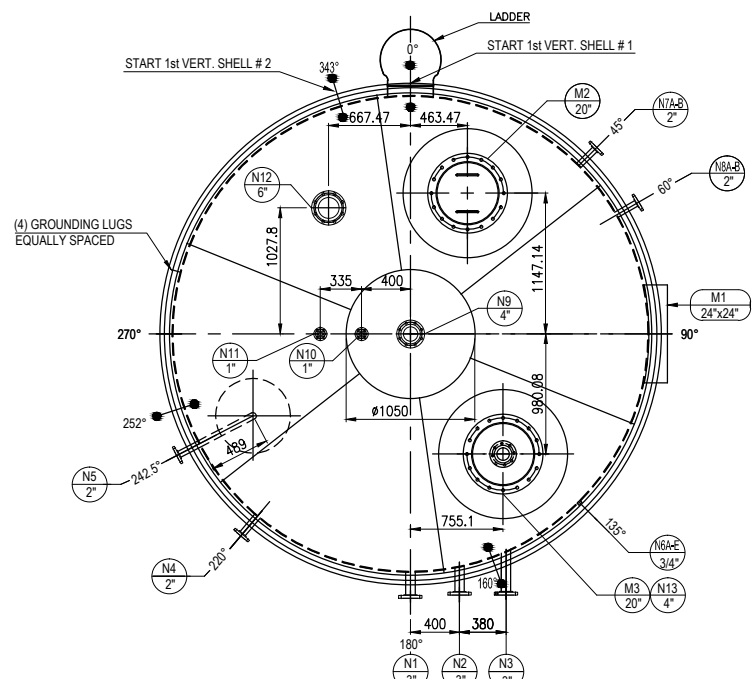
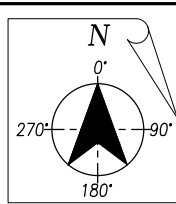


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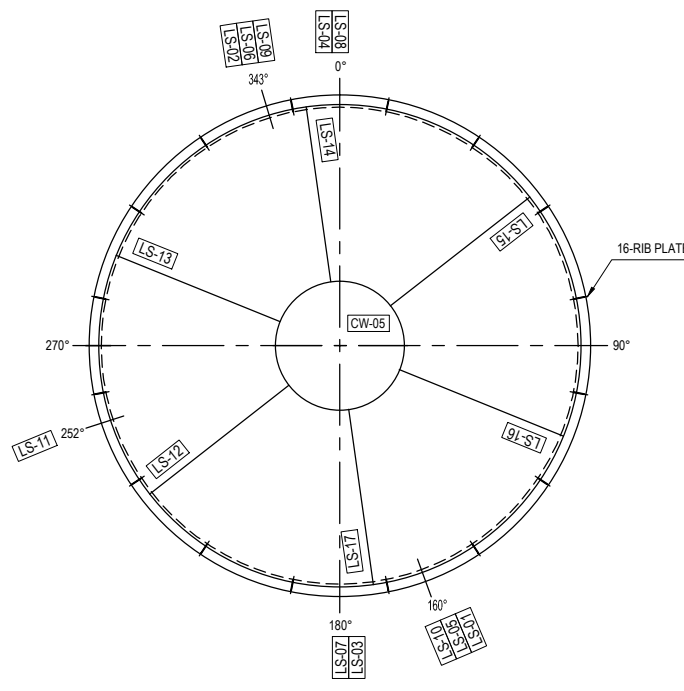
1. American Petroleum Institute 650. *Welded Steel Tanks for Oil Storage* (10th ed), November 1988. Washington, DC.
2. ASME Boiler and Pressure Vessel Code. *Section II Code An International Code Part D. 2010.*
3. Astanks.(n.d).*Types of Aboveground steel tank*. Retrieved August 21,2008. From http://www.astanks.com/EN/Fixed_roof_EN.html
4. American Petroleum Institute 2000. *Venting Atmospheric and Low-pressure Storage Tanks* (6t ed), November 2009. Washington, DC.
5. Buthod, Paul. *Pressure Vessel Handbook*, Seventh Edition. Professor of Chemical Engineering University of Tulsa.
6. Japanese Industrial Standart Handbook, *Ferrous material and metallurgy*, (1976). Tokyo: Japanese Standart Association.
7. Schodek, Daniel L. *Struktur* . (1988) Bandung : PT. Refika Aditama.

DAFTAR ACUAN

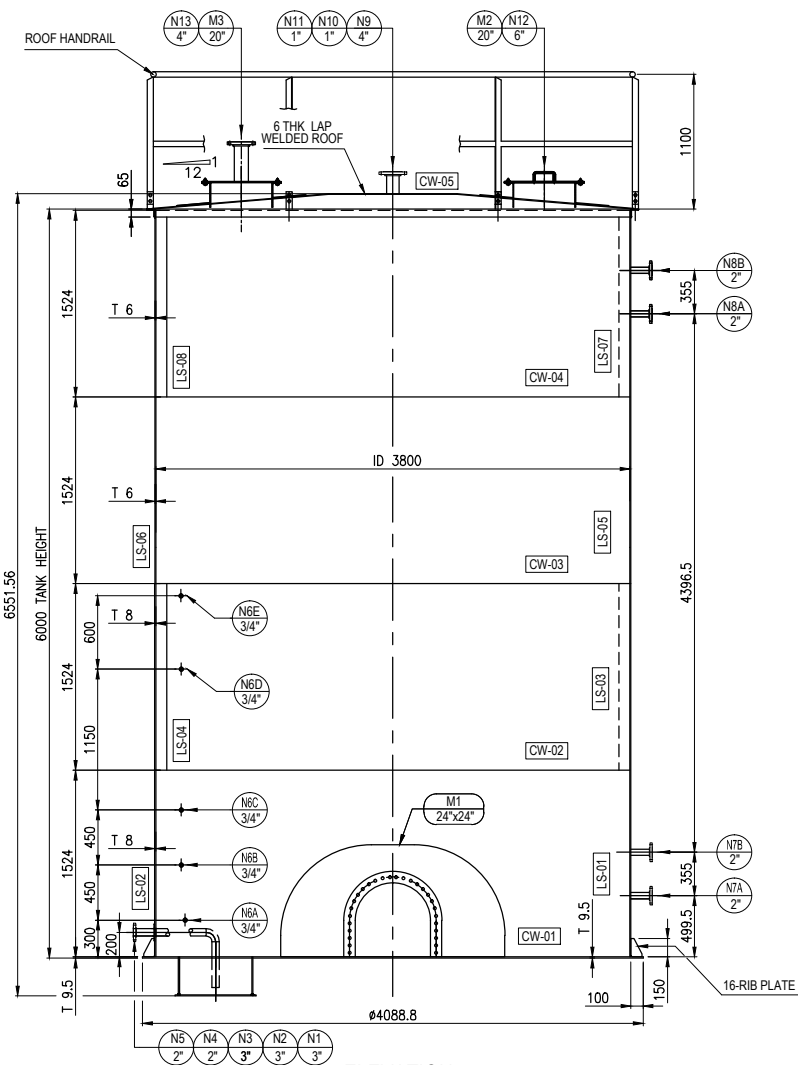
1. http://www.excavationsafetynews.com/wpcontent/uploads/2011/01/CS_storage_tank.jpg
2. <http://ferrysibarani.wordpress.com/2009/10/23/dome-roof-with-internal-floating-roof/>
3. http://www.fall-arrest.com/images/Floating-Roof-Tank_01.jpg.
4. <http://structuralarchaeology.blogspot.com/2011/06/stonehenge-and-archaeology-of.html>
5. <http://www.fgg.unilj.si/kmk/esdep/master/wg15c/10100.html>



NOZZLE ORIENTATION
(SCALE = 1/40)



LONG SEAM ORIENTATION
(SCALE = 1/40)



ELEVATION
(SCALE = 1/40)

| TABLE OF CONNECTION | | | | | | | | | |
|---------------------|-----------|------|-------------|---------|---------------|----------|-----------------|----------------------|--|
| MARK | NO. REQ'D | SIZE | SCH/ (TH'K) | FLANGE | | LOCATION | SERVICE/REMARKS | | |
| | | | | RATING | FACING | | | TYPE | |
| N1 | 1 | 3" | 160 | 150# | R.F. | S.O. | SHELL PLATE | INLET | |
| N2 | 1 | 3" | 160 | 150# | R.F. | S.O. | SHELL PLATE | OUTLET | |
| N3 | 1 | 3" | 160 | 150# | R.F. | S.O. | SHELL PLATE | RECYCLE TO HEATER | |
| N4 | 1 | 2" | 160 | 150# | R.F. | S.O. | SHELL PLATE | PUMP RECYCLE | |
| N5 | 1 | 2" | 160 | 150# | R.F. | S.O. | SHELL PLATE | DRAWOFF SUMP | |
| N6A/E | 5 | 3/4" | - | 3000# | HALF COUPLING | | SHELL PLATE | SAMPLING CONNECTION | |
| N7A/B | 2 | 2" | 160 | 150# | R.F. | S.O. | SHELL PLATE | LEVEL SWITCH LOW | |
| N8A/B | 2 | 2" | 160 | 150# | R.F. | S.O. | SHELL PLATE | LEVEL SWITCH HIGH | |
| N9 | 1 | 4" | 160 | 150# | R.F. | S.O. | ROOF PLATE | BREATHER VALVE | |
| N10 | 1 | 1" | 160 | 150# | R.F. | S.O. | ROOF PLATE | PRESSURE GAUGE | |
| N11 | 1 | 1" | 160 | 150# | R.F. | S.O. | ROOF PLATE | GAS BLANKET | |
| N12 | 1 | 6" | 160 | 150# | R.F. | S.O. | ROOF PLATE | EMERGENCY HATCH | |
| N13 | 1 | 4" | 160 | 150# | R.F. | S.O. | ROOF PLATE | LEVEL GAUGE | |
| M1 | 1 | 24" | t12.7 | API 650 | R.F. | S.O. | ROOF PLATE | FLUSH CLEAN OUT DOOR | |
| M2 | 1 | 20" | t12.7 | API 650 | R.F. | S.O. | SHELL PLATE | ROOF MANHOLE | |
| M3 | 1 | 20" | t12.7 | API 650 | R.F. | S.O. | SHELL PLATE | ROOF MANHOLE | |

GENERAL NOTES :

- ALL DIMENSIONS ARE IN METRIC, UNLESS OTHERWISE NOTED.
- ALL FLANGE BOLT HOLES TO STRADDLE CENTER LINES NATURAL VERTICAL & HORIZONTAL OF VESSEL.

| | | |
|--------------|------|-----------------------------|
| | A | DETAIL OF NAME PLATE |
| | A | DETAIL OF PLATFORM & LADDER |
| | A | DETAIL OF LADDER |
| | A | DETAIL OF CLEAN OUT |
| | A | DETAIL OF ROOF MANHOLE |
| | A | DETAIL OF NOZZLE |
| | A | DETAIL OF NOZZLE |
| | A | DETAIL OF ROOF STRUCTURE |
| | A | DETAIL OF ROOF PLATE |
| | A | DETAIL OF BOTTOM PLATE |
| | A | SHELL PLATE DETAIL |
| DRAWINGS NO. | REV. | TITLE |

REFERENCE DRAWING

DESIGN DATA

| | | | |
|---|------------------------------------|------|-----------------|
| CODE | : API 650 10 TH EDITION | | |
| REGULATION | : MIGAS | | |
| DESIGN CONDITION | PRESSURE [INTERNAL] | Psig | STATIC LIQUID |
| OPERATION CONDITION | TEMPERATURE | °F | |
| HYDROSTATIC TEST PRESSURE | Psig | | STATIC / LIQUID |
| VESEL POSITION DURING HYDROTEST | | | °F AMB |
| PNEUMATIC TEST | | | FULL OF WATER |
| M.A.W.P / M.A.P | Psig | | VERTICAL |
| M.D.M.T / MIN. PERMISSIBLE TEMP. | °F | | YES |
| IMPACT TEST | | | NO |
| PMI | | | NO |
| EARTH QUAKE FACTOR | | | - |
| POST WELD HEAT TREATMENT | | | NO |
| CORROSION ALLOWANCE [BOTTOM/SHELL/ROOF] | INCH | | 0.125 |
| EARTHQUAKE ZONE | | | 2A |
| WIND VELOCITY | Km/h | | 80 |
| INSULATION | | | NO |
| PERSONAL PROTECTION | | | YES |
| HEATING COIL | | | NO |
| FOUNDATION TYPE | | | - |
| TOP ANGLE TURNED | | | - |
| FRANGIBLE ROOF JOINT | | | - |
| MAXIMUM CAPACITY | m ³ | | +/- 72 |
| GASKET | : ASBESTOS | | - |
| INTERNAL PIPE | : - | | |
| STUD BOLT | : A 193 Gr. B7 | | |
| NUT | : A 194 Gr. 2H | | |

MATERIAL SPECIFICATION

| | |
|--------------------|----------------|
| BOTTOM & ANNULAR | : A 36 |
| SHELL | : A 36 |
| ROOF | : A 36 |
| STRUCTURE / RAFTER | : A 36 |
| NOZZLE NECK | : A 106 Gr. B |
| NOZZLE PAD | : A 36 |
| NOZZLE FLANGE | : A 105 |
| GASKET | : ASBESTOS |
| INTERNAL PIPE | : - |
| STUD BOLT | : A 193 Gr. B7 |
| NUT | : A 194 Gr. 2H |

WEIGHT

| | |
|---------------|------|
| ERECTION | : LB |
| EMPTY | : LB |
| OPERATING | : LB |
| FULL OF WATER | : LB |
| INTERNALS | : LB |

| | | | | | |
|----|-------------------|-------------|------------|-------------|-------------|
| NO | ISSUED FOR REVIEW | Prepared by | Checked by | Reviewed by | Approved by |
| | DESCRIPTION | | | | |

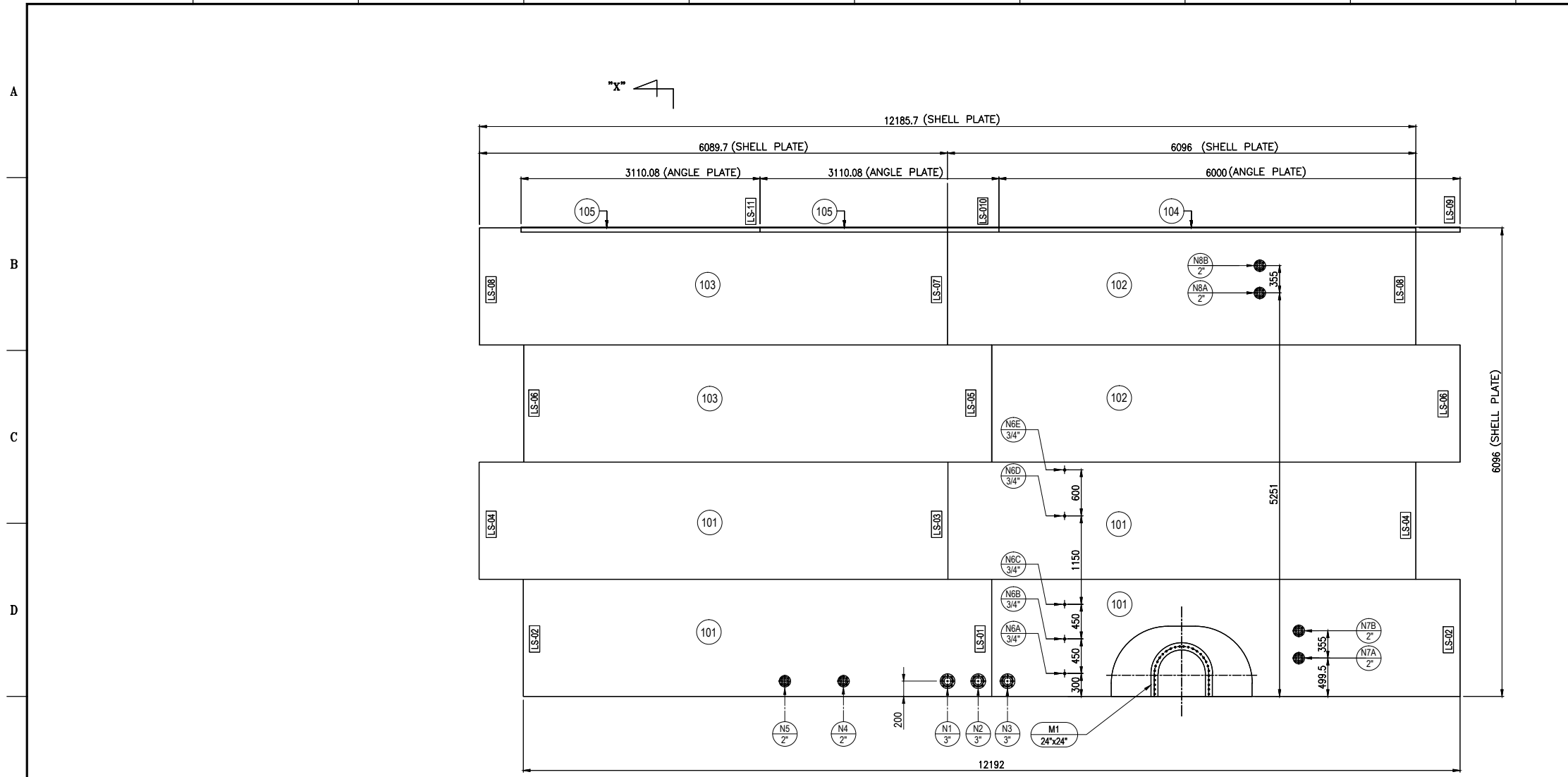
REVISION

| | |
|----------------|-----------|
| OWNER / CLIENT | |
| PROJECT | P.O. NO. |
| ITEM No. | 3900-T-02 |

TITLE : **PRODUCTION TANK**
SIZE : 3800 ID. x 6000 H
GENERAL ARRANGEMENT

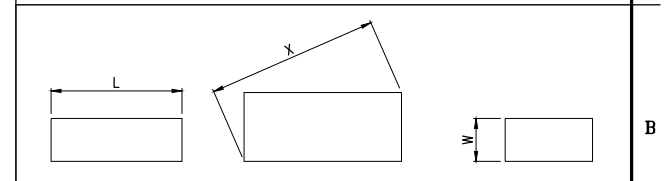
| | |
|------------------|----------|
| SCALE : AS-SHOWN | UNIT : 1 |
| DRAWING No. | REVISION |

1 2 3 4 5 6 7 8 9 10 11 12



SHELL PLATE DEVELOPMENT
SCALE 1/45

NOTES :
1. ALL DIMENSIONS ARE IN METRIC, UNLESS OTHERWISE NOTED.

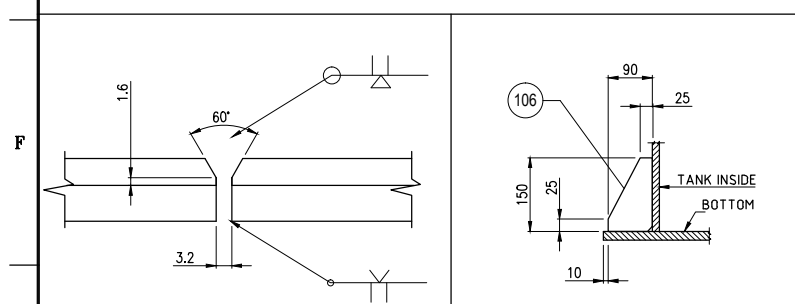


| MARK | L | W | X | BENDING RADIUS (INSIDE) | REMARK |
|------|--------|------|---------|-------------------------|--------|
| 101 | 6096 | 1524 | 6283.61 | 1936.4 | |
| 102 | 6096 | 1524 | 6283.61 | 1936.4 | |
| 103 | 6089.7 | 1524 | 6277.5 | 1936.4 | |

SHELL PLATE CUTTING PLAN

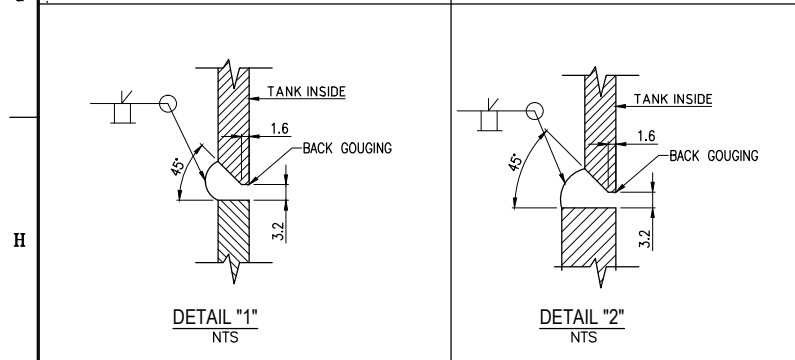


WEIGHT PER UNIT = 1144 kg



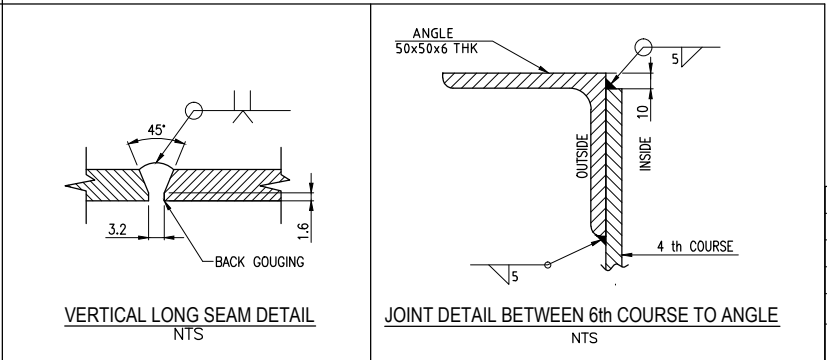
JOINT DETAIL OF TOP ANGLE JOINT
NTS

DETAIL OF SUPPORT PLATE
NTS



DETAIL "1"
NTS

DETAIL "2"
NTS



VERTICAL LONG SEAM DETAIL
NTS

JOINT DETAIL BETWEEN 6th COURSE TO ANGLE
NTS

| NO | DESCRIPTION | Prepared by | Checked by | Reviewed by | Approved by |
|----|-------------|-------------|------------|-------------|-------------|
| | | | | | |
| | | | | | |
| | | | | | |
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| MARK | NAME | MATERIAL | SIZE | Q'TY. | UNIT | (Kg) WEIGHT |
|------|-------|----------|----------------------|-------|------|-------------|
| 106 | PLATE | A-36 | 150x90x6 THK | 16 | PCS | 10 |
| 105 | ANGLE | A-36 | L 50x50x6x3110.08 LG | 2 | PCS | 37 |
| 104 | ANGLE | A-36 | L 50x50x6x6000 LG | 1 | PCS | 35 |
| 103 | SHELL | A-36 | 6089.7x1524x6 THK. | 2 | PCS | 874.2422038 |
| 102 | SHELL | A-36 | 6096x1524x6 THK. | 2 | PCS | 875.1466368 |
| 101 | SHELL | A-36 | 6096x1524x8 THK. | 4 | PCS | 2333.724365 |

(1) SET TO BE MANUFACTURED

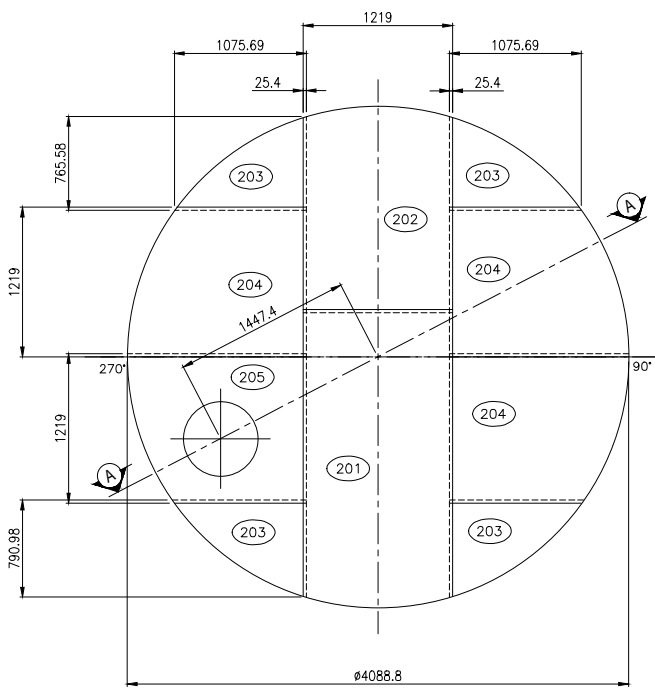
OWNER / CLIENT
PROJECT
ITEM No.

P.O. NO.
3900-T-02

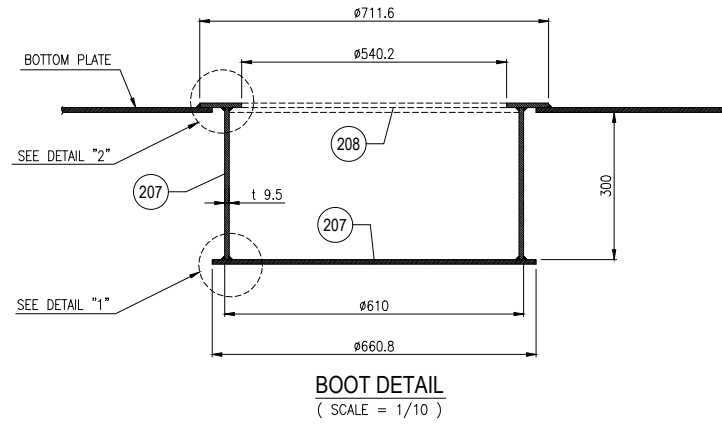
TITLE :
PRODUCTION TANK
SIZE : 3800 ID. x 6000 H
DETAIL OF SHELL PLATE

SCALE : AS-SHOWN
UNIT : 1

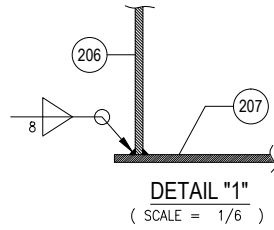
DRAWING No. REVISION



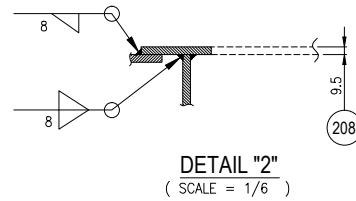
BOTTOM PLATE LAYOUT
(SCALE = 1/40)



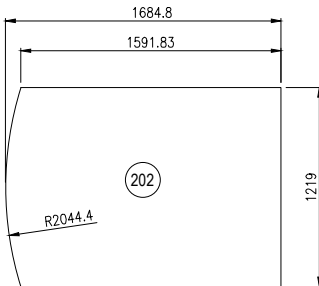
BOOT DETAIL
(SCALE = 1/10)



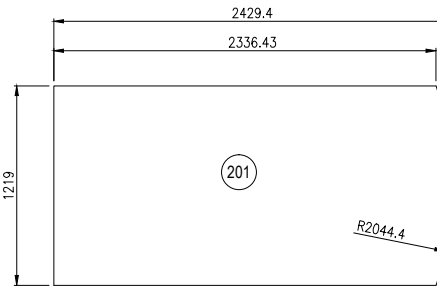
DETAIL "1"
(SCALE = 1/6)



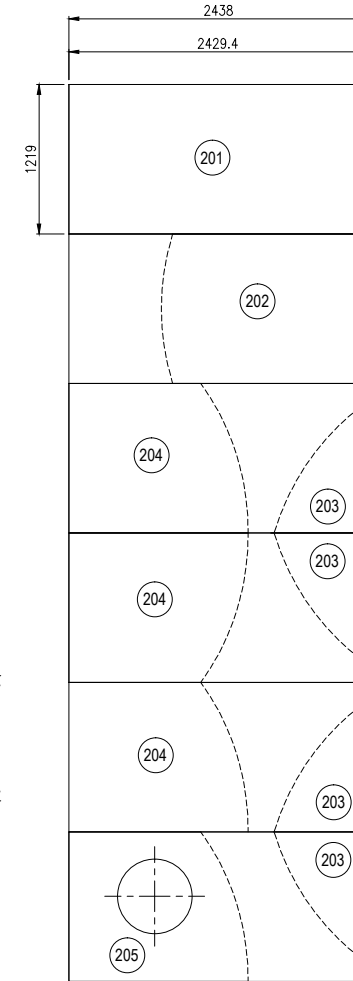
DETAIL "2"
(SCALE = 1/6)



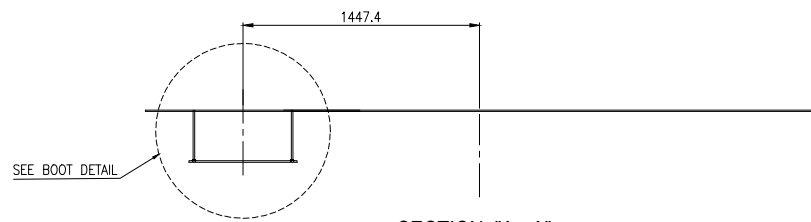
P/N. C202
(SCALE = 1/30)



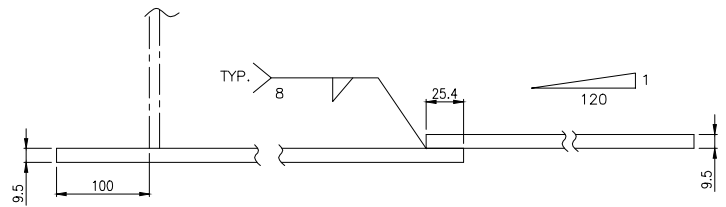
P/N. C201
(SCALE = 1/30)



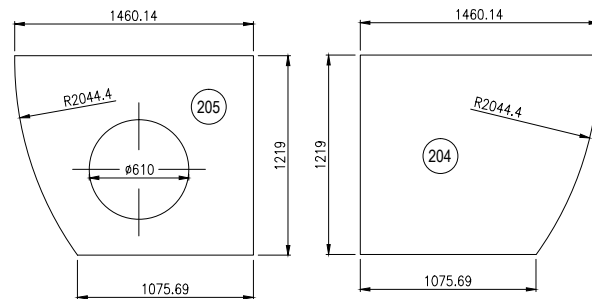
CUTTING PLAN FOR BOTTOM PLATE
(SCALE = 1/40)



SECTION "A - A"
(SCALE = 1/30)

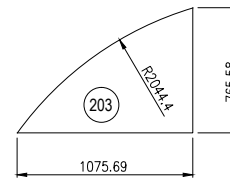


LAP JOINT IN BOTTOM
NOT TO SCALE

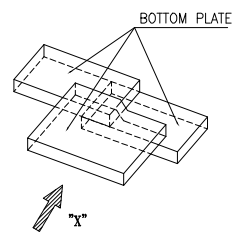


P/N. C205
(SCALE = 1/30)

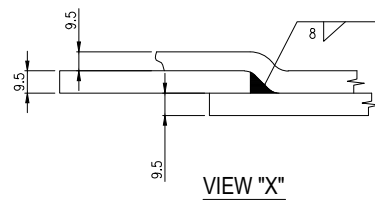
P/N. C204
(SCALE = 1/30)



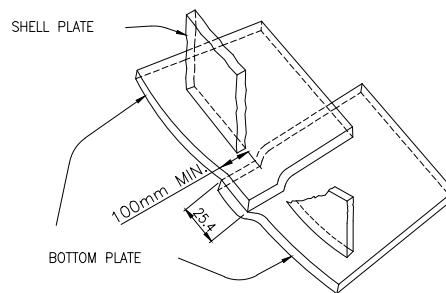
P/N. C203
(SCALE = 1/30)



THREE LAP JOINT
NOT TO SCALE



VIEW "X"



LAP WELDED BOTTOM PLATES UNDER TANK SHELL

| NO | DESCRIPTION | Prepared by | Checked by | Reviewed by | Approved by |
|----|-------------|-------------|------------|-------------|-------------|
| | | | | | |
| | | | | | |
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REVISION

NOTES :

1. ALL DIMENSIONS ARE IN METRIC, UNLESS OTHERWISE NOTED.

WEIGHT = 1185 Kg

| MARK | NAME | MATERIAL | SIZE | Q'TY. | UNIT | (Kg) WEIGHT |
|------|--------------|----------|-------------------------|-------|------|-------------|
| 208 | RING PLATE | A-36 | 711.85x711.85x9.5 THK. | 1 | PCS | 12.5668 |
| 207 | COVER PLATE | A-36 | 660.8x660.8x9.5 THK. | 1 | PCS | 32.5637 |
| 206 | BOOT PLATE | A-36 | 1876x309.5x9.5 THK. | 1 | PCS | 43.2999 |
| 205 | BOTTOM PLATE | A-36 | 1460.14x1219x9.5 THK. | 1 | PCS | 132.7368 |
| 204 | BOTTOM PLATE | A-36 | 1460.14x1219x9.5 THK. | 3 | PCS | 398.2105 |
| 203 | BOTTOM PLATE | A-36 | 1075.69x765.58x9.5 THK. | 4 | PCS | 258.0483 |
| 202 | BOTTOM PLATE | A-36 | 1684.8x1219x9.5 THK. | 1 | PCS | 153.1600 |
| 201 | BOTTOM PLATE | A-36 | 2429.4x1219x9.5 THK. | 1 | PCS | 220.8493 |

(1) SET TO BE MANUFACTURED

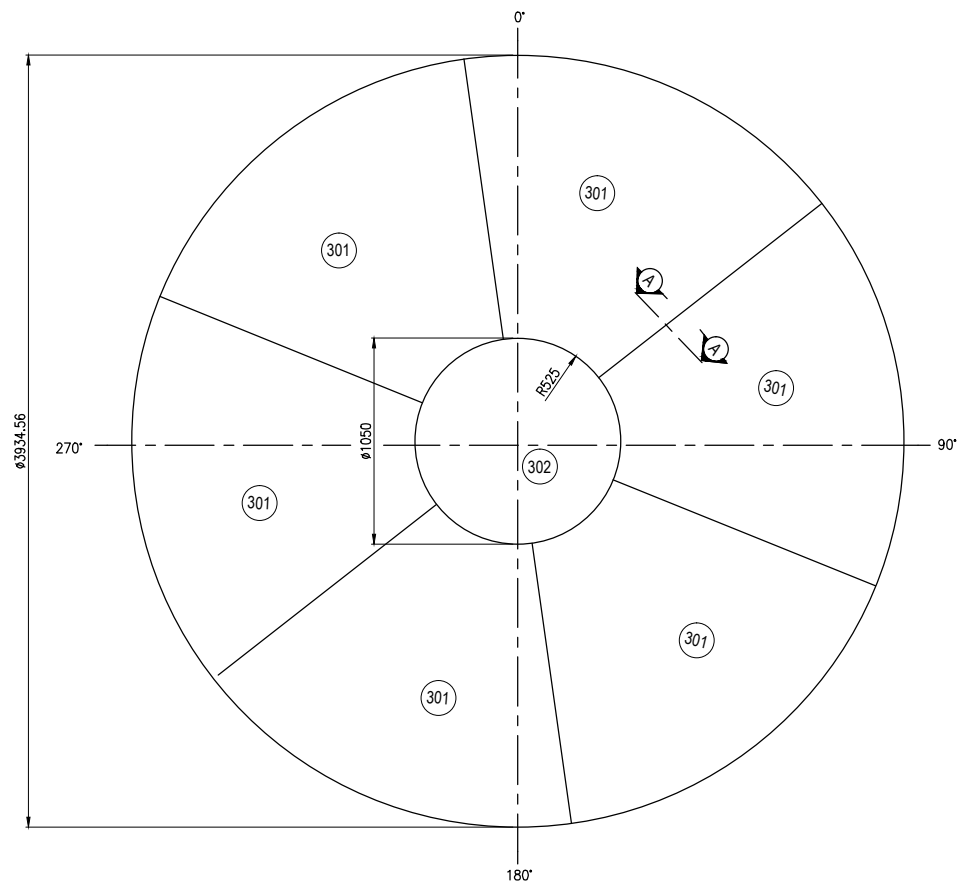
| | |
|----------------|------------------|
| OWNER / CLIENT | |
| PROJECT | |
| ITEM No. | 3900-T-02 |

TITLE : **PRODUCTION TANK
SIZE : 3800 ID. x 6000 H
DETAIL OF BOTTOM PLATE**

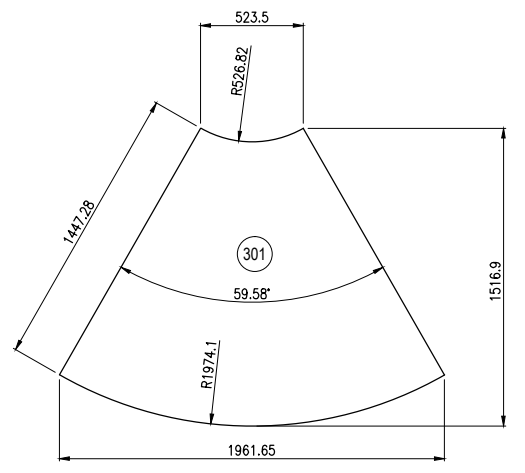
| | |
|------------------|--|
| SCALE : AS-SHOWN | |
| UNIT : 1 | |
| DRAWING No. | |
| REVISION | |

1 2 3 4 5 6 7 8 9 10 11 12

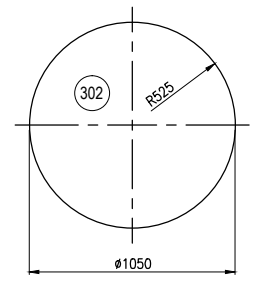
A
B
C
D
E
F
G
H



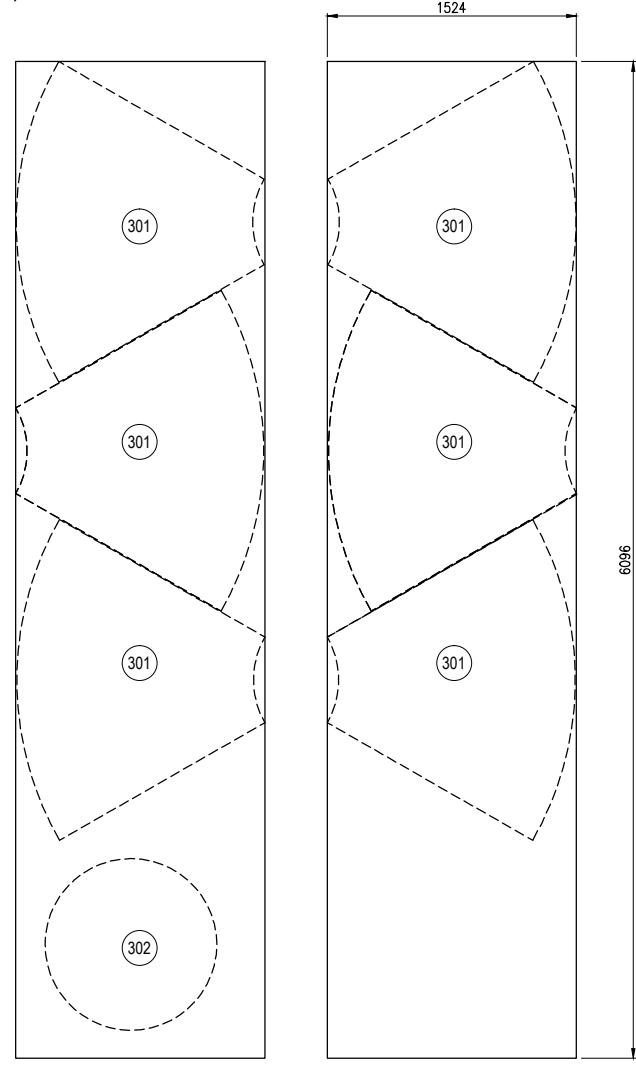
ROOF PLATE DETAIL
(SCALE = 1/25)



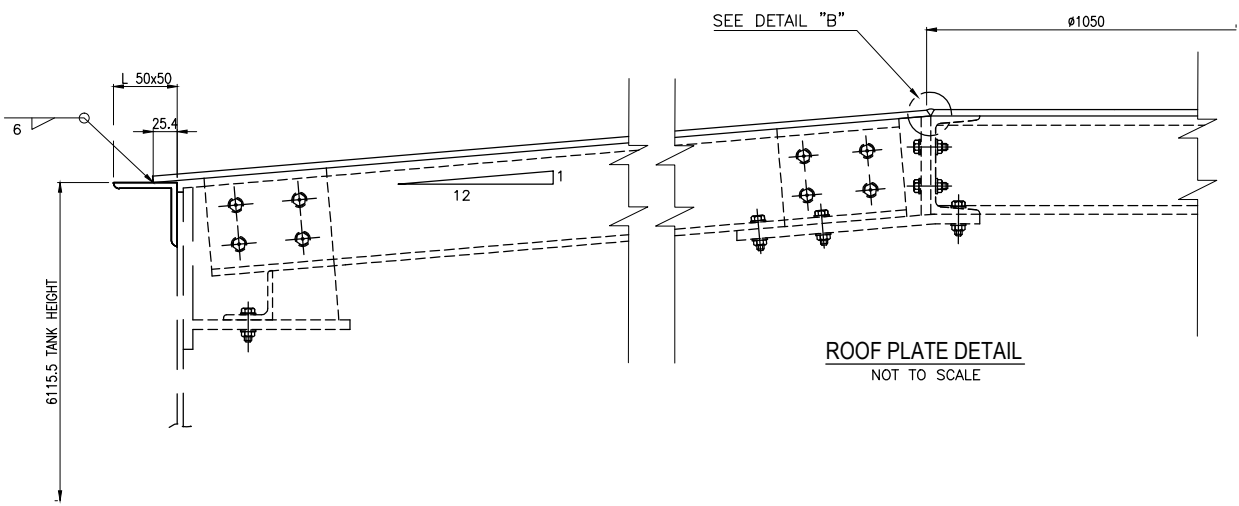
P/N 301
(SCALE = 1/25)



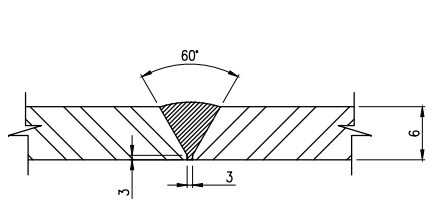
P/N 302
(SCALE = 1/25)



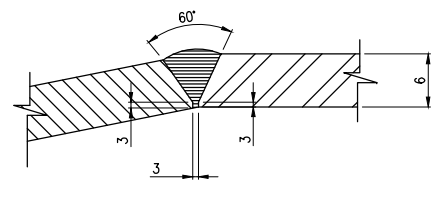
CUTTING PLAN OF ROOF PLATE
(SCALE = 1/30)



ROOF PLATE DETAIL
NOT TO SCALE



SECTION "A-A"
NOT TO SCALE



DETAIL "B"
NOT TO SCALE

WEIGHT PER UNIT = 8.97 Kg

| MARK | NAME | MATERIAL | SIZE | Q'TY. | UNIT | (Kg) |
|------|------------|----------|--------------------|-------|------|------|
| 302 | ROOF PLATE | A-36 | #1050x6 thk | 1 | PCS | 52 |
| 301 | ROOF PLATE | A-36 | 1961.65x1524x6 thk | 6 | PCS | 845 |

(1) SET TO BE MANUFACTURED

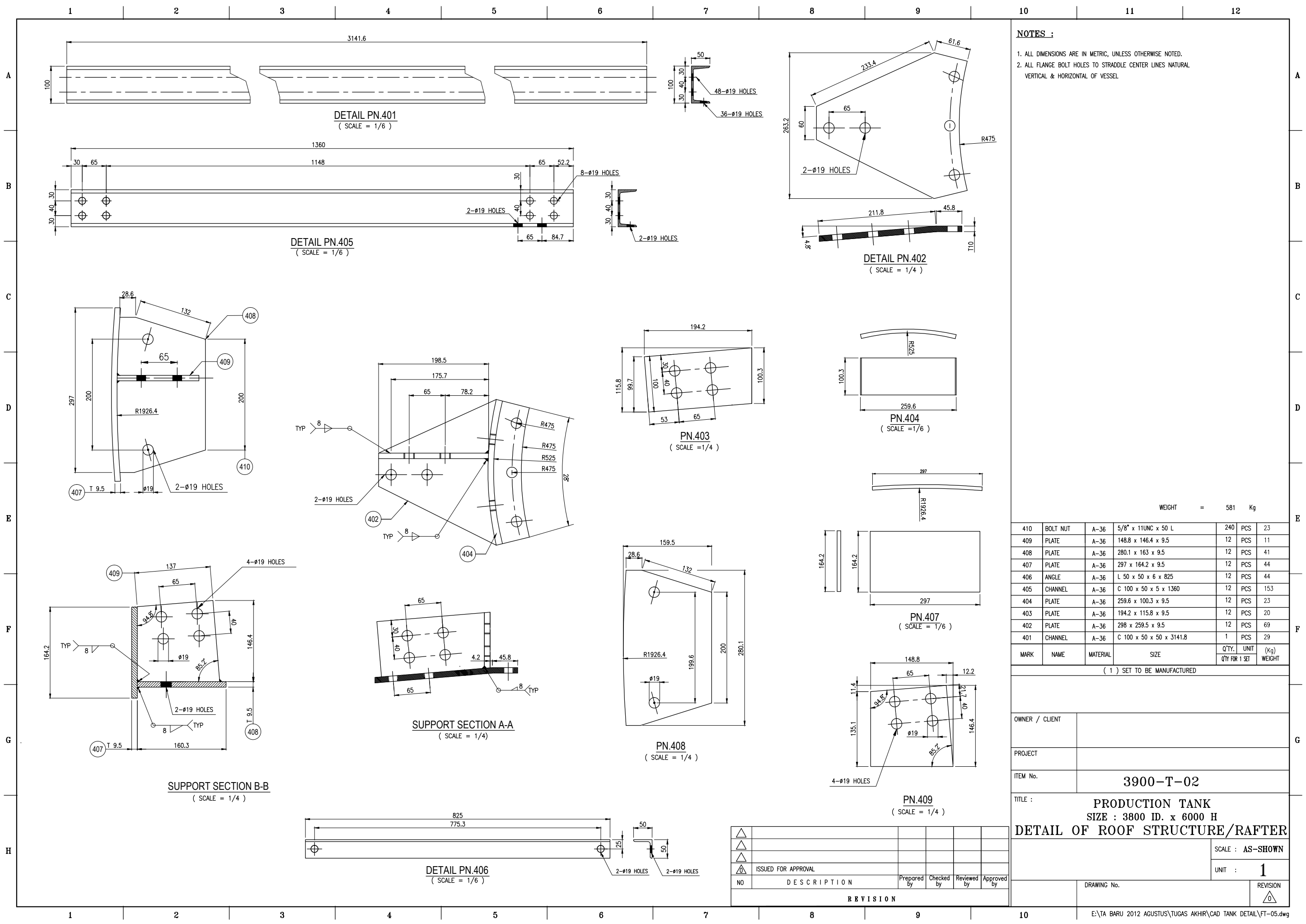
| | |
|----------------|---|
| OWNER / CLIENT | |
| PROJECT | |
| ITEM No. | 3900-T-02 |
| TITLE : | PRODUCTION TANK SIZE : 3800 ID. x 6000 H ROOF PLATE DETAIL |

SCALE : AS-SHOWN
UNIT : **1**

| NO | DESCRIPTION | Prepared by | Checked by | Reviewed by | Approved by |
|----|-------------|-------------|------------|-------------|-------------|
| | | | | | |
| | | | | | |
| | | | | | |

REVISION

| | |
|-------------|----------|
| DRAWING No. | REVISION |
| | |



NOTES :
 1. ALL DIMENSIONS ARE IN METRIC, UNLESS OTHERWISE NOTED.
 2. ALL FLANGE BOLT HOLES TO STRADDLE CENTER LINES NATURAL VERTICAL & HORIZONTAL OF VESSEL

WEIGHT = 581 Kg

| MARK | NAME | MATERIAL | SIZE | Q'TY. | UNIT | (Kg) WEIGHT |
|------|----------|----------|--------------------------|-------|------|-------------|
| 410 | BOLT NUT | A-36 | 5/8" x 11UNC x 50 L | 240 | PCS | 23 |
| 409 | PLATE | A-36 | 148.8 x 146.4 x 9.5 | 12 | PCS | 11 |
| 408 | PLATE | A-36 | 280.1 x 163 x 9.5 | 12 | PCS | 41 |
| 407 | PLATE | A-36 | 297 x 164.2 x 9.5 | 12 | PCS | 44 |
| 406 | ANGLE | A-36 | L 50 x 50 x 6 x 825 | 12 | PCS | 44 |
| 405 | CHANNEL | A-36 | C 100 x 50 x 5 x 1360 | 12 | PCS | 153 |
| 404 | PLATE | A-36 | 259.6 x 100.3 x 9.5 | 12 | PCS | 23 |
| 403 | PLATE | A-36 | 194.2 x 115.8 x 9.5 | 12 | PCS | 20 |
| 402 | PLATE | A-36 | 298 x 259.5 x 9.5 | 12 | PCS | 69 |
| 401 | CHANNEL | A-36 | C 100 x 50 x 50 x 3141.8 | 1 | PCS | 29 |

(1) SET TO BE MANUFACTURED

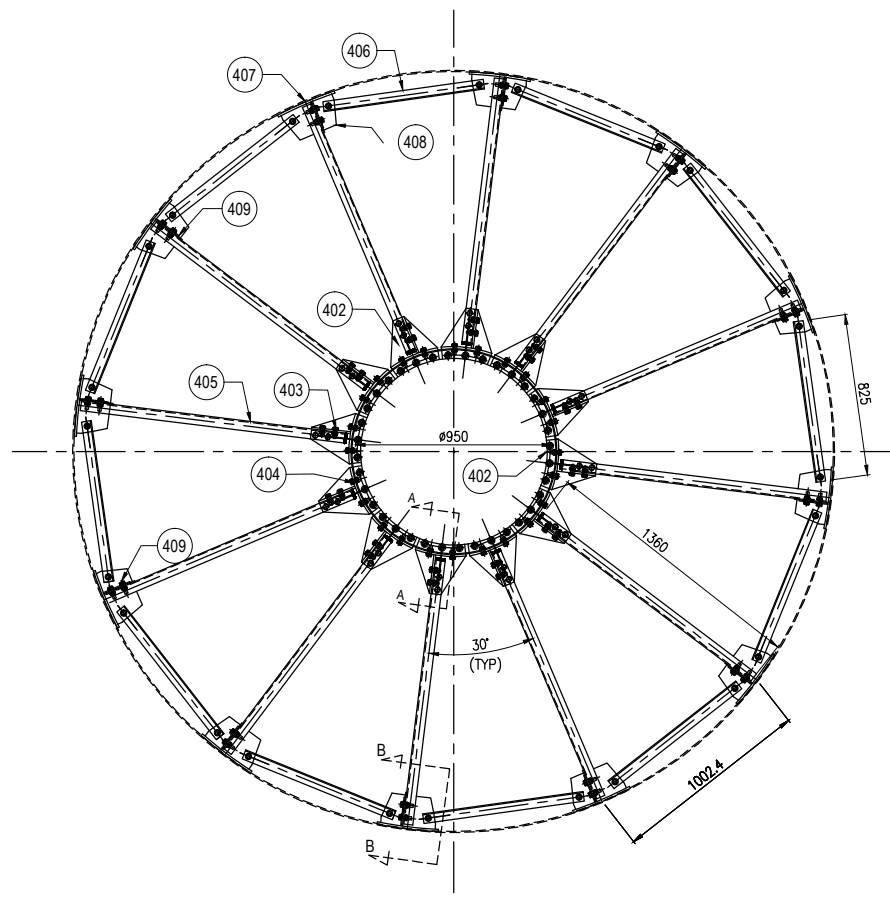
| | |
|----------------|------------------|
| OWNER / CLIENT | |
| PROJECT | |
| ITEM No. | 3900-T-02 |

TITLE : **PRODUCTION TANK
 SIZE : 3800 ID. x 6000 H
 DETAIL OF ROOF STRUCTURE/RAFTER**

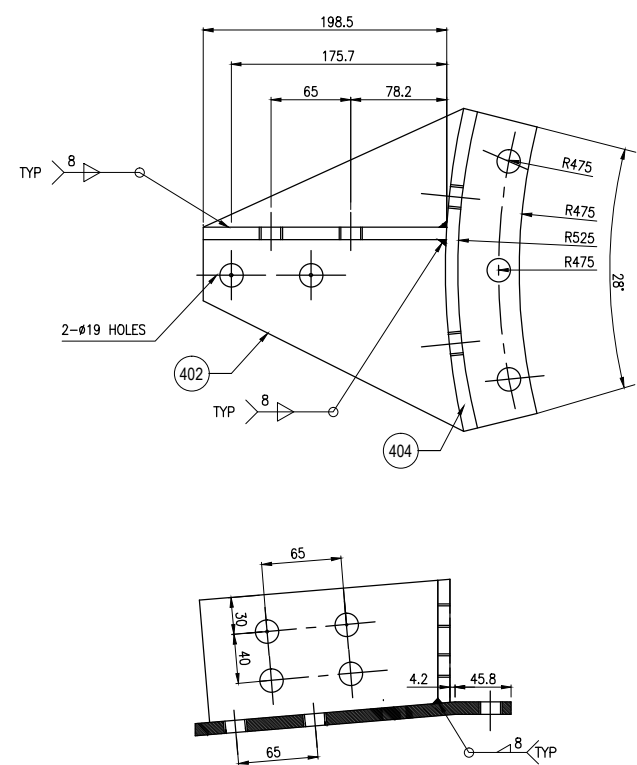
SCALE : **AS-SHOWN**
 UNIT : **1**

| NO | DESCRIPTION | Prepared by | Checked by | Reviewed by | Approved by |
|----|-------------|-------------|------------|-------------|-------------|
| | | | | | |
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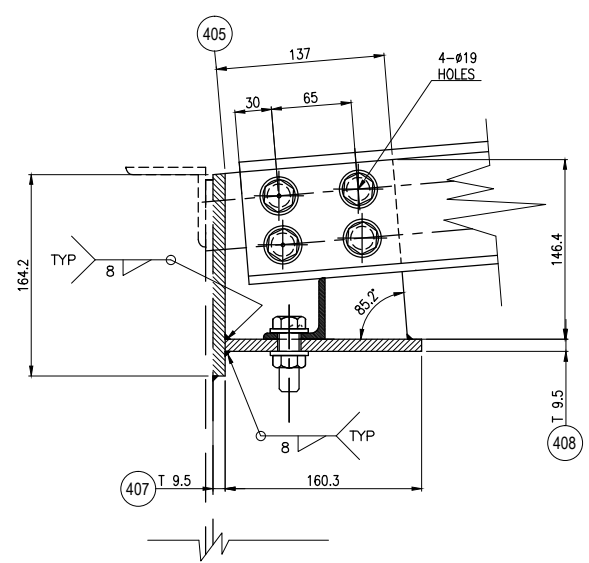
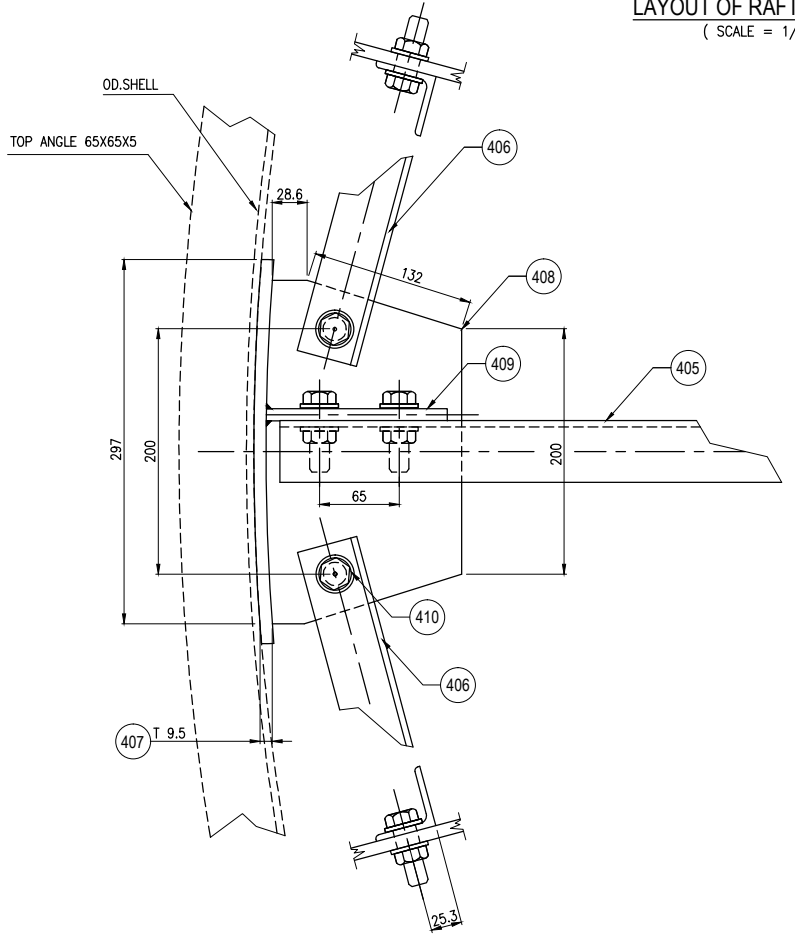
DRAWING No. _____ REVISION _____



LAYOUT OF RAFTER FRAME
(SCALE = 1/25)



SUPPORT SECTION A-A
(SCALE = 1/4)



SECTION B-B
(SCALE = 1/4)

- NOTES :**
1. ALL DIMENSIONS ARE IN METRIC, UNLESS OTHERWISE NOTED.
 2. ALL FLANGE BOLT HOLES TO STRADDLE CENTER LINES NATURAL VERTICAL & HORIZONTAL OF VESSEL
 3. ALL BOLTS & TACK HEX BOLTS N WASHER 5/8" DIAMETER P/N.410

(1) SET TO BE MANUFACTURED

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|----------------|---|
| OWNER / CLIENT | |
| PROJECT | P0. NO. |
| ITEM No. | 3900-T-02 |
| TITLE : | PRODUCTION TANK SIZE : 3800 ID. x 6000 H DETAIL OF ROOF STRUCTURE |
| | SCALE : AS-SHOWN |
| | UNIT : 1 |
| SBS WO No. | DRAWING No. |
| | REVISION |

| NO | DESCRIPTION | Prepared by | Checked by | Reviewed by | Approved by |
|----|-------------|-------------|------------|-------------|-------------|
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