

PIPING MATERIAL SPECIFICATION

PROJECT: IMPLEMENTATION OF ZERO LIQUID DISCHARGE UNIT

AT

RAMAGUNDAM FERTILIZERS AND CHEMICALS LIMITED (RFCL),

TELANGANA, INDIA

Index of Piping Material Specifications

| SL.NO. | EIL/PDIL PMS_RFCL | SERVICE | RATING, FACE ,D.TEMP. | BASIC MATERIAL | CORROSION ALLOW. (MIN.) |
|--------|-------------------|--|-------------------------------------|----------------|-------------------------|
| 1 | 31B | UL | CLASS 150, RF,150°C Max | 316L SS | 0.0 MM |
| 2 | 33A | UL | CLASS 300, RF,150°C Max | 316L SS | 0.0 MM |
| 3 | A1A | PW,WW,BD,DO,SC,TC,SW,PA,CWS,CWR,NI, CW,ES,FG,FN,FO,FW,NI,PG,PV,SA,PN,IAW | CLASS 150, RF, 200 °C Max | CS | 1.5 MM |
| 4 | A21K | AF, AW, CD, DW, HZ, IA, MDA, PC, PH, VS | CLASS 150, RF,150°C Max | 304 SS | 0.0 MM |
| 5 | A23K | CD,FG,HG,PA,PC | CLASS 150, RF,150°C Max | 304L SS | 0.0 MM |
| 6 | A2A | SL,SC (IBR) | CLASS 150, RF, 240°C Max | CS | 1.5 MM |
| 7 | A3A | CONST.WATER | CLASS 150, FF, 80°C Max | CS | 1.5 MM |
| 8 | A3Y | EFFLUENT, WASTE H2O, CHLORINATED H2O | CLASS 150, FF, 80°C Max | CSRL | 1.5 MM |
| 9 | A91A | CW (UG) | CLASS 150, RF, 70°C Max | CS | 1.5MM |
| 10 | B1A | AG,AL,AW,FG,FN,HG,IAH,IAW, PA | CLASS 300, RF,280°C Max | CS | 1.5 MM |
| 11 | B1K | AW,PH,PC | CLASS 300, RF,200°C Max | 304 SS | 0.0 MM |
| 12 | B24A | AG,AL,FG | CLASS 150, RF,50°C Max, - 35°C Min. | LTCS | 1.5 MM |
| 13 | B24P | WASTE EFFLUENT,EFFLUENT,ACIDIC H2O ETC. | CLASS 150, FF, 80°C Max | CPVC | 0.0 MM |
| 14 | B25 | PW (RO-III SYSTEMS) | CLASS 150, RF, | SDSS | 0.0 MM |
| 15 | D1A | AW,HG,PA,PC,PN,SG | CLASS 600, RF,425°C Max | CS | 1.5 MM |
| 16 | J2A | DW | CLASS 150, RF, 70°C Max | CS (GALV) | 1.5MM |
| 17 | J91A | DW | CLASS 150, RF, 70°C Max | CS (GALV) | 1.5MM |

| Abbrev. | Service |
|---------|-------------------------------|
| AF | Antifoam solution |
| AG | Ammonia Gaseous |
| AL/LA | Ammonia Liquid |
| AW | Ammonia water |
| BB | Boiler BlowDown |
| BD | Blow Down |
| BF | Boiler feed water |
| CD | CO2/Steam mixture |
| CW | Cooling water |
| CWS | Cooling water supply |
| CWR | Cooling water return |
| DM | DM water |
| DW | Drinking Water |
| DO | Diesel Oil |
| ES | Exhaust steam |
| FG | Fuel gas |
| FO | Fuel oil |
| FN | Fuel Naphtha |
| FW | Fire Water |
| HC | Mixed Hydrocarbons |
| HG | Hydrogen Gas |
| HZ | Hydrazine |
| IA | Instrument air |
| IAH | Instrument air(High pressure) |
| IAW | Instrument air(Wet) |
| IG | Inert gas |
| NG | Natural gas |
| NI | Nitrogen |
| PA | Process Air |
| PC | Process condensate |
| PG | Process Gas |

| Abbrev. | Service |
|-----------|-------------------------|
| PH | Phosphate Solution |
| PN | Process Naphtha |
| PV | Vent gas |
| PW | Process Water |
| SA | service air |
| SC | Steam condensate |
| SG | Synthesis Gas |
| SH/HPS/HP | High Pressure Steam |
| SL/LP/LPS | LP Steam |
| SM/MPS | Medium Pressure Steam |
| SW | Service water |
| TC | Turbine Condensate |
| UL | Urea solutions handling |
| WW | Waste Water |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 31B Sheet I of 6 |

PIPE CLASS : **31B**
RATING : 150
BASE MATERIAL : SS 316L
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT : SPECIAL REQUIREMENT-1

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| TEMP | -10 | 38 | 50 | 100 | 150 | 200 |
|-------|-------|-------|-------|-------|-------|-------|
| PRESS | 16.16 | 16.15 | 15.62 | 13.53 | 12.28 | 11.33 |

SERVICE

LOW PRESSURE FLUSHING CONDENSATE, LOW PRESSURE UREA

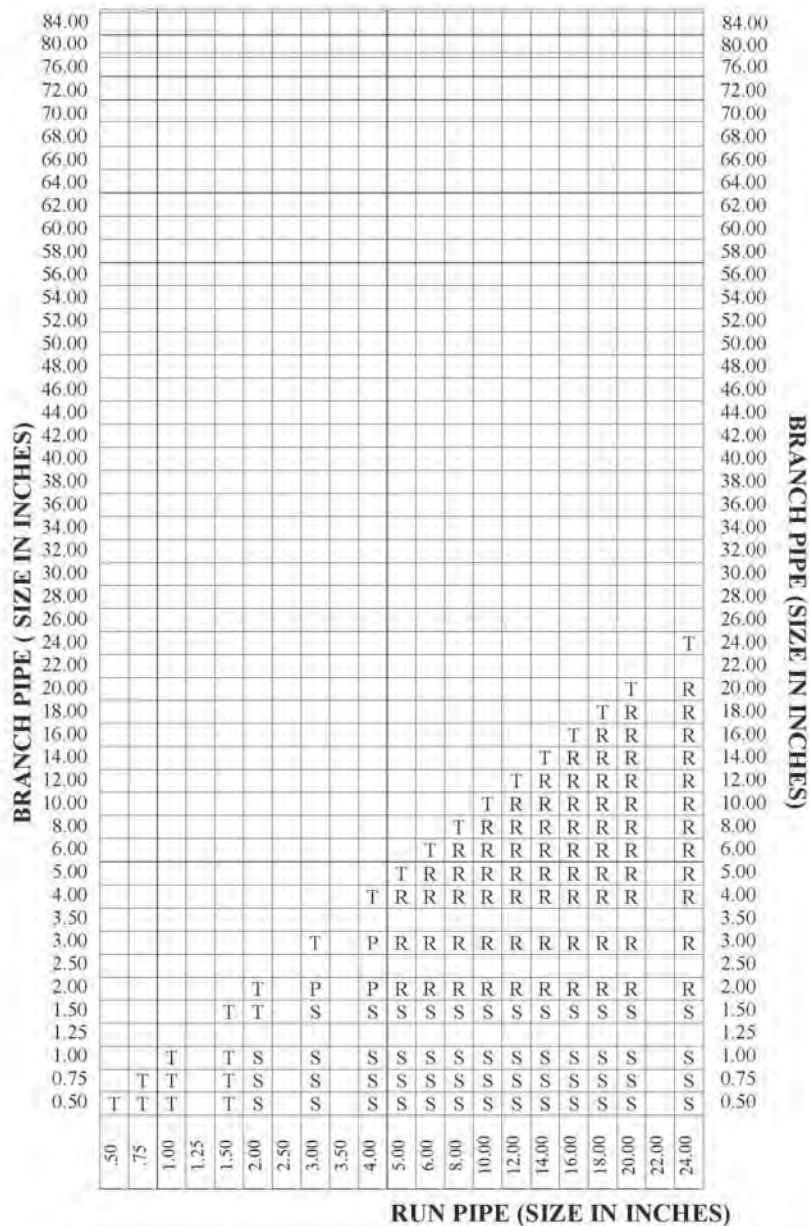
NOTES

- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW SOCKOLET | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER JOB STD A747-7-44-0350, DF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER JOB STD. A747-7-44-0351, D4 | |
| VENT'S | ON LINES <= 1.5" | REFER JOB STD. A747-7-44-0350, VF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER JOB STD A747-7-44-0351, V4 | |
| TEMP.CONN | 1" | THREDOLET | |
| PRESS.CONN | 3" | REFER SHEET 16 OF TB.HPU.5002 | |

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 31B Sheet 2 of 6 |



| CODE | DESCRIPTION | | | | |
|------|-----------------|---|----------------|---|------------|
| F | SADDLE FUSED JT | T | TEES | J | THREADOLET |
| H | H. COUPLING | W | WELDOLETS | | |
| P | PIPE TO PIPE | I | INSTRUMENT TEE | | |
| R | REINFORCED | X | Refer Notes | | |
| S | SOCKOLETS | L | SWEEPOLET | | |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 31B Sheet 3 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|-------------|-------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | 80S | B-36.19 | ASTM A 312 TP316L | PE, SEAMLESS | PI34077ZI | |
| PIP | PIPE | 1 | 1.5 | 40S | B-36.19 | ASTM A 312 TP316L | PE, SEAMLESS | PI34077ZI | |
| PIP | PIPE | 2 | 2 | 40S | B-36.19 | ASTM A 312 TP316L | BE, SEAMLESS | PI34017ZI | |
| PIP | PIPE | 3 | 4 | 10S | B-36.19 | ASTM A 312 TP316L | BE, SEAMLESS | PI34017ZI | |
| PIP | PIPE | 6 | 24 | 10S | B-36.19 | ASTM A 358 TP316L CL.1 | BE, E.F.S.W | PI36713ZI | |
| NIP | NIPPLE | .5 | .75 | M | B-36.19 | ASTM A 312 TP316L | PBE, SEAMLESS | PN34067ZI | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.19 | ASTM A 312 TP316L | PBE, SEAMLESS | PN34067ZI | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 182 GR.F316L | 600, RF/125AARH | FSC4667ZI | |
| FLG | FLNG.WN | 2 | 24 | M | B-16.5 | ASTM A 182 GR.F316L | 150, RF/125AARH | FWC4627ZI | |
| FLG/600 | FLNG.WN | 6 | 8 | M | B-16.5 | ASTM A 182 GR.F316L | 600, RF/125AARH | FWC4667ZI | |
| FLG/300 | FLNG.WN | 2 | 18 | M | B-16.5 | ASTM A 182 GR.F316L | 300, RF/125AARH | FWC4647ZI | |
| FLB | FLNG.BLIND | .5 | 1.5 | | B-16.5 | ASTM A 182 GR.F316L | 600, RF/125AARH | FBC4667ZI | |
| FLB | FLNG.BLIND | 2 | 24 | | B-16.5 | ASTM A 182 GR.F316L | 150, RF/125AARH | FBC4627ZI | |
| FLB/600 | FLNG.BLIND | 8 | 8 | | B-16.5 | ASTM A 182 GR.F316L | 600, RF/125AARH | FBC4667ZI | |
| FLB/300 | FLNG.BLIND | 2 | 18 | | B-16.5 | ASTM A 182 GR.F316L | 300, RF/125AARH | FBC4647ZI | |
| FEF | FLNG.FIG.8 | .5 | 1.5 | | ASME-B16.48 | ASTM A 240 GR.316L | 600, RF/125AARH | FGKC167ZI | |
| FEF | FLNG.FIG.8 | 2 | 8 | | ASME-B16.48 | ASTM A 240 GR.316L | 150, RF/125AARH | FGKC127ZI | |
| FEF | SPCR&BLND | 10 | 14 | | ASME-B16.48 | ASTM A 240 GR.316L | 150, RF/125AARH | FCKC127ZI | |
| FLP | FLNG.SPCL | 4 | 24 | | TB.HPU-5002 | ASTM A 182 GR.F316L | SP2, RF/125AARH | FUV46T7ZI | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WA647D2ZI | |
| ELB90 | ELBOW.90 | 2 | 4 | M | B-16.9 | ASTM A 403 GR.WP316L-S | BW, 1.5D | WAGA34Z1I | |
| ELB90 | ELBOW.90 | 5 | 24 | M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW, 1.5D | WAG864Z1I | |

Package : IPMCS

Report No. : 50

31B

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 31B Sheet 4 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dim. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|----------|-------------------------|-------------|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB45 | ELBOW.45 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WB647D2ZI | |
| ELB45 | ELBOW.45 | 2 | 4 | M | B-16.9 | ASTM A 403 GR.WP316L-S | BW, 1.5D | WBGA34ZZI | |
| ELB45 | ELBOW.45 | 5 | 24 | M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW, 1.5D | WBG864ZZI | |
| TEQ | T.EQUAL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WE647D2ZI | |
| TEQ | T.EQUAL | 2 | 4 | M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WEGA34ZZI | |
| TEQ | T.EQUAL | 5 | 24 | M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW | WEG864ZZI | |
| TRED | T.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WR647D2ZI | |
| TRED | T.RED | 2 | 4 | M, M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WRGA34ZZI | |
| TRED | T.RED | 5 | 24 | M, M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW | WRG864ZZI | |
| REDC | REDUC.CONC | 2 | 4 | M, M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WUGA34ZZI | |
| REDC | REDUC.CONC | 5 | 24 | M, M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW | WUG864ZZI | |
| REDE | REDUC.ECC | 2 | 4 | M, M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WVGA34ZZI | |
| REDE | REDUC.ECC | 5 | 24 | M, M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW | WVG864ZZI | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR.F316L | PBE | WNH476ZZI | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR.F316L | PBE | WPH476ZZI | |
| CAP | CAP | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WF64782ZI | |
| CAP | CAP | 2 | 24 | M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WFGA34ZZI | |
| CPLF | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WJ647D2ZI | |
| CPLF/I | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WJ64782ZI | |
| CPLH | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WK647D2ZI | |
| CPLH/I | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WK64782ZI | |
| CPLL | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WL647D2ZI | |
| CPLL/I | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WL64782ZI | |

Package : IPMCS

Report No. : 50

31B

| | |
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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 31B Sheet 5 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|-----------------|---|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| CPLR | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WM647D2ZI | |
| CPLR/I | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WM64782ZI | |
| O'let Group | | | | | | | | | |
| SLT | SOCKO'LET | .5 | 1.5 | | MSS-SP97 | ASTM A 182 GR.F316L | SW, 3000 | YSS47D2ZI | |
| TLT | THREAO'LET | .5 | 1.5 | | MSS-SP97 | ASTM A 182 GR.F316L | SCRF, 3000 | YTS4782ZI | |
| Valves Group | | | | | | | | | |
| CHV | VLV.CHECK | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 182 GR.F316L,TRIM-SS 316L | SW, 800, 3000, B-16.11, SHT NO.- 530MU | 530MUZZZI | |
| CHV | VLV.CHECK | 2 | 12 | | BS-1868 | BODY-ASTM A 351 GR CF3M,TRIM-SS 316L | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 533MU | 533MUZZZI | |
| CHV | VLV.CHECK | 14 | 24 | | MNF'STD | BODY-ASTM A 351 GR CF3M,TRIM-SS 316L | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 533MT | 533MTZZZI | |
| BLV | VLV.BALL | .5 | 1.5 | | BS EN ISO 17292 | BODY-ASTM A 182 GR.F316L,TRIM-SS 316L + PTFE SEATS | SPCL, 800, 3000, JOB'STD, REFER VMS SHT, SHT NO.- 540MU | 540MUZZZI | |
| BLV | VLV.BALL | 2 | 6 | | BS EN ISO 17292 | BODY-ASTM A 351 GR CF3M,TRIM-SS 316L + PTFE SEATS | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 543MU | 543MUZZZI | |
| PLV | VLV.PLUG | .5 | 1.5 | | API-599 | BODY-ASTM A 182 GR.F316L,TRIM-SS 316L + PTFE SLEEVE | SW, 800, 3000, B-16.11, SHT NO.- 550MU | 550MUZZZI | |
| PLV | VLV.PLUG | 2 | 12 | | API-599 | BODY-ASTM A 351 GR CF3M,TRIM-SS 316L + PTFE SLEEVE | BW, 150, B-16.25, SHT NO.- 553MU | 553MUZZZI | |
| PLV/I | VLV.PLUG | 2 | 18 | | API-599 | BODY-ASTM A 351 GR CF3M,TRIM-SS 316L + PTFE SLEEVE | BW, 150, B-16.25, SHT NO.- 553MP | 553MPZZZI | |
| P3V | VLV.3WYPLG | 2 | 12 | | API-599 | BODY-ASTM A 351 GR CF3M,TRIM-SS 316L + PTFE SLEEVE | BW, 150, B-16.25, SHT NO.- 613MU | 613MUZZZI | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT,STUD | .5 | 24 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404ZI | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 31B Sheet 6 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|---------------------|-----------|-------------------|-------------------|--------------|--------------------|-----------------------------------|--------------|----------------|---------|
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 1.5 | | B-16.20-ANSI B16.5 | SP.WND SS316L+GRAFIL+I RING | SPIRAL., 600 | GK66376ZI | |
| GAS | GASKET | 2 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316L+GRAFIL+I RING | SPIRAL., 150 | GK66372ZI | |
| GAS/600 | GASKET | 6 | 8 | | B-16.20-ANSI B16.5 | SP.WND SS316L+GRAFIL+I RING | SPIRAL., 600 | GK66376ZI | |
| GAS/300 | GASKET | 2 | 18 | | B-16.20-ANSI B16.5 | SP.WND SS316L+GRAFIL+I RING | SPIRAL., 300 | GK66374ZI | |

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 33A Sheet I of 6 |

PIPE CLASS : **33A**
 RATING : 300
 BASE MATERIAL : SS 316L
 CORROSION ALLOWANCE : 0 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| TEMP | -33 | -28 | 38 | 50 | 93 | 100 | 148 | 150 | 200 | 204 | 234 |
|-------|-------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|
| PRESS | 42.11 | 42.11 | 42.11 | 40.8 | 35.9 | 35.39 | 32.05 | 31.94 | 29.72 | 29.54 | 28.59 |

SERVICE

MEDIUM PRESSURE FLUSHING CONDENSATE(HW), LOW PRESSURE FLUSHING CONDENSATE(LW), MEAN PRESSURE UREA(P)-CARBONATE SOLUTION

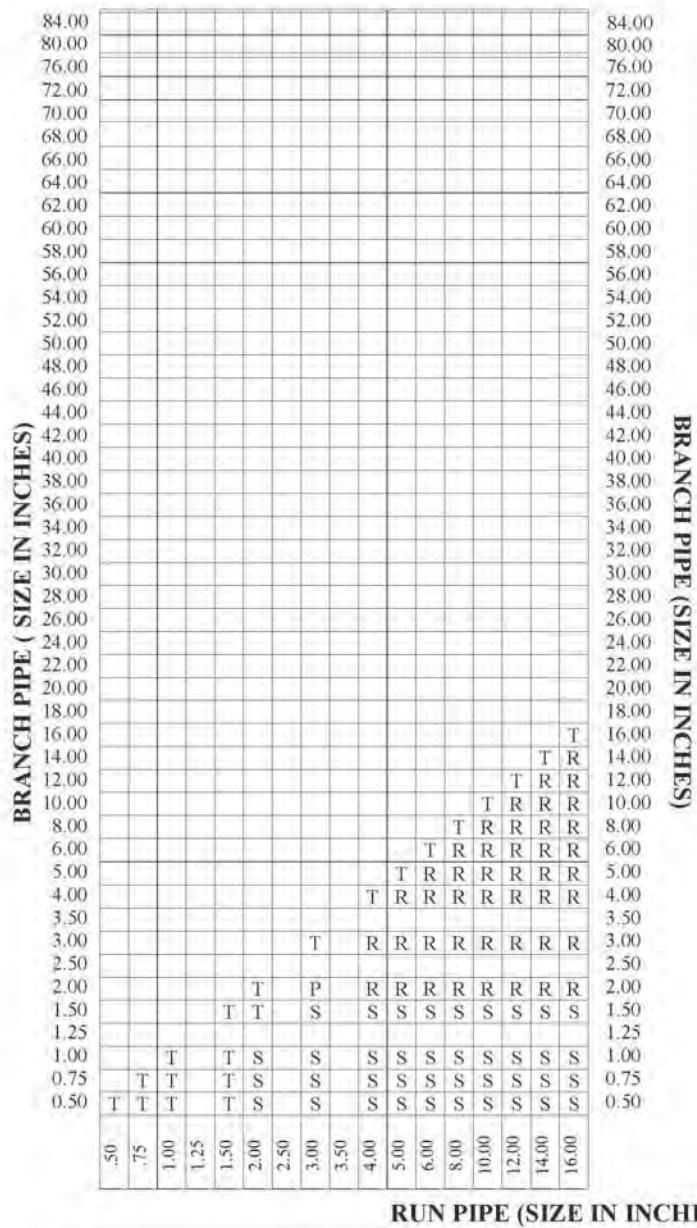
NOTES

- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016
- 203 IN THIS SPEC WHERE UREA SERVICE IS COMING PRESSURE CONNECTION AND TEMPERATURE CONNECTION SHALL BE AS PER THE SAIPEM STANDARD TB. HPU.5002 (SH. 16)

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|--|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW SOCKOLET | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER JOB STD. A747-7-44-0350, DF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER JOB STD. A747-7-44-0351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER JOB STD. A747-7-44-0350, VF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER JOB STD A747-7-44-0351, V4 | |
| TEMP.CONN | 1.5" | FLANGED. REFER JOB STD A747-7-44-0353 | |
| PRESS.CONN | 0.75" | SW NIPPLE WITH VALVE TO SPEC AS PER JOB STD A747-7-44-0354 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 33A Sheet 2 of 6 |



| <u>CODE</u> | <u>DESCRIPTION</u> |
|-------------|--------------------|
| F | SADDLE FUSED JT |
| H | H. COUPLING |
| P | PIPE TO PIPE |
| R | REINFORCED |
| S | SOCKOLETS |
| T | TEES |
| W | WELDOLETS |
| I | INSTRUMENT TEE |
| X | Refer Notes |
| L | SWEEPOLET |
| J | THREADOLET |

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 33A Sheet 3 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|---------------------|------------|-------------------|-------------------|---------------|-------------|------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | 80S | B-36.19 | ASTM A 312 TP316L | PE, SEAMLESS | PI34077Z0 | |
| PIP | PIPE | 1 | 1.5 | 40S | B-36.19 | ASTM A 312 TP316L | PE, SEAMLESS | PI34077Z0 | |
| PIP | PIPE | 2 | 2 | 40S | B-36.19 | ASTM A 312 TP316L | BE, SEAMLESS | PI34017Z0 | |
| PIP | PIPE | 3 | 4 | 10S | B-36.19 | ASTM A 312 TP316L | BE, SEAMLESS | PI34017Z0 | |
| PIP | PIPE | 5 | 6 | 10S | B-36.19 | ASTM A 358 TP316L CL.1 | BE, E.F.S.W | PI36713Z0 | |
| PIP | PIPE | 8 | 10 | S20 | B-36.10 | ASTM A 358 TP316L CL.1 | BE, E.F.S.W | PI26713Z0 | |
| PIP | PIPE | 12 | 12 | 7.14 | B-36.10 | ASTM A 358 TP316L CL.1 | BE, E.F.S.W | PI26713Z0 | |
| PIP | PIPE | 14 | 14 | S20 | B-36.10 | ASTM A 358 TP316L CL.1 | BE, E.F.S.W | PI26713Z0 | |
| PIP | PIPE | 16 | 18 | 40S | B-36.19 | ASTM A 358 TP316L CL.1 | BE, E.F.S.W | PI36713Z0 | |
| PIP | PIPE | 20 | 20 | 80S | B-36.19 | ASTM A 358 TP316L CL.1 | BE, E.F.S.W | PI36713Z0 | |
| NIP | NIPPLE | .5 | .75 | M | B-36.19 | ASTM A 312 TP316L | PBE, SEAMLESS | PN34067Z0 | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.19 | ASTM A 312 TP316L | PBE, SEAMLESS | PN34067Z0 | |
| Flange Group | | | | | | | | | |
| FLG/SP2 | FLNG.SCRD | .5 | 10 | | TB.HPU.5002 | ASTM A 105 | SP2, SPECIAL | FTV01TMZ0 | |
| FLG | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 182 GR.F316L | 600, RF/125AARH | FSC4667Z0 | |
| FLG | FLNG.WN | 2 | 20 | M | B-16.5 | ASTM A 182 GR.F316L | 300, RF/125AARH | FWC4647Z0 | |
| FLG/600 | FLNG.WN | 4 | 6 | M | B-16.5 | ASTM A 182 GR.F316L | 600, RF/125AARH | FWC4667Z0 | |
| FLB | FLNG.BLIND | .5 | 1.5 | | B-16.5 | ASTM A 182 GR.F316L | 600, RF/125AARH | FBC4667Z0 | |
| FLB | FLNG.BLIND | 2 | 16 | | B-16.5 | ASTM A 182 GR.F316L | 300, RF/125AARH | FBC4647Z0 | |
| FEF | FLNG.FIG.8 | .5 | 1.5 | | ASME-B16.48 | ASTM A 240 GR.316L | 600, RF/125AARH | FGKC167Z0 | |
| FEF | FLNG.FIG.8 | 2 | 8 | | ASME-B16.48 | ASTM A 240 GR.316L | 300, RF/125AARH | FGKC147Z0 | |
| FEF | SPCR&BLND | 10 | 16 | | ASME-B16.48 | ASTM A 240 GR.316L | 300, RF/125AARH | FCKC147Z0 | |
| FLP | FLNG.SPCL | 4 | 16 | | TB.HPU.5002 | ASTM A 182 GR.F316L | SP2, RF/125AARH | FUV46T7Z0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 33A Sheet 4 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|----------|-------------------------|-------------|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WA647D2Z0 | |
| ELB90 | ELBOW.90 | 2 | 4 | M | B-16.9 | ASTM A 403 GR.WP316L-S | BW, 1.5D | WAGA34Z10 | |
| ELB90 | ELBOW.90 | 5 | 20 | M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW, 1.5D | WAG864Z10 | |
| ELB45 | ELBOW.45 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WB647D2Z0 | |
| ELB45 | ELBOW.45 | 2 | 4 | M | B-16.9 | ASTM A 403 GR.WP316L-S | BW, 1.5D | WBGA34Z10 | |
| ELB45 | ELBOW.45 | 5 | 20 | M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW, 1.5D | WBG864Z10 | |
| TEQ | T.EQUAL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WE647D2Z0 | |
| TEQ | T.EQUAL | 2 | 4 | M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WEGA34ZZ0 | |
| TEQ | T.EQUAL | 5 | 20 | M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW | WEG864ZZ0 | |
| TRED | T.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WR647D2Z0 | |
| TRED | T.RED | 2 | 4 | M, M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WRGA34ZZ0 | |
| TRED | T.RED | 5 | 20 | M, M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW | WRG864ZZ0 | |
| REDC | REDUC.CONC | 2 | 4 | M, M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WUGA34ZZ0 | |
| REDC | REDUC.CONC | 5 | 20 | M, M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW | WUG864ZZ0 | |
| REDE | REDUC.ECC | 2 | 4 | M, M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WVGA34ZZ0 | |
| REDE | REDUC.ECC | 5 | 20 | M, M | B-16.9 | ASTM A 403 GR.WP316L-WX | BW | WVG864ZZ0 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR.F316L | PBE | WNH476ZZ0 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR.F316L | PBE | WPH476ZZ0 | |
| CAP | CAP | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WF64782Z0 | |
| CAP | CAP | 2 | 16 | M | B-16.9 | ASTM A 403 GR.WP316L-S | BW | WFGA34ZZ0 | |
| CPLF | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WJ647D2Z0 | |
| CPLF/I | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WJ64782Z0 | |
| CPLH | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WK647D2Z0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 33A Sheet 5 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|-----------------|--|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| CPLH/I | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WK64782Z0 | |
| CPLL | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WL647D2Z0 | |
| CPLL/I | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WL64782Z0 | |
| CPLR | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SW, 3000 | WM647D2Z0 | |
| CPLR/I | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F316L | SCRF, 3000 | WM64782Z0 | |
| THDN | THNOZZLE | .5 | 10 | M | TB.HPU5002 | ASTM A 182 GR.F316L | SPCL, NA, LENSFACING | WZY47CZZ0 | |
| O'let Group | | | | | | | | | |
| SLT | SOCKOLET | .5 | 1.5 | | MSS-SP97 | ASTM A 182 GR.F316L | SW, 3000 | YSS47D2Z0 | |
| TLT | THREAOLET | .5 | 1.5 | | MSS-SP97 | ASTM A 182 GR.F316L | SCRF, 3000 | YTS4782Z0 | |
| NLT | NIPPOLET | .5 | 1.5 | M, M | MNF STD | ASTM A 182 GR.F316L | SCRM | YNN479ZZ0 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .5 | 1.5 | | API-602 | BODY-ASTM A 182 GR.F316L, TRIM-SS 316L | SW, 800, 3000, B-16.11, SHT NO.-510ML | 510MLZZZ0 | |
| GLV | VLV.GLOBE | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 182 GR.F316L, TRIM-SS 316L | SW, 800, 3000, B-16.11, SHT NO.-520ML | 520MLZZZ0 | |
| GLV | VLV.GLOBE | .2 | 3 | | BS-1873 | BODY-ASTM A 351 GR CF3M, TRIM-SS 316L | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 524ML | 524MLZZZ0 | |
| CHV | VLV.CHECK | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 182 GR.F316L, TRIM-SS 316L | SW, 800, 3000, B-16.11, SHT NO.-530MU | 530MUZZZ0 | |
| CHV | VLV.CHECK | .2 | 16 | | BS-1868 | BODY-ASTM A 351 GR CF3M, TRIM-SS 316L | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 534MU | 534MUZZZ0 | |
| BLV | VLV.BALL | .5 | 1.5 | | BS EN ISO 17292 | BODY-ASTM A 182 GR.F316L, TRIM-SS 316L+PTFE SEAT | SPCL, 800, 3000, B-16.11, REFER VMS SHT, SHT NO.- 540ML | 540MLZZZ0 | |
| BLV | VLV.BALL | .2 | 2 | | API-6D | BODY-ASTM A 351 GR CF3M, TRIM-SS 316L +PTFE SEAT | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 544ML | 544MLZZZ0 | |
| BLV | VLV.BALL | .12 | 16 | | API-6D | BODY-ASTM A 351 GR CF3M, TRIM-SS 316L+PTFE SEAT | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 544MM | 544MMZZZ0 | |
| BLV/I | VLV.BALL | .5 | 1.5 | | BS EN ISO 17292 | BODY-ASTM A 182 GR.F316L, TRIM-SS 316L+PTFE SEAT | SPCL, 800, 3000, B-16.11, REFER VMS SHT, SHT NO.- 540MF | 540MFZZZ0 | |

Package : IPMCS

Report No. : 50

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : 33A Sheet 6 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|--------------|--------------------|---|--|----------------|---------|
| Valves Group | | | | | | | | | |
| PLV | VLV.PLUG | .5 | 1.5 | | API-599 | BODY-ASTM A 182 GR.F316L,TRIM-SS 316L + PTFE SLEEVE | SW, 800, 3000, B-16.11, SHT NO.- 550MU | 550MUZZZ0 | |
| PLV | VLV.PLUG | 2 | 12 | | API-599 | BODY-ASTM A 351 GR CF3M,TRIM-SS 316L+PTFE SLEEVE | BW, 300, B-16.25, SHT NO.- 554ML | 554ML.ZZZ0 | |
| PLV/I | VLV.PLUG | 2 | 14 | | API-599 | BODY-ASTM A 351 GR CF3M,TRIM-SS 316L + PTFE SLEEVE | BW, 300, B-16.25, SHT NO.- 554NP | 554NPZZZ0 | |
| P3V | VLV.3WYPLG | 2 | 14 | | API-599 | BODY-ASTM A 351 GR CF3M,TRIM-SS 316L + PTFE SLEEVE | BW, 300, B-16.25, SHT NO.- 614NL | 614NL.ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 20 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 1.5 | | B-16.20-ANSI B16.5 | SP.WND SS316L+GRAFIL+I RING | SPIRAL, 600 | GK66376Z0 | |
| GAS | GASKET | 2 | 20 | | B-16.20-ANSI B16.5 | SP.WND SS316L+GRAFIL+I RING | SPIRAL, 300 | GK66374Z0 | |
| GAS/SP 2 | GASKET | .5 | 10 | | TB.HPU.5002 | SS 316L | LENS, SP2 | GKJ75ATZ0 | |
| GAS/600 | GASKET | 4 | 6 | | B-16.20-ANSI B16.5 | SP.WND SS316L+GRAFIL+I RING | SPIRAL, 600 | GK66376Z0 | |
| Trap/Strainer Group | | | | | | | | | |
| PSR | STRNR.PERM | .5 | 1.5 | | JOB'STD | B:A182GR.F316L, I NT:SS316L | SW, Y-TYPE, 800 | SP216D510 | |
| PSR | STRNR.PERM | 2 | 12 | | JOB'STD | B:A351GR.CF3M, I NT:SS316L | FLGD, Y-TYPE, 300, RF/125AARH | SP2F355B0 | |
| PSR | STRNR.PERM | 14 | 16 | M | JOB'STD | B:A403WP316L- WX:I,SS316L | BW, T-TYPE | SP26044Z0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A1A Sheet I of 8 |

PIPE CLASS : **A1A**
RATING : 150
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| TEMP | -29 | 38 | 93 | 149 | 204 | 260 | 316 | 343 | 371 |
|-------|-------|-------|-------|-------|-------|-------|------|------|------|
| PRESS | 20.03 | 20.03 | 18.28 | 16.17 | 14.06 | 11.95 | 9.84 | 8.78 | 7.73 |

SERVICE

NON CORROSIVE/ FLAMMABLE / NON FLAMMABLE/ NON LETHAL -PROCESS & HYDROCARBONS, LUBE OIL BEFORE FILTER; GASEOUS AMMONIA ,LOW PRESSURE STEAM & CONDENSATE (NON IBR); UTILITIES- INST AIR(BEYOND A3A), PLANT AIR, NITROGEN, CARBONDIOXIDE, ; WATER - BEYOND A3A ; BOILER BLOWDOWN, BOILER FEEDWATER,COOLING WATER,FUEL GAS,MDEA SOLUTION,PROCESS AIR,PROCESS CONDENSATE,PROCESS GAS VENT,SYNTHESIS GAS , TURBINE CONDENSATE,UTILITY AIR, PROCESS FLARE & AMMONIA FLARE

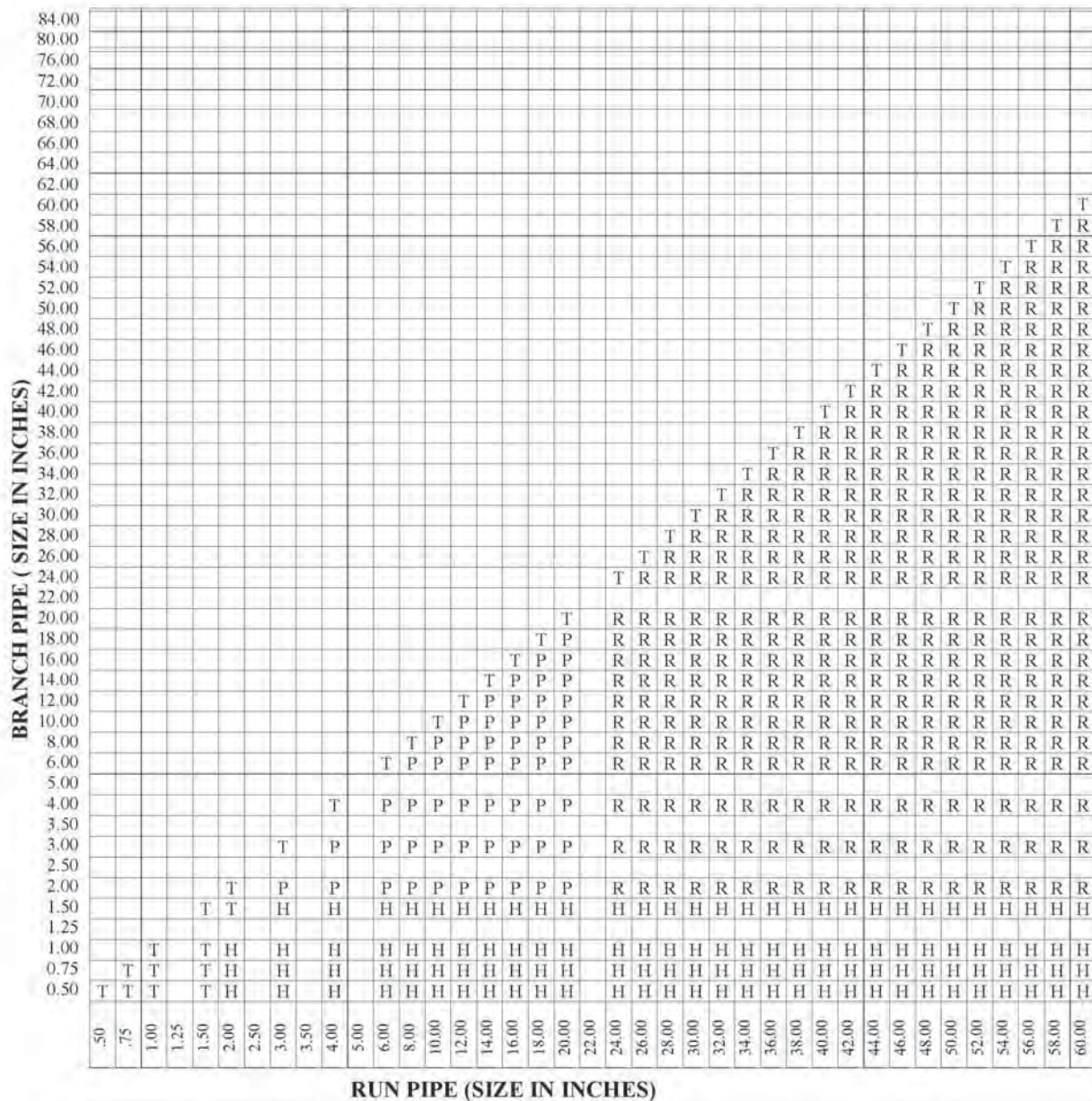
NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 36 THIS IS A PRESSURE BALANCED PLUG VALVES WHICH SHALL BE USED ONLY IF SPECIFIED IN P&ID.
- 92 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH B-16.34/ BS-1414 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016
- 144 PIPE THICKNESS IS CALCULATED BASED ON 80% OF DESIGN CONDITION FOR SIZE 50" to 60".

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EIL'STD 7-44-0350, DF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-0350, VF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4 | |
| TEMP.CONN | 1.5" | FLANGED, REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A1A Sheet 2 of 8 |



| <u>CODE</u> | <u>DESCRIPTION</u> | | | | |
|-------------|--------------------|---|----------------|---|------------|
| F | SADDLE FUSED JT | T | TEES | J | THREADOLET |
| H | H. COUPLING | W | WELDOLETS | | |
| P | PIPE TO PIPE | I | INSTRUMENT TEE | | |
| R | REINFORCED | X | Refer Notes | | |
| S | SOCKOLETS | L | SWEEPOLET | | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A1A Sheet 3 of 8 |

84.00
80.00
76.00
72.00
70.00
68.00
66.00
64.00
62.00
60.00
58.00
56.00
54.00
52.00
50.00
48.00
46.00
44.00
42.00
40.00
38.00
36.00
34.00
32.00
30.00
28.00
26.00
24.00
22.00
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
5.00
4.00
3.50
3.00
2.50
2.00
1.50
1.25
1.00
0.75
0.50

BRANCH PIPE (SIZE IN INCHES)

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A1A Sheet 4 of 8 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|---------------------|------------|-------------------|-------------------|--------------|-------------|-------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | S160 | B-36.10 | ASTM A 106 GR.B | PE, SEAMLESS | PI21977Z0 | |
| PIP | PIPE | 1 | 1.5 | XS | B-36.10 | ASTM A 106 GR.B | PE, SEAMLESS | PI21977Z0 | |
| PIP | PIPE | 2 | 2 | XS | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z0 | |
| PIP | PIPE | 3 | 14 | STD | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z0 | |
| PIP | PIPE | 16 | 36 | STD | B-36.10 | ASTM A 672 GR.B60 CL.12 | BE, E.F.S.W | PI2A813Z0 | |
| PIP | PIPE | 40 | 48 | XS | B-36.10 | ASTM A 672 GR.B60 CL.12 | BE, E.F.S.W | PI2A813Z0 | |
| PIP | PIPE | 50 | 60 | 12.7 | B-36.10 | ASTM A 672 GR.B60 CL.12 | BE, E.F.S.W | PI2A813Z0 | 144 |
| NIP | NIPPLE | .5 | .75 | M | B-36.10 | ASTM A 106 GR.B | PBE, SEAMLESS | PN21967Z0 | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.10 | ASTM A 106 GR.B | PBE, SEAMLESS | PN21967Z0 | |
| Flange Group | | | | | | | | | |
| FLG/600 | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 105 | 600, RF/125AARH | FSC0167Z0 | |
| FLG/300 | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 105 | 300, RF/125AARH | FSC0147Z0 | |
| FLG | FLNG.WN | .5 | 24 | M | B-16.5 | ASTM A 105 | 150, RF/125AARH | FWC0127Z0 | |
| FLG | FLNG.WN | 26 | 60 | M | B-16.47-B | ASTM A 105 | 150, RF/125AARH | FWB0127Z0 | |
| FLG/600 | FLNG.WN | 26 | 60 | M | B-16.47-B | ASTM A 105 | 600, RF/125AARH | FWB0167Z0 | |
| FLG/600 | FLNG.WN | 2 | 24 | M | B-16.5 | ASTM A 105 | 600, RF/125AARH | FWC0167Z0 | |
| FLG/300 | FLNG.WN | 26 | 60 | M | B-16.47-B | ASTM A 105 | 300, RF/125AARH | FWB0147Z0 | |
| FLG/300 | FLNG.WN | 2 | 24 | M | B-16.5 | ASTM A 105 | 300, RF/125AARH | FWC0147Z0 | |
| FLB | FLNG.BLIND | .5 | 24 | | B-16.5 | ASTM A 105 | 150, RF/125AARH | FBC0127Z0 | |
| FLB | FLNG.BLIND | 26 | 60 | | B-16.47-B | ASTM A 105 | 150, RF/125AARH | FBF0127Z0 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 105 | 150, FF/125AARH | FGK0121Z0 | |
| FEF | SPCR&BLND | 10 | 24 | | ASME-B16.48 | ASTM A 105 | 150, FF/125AARH | FEK0121Z0 | |
| FEF | SPCR&BLND | 26 | 60 | | EIL'STD | ASTM A 516 GR.70 | 150, FF/125AARH | FEF6321Z0 | |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A1A Sheet 5 of 8 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|---------------|------------|-------------------|-------------------|---------------|----------|---------------------|-------------|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WA602D3Z0 | |
| ELB90 | ELBOW.90 | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WA602D2Z0 | |
| ELB90 | ELBOW.90 | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW, 1.5D | WAG684Z.10 | |
| ELB90 | ELBOW.90 | 16 | 48 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW, 1.5D | WAG754Z.10 | |
| ELB90 | ELBOW.90 | 50 | 60 | M | MNF"STD | ASTM A 234 GR.WPB-W | BW, 1.5D | WAN754Z.10 | |
| ELB45 | ELBOW.45 | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WB602D3Z0 | |
| ELB45 | ELBOW.45 | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WB602D2Z0 | |
| ELB45 | ELBOW.45 | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW, 1.5D | WBG684Z.10 | |
| ELB45 | ELBOW.45 | 16 | 48 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW, 1.5D | WBG754Z.10 | |
| ELB45 | ELBOW.45 | 50 | 60 | M | MNF"STD | ASTM A 234 GR.WPB-W | BW, 1.5D | WBN754Z.10 | |
| TEQ | T.EQUAL | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WE602D3Z0 | |
| TEQ | T.EQUAL | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WE602D2Z0 | |
| TEQ | T.EQUAL | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WEG684ZZ0 | |
| TEQ | T.EQUAL | 16 | 48 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WEG754ZZ0 | |
| TEQ | T.EQUAL | 50 | 60 | M | MNF"STD | ASTM A 234 GR.WPB-W | BW | WEN754ZZ0 | |
| TRED | T.RED | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WR602D3Z0 | |
| TRED | T.RED | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WR602D2Z0 | |
| TRED | T.RED | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WRG684ZZ0 | |
| TRED | T.RED | 16 | 48 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WRG754ZZ0 | |
| TRED | T.RED | 50 | 60 | M, M | MNF"STD | ASTM A 234 GR.WPB-W | BW | WRN754ZZ0 | |
| REDC | REDUC.CONC | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WUG684ZZ0 | |
| REDC | REDUC.CONC | 16 | 48 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WUG754ZZ0 | |
| REDC | REDUC.CONC | 50 | 60 | M, M | MNF"STD | ASTM A 234 GR.WPB-W | BW | WUN754ZZ0 | |

Package : IPMCS

Report No. : 50

A1A

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A1A Sheet 6 of 8 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|--------------------|---|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| REDE | REDUC.ECC | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WVG684ZZ0 | |
| REDE | REDUC.ECC | 16 | 48 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WVG754ZZ0 | |
| REDE | REDUC.ECC | 50 | 60 | M, M | MNF"STD | ASTM A 234 GR.WPB-W | BW | WVN754ZZ0 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 105 | PBE | WNH026ZZ0 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 105 | PBE | WPH026ZZ0 | |
| CAP | CAP | .5 | .75 | | B-16.11 | ASTM A 105 | SCRF, 6000 | WF60283Z0 | |
| CAP | CAP | 1 | 1.5 | | B-16.11 | ASTM A 105 | SCRF, 3000 | WF60282Z0 | |
| CAP | CAP | 2 | 48 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WFG684ZZ0 | |
| CAP | CAP | 50 | 60 | M | MNF"STD | ASTM A 234 GR.WPB-W | BW | WFN754ZZ0 | |
| CPLF | CPLNG.FULL | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WJ602D3Z0 | |
| CPLF | CPLNG.FULL | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WJ602D2Z0 | |
| CPLH | CPLNG.HALF | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WK602D3Z0 | |
| CPLH | CPLNG.HALF | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WK602D2Z0 | |
| CPLL | CPLNG.LH | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WL602D3Z0 | |
| CPLL | CPLNG.LH | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WL602D2Z0 | |
| CPLR | CPLNG.RED | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WM602D3Z0 | |
| CPLR | CPLNG.RED | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WM602D2Z0 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .25 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL | SW, 800, 3000, B-16.11, SHT NO.- 51001 | 51001ZZZ0 | |
| GAV | VLV.GATE | 2 | 42 | | API 600/ ISO 10434 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51301 | 51301ZZZ0 | 92 |
| GLV | VLV.GLOBE | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL | SW, 800, 3000, B-16.11, SHT NO.- 52001 | 52001ZZZ0 | |
| GLV | VLV.GLOBE | 2 | 16 | | BS-1873 | BODY-ASTM A 216 GR.WCB,TRIM- | FLGD, 150, B-16.5, RF/125AARH, SHT | 52301ZZZ0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A1A Sheet 7 of 8 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|---------------------|------------|-------------------|-------------------|--------------|----------------------|--|--|----------------|---------|
| Valves Group | | | | | | | | | |
| | | | | | | 13% CR.STEEL | NO.- 52301 | | |
| CHV | VLV.CHECK | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED | SW, 800, 3000, B-16.11, SHT NO.- 53001 | 53001ZZZ0 | |
| CHV | VLV.CHECK | 2 | 24 | | BS 1868 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53301 | 53301ZZZ0 | |
| BLV | VLV.BALL | .5 | 16 | | BS EN ISO 17292 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54301 | 54301ZZZ0 | |
| PLV | VLV.PLUG | .5 | 24 | | BS-5353 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-PLUG-HARDENED | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55301 | 55301ZZZ0 | |
| PLV/I | VLV.PLUG | .5 | 36 | | BS-5353 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-PLUG-HARDENED | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55315 | 55315ZZZ0 | 36 |
| BFV | VLV.BTRFLY | 3 | 24 | | BS EN 593 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | WAF, 150, B-16.5, WAF/125AARH, SHT NO.- 56301 | 56301ZZZ0 | |
| BFV | VLV.BTRFLY | 26 | 48 | | BS EN 593 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, B-16.47 B, RF/125AARH, SHT NO.- 56315 | 56315ZZZ0 | |
| BFV | VLV.BTRFLY | 50 | 60 | | BS EN 593 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, B-16.47 B, RF/125AARH, SHT NO.- 56923 | 56923ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 60 | | B-18.2 | BOLT A193 GR.B7, NUT A194 GR.2H | | BS40404Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 150 | GK65072Z0 | |
| GAS | GASKET | 26 | 60 | | B-16.20-ANSI B16.47B | SP.WND SS316+GRAFIL+I RING | SPIRAL, 150 | GK56272Z0 | |
| GAS/600 | GASKET | 26 | 60 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL+I RING | SPIRAL, 600 | GK66276Z0 | |
| GAS/600 | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 600 | GK65076Z0 | |
| GAS/300 | GASKET | 26 | 60 | | B-16.20-ANSI B16.47B | SP.WND SS316+GRAFIL+I RING | SPIRAL, 300 | GK56274Z0 | |
| GAS/300 | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 300 | GK65074Z0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A1A Sheet 8 of 8 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|--------------|----------|--------------------------|--------------------------------|----------------|---------|
| Trap/Strainer Group | | | | | | | | | |
| TRP | TRAP:STEAM | .5 | 1.5 | | MNF"STD | B:A105;T:13%CR;S:SS304 | FLGD, THRMDNMC, 150,RF/125AARH | TR3065530 | |
| TSR | STRNR:TEMP | 1.5 | 24 | | EIL"STD | B:A516GR.70;INT:S S304 | CONETYPE, 150,FF/125AARH | ST16831Z0 | |
| PSR | STRNR:PERM | .5 | 1.5 | | MNF"STD | B:A105;INT:SS304 | SW, Y-TYPE, 800 | SP303D510 | |
| PSR | STRNR:PERM | 2 | 14 | M | EIL"STD | B:A234GR.WPB;IN T:SS304 | BW, T-TYPE | SP13344Z0 | |
| PSR | STRNR:PERM | 16 | 24 | M | EIL"STD | B:A234GR.WPBW;I NT:SS304 | BW, T-TYPE | SP13644Z0 | |

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|---|--------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A21K Sheet I of 6 |

PIPE CLASS : **A21K**
 RATING : 150
 BASE MATERIAL : SS 304
 CORROSION ALLOWANCE : 0 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| TEMP | -100 | -29 | 38 | 93 | 149 | 204 | 260 | 316 | 343 | 371 |
|-------|-------|-------|-------|-------|-------|-------|-------|------|------|------|
| PRESS | 19.33 | 19.33 | 19.33 | 16.17 | 14.41 | 13.35 | 11.95 | 9.84 | 8.78 | 7.73 |

SERVICE

ANTI-FOAM AGENT, MDEA SOLUTION, PROCESS CONDENSATE

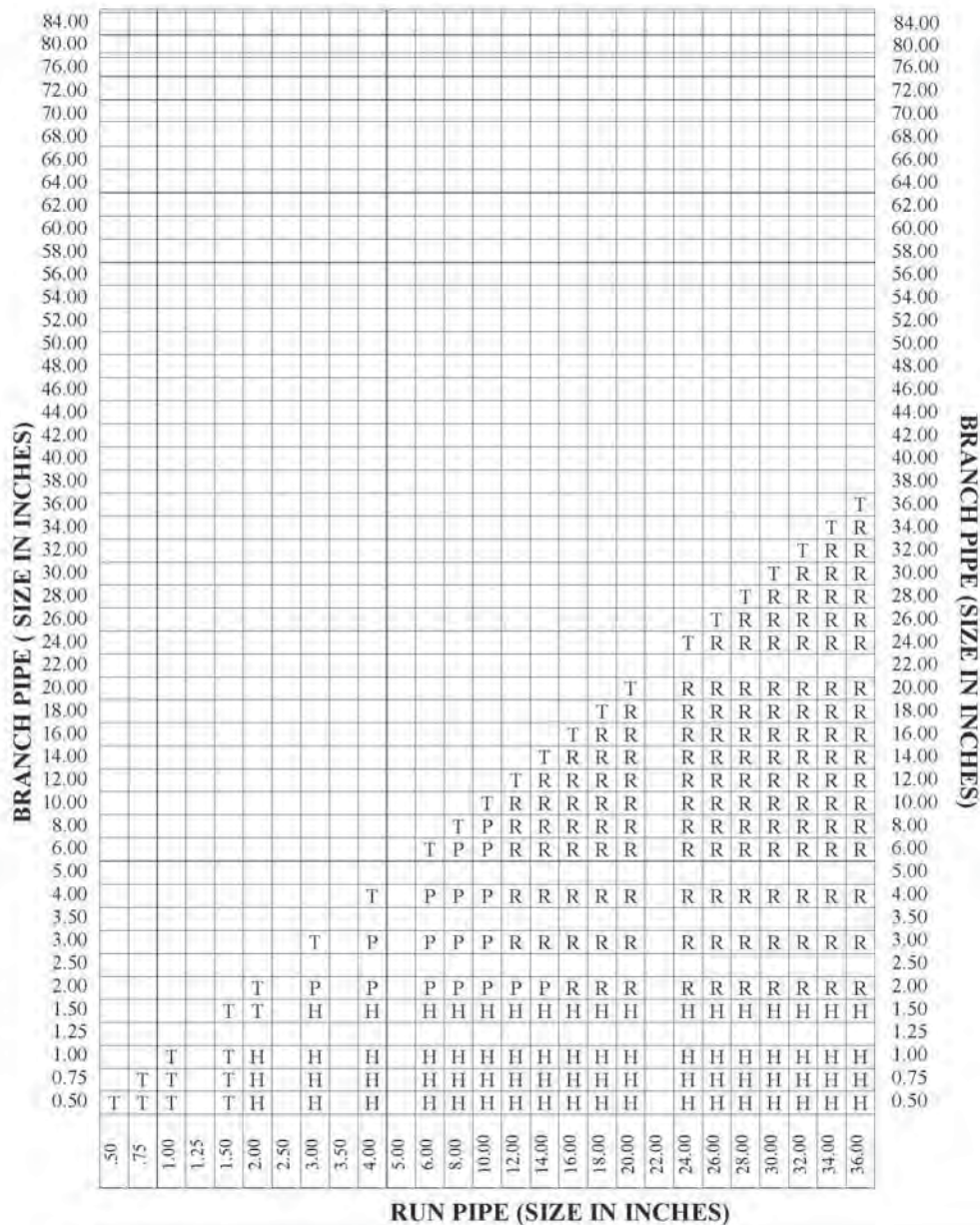
NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS, REFER EIL STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS, REFER EIL STD 7-44-0300; FOR SPACER AND BLIND REFER EIL STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL, PLUG & BUTTERFLY VALVES, REFER GENERAL NOTES.
- 48 FOR INSULATED FLANGED JOINTS BEYOND 427 DEG.C, IN THIS CLASS, USE A453 GR.660 CL.A
- 74 STRESS RUPTURE TEST AS DETAILED IN ASTM A453 SHALL BE CARRIED OUT FOR ALL ASTM A453 GR.660A BOLTING MATERIALS.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EIL STD 7-44-0350, DF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75", REFER EIL STD. 7-44-0351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-0350, VP3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75", REFER EIL STD 7-44-0351, V4 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A21K Sheet 2 of 6 |



| CODE | DESCRIPTION | | | | |
|------|-----------------|---|----------------|---|------------|
| F | SADDLE FUSED JT | T | TEES | J | THREADOLET |
| H | H. COUPLING | W | WELDOLETS | | |
| P | PIPE TO PIPE | I | INSTRUMENT TEE | | |
| R | REINFORCED | X | Refer Notes | | |
| S | SOCKOLETS | L | SWEEPOLET | | |

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|---|--------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A21K Sheet 3 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|-------------|-----------------------|----------------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | 80S | B-36.19 | ASTM A 312 TP304 | PE, SEAMLESS | PI33577Z0 | |
| PIP | PIPE | 1 | 1.5 | 40S | B-36.19 | ASTM A 312 TP304 | PE, SEAMLESS | PI33577Z0 | |
| PIP | PIPE | 2 | 2 | 40S | B-36.19 | ASTM A 312 TP304 | BE, SEAMLESS | PI33517Z0 | |
| PIP | PIPE | 3 | 8 | 10S | B-36.19 | ASTM A 312 TP304 | BE, SEAMLESS | PI33517Z0 | |
| PIP | PIPE | 10 | 24 | 10S | B-36.19 | ASTM A 358 TP304 CL.1 | BE, E.FS.W | PI35513Z0 | |
| PIP | PIPE | 26 | 26 | 6.35 | B-36.19 | ASTM A 358 TP304 CL.1 | BE, E.FS.W | PI35513Z0 | |
| PIP | PIPE | 28 | 28 | 7.14 | B-36.19 | ASTM A 358 TP304 CL.1 | BE, E.FS.W | PI35513Z0 | |
| PIP | PIPE | 30 | 30 | 10S | B-36.19 | ASTM A 358 TP304 CL.1 | BE, E.FS.W | PI35513Z0 | |
| PIP | PIPE | 32 | 32 | 7.92 | B-36.10 | ASTM A 358 TP304 CL.1 | BE, E.FS.W | PI25513Z0 | |
| PIP | PIPE | 34 | 34 | 8.74 | B-36.10 | ASTM A 358 TP304 CL.1 | BE, E.FS.W | PI25513Z0 | |
| PIP | PIPE | 36 | 36 | 9.53 | B-36.10 | ASTM A 358 TP304 CL.1 | BE, E.FS.W | PI25513Z0 | |
| NIP | NIPPLE | .5 | .75 | M | B-36.19 | ASTM A 312 TP304 | PBE, SEAMLESS | PN33567Z0 | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.19 | ASTM A 312 TP304 | PBE, SEAMLESS | PN33567Z0 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.WN | .5 | 1.5 | M | B-16.5 | ASTM A 182 GR.F304 | 150, RF/125AARH | FWC4127Z0 | |
| FLG | FLNG.WN | 26 | 36 | M | B-16.47-B | ASTM A 182 GR.F304 | 150, RF/125AARH | FWB4127Z0 | |
| FLG | FLNG.LJ | 2 | 24 | | B-16.5 | ASTM A 105 | 150, STK/MAX1000AARH | FLC012EZ0 | |
| FLB | FLNG.BLIND | .5 | 24 | | B-16.5 | ASTM A 182 GR.F304 | 150, RF/125AARH | FBC4127Z0 | |
| FLB | FLNG.BLIND | 26 | 36 | | B-16.47-B | ASTM A 182 GR.F304 | 150, RF/125AARH | FBB4127Z0 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 182 GR.F304 | 150, FF/125AARH | FGK4121Z0 | |
| FEF | SPCR&BLND | 10 | 24 | | ASME-B16.48 | ASTM A 182 GR.F304 | 150, FF/125AARH | FCK4121Z0 | |
| FEF | SPCR&BLND | 26 | 36 | | EIL'STD | ASTM A 182 GR.F304 | 150, FF/125AARH | FCE4121Z0 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW_90 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WA642D2Z0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A21K Sheet 4 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|----------|------------------------|-------------|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304-S | BW, 1.5D | WAG874Z10 | |
| ELB90 | ELBOW.90 | 10 | 36 | M | B-16.9 | ASTM A 403 GR.WP304-WX | BW, 1.5D | WAG894Z10 | |
| ELB45 | ELBOW.45 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WB642D2Z0 | |
| ELB45 | ELBOW.45 | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304-S | BW, 1.5D | WBG874Z10 | |
| ELB45 | ELBOW.45 | 10 | 36 | M | B-16.9 | ASTM A 403 GR.WP304-WX | BW, 1.5D | WBG894Z10 | |
| TEQ | T.EQUAL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WE642D2Z0 | |
| TEQ | T.EQUAL | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304-S | BW | WEG874ZZ0 | |
| TEQ | T.EQUAL | 10 | 36 | M | B-16.9 | ASTM A 403 GR.WP304-WX | BW | WEG894ZZ0 | |
| TRED | T.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WR642D2Z0 | |
| TRED | T.RED | 2 | 8 | M, M | B-16.9 | ASTM A 403 GR.WP304-S | BW | WRG874ZZ0 | |
| TRED | T.RED | 10 | 36 | M, M | B-16.9 | ASTM A 403 GR.WP304-WX | BW | WRG894ZZ0 | |
| REDC | REDUC.CONC | 2 | 8 | M, M | B-16.9 | ASTM A 403 GR.WP304-S | BW | WUG874ZZ0 | |
| REDC | REDUC.CONC | 10 | 36 | M, M | B-16.9 | ASTM A 403 GR.WP304-WX | BW | WUG894ZZ0 | |
| REDE | REDUC.ECC | 2 | 8 | M, M | B-16.9 | ASTM A 403 GR.WP304-S | BW | WVG874ZZ0 | |
| REDE | REDUC.ECC | 10 | 36 | M, M | B-16.9 | ASTM A 403 GR.WP304-WX | BW | WVG894ZZ0 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR.F304 | PBE | WNH426ZZ0 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR.F304 | PBE | WPH426ZZ0 | |
| CAP | CAP | 2 | 36 | M | B-16.9 | ASTM A 403 GR.WP304-S | BW | WFG874ZZ0 | |
| CPLF | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WJ642D2Z0 | |
| CPLH | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WK642D2Z0 | |
| CPLL | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WL642D2Z0 | |
| CPLR | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WM642D2Z0 | |
| STB | STUB.END | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304-S | BW, 125AARH | WSG8741Z0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A21K Sheet 5 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|---------------|----------------------|---|--|----------------|---------|
| Fitting Group | | | | | | | | | |
| STB | STUB.END | 10 | 24 | M | B-16.9 | ASTM A 403 GR.WP304-WX | BW, 125AARH | WSG8941Z0 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .5 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 304 | SW, 800, 3000, B-16.11, SHT NO.- 51045 | 51045ZZZ0 | |
| GAV | VLV.GATE | 2 | 24 | | API 600/ ISO 10434 | BODY-ASTM A 351 GR.CF8,TRIM-SS 304 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51345 | 51345ZZZ0 | |
| GAV | VLV.GATE | 26 | 30 | | ANSI-B-16.34 | BODY-ASTM A 351 GR CF8,TRIM-SS 304 | FLGD, 150, B-16.47 B, RF/125AARH, SHT NO.- 51924 | 51924ZZZ0 | |
| GLV | VLV.GLOBE | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS304 | SW, 800, 3000, B-16.11, SHT NO.- 52045 | 52045ZZZ0 | |
| GLV | VLV.GLOBE | 2 | 16 | | BS-1873 | BODY-ASTM A 351 GR.CF8,TRIM-SS 304 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52345 | 52345ZZZ0 | |
| CHV | VLV.CHECK | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 182 GR.F304,TRIM-STELLITED | SW, 800, 3000, B-16.11, SHT NO.- 53045 | 53045ZZZ0 | |
| CHV | VLV.CHECK | 2 | 24 | | BS-1868 | BODY-ASTM A 351 GR.CF8,TRIM-SS 304 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53345 | 53345ZZZ0 | |
| BLV | VLV.BALL | .5 | 16 | | BS EN ISO 17292 | BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT-RPTFE | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54345 | 54345ZZZ0 | |
| PLV | VLV.PLUG | .5 | 24 | | BS-5353 | BODY-ASTM A 182 GR.F304 / ASTM A 351 GR.CF8,TRIM-PLUG-SS304/SS316 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55345 | 55345ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 36 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 150 | GK65072Z0 | |
| GAS | GASKET | 26 | 36 | | B-16.20-ANSI B16.47B | SP.WND SS316+GRAFIL.+1 RING | SPIRAL, 150 | GK56272Z0 | |
| Trap/Strainer Group | | | | | | | | | |
| TSR | STRNR.TEMP | 1.5 | 24 | | EIL'STD | B:A240TP304;INT:SS304 | CONETYPE, 150,FF/125AARH | ST14131Z0 | |
| PSR | STRNR.PERM | .5 | 1.5 | | MNF'STD | B:A182GR.F304;IN T:SS304 | SW, Y-TYPE, 800 | SP307D510 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A21K Sheet 6 of 6 |

Note :(The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|---------------|----------|-----------------------------|-------------|----------------|---------|
| Trap/Strainer Group | | | | | | | | | |
| PSR | STRNR.PERM | 2 | 8 | M | EIL'STD | B:A403GR.WP304-S;INT:SS304 | BW, T-TYPE | SP15344Z0 | |
| PSR | STRNR.PERM | 10 | 24 | M | EIL'STD | B:A403GR.WP304-WX;INT:SS304 | BW, T-TYPE | SP15444Z0 | |

| | |
|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A23K Sheet 1 of 5 |

| | | |
|---------------------|---|---------|
| PIPE CLASS | : | A23K |
| RATING | : | 150 |
| BASE MATERIAL | : | SS 304L |
| CORROSION ALLOWANCE | : | 0 MM |
| SPECIAL REQUIREMENT | : | |

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| | | | | | | | | | |
|-------|-------|-------|-------|------|-------|-------|------|------|------|
| TEMP | -29 | 38 | 93 | 149 | 204 | 260 | 316 | 343 | 371 |
| PRESS | 16.17 | 16.17 | 13.71 | 12.3 | 11.24 | 10.54 | 9.84 | 8.78 | 7.73 |

SERVICE

ANTI-FOAM AGENT, AMMONIA WATER, CARBON DIOXIDE, HYDRAZINE (OXYGEN SCAVENGER), MDEA SOLUTION,
PROCESS CONDENSATE, PROCESS GAS,
INSTRUMENT AIR (AMMONIA UNIT).

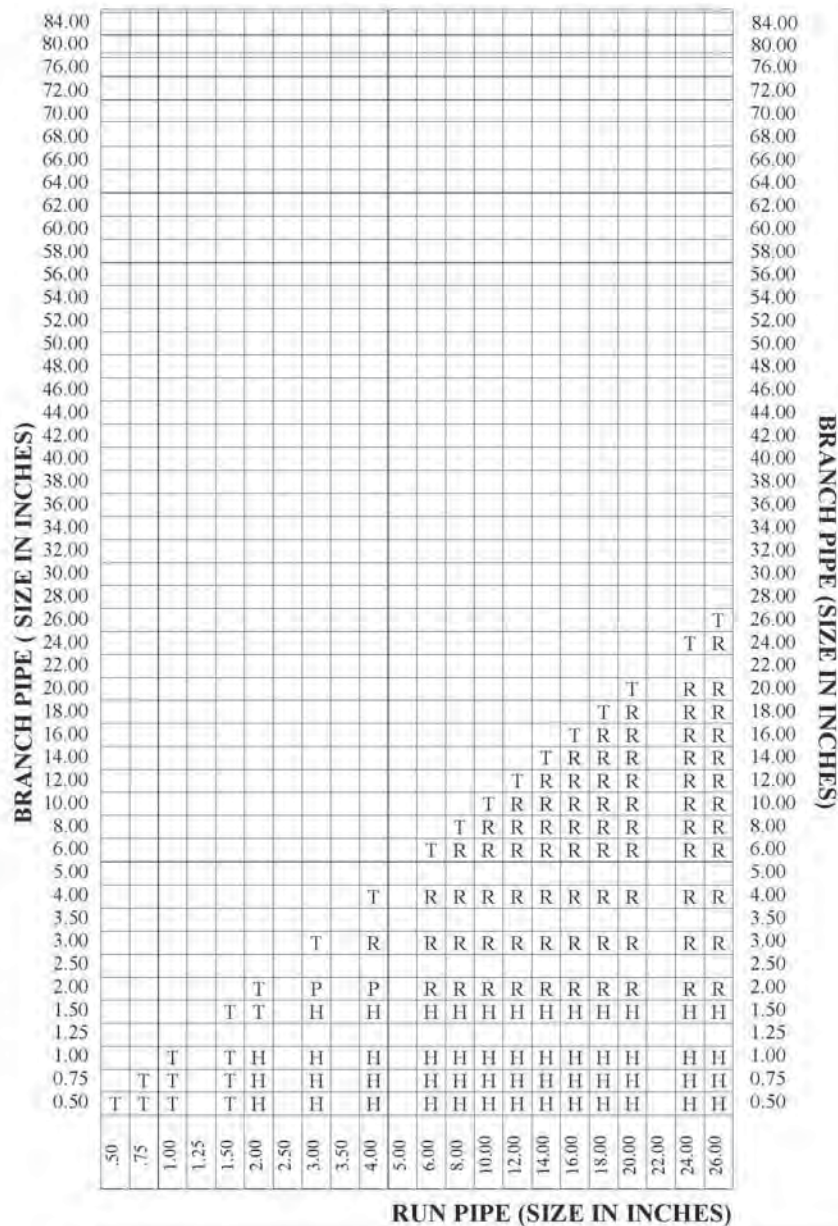
NOTES

- 5 FOR PERMANENT "T" TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY
STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|--|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EIL STD 7-44-0350, DF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-0350, VF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SW NIPPLE WITH VALVE TO SPEC AS PER EIL, STD 7-44-0354 | |

| | |
|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A23K Sheet 2 of 5 |



| <u>CODE</u> | <u>DESCRIPTION</u> |
|-------------|--------------------|
| F | SADDLE FUSED JT |
| H | H. COUPLING |
| P | PIPE TO PIPE |
| R | REINFORCED |
| S | SOCKOLETS |
| T | TEES |
| W | WELDOLETS |
| I | INSTRUMENT TEE |
| X | Refer Notes |
| L | SWEEPOLET |
| J | THREADOLET |

| | |
|---|--------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A23K Sheet 3 of 5 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|-------------|-------------------------|----------------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | 80S | B-36.19 | ASTM A 312 TP304L | PE, SEAMLESS | PI33777Z0 | |
| PIP | PIPE | 1 | 1.5 | 40S | B-36.19 | ASTM A 312 TP304L | PE, SEAMLESS | PI33777Z0 | |
| PIP | PIPE | 2 | 2 | 40S | B-36.19 | ASTM A 312 TP304L | BE, SEAMLESS | PI33717Z0 | |
| PIP | PIPE | 3 | 8 | 10S | B-36.19 | ASTM A 312 TP304L | BE, SEAMLESS | PI33717Z0 | |
| PIP | PIPE | 10 | 24 | 10S | B-36.19 | ASTM A 358 TP304L CL.1 | BE, E.F.S.W | PI36213Z0 | |
| PIP | PIPE | 26 | 26 | 6.35 | B-36.19 | ASTM A 358 TP304L CL.1 | BE, E.F.S.W | PI36213Z0 | |
| NIP | NIPPLE | .5 | .75 | M | B-36.19 | ASTM A 312 TP304L | PBE, SEAMLESS | PN33767Z0 | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.19 | ASTM A 312 TP304L | PBE, SEAMLESS | PN33767Z0 | |
| Flange Group | | | | | | | | | |
| FLG/300 | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 182 GR.F304L | 300, RF/125AARH | FSC4347Z0 | |
| FLG | FLNG.WN | .5 | 1.5 | M | B-16.5 | ASTM A 182 GR.F304L | 150, RF/125AARH | FWC4327Z0 | |
| FLG | FLNG.WN | 26 | 26 | M | B-16.47-B | ASTM A 182 GR.F304L | 150, RF/125AARH | FWB4327Z0 | |
| FLG/300 | FLNG.WN | 2 | 24 | M | B-16.5 | ASTM A 182 GR.F304L | 300, RF/125AARH | FWC4347Z0 | |
| FLG | FLNG.LJ | 2 | 24 | | B-16.5 | ASTM A 105 | 150, STK/MAX1000AARH | FLC012EZ0 | |
| FLB | FLNG.BLIND | .5 | 24 | | B-16.5 | ASTM A 182 GR.F304L | 150, RF/125AARH | FBC4327Z0 | |
| FLB | FLNG.BLIND | 26 | 26 | | B-16.47-B | ASTM A 182 GR.F304L | 150, RF/125AARH | FBB4327Z0 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 182 GR.F304L | 150, FF/125AARH | FGK4321Z0 | |
| FEF | SPCR&BLND | 10 | 24 | | ASME-B16.48 | ASTM A 182 GR.F304L | 150, FF/125AARH | FCK4321Z0 | |
| FEF | SPCR&BLND | 26 | 26 | | EIL/STD | ASTM A 182 GR.F304L | 150, FF/125AARH | FCE4321Z0 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304L | SW, 3000 | WA644D2Z0 | |
| ELB90 | ELBOW.90 | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304L-S | BW, 1.5D | WAG934Z10 | |
| ELB90 | ELBOW.90 | 10 | 26 | M | B-16.9 | ASTM A 403 GR.WP304L-WX | BW, 1.5D | WAG954Z10 | |
| ELB45 | ELBOW.45 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304L | SW, 3000 | WB644D2Z0 | |

| | |
|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A23K Sheet 4 of 5 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|--------------------|--|--|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB45 | ELBOW.45 | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304L-S | BW, 1.5D | WBG934Z10 | |
| ELB45 | ELBOW.45 | 10 | 26 | M | B-16.9 | ASTM A 403 GR.WP304L-WX | BW, 1.5D | WBG954Z10 | |
| TEQ | T.EQUAL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304L | SW, 3000 | WE644D2Z0 | |
| TEQ | T.EQUAL | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304L-S | BW | WEG934ZZ0 | |
| TEQ | T.EQUAL | 10 | 26 | M | B-16.9 | ASTM A 403 GR.WP304L-WX | BW | WEG954ZZ0 | |
| TRED | T.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304L | SW, 3000 | WR644D2Z0 | |
| TRED | T.RED | 2 | 8 | M, M | B-16.9 | ASTM A 403 GR.WP304L-S | BW | WRG934ZZ0 | |
| TRED | T.RED | 10 | 26 | M, M | B-16.9 | ASTM A 403 GR.WP304L-WX | BW | WRG954ZZ0 | |
| REDC | REDUC.CONC | 2 | 8 | M, M | B-16.9 | ASTM A 403 GR.WP304L-S | BW | WUG934ZZ0 | |
| REDC | REDUC.CONC | 10 | 26 | M, M | B-16.9 | ASTM A 403 GR.WP304L-WX | BW | WUG954ZZ0 | |
| REDE | REDUC.ECC | 2 | 8 | M, M | B-16.9 | ASTM A 403 GR.WP304L-S | BW | WVG934ZZ0 | |
| REDE | REDUC.ECC | 10 | 26 | M, M | B-16.9 | ASTM A 403 GR.WP304L-WX | BW | WVG954ZZ0 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR.F304L | PBE | WNH446Z0 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR.F304L | PBE | WPH446Z0 | |
| CAP | CAP | 2 | 26 | M | B-16.9 | ASTM A 403 GR.WP304L-S | BW | WFG934ZZ0 | |
| CPLF | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304L | SW, 3000 | WJ644D2Z0 | |
| CPLH | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304L | SW, 3000 | WK644D2Z0 | |
| CPLL | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304L | SW, 3000 | WL644D2Z0 | |
| CPLR | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304L | SW, 3000 | WM644D2Z0 | |
| STB | STUB.END | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304L-S | BW, 125AARH | WSG9341Z0 | |
| STB | STUB.END | 10 | 24 | M | B-16.9 | ASTM A 403 GR.WP304L-WX | BW, 125AARH | WSG9541Z0 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .5 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 182 GR.F304L, TRIM- STELLITED, STEM- | SW, 800, 3000, B-16.11, SHT NO.- 51050 | 51050ZZ0 | |

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|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A23K Sheet 5 of 5 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|-------------|-------------------|-------------------|---------------|----------------------|---|--|----------------|---------|
| Valves Group | | | | | | | | | |
| | | | | | | SS 316L | | | |
| GAV | VL.V.GATE | 2 | 24 | | API 600/ ISO 10434 | BODY-ASTM A 351 GR.CF3,TRIM-SS 304L | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51350 | 51350ZZZ0 | |
| GLV | VL.V.GLOBE | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 182 GR.F304L,TRIM-STELLITED,STEM-SS 316L | SW, 800, 3000, B-16.11, SHT NO.- 52050 | 52050ZZZ0 | |
| GLV | VL.V.GLOBE | 2 | 16 | | BS-1873 | BODY-ASTM A 351 GR.CF3,TRIM-SS 304L | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52350 | 52350ZZZ0 | |
| CHV | VL.V.CHECK | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 182 GR.F304L,TRIM-STELLITED | SW, 800, 3000, B-16.11, SHT NO.- 53050 | 53050ZZZ0 | |
| CHV | VL.V.CHECK | 2 | 24 | | BS-1868 | BODY-ASTM A 351 GR.CF3,TRIM-SS 304L | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53350 | 53350ZZZ0 | |
| BLV | VL.V.BALL | .5 | 12 | | API-6D/ISO 17292 | ASTM A 351 GR. CF3/ ASTM A 182 GR. F304L,TRIM-BODY SEAT : RPTFE | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54394 | 54394ZZZ0 | |
| BFV | VL.V.BTRFLY | 3 | 12 | | API-609/ BS EN 593 | ASTM A 351 GR. CF3/ ASTM A 182 GR. F304L,TRIM-SS 304L | WAF., 150, B-16.5, WAF/125AARH, SHT NO.- 56394 | 56394ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 26 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316L+GRAFIL | SPIRAL, 150 | GK64972Z0 | |
| GAS | GASKET | 26 | 26 | | B-16.20-ANSI B16.47B | SP.WND SS316L+GRAFIL+I RING | SPIRAL, 150 | GK56372Z0 | |
| GAS/300 | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316L+GRAFIL | SPIRAL, 300 | GK64974Z0 | |
| Trap/Strainer Group | | | | | | | | | |
| PSR | STRNR.PERM | 2 | 8 | M | EIL/STD | B-A403WP304L-S:INT:SS304L | BW, T-TYPE | SP15544Z0 | |

Package : IPMCS

Report No. : 50

A23K

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A2A Sheet I of 6 |

PIPE CLASS : **A2A**
RATING : 150
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT : IBR SERVICE

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| TEMP | 0 | 38 | 93 | 149 | 204 | 260 | 280 | 300 |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| PRESS | 20.03 | 20.03 | 18.28 | 16.17 | 14.06 | 11.95 | 11.19 | 10.44 |

SERVICE

LOW PRESSURE STEAM (IBR), BOILER FEED WATER (IBR) & CONDENSATE (IBR),BOILER BLOWDOWN

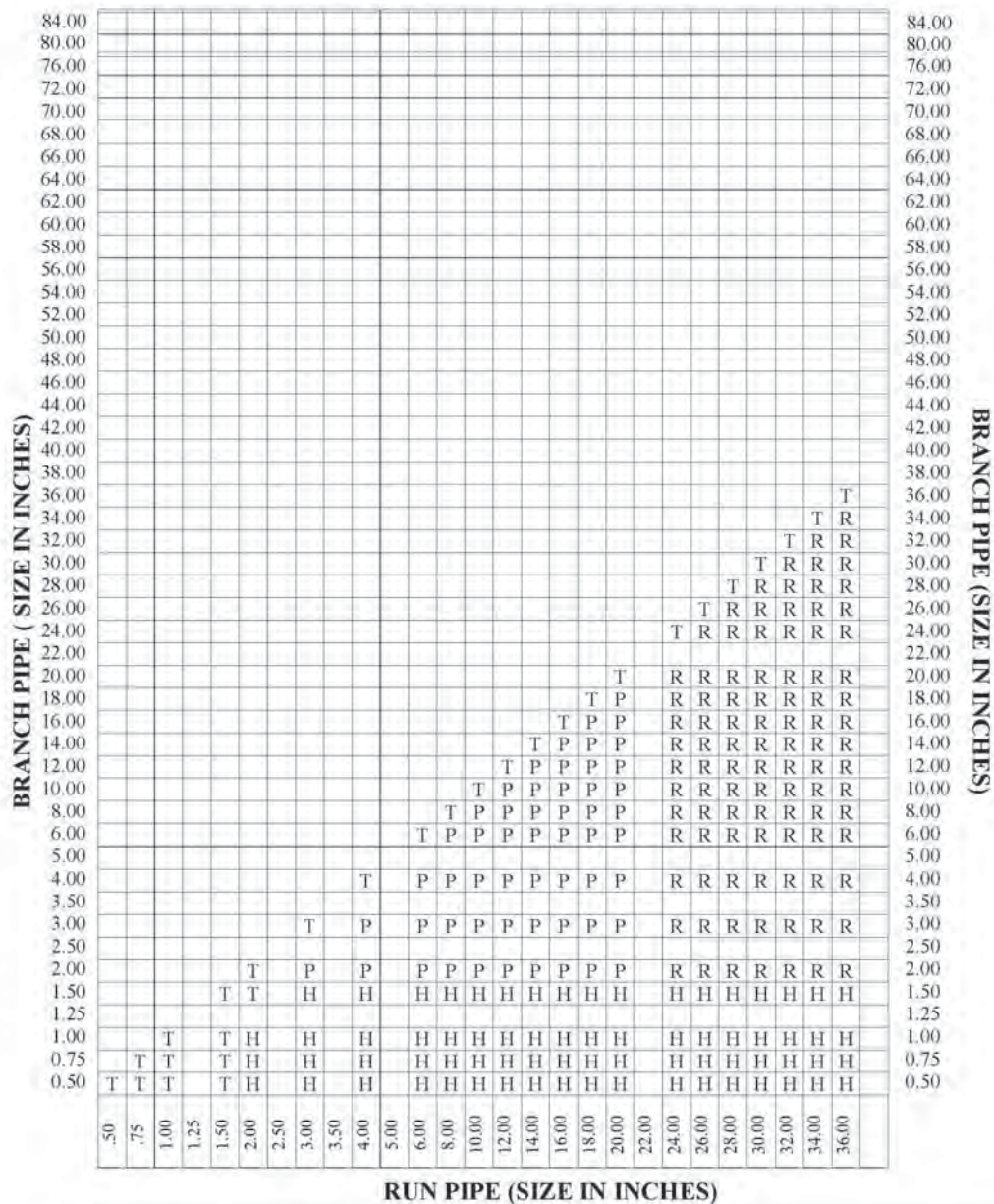
NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 8 ALL PIPES,FITTINGS,VALVES,FLANGES,TRAPS AND STRAINERS SHALL BE TESTED AND TEST CERTIFICATE IN FORM III A FOR PIPE AND FORM III C FOR OTHERS SHALL BE REQD. DULY COUNTERSIGNED BY IBR AUTHORITY OR ITS APPROVED REPRESENTATIVE.
- 9 CARBON CONTENT SHALL NOT EXCEED 0.25% FOR ALL PIPES,FITTINGS FLANGES ETC. THAT MAY REQUIRE WELDING. MOREOVER,FOR FLANGES THE SULPHUR AND PHOSPHOROUS SHALL ALSO BE LIMITED TO 0.05% EACH.
- 92 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH B-16.34/ BS-1414 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EILSTD 7-44-0350, DF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75", REFER EIL STD. 7-44-0351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-0350, VF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75", REFER EIL STD 7-44-0351, V4 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354 | |

| | |
|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A2A Sheet 2 of 6 |



| CODE | DESCRIPTION | CODE | DESCRIPTION | CODE | DESCRIPTION |
|------|-----------------|------|----------------|------|-------------|
| F | SADDLE FUSED JT | T | TEES | J | THREADOLET |
| H | H. COUPLING | W | WELDOLETS | | |
| P | PIPE TO PIPE | I | INSTRUMENT TEE | | |
| R | REINFORCED | X | Refer Notes | | |
| S | SOCKOLETS | L | SWEEPOLET | | |

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A2A Sheet 3 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|-------------|-------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | S160 | B-36.10 | ASTM A 106 GR.B | PE, SEAMLESS | PI21977Z1 | |
| PIP | PIPE | 1 | 1.5 | XS | B-36.10 | ASTM A 106 GR.B | PE, SEAMLESS | PI21977Z1 | |
| PIP | PIPE | 2 | 2 | XS | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z1 | |
| PIP | PIPE | 3 | 14 | STD | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z1 | |
| PIP | PIPE | 16 | 36 | STD | B-36.10 | ASTM A 672 GR.B60 CL.12 | BE, E.F.S.W | PI2A813Z1 | |
| NIP | NIPPLE | .5 | .75 | M | B-36.10 | ASTM A 106 GR.B | PBE, SEAMLESS | PN21967Z1 | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.10 | ASTM A 106 GR.B | PBE, SEAMLESS | PN21967Z1 | |
| Flange Group | | | | | | | | | |
| FLG/300 | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 105 | 300, RF/125AARH | FSC0147Z1 | |
| FLG | FLNG.WN | .5 | 1.5 | M | B-16.5 | ASTM A 105 | 150, RF/125AARH | FWC0127Z1 | |
| FLG | FLNG.WN | 2 | 24 | M | B-16.5 | ASTM A 105 | 150, RF/125AARH | FWC0127Z1 | |
| FLG | FLNG.WN | 26 | 36 | M | B-16.47-B | ASTM A 105 | 150, RF/125AARH | FWB0127Z1 | |
| FLG/300 | FLNG.WN | 26 | 36 | M | B-16.47-B | ASTM A 105 | 300, RF/125AARH | FWB0147Z1 | |
| FLG/300 | FLNG.WN | 2 | 24 | M | B-16.5 | ASTM A 105 | 300, RF/125AARH | FWC0147Z1 | |
| FLB | FLNG.BLIND | .5 | 24 | | B-16.5 | ASTM A 105 | 150, RF/125AARH | FBC0127Z1 | |
| FLB | FLNG.BLIND | 26 | 36 | | B-16.47-B | ASTM A 105 | 150, RF/125AARH | FBB0127Z1 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 105 | 150, FF/125AARH | FGK0121Z1 | |
| FEF | SPCR&BLND | 10 | 24 | | ASME-B16.48 | ASTM A 105 | 150, FF/125AARH | FCK0121Z1 | |
| FEF | SPCR&BLND | 26 | 36 | | EIL/STD | ASTM A 516 GR.70 | 150, FF/125AARH | FCE6321Z1 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WA602D3Z1 | |
| ELB90 | ELBOW.90 | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WA602D2Z1 | |
| ELB90 | ELBOW.90 | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW, 1.5D | WAG684Z11 | |
| ELB90 | ELBOW.90 | 16 | 36 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW, 1.5D | WAG754Z11 | |

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A2A Sheet 4 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|----------|---------------------|-------------|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB45 | ELBOW.45 | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WB602D3Z1 | |
| ELB45 | ELBOW.45 | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WB602D2Z1 | |
| ELB45 | ELBOW.45 | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW, 1.5D | WBG684Z11 | |
| ELB45 | ELBOW.45 | 16 | 36 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW, 1.5D | WBG754Z11 | |
| TEQ | T.EQUAL | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WE602D3Z1 | |
| TEQ | T.EQUAL | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WE602D2Z1 | |
| TEQ | T.EQUAL | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WEG684ZZ1 | |
| TEQ | T.EQUAL | 16 | 36 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WEG754ZZ1 | |
| TRED | T.RED | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WR602D3Z1 | |
| TRED | T.RED | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WR602D2Z1 | |
| TRED | T.RED | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WRG684ZZ1 | |
| TRED | T.RED | 16 | 36 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WRG754ZZ1 | |
| REDC | REDUC.CONC | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WUG684ZZ1 | |
| REDC | REDUC.CONC | 16 | 36 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WUG754ZZ1 | |
| REDE | REDUC.ECC | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WVG684ZZ1 | |
| REDE | REDUC.ECC | 16 | 36 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WVG754ZZ1 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 105 | PBE | WNH026ZZ1 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 105 | PBE | WPH026ZZ1 | |
| CAP | CAP | 2 | 36 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WFG684ZZ1 | |
| CPLF | CPLNG.FULL | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WJ602D3Z1 | |
| CPLF | CPLNG.FULL | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WJ602D2Z1 | |
| CPLH | CPLNG.HALF | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WK602D3Z1 | |
| CPLH | CPLNG.HALF | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WK602D2Z1 | |

Package : IPMCS

Report No. : 50

A2A

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A2A Sheet 5 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|----------------------|---|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| CPLL | CPLNG.LH | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WL602D3Z1 | |
| CPLL | CPLNG.LH | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WL602D2Z1 | |
| CPLR | CPLNG.RED | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WM602D3Z1 | |
| CPLR | CPLNG.RED | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WM602D2Z1 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .5 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL | SW, 800, 3000, B-16.11, SHT NO.- 51002 | 51002ZZZ1 | |
| GAV | VLV.GATE | 2 | 36 | | API 600/ ISO 10434 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51302 | 51302ZZZ1 | 92 |
| GLV | VLV.GLOBE | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL | SW, 800, 3000, B-16.11, SHT NO.- 52002 | 52002ZZZ1 | |
| GLV | VLV.GLOBE | 2 | 16 | | BS-1873 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52302 | 52302ZZZ1 | |
| CHV | VLV.CHECK | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED | SW, 800, 3000, B-16.11, SHT NO.- 53002 | 53002ZZZ1 | |
| CHV | VLV.CHECK | 2 | 24 | | BS-1868 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53302 | 53302ZZZ1 | |
| BLV | VLV.BALL | .5 | 1.5 | | BS EN ISO 17292 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-PEEK | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54302 | 54302ZZZ1 | |
| G3V | VLV.PISTON | .5 | 1 | | MNF*STD | BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL | SW, 300, 3000, B-16.11, SHT NO.- 64402 | 64402ZZZ1 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 36 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 150 | GK65072Z0 | |
| GAS | GASKET | 26 | 36 | | B-16.20-ANSI B16.47B | SP.WND SS316+GRAFIL+ I RING | SPIRAL, 150 | GK56272Z0 | |
| GAS/300 | GASKET | 26 | 36 | | B-16.20-ANSI B16.47B | SP.WND SS316+GRAFIL+ I RING | SPIRAL, 300 | GK56274Z0 | |

Package : IPMCS

Report No. : 50

A2A

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A2A Sheet 6 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|--------------|--------------------|-------------------------|---------------------------------|----------------|---------|
| Gasket Group | | | | | | | | | |
| GAS/300 | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 300 | GK65074Z0 | |
| Trap/Strainer Group | | | | | | | | | |
| TRP | TRAP,STEAM | .5 | 1.5 | | MNF"STD | B:A105;T:13%CR;S:SS304 | FLGD, THRM DNMC, 150,RF/125AARH | TR3065531 | |
| TSR | STRNR,TEMP | 1.5 | 24 | | EIL"STD | B:A516GR.70;INT:S S304 | CONETYP, 150,FF/125AARH | ST16831Z1 | |
| PSR | STRNR,PERM | .5 | 1.5 | | MNF"STD | B:A105;INT:SS304 | SW, Y-TYPE, 800 | SP303D511 | |
| PSR | STRNR,PERM | 2 | 24 | | MNF"STD | B:A216GR.WCB;IN T:SS304 | FLGD, Y-TYPE, 150,RF/125AARH | SP3805531 | |

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3A Sheet I of 7 |

PIPE CLASS : **A3A**
 RATING : 150
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| TEMP | 0 | 38 | 50 | 65 | 100 | 150 | 186 |
|-------|-------|-------|-------|-------|-------|-------|-------|
| PRESS | 10.55 | 10.55 | 10.55 | 10.55 | 10.55 | 10.55 | 10.55 |

SERVICE

NON CORROSIVE UTILITIES (ABOVE GROUND) CATEGORY "D" FLUID - COOLING WATER, RAW WATER, SERVICE WATER, INSTRUMENT AIR(2" & ABOVE), PLANT AIR, INERT GAS, CARBON DI OXIDE (DRY), NITROGEN, CONDENSATE & BOILER FEED SUCTION (NON IBR). THIS CLASS DOES NOT COVER UNDERGROUND PIPING AND THE FIRE WATER SERVICE..

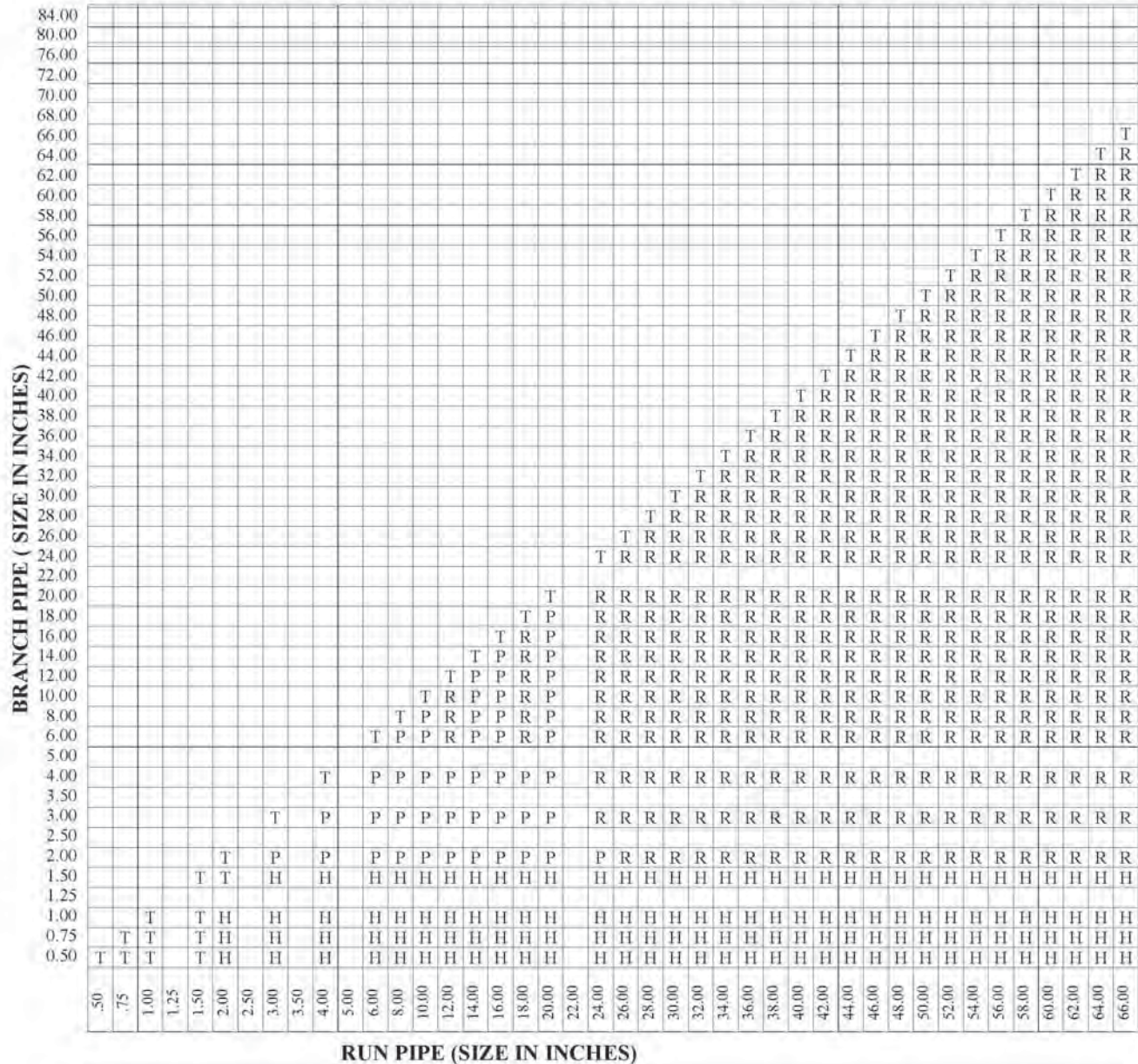
NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300, FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 6 FOR FABRICATED REDUCERS,REFER EIL'STD 7-44-0485 & 7-44-0487. FOR MITRES, REFER EIL'STD 7-44-0033.
- 64 AWWA C207 CL.D FLANGES SHALL BE OF HUB TYPE.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 86 BUTTERFLY VALVES FOR THE SPEC ARE PN10 RATED WITH A MAXIMUM PRESSURE OF 10.2 KG/CM2G.
- 99 BLIND FLANGES AND SPACER & BLINDS SPECIFIED TO MANUFACTURER'S STANDARD SHALL BE DESIGNED FOR 70 DEG.C AND 7.0 KG/CM2G TO SUIT 150#, FF, 125AARH, AWWA C207 CL.D FLANGES.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016
- 102 USE BUTTERFLY VALVES INSTEAD OF GATE VALVES FROM 12" ONWARDS IN WATER SERVICE AND UPTO 70 DEG C. DESIGN PRESSURE FOR BUTTERFLY VALVES IS LIMITED UPTO 10 BAR.
- 109 FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 65 DEG.C & 8.5 KG/CM2G RESPECTIVELY.
- 110 USE 5 PIECES 90 DEG MITRE FOR SIZE(S) 16" TO 44" ; 6 PIECES 90 DEG MITRE FOR SIZE(S) 46" TO 56"; 7 PIECES 90 DEG MITRE FOR SIZE(S) 58" TO 76"; 45 DEG MITRE REQUIRES ONE PIECE LESS

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|--|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING 3000 LBS. | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EIL'STD 7-44-350, DF3 | |
| | ON LINES >= 2.0" | 0.75" OR AS PER P&ID. REFER EIL STD. 7-44-351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-350, VC1 | |
| | ON LINES >= 2.0" | 0.75" OR AS PER P&ID. REFER EIL STD 7-44-351, V1 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-353 | |
| PRESS.CONN | 0.75" | SW, NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-354 | |

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3A Sheet 2 of 7 |



| CODE | DESCRIPTION | CODE | DESCRIPTION | CODE | DESCRIPTION |
|------|-----------------|------|----------------|------|-------------|
| F | SADDLE FUSED JT | T | TEES | J | THREADOLET |
| H | H. COUPLING | W | WELDOLETS | | |
| P | PIPE TO PIPE | I | INSTRUMENT TEE | | |
| R | REINFORCED | X | Refer Notes | | |
| S | SOCKOLETS | L | SWEEPOLET | | |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3A Sheet 4 of 7 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|---------------------|------------|-------------------|-------------------|--------------|----------------|-----------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | 1.5 | HVY | IS-1239-I | IS-1239 (BLACK) | PE, C.WELDED | PI6D471Z0 | |
| PIP | PIPE | 2 | 6 | HVY | IS-1239-I | IS-1239 (BLACK) | BE, C.WELDED | PI6D411Z0 | |
| PIP | PIPE | 8 | 14 | 6.0 | IS-3589 | IS-3589 GR.330 | BE, WELDED | PI7D919Z0 | |
| PIP | PIPE | 16 | 18 | 8.0 | IS-3589 | IS-3589 GR.330 | BE, WELDED | PI7D919Z0 | |
| PIP | PIPE | 20 | 24 | 10.0 | IS-3589 | IS-3589 GR.330 | BE, WELDED | PI7D919Z0 | |
| PIP | PIPE | 26 | 30 | 12.0 | IS-3589 | IS-3589 GR.330 | BE, WELDED | PI7D919Z0 | |
| PIP | PIPE | 32 | 38 | 12.0 | IS-3589 | IS-3589 GR.330 | BE, WELDED | PI7D919Z0 | 109 |
| PIP | PIPE | 40 | 48 | 14.0 | IS-3589 | IS-3589 GR.330 | BE, WELDED | PI7D919Z0 | 109 |
| PIP | PIPE | 50 | 60 | 16.0 | IS-3589 | IS-3589 GR.330 | BE, WELDED | PI7D919Z0 | 109 |
| PIP | PIPE | 64 | 70 | 18.0 | IS-3589 | IS-3589 GR.330 | BE, WELDED | PI7D919Z0 | 109 |
| PIP | PIPE | 72 | 76 | 20.0 | IS-3589 | IS-3589 GR.330 | BE, WELDED | PI7D919Z0 | 109 |
| NIP | NIPPLE | .5 | 1.5 | HVY | IS-1239-I | IS-1239 (BLACK) | PBE, C.WELDED | PN6D461Z0 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 105 | 150, RF/125AARH | FSC0127Z0 | |
| FLG/300 | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 105 | 300, RF/125AARH | FSC0147Z0 | |
| FLG/300 | FLNG.WN | 2 | 24 | M | B-16.5 | ASTM A 105 | 300, RF/125AARH | FWC0147Z0 | |
| FLG | FLNG.SO | 2 | 24 | | B-16.5 | ASTM A 105 | 150, RF/125AARH | FNC0127Z0 | |
| FLG | FLNG.SO | 26 | 76 | | AWWA-C207 CL.D | ASTM A 105 | 150, FF/125AARH | FN40121Z0 | |
| FLB | FLNG.BLIND | .5 | 24 | | B-16.5 | ASTM A 105 | 150, RF/125AARH | FBC0127Z0 | |
| FLB | FLNG.BLIND | 26 | 48 | | AWWA-C207 CL.D | ASTM A 285 GR.C | 150, FF/125AARH | FB45321Z0 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 105 | 150, FF/125AARH | FGK0121Z0 | |
| FEF | SPCR&BLND | 10 | 24 | | ASME-B16.48 | ASTM A 105 | 150, FF/125AARH | FCK0121Z0 | |
| FEF | SPCR&BLND | 26 | 76 | | MNF*STD | ASTM A 285 GR.C | 150, FF/125AARH | FCG5321Z0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3A Sheet 5 of 7 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|----------|---------------------|-------------|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WA602D2Z0 | |
| ELB90 | ELBOW.90 | 2 | 6 | STD | B-16.9 | ASTM A 234 GR WPB | BW, 1.5D | WAG684Z.10 | |
| ELB90 | ELBOW.90 | 8 | 14 | M | B-16.9 | ASTM A 234 GR WPB-W | BW, 1.5D | WAG754Z.10 | |
| ELB45 | ELBOW.45 | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WB602D2Z0 | |
| ELB45 | ELBOW.45 | 2 | 6 | STD | B-16.9 | ASTM A 234 GR WPB | BW, 1.5D | WBG684Z.10 | |
| ELB45 | ELBOW.45 | 8 | 14 | M | B-16.9 | ASTM A 234 GR WPB-W | BW, 1.5D | WBG754Z.10 | |
| MIT90 | MITRE.90 | 16 | 76 | M | EIL'STD | 1S-3589 GR.330 | BW, 1.5D | WDKF141Z0 | |
| MIT45 | MITRE.45 | 16 | 76 | M | EIL'STD | 1S-3589 GR.330 | BW, 1.5D | WGKF141Z0 | |
| TEQ | T.EQUAL | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WE602D2Z0 | |
| TEQ | T.EQUAL | 2 | 6 | STD | B-16.9 | ASTM A 234 GR WPB | BW | WEG684ZZ0 | |
| TEQ | T.EQUAL | 8 | 48 | M | B-16.9 | ASTM A 234 GR WPB-W | BW | WEG754ZZ0 | |
| TRED | T.RED | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WR602D2Z0 | |
| TRED | T.RED | 2 | 6 | STD, STD | B-16.9 | ASTM A 234 GR WPB | BW | WRG684ZZ0 | |
| TRED | T.RED | 8 | 48 | M, M | B-16.9 | ASTM A 234 GR WPB-W | BW | WRG754ZZ0 | |
| REDC | REDUC.CONC | 2 | 6 | STD, STD | B-16.9 | ASTM A 234 GR WPB | BW | WUG684ZZ0 | |
| REDC | REDUC.CONC | 8 | 14 | M, M | B-16.9 | ASTM A 234 GR WPB-W | BW | WUG754ZZ0 | |
| REDC | REDUC.CONC | 16 | 76 | M, M | EIL'STD | 1S-3589 GR.330 | BW | WUKF142Z0 | |
| REDE | REDUC.ECC | 2 | 6 | STD, STD | B-16.9 | ASTM A 234 GR WPB | BW | WVG684ZZ0 | |
| REDE | REDUC.ECC | 8 | 14 | M, M | B-16.9 | ASTM A 234 GR WPB-W | BW | WVG754ZZ0 | |
| REDE | REDUC.ECC | 16 | 76 | M, M | EIL'STD | 1S-3589 GR.330 | BW | WVKF142Z0 | |
| SWGC | SWAGE.CONC | .5 | 3 | STD, STD | BS-3799 | ASTM A 105 | PBE | WNH026ZZ0 | |
| SWGE | SWAGE.ECC | .5 | 3 | STD, STD | BS-3799 | ASTM A 105 | PBE | WPH026ZZ0 | |
| CAP | CAP | .5 | 1.5 | | B-16.11 | ASTM A 105 | SCRF, 3000 | WF60282Z0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3A Sheet 6 of 7 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|--------------------|--|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| CAP | CAP | 2 | 6 | STD | B-16.9 | ASTM A 234 GR.WPB | BW | WFG684ZZ0 | |
| CAP | CAP | 8 | 48 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WFG684ZZ0 | |
| CAP | CAP | 50 | 76 | CALC | ASME-VIII | ASTM A 285 GR.C | BW | WF3J54ZZ0 | |
| CPLF | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WJ602D2Z0 | |
| CPLH | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WK602D2Z0 | |
| CPLL | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WL602D2Z0 | |
| CPLR | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WM602D2Z0 | |
| UNN | UNION | .5 | 1.5 | | BS-3799 | ASTM A 105 | SW, 3000 | WQH02D2Z0 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .25 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL | SW, 800, 3000, B-16.11, SHT NO.- 51001 | 51001ZZZ0 | |
| GAV | VLV.GATE | 2 | 24 | | API 600/ ISO 10434 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51321 | 51321ZZZ0 | |
| GLV | VLV.GLOBE | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL | SW, 800, 3000, B-16.11, SHT NO.- 52001 | 52001ZZZ0 | |
| GLV | VLV.GLOBE | 2 | 16 | | BS-1873 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52321 | 52321ZZZ0 | |
| CHV | VLV.CHECK | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED | SW, 800, 3000, B-16.11, SHT NO.- 53001 | 53001ZZZ0 | |
| CHV | VLV.CHECK | 2 | 24 | | BS 1868 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53321 | 53321ZZZ0 | |
| CHV | VLV.CHECK | 26 | 48 | | API-594 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 53391 | 53391ZZZ0 | |
| BLV | VLV.BALL | .5 | 16 | | BS EN ISO 17292 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54321 | 54321ZZZ0 | |
| BFV | VLV.BTRFLY | 3 | 24 | | BS EN 593 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | WAFI, 150, B-16.5, WAF/125AARH, SHT NO.- 56321 | 56321ZZZ0 | |

Package : IPMCS

Report No. : 50

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3A Sheet 7 of 7 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|--------------|--------------------|--|---|----------------|---------|
| Valves Group | | | | | | | | | |
| BFV | VLV.BTRFLY | 26 | 48 | | BS EN 593 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 56316 | 56316ZZZ0 | |
| BFV | VLV.BTRFLY | 50 | 52 | | BS EN 593 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 56391 | 56391ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | 18 | 76 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404Z0 | |
| BOM | BOLT.M/C | .5 | 16 | | B-18.2 | BOLT:A307 GR.B, NUT:A563 GR.B | | BM41418Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 24 | | B-16.21-ANSI B16.5 | NONASBESTOS BS7531 GR X | RING, 150, 2 MM | GKBAX52Z0 | |
| GAS | GASKET | 26 | 76 | | AWWA-C207 CL.D | NONASBESTOS BS7531 GR X | FULLFACE, 150, 2 MM | GK2AX22Z0 | |
| GAS/300 | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 300 | GK65074Z0 | |
| Trap/Strainer Group | | | | | | | | | |
| TRP | TRAP.STEAM | .5 | 1.5 | | MNF"STD | B:A105;T:13%CR;S:SS304 | FLGD, THRM DNMC, 150, RF/125AARH | TR3065530 | |
| TSR | STRNR.TEMP | 1.5 | 24 | | EIL"STD | B:A285GR.C;INT:S S304 | CONETYP, 150, FF/125AARH | ST14431Z0 | |
| PSR | STRNR.PERM | .5 | 1.5 | | MNF"STD | B:A105;INT:SS304 | SW, Y-TYPE, 800 | SP303D510 | |
| PSR | STRNR.PERM | 2 | 6 | M | EIL"STD | B:A234GR.WPB;IN T:SS304 | BW, T-TYPE | SP13344Z0 | |
| PSR | STRNR.PERM | 8 | 24 | M | EIL"STD | B:A234GR.WPBW;I NT:SS304 | BW, T-TYPE | SP13644Z0 | |
| PSR | STRNR.PERM | 26 | 52 | M | MNF"STD | B:A234GR.WPBW;I NT:SS304 | BW, T-TYPE | SP33644Z0 | |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3Y Sheet I of 4 |

PIPE CLASS : **A3Y**
RATING : 150
BASE MATERIAL : RUBBER LINED CS
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| | | | |
|--------------|-------|-------|-------|
| TEMP | 0 | 38 | 80 |
| PRESS | 10.55 | 10.55 | 10.55 |

SERVICE

BLOWDOWN FROM DM/CPU TO ETP.
CATEGORY 'D'.

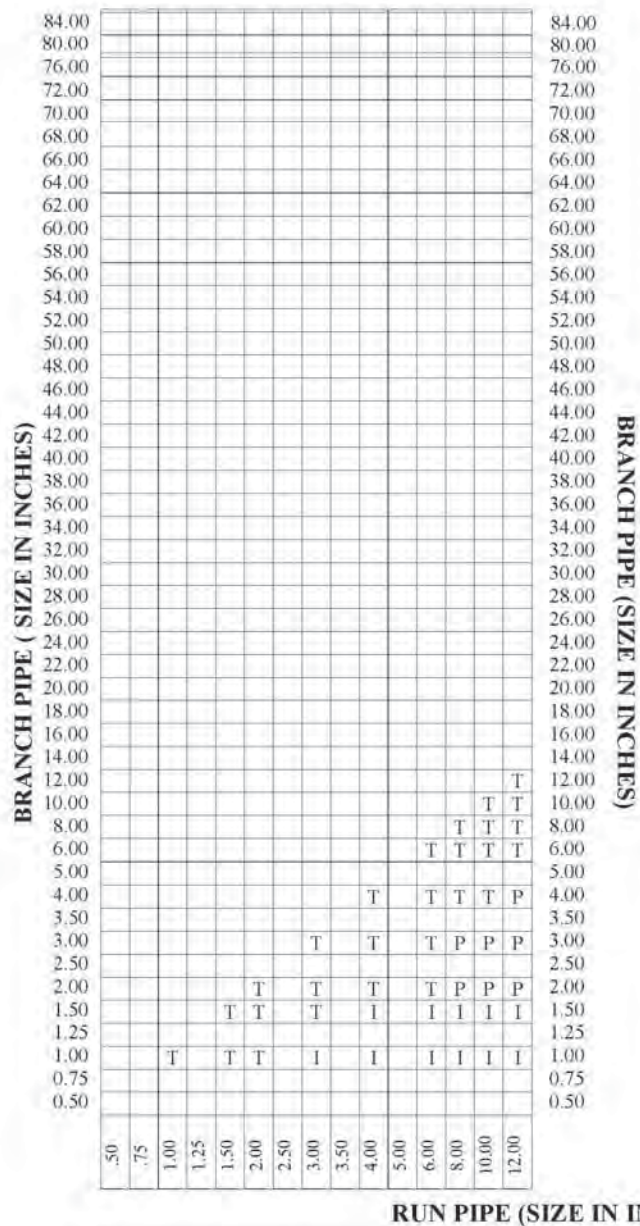
NOTES

- 22 REFER 'STANDARD SPECIFICATION FOR RUBBER-LINED PIPING' (EIL/STD 6-44-0061) FOR DETAILS.
- 66 S.O. FLANGES SHALL BE USED WITH PIPE SPOOLS.
- 67 ALL FITTINGS SHALL HAVE ENDS CONNECTED TO WN FLANGES.
- 68 MAIN HEADER SIZE SHALL NOT BE LESS THAN 1.5".
- 70 NATURAL RUBBER (SOFT) LINING OF SHORE HARDNESS 65-70 A SHALL BE CARRIED OUT AS PER IS:4682 PART-I. THICKNESS OF THE LINING SHALL BE 3MM(MIN.).
- 72 REFER EIL/STD 6-44-0061 FOR RESTRICTIONS ON PRESS.-TEMP. RATINGS FOR BUTTERFLY AND DIAPHRAGM VALVES
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|--------------------|------|--|--------|
| MAINTENANCE JOINTS | ALL | FLANGED | |
| PIPE JOINTS | ALL | FLANGED, S.O. TYPE | |
| DRAINS | ALL | AS PER P&ID OR 1" WITH DIAPHRAGM VALVE. REFER EIL/STD 6-44-0061 | |
| VENTS | ALL | AS PER P&ID OR 1" WITH DIAPHRAGM VALVE. REFER EIL/STD 6-44-0061 | |
| TEMP. CONN. | 1.5" | FLANGED. INSTALL AS PER EIL/STD 6-44-0061 | |
| PRESS. CONN. | 1" | FLANGED WITH DIAPHRAGM VALVE TO SPEC. INSTALL AS PER EIL/STD 6-44-0061 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3Y Sheet 2 of 4 |



| <u>CODE</u> | <u>DESCRIPTION</u> |
|-------------|--------------------|
| F | SADDLE FUSED JT |
| H | H. COUPLING |
| P | PIPE TO PIPE |
| R | REINFORCED |
| S | SOCKOLETS |
| T | TEES |
| W | WELDOLETS |
| I | INSTRUMENT TEE |
| X | Refer Notes |
| L | SWEEPOLET |
| J | THREADOLET |

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3Y Sheet 3 of 4 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|-------------|-------------------------------|----------------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | 1 | 1.5 | XS | B-36.10 | API 5L GR.B PSL1(RUB. LINED) | PE, SEAMLESS | PI2F677Z0 | |
| PIP | PIPE | 2 | 6 | STD | B-36.10 | API 5L GR.B PSL1(RUB. LINED) | PE, SEAMLESS | PI2F677Z0 | |
| PIP | PIPE | 8 | 12 | S20 | B-36.10 | API 5L GR.B PSL1(RUB. LINED) | PE, E.R.W | PI2F674Z0 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.WN | 1 | 12 | M | B-16.5 | ASTM A 105(RUB.LINED) | 150, STK/MAX1000AARH | FWC082EZ0 | 67 |
| FLG | FLNG.SO | 1 | 12 | | B-16.5 | ASTM A 105(RUB.LINED) | 150, STK/MAX1000AARH | FNC082EZ0 | 66 |
| FLB | FLNG.BLIND | 1 | 12 | | B-16.5 | ASTM A 105(RUB.LINED) | 150, STK/MAX1000AARH | FBC082EZ0 | |
| FEF | FLNG.FIG.8 | 1 | 8 | | ASME-B16.48 | ASTM A 105(RUB.LINED) | 150, STK/MAX1000AARH | FGK082EZ0 | |
| FEF | SPCR&BLND | 10 | 12 | | ASME-B16.48 | ASTM A 105(RUB.LINED) | 150, STK/MAX1000AARH | FCK082EZ0 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | 2 | 6 | M | B-16.9 | ASTM A 234 GR WPB(RUB.LINE D) | BW, 1.5D | WAG744Z10 | 67 |
| ELB90 | ELBOW.90 | 8 | 12 | M | B-16.9 | ASTM A 234 WPB-W(RUB.LINED) | BW, 1.5D | WAGK34Z10 | 67 |
| ELB45 | ELBOW.45 | 2 | 6 | M | B-16.9 | ASTM A 234 GR WPB(RUB.LINE D) | BW, 1.5D | WBG744Z10 | 67 |
| ELB45 | ELBOW.45 | 8 | 12 | M | B-16.9 | ASTM A 234 WPB-W(RUB.LINED) | BW, 1.5D | WBGK34Z10 | 67 |
| BND | PIPE.BEND | 1 | 1.5 | M | EIL'STD | API 5L GR.B PSL1(RUB. LINED) | BW, 3D | WCKK443Z0 | 67 |
| TEQ | T.EQUAL | 1 | 6 | M | B-16.9 | ASTM A 234 GR WPB(RUB.LINE D) | BW | WEG744ZZ0 | 67 |
| TEQ | T.EQUAL | 8 | 12 | M | B-16.9 | ASTM A 234 WPB-W(RUB.LINED) | BW | WEGK34ZZ0 | 67 |
| TRED | T.RED | 1 | 6 | M, M | B-16.9 | ASTM A 234 GR WPB(RUB.LINE D) | BW | WRG744ZZ0 | 67 |
| TRED | T.RED | 8 | 12 | M, M | B-16.9 | ASTM A 234 WPB-W(RUB.LINED) | BW | WRGK34ZZ0 | 67 |
| REDC | REDUC.CONC | 1 | 6 | M, M | B-16.9 | ASTM A 234 GR WPB(RUB.LINE D) | BW | WUG744ZZ0 | 67 |
| REDC | REDUC.CONC | 8 | 12 | M, M | B-16.9 | ASTM A 234 WPB-W(RUB.LINED) | BW | WUGK34ZZ0 | 67 |
| REDE | REDUC.ECC | 1 | 6 | M, M | B-16.9 | ASTM A 234 GR WPB(RUB.LINE D) | BW | WVG744ZZ0 | 67 |

Package : IPMCS

Report No. : 50

A3Y

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A3Y Sheet 4 of 4 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|--------------------|---|--|----------------|---------|
| Fitting Group | | | | | | | | | |
| | | | | | | D) | | | |
| REDE | REDUC.ECC | 8 | 12 | M, M | B-16.9 | ASTM A 234 WPB-W(RUB.LINED) | BW | WVGK34ZZ0 | 67 |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .5 | 24 | | API 600/ ISO 10434 | BODY-ASTM A 351 GR CF8,TRIM-SS 304 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51351 | 51351ZZZ0 | |
| GAV | VLV.GATE | 1 | 1.5 | | API 600/ ISO 10434 | BODY-ASTM A 351 GR.CF8,TRIM-SS 304 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51347 | 51347ZZZ0 | |
| GLV | VLV.GLOBE | 1 | 1.5 | | BS-1873 | BODY-ASTM A 351 GR.CF8,TRIM-SS 304 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52347 | 52347ZZZ0 | |
| GLV | VLV.GLOBE | 2 | 16 | | BS-1873 | BODY-ASTM A 351 GR CF8,TRIM-SS 304 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52351 | 52351ZZZ0 | |
| CHV | VLV.CHECK | 1 | 1.5 | | BS-1868 | BODY-ASTM A 351 GR.CF8,TRIM-SS 304 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53347 | 53347ZZZ0 | |
| CHV | VLV.CHECK | 1 | 12 | | BS-1868 | BODY-ASTM A 216 GR.WCB RUBBER LINED,TRIM-SS 304 | FLGD, 150, B-16.5, STK/MAX1000AARH, SHT NO.- 53389 | 53389ZZZ0 | |
| CHV | VLV.CHECK | 2 | 24 | | BS-1868 | BODY-ASTM A 351 GR CF8,TRIM-SS 304 | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53351 | 53351ZZZ0 | |
| BFV | VLV.BTRFLY | 3 | 14 | | BS EN 593 | BODY-ASTM A 351 GR CF8,TRIM-SS 304 | WAFI, 150, B-16.5, SHT NO.- 56351 | 56351ZZZ0 | |
| DPV | VLV.DIAPHR | 1 | 12 | | BS-5156 | BODY-ASTM A 216 GR.WCB RUBBER LINED,TRIM-SS 304 | FLGD, 150, B-16.5, STK/MAX1000AARH, SHT NO.- 57389 | 57389ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOM | BOLT.M/C | 1 | 12 | | B-18.2 | BOLT:A307 GR.B, NUT:A563 GR.B | | BM41418Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | 1 | 12 | | B-16.21-ANSI B16.5 | BUTYL RUBBER | FULLFACE, 150, 2 MM | GKB0422Z0 | |

Package : IPMCS

Report No. : 50

A3Y

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|---|--------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A91A Sheet I of 8 |

PIPE CLASS : **A91A**
 RATING : 150
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| TEMP | 0 | 38 | 50 | 65 |
|-------|-------|-------|-------|-------|
| PRESS | 10.55 | 10.55 | 10.55 | 10.55 |

SERVICE

COOLING WATER (U/G), RAW WATER & CONSTRUCTION WATER (U/G). FOR ABOVE GROUND SERVICES REFER 'A3A'

NOTES

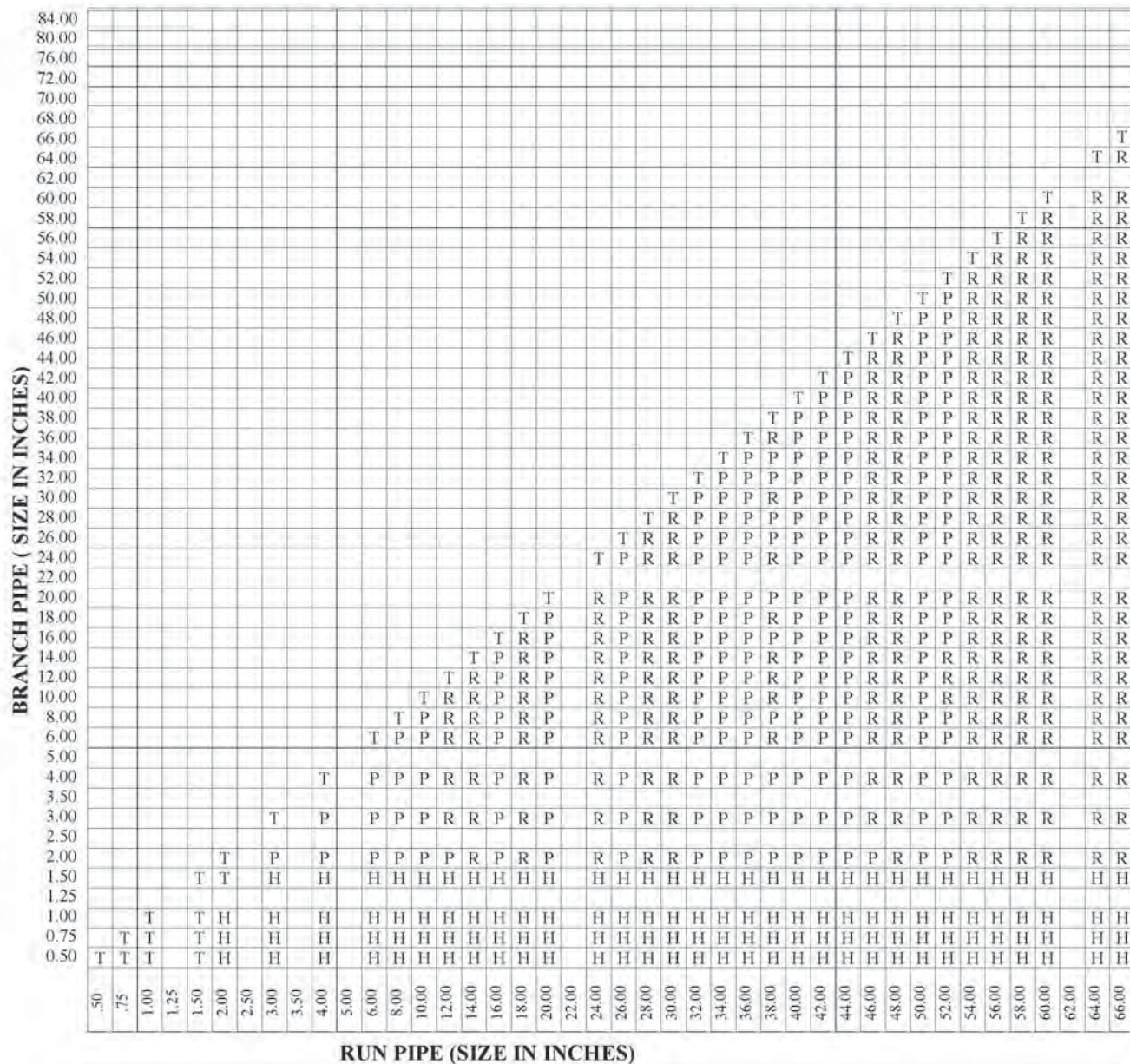
- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 6 FOR FABRICATED REDUCERS,REFER EIL'STD 7-44-0485 & 7-44-0487. FOR MITRES, REFER EIL'STD 7-44-0033.
- 64 AWWA C207 CL.D FLANGES SHALL BE OF HUB TYPE.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 86 BUTTERFLY VALVES FOR THE SPEC ARE PN10 RATED WITH A MAXIMUM PRESSURE OF 10.2 KG/CM2G.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016
- 102 USE BUTTERFLY VALVES INSTEAD OF GATE VALVES FROM 12" ONWARDS IN WATER SERVICE AND UPTO 70 DEG C. DESIGN PRESSURE FOR BUTTERFLY VALVES IS LIMITED UPTO 10 BAR.
- 105 FOR UNDERGROUND PIPING, PIPE WALL THICKNESSES ARE CALCULATED BASED ON SOIL PARAMETERS AND BURIAL DEPTH OF 600 MM TO 1500 MM FOR SIZES UPTO 36", 800 MM TO 1500 MM FOR SIZES 38" TO 48", 1000 MM TO 1500 MM FOR SIZES 50" TO 60", 1200 MM TO 1500 MM FOR SIZES 62" TO 68" AND 1500 MM FOR SIZES 70" AND ABOVE
- 109 FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 65 DEG.C & 8.5 KG/CM2G RESPECTIVELY.
- 110 USE 5 PIECES 90 DEG MITRE FOR SIZE(S) 16" TO 44" ; 6 PIECES 90 DEG MITRE FOR SIZE(S) 46" TO 56"; 7 PIECES 90 DEG MITRE FOR SIZE(S) 58" TO 76"; 45 DEG MITRE REQUIRES ONE PIECE LESS
- 141 ALL UNDERGROUND PIPES SHALL BE PROVIDED WITH CORROSION RESISTANCE PROTECTION (3L PE COATED) AS PER APPLICABLE SPECIFICATION.
- 147 ALL UNDERGROUND PIPES (BELOW 2") SHALL BE PROVIDED WITH CORROSION RESISTANCE PROTECTION (3L PE COATED) AS PER APPLICABLE SPECIFICATION AT SITE.
- 148 ALL UNDERGROUND FITTINGS SHALL BE PROVIDED WITH CORROSION RESISTANCE PROTECTION (EPOXY COATED) AS PER APPLICABLE SPECIFICATION AT SITE.
- 150 ALL MITERS SHALL BE FABRICATED AT SITE FROM PLAIN PIPE & PROVIDED WITH CORROSION RESISTANCE PROTECTION (EPOXY COATED) AS PER APPLICABLE SPECIFICATION AT SITE.

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A91A Sheet 2 of 8 |

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|--|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING 3000 LBS. | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EIL STD 7-44-350, DF3 | |
| | ON LINES >= 2.0" | 0.75" OR AS PER P&ID. REFER EIL STD. 7-44-351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-350, VC1 | |
| | ON LINES >= 2.0" | 0.75" OR AS PER P&ID. REFER EIL STD 7-44-351, V1 | |
| TEMP.CONN | 1.5" | FLANGED, REFER EIL STD 7-44-353 | |
| PRESS.CONN | 0.75" | SW, NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-354 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A91A Sheet 3 of 8 |



| <u>CODE</u> | <u>DESCRIPTION</u> |
|-------------|--------------------|
| F | SADDLE FUSED JT |
| H | H. COUPLING |
| P | PIPE TO PIPE |
| R | REINFORCED |
| S | SOCKOLETS |
| T | TEES |
| W | WELDOLETS |
| I | INSTRUMENT TEE |
| X | Refer Notes |
| L | SWEEPOLET |
| J | THREADOLET |

| | |
|--|--------------------------------|
| Client : RFCL | Dept./Sect. : 16/43 |
| Project : Revival of Ramagundam Fertilizer Complex | |
| Location : RAMAGUNDAM | Pipe Class : A91A Sheet 5 of 8 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|---------------------|------------|-------------------|-------------------|--------------|----------------|-----------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | 1.5 | HVY | IS-1239-I | IS-1239 (BLACK) | PE, C.WELDED | PI6D471Z0 | 147 |
| PIP | PIPE | 2 | 6 | HVY | IS-1239-I | IS-1239 (BLACK) (PE COATED) | BE, C.WELDED | PI6V411Z0 | |
| PIP | PIPE | 8 | 14 | 6.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | |
| PIP | PIPE | 16 | 18 | 8.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | |
| PIP | PIPE | 20 | 24 | 10.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | |
| PIP | PIPE | 26 | 30 | 12.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | |
| PIP | PIPE | 32 | 38 | 12.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | 109 |
| PIP | PIPE | 40 | 48 | 14.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | 109 |
| PIP | PIPE | 50 | 56 | 16.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | 109 |
| PIP | PIPE | 58 | 60 | 16.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | 109 |
| PIP | PIPE | 64 | 70 | 18.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | 109 |
| PIP | PIPE | 72 | 76 | 20.0 | IS-3589 | IS-3589 GR.330 (PE COATED) | BE, WELDED | PI7V519Z0 | 109 |
| NIP | NIPPLE | .5 | 1.5 | HVY | IS-1239-I | IS-1239 (BLACK) | PBE, C.WELDED | PN6D461Z0 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 105 | 150, RF/125AARH | FSC0127Z0 | |
| FLG | FLNG.SO | 2 | 24 | | B-16.5 | ASTM A 105 | 150, RF/125AARH | FNC0127Z0 | |
| FLG | FLNG.SO | 26 | 72 | | AWWA-C207 CL.D | ASTM A 105 | 150, FF/125AARH | FN40121Z0 | |
| FLG | FLNG.SO | 74 | 76 | | JOB'STD | ASTM A 285 GR.C | 150, FF/125AARH | FNF5321Z0 | |
| FLB | FLNG.BLIND | .5 | 24 | | B-16.5 | ASTM A 105 | 150, RF/125AARH | FBC0127Z0 | |
| FLB | FLNG.BLIND | 26 | 72 | | AWWA-C207 CL.D | ASTM A 285 GR.C | 150, FF/125AARH | FB45321Z0 | |
| FLB | FLNG.BLIND | 74 | 76 | | JOB'STD | ASTM A 285 GR.C | 150, FF/125AARH | FBF5321Z0 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 105 | 150, FF/125AARH | FGK0121Z0 | |
| FEF | SPCR&BLND | 10 | 24 | | ASME-B16.48 | ASTM A 105 | 150, FF/125AARH | FCK0121Z0 | |
| FEF | SPCR&BLND | 26 | 76 | | EIL'STD | ASTM A 285 GR.C | 150, FF/125AARH | FCE5321Z0 | |

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|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A91A Sheet 6 of 8 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|----------|---------------------|-------------|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WA602D2Z0 | 148 |
| ELB90 | ELBOW.90 | 2 | 6 | STD | B-16.9 | ASTM A 234 GR WPB | BW, 1.5D | WAG684Z.10 | 148 |
| ELB90 | ELBOW.90 | 8 | 14 | M | B-16.9 | ASTM A 234 GR WPB-W | BW, 1.5D | WAG754Z.10 | 148 |
| ELB45 | ELBOW.45 | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WB602D2Z0 | 148 |
| ELB45 | ELBOW.45 | 2 | 6 | STD | B-16.9 | ASTM A 234 GR WPB | BW, 1.5D | WBG684Z.10 | 148 |
| ELB45 | ELBOW.45 | 8 | 14 | M | B-16.9 | ASTM A 234 GR WPB-W | BW, 1.5D | WBG754Z.10 | 148 |
| MIT90 | MITRE.90 | 16 | 70 | M | EIL'STD | IS-3589 GR.330 | BW, 1.5D | WDKF14IZ0 | 110,150 |
| MIT45 | MITRE.45 | 16 | 70 | M | EIL'STD | IS-3589 GR.330 | BW, 1.5D | WGKF14IZ0 | 110 |
| TEQ | T.EQUAL | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WE602D2Z0 | 148 |
| TEQ | T.EQUAL | 2 | 6 | STD | B-16.9 | ASTM A 234 GR WPB | BW | WEG684ZZ0 | 148 |
| TEQ | T.EQUAL | 8 | 48 | M | B-16.9 | ASTM A 234 GR WPB-W | BW | WEG754ZZ0 | 148 |
| TEQ | T.EQUAL | 52 | 76 | M | MNF'STD | IS-3589 GR.330 | BW | WENF14ZZ0 | 148 |
| TRED | T.RED | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WR602D2Z0 | 148 |
| TRED | T.RED | 2 | 6 | STD, STD | B-16.9 | ASTM A 234 GR WPB | BW | WRG684ZZ0 | 148 |
| TRED | T.RED | 8 | 48 | M, M | B-16.9 | ASTM A 234 GR WPB-W | BW | WRG754ZZ0 | 148 |
| TRED | T.RED | 52 | 76 | M, M | MNF'STD | IS-3589 GR.330 | BW | WRNF14ZZ0 | 148 |
| REDC | REDUC.CONC | 2 | 6 | STD, STD | B-16.9 | ASTM A 234 GR WPB | BW | WUG684ZZ0 | 148 |
| REDC | REDUC.CONC | 8 | 14 | M, M | B-16.9 | ASTM A 234 GR WPB-W | BW | WUG754ZZ0 | 148 |
| REDC | REDUC.CONC | 16 | 76 | M, M | EIL'STD | IS-3589 GR.330 | BW | WUKF14ZZ0 | 148 |
| REDE | REDUC.ECC | 2 | 6 | STD, STD | B-16.9 | ASTM A 234 GR WPB | BW | WVG684ZZ0 | 148 |
| REDE | REDUC.ECC | 8 | 14 | M, M | B-16.9 | ASTM A 234 GR WPB-W | BW | WVG754ZZ0 | 148 |
| REDE | REDUC.ECC | 16 | 76 | M, M | EIL'STD | IS-3589 GR.330 | BW | WVKF14ZZ0 | 148 |
| SWGC | SWAGE.CONC | .5 | 3 | STD, STD | BS-3799 | ASTM A 105 | PBE | WNH026ZZ0 | 148 |

| | |
|---|--------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A91A Sheet 7 of 8 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|--------------------|---|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| SWGE | SWAGE.ECC | .5 | 3 | STD, STD | BS-3799 | ASTM A 105 | PBE | WPH026ZZ0 | 148 |
| CAP | CAP | .5 | 1.5 | | B-16.11 | ASTM A 105 | SCRF, 3000 | WF60282Z0 | 148 |
| CAP | CAP | 2 | 6 | STD | B-16.9 | ASTM A 234 GR.WPB | BW | WFG684ZZ0 | 148 |
| CAP | CAP | 8 | 48 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WFG684ZZ0 | 148 |
| CAP | CAP | 50 | 76 | M | ASME-VIII | ASTM A 285 GR.C | BW | WF3J54ZZ0 | 148 |
| CPLF | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WJ602D2Z0 | 148 |
| CPLH | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WK602D2Z0 | 148 |
| CPLL | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WL602D2Z0 | 148 |
| CPLR | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WM602D2Z0 | 148 |
| UNN | UNION | .5 | 1.5 | | BS-3799 | ASTM A 105 | SW, 3000 | WQH02D2Z0 | 148 |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .25 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 105,TRIM- STELLITED,STEM- 13%CR.STEEL | SW, 800, 3000, B- 16.11, SHT NO.- 51001 | 51001ZZZ0 | |
| GAV | VLV.GATE | 2 | 24 | | API 600/ ISO 10434 | BODY-ASTM A 216 GR.WCB,TRIM- 13% CR.STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51321 | 51321ZZZ0 | |
| GAV | VLV.GATE | 26 | 48 | | ANSI-B- 16.34 | BODY-ASTM A 216 GR.WCB,TRIM- 13% CR.STEEL | FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 51391 | 51391ZZZ0 | |
| GLV | VLV.GLOBE | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM- STELLITED,STEM- 13%CR STEEL | SW, 800, 3000, B- 16.11, SHT NO.- 52001 | 52001ZZZ0 | |
| GLV | VLV.GLOBE | 2 | 16 | | BS-1873 | BODY-ASTM A 216 GR.WCB,TRIM- 13% CR.STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52321 | 52321ZZZ0 | |
| CHV | VLV.CHECK | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM- STELLITED | SW, 800, 3000, B- 16.11, SHT NO.- 53001 | 53001ZZZ0 | |
| CHV | VLV.CHECK | 2 | 24 | | BS 1868 | BODY-ASTM A 216 GR.WCB,TRIM- 13% CR.STEEL | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53321 | 53321ZZZ0 | |
| CHV | VLV.CHECK | 26 | 48 | | API-594 | BODY-ASTM A 105 / A 216GR.WCB,TRIM- 13% CR.STEEL | FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 53391 | 53391ZZZ0 | |

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|---|--------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : A91A Sheet 8 of 8 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|--------------|--------------------|--|---|----------------|---------|
| Valves Group | | | | | | | | | |
| BLV | VLV.BALL | .5 | 16 | | BS EN ISO 17292 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE | FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54321 | 54321ZZZ0 | |
| BFV | VLV.BTRFLY | 3 | 24 | | BS EN 593 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | WAF, 150, B-16.5, WAF/125AARH, SHT NO.- 56321 | 56321ZZZ0 | |
| BFV | VLV.BTRFLY | 26 | 48 | | BS EN 593 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL | FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 56316 | 56316ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | 18 | 78 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404Z0 | |
| BOM | BOLT.M/C | .5 | 16 | | B-18.2 | BOLT:A307 GR.B, NUT:A563 GR.B | | BM41418Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 24 | | B-16.21-ANSI B16.5 | NONASBESTOS BS7531 GR X | RING, 150, 2 MM | GKBAX52Z0 | |
| GAS | GASKET | 26 | 78 | | AWWA-C207 CL.D | NONASBESTOS BS7531 GR X | FULLFACE, 150, 2 MM | GK2AX22Z0 | |
| Trap/Strainer Group | | | | | | | | | |
| TRP | TRAP.STEAM | .5 | 1.5 | | MNF"STD | B:A105;T:13%CR:S:SS304 | FLGD, THRMDNMC, 150,RF/125AARH | TR3065530 | |
| TSR | STRNR.TEMP | 1.5 | 24 | | EIL"STD | B:A285GR.C;INT:S S304 | CONETYP, 150,FF/125AARH | ST14431Z0 | |
| PSR | STRNR.PERM | .5 | 1.5 | | MNF"STD | B:A105;INT:SS304 | SW, Y-TYPE, 800 | SP303D510 | |
| PSR | STRNR.PERM | 2 | 6 | M | EIL"STD | B:A234GR.WPB;IN T:SS304 | BW, T-TYPE | SP13344Z0 | |
| PSR | STRNR.PERM | .8 | 24 | M | EIL"STD | B:A234GR.WPBW;I NT:SS304 | BW, T-TYPE | SP13644Z0 | |

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1A Sheet I of 6 |

PIPE CLASS : **B1A**
 RATING : 300
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| TEMP | -29 | 38 | 93 | 149 | 204 | 260 | 316 | 343 | 371 | 399 | 427 |
|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|------|-------|
| PRESS | 52.02 | 52.02 | 47.8 | 46.05 | 44.64 | 42.53 | 40.07 | 38.66 | 37.26 | 35.5 | 28.82 |

SERVICE

NON CORROSIVE PROCESS - FLAMMABLE / NON FLAMMABLE, NON LETHAL - HYDROCARBONS, AROMATICS, AMMONIA, SWEET GAS, FLUSHING OIL, AMMONIA GASEOUS, AMMONIA LIQUID, AMMONIA WATER, FUEL GAS, PROCESS GAS, MDEA SOLUTION, PROCESS AIR AND OTHER UTILITIES -MP CONDENSATE, INSTRUMENT AIR, PLANT AIR, NITROGEN, PROCESS CONDENSATE ETC. ABOVE CLASS 'A1A'.

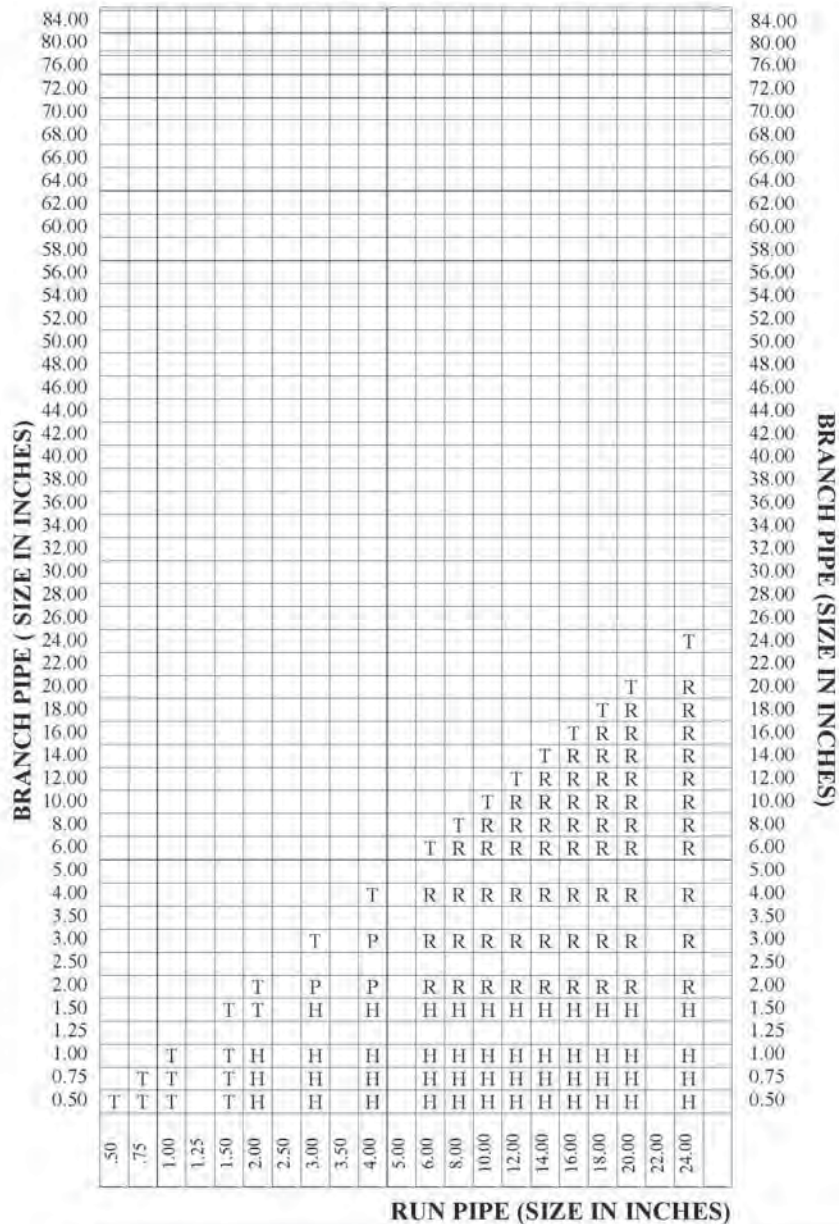
NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS, REFER EIL STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS, REFER EIL STD 7-44-0300; FOR SPACER AND BLIND REFER EIL STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL, PLUG & BUTTERFLY VALVES, REFER GENERAL NOTES.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCHEDULE. REFER GENERAL NOTES TO PMS.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016
- 146 PIPE THICKNESS IS CALCULATED BASED ON 80% OF DESIGN CONDITION FOR SIZE 24".

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EIL STD 7-44-0350, DF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-0350, VF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354 | |

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1A Sheet 2 of 6 |



| CODE | DESCRIPTION | CODE | DESCRIPTION | CODE | DESCRIPTION |
|------|-----------------|------|----------------|------|-------------|
| F | SADDLE FUSED JT | T | TEES | J | THREADOLET |
| H | H. COUPLING | W | WELDOLETS | | |
| P | PIPE TO PIPE | I | INSTRUMENT TEE | | |
| R | REINFORCED | X | Refer Notes | | |
| S | SOCKOLETS | L | SWEEPOLET | | |

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1A Sheet 3 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|-------------|-------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | S160 | B-36.10 | ASTM A 106 GR.B | PE, SEAMLESS | PI21977Z0 | |
| PIP | PIPE | 1 | 1.5 | XS | B-36.10 | ASTM A 106 GR.B | PE, SEAMLESS | PI21977Z0 | |
| PIP | PIPE | 2 | 2 | XS | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z0 | |
| PIP | PIPE | 3 | 14 | STD | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z0 | |
| PIP | PIPE | 16 | 18 | XS | B-36.10 | ASTM A 672 GR.B60 CL.12 | BE, E.F.S.W | PI2A813Z0 | |
| PIP | PIPE | 20 | 20 | XS | B-36.10 | ASTM A 672 GR.B60 CL.12 | BE, E.F.S.W | PI2A813Z0 | |
| PIP | PIPE | 24 | 24 | XS | B-36.10 | ASTM A 672 GR.B60 CL.12 | BE, E.F.S.W | PI2A813Z0 | 146 |
| NIP | NIPPLE | .5 | .75 | M | B-36.10 | ASTM A 106 GR.B | PBE, SEAMLESS | PN21967Z0 | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.10 | ASTM A 106 GR.B | PBE, SEAMLESS | PN21967Z0 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 105 | 300, RF/125AARH | FSC0147Z0 | |
| FLG | FLNG.WN | 2 | 24 | M | B-16.5 | ASTM A 105 | 300, RF/125AARH | FWC0147Z0 | |
| FLB | FLNG.BLIND | .5 | 24 | | B-16.5 | ASTM A 105 | 300, RF/125AARH | FBC0147Z0 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 105 | 300, FF/125AARH | FGK0141Z0 | |
| FEF | SPCR&BLND | 10 | 24 | | ASME-B16.48 | ASTM A 105 | 300, FF/125AARH | FCK0141Z0 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WA602D3Z0 | |
| ELB90 | ELBOW.90 | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WA602D2Z0 | |
| ELB90 | ELBOW.90 | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW, 1.5D | WAG684Z10 | |
| ELB90 | ELBOW.90 | 16 | 24 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW, 1.5D | WAG754Z10 | |
| ELB45 | ELBOW.45 | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WB602D3Z0 | |
| ELB45 | ELBOW.45 | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WB602D2Z0 | |
| ELB45 | ELBOW.45 | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW, 1.5D | WBG684Z10 | |
| ELB45 | ELBOW.45 | 16 | 24 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW, 1.5D | WBG754Z10 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1A Sheet 4 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|----------|---------------------|-------------|----------------|---------|
| Fitting Group | | | | | | | | | |
| TEQ | T.EQUAL | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WE602D3Z0 | |
| TEQ | T.EQUAL | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WE602D2Z0 | |
| TEQ | T.EQUAL | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WEG684ZZ0 | |
| TEQ | T.EQUAL | 16 | 24 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WEG754ZZ0 | |
| TRED | T.RED | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WR602D3Z0 | |
| TRED | T.RED | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WR602D2Z0 | |
| TRED | T.RED | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WRG684ZZ0 | |
| TRED | T.RED | 16 | 24 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WRG754ZZ0 | |
| REDC | REDUC.CONC | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WUG684ZZ0 | |
| REDC | REDUC.CONC | 16 | 24 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WUG754ZZ0 | |
| REDE | REDUC.ECC | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WVG684ZZ0 | |
| REDE | REDUC.ECC | 16 | 24 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WVG754ZZ0 | |
| SWG | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 105 | PBE | WNH026ZZ0 | |
| SWG | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 105 | PBE | WPH026ZZ0 | |
| CAP | CAP | .5 | .75 | | B-16.11 | ASTM A 105 | SCRF, 6000 | WF60283Z0 | |
| CAP | CAP | 1 | 1.5 | | B-16.11 | ASTM A 105 | SCRF, 3000 | WF60282Z0 | |
| CAP | CAP | 2 | 24 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WFG684ZZ0 | |
| CPLF | CPLNG.FULL | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WJ602D3Z0 | |
| CPLF | CPLNG.FULL | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WJ602D2Z0 | |
| CPLH | CPLNG.HALF | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WK602D3Z0 | |
| CPLH | CPLNG.HALF | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WK602D2Z0 | |
| CPLL | CPLNG.LH | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WL602D3Z0 | |
| CPLL | CPLNG.LH | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WL602D2Z0 | |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1A Sheet 5 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|--------------|--------------------|--|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| CPLR | CPLNG.RED | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WM602D3Z0 | |
| CPLR | CPLNG.RED | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WM602D2Z0 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .25 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR,STEEL | SW, 800, 3000, B-16.11, SHT NO.- 51001 | 51001ZZZ0 | |
| GAV | VLV.GATE | 2 | 24 | | API 600/ ISO 10434 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 51401 | 51401ZZZ0 | |
| GLV | VLV.GLOBE | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL | SW, 800, 3000, B-16.11, SHT NO.- 52001 | 52001ZZZ0 | |
| GLV | VLV.GLOBE | 2 | 12 | | BS-1873 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 52401 | 52401ZZZ0 | |
| CHV | VLV.CHECK | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED | SW, 800, 3000, B-16.11, SHT NO.- 53001 | 53001ZZZ0 | |
| CHV | VLV.CHECK | 2 | 24 | | BS-1868 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 53401 | 53401ZZZ0 | |
| BLV | VLV.BALL | .5 | 16 | | BS EN ISO 17292 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 54401 | 54401ZZZ0 | |
| PLV | VLV.PLUG | .5 | 24 | | BS-5353 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-PLUG-HARDENED | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 55401 | 55401ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 24 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 300 | GK65074Z0 | |
| Trap/Strainer Group | | | | | | | | | |
| TRP | TRAP.STEAM | .5 | 1.5 | | MNF'STD | B:A105,T:13%CR,S:SS304 | FLGD, THRM DNMC, 300,RF/125AARH | TR30655B0 | |
| TSR | STRNR.TEMP | 1.5 | 24 | | EIL'STD | B:A516GR.70;INT:S S304 | CONE TYPE, 300,FF/125AARH | ST16839Z0 | |
| PSR | STRNR.PERM | .5 | 1.5 | | MNF'STD | B:A105;INT:SS304 | SW, Y-TYPE, 800 | SP303D510 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1A Sheet 6 of 6 |

Note :(The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|---------------|----------|--------------------------|-------------|----------------|---------|
| Trap/Strainer Group | | | | | | | | | |
| PSR | STRNR.PERM | 2 | 14 | M | EIL'STD | B:A234GR.WPB;IN T:SS304 | BW, T-TYPE | SP13344Z0 | |
| PSR | STRNR.PERM | 16 | 24 | M | EIL'STD | B:A234GR.WPBW;I NT:SS304 | BW, T-TYPE | SP13644Z0 | |

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1K Sheet I of 5 |

PIPE CLASS : **B1K**
RATING : 300
BASE MATERIAL : SS 304
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| TEMP | -29 | 38 | 93 | 149 | 204 | 260 | 316 | 343 | 371 | 399 | 427 | 454 |
|-------|------|------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| PRESS | 50.5 | 50.5 | 42.18 | 37.96 | 34.8 | 32.69 | 30.93 | 30.23 | 29.52 | 29.17 | 28.47 | 27.77 |

SERVICE

PURE PROCESS LIQUID, VAPOUR AND GAS OR MILD CORROSIVE HYDROCARBON - FLAMMABLE/ NON FLAMMABLE & NON LETHAL HYDROCARBONS, CHEMICAL, DM WATER (AMMONIA UNIT)

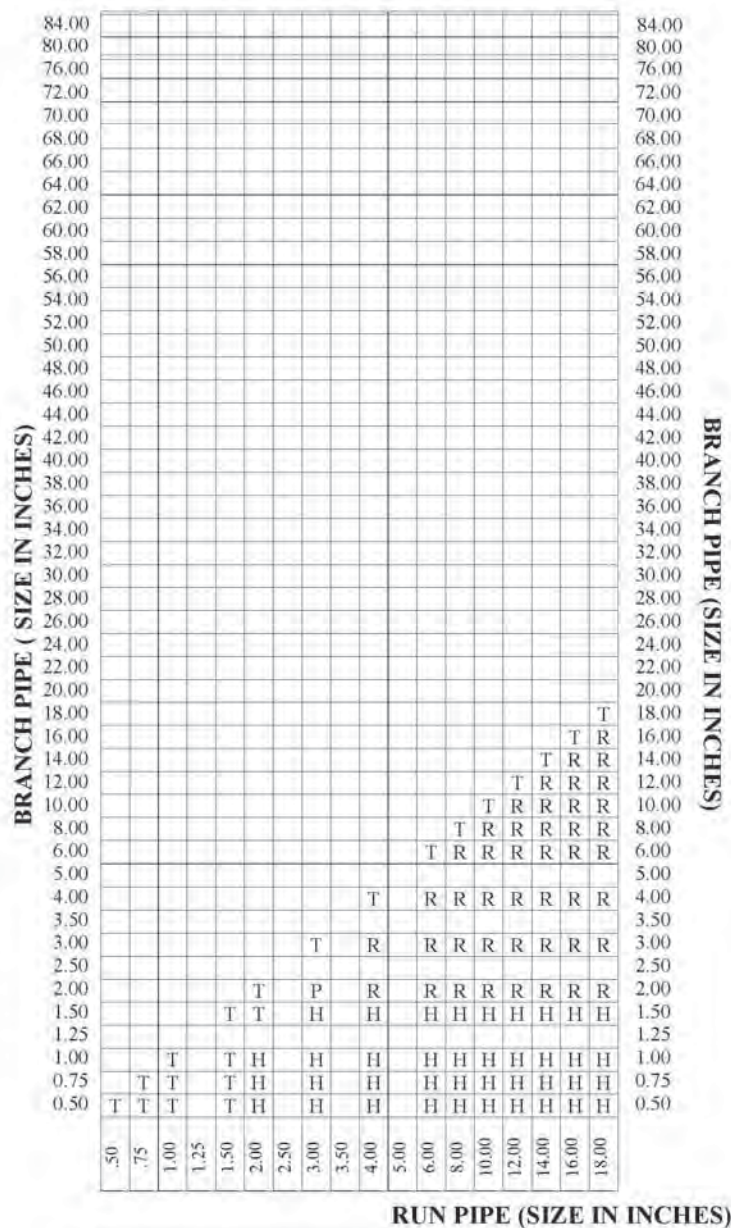
NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 48 FOR INSULATED FLANGED JOINTS BEYOND 427 DEG.C. IN THIS CLASS, USE A453 GR.660 CL.A
- 51 DESIGN PRESSURE AT -29 DEG.C. AND 38 DEG.C. FOR THIS PRESSURE HAS BEEN REDUCED FROM 50.62 KG/CM2G TO 50.50 KG/CM2G TO OPTIMISE THE THICKNESS FOR 6" SIZE.
- 74 STRESS RUPTURE TEST AS DETAILED IN ASTM A453 SHALL BE CARRIED OUT FOR ALL ASTM A453 GR.660A BOLTING MATERIALS.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING | |
| | 2.0" & ABOVE | BUTT WELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EIL STD 7-44-0350, Df3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-350, VF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354 | |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1K Sheet 2 of 5 |



| <u>CODE</u> | <u>DESCRIPTION</u> | | | | |
|-------------|--------------------|---|----------------|---|------------|
| F | SADDLE FUSED JT | T | TEES | J | THREADOLET |
| H | H. COUPLING | W | WELDOLETS | | |
| P | PIPE TO PIPE | I | INSTRUMENT TEE | | |
| R | REINFORCED | X | Refer Notes | | |
| S | SOCKOLETS | L | SWEEPOLET | | |

| | |
|--|-------------------------------|
| Client : RFCL | Dept./Sect. : 16/43 |
| Project : Revival of Ramagundam Fertilizer Complex | |
| Location : RAMAGUNDAM | Pipe Class : B1K Sheet 3 of 5 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|-------------|------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | 80S | B-36.19 | ASTM A 312 TP304 | PE, SEAMLESS | PI33577Z0 | |
| PIP | PIPE | 1 | 1.5 | 40S | B-36.19 | ASTM A 312 TP304 | PE, SEAMLESS | PI33577Z0 | |
| PIP | PIPE | 2 | 2 | 40S | B-36.19 | ASTM A 312 TP304 | BE, SEAMLESS | PI33517Z0 | |
| PIP | PIPE | 3 | 4 | 10S | B-36.19 | ASTM A 312 TP304 | BE, SEAMLESS | PI33517Z0 | |
| PIP | PIPE | 6 | 6 | 10S | B-36.19 | ASTM A 312 TP304 | BE, SEAMLESS | PI33517Z0 | 51 |
| PIP | PIPE | 8 | 8 | 6.35 | B-36.19 | ASTM A 312 TP304 | BE, SEAMLESS | PI33517Z0 | |
| PIP | PIPE | 10 | 10 | 6.35 | B-36.19 | ASTM A 358 TP304 CL.1 | BE, E.F.S.W | PI35513Z0 | |
| PIP | PIPE | 12 | 12 | 8.38 | B-36.19 | ASTM A 358 TP304 CL.1 | BE, E.F.S.W | PI35513Z0 | |
| PIP | PIPE | 14 | 14 | 7.92 | B-36.19 | ASTM A 358 TP304 CL.1 | BE, E.F.S.W | PI35513Z0 | |
| PIP | PIPE | 16 | 18 | 40S | B-36.19 | ASTM A 358 TP304 CL.1 | BE, E.F.S.W | PI35513Z0 | |
| NIP | NIPPLE | .5 | .75 | M | B-36.19 | ASTM A 312 TP304 | PBE, SEAMLESS | PN33567Z0 | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.19 | ASTM A 312 TP304 | PBE, SEAMLESS | PN33567Z0 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 182 GR.F304 | 300, RF/125AARH | FSC4147Z0 | |
| FLG | FLNG.WN | 2 | 18 | M | B-16.5 | ASTM A 182 GR.F304 | 300, RF/125AARH | FWC4147Z0 | |
| FLB | FLNG.BLIND | .5 | 18 | | B-16.5 | ASTM A 182 GR.F304 | 300, RF/125AARH | FBC4147Z0 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 182 GR.F304 | 300, FF/125AARH | FGK4141Z0 | |
| FEF | SPCR&BLND | 10 | 18 | | ASME-B16.48 | ASTM A 182 GR.F304 | 300, FF/125AARH | FCK4141Z0 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WA642D2Z0 | |
| ELB90 | ELBOW.90 | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304-S | BW, 1.5D | WAG874Z.10 | |
| ELB90 | ELBOW.90 | 10 | 18 | M | B-16.9 | ASTM A 403 GR.WP304-WX | BW, 1.5D | WAG894Z.10 | |
| ELB45 | ELBOW.45 | .5 | 1.5 | | B-16.11 | ASTM A 182 GR.F304 | SW, 3000 | WB642D2Z0 | |
| ELB45 | ELBOW.45 | 2 | 8 | M | B-16.9 | ASTM A 403 GR.WP304-S | BW, 1.5D | WBG874Z.10 | |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1K Sheet 4 of 5 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dimn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|--------------------|--|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB45 | ELBOW.45 | 10 | 18 | M | B-16.9 | ASTM A 403 GR WP304-WX | BW, 1.5D | WBG894ZZ10 | |
| TEQ | T.EQUAL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR F304 | SW, 3000 | WE642D2ZZ0 | |
| TEQ | T.EQUAL | 2 | 8 | M | B-16.9 | ASTM A 403 GR WP304-S | BW | WEG874ZZZ0 | |
| TEQ | T.EQUAL | 10 | 18 | M | B-16.9 | ASTM A 403 GR WP304-WX | BW | WEG894ZZZ0 | |
| TRED | T.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR F304 | SW, 3000 | WR642D2ZZ0 | |
| TRED | T.RED | 2 | 8 | M, M | B-16.9 | ASTM A 403 GR WP304-S | BW | WRG874ZZZ0 | |
| TRED | T.RED | 10 | 18 | M, M | B-16.9 | ASTM A 403 GR WP304-WX | BW | WRG894ZZZ0 | |
| REDC | REDUC.CONC | 2 | 8 | M, M | B-16.9 | ASTM A 403 GR WP304-S | BW | WUG874ZZZ0 | |
| REDC | REDUC.CONC | 10 | 18 | M, M | B-16.9 | ASTM A 403 GR WP304-WX | BW | WUG894ZZZ0 | |
| REDE | REDUC.ECC | 2 | 8 | M, M | B-16.9 | ASTM A 403 GR WP304-S | BW | WVG874ZZZ0 | |
| REDE | REDUC.ECC | 10 | 18 | M, M | B-16.9 | ASTM A 403 GR WP304-WX | BW | WVG894ZZZ0 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR F304 | PBE | WNH426ZZZ0 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 182 GR F304 | PBE | WPH426ZZZ0 | |
| CAP | CAP | 2 | 18 | M | B-16.9 | ASTM A 403 GR WP304-S | BW | WFG874ZZZ0 | |
| CPLF | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 182 GR F304 | SW, 3000 | WJ642D2ZZ0 | |
| CPLH | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 182 GR F304 | SW, 3000 | WK642D2ZZ0 | |
| CPLL | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 182 GR F304 | SW, 3000 | WL642D2ZZ0 | |
| CPLR | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 182 GR F304 | SW, 3000 | WM642D2ZZ0 | |
| Valves Group | | | | | | | | | |
| GAV | VL.V.GATE | .5 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 182 GR F304,TRIM-STELLITED,STEM-SS 304 | SW, 800, 3000, B-16.11, SHT NO.- 51045 | 51045ZZZ0 | |
| GAV | VL.V.GATE | 2 | 24 | | API 600/ ISO 10434 | BODY-ASTM A 351 GR CF8,TRIM-SS 304 | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 51445 | 51445ZZZ0 | |
| GLV | VL.V.GLOBE | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 182 GR F304,TRIM-STELLITED,STEM- | SW, 800, 3000, B-16.11, SHT NO.- 52045 | 52045ZZZ0 | |

Package : IPMCS

Report No. : 50

B1K

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B1K Sheet 5 of 5 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|---------------|--------------------|---|---|----------------|---------|
| Valves Group | | | | | | | | | |
| | | | | | | SS304 | | | |
| GLV | VLV.GLOBE | 2 | 12 | | BS-1873 | BODY-ASTM A 351 GR.CF8,TRIM-SS 304 | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 52445 | 52445ZZZ0 | |
| CHV | VLV.CHECK | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 182 GR.F304,TRIM-STELLITED | SW, 800, 3000, B-16.11, SHT NO.- 53045 | 53045ZZZ0 | |
| CHV | VLV.CHECK | 2 | 24 | | BS-1868 | BODY-ASTM A 351 GR.CF8,TRIM-SS 304 | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 53445 | 53445ZZZ0 | |
| BLV | VLV.BALL | .5 | 16 | | BS EN ISO 17292 | BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT-RPTFE | FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 54445 | 54445ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 18 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404Z0 | 48 |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 18 | | B-16.20-ANSI B16.5 | SP WND SS316+GRAFIL+I RING | SPIRAL., 300 | GK66274Z0 | |
| Trap/Strainer Group | | | | | | | | | |
| TSR | STRNR.TEMP | 1.5 | 18 | | EIL'STD | B:A240TP304;INT:S S304 | CONETYPE, 300,FF/125AARH | ST14139Z0 | |
| PSR | STRNR.PERM | .5 | 1.5 | | MNF'STD | B:A182GR.F304;INT:SS304 | SW, Y-TYPE, 800 | SP307D510 | |
| PSR | STRNR.PERM | 2 | 8 | M | EIL'STD | B:A403GR.WP304-S;INT:SS304 | BW, T-TYPE | SP15344Z0 | |
| PSR | STRNR.PERM | 10 | 18 | M | EIL'STD | B:A403GR.WP304-WX;INT:SS304 | BW, T-TYPE | SP15444Z0 | |

Package : IPMCS

Report No. : 50

B1K

| | |
|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B24A Sheet 1 of 5 |

| | | |
|---------------------|---|-------------------------|
| PIPE CLASS | : | B24A |
| RATING | : | 300 |
| BASE MATERIAL | : | CARBON STEEL |
| CORROSION ALLOWANCE | : | 3 MM |
| SPECIAL REQUIREMENT | : | LOW TEMPERATURE SERVICE |

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| | | | | | | |
|-------|-------|-------|------|-------|-------|-------|
| TEMP | -45 | 38 | 93 | 120 | 149 | 204 |
| PRESS | 48.86 | 48.86 | 46.4 | 45.72 | 44.99 | 43.23 |

SERVICE

LIQUID AMMONIA & VAPOUR AMMONIA (STRESS RELIEVED)

NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY
STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
11 IMPACT TESTING REQUIRED FOR ALL WELDED ITEMS. VALUES SHALL BE AS PER ASME B31.3 TABLE 323.35 AND
ASTM A 370.
12 VALVES SHALL HAVE EXTENDED BONNET AS PER BS 6364(NON COLD BOX APPLICATION).
32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCHEDULE. REFER GENERAL NOTES TO PMS.
34 MAXIMUM HARDNESS IN WELD JOINTS SHALL BE LIMITED TO 200 BHN.
101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EIL STD 7-44-0350, DF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-0350, VF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354 | |

| | |
|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B24A Sheet 2 of 5 |

[illegible]

| <u>CODE</u> | <u>DESCRIPTION</u> |
|-------------|--------------------|
| F | SADDLE FUSED JT |
| H | H. COUPLING |
| P | PIPE TO PIPE |
| R | REINFORCED |
| S | SOCKOLETS |
| T | TEES |
| W | WELDOLETS |
| I | INSTRUMENT TEE |
| X | Refer Notes |
| L | SWEEPOLET |
| J | THREADOLET |

| | |
|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B24A Sheet 3 of 5 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|-------------|---------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | S160 | B-36.10 | ASTM A 333 GR.6 | PE, SEAMLESS | PI24677Z5 | |
| PIP | PIPE | 1 | 1.5 | XS | B-36.10 | ASTM A 333 GR.6 | PE, SEAMLESS | PI24677Z5 | |
| PIP | PIPE | 2 | 2 | XS | B-36.10 | ASTM A 333 GR.6 | BE, SEAMLESS | PI24617Z5 | |
| PIP | PIPE | 3 | 10 | STD | B-36.10 | ASTM A 333 GR.6 | BE, SEAMLESS | PI24617Z5 | |
| PIP | PIPE | 12 | 12 | STD | B-36.10 | ASTM A 333 GR.6 | BE, SEAMLESS | PI24617Z5 | 32 |
| PIP | PIPE | 14 | 14 | XS | B-36.10 | ASTM A 333 GR.6 | BE, SEAMLESS | PI24617Z5 | |
| NIP | NIPPLE | .5 | .75 | M | B-36.10 | ASTM A 333 GR.6 | PBE, SEAMLESS | PN24667Z5 | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.10 | ASTM A 333 GR.6 | PBE, SEAMLESS | PN24667Z5 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 350 GR.LF2 CL.1 | 300, RF/125AARH | FSCD747Z5 | |
| FLG | FLNG.WN | 2 | 14 | M | B-16.5 | ASTM A 350 GR.LF2 CL.1 | 300, RF/125AARH | FWCD747Z5 | |
| FLB | FLNG.BLIND | .5 | 14 | | B-16.5 | ASTM A 350 GR.LF2 CL.1 | 300, RF/125AARH | FBCD747Z5 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 350 GR.LF2 CL.1 | 300, FF/125AARH | FGKD741Z5 | |
| FEF | SPCR&BLND | 10 | 14 | | ASME-B16.48 | ASTM A 350 GR.LF2 CL.1 | 300, FF/125AARH | FCKD741Z5 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | .75 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 6000 | WA6T7D3Z5 | |
| ELB90 | ELBOW.90 | 1 | 1.5 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 3000 | WA6T7D2Z5 | |
| ELB90 | ELBOW.90 | 2 | 14 | M | B-16.9 | ASTM A 420 GR.WPL6 | BW, 1.5D | WAGB44Z15 | |
| ELB45 | ELBOW.45 | .5 | .75 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 6000 | WB6T7D3Z5 | |
| ELB45 | ELBOW.45 | 1 | 1.5 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 3000 | WB6T7D2Z5 | |
| ELB45 | ELBOW.45 | 2 | 14 | M | B-16.9 | ASTM A 420 GR.WPL6 | BW, 1.5D | WGB44Z15 | |
| TEQ | T.EQUAL | .5 | .75 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 6000 | WE6T7D3Z5 | |
| TEQ | T.EQUAL | 1 | 1.5 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 3000 | WE6T7D2Z5 | |
| TEQ | T.EQUAL | 2 | 14 | M | B-16.9 | ASTM A 420 GR.WPL6 | BW | WGB44Z5 | |

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|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B24A Sheet 4 of 5 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|--------------------|---|--|----------------|---------|
| Fitting Group | | | | | | | | | |
| TRED | T.RED | .5 | .75 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 6000 | WR6T7D3Z5 | |
| TRED | T.RED | 1 | 1.5 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 3000 | WR6T7D2Z5 | |
| TRED | T.RED | 2 | 14 | M, M | B-16.9 | ASTM A 420 GR.WPL6 | BW | WRGB44ZZ5 | |
| REDC | REDUC.CONC | 2 | 14 | M, M | B-16.9 | ASTM A 420 GR.WPL6 | BW | WUGB44ZZ5 | |
| REDE | REDUC.ECC | 2 | 14 | M, M | B-16.9 | ASTM A 420 GR.WPL6 | BW | WVGB44ZZ5 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 350 GR.LF2 CL.1 | PBE | WNHT76ZZ5 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 350 GR.LF2 CL.1 | PBE | WPHT76ZZ5 | |
| CAP | CAP | 2 | 14 | M | B-16.9 | ASTM A 420 GR.WPL6 | BW | WFGB44ZZ5 | |
| CPLF | CPLNG.FULL | .5 | .75 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 6000 | WJ6T7D3Z5 | |
| CPLF | CPLNG.FULL | 1 | 1.5 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 3000 | WJ6T7D2Z5 | |
| CPLH | CPLNG.HALF | .5 | .75 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 6000 | WK6T7D3Z5 | |
| CPLH | CPLNG.HALF | 1 | 1.5 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 3000 | WK6T7D2Z5 | |
| CPLL | CPLNG.LH | .5 | .75 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 6000 | WL6T7D3Z5 | |
| CPLL | CPLNG.LH | 1 | 1.5 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 3000 | WL6T7D2Z5 | |
| CPLR | CPLNG.RED | .5 | .75 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 6000 | WM6T7D3Z5 | |
| CPLR | CPLNG.RED | 1 | 1.5 | | B-16.11 | ASTM A 350 GR.LF2 CL.1 | SW, 3000 | WM6T7D2Z5 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .5 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 350 GR.LF2 CL.1, TRIM- STELLITED, STEM- SS 304 | SW, 800, 3000, B- 16.11, SHT NO. - 51003 | 51003ZZZ5 | |
| GAV | VLV.GATE | 2 | 24 | | API 600/ ISO 10434 | BODY-ASTM A 352 GR.LCB, TRIM- STELLITED, STEM- SS304 | FLGD, 300, B-16.5, RF/125AARH, SHT NO. - 51403 | 51403ZZZ5 | |
| GLV | VLV.GLOBE | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 350 GR.LF2 CL.1, TRIM- STELLITED, STEM- SS304 | SW, 800, 3000, B- 16.11, SHT NO. - 52003 | 52003ZZZ5 | |

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|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : B24A Sheet 5 of 5 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|--------------|--------------------|--|---|----------------|---------|
| Valves Group | | | | | | | | | |
| GLV | VLV.GLOBE | 2 | 12 | | BS-1873 | BODY-ASTM A 352 GR.LCB,TRIM-STELLITED,STEM-SS304 | FLGD, 300, B-16.5, RF/125AARI, SHT NO.- 52403 | 52403ZZZ5 | |
| CHV | VLV.CHECK | .5 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 350 GR.LF2 CL.1,TRIM-STELLITED | SW, 800, 3000, B-16.11, SHT NO.- 53003 | 53003ZZZ5 | |
| CHV | VLV.CHECK | 2 | 24 | | BS-1868 | BODY-ASTM A 352 GR.LCB,TRIM-STELLITED | FLGD, 300, B-16.5, RF/125AARI, SHT NO.- 53403 | 53403ZZZ5 | |
| BLV | VLV.BALL | .5 | 16 | | BS EN ISO 17292 | BODY-ASTM A352 GR.LCB / ASTM A350 GR.LF2 CL.1,TRIM-BODY SEAT-RPTFE | FLGD, 300, B-16.5, RF/125AARI, SHT NO.- 54403 | 54403ZZZ5 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 14 | | B-18.2 | BOLT:A320 GR.L7, NUT:A194 GR.4 | | BS42007Z5 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 14 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 300 | GK65074Z5 | |
| Trap/Strainer Group | | | | | | | | | |
| TSR | STRNR.TEMP | 1.5 | 14 | | EIL/STD | B:A516GR.70(NORM),INT:SS304 | CONETYPE, 300,FF/125AARI | ST17539Z5 | |
| PSR | STRNR.PERM | .5 | 1.5 | | MNF/STD | B:A350GR.LF2 CL.1,INT:SS304 | SW, Y-TYPE, 800 | SP3D9D515 | |
| PSR | STRNR.PERM | 2 | 14 | M | EIL/STD | B:A420GR.WPL6,INT:SS304 | BW, T-TYPE | SP16544Z5 | |




PIPING MATERIAL SPECIFICATION

Class: B24P

PROJECTS AND DEVELOPMENT INDIA LIMITED

| SERVICE WASTE EFFLUENT,EFFLUENT,ACIDIC H2O ETC. | | TEMPERATURE LIMITS (Deg.C) | | | | | |
|--|-----------------------------|----------------------------|----------|---------------|--|-----------|----------|
| | | Ref.SI | Ref.SI | | | | |
| RATING ASME 150# FF | CORROSION ALLOWANCE NONE | MATERIAL CPVC | | | | | |
| ITEM | NOTES | SIZE (NPS) | SCH/ RAT | END | DESCRIPTION | COMM CODE | SPCL REV |
| PIPE | | | | | | | |
| PIPE | | 2 - 3 | SCH 80 | PE | CPVC,ASTM F441,MF.STD/ASTM F441,PLASTIC PIPE | PP552QC00 | |
| PIPE | | 4 - 6 | SCH 80 | PE | CPVC,ASTM F441,MF.STD/ASTM F441,PLASTIC PIPE | PP552QC00 | |
| PIPE | | 8 - 10 | SCH 80 | PE | CPVC,ASTM F441,MF.STD/ASTM F441,PLASTIC PIPE | PP552QC00 | |
| PIPE | | 12 - 12 | SCH 80 | PE | CPVC,ASTM F441,MF.STD/ASTM F441,PLASTIC PIPE | PP552QC00 | |
| PIPE | | 1/2 - 3/4 | SCH 80 | PE | CPVC,ASTM F441,MF.STD/ASTM F441,PLASTIC PIPE | PP552QC00 | |
| PIPE | | 1 - 11/2 | SCH 80 | PE | CPVC,ASTM F441,MF.STD/ASTM F441,PLASTIC PIPE | PP552QC00 | |
| FLANGE | | | | | | | |
| FLANGE | | 1/2 - 12 | 150# | FF | CPVC,ASTM F441,MF.STD/ASTM F441,SCH80 | FL551QC01 | |
| BLIND FLANGE | | | | | | | |
| BLIND FLANGE | | 1/2 - 12 | 150# | FF | CPVC,ASTM F441,MF.STD/ASTM F441, | BF551QC01 | |
| GASKET | | | | | | | |
| GASKET | | 1/2 - 12 | 150# | 3.0 MM THK FF | EPDM,MF.STD./ASME B16.21,FULL FACE | GS788PA01 | |
| STUD & NUTS | | | | | | | |
| STUD & 2NUTS HVY HEX | - | | | | ASTM A193 GR.B7/ASTM A194 GR.2H,, | SNDE00000 | |
| FITTING (BW) | | | | | | | |
| BRANCH WELD WITH RP | | 1/2 - 12 | | PE | CPVC,ASTM F441,MF.STD/ASTM F441, | WB55JQC00 | |
| FITTING (THD) | | | | | | | |
| CAP | | 1/2 - 11/2 | 3000# | THD | CPVC,ASTM F441,MF.STD/ASTM F441, | CP554QC07 | |
| FITTING | | | | | | | |
| ELBOW | | 1/2 - 12 | | PE | CPVC,ASTM F441,MF.STD/ASTM F441, | EL55JQC00 | |
| REDUCER CONC. | | 1/2 - 12 | | PE | CPVC,ASTM F441,MF.STD/ASTM F441, | RC55JQC00 | |
| REDUCER ECC. | | 1/2 - 12 | | PE | CPVC,ASTM F441,MF.STD/ASTM F441, | RE55JQC00 | |
| TEE | | 1/2 - 12 | | PE | CPVC,ASTM F441,MF.STD/ASTM F441, | TE55JQC00 | |
| UNION (GJ) | | 1/2 - 12 | | PE | CPVC,ASTM F441,MF.STD/ASTM F441, | UN55JQC00 | |
| NIPPLE | | | | | | | |
| NIPPLE | | 1/2 - 11/2 | SCH160 | PLN-PLN | CPVC,ASTM F441,MF.STD/ASTM F441, | NP555QC12 | 1 |
| NIPPLE | | 1/2 - 11/2 | SCH160 | PLN-THD | CPVC,ASTM F441,MF.STD/ASTM F441,PLASTIC PIPE NPT | NP556QC12 | 2 |
| NIPPLE | | 1/2 - 11/2 | SCH160 | THD | CPVC,ASTM F441,MF.STD/ASTM F441,PLASTIC PIPE NPT | NP554QC12 | 3 |
| VALVES | | | | | | | |
| GATE VALVE | | 1/2 - 12 | 150# | FF | CPVC BODY W/ PP PLUG & EPDM SEATS,GAV500C, | GAV500C | |
| CHECK VALVE | | 1/2 - 12 | 150# | FF | CPVC BODY,CHV500C, | CHV500C | |
| BALL VALVE | | 1/2 - 2 | 150# | FF | CPVC BODY WITH CPVC BALL,BAV500C, | BAV500C | |
| BALL VALVE | | 3 - 6 | 150# | FF | CPVC BODY WITH CPVC BALL,BAV501C, | BAV501C | |

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|---|-------------|-------------------------------|------------------------|---|-----------|-----------------------------|
| <div></div> | | PIPING MATERIAL SPECIFICATION | | B25 | | |
| PMC | | | | PIPE CLASS | | <div>B25</div> <div>4</div> |
| PROJECTS & DEVELOPEMENT | | | | REV NO | | 4 |
| INDIA LIMITED (NOIDA) | | | | SERVICE : PW (RO-III SYSTEMS) | | |
| RATING ASME 150 # RF | | MATERIAL : SDSS | | | | |
| | | MAX. DESIGN TEMP. DEG C | MAX. DESIGN PR. KG/CM2 | | | |
| | | 65 | 3.7 <div>4</div> | | | |
| CORROSION ALLOWANCE : NIL | | | | | | |
| ITEM | SIZE (NPS) | SCH/ RAT | END | DESCRIPTION | COMM CODE | REMARKS |
| PIPE | | | | | | |
| PIPE | 1/2 - 1 1/2 | SCH 40S | PE | SMLS,ASTM A 790 (UNS S32750) , ASME B36.19 | | |
| PIPE | 2 - 2 | SCH 40S | BE | SMLS,ASTM A 790 (UNS S32750) , ASME B36.19 | | |
| PIPE | 3 - 18 | SCH 10S | BE | SMLS,ASTM A 790 (UNS S32750) , ASME B36.19 | | |
| FLANGE | 1/2 - 18 | 150# | WN-RF 125 AARH | ASTM A 182 GR.F53 , ASME B 16.5 , WELD NECK | | |
| SPEC. BLIND | 1/2 - 12 | 150# | RF 125 AARH | ASTM A 182 GR.F53 , ASME B16.48 | | |
| SPACER AND BLIND | 14 - 18 | 150# | RF 125 AARH | ASTM A 182 GR.F53 , ASME B16.48 | | |
| BLIND FLANGE | | | | | | |
| BLIND FLANGE | 1/2 - 18 | 150# | RF 125 AARH | ASTM A 182 GR.F53 , ASME B 16.5 | | |
| GASKET | | | | | | |
| GASKET | 1/2 - 18 | 150# | SPRL-WND RF | S32750 SS WDG;GPH FLR;S32750 SS INR RNG;SS OTR RNG;ASME 16.20 | | |
| STUD & NUTS | | | | | | |
| HEX STUD & 2 NUTS | - | | | ASTM A193 GR.B8/ASTM A194 GR.8 , ASME B18.2 | | |
| FITTING (BW) | | | | | | |
| BRANCH WELD | 2 - 24 | M | BW | ASTM A 790 (UNS S32750) , ASME B36.19 | | |
| BRANCH WELD WITH RP | 2 - 24 | M | BW | ASTM A 790 (UNS S32750) , ASME B36.19 | | |
| CAP | 2 - 18 | M | BW | ASTM A 185 GR.WP UNS S32750, SMLS | | |
| ELBOW | 2 - 10 | M | BW | ASTM A 185 GR.WP UNS S32750, SMLS | | |
| ELBOW | 12 - 18 | M | BW | ASTM A 185 GR.WP UNS S32750, WLDD | | |
| REDUCER CONC. | 2 - 10 | M | BW | ASTM A 185 GR.WP UNS S32750, SMLS | | |
| REDUCER CONC. | 12 - 18 | M | BW | ASTM A 185 GR.WP UNS S32750, WLDD | | |
| REDUCER ECC. | 2 - 10 | M | BW | ASTM A 185 GR.WP UNS S32750, SMLS | | |
| REDUCER ECC. | 12 - 18 | M | BW | ASTM A 185 GR.WP UNS S32750, WLDD | | |
| TEE | 2 - 10 | M | BW | ASTM A 185 GR.WP UNS S32750, SMLS | | |
| TEE | 12 - 18 | M | BW | ASTM A 185 GR.WP UNS S32750, WLDD | | |
| FITTING (SW) | | | | | | |
| CAP | 1/2 - 1 1/2 | 3000# | SOCW | ASTM A 182 GR.F53 , ASME B 16.11 | | |
| HALF COUPLING | 1/2 - 1 1/2 | 3000# | SOCW | ASTM A 182 GR.F53 , ASME B 16.11 | | |
| ELBOW | 1/2 - 1 1/2 | 3000# | SOCW | ASTM A 182 GR.F53 , ASME B 16.11 | | |

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| | | | | | | |
|----------------------|-------------|-------|-----------|--|---------|--|
| COUPLING | 1/2 - 1 1/2 | 3000# | SOCW | ASTM A 182 GR.F53 , ASME B 16.11 | | |
| SOCKOLET | 1/2 - 18 | 3000# | SOCW | ASTM A 182 GR.F53 , MSS SP97 | | |
| TEE | 1/2 - 1 1/2 | 3000# | SOCW | ASTM A 182 GR.F53 , ASME B 16.11 | | |
| FITTING (THD) | | | | | | |
| CAP | 1/2 - 1 1/2 | 3000# | THD | ASTM A 182 GR.F53 , ASME B 16.11 | | |
| COUPLING | 1/2 - 1 1/2 | 3000# | THD | ASTM A 182 GR.F53 , ASME B 16.11 | | |
| PLUG | 1/2 - 1 1/2 | | THD | ASTM A 182 GR.F53 , ASME B 16.11 | | |
| THREDOLET | 1/2 - 18 | 3000# | THD | ASTM A 182 GR.F53 , MSS SP97 | | |
| NIPPLE | | | | | | |
| NIPPLE | 1/2 - 1 1/2 | M | PLN - PLN | SMLS,ASTM A 790 (UNS S32750) , ASME B36.19 | | |
| NIPPLE | 1/2 - 1 1/2 | M | PLN - THD | SMLS,ASTM A 790 (UNS S32750) , ASME B36.19 | | |
| NIPPLE | 1/2 - 1 1/2 | M | THD | SMLS,ASTM A 790 (UNS S32750) , ASME B36.19 | | |
| SWAGE NIPPLE | | | | | | |
| SWAGE (CONC) | 1/2 - 1 1/2 | M | PE | ASTM A 182 GR.F53 , MSS SP95 | | |
| SWAGE (CONC) | 1/2 - 1 1/2 | M | PLN - THD | ASTM A 182 GR.F53 , MSS SP95 | | |
| SWAGE (ECC) | 1/2 - 1 1/2 | M | PE | ASTM A 182 GR.F53 , MSS SP95 | | |
| SWAGE (ECC) | 1/2 - 1 1/2 | M | PLN - THD | ASTM A 182 GR.F53 , MSS SP95 | | |
| VALVES | | | | | | |
| BALL VALVE | 1/2 - 1 1/2 | 800# | SOCW | BODY ASTM A 182 GR.F53 | | |
| CHECK VALVE | 2 - 10 | 150# | FLGD , RF | BODY ASTM A 995 GR.5A | | |
| GLOBE VALVE | 2 - 10 | 150# | FLGD , RF | BODY ASTM A 995 GR.5A | | |
| GATE VALVE | 1/2 - 1 1/2 | 800# | SOCW | BODY ASTM A 182 GR.F53 | | |
| GATE VALVE | 2 - 24 | 150# | FLGD , RF | BODY ASTM A 995 GR.5A | | |
| BUTTERFLY VALVE | 3 - 18 | 150# | FLGD , RF | BODY ASTM A 995 GR.5A/ CE3MN | BUV 710 | |
| STRAINER | | | | | | |
| T TYPE STRAINER | 2 -24 | 150# | BW | BODY ASTM A 955 GR 5A | TTS 610 | |

NOTE :

1) M - MATCH TO PIPE THICKNESS

2) FOR VALVES CLASS AND OTHER DETAILED SPECIFICATION , REFER VMS (VALVE MATERIAL SPECIFICATION) SEPERATELY.

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : D1A Sheet 1 of 6 |

| | | |
|---------------------|---|--------------|
| PIPE CLASS | : | D1A |
| RATING | : | 600 |
| BASE MATERIAL | : | CARBON STEEL |
| CORROSION ALLOWANCE | : | 1.5 MM |
| SPECIAL REQUIREMENT | : | |

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| | | | | | | | | | | | |
|-------|--------|--------|------|-------|-------|-------|-------|-------|-------|-------|-----|
| TEMP | -29 | 38 | 93 | 149 | 204 | 260 | 316 | 343 | 371 | 399 | 427 |
| PRESS | 104.05 | 104.05 | 95.6 | 92.09 | 88.92 | 84.71 | 79.79 | 77.33 | 74.52 | 71.35 | 58 |

SERVICE

NON CORROSIVE PROCESS - FLAMMABLE / NON FLAMMABLE AND NON LETHAL - PETROLEUM PRODUCTS: FO, FG, SWEET GAS, INHIBITOR SOLUTION, NH₃, BRINE (MINUS 10 DEG C), CO₂, CAUSTIC SODA (20 Be MAX & TEMP 70 DEG C MAX), PARAXYLENE, BITUMEN, BOILER FEED WATER, FUEL GAS, MDEA SOLUTION, NATURAL GAS, PROCESS AIR, STEAM CONDENSATE, SYNTHESIS GAS.

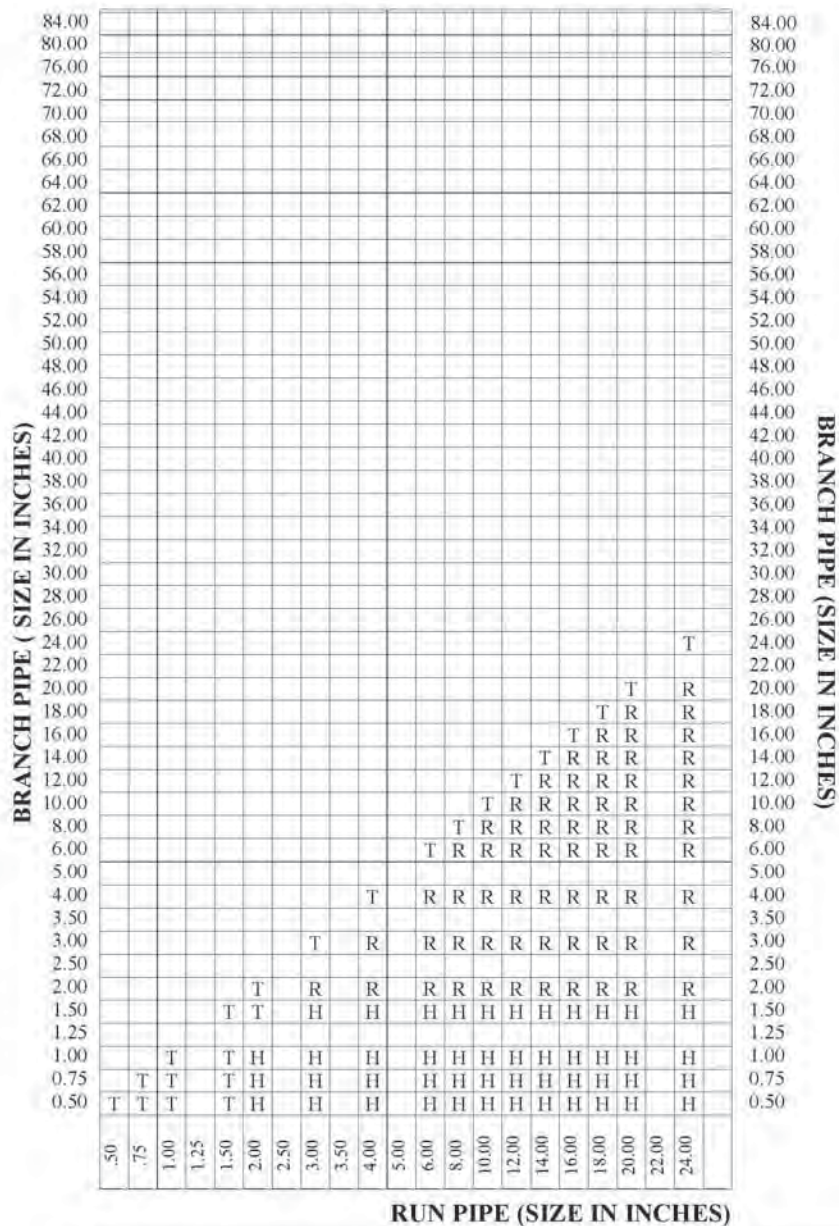
NOTES

- 3 USE PIPE OF CLASS 22 INSTEAD OF CLASS 12 IF PIPE THICKNESS EXCEEDS 20.00 MM.
5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY
7 STRAINERS,REFER EIL/STD 7-44-0300; FOR SPACER AND BLIND REFER EIL/STD 7-44-0162.
9 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCHEDULE. REFER GENERAL NOTES TO PMS.
101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016
139 PIPE THICKNESSES ARE CALCULATED BASED ON ACTUAL LINE CONDITION OF 51.5 KG/CM2 PRESSURE AT 425 DEG.
C FOR SIZE 10" TO 24"

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | ALL | FLANGED, TO BE KEPT MINIMUM | |
| PIPE JOINTS | 1.5" & BELOW | SW COUPLING | |
| | 2.0" & ABOVE | BUTTWELDED | |
| DRAINS | ON LINES <= 1.5" | REFER EIL STD 7-44-0350, DF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD. 7-44-0350, VF3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354 | |

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : D1A Sheet 2 of 6 |



| CODE | DESCRIPTION | CODE | DESCRIPTION | CODE | DESCRIPTION |
|------|-----------------|------|----------------|------|-------------|
| F | SADDLE FUSED JT | T | TEES | J | THREADOLET |
| H | H. COUPLING | W | WELDOLETS | | |
| P | PIPE TO PIPE | I | INSTRUMENT TEE | | |
| R | REINFORCED | X | Refer Notes | | |
| S | SOCKOLETS | L | SWEEPOLET | | |

| | |
|--|-------------------------------|
| Client : RFCL | Dept./Sect. : 16/43 |
| Project : Revival of Ramagundam Fertilizer Complex | |
| Location : RAMAGUNDAM | Pipe Class : D1A Sheet 3 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|-------------|-------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | S160 | B-36.10 | ASTM A 106 GR.B | PE, SEAMLESS | PI21977Z0 | |
| PIP | PIPE | 1 | 1.5 | XS | B-36.10 | ASTM A 106 GR.B | PE, SEAMLESS | PI21977Z0 | |
| PIP | PIPE | 2 | 2 | XS | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z0 | |
| PIP | PIPE | 3 | 3 | STD | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z0 | 32 |
| PIP | PIPE | 4 | 8 | XS | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z0 | |
| PIP | PIPE | 10 | 10 | XS | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z0 | 139 |
| PIP | PIPE | 12 | 14 | S60 | B-36.10 | ASTM A 106 GR.B | BE, SEAMLESS | PI21917Z0 | 139 |
| PIP | PIPE | 16 | 18 | S60 | B-36.10 | ASTM A 672 GR.B60 CL.12 | BE, E.F.S.W | PI2A813Z0 | 139 |
| PIP | PIPE | 20 | 24 | S60 | B-36.10 | ASTM A 672 GR.B60 CL.22 | BE, E.F.S.W | PI2A913Z0 | 3 |
| NIP | NIPPLE | .5 | .75 | M | B-36.10 | ASTM A 106 GR.B | PBE, SEAMLESS | PN21967Z0 | |
| NIP | NIPPLE | 1 | 1.5 | M | B-36.10 | ASTM A 106 GR.B | PBE, SEAMLESS | PN21967Z0 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.SW | .5 | 1.5 | M | B-16.5 | ASTM A 105 | 600, RF/125AARH | FSC0167Z0 | |
| FLG | FLNG.WN | 2 | 24 | M | B-16.5 | ASTM A 105 | 600, RF/125AARH | FWC0167Z0 | |
| FLB | FLNG.BLIND | .5 | 24 | | B-16.5 | ASTM A 105 | 600, RF/125AARH | FBC0167Z0 | |
| FEF | FLNG.FIG.8 | .5 | 8 | | ASME-B16.48 | ASTM A 105 | 600, FF/125AARH | FGK0161Z0 | |
| FEF | SPCR&BLND | 10 | 24 | | ASME-B16.48 | ASTM A 105 | 600, FF/125AARH | FCK0161Z0 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WA602D3Z0 | |
| ELB90 | ELBOW.90 | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WA602D2Z0 | |
| ELB90 | ELBOW.90 | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW, 1.5D | WAG684Z10 | |
| ELB90 | ELBOW.90 | 16 | 24 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW, 1.5D | WAG754Z10 | |
| ELB45 | ELBOW.45 | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WB602D3Z0 | |
| ELB45 | ELBOW.45 | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WB602D2Z0 | |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : D1A Sheet 4 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|----------|---------------------|-------------|----------------|---------|
| Fitting Group | | | | | | | | | |
| ELB45 | ELBOW.45 | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW, 1.5D | WBG684Z10 | |
| ELB45 | ELBOW.45 | 16 | 24 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW, 1.5D | WBG754Z10 | |
| TEQ | T.EQUAL | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WE602D3Z0 | |
| TEQ | T.EQUAL | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WE602D2Z0 | |
| TEQ | T.EQUAL | 2 | 14 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WEG684ZZ0 | |
| TEQ | T.EQUAL | 16 | 24 | M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WEG754ZZ0 | |
| TRED | T.RED | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WR602D3Z0 | |
| TRED | T.RED | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WR602D2Z0 | |
| TRED | T.RED | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WRG684ZZ0 | |
| TRED | T.RED | 16 | 24 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WRG754ZZ0 | |
| REDC | REDUC.CONC | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WUG684ZZ0 | |
| REDC | REDUC.CONC | 16 | 24 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WUG754ZZ0 | |
| REDE | REDUC.ECC | 2 | 14 | M, M | B-16.9 | ASTM A 234 GR.WPB | BW | WVG684ZZ0 | |
| REDE | REDUC.ECC | 16 | 24 | M, M | B-16.9 | ASTM A 234 GR.WPB-W | BW | WVG754ZZ0 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 105 | PBE | WNH026ZZ0 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 105 | PBE | WPH026ZZ0 | |
| CAP | CAP | 2 | 24 | M | B-16.9 | ASTM A 234 GR.WPB | BW | WFG684ZZ0 | |
| CPLF | CPLNG.FULL | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WJ602D3Z0 | |
| CPLF | CPLNG.FULL | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WJ602D2Z0 | |
| CPLH | CPLNG.HALF | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WK602D3Z0 | |
| CPLH | CPLNG.HALF | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WK602D2Z0 | |
| CPLL | CPLNG.LH | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WL602D3Z0 | |
| CPLL | CPLNG.LH | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WL602D2Z0 | |

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|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : D1A Sheet 5 of 6 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|--------------|--------------------|--|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| CPLR | CPLNG.RED | .5 | .75 | | B-16.11 | ASTM A 105 | SW, 6000 | WM602D3Z0 | |
| CPLR | CPLNG.RED | 1 | 1.5 | | B-16.11 | ASTM A 105 | SW, 3000 | WM602D2Z0 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .25 | 1.5 | | API 602/ ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR,STEEL | SW, 800, 3000, B-16.11, SHT NO.- 51001 | 51001ZZZ0 | |
| GAV | VLV.GATE | 2 | 24 | | API 600/ ISO 10434 | BODY-ASTM A 216 GR.WCB,TRIM-STELLITED,STEM-13%CR STEEL | FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 51501 | 51501ZZZ0 | |
| GLV | VLV.GLOBE | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL | SW, 800, 3000, B-16.11, SHT NO.- 52001 | 52001ZZZ0 | |
| GLV | VLV.GLOBE | 2 | 12 | | BS-1873 | BODY-ASTM A 216 GR.WCB,TRIM-STELLITED,STEM-13%CR,STEEL | FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 52501 | 52501ZZZ0 | |
| CHV | VLV.CHECK | .25 | 1.5 | | BS EN ISO 15761 | BODY-ASTM A 105,TRIM-STELLITED | SW, 800, 3000, B-16.11, SHT NO.- 53001 | 53001ZZZ0 | |
| CHV | VLV.CHECK | 2 | 24 | | BS-1868 | BODY-ASTM A 216 GR.WCB,TRIM-STELLITED | FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 53501 | 53501ZZZ0 | |
| BLV | VLV.BALL | .5 | 16 | | BS EN ISO 17292 | BODY-ASTM A 105 / A 216GR.WCB,TRIM-SEAT-RPTFE | FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 54501 | 54501ZZZ0 | |
| BFV | VLV.BTRFLY | 3 | 16 | | API-609/ BS EN 593 | BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL | WAF, 600, B-16.5, WAF/125AARH, SHT NO.- 56963 | 56963ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 24 | | B-18.2 | BOLT:A193 GR.B7, NUT:A194 GR.2H | | BS40404Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 24 | | B-16.20-ANSI B16.5 | SP.WND SS316+GRAFIL | SPIRAL, 600 | GK65076Z0 | |
| Trap/Strainer Group | | | | | | | | | |
| TSR | STRNR.TEMP | 1.5 | 24 | | EIL'STD | B:A516GR.70;INT:S S304 | CONETYP, 600,FF/125AARH | ST1683IZ0 | |
| PSR | STRNR.PERM | .5 | 1.5 | | MNF'STD | B:A105;INT:SS304 | SW, Y-TYPE, 800 | SP303D510 | |
| PSR | STRNR.PERM | 2 | 14 | M | EIL'STD | B:A234GR.WPB;IN T:SS304 | BW, T-TYPE | SP13344Z0 | |

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| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : D1A Sheet 6 of 6 |

Note :(The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------------|------------|-------------------|-------------------|--------------|----------|--------------------------|-------------|----------------|---------|
| Trap/Strainer Group | | | | | | | | | |
| PSR | STRNR.PERM | 16 | 24 | M | EIL'STD | B:A234GR.WPBW;I NT:SS304 | BW, T-TYPE | SP13644Z0 | |

| | |
|---|-------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : J2A Sheet I of 4 |

PIPE CLASS : **J2A**
 RATING : 150
 BASE MATERIAL : CS (Galv.)
 CORROSION ALLOWANCE : 0 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| | | | |
|-------|-------|-------|-------|
| TEMP | 0 | 38 | 65 |
| PRESS | 10.55 | 10.55 | 10.55 |

SERVICE

POTABLE WATER (UNDER GROUND & ABOVE GROUND),
 FIRE WATER-SPRINKLER SYSTEM AFTER ORIFICE

NOTES

- 19 THREADED JOINTS SHALL BE MADE WITH 1" WIDTH PTFE JOINING TAPE.
- 20 SURFACES WHERE GALVANISING HAS BEEN BURNT OFF SHALL BE WIRE BRUSHED AND COLD GALVANISED WITH ZINC COATING COMPOUND.
- 46 FOR BRANCH CONNECTION "X", USE EQUAL TEE WITH NIPPLE AND REDUCING COUPLING.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016
- 106 ALL UNDERGROUND PIPING SHALL BE PROVIDED WITH CORROSION RESISTANCE PROTECTION AS PER APPLICABLE SPECIFICATION.
- 108 FOR UNDERGROUND PIPING, PIPE WALL THICKNESSES ARE CALCULATED BASED ON SOIL PARAMETERS AND BURIAL DEPTH OF 600 MM TO 1500 MM FOR SIZES UPTO 4".

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | 1.5" & BELOW | UNIONS (SCRF) TO BE KEPT MINIMUM | |
| | 2" & ABOVE | FLANGED (SCREWED) TO BE KEPT MINIMUM | |
| PIPE JOINTS | UPTO 6" | SCREWED COUPLING | |
| DRAINS | ON LINES <= 1.5" | REFER EIL STD 7-44-0350, DC3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75", REFER EIL STD. 7-44-0351, D3 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD 7-440350, VC3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75", REFER EIL STD 7-44-0351, V3 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SCRD NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354 | |

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|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : J2A Sheet 2 of 4 |

[illegible]

| <u>CODE</u> | <u>DESCRIPTION</u> |
|-------------|--------------------|
| F | SADDLE FUSED JT |
| H | H. COUPLING |
| P | PIPE TO PIPE |
| R | REINFORCED |
| S | SOCKOLETS |
| T | TEES |
| W | WELDOLETS |
| I | INSTRUMENT TEE |
| X | Refer Notes |
| L | SWEEPOLET |
| J | THREADOLET |

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : J2A Sheet 3 of 4 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|-------------|-------------------------|-----------------|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | 6 | HVY | IS-1239-I | IS-1239 (GALV) | SCRM, WELDED | PI6D599Z0 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.SCRD | .5 | 6 | | B-16.5 | ASTM A 105(GALV.) | 150, FF/125AARH | FTC0721Z0 | |
| FLB | FLNG.BLIND | .5 | 6 | | B-16.5 | ASTM A 105(GALV.) | 150, FF/125AARH | FBC0721Z0 | |
| FEF | FLNG.FIG.8 | .5 | 6 | | ASME-B16.48 | ASTM A 105(GALV.) | 150, FF/125AARH | FGK0721Z0 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | 1.5 | | B-16.11 | ASTM A 105(GALV) | SCRF, 3000 | WA60882Z0 | |
| ELB90 | ELBOW.90 | 2 | 6 | | IS-1239-II | IS-1239(PART-II) (GALV) | SCRF, NA | WALE98ZZ0 | |
| ELB45 | ELBOW.45 | .5 | 1.5 | | B-16.11 | ASTM A 105(GALV) | SCRF, 3000 | WB60882Z0 | |
| ELB45 | ELBOW.45 | 2 | 6 | | IS-1239-II | IS-1239(PART-II) (GALV) | SCRF, NA | WBLE98ZZ0 | |
| TEQ | T.EQUAL | .5 | 1.5 | | B-16.11 | ASTM A 105(GALV) | SCRF, 3000 | WE60882Z0 | |
| TEQ | T.EQUAL | 2 | 6 | | IS-1239-II | IS-1239(PART-II) (GALV) | SCRF, NA | WELE98ZZ0 | |
| TRED | T.RED | .5 | 1.5 | | B-16.11 | ASTM A 105(GALV) | SCRF, 3000 | WR60882Z0 | |
| TRED | T.RED | 2 | 6 | | IS-1239-II | IS-1239(PART-II) (GALV) | SCRF, NA | WRLE98ZZ0 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 105(GALV) | TBE | WNH08EZZ0 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 105(GALV) | TBE | WPH08EZZ0 | |
| CAP | CAP | .5 | 1.5 | | B-16.11 | ASTM A 105(GALV) | SCRF, 3000 | WF60882Z0 | |
| CAP | CAP | 2 | 6 | | IS-1239-II | IS-1239(PART-II) (GALV) | SCRF, NA | WFLE98ZZ0 | |
| CPLF | CPLNG.FULL | .5 | 1.5 | | B-16.11 | ASTM A 105(GALV) | SCRF, 3000 | WJ60882Z0 | |
| CPLF | CPLNG.FULL | 2 | 6 | | IS-1239-II | IS-1239(PART-II) (GALV) | SCRF, NA | WJLE98ZZ0 | |
| CPLH | CPLNG.HALF | .5 | 1.5 | | B-16.11 | ASTM A 105(GALV) | SCRF, 3000 | WK60882Z0 | |
| CPLH | CPLNG.HALF | 2 | 6 | | IS-1239-II | IS-1239(PART-II) (GALV) | SCRF, NA | WKLE98ZZ0 | |
| CPLL | CPLNG.LH | .5 | 1.5 | | B-16.11 | ASTM A 105(GALV) | SCRF, 3000 | WL60882Z0 | |
| CPLL | CPLNG.LH | 2 | 6 | | IS-1239-II | IS-1239(PART-II) (GALV) | SCRF, NA | WLLE98ZZ0 | |

Package : IPMCS

Report No. : 50

J2A

| | |
|--|--------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : J2A Sheet 4 of 4 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|--------------|--------------------|--|---|----------------|---------|
| Fitting Group | | | | | | | | | |
| CPLR | CPLNG.RED | .5 | 1.5 | | B-16.11 | ASTM A 105(GALV) | SCRF, 3000 | WM6088ZZ0 | |
| CPLR | CPLNG.RED | 2 | 6 | | IS-1239-II | IS-1239(PART-I) (GALV) | SCRF, NA | WMLE98ZZ0 | |
| UNN | UNION | .5 | 6 | | IS-1239-II | IS-1239(PART-II) (GALV) | SCRF, NA | WQLE98ZZ0 | |
| Valves Group | | | | | | | | | |
| GAV | VL.V.GATE | .5 | 1.5 | | IS:778 CL.2 | BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM- IS 320 ALLOY HT2 | SCRF, CL.2, 3000, B-1.20.1, SHT NO.- 51080 | 51080ZZZ0 | |
| GAV | VL.V.GATE | 2 | 6 | | IS:14846 | BODY-IS 210 GR.FG 200,TRIM- IS 320 ALLOY HT2 | FLGD, PN1.6, B-16.1, FF/125AARH, SHT NO.- 51380 | 51380ZZZ0 | |
| GLV | VL.V.GLOBE | .5 | 1.5 | | IS:778 CL.2 | BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM- IS 320 ALLOY HT2 | SCRF, CL.2, 3000, B-1.20.1, SHT NO.- 52080 | 52080ZZZ0 | |
| CHV | VL.V.CHECK | .5 | 1.5 | | IS:778 CL.2 | BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM- IS 320 ALLOY HT2 | SCRF, CL.2, 3000, B-1.20.1, SHT NO.- 53080 | 53080ZZZ0 | |
| CHV | VL.V.CHECK | 2 | 6 | | IS:5312 (PT-1) | BODY-IS 210 GR.FG 200,TRIM- IS 320 ALLOY HT2 | FLGD, PN1.6, B-16.1, FF/125AARH, SHT NO.- 53380 | 53380ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOM | BOLT.M/C | .5 | 6 | | B-18.2 | BOLT:A307 GR.B(GALV), NUT:A563 GR.B(GALV) | | BM41519Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 6 | | B-16.21-ANSI B16.5 | BUTYL RUBBER | FULLFACE, 150, 2 MM | GKB0422Z0 | |

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|---|--------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : J91A Sheet I of 4 |

PIPE CLASS : **J91A**
 RATING : 150
 BASE MATERIAL : CS (Galv.)
 CORROSION ALLOWANCE : 0 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

| | | | |
|-------|------|------|------|
| TEMP | 0 | 38 | 65 |
| PRESS | 18.2 | 18.2 | 18.2 |

SERVICE

POTABLE WATER UG/AG (FOR PRILLING TOWER). BEYOND J2A.

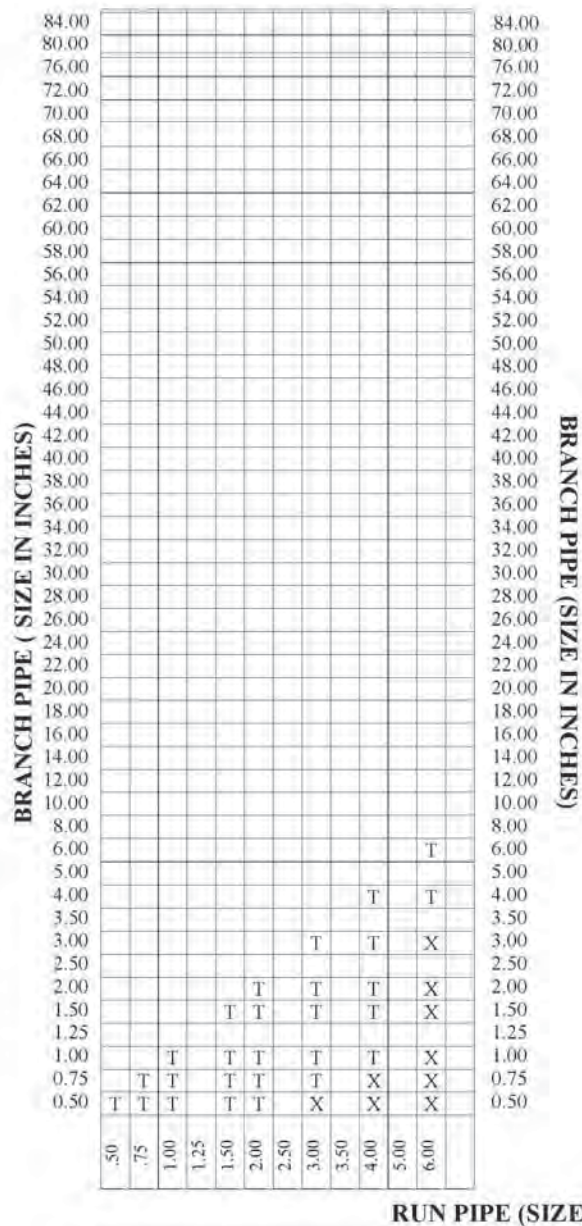
NOTES

- 19 THREADED JOINTS SHALL BE MADE WITH 1" WIDTH PTFE JOINING TAPE.
- 20 SURFACES WHERE GALVANISING HAS BEEN BURNT OFF SHALL BE WIRE BRUSHED AND COLD GALVANISED WITH ZINC COATING COMPOUND.
- 46 FOR BRANCH CONNECTION "X", USE EQUAL TEE WITH NIPPLE AND REDUCING COUPLING.
- 101 NDT REQUIREMENTS AS PER JOB STD. A747-6-44-0016
- 106 ALL UNDERGROUND PIPING SHALL BE PROVIDED WITH CORROSION RESISTANCE PROTECTION AS PER APPLICABLE SPECIFICATION.
- 108 FOR UNDERGROUND PIPING, PIPE WALL THICKNESSES ARE CALCULATED BASED ON SOIL PARAMETERS AND BURIAL DEPTH OF 600 MM TO 1500 MM FOR SIZES UPTO 4".

SPECIAL NOTES

| ITEM | SIZE | DESCRIPTION | A.CODE |
|---------------------|------------------|---|--------|
| MAINTAINENCE JOINTS | 1.5" & BELOW | UNIONS (SCRF) TO BE KEPT MINIMUM | |
| | 2" & ABOVE | FLANGED (SCREWED) TO BE KEPT MINIMUM | |
| PIPE JOINTS | UPTO 6 " | SCREWED COUPLING | |
| DRAINS | ON LINES <= 1.5" | REFER EIL STD 7-44-0350, DC3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D3 | |
| VENTS | ON LINES <= 1.5" | REFER EIL STD 7-440350, VC3 | |
| | ON LINES >= 2.0" | AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V3 | |
| TEMP.CONN | 1.5" | FLANGED. REFER EIL STD 7-44-0353 | |
| PRESS.CONN | 0.75" | SCRD NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354 | |

| | |
|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : J91A Sheet 2 of 4 |



| <u>CODE</u> | <u>DESCRIPTION</u> |
|-------------|--------------------|
| F | SADDLE FUSED JT |
| H | H. COUPLING |
| P | PIPE TO PIPE |
| R | REINFORCED |
| S | SOCKOLETS |
| T | TEES |
| W | WELDOLETS |
| I | INSTRUMENT TEE |
| X | Refer Notes |
| L | SWEEPOLET |
| J | THREADOLET |

| | |
|---|--------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : J91A Sheet 3 of 4 |

Note : (The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/ Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|----------------------|------------|-------------------|-------------------|---------------|-------------|--------------------------------------|---|----------------|---------|
| Pipe Group | | | | | | | | | |
| PIP | PIPE | .5 | .75 | S160 | B-36.10 | ASTM A 53 GR.B(GALV.) | SCRM, WELDED | PI2L499Z0 | |
| PIP | PIPE | 1 | 2 | XS | B-36.10 | ASTM A 53 GR.B(GALV.) | SCRM, WELDED | PI2L499Z0 | |
| PIP | PIPE | 3 | 4 | STD | B-36.10 | ASTM A 53 GR.B(GALV.) | SCRM, WELDED | PI2L499Z0 | |
| Flange Group | | | | | | | | | |
| FLG | FLNG.SCRD | .5 | 4 | | B-16.5 | ASTM A 105(GALV.) | 150, FF/125AARH | FTC0721Z0 | |
| FLB | FLNG.BLIND | .5 | 4 | | B-16.5 | ASTM A 105(GALV.) | 150, FF/125AARH | FBC0721Z0 | |
| FEF | FLNG.FIG.8 | .5 | 4 | | ASME-B16.48 | ASTM A 105(GALV.) | 150, FF/125AARH | FGK0721Z0 | |
| Fitting Group | | | | | | | | | |
| ELB90 | ELBOW.90 | .5 | 4 | | B-16.11 | ASTM A 105(GALV.) | SCRF, 3000 | WA60882Z0 | |
| ELB45 | ELBOW.45 | .5 | 4 | | B-16.11 | ASTM A 105(GALV.) | SCRF, 3000 | WB60882Z0 | |
| TEQ | T.EQUAL | .5 | 4 | | B-16.11 | ASTM A 105(GALV.) | SCRF, 3000 | WE60882Z0 | |
| TRED | T.RED | .5 | 4 | | B-16.11 | ASTM A 105(GALV.) | SCRF, 3000 | WR60882Z0 | |
| SWGC | SWAGE.CONC | .5 | 3 | M, M | BS-3799 | ASTM A 105(GALV.) | TBE | WNH08EZZ0 | |
| SWGE | SWAGE.ECC | .5 | 3 | M, M | BS-3799 | ASTM A 105(GALV.) | TBE | WPH08EZZ0 | |
| CAP | CAP | .5 | 4 | | B-16.11 | ASTM A 105(GALV.) | SCRF, 3000 | WF60882Z0 | |
| CPLF | CPLNG.FULL | .5 | 4 | | B-16.11 | ASTM A 105(GALV.) | SCRF, 3000 | WJ60882Z0 | |
| CPLH | CPLNG.HALF | .5 | 4 | | B-16.11 | ASTM A 105(GALV.) | SCRF, 3000 | WK60882Z0 | |
| CPLL | CPLNG.LH | .5 | 4 | | B-16.11 | ASTM A 105(GALV.) | SCRF, 3000 | WL60882Z0 | |
| CPLR | CPLNG.RED | .5 | 4 | | B-16.11 | ASTM A 105(GALV.) | SCRF, 3000 | WM60882Z0 | |
| UNN | UNION | .5 | 4 | | BS-3799 | ASTM A 105(GALV.) | SCRF, 3000 | WQH0882Z0 | |
| Valves Group | | | | | | | | | |
| GAV | VLV.GATE | .5 | 1.5 | | MSS-SP80 | BODY-ASTM B62 UNS C83600,TRIM-BRONZE | SCRF, 150, 3000, B-1.20.1, SHI NO.- 51090 | 51090ZZZ0 | |
| GAV | VLV.GATE | 2 | 4 | | MSS-SP128 | BODY-ASTM A 395,TRIM-BRONZE | FLGD, 150, B-16.5, FF/125AARH, SHI NO.- 51390 | 51390ZZZ0 | |

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|--|---------------------------------------|
| Client :RFCL | Dept./Sect. : 16/43 |
| Project :Revival of Ramagundam Fertilizer Complex | |
| Location RAMAGUNDAM | Pipe Class : J91A Sheet 4 of 4 |

Note :(The shaded portion of PMS body shows Field Fabricated Items)

| Input Id. | Item Type | Lower Size (Inch) | Upper Size (Inch) | Sch/Thk (mm) | Dmn. STD | Material | Description | Commodity Code | Note No |
|---------------------|-----------|-------------------|-------------------|--------------|--------------------|--|---|----------------|---------|
| Valves Group | | | | | | | | | |
| GLV | VLV.GLOBE | .5 | 1.5 | | MSS-SP80 | BODY-ASTM B62 UNS C83600,TRIM-BRONZE | SCRF, 150, 3000, B-1,20.1, SHT NO.- 52090 | 52090ZZZ0 | |
| CHV | VLV.CHECK | .5 | 1.5 | | MSS-SP80 | BODY-ASTM B62 UNS C83600,TRIM-BRONZE | SCRF, 150, 3000, B-1,20.1, SHT NO.- 53090 | 53090ZZZ0 | |
| CHV | VLV.CHECK | .2 | 4 | | MSS-SP136 | BODY-ASTM.A 395,TRIM-BRONZE | FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 53390 | 53390ZZZ0 | |
| Bolt Group | | | | | | | | | |
| BOS | BOLT.STUD | .5 | 4 | | B-18.2 | BOLT:A193 GR.B7(GALV), NUT:A194 2H(GALV) | | BS40513Z0 | |
| Gasket Group | | | | | | | | | |
| GAS | GASKET | .5 | 4 | | B-16.21-ANSI B16.5 | BUTYL RUBBER | FULLFACE, 150, 2 MM | GKB0422Z0 | |