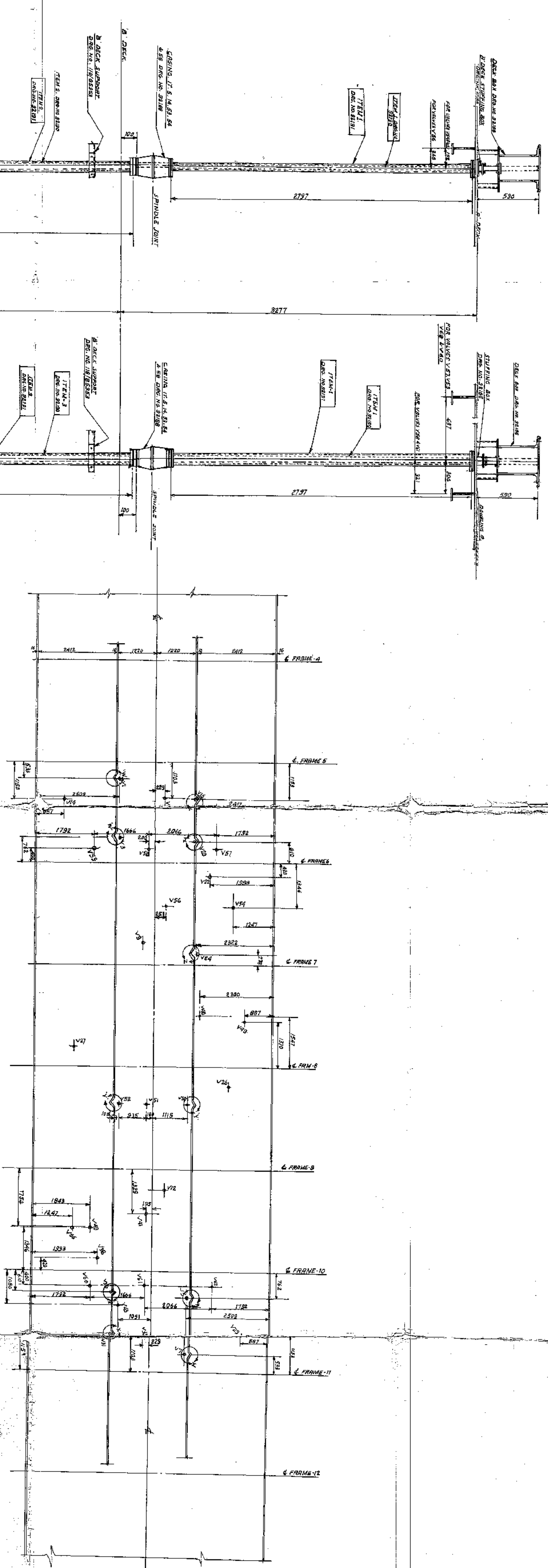
204



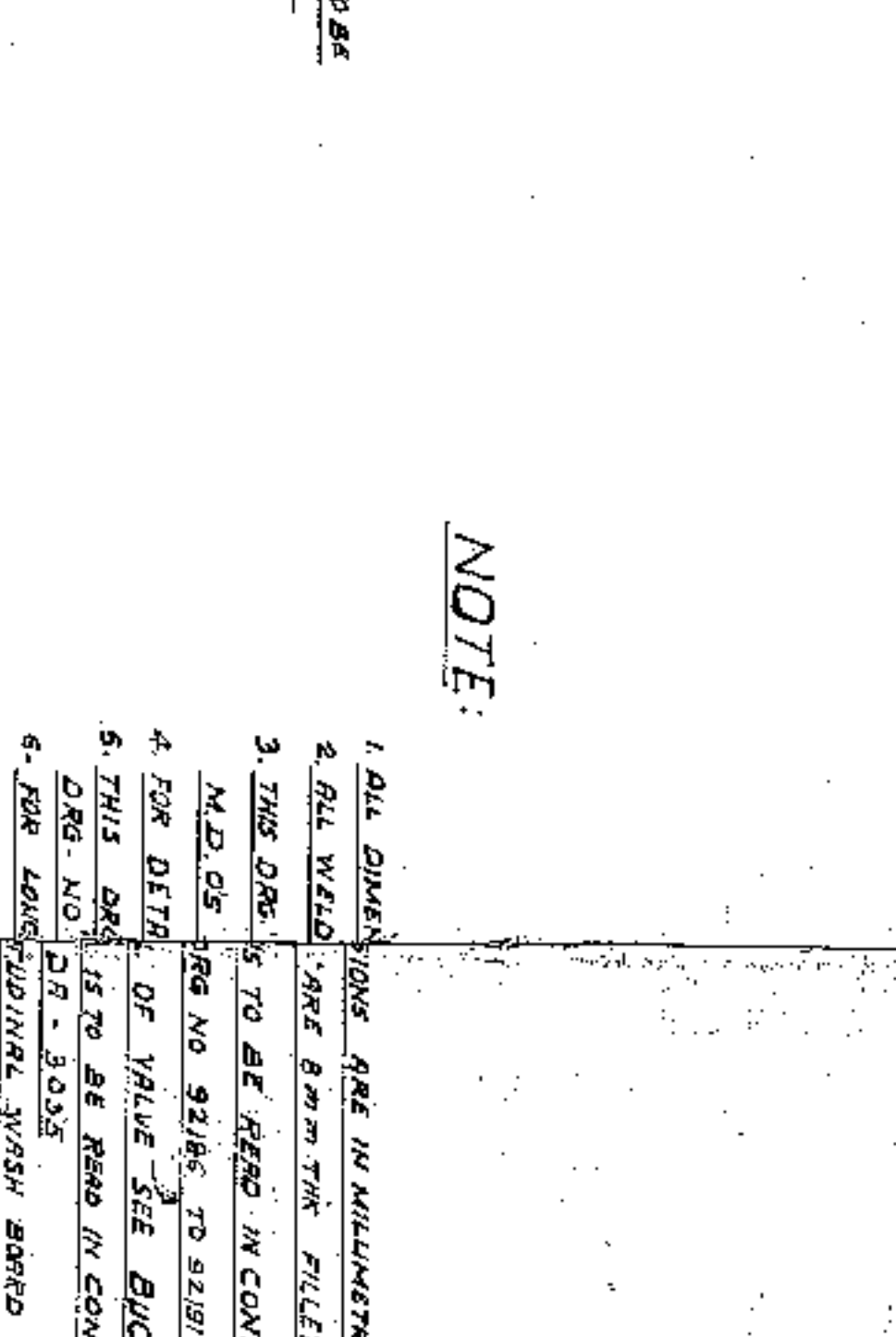
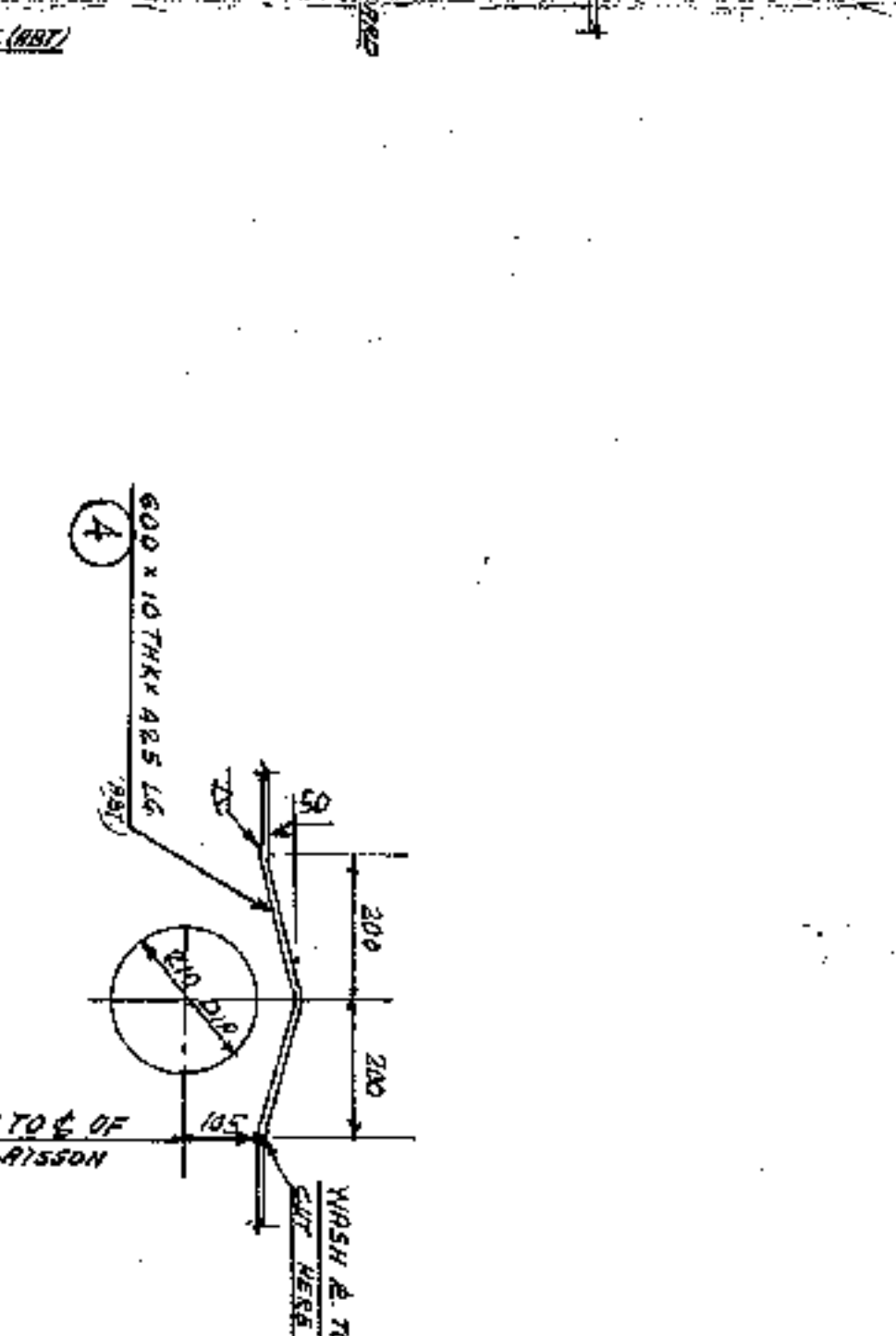
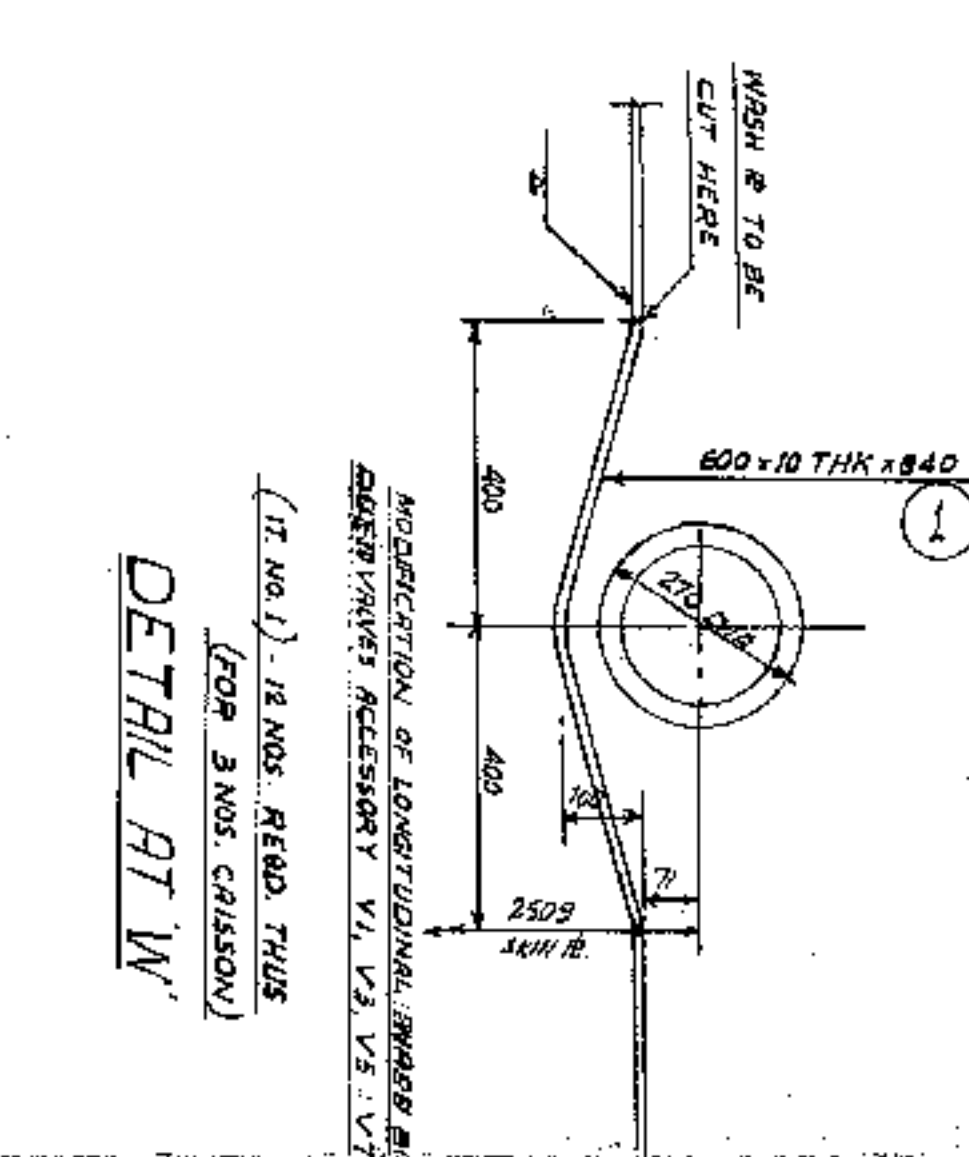
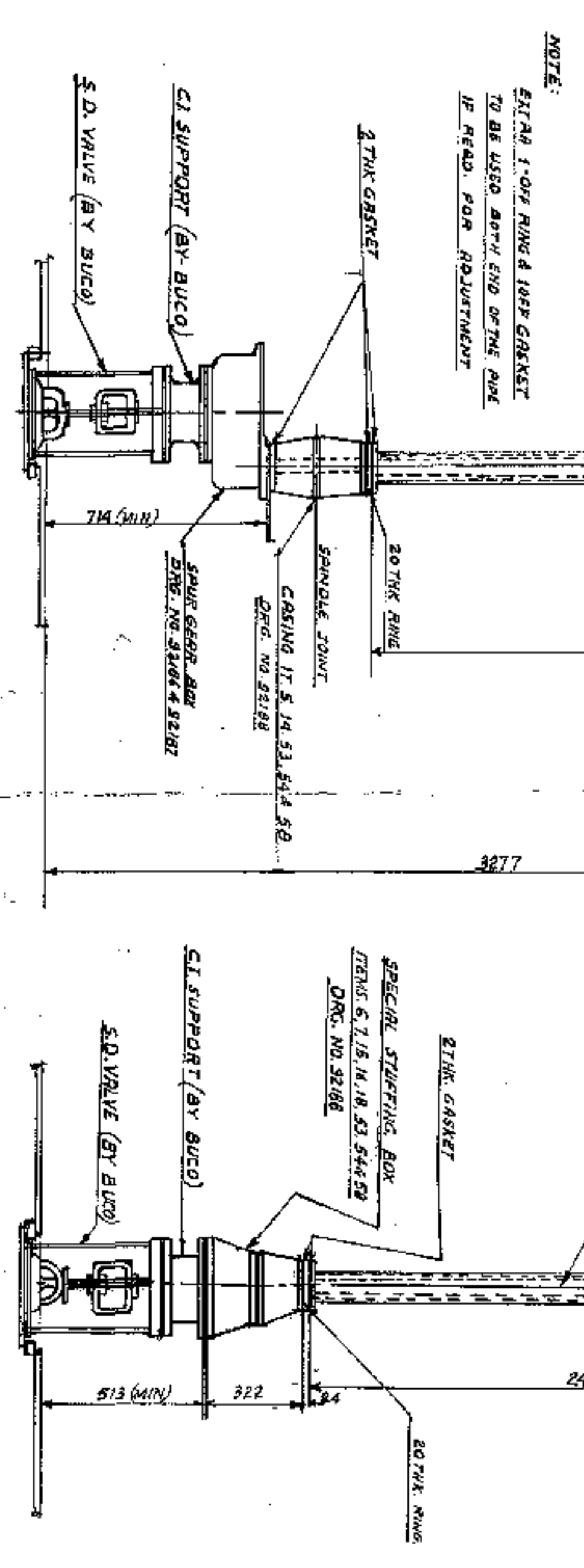


ITEMS PER CAISSON			ITEMS PER CAISSON		
ITEM NO.	QTY.	DESCRIPTION	ITEM NO.	QTY.	DESCRIPTION
51	2	C/S BOLT	51	2	C/S BOLT
52	1	WASHER 7/8" DIA. X 1 1/2" LG.	52	1	WASHER 7/8" DIA. X 1 1/2" LG.
53	1	NUT 7/8" DIA. X 1 1/2" LG.	53	1	NUT 7/8" DIA. X 1 1/2" LG.
54	6	WASHER 1/4" DIA. (GALV.)	54	6	WASHER 1/4" DIA. (GALV.)
55	6	NUT 1/4" DIA. (GALV.)	55	6	NUT 1/4" DIA. (GALV.)
56	12	WASHER 3/8" DIA. (GALV.)	56	12	WASHER 3/8" DIA. (GALV.)
57	12	NUT 3/8" DIA. (GALV.)	57	12	NUT 3/8" DIA. (GALV.)
58	24	WASHER 1/2" DIA. (GALV.)	58	24	WASHER 1/2" DIA. (GALV.)
59	24	NUT 1/2" DIA. (GALV.)	59	24	NUT 1/2" DIA. (GALV.)
60	24	WASHER 5/8" DIA. (GALV.)	60	24	WASHER 5/8" DIA. (GALV.)
61	24	NUT 5/8" DIA. (GALV.)	61	24	NUT 5/8" DIA. (GALV.)
62	24	WASHER 3/4" DIA. (GALV.)	62	24	WASHER 3/4" DIA. (GALV.)
63	24	NUT 3/4" DIA. (GALV.)	63	24	NUT 3/4" DIA. (GALV.)
64	24	WASHER 7/8" DIA. (GALV.)	64	24	WASHER 7/8" DIA. (GALV.)
65	24	NUT 7/8" DIA. (GALV.)	65	24	NUT 7/8" DIA. (GALV.)
66	24	WASHER 1" DIA. (GALV.)	66	24	WASHER 1" DIA. (GALV.)
67	24	NUT 1" DIA. (GALV.)	67	24	NUT 1" DIA. (GALV.)
68	24	WASHER 1 1/8" DIA. (GALV.)	68	24	WASHER 1 1/8" DIA. (GALV.)
69	24	NUT 1 1/8" DIA. (GALV.)	69	24	NUT 1 1/8" DIA. (GALV.)
70	24	WASHER 1 1/4" DIA. (GALV.)	70	24	WASHER 1 1/4" DIA. (GALV.)
71	24	NUT 1 1/4" DIA. (GALV.)	71	24	NUT 1 1/4" DIA. (GALV.)
72	24	WASHER 1 3/8" DIA. (GALV.)	72	24	WASHER 1 3/8" DIA. (GALV.)
73	24	NUT 1 3/8" DIA. (GALV.)	73	24	NUT 1 3/8" DIA. (GALV.)
74	24	WASHER 1 1/2" DIA. (GALV.)	74	24	WASHER 1 1/2" DIA. (GALV.)
75	24	NUT 1 1/2" DIA. (GALV.)	75	24	NUT 1 1/2" DIA. (GALV.)
76	24	WASHER 1 3/4" DIA. (GALV.)	76	24	WASHER 1 3/4" DIA. (GALV.)
77	24	NUT 1 3/4" DIA. (GALV.)	77	24	NUT 1 3/4" DIA. (GALV.)
78	24	WASHER 2" DIA. (GALV.)	78	24	WASHER 2" DIA. (GALV.)
79	24	NUT 2" DIA. (GALV.)	79	24	NUT 2" DIA. (GALV.)
80	24	WASHER 2 1/4" DIA. (GALV.)	80	24	WASHER 2 1/4" DIA. (GALV.)
81	24	NUT 2 1/4" DIA. (GALV.)	81	24	NUT 2 1/4" DIA. (GALV.)
82	24	WASHER 2 1/2" DIA. (GALV.)	82	24	WASHER 2 1/2" DIA. (GALV.)
83	24	NUT 2 1/2" DIA. (GALV.)	83	24	NUT 2 1/2" DIA. (GALV.)
84	24	WASHER 2 3/4" DIA. (GALV.)	84	24	WASHER 2 3/4" DIA. (GALV.)
85	24	NUT 2 3/4" DIA. (GALV.)	85	24	NUT 2 3/4" DIA. (GALV.)
86	24	WASHER 3" DIA. (GALV.)	86	24	WASHER 3" DIA. (GALV.)
87	24	NUT 3" DIA. (GALV.)	87	24	NUT 3" DIA. (GALV.)
88	24	WASHER 3 1/4" DIA. (GALV.)	88	24	WASHER 3 1/4" DIA. (GALV.)
89	24	NUT 3 1/4" DIA. (GALV.)	89	24	NUT 3 1/4" DIA. (GALV.)
90	24	WASHER 3 1/2" DIA. (GALV.)	90	24	WASHER 3 1/2" DIA. (GALV.)
91	24	NUT 3 1/2" DIA. (GALV.)	91	24	NUT 3 1/2" DIA. (GALV.)
92	24	WASHER 3 3/4" DIA. (GALV.)	92	24	WASHER 3 3/4" DIA. (GALV.)
93	24	NUT 3 3/4" DIA. (GALV.)	93	24	NUT 3 3/4" DIA. (GALV.)
94	24	WASHER 4" DIA. (GALV.)	94	24	WASHER 4" DIA. (GALV.)
95	24	NUT 4" DIA. (GALV.)	95	24	NUT 4" DIA. (GALV.)
96	24	WASHER 4 1/4" DIA. (GALV.)	96	24	WASHER 4 1/4" DIA. (GALV.)
97	24	NUT 4 1/4" DIA. (GALV.)	97	24	NUT 4 1/4" DIA. (GALV.)
98	24	WASHER 4 1/2" DIA. (GALV.)	98	24	WASHER 4 1/2" DIA. (GALV.)
99	24	NUT 4 1/2" DIA. (GALV.)	99	24	NUT 4 1/2" DIA. (GALV.)
100	24	WASHER 4 3/4" DIA. (GALV.)	100	24	WASHER 4 3/4" DIA. (GALV.)
101	24	NUT 4 3/4" DIA. (GALV.)	101	24	NUT 4 3/4" DIA. (GALV.)
102	24	WASHER 5" DIA. (GALV.)	102	24	WASHER 5" DIA. (GALV.)
103	24	NUT 5" DIA. (GALV.)	103	24	NUT 5" DIA. (GALV.)
104	24	WASHER 5 1/4" DIA. (GALV.)	104	24	WASHER



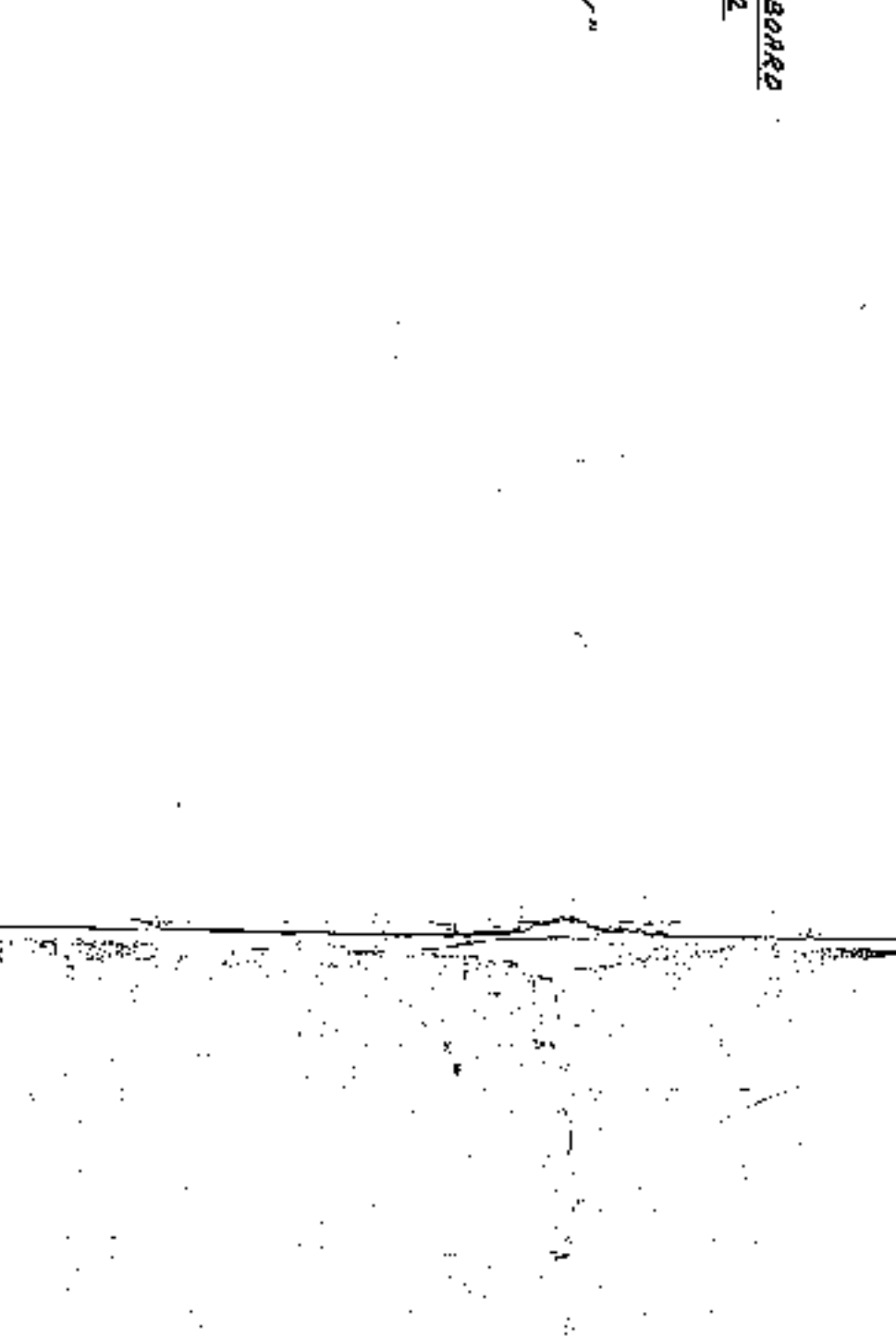
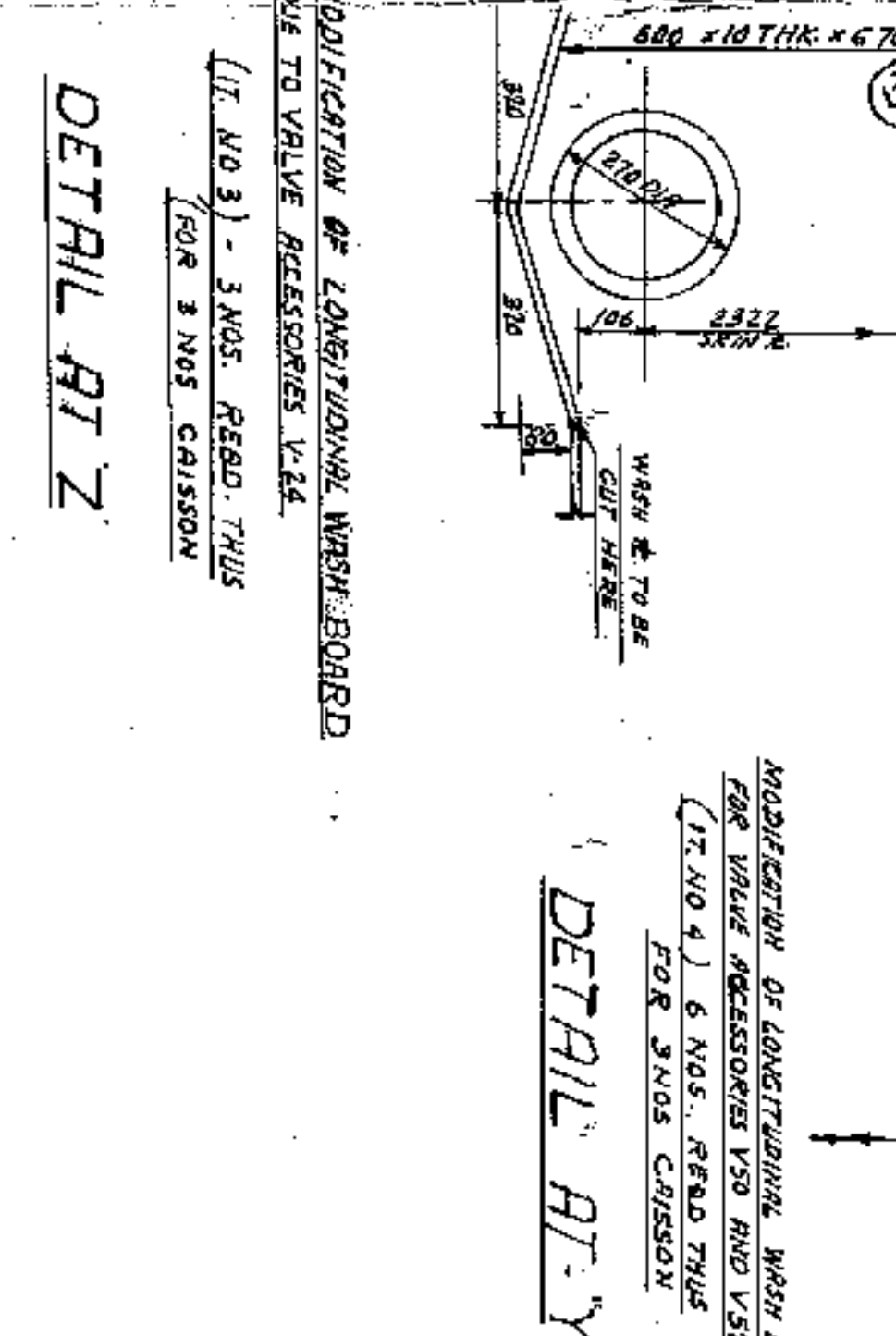
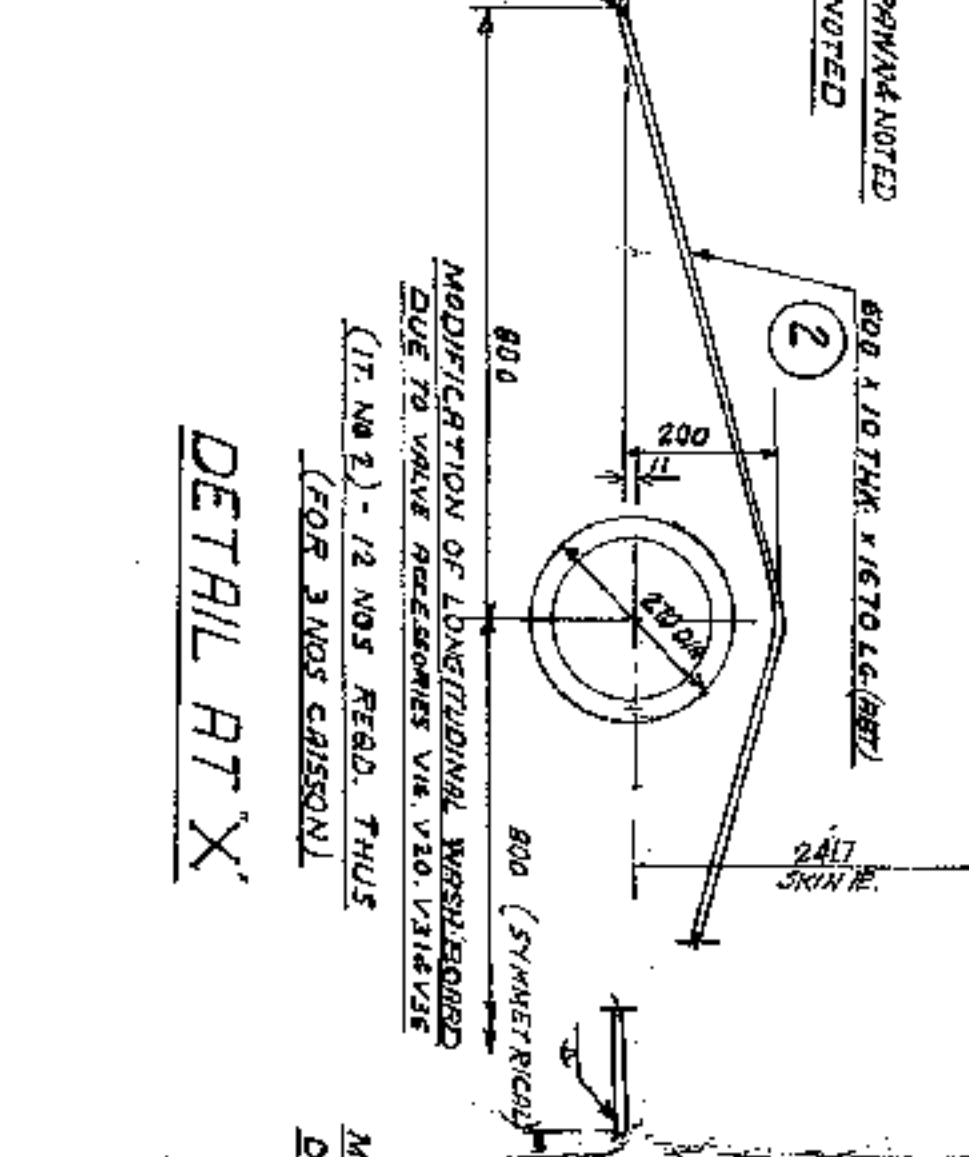
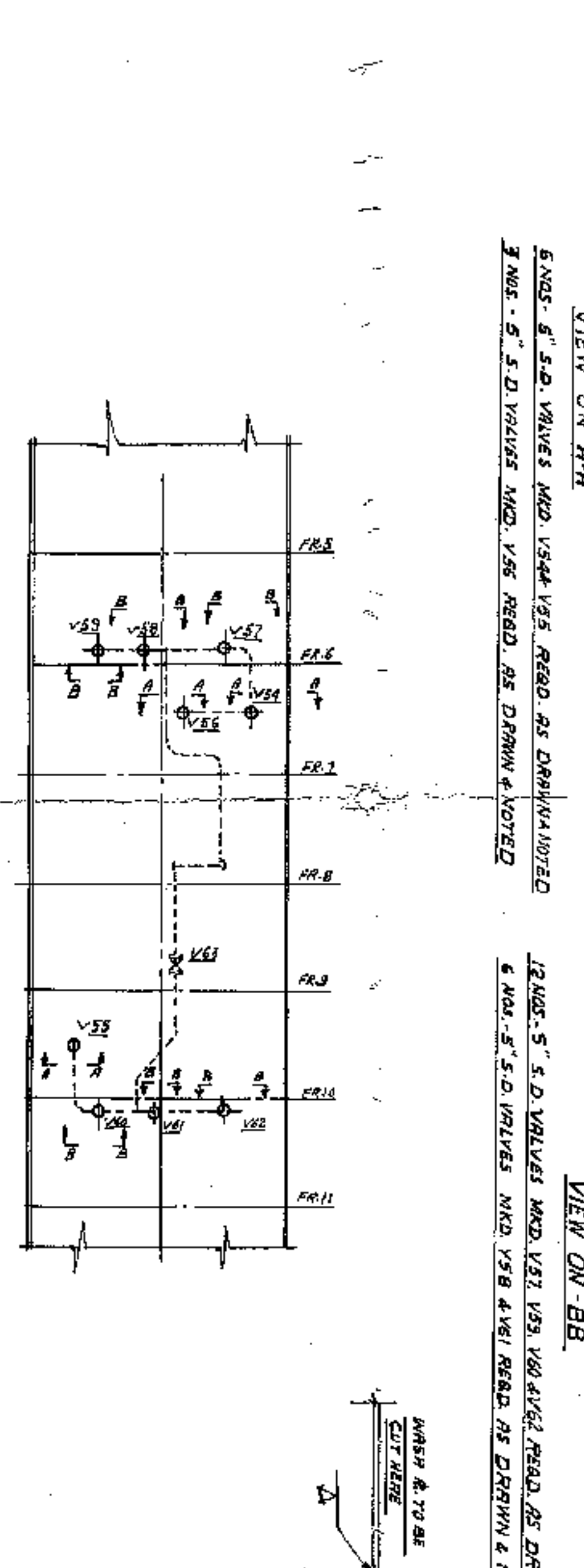


ELEVATION OF DECK SHOWING MODIFICATION OF MEMBERS DUE TO VALUE REQUIREMENTS



NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
2. ALL WELDS ARE 8mm MIN. FILLET UNLESS OTHERWISE NOTED.
3. THE DECK IS TO BE WELDED IN CONJUNCTION WITH THE HULL.
4. FOR DETAIL OF VALUE SEE DECKING DRAWING NO. 11/11/12.
5. THE DECK IS TO BE WELDED IN CONJUNCTION WITH THE HULL.
6. FOR LARGER DIMENSIONS SEE DRAWING NO. 11/11/12.



PLAN ON C DECK

JESSOP & Co Ltd

3.000 SLIDING CHASSIS GATES FOR MARINA	11/8
GENERAL ARRANGEMENT OF 3.000 SLIDING CHASSIS GATES FOR MARINA	33550B
SCALE: 1:100	
DRAWN: 11/8	
CHECKED: 11/8	
DATE: 14.6.76	













