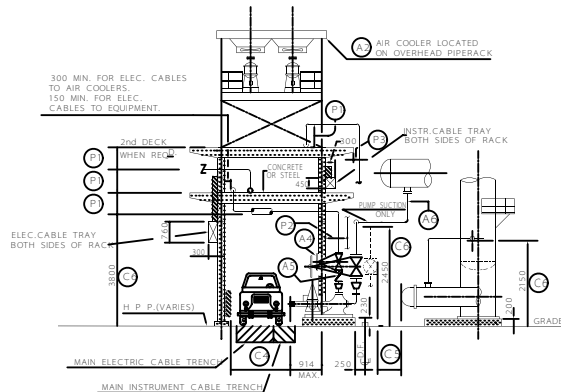
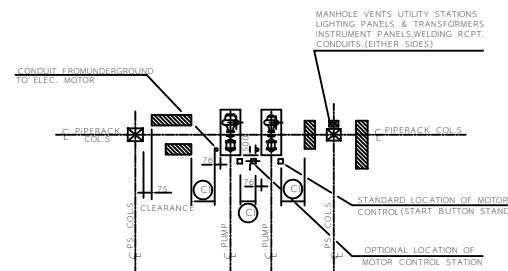


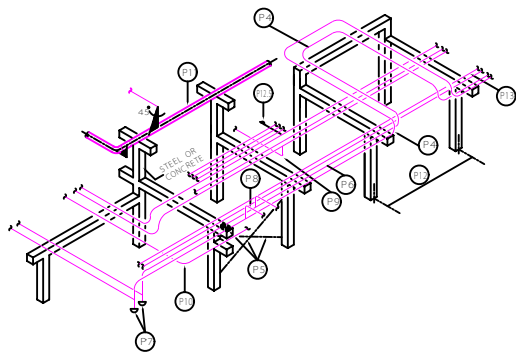
TYPICAL UNIT PLOT PLAN ARRANGEMENT
SHOWING MINIMUM CLEARANCES



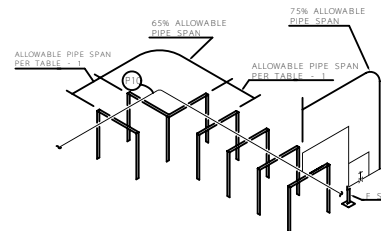
TYP. SECT. THROUGH PIPERACK SHOWING
MIN. CLEARANCES IN PROCESS & UTILITY AREAS



SPACE ALLOCATION AT SUPPORT COLUMNS



PIPERACK LAYOUT



ALLOWABLE PIPE SPAN
AT TURNS & TAKE OFFS

TABLE - 1
ALLOWABLE PIPE SPANS
BASED ON USING ASTM A53 GR.B PIPE FILLED WITH WATER

| PIPE SIZE | MAX. THK. | 53°C & UNDER (LIMITING STRESS=14.47 N/mm ²) UNINSUL. | | 93°C & 115°C (LIMITING STRESS=39.82 N/mm ²) INSULATED | |
|-----------|-----------|--|--------------|---|--------------|
| | | SPAN | DEFLECT/SPAN | SPAN | DEFLECT/SPAN |
| 20 | 17.4 | 3.20 | 15 | 1600 | 9 |
| 25 | 19.1 | 3.50 | 16 | 1800 | 10 |
| 30 | 21.7 | 3.80 | 17 | 2000 | 11 |
| 40 | 27.1 | 4.50 | 20 | 2500 | 14 |
| 50 | 33.8 | 5.00 | 22 | 3000 | 16 |
| 60 | 41.3 | 5.50 | 24 | 3500 | 18 |
| 75 | 51.8 | 6.50 | 28 | 4200 | 22 |
| 90 | 63.4 | 7.50 | 32 | 5000 | 26 |
| 100 | 71.1 | 8.00 | 34 | 5500 | 28 |
| 125 | 89.1 | 9.50 | 40 | 6500 | 34 |
| 150 | 107.1 | 11.00 | 46 | 7500 | 40 |
| 175 | 125.1 | 12.50 | 52 | 8500 | 46 |
| 200 | 143.1 | 14.00 | 58 | 9500 | 52 |
| 225 | 161.1 | 15.50 | 64 | 10500 | 58 |
| 250 | 179.1 | 17.00 | 70 | 11500 | 64 |
| 275 | 197.1 | 18.50 | 76 | 12500 | 70 |
| 300 | 215.1 | 20.00 | 82 | 13500 | 76 |
| 325 | 233.1 | 21.50 | 88 | 14500 | 82 |
| 350 | 251.1 | 23.00 | 94 | 15500 | 88 |
| 375 | 269.1 | 24.50 | 100 | 16500 | 94 |
| 400 | 287.1 | 26.00 | 106 | 17500 | 100 |
| 425 | 305.1 | 27.50 | 112 | 18500 | 106 |
| 450 | 323.1 | 29.00 | 118 | 19500 | 112 |
| 475 | 341.1 | 30.50 | 124 | 20500 | 118 |
| 500 | 359.1 | 32.00 | 130 | 21500 | 124 |
| 525 | 377.1 | 33.50 | 136 | 22500 | 130 |
| 550 | 395.1 | 35.00 | 142 | 23500 | 136 |
| 575 | 413.1 | 36.50 | 148 | 24500 | 142 |
| 600 | 431.1 | 38.00 | 154 | 25500 | 148 |

TABLE-1 IS MAINLY A GUIDE LINE FOR ABOVE CONDITION.
FOR OTHER CASES THIS TABLE MUST BE RECHECKED.

THIS DRAWING SUPERSEDES DWG. No. D-O-5005

NOTES

- ALL THK. VALUES & DIM.S ARE IN mm.
 - DESIGNATION DN IN "SI" UNITS IS USED FOR NOMINAL DIA.
 - FOR ABBREVIATIONS SEE DWG. IPS-D-PI-100
- ARRANGEMENT**
- SPACE FOR PIPING CONTROL VALVE MANIFOLDS, BY PASSES, ETC. USE 600 BEYOND ADJACENT EQUIPMENT FOR LAYOUT.
 - IN A LIMITED PLOT WHEN PROCESS CONDITIONS PERMIT AND IT IS ECONOMICALLY PREFERABLE AIR COOLERS MAY BE INSTALLED ABOVE OVERHEAD PIPERACKS.
 - PUMPS WITH PROCESS REQUIREMENTS OF LOW SUCTION LINES SHALL NORMALLY BE LOCATED AS SHOWN IF ECONOMICALLY FEASIBLE PROVIDING SUFFICIENT SPACE OR ACCESS IS AVAILABLE FOR MAINTENANCE.
 - PUMP SUCTION & DISCHARGE VALVES SHALL, IF POSSIBLE, BE ACCESSIBLE FOR OPERATION WITHOUT THE USE OF CHAIN OR EXTENSION STEMS.
 - DISCHARGE CHECK VALVES SHALL, IF PRACTICABLE, BE LOCATED IN THE VERTICAL.
 - PUMP SUCTION LINES SHALL BE AS SHORT AND DIRECT AS POSSIBLE UNLESS OTHERWISE REQUIRED FOR FLEXIBILITY REASONS.
- CLEARANCE**
- 1000 CLEAR WALKING SPACE FOR PASSAGE WAY. C-2 - 1000 MAY BE MEASURED ON THE DIAGONAL OF 45° MAX.
 - CLEARANCE BETWEEN FLANGES OF EXCHANGERS AROUND OTHER BOLTED EQUIPMENT CONNECTION WHICH MUST BE SERVICED OR MAINTAINED SHALL BE 600 CLEAR.
 - A CLEAR ACCESSWAY SHALL BE PROVIDED WHICH WILL FURNISH SUFFICIENT SPACE FOR VEHICLE MANOEUVRING BUT WHICH MAY NOT NECESSARILY BE IN A STRAIGHT LINE. 4800 MIN. FOR A 6100 WIDE PIPERACK & 5800 MIN. FOR A 7600 & 8000 MIN. FOR A 10000
 - CLEAR AISLEWAY FOR EXCHANGER HEAD REMOVAL SHALL BE 2300.
 - PIPERACK BOTTOM OF PIPE ELEVATION ABOVE GRADE OR HIGH POINT OF PAVING SHALL BE 2150 OVER PASSAGE WAYS, 2450 OVER AISLES AND 3800 OVER ACCESSWAYS.
 - MINIMUM DIMENSION=760.
- PIPERACK**
- DIFFERENCE IN PIPERACK ELEV.S SHALL GENERALLY BE 760 MIN.
 - ALLOW 350 DROP SPACE FOR UTILITY, STEAM TRAP, VENT PIPING, ETC.
 - GENERALLY THE CENTERLINE OF LINE DROPS SHALL BE BASED ON MIN. CLEARANCE BETWEEN THE EDGE OF THE PIPE SUPPORT AND/ OR INSTRUMENT RACK AND THE BACK OF THE LARGEST PIPE AND/ OR INSULATION. OTHER DROPS SHALL BE ON APPROX. THE SAME AS THE LARGEST PIPE.
 - LOOPS ARE REQUIRED WHEN IT IS IMPRACTICABLE TO TAKE PIPING EXPANSION MOVEMENTS AT CORNERS OR AT EQUIP. THEY SHALL NORMALLY BE OBTAINED BY FOLDING BACK OVER THE PIPERACK.
 - IF ANCHORS ARE REQUIRED TO MINIMIZE FORCES ON EQUIPMENT OR REDUCE PIPING EXPANSION MOVEMENT, THEY SHALL BE LOCATED THAT ANY NECESSARY BRACING DOES NOT INTERFERE WITH PASSAGEWAY OR EQUIPMENT CLEARANCES.
 - GENERALLY LARGEST PIPE DIAMETER AND/ OR HOT LINES SHALL BE ROUTED ON THE OUTSIDE OF PIPERACK TO PERMIT MAXIMUM EXPANSION MOVEMENTS IN A MIN. OF SPACE.
 - WHEN CONDENSATE REMOVAL IS REQUIRED IN UTILITY AIR OR STEAM HEADERS, DRIP OR BOOT LEGS SHALL BE PROVIDED AT FIPPING LOW POINTS OR OTHER CONVENIENT LOCATIONS.
 - GENERALLY, PIPERACK HEADER BRANCH CONNECTORS FOR UTILITY & PROCESS GASES, AIR, STEAM, ETC. WILL BE MADE ON THE TOP OF THE LINE TO AVOID HEADER LOW POINTS WHERE COND. MAY COLLECT.
 - PIPERACK HEADER BRANCH CONNECTIONS FOR LIQUIDS GENERALLY ARE ON THE BOTTOM OF THE HEADER TO AVOID BRANCH HIGH POINTS WHERE GASES MAY COLLECT AND PREVENTING LIQUID FLOW.
 - WHEN ECONOMICALLY FEASIBLE, OR AS STIPULATED BY PROCESS CONDITIONS, FLAT TURNS & DIAGONAL RUNS SHALL BE USED WHEN PRACTICABLE.
 - THE NORMALLY DESIRABLE LOCATION OF RELIEF AND BLOWDOWN HEADERS ELEVATED ABOVE PIPERACK IS OVER THE PIPERACK COLUMNS.
 - THE CENTERLINE TO CENTERLINE OF PIPERACK COLUMNS SHALL BE 7600 WITH THE FOLLOWING EXCEPTIONS:
 - IF THE PREDOMINANT PORTION OF THE PIPING IN THE RACK IS UNDER 3" (DN80) SEE TABLE -1 FOR ALLOWABLE PIPE SPANS
 - ALUMINIUM OR OTHER SPECIAL MATERIALS CONSTITUTE THE MAJORITY.
 - SPANS MAY BE SHORTENED SLIGHTLY TO MAKE EVEN SPACING ACROSS A PLOT.
 - SUPPORT SPACING SHALL BE INCREASED FOR SINGLE OR MULTIPLE LINES 200 & LARGER (SEE TABLE -1 FOR ALLOWABLE PIPE SPANS)
 - SMALL LINES UNABLE TO SPAN THE NORMAL 7600 SPACING SHALL BE SUPPORTED BY INTERMEDIATE PICK-UP.
 - FOR LINE SPACING SEE DWG. IPS-D-PI-103.

IRANIAN PETROLEUM STANDARD

(NO REVISION PERMITTED UNLESS APPROVED BY STANDARD ORGANIZATION)

TYPICAL UNIT ARRANGEMENT &
PIPERACK LAYOUT

| | | | |
|------|--------------|-------|------|
| DATE | DRAWING No. | SHEET | REV. |
| | IPS-D-PI-102 | 1 | 1 |