ANEXO 3. MODELACIÓN EN VISUAL HYDRAULICS. PERFIL HIDRÁULICO

Anexo 3.1. Perfil hidráulico alternativa 1 Cota de inicio 2542.38

Anexo 3.2. Perfil hidráulico alternativa 2 Cota de inicio 2542.38

Anexo 3.3. Perfil hidráulico alternativa 1 Cota de inicio 2540.23

Anexo 3.4. Perfil hidráulico alternativa 2 Cota de inicio 2540.23

Anexo 3.1.Perfil hidráulico alternativa 1 Cota de inicio 2542.38

HP CANOAS Cota 2542 - 38 - 22 nov Q16 - V9.vhf

Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
13.6 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation
Starting water surface elevation	**2543.03**
Exit Pipe	**2543.08**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m^2
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on−line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.05 m
0

Chlorination Exit Tank **2543.08**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 13.6 cms
Downstream channel invert = 2540.45
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 406.28 m^2
Flow profile = Mild
Normal depth = 0.28 m
Critical depth = 0.093 m
Units on−line = 1

Section Description	**Water Surface Elevation**

Total flow, all units = 13.6 cms
Depth downstream = 2.63 m
Bend loss = 0 m
Depth upstream = 2.63 m
Velocity = 0.03 m/s

Chlorination Tank Weir **2544.02**

Weir invert (top of weir) = 2543.83
Weir length = 23 m
Weir height = 5.1 m
Weir 'C' coefficient = 1.794
Flow over weir = 3.4 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 13.6 cms
Head over weir = 0.19 m

Chlorination Tank **2544.02**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 356.5 m
Channel width/diameter = 8 m
Flow = 3.4 cms
Downstream channel invert = 2540
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 32.01 m^2
Flow profile = Mild
Normal depth = 0.76 m
Critical depth = 0.264 m
Units on−line = 4
Total flow, all units = 13.6 cms
Depth downstream = 4.02 m
Bend loss = 0 m
Depth upstream = 3.98 m
Velocity = 0.11 m/s

Chlorination Tank - Enter Gate **2544.02**

Opening type = rectangular gate
Opening diameter/width = 8000 mm
Gate height = 4000 mm
Invert = 2540
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 32 m^2
Velocity through gate(s) = 0.11 m/s
Flow behavior = orifice, downstream control
Units on−line = 4

Section Description	Water Surface Elevation

Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2544.02
Upstream water level = 2544.02

Chlorination Enter Tank	**2544.02**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 13.6 cms
Downstream channel invert = 2540
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 369.89 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.131 m
Units on−line = 1
Total flow, all units = 13.6 cms
Depth downstream = 4.02 m
Bend loss = 0 m
Depth upstream = 4.02 m
Velocity = 0.04 m/s

Secondary Clarifier - Chlorination Pipe	**2544.1**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on−line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.05 m
Fitting loss = 0.03 m
Total loss = 0.08 m
0

Secondary Clarifier Exit Pipe	**2544.14**

Pipe shape = Circular

Section Description	Water Surface Elevation

Diameter = 1500 mm
Length = 117 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on−line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.04 m

2 Clarifier Orifice	**2544.17**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 0.85 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.48 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 13.6 cms
Orifice loss = 0.03 m
Downstream water level = 2544.14
Upstream water level = 2544.17

Launder Channel 2 C	**2544.18**

Launder invert = 2543
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.43 cms
Critical depth = 0.2 m
Units on−line = 32
Total flow, all units = 13.6 cms
Downstream depth = 1.17 m
Upstream depth = 0.82 m

Weir 2 Clarifier	**2545.1**

Invert of V notch = 2545.05
Angle of V notch = 90 degrees

Section Description	Water Surface Elevation
Number of notches = 911	
Total flow over weir = 0.68 cms	
Weir submergence = unsubmerged	
Units on−line = 20	
Total flow, all units = 13.6 cms	
Head over weir = 0.05 m	
2 Clarifier Enter Pipe	**2545.17**
Pipe shape = Circular	
Diameter = 1500 mm	
Length = 48.8 m	
Flow = 1.42 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 1.767 m^2	
Pipe hydraulic radius = 0.375	
Age factor = 1	
Solids factor = 1	
Velocity = 0.81 m/s	
Units on−line = 16	
Total flow, all units = 22.8 cms	
Friction loss = 0.02 m	
Fitting loss = 0.05 m	
Total loss = 0.07 m	
Gate Clarifier Distribution Box	**2545.18**
Opening type = rectangular gate	
Opening diameter/width = 1500 mm	
Gate height = 4000 mm	
Invert = 2541	
Number of gates = 1	
Flow through gate(s) = 1.42 cms	
Total area of opening(s) = 6 m^2	
Velocity through gate(s) = 0.24 m/s	
Flow behavior = orifice, downstream control	
Units on−line = 16	
Total flow, all units = 22.8 cms	
Gate loss = 0.01 m	
Downstream water level = 2545.17	
Upstream water level = 2545.18	
Box 2 Weir	**2545.94**
Weir invert (top of weir) = 2545.53	
Weir length = 3.05 m	
Weir height = 5.04 m	
Weir 'C' coefficient = 1.807	
Flow over weir = 1.42 cms	

Section Description | **Water Surface Elevation**

Weir submergence = unsubmerged
Units on–line = 16
Total flow, all units = 22.8 cms
Head over weir = 0.41 m

Enter Pipe BOX 2 2546

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 120.4 m
Flow = 5.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m^2
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on–line = 4
Total flow, all units = 22.8 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m
0

General Box 2 Gate 2546

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 21 m^2
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on–line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2546
Upstream water level = 2546

General box 2 Weir 2546.93

Weir invert (top of weir) = 2546.38
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 5.7 cms

<u>Section Description</u> **<u>Water Surface Elevation</u>**

Weir submergence = unsubmerged
Units on–line = 4
Total flow, all units = 22.8 cms
Head over weir = 0.55 m

Aeration Exit pipe **2547.1**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 18.19 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 0.87 m/s
Units on–line = 1
Total flow, all units = 18.2 cms
Friction loss = 0.11 m
Fitting loss = 0.06 m
Total loss = 0.17 m
0

Aeration Exit Channel **2547.1**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 3.8 cms
Downstream channel invert = 2542
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 19.16 m^2
Flow profile = Mild
Normal depth = 0.51 m
Critical depth = 0.452 m
Units on–line = 6
Total flow, all units = 22.8 cms
Depth downstream = 5.1 m
Bend loss = 0 m
Depth upstream = 4.48 m
Velocity = 0.19 m/s

AB Tank Weir **2547.96**

Weir invert (top of weir) = 2547.9

Section Description	**Water Surface Elevation**

Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 0.95 cms
Weir submergence = unsubmerged
Units on–line = 24
Total flow, all units = 22.8 cms
Head over weir = 0.06 m

Aeration Basin — **2547.97**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 0.95 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 98.61 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.091 m
Units on–line = 24
Total flow, all units = 22.8 cms
Depth downstream = 8.96 m
Bend loss = 0 m
Depth upstream = 8.97 m
Velocity = 0.01 m/s

Aeration Enter Gate — **2547.97**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 0.95 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.08 m/s
Flow behavior = orifice, downstream control
Units on–line = 24
Total flow, all units = 22.8 cms
Gate loss = 0 m
Downstream water level = 2547.97
Upstream water level = 2547.97

AB Distribution Pipe — **2548.07**

Pipe shape = Circular
Diameter = 1200 mm

Section Description	Water Surface Elevation

Length = 77 m
Flow = 0.95 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m^2
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 0.84 m/s
Units on−line = 24
Total flow, all units = 22.8 cms
Friction loss = 0.05 m
Fitting loss = 0.05 m
Total loss = 0.1 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2548.07**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 0.95 cms
Total area of opening(s) = 6.5 m^2
Velocity through gate(s) = 0.15 m/s
Flow behavior = orifice, downstream control
Units on−line = 24
Total flow, all units = 22.8 cms
Gate loss = 0 m
Downstream water level = 2548.07
Upstream water level = 2548.07

AB Distribution Box Weir **2548.66**

Weir invert (top of weir) = 2548.35
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815
Flow over weir = 0.95 cms
Weir submergence = unsubmerged
Units on−line = 24
Total flow, all units = 22.8 cms
Head over weir = 0.31 m

Aeration Enter Pipe **2548.71**

Pipe shape = Rectangular
Height = 2500 mm

Section Description	Water Surface Elevation

Width = 3500 mm
Length = 375 m
Flow = 4.53 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m^2
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.52 m/s
Units on–line = 3
Total flow, all units = 13.6 cms
Friction loss = 0.03 m
Fitting loss = 0.02 m
Total loss = 0.05 m
0

General aeration box Weir Gate **2548.74**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 4.53 cms
Total area of opening(s) = 10 m^2
Velocity through gate(s) = 0.45 m/s
Flow behavior = orifice, downstream control
Units on–line = 3
Total flow, all units = 13.6 cms
Gate loss = 0.03 m
Downstream water level = 2548.71
Upstream water level = 2548.74

General Aeration Box Weir **2549.73**

Weir invert (top of weir) = 2549.26
Weir length = 7.62 m
Weir height = 3 m
Weir 'C' coefficient = 1.846
Flow over weir = 4.53 cms
Weir submergence = unsubmerged
Units on–line = 3
Total flow, all units = 13.6 cms
Head over weir = 0.47 m

Clarifier Junction Exit Pipe **2549.8**

Pipe shape = Rectangular
Height = 3500 mm

Section Description	Water Surface Elevation

Width = 3500 mm
Length = 652 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.56 m/s
Units on–line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.04 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

Clarifier Exit Pipe **2549.84**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on–line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.04 m

Clarifier Orifice **2549.87**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 0.85 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.48 m/s
Flow behavior = orifice, downstream control
Units on–line = 16

Section Description	**Water Surface Elevation**
Total flow, all units = 13.6 cms	
Orifice loss = 0.03 m	
Downstream water level = 2549.84	
Upstream water level = 2549.87	
Clarifier Launder	**2549.87**
Launder invert = 2547	
Launder length = 81.7 m	
Launder width = 1.5 m	
Launder slope = 0.004 m/m	
Flow through launder = 0.43 cms	
Critical depth = 0.2 m	
Units on–line = 32	
Total flow, all units = 13.6 cms	
Downstream depth = 2.87 m	
Upstream depth = 2.55 m	
Weir Clarifier	**2550.93**
Invert of V notch = 2550.87	
Angle of V notch = 90 degrees	
Number of notches = 864	
Total flow over weir = 0.85 cms	
Weir submergence = unsubmerged	
Units on–line = 16	
Total flow, all units = 13.6 cms	
Head over weir = 0.06 m	
Clarifier Enter Pipe	**2550.95**
Pipe shape = Circular	
Diameter = 1500 mm	
Length = 45 m	
Flow = 0.85 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 1.767 m^2	
Pipe hydraulic radius = 0.375	
Age factor = 1	
Solids factor = 1	
Velocity = 0.48 m/s	
Units on–line = 16	
Total flow, all units = 13.6 cms	
Friction loss = 0.01 m	
Fitting loss = 0.02 m	
Total loss = 0.02 m	
Distribution Box Gate	**2550.95**
Opening type = rectangular gate	

Section Description	**Water Surface Elevation**

Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 0.85 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2550.95
Upstream water level = 2550.95

Box 1 Weir **2551.42**

Weir invert (top of weir) = 2551.13
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 0.85 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 13.6 cms
Head over weir = 0.29 m

Enter Pipe BOX 1 **2551.45**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 3.4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2
Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.54 m/s
Units on−line = 4
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.03 m
Total loss = 0.04 m
0

General Box Gate **2551.45**

Opening type = rectangular gate

Section Description	Water Surface Elevation

Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2551.45
Upstream water level = 2551.45

General box 1 Weir **2552.34**

Weir invert (top of weir) = 2551.89
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 3.4 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 13.6 cms
Head over weir = 0.45 m

R Mix to Clarifiers Pipe **2552.39**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on−line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.03 m
Total loss = 0.05 m
0

RM Exit Channel **2552.39**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 13.6 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 204.49 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on−line = 1
Total flow, all units = 13.6 cms
Depth downstream = 6.39 m
Bend loss = 0 m
Depth upstream = 6.39 m
Velocity = 0.07 m/s

RM Exit Gate **2552.39**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 50.27 m^2
Velocity through gate(s) = 0.07 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2552.39
Upstream water level = 2552.39

RM **2552.39**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 3.4 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 59.14 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on−line = 4

Section Description	**Water Surface Elevation**
Total flow, all units = 13.6 cms	
Depth downstream = 7.39 m	
Bend loss = 0 m	
Depth upstream = 7.39 m	
Velocity = 0.06 m/s	
RM Enter Gate	**2552.4**
Opening type = circular gate	
Opening diameter/width = 2000 mm	
Gate height = 2000 mm	
Invert = 2548	
Number of gates = 4	
Flow through gate(s) = 3.4 cms	
Total area of opening(s) = 12.57 m^2	
Velocity through gate(s) = 0.27 m/s	
Flow behavior = orifice, downstream control	
Units on−line = 4	
Total flow, all units = 13.6 cms	
Gate loss = 0.01 m	
Downstream water level = 2552.39	
Upstream water level = 2552.4	
RM Enter Channel	**2552.41**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 8 m	
Channel width/diameter = 32 m	
Flow = 13.6 cms	
Downstream channel invert = 2546.5	
Channel slope = 0 m/m	
Channel side slope = not applicable	
Area of flow = 188.97 m^2	
Flow profile = Horizontal	
Normal depth = Infinite	
Critical depth = 0.264 m	
Units on−line = 1	
Total flow, all units = 13.6 cms	
Depth downstream = 5.9 m	
Bend loss = 0 m	
Depth upstream = 5.91 m	
Velocity = 0.07 m/s	
Grit Channel to RM Pipe	**2552.44**
Pipe shape = Rectangular	
Height = 3500 mm	
Width = 3500 mm	
Length = 43.77 m	
Flow = 6.8 cms	

Section Description | **Water Surface Elevation**

Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.56 m/s
Units on−line = 2
Total flow, all units = 13.6 cms
Friction loss = 0 m
Fitting loss = 0.03 m
Total loss = 0.03 m
0

Junction Tank Grit Channel **2552.44**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 6.8 cms
Downstream channel invert = 2547
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 245.91 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.132 m
Units on−line = 2
Total flow, all units = 13.6 cms
Depth downstream = 5.44 m
Bend loss = 0 m
Depth upstream = 5.44 m
Velocity = 0.03 m/s

Grit Weir **2553.35**

Weir invert (top of weir) = 2553.2
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 1.36 cms
Weir submergence = unsubmerged
Units on−line = 10
Total flow, all units = 13.6 cms
Head over weir = 0.15 m

Grit Channel **2553.35**

Channel shape = Rectangular

Section Description	Water Surface Elevation

Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 0.97 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 50.11 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.139 m
Units on−line = 14
Total flow, all units = 13.6 cms
Depth downstream = 8.35 m
Bend loss = 0 m
Depth upstream = 8.35 m
Velocity = 0.02 m/s

Screening Exit Channel Gate **2553.37**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 1.36 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.34 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 13.6 cms
Gate loss = 0.02 m
Downstream water level = 2553.35
Upstream water level = 2553.37

Screen Channel 1 - 2 **2553.37**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.4 m
Flow = 1.13 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.8 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.284 m
Units on−line = 12

Section Description	Water Surface Elevation

Total flow, all units = 13.6 cms
Depth downstream = 6.17 m
Bend loss = 0 m
Depth upstream = 6.17 m
Velocity = 0.08 m/s

Fine Screen	**2553.37**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 1.36 cms
Bar width = 5 mm
Bar spacing = 10 mm
Percent blocked = 0%
Net rack open area = 6.44 m^2
Downstream depth = 5.37 m
Velocity in channel = 0.13 m/s
Velocity through bars = 0.21 m/s
Units on−line = 10
Total flow, all units = 13.6 cms
Rack head loss = 0 m

Screen Channel 2 -3	**2553.37**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.4 m
Flow = 1.13 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.81 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.284 m
Units on−line = 12
Total flow, all units = 13.6 cms
Depth downstream = 6.17 m
Bend loss = 0 m
Depth upstream = 6.17 m
Velocity = 0.08 m/s

Medium Screen	**2553.38**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 1.36 cms
Bar width = 10 mm

Section Description	Water Surface Elevation

Bar spacing = 30 mm
Percent blocked = 0%
Net rack open area = 7.26 m^2
Downstream depth = 5.37 m
Velocity in channel = 0.13 m/s
Velocity through bars = 0.19 m/s
Units on−line = 10
Total flow, all units = 13.6 cms
Rack head loss = 0 m

Screen Channel 3 - 4 **2553.38**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.4 m
Flow = 1.13 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 13.38 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.284 m
Units on−line = 12
Total flow, all units = 13.6 cms
Depth downstream = 5.58 m
Bend loss = 0 m
Depth upstream = 5.58 m
Velocity = 0.08 m/s

Screening Enter Channel Gate **2553.39**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 1.36 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.34 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 13.6 cms
Gate loss = 0.02 m
Downstream water level = 2553.38
Upstream water level = 2553.39

Screening Distribution Channel **2553.4**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 6.8 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 234.37 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.139 m
Units on–line = 2
Total flow, all units = 13.6 cms
Depth downstream = 5.59 m
Bend loss = 0 m
Depth upstream = 5.6 m
Velocity = 0.03 m/s

Initial Pipe **2553.42**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 14 m^2
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.49 m/s
Units on–line = 2
Total flow, all units = 13.6 cms
Friction loss = 0 m
Fitting loss = 0.02 m
Total loss = 0.02 m
0

Initial Gate **2553.44**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 6.8 cms
Total area of opening(s) = 20 m^2
Velocity through gate(s) = 0.34 m/s

Section Description | **Water Surface Elevation**

Flow behavior = orifice, downstream control
Units on−line = 2
Total flow, all units = 13.6 cms
Gate loss = 0.02 m
Downstream water level = 2553.42
Upstream water level = 2553.44

Inicial Junction Tank **2553.44**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 13.6 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 185.9 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.312 m
Units on−line = 1
Total flow, all units = 13.6 cms
Depth downstream = 7.44 m
Bend loss = 0 m
Depth upstream = 7.44 m
Velocity = 0.07 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
16 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation
Starting water surface elevation	**2543.12**
Exit Pipe	**2543.19**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m^2
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.67 m/s
Units on–line = 2
Total flow, all units = 16 cms
Friction loss = 0.03 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

Chlorination Exit Tank	**2543.19**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 16 cms
Downstream channel invert = 2540.45
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 423.25 m^2
Flow profile = Mild
Normal depth = 0.31 m
Critical depth = 0.103 m
Units on–line = 1

Section Description	Water Surface Elevation
Total flow, all units = 16 cms	
Depth downstream = 2.74 m	
Bend loss = 0 m	
Depth upstream = 2.74 m	
Velocity = 0.04 m/s	
Chlorination Tank Weir	**2544.04**
Weir invert (top of weir) = 2543.83	
Weir length = 23 m	
Weir height = 5.1 m	
Weir 'C' coefficient = 1.794	
Flow over weir = 4 cms	
Weir submergence = unsubmerged	
Units on–line = 4	
Total flow, all units = 16 cms	
Head over weir = 0.21 m	
Chlorination Tank	**2544.04**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 356.5 m	
Channel width/diameter = 8 m	
Flow = 4 cms	
Downstream channel invert = 2540	
Channel slope = 0.0001 m/m	
Channel side slope = not applicable	
Area of flow = 32.18 m^2	
Flow profile = Mild	
Normal depth = 0.84 m	
Critical depth = 0.295 m	
Units on–line = 4	
Total flow, all units = 16 cms	
Depth downstream = 4.04 m	
Bend loss = 0 m	
Depth upstream = 4 m	
Velocity = 0.12 m/s	
Chlorination Tank - Enter Gate	**2544.04**
Opening type = rectangular gate	
Opening diameter/width = 8000 mm	
Gate height = 4000 mm	
Invert = 2540	
Number of gates = 1	
Flow through gate(s) = 4 cms	
Total area of opening(s) = 32 m^2	
Velocity through gate(s) = 0.12 m/s	
Flow behavior = orifice, downstream control	
Units on–line = 4	

Section Description	Water Surface Elevation

Total flow, all units = 16 cms
Gate loss = 0 m
Downstream water level = 2544.04
Upstream water level = 2544.04

Chlorination Enter Tank	**2544.04**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 16 cms
Downstream channel invert = 2540
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 371.95 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.146 m
Units on−line = 1
Total flow, all units = 16 cms
Depth downstream = 4.04 m
Bend loss = 0 m
Depth upstream = 4.04 m
Velocity = 0.04 m/s

Secondary Clarifier - Chlorination Pipe	**2544.16**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on−line = 2
Total flow, all units = 16 cms
Friction loss = 0.07 m
Fitting loss = 0.04 m
Total loss = 0.11 m
0

Secondary Clarifier Exit Pipe	**2544.21**

Pipe shape = Circular

Section Description	**Water Surface Elevation**

Diameter = 1500 mm
Length = 117 m
Flow = 1 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on–line = 16
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m

2 Clarifier Orifice **2544.26**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 1 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.57 m/s
Flow behavior = orifice, downstream control
Units on–line = 16
Total flow, all units = 16 cms
Orifice loss = 0.05 m
Downstream water level = 2544.21
Upstream water level = 2544.26

Launder Channel 2 C **2544.26**

Launder invert = 2543
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.5 cms
Critical depth = 0.22 m
Units on–line = 32
Total flow, all units = 16 cms
Downstream depth = 1.26 m
Upstream depth = 0.9 m

Weir 2 Clarifier **2545.1**

Invert of V notch = 2545.05
Angle of V notch = 90 degrees

Section Description	**Water Surface Elevation**
Number of notches = 911	
Total flow over weir = 0.8 cms	
Weir submergence = unsubmerged	
Units on−line = 20	
Total flow, all units = 16 cms	
Head over weir = 0.05 m	
2 Clarifier Enter Pipe	**2545.19**
Pipe shape = Circular	
Diameter = 1500 mm	
Length = 48.8 m	
Flow = 1.57 cms	
Friction method = Manning′s Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 1.767 m^2	
Pipe hydraulic radius = 0.375	
Age factor = 1	
Solids factor = 1	
Velocity = 0.89 m/s	
Units on−line = 16	
Total flow, all units = 25.2 cms	
Friction loss = 0.02 m	
Fitting loss = 0.06 m	
Total loss = 0.08 m	
Gate Clarifier Distribution Box	**2545.2**
Opening type = rectangular gate	
Opening diameter/width = 1500 mm	
Gate height = 4000 mm	
Invert = 2541	
Number of gates = 1	
Flow through gate(s) = 1.57 cms	
Total area of opening(s) = 6 m^2	
Velocity through gate(s) = 0.26 m/s	
Flow behavior = orifice, downstream control	
Units on−line = 16	
Total flow, all units = 25.2 cms	
Gate loss = 0.01 m	
Downstream water level = 2545.19	
Upstream water level = 2545.2	
Box 2 Weir	**2545.96**
Weir invert (top of weir) = 2545.53	
Weir length = 3.05 m	
Weir height = 5.04 m	
Weir ′C′ coefficient = 1.807	
Flow over weir = 1.57 cms	

Section Description	**Water Surface Elevation**

Weir submergence = unsubmerged
Units on–line = 16
Total flow, all units = 25.2 cms
Head over weir = 0.43 m

Enter Pipe BOX 2	**2546.04**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 120.4 m
Flow = 6.3 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m^2
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 0.84 m/s
Units on–line = 4
Total flow, all units = 25.2 cms
Friction loss = 0.02 m
Fitting loss = 0.05 m
Total loss = 0.08 m
0

General Box 2 Gate	**2546.04**

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1
Flow through gate(s) = 4 cms
Total area of opening(s) = 21 m^2
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on–line = 4
Total flow, all units = 16 cms
Gate loss = 0 m
Downstream water level = 2546.04
Upstream water level = 2546.04

General box 2 Weir	**2546.97**

Weir invert (top of weir) = 2546.38
Weir length = 7.62 m
Weir height = 4 m
Weir ′C′ coefficient = 1.828
Flow over weir = 6.3 cms

Section Description	Water Surface Elevation

Weir submergence = unsubmerged
Units on–line = 4
Total flow, all units = 25.2 cms
Head over weir = 0.59 m

Aeration Exit pipe **2547.18**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 20.59 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 0.98 m/s
Units on–line = 1
Total flow, all units = 20.6 cms
Friction loss = 0.14 m
Fitting loss = 0.07 m
Total loss = 0.21 m
0

Aeration Exit Channel **2547.18**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 4.2 cms
Downstream channel invert = 2542
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 19.48 m^2
Flow profile = Mild
Normal depth = 0.54 m
Critical depth = 0.483 m
Units on–line = 6
Total flow, all units = 25.2 cms
Depth downstream = 5.18 m
Bend loss = 0 m
Depth upstream = 4.56 m
Velocity = 0.2 m/s

AB Tank Weir **2547.97**

Weir invert (top of weir) = 2547.9

Section Description	**Water Surface Elevation**

Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.05 cms
Weir submergence = unsubmerged
Units on−line = 24
Total flow, all units = 25.2 cms
Head over weir = 0.07 m

Aeration Basin **2547.97**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.05 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 98.66 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.098 m
Units on−line = 24
Total flow, all units = 25.2 cms
Depth downstream = 8.97 m
Bend loss = 0 m
Depth upstream = 8.97 m
Velocity = 0.01 m/s

Aeration Enter Gate **2547.97**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.05 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.09 m/s
Flow behavior = orifice, downstream control
Units on−line = 24
Total flow, all units = 25.2 cms
Gate loss = 0 m
Downstream water level = 2547.97
Upstream water level = 2547.97

AB Distribution Pipe **2548.09**

Pipe shape = Circular
Diameter = 1200 mm

Section Description	**Water Surface Elevation**

Length = 77 m
Flow = 1.05 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m^2
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 0.93 m/s
Units on−line = 24
Total flow, all units = 25.2 cms
Friction loss = 0.06 m
Fitting loss = 0.07 m
Total loss = 0.12 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2548.09**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.05 cms
Total area of opening(s) = 6.5 m^2
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on−line = 24
Total flow, all units = 25.2 cms
Gate loss = 0 m
Downstream water level = 2548.09
Upstream water level = 2548.09

AB Distribution Box Weir **2548.68**

Weir invert (top of weir) = 2548.35
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815
Flow over weir = 1.05 cms
Weir submergence = unsubmerged
Units on−line = 24
Total flow, all units = 25.2 cms
Head over weir = 0.33 m

Aeration Enter Pipe **2548.75**

Pipe shape = Rectangular
Height = 2500 mm

Section Description	Water Surface Elevation

Width = 3500 mm
Length = 375 m
Flow = 5.33 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m^2
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.61 m/s
Units on−line = 3
Total flow, all units = 16 cms
Friction loss = 0.04 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

General aeration box Weir Gate **2548.79**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 5.33 cms
Total area of opening(s) = 10 m^2
Velocity through gate(s) = 0.53 m/s
Flow behavior = orifice, downstream control
Units on−line = 3
Total flow, all units = 16 cms
Gate loss = 0.04 m
Downstream water level = 2548.75
Upstream water level = 2548.79

General Aeration Box Weir **2549.78**

Weir invert (top of weir) = 2549.26
Weir length = 7.62 m
Weir height = 3 m
Weir 'C' coefficient = 1.846
Flow over weir = 5.33 cms
Weir submergence = unsubmerged
Units on−line = 3
Total flow, all units = 16 cms
Head over weir = 0.52 m

Clarifier Junction Exit Pipe **2549.88**

Pipe shape = Rectangular
Height = 3500 mm

Section Description	**Water Surface Elevation**

Width = 3500 mm
Length = 652 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on−line = 2
Total flow, all units = 16 cms
Friction loss = 0.06 m
Fitting loss = 0.04 m
Total loss = 0.1 m
0

Clarifier Exit Pipe **2549.93**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 1 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on−line = 16
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m

Clarifier Orifice **2549.98**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 1 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.57 m/s
Flow behavior = orifice, downstream control
Units on−line = 16

Section Description	Water Surface Elevation

Total flow, all units = 16 cms
Orifice loss = 0.05 m
Downstream water level = 2549.93
Upstream water level = 2549.98

Clarifier Launder **2549.98**

Launder invert = 2547
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.5 cms
Critical depth = 0.22 m
Units on−line = 32
Total flow, all units = 16 cms
Downstream depth = 2.98 m
Upstream depth = 2.65 m

Weir Clarifier **2550.93**

Invert of V notch = 2550.87
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 1 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 16 cms
Head over weir = 0.06 m

Clarifier Enter Pipe **2550.96**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 1 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on−line = 16
Total flow, all units = 16 cms
Friction loss = 0.01 m
Fitting loss = 0.02 m
Total loss = 0.03 m

Distribution Box Gate **2550.97**

Opening type = rectangular gate

Section Description	Water Surface Elevation

Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 1 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.22 m/s
Flow behavior = orifice, downstream control
Units on–line = 16
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2550.96
Upstream water level = 2550.97

Box 1 Weir — **2551.45**

Weir invert (top of weir) = 2551.13
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 1 cms
Weir submergence = unsubmerged
Units on–line = 16
Total flow, all units = 16 cms
Head over weir = 0.32 m

Enter Pipe BOX 1 — **2551.5**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2
Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.64 m/s
Units on–line = 4
Total flow, all units = 16 cms
Friction loss = 0.01 m
Fitting loss = 0.04 m
Total loss = 0.05 m
0

General Box Gate — **2551.51**

Opening type = rectangular gate

Section Description	Water Surface Elevation

Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 4 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.22 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2551.5
Upstream water level = 2551.51

General box 1 Weir — **2552.39**

Weir invert (top of weir) = 2551.89
Weir length = 6.1 m
Weir height = 3 m
Weir ′C′ coefficient = 1.843
Flow over weir = 4 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 16 cms
Head over weir = 0.5 m

R Mix to Clarifiers Pipe — **2552.46**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 8 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on−line = 2
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m
0

RM Exit Channel — **2552.46**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 16 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 206.73 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on−line = 1
Total flow, all units = 16 cms
Depth downstream = 6.46 m
Bend loss = 0 m
Depth upstream = 6.46 m
Velocity = 0.08 m/s

RM Exit Gate **2552.46**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 4 cms
Total area of opening(s) = 50.27 m^2
Velocity through gate(s) = 0.08 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 16 cms
Gate loss = 0 m
Downstream water level = 2552.46
Upstream water level = 2552.46

RM **2552.46**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 4 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 59.71 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on−line = 4

Section Description	Water Surface Elevation
Total flow, all units = 16 cms Depth downstream = 7.46 m Bend loss = 0 m Depth upstream = 7.46 m Velocity = 0.07 m/s	
RM Enter Gate	**2552.48**
Opening type = circular gate Opening diameter/width = 2000 mm Gate height = 2000 mm Invert = 2548 Number of gates = 4 Flow through gate(s) = 4 cms Total area of opening(s) = 12.57 m^2 Velocity through gate(s) = 0.32 m/s Flow behavior = orifice, downstream control Units on−line = 4 Total flow, all units = 16 cms Gate loss = 0.01 m Downstream water level = 2552.46 Upstream water level = 2552.48	
RM Enter Channel	**2552.48**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 8 m Channel width/diameter = 32 m Flow = 16 cms Downstream channel invert = 2546.5 Channel slope = 0 m/m Channel side slope = not applicable Area of flow = 191.35 m^2 Flow profile = Horizontal Normal depth = Infinite Critical depth = 0.295 m Units on−line = 1 Total flow, all units = 16 cms Depth downstream = 5.98 m Bend loss = 0 m Depth upstream = 5.98 m Velocity = 0.08 m/s	
Grit Channel to RM Pipe	**2552.52**
Pipe shape = Rectangular Height = 3500 mm Width = 3500 mm Length = 43.77 m Flow = 8 cms	

Section Description | **Water Surface Elevation**

Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on–line = 2
Total flow, all units = 16 cms
Friction loss = 0 m
Fitting loss = 0.04 m
Total loss = 0.04 m
0

Junction Tank Grit Channel 2552.52

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 8 cms
Downstream channel invert = 2547
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 249.53 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.148 m
Units on–line = 2
Total flow, all units = 16 cms
Depth downstream = 5.52 m
Bend loss = 0 m
Depth upstream = 5.52 m
Velocity = 0.03 m/s

Grit Weir 2553.37

Weir invert (top of weir) = 2553.2
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 1.6 cms
Weir submergence = unsubmerged
Units on–line = 10
Total flow, all units = 16 cms
Head over weir = 0.17 m

Grit Channel 2553.37

Channel shape = Rectangular

Section Description	Water Surface Elevation

Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 1.14 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 50.21 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.155 m
Units on−line = 14
Total flow, all units = 16 cms
Depth downstream = 8.37 m
Bend loss = 0 m
Depth upstream = 8.37 m
Velocity = 0.02 m/s

Screening Exit Channel Gate **2553.39**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 1.6 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.4 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 16 cms
Gate loss = 0.02 m
Downstream water level = 2553.37
Upstream water level = 2553.39

Screen Channel 1 - 2 **2553.39**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.4 m
Flow = 1.33 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.86 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.316 m
Units on−line = 12

Section Description	**Water Surface Elevation**

Total flow, all units = 16 cms
Depth downstream = 6.19 m
Bend loss = 0 m
Depth upstream = 6.19 m
Velocity = 0.09 m/s

Fine Screen — **2553.4**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 1.6 cms
Bar width = 5 mm
Bar spacing = 10 mm
Percent blocked = 0%
Net rack open area = 6.47 m^2
Downstream depth = 5.39 m
Velocity in channel = 0.15 m/s
Velocity through bars = 0.25 m/s
Units on−line = 10
Total flow, all units = 16 cms
Rack head loss = 0 m

Screen Channel 2 -3 — **2553.4**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.4 m
Flow = 1.33 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.87 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.316 m
Units on−line = 12
Total flow, all units = 16 cms
Depth downstream = 6.2 m
Bend loss = 0 m
Depth upstream = 6.2 m
Velocity = 0.09 m/s

Medium Screen — **2553.4**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 1.6 cms
Bar width = 10 mm

Section Description	Water Surface Elevation

Bar spacing = 30 mm
Percent blocked = 0%
Net rack open area = 7.29 m^2
Downstream depth = 5.4 m
Velocity in channel = 0.15 m/s
Velocity through bars = 0.22 m/s
Units on–line = 10
Total flow, all units = 16 cms
Rack head loss = 0 m

Screen Channel 3 - 4 — **2553.4**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.4 m
Flow = 1.33 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 13.44 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.316 m
Units on–line = 12
Total flow, all units = 16 cms
Depth downstream = 5.6 m
Bend loss = 0 m
Depth upstream = 5.6 m
Velocity = 0.1 m/s

Screening Enter Channel Gate — **2553.42**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 1.6 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.4 m/s
Flow behavior = orifice, downstream control
Units on–line = 10
Total flow, all units = 16 cms
Gate loss = 0.02 m
Downstream water level = 2553.4
Upstream water level = 2553.42

Screening Distribution Channel — **2553.43**

Channel shape = Rectangular

Section Description	Water Surface Elevation

Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 8 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 235.64 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.155 m
Units on–line = 2
Total flow, all units = 16 cms
Depth downstream = 5.62 m
Bend loss = 0 m
Depth upstream = 5.63 m
Velocity = 0.03 m/s

Initial Pipe **2553.46**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 14 m^2
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on–line = 2
Total flow, all units = 16 cms
Friction loss = 0 m
Fitting loss = 0.03 m
Total loss = 0.03 m
0

Initial Gate **2553.48**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 20 m^2
Velocity through gate(s) = 0.4 m/s

Section Description **Water Surface Elevation**

Flow behavior = orifice, downstream control
Units on−line = 2
Total flow, all units = 16 cms
Gate loss = 0.02 m
Downstream water level = 2553.46
Upstream water level = 2553.48

Inicial Junction Tank **2553.48**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 16 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 187.04 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.347 m
Units on−line = 1
Total flow, all units = 16 cms
Depth downstream = 7.48 m
Bend loss = 0 m
Depth upstream = 7.48 m
Velocity = 0.09 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
21.4 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation
Starting water surface elevation	**2543.29**
Exit Pipe	**2543.41**

Exit Pipe — **2543.41**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 10.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m^2
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.89 m/s
Units on−line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.06 m
Fitting loss = 0.06 m
Total loss = 0.12 m
0

Chlorination Exit Tank — **2543.41**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 21.4 cms
Downstream channel invert = 2540.45
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 457.24 m^2
Flow profile = Mild
Normal depth = 0.36 m
Critical depth = 0.125 m
Units on−line = 1

Section Description	Water Surface Elevation

Total flow, all units = 21.4 cms
Depth downstream = 2.96 m
Bend loss = 0 m
Depth upstream = 2.96 m
Velocity = 0.05 m/s

Chlorination Tank Weir **2544.09**

Weir invert (top of weir) = 2543.83
Weir length = 23 m
Weir height = 5.1 m
Weir 'C' coefficient = 1.794
Flow over weir = 5.35 cms
Weir submergence = unsubmerged
Units on–line = 4
Total flow, all units = 21.4 cms
Head over weir = 0.26 m

Chlorination Tank **2544.09**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 356.5 m
Channel width/diameter = 8 m
Flow = 5.35 cms
Downstream channel invert = 2540
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 32.54 m^2
Flow profile = Mild
Normal depth = 1.01 m
Critical depth = 0.358 m
Units on–line = 4
Total flow, all units = 21.4 cms
Depth downstream = 4.09 m
Bend loss = 0 m
Depth upstream = 4.05 m
Velocity = 0.16 m/s

Chlorination Tank - Enter Gate **2544.09**

Opening type = rectangular gate
Opening diameter/width = 8000 mm
Gate height = 4000 mm
Invert = 2540
Number of gates = 1
Flow through gate(s) = 5.35 cms
Total area of opening(s) = 32 m^2
Velocity through gate(s) = 0.17 m/s
Flow behavior = orifice, downstream control
Units on–line = 4

Section Description	**Water Surface Elevation**

Total flow, all units = 21.4 cms
Gate loss = 0 m
Downstream water level = 2544.09
Upstream water level = 2544.09

Chlorination Enter Tank **2544.09**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 21.4 cms
Downstream channel invert = 2540
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 376.31 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.177 m
Units on–line = 1
Total flow, all units = 21.4 cms
Depth downstream = 4.09 m
Bend loss = 0 m
Depth upstream = 4.09 m
Velocity = 0.06 m/s

Secondary Clarifier - Chlorination Pipe **2544.29**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 10.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.02 m/s
Units on–line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.12 m
Fitting loss = 0.08 m
Total loss = 0.2 m
0

Secondary Clarifier Exit Pipe **2544.38**

Pipe shape = Circular

Section Description	Water Surface Elevation

Diameter = 1500 mm
Length = 117 m
Flow = 1.34 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on–line = 16
Total flow, all units = 21.4 cms
Friction loss = 0.04 m
Fitting loss = 0.05 m
Total loss = 0.09 m

2 Clarifier Orifice **2544.46**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 1.34 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.76 m/s
Flow behavior = orifice, downstream control
Units on–line = 16
Total flow, all units = 21.4 cms
Orifice loss = 0.08 m
Downstream water level = 2544.38
Upstream water level = 2544.46

Launder Channel 2 C **2544.47**

Launder invert = 2543
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.67 cms
Critical depth = 0.27 m
Units on–line = 32
Total flow, all units = 21.4 cms
Downstream depth = 1.46 m
Upstream depth = 1.11 m

Weir 2 Clarifier **2545.11**

Invert of V notch = 2545.05
Angle of V notch = 90 degrees

Section Description	**Water Surface Elevation**

Number of notches = 911
Total flow over weir = 1.07 cms
Weir submergence = unsubmerged
Units on−line = 20
Total flow, all units = 21.4 cms
Head over weir = 0.06 m

2 Clarifier Enter Pipe **2545.23**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 1.91 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.08 m/s
Units on−line = 16
Total flow, all units = 30.6 cms
Friction loss = 0.04 m
Fitting loss = 0.09 m
Total loss = 0.13 m

Gate Clarifier Distribution Box **2545.24**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 1.91 cms
Total area of opening(s) = 6 m^2
Velocity through gate(s) = 0.32 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 30.6 cms
Gate loss = 0.01 m
Downstream water level = 2545.23
Upstream water level = 2545.24

Box 2 Weir **2546.02**

Weir invert (top of weir) = 2545.53
Weir length = 3.05 m
Weir height = 5.04 m
Weir ′C′ coefficient = 1.807
Flow over weir = 1.91 cms

Section Description	Water Surface Elevation
Weir submergence = unsubmerged	
Units on−line = 16	
Total flow, all units = 30.6 cms	
Head over weir = 0.49 m	
Enter Pipe BOX 2	**2546.14**
Pipe shape = Rectangular	
Height = 2500 mm	
Width = 3000 mm	
Length = 120.4 m	
Flow = 7.64 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 7.5 m^2	
Pipe hydraulic radius = 0.682	
Age factor = 1	
Solids factor = 1	
Velocity = 1.02 m/s	
Units on−line = 4	
Total flow, all units = 30.6 cms	
Friction loss = 0.04 m	
Fitting loss = 0.08 m	
Total loss = 0.11 m	
0	
General Box 2 Gate	**2546.15**
Opening type = rectangular gate	
Opening diameter/width = 7000 mm	
Gate height = 3000 mm	
Invert = 2542	
Number of gates = 1	
Flow through gate(s) = 5.35 cms	
Total area of opening(s) = 21 m^2	
Velocity through gate(s) = 0.25 m/s	
Flow behavior = orifice, downstream control	
Units on−line = 4	
Total flow, all units = 21.4 cms	
Gate loss = 0.01 m	
Downstream water level = 2546.14	
Upstream water level = 2546.15	
General box 2 Weir	**2547.05**
Weir invert (top of weir) = 2546.38	
Weir length = 7.62 m	
Weir height = 4 m	
Weir 'C' coefficient = 1.828	
Flow over weir = 7.64 cms	

Section Description	Water Surface Elevation

Weir submergence = unsubmerged
Units on–line = 4
Total flow, all units = 30.6 cms
Head over weir = 0.67 m

Aeration Exit pipe **2547.39**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 25.99 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 1.24 m/s
Units on–line = 1
Total flow, all units = 26 cms
Friction loss = 0.22 m
Fitting loss = 0.12 m
Total loss = 0.34 m
0

Aeration Exit Channel **2547.39**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 5.1 cms
Downstream channel invert = 2542
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 20.32 m^2
Flow profile = Mild
Normal depth = 0.62 m
Critical depth = 0.55 m
Units on–line = 6
Total flow, all units = 30.6 cms
Depth downstream = 5.39 m
Bend loss = 0 m
Depth upstream = 4.77 m
Velocity = 0.24 m/s

AB Tank Weir **2547.98**

Weir invert (top of weir) = 2547.9

Section Description	**Water Surface Elevation**

Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.27 cms
Weir submergence = unsubmerged
Units on–line = 24
Total flow, all units = 30.5 cms
Head over weir = 0.08 m

Aeration Basin **2547.98**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.27 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 98.76 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.111 m
Units on–line = 24
Total flow, all units = 30.6 cms
Depth downstream = 8.98 m
Bend loss = 0 m
Depth upstream = 8.98 m
Velocity = 0.01 m/s

Aeration Enter Gate **2547.98**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.27 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.11 m/s
Flow behavior = orifice, downstream control
Units on–line = 24
Total flow, all units = 30.6 cms
Gate loss = 0 m
Downstream water level = 2547.98
Upstream water level = 2547.98

AB Distribution Pipe **2548.16**

Pipe shape = Circular
Diameter = 1200 mm

Section Description	**Water Surface Elevation**

Length = 77 m
Flow = 1.27 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m^2
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on−line = 24
Total flow, all units = 30.6 cms
Friction loss = 0.08 m
Fitting loss = 0.1 m
Total loss = 0.18 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2548.17**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.27 cms
Total area of opening(s) = 6.5 m^2
Velocity through gate(s) = 0.2 m/s
Flow behavior = orifice, downstream control
Units on−line = 24
Total flow, all units = 30.6 cms
Gate loss = 0.01 m
Downstream water level = 2548.16
Upstream water level = 2548.17

AB Distribution Box Weir **2548.73**

Weir invert (top of weir) = 2548.35
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815
Flow over weir = 1.27 cms
Weir submergence = unsubmerged
Units on−line = 24
Total flow, all units = 30.5 cms
Head over weir = 0.38 m

Aeration Enter Pipe **2548.85**

Pipe shape = Rectangular
Height = 2500 mm

Section Description	**Water Surface Elevation**

Width = 3500 mm
Length = 375 m
Flow = 7.13 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m^2
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.82 m/s
Units on−line = 3
Total flow, all units = 21.4 cms
Friction loss = 0.06 m
Fitting loss = 0.06 m
Total loss = 0.13 m
0

General aeration box Weir Gate **2548.92**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 7.13 cms
Total area of opening(s) = 10 m^2
Velocity through gate(s) = 0.71 m/s
Flow behavior = orifice, downstream control
Units on−line = 3
Total flow, all units = 21.4 cms
Gate loss = 0.07 m
Downstream water level = 2548.85
Upstream water level = 2548.92

General Aeration Box Weir **2549.9**

Weir invert (top of weir) = 2549.26
Weir length = 7.62 m
Weir height = 3 m
Weir 'C' coefficient = 1.846
Flow over weir = 7.13 cms
Weir submergence = unsubmerged
Units on−line = 3
Total flow, all units = 21.4 cms
Head over weir = 0.64 m

Clarifier Junction Exit Pipe **2550.07**

Pipe shape = Rectangular
Height = 3500 mm

Section Description	Water Surface Elevation

Width = 3500 mm
Length = 652 m
Flow = 10.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.87 m/s
Units on–line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.1 m
Fitting loss = 0.07 m
Total loss = 0.17 m
0

Clarifier Exit Pipe **2550.16**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 1.34 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on–line = 16
Total flow, all units = 21.4 cms
Friction loss = 0.04 m
Fitting loss = 0.05 m
Total loss = 0.09 m

Clarifier Orifice **2550.24**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 1.34 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.76 m/s
Flow behavior = orifice, downstream control
Units on–line = 16

Section Description	**Water Surface Elevation**
Total flow, all units = 21.4 cms Orifice loss = 0.08 m Downstream water level = 2550.16 Upstream water level = 2550.24	
Clarifier Launder	**2550.24**
Launder invert = 2547 Launder length = 81.7 m Launder width = 1.5 m Launder slope = 0.004 m/m Flow through launder = 0.67 cms Critical depth = 0.27 m Units on−line = 32 Total flow, all units = 21.4 cms Downstream depth = 3.24 m Upstream depth = 2.92 m	
Weir Clarifier	**2550.94**
Invert of V notch = 2550.87 Angle of V notch = 90 degrees Number of notches = 864 Total flow over weir = 1.34 cms Weir submergence = unsubmerged Units on−line = 16 Total flow, all units = 21.4 cms Head over weir = 0.07 m	
Clarifier Enter Pipe	**2551**
Pipe shape = Circular Diameter = 1500 mm Length = 45 m Flow = 1.34 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 1.767 m^2 Pipe hydraulic radius = 0.375 Age factor = 1 Solids factor = 1 Velocity = 0.76 m/s Units on−line = 16 Total flow, all units = 21.4 cms Friction loss = 0.02 m Fitting loss = 0.04 m Total loss = 0.06 m	
Distribution Box Gate	**2551.01**
Opening type = rectangular gate	

Section Description	**Water Surface Elevation**

Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 1.34 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.3 m/s
Flow behavior = orifice, downstream control
Units on–line = 16
Total flow, all units = 21.4 cms
Gate loss = 0.01 m
Downstream water level = 2551
Upstream water level = 2551.01

Box 1 Weir **2551.52**

Weir invert (top of weir) = 2551.13
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 1.34 cms
Weir submergence = unsubmerged
Units on–line = 16
Total flow, all units = 21.4 cms
Head over weir = 0.39 m

Enter Pipe BOX 1 **2551.61**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 5.35 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2
Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.86 m/s
Units on–line = 4
Total flow, all units = 21.4 cms
Friction loss = 0.03 m
Fitting loss = 0.06 m
Total loss = 0.09 m
0

General Box Gate **2551.62**

Opening type = rectangular gate

Section Description	**Water Surface Elevation**

Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 5.35 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.3 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 21.4 cms
Gate loss = 0.01 m
Downstream water level = 2551.61
Upstream water level = 2551.62

General box 1 Weir **2552.5**

Weir invert (top of weir) = 2551.89
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 5.35 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 21.4 cms
Head over weir = 0.61 m

R Mix to Clarifiers Pipe **2552.61**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 10.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.02 m/s
Units on−line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.04 m
Fitting loss = 0.08 m
Total loss = 0.11 m
0

RM Exit Channel **2552.61**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 21.4 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 211.54 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.358 m
Units on−line = 1
Total flow, all units = 21.4 cms
Depth downstream = 6.61 m
Bend loss = 0 m
Depth upstream = 6.61 m
Velocity = 0.1 m/s

RM Exit Gate **2552.61**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 5.35 cms
Total area of opening(s) = 50.27 m^2
Velocity through gate(s) = 0.11 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 21.4 cms
Gate loss = 0 m
Downstream water level = 2552.61
Upstream water level = 2552.61

RM **2552.62**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 5.35 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 60.91 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.358 m
Units on−line = 4

Section Description	Water Surface Elevation

Total flow, all units = 21.4 cms
Depth downstream = 7.61 m
Bend loss = 0 m
Depth upstream = 7.62 m
Velocity = 0.09 m/s

RM Enter Gate **2552.64**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 5.35 cms
Total area of opening(s) = 12.57 m^2
Velocity through gate(s) = 0.43 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 21.4 cms
Gate loss = 0.03 m
Downstream water level = 2552.62
Upstream water level = 2552.64

RM Enter Channel **2552.64**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 21.4 cms
Downstream channel invert = 2546.5
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 196.54 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.358 m
Units on−line = 1
Total flow, all units = 21.4 cms
Depth downstream = 6.14 m
Bend loss = 0 m
Depth upstream = 6.14 m
Velocity = 0.11 m/s

Grit Channel to RM Pipe **2552.72**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 10.7 cms

Section Description	Water Surface Elevation

Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.87 m/s
Units on−line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.01 m
Fitting loss = 0.07 m
Total loss = 0.08 m
0

Junction Tank Grit Channel **2552.72**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 10.7 cms
Downstream channel invert = 2547
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 258.57 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.179 m
Units on−line = 2
Total flow, all units = 21.4 cms
Depth downstream = 5.72 m
Bend loss = 0 m
Depth upstream = 5.72 m
Velocity = 0.04 m/s

Grit Weir **2553.4**

Weir invert (top of weir) = 2553.2
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 2.14 cms
Weir submergence = unsubmerged
Units on−line = 10
Total flow, all units = 21.4 cms
Head over weir = 0.2 m

Grit Channel **2553.41**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 1.53 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 50.43 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.188 m
Units on−line = 14
Total flow, all units = 21.4 cms
Depth downstream = 8.4 m
Bend loss = 0 m
Depth upstream = 8.41 m
Velocity = 0.03 m/s

Screening Exit Channel Gate — **2553.44**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 2.14 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.54 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 21.4 cms
Gate loss = 0.04 m
Downstream water level = 2553.41
Upstream water level = 2553.44

Screen Channel 1 - 2 — **2553.45**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.4 m
Flow = 1.78 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.99 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.384 m
Units on−line = 12

Section Description	**Water Surface Elevation**

Total flow, all units = 21.4 cms
Depth downstream = 6.24 m
Bend loss = 0 m
Depth upstream = 6.25 m
Velocity = 0.12 m/s

Fine Screen **2553.45**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 2.14 cms
Bar width = 5 mm
Bar spacing = 10 mm
Percent blocked = 0%
Net rack open area = 6.53 m^2
Downstream depth = 5.45 m
Velocity in channel = 0.2 m/s
Velocity through bars = 0.33 m/s
Units on−line = 10
Total flow, all units = 21.4 cms
Rack head loss = 0 m

Screen Channel 2 -3 **2553.45**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.4 m
Flow = 1.78 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 15 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.384 m
Units on−line = 12
Total flow, all units = 21.4 cms
Depth downstream = 6.25 m
Bend loss = 0 m
Depth upstream = 6.25 m
Velocity = 0.12 m/s

Medium Screen **2553.46**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 2.14 cms
Bar width = 10 mm

Section Description	Water Surface Elevation

Bar spacing = 30 mm
Percent blocked = 0%
Net rack open area = 7.36 m^2
Downstream depth = 5.45 m
Velocity in channel = 0.2 m/s
Velocity through bars = 0.29 m/s
Units on−line = 10
Total flow, all units = 21.4 cms
Rack head loss = 0 m

Screen Channel 3 - 4 **2553.46**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.4 m
Flow = 1.78 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 13.58 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.384 m
Units on−line = 12
Total flow, all units = 21.4 cms
Depth downstream = 5.66 m
Bend loss = 0 m
Depth upstream = 5.66 m
Velocity = 0.13 m/s

Screening Enter Channel Gate **2553.5**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 2.14 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.54 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 21.4 cms
Gate loss = 0.04 m
Downstream water level = 2553.46
Upstream water level = 2553.5

Screening Distribution Channel **2553.5**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 10.7 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 238.68 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.188 m
Units on–line = 2
Total flow, all units = 21.4 cms
Depth downstream = 5.7 m
Bend loss = 0 m
Depth upstream = 5.7 m
Velocity = 0.04 m/s

Initial Pipe **2553.55**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 10.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 14 m^2
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on–line = 2
Total flow, all units = 21.4 cms
Friction loss = 0 m
Fitting loss = 0.05 m
Total loss = 0.05 m
0

Initial Gate **2553.59**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 10.7 cms
Total area of opening(s) = 20 m^2
Velocity through gate(s) = 0.53 m/s

Section Description	Water Surface Elevation

Flow behavior = orifice, downstream control
Units on−line = 2
Total flow, all units = 21.4 cms
Gate loss = 0.04 m
Downstream water level = 2553.55
Upstream water level = 2553.59

Inicial Junction Tank **2553.59**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 21.4 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 189.71 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.422 m
Units on−line = 1
Total flow, all units = 21.4 cms
Depth downstream = 7.59 m
Bend loss = 0 m
Depth upstream = 7.59 m
Velocity = 0.11 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
32 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation

Starting water surface elevation **2543.56**

Exit Pipe **2543.82**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m^2
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 1.33 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.13 m
Fitting loss = 0.14 m
Total loss = 0.26 m
0

Chlorination Exit Tank **2543.82**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 32 cms
Downstream channel invert = 2540.45
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 520.61 m^2
Flow profile = Mild
Normal depth = 0.46 m
Critical depth = 0.164 m
Units on−line = 1

Section Description	Water Surface Elevation

Total flow, all units = 32 cms
Depth downstream = 3.37 m
Bend loss = 0 m
Depth upstream = 3.37 m
Velocity = 0.06 m/s

Chlorination Tank Weir **2544.16**

Weir invert (top of weir) = 2543.83
Weir length = 23 m
Weir height = 5.1 m
Weir 'C' coefficient = 1.794
Flow over weir = 8 cms
Weir submergence = unsubmerged
Units on–line = 4
Total flow, all units = 32 cms
Head over weir = 0.33 m

Chlorination Tank **2544.17**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 356.5 m
Channel width/diameter = 8 m
Flow = 8 cms
Downstream channel invert = 2540
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 33.18 m^2
Flow profile = Mild
Normal depth = 1.32 m
Critical depth = 0.467 m
Units on–line = 4
Total flow, all units = 32 cms
Depth downstream = 4.16 m
Bend loss = 0 m
Depth upstream = 4.13 m
Velocity = 0.24 m/s

Chlorination Tank - Enter Gate **2544.18**

Opening type = rectangular gate
Opening diameter/width = 8000 mm
Gate height = 4000 mm
Invert = 2540
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 32 m^2
Velocity through gate(s) = 0.25 m/s
Flow behavior = orifice, downstream control
Units on–line = 4

Section Description	**Water Surface Elevation**

Total flow, all units = 32 cms
Gate loss = 0.01 m
Downstream water level = 2544.17
Upstream water level = 2544.18

Chlorination Enter Tank **2544.18**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 32 cms
Downstream channel invert = 2540
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 384.26 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.231 m
Units on−line = 1
Total flow, all units = 32 cms
Depth downstream = 4.18 m
Bend loss = 0 m
Depth upstream = 4.18 m
Velocity = 0.08 m/s

Secondary Clarifier - Chlorination Pipe **2544.63**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.27 m
Fitting loss = 0.18 m
Total loss = 0.45 m
0

Secondary Clarifier Exit Pipe **2544.83**

Pipe shape = Circular

Section Description	**Water Surface Elevation**

Diameter = 1500 mm
Length = 117 m
Flow = 2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on–line = 16
Total flow, all units = 32 cms
Friction loss = 0.09 m
Fitting loss = 0.11 m
Total loss = 0.2 m

2 Clarifier Orifice **2545.01**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 2 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 1.13 m/s
Flow behavior = orifice, downstream control
Units on–line = 16
Total flow, all units = 32 cms
Orifice loss = 0.18 m
Downstream water level = 2544.83
Upstream water level = 2545.01

Launder Channel 2 C **2545.02**

Launder invert = 2543
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 1 cms
Critical depth = 0.36 m
Units on–line = 32
Total flow, all units = 32 cms
Downstream depth = 2.01 m
Upstream depth = 1.66 m

Weir 2 Clarifier **2545.12**

Invert of V notch = 2545.05
Angle of V notch = 90 degrees

Section Description	Water Surface Elevation

Number of notches = 911
Total flow over weir = 1.6 cms
Weir submergence = unsubmerged
Units on−line = 20
Total flow, all units = 32 cms
Head over weir = 0.07 m

2 Clarifier Enter Pipe **2545.35**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 2.57 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.46 m/s
Units on−line = 16
Total flow, all units = 41.2 cms
Friction loss = 0.06 m
Fitting loss = 0.16 m
Total loss = 0.23 m

Gate Clarifier Distribution Box **2545.37**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 2.57 cms
Total area of opening(s) = 6 m^2
Velocity through gate(s) = 0.43 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 41.2 cms
Gate loss = 0.02 m
Downstream water level = 2545.35
Upstream water level = 2545.37

Box 2 Weir **2546.13**

Weir invert (top of weir) = 2545.53
Weir length = 3.05 m
Weir height = 5.04 m
Weir ′C′ coefficient = 1.807
Flow over weir = 2.57 cms

Section Description	**Water Surface Elevation**
Weir submergence = unsubmerged Units on−line = 16 Total flow, all units = 41.2 cms Head over weir = 0.6 m	
Enter Pipe BOX 2	**2546.34**
Pipe shape = Rectangular Height = 2500 mm Width = 3000 mm Length = 120.4 m Flow = 10.3 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 7.5 m^2 Pipe hydraulic radius = 0.682 Age factor = 1 Solids factor = 1 Velocity = 1.37 m/s Units on−line = 4 Total flow, all units = 41.2 cms Friction loss = 0.06 m Fitting loss = 0.14 m Total loss = 0.21 m 0	
General Box 2 Gate	**2546.36**
Opening type = rectangular gate Opening diameter/width = 7000 mm Gate height = 3000 mm Invert = 2542 Number of gates = 1 Flow through gate(s) = 8 cms Total area of opening(s) = 21 m^2 Velocity through gate(s) = 0.38 m/s Flow behavior = orifice, downstream control Units on−line = 4 Total flow, all units = 32 cms Gate loss = 0.02 m Downstream water level = 2546.34 Upstream water level = 2546.36	
General box 2 Weir	**2547.2**
Weir invert (top of weir) = 2546.38 Weir length = 7.62 m Weir height = 4 m Weir 'C' coefficient = 1.828 Flow over weir = 10.3 cms	

Section Description	**Water Surface Elevation**

Weir submergence = unsubmerged
Units on–line = 4
Total flow, all units = 41.2 cms
Head over weir = 0.82 m

Aeration Exit pipe **2547.87**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 36.59 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 1.74 m/s
Units on–line = 1
Total flow, all units = 36.6 cms
Friction loss = 0.44 m
Fitting loss = 0.23 m
Total loss = 0.67 m
0

Aeration Exit Channel **2547.87**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 6.87 cms
Downstream channel invert = 2542
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 22.24 m^2
Flow profile = Mild
Normal depth = 0.75 m
Critical depth = 0.67 m
Units on–line = 6
Total flow, all units = 41.2 cms
Depth downstream = 5.87 m
Bend loss = 0 m
Depth upstream = 5.25 m
Velocity = 0.29 m/s

AB Tank Weir **2548**

Weir invert (top of weir) = 2547.9

Section Description **Water Surface Elevation**

Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.71 cms
Weir submergence = unsubmerged
Units on–line = 24
Total flow, all units = 41.1 cms
Head over weir = 0.1 m

Aeration Basin **2548**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.71 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 98.95 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.136 m
Units on–line = 24
Total flow, all units = 41.1 cms
Depth downstream = 9 m
Bend loss = 0 m
Depth upstream = 9 m
Velocity = 0.02 m/s

Aeration Enter Gate **2548**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.71 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.14 m/s
Flow behavior = orifice, downstream control
Units on–line = 24
Total flow, all units = 41.2 cms
Gate loss = 0 m
Downstream water level = 2548
Upstream water level = 2548

AB Distribution Pipe **2548.32**

Pipe shape = Circular
Diameter = 1200 mm

Section Description	**Water Surface Elevation**

Length = 77 m
Flow = 1.71 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m^2
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on−line = 24
Total flow, all units = 41.1 cms
Friction loss = 0.15 m
Fitting loss = 0.18 m
Total loss = 0.32 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2548.33**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.71 cms
Total area of opening(s) = 6.5 m^2
Velocity through gate(s) = 0.26 m/s
Flow behavior = orifice, downstream control
Units on−line = 24
Total flow, all units = 41.2 cms
Gate loss = 0.01 m
Downstream water level = 2548.32
Upstream water level = 2548.33

AB Distribution Box Weir **2548.81**

Weir invert (top of weir) = 2548.35
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815
Flow over weir = 1.71 cms
Weir submergence = unsubmerged
Units on−line = 24
Total flow, all units = 41.1 cms
Head over weir = 0.46 m

Aeration Enter Pipe **2549.09**

Pipe shape = Rectangular
Height = 2500 mm

Section Description	**Water Surface Elevation**

Width = 3500 mm
Length = 375 m
Flow = 10.67 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m^2
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 1.22 m/s
Units on−line = 3
Total flow, all units = 32 cms
Friction loss = 0.14 m
Fitting loss = 0.14 m
Total loss = 0.28 m
0

General aeration box Weir Gate **2549.24**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 10.67 cms
Total area of opening(s) = 10 m^2
Velocity through gate(s) = 1.07 m/s
Flow behavior = orifice, downstream control
Units on−line = 3
Total flow, all units = 32 cms
Gate loss = 0.15 m
Downstream water level = 2549.09
Upstream water level = 2549.24

General Aeration Box Weir **2550.09**

Weir invert (top of weir) = 2549.26
Weir length = 7.62 m
Weir height = 3 m
Weir 'C' coefficient = 1.846
Flow over weir = 10.67 cms
Weir submergence = unsubmerged
Units on−line = 3
Total flow, all units = 32 cms
Head over weir = 0.83 m

Clarifier Junction Exit Pipe **2550.47**

Pipe shape = Rectangular
Height = 3500 mm

Section Description	**Water Surface Elevation**

Width = 3500 mm
Length = 652 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 1.31 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.22 m
Fitting loss = 0.16 m
Total loss = 0.38 m
0

Clarifier Exit Pipe **2550.67**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on−line = 16
Total flow, all units = 32 cms
Friction loss = 0.08 m
Fitting loss = 0.12 m
Total loss = 0.2 m

Clarifier Orifice **2550.85**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 2 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 1.13 m/s
Flow behavior = orifice, downstream control
Units on−line = 16

Section Description	Water Surface Elevation

Total flow, all units = 32 cms
Orifice loss = 0.18 m
Downstream water level = 2550.67
Upstream water level = 2550.85

Clarifier Launder **2550.85**

Launder invert = 2547
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 1 cms
Critical depth = 0.36 m
Units on−line = 32
Total flow, all units = 32 cms
Downstream depth = 3.85 m
Upstream depth = 3.53 m

Weir Clarifier **2550.95**

Invert of V notch = 2550.87
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 2 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 32 cms
Head over weir = 0.08 m

Clarifier Enter Pipe **2551.08**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 2 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on−line = 16
Total flow, all units = 32 cms
Friction loss = 0.04 m
Fitting loss = 0.1 m
Total loss = 0.13 m

Distribution Box Gate **2551.11**

Opening type = rectangular gate

Section Description	**Water Surface Elevation**

Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 2 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.44 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 32 cms
Gate loss = 0.03 m
Downstream water level = 2551.08
Upstream water level = 2551.11

Box 1 Weir **2551.64**

Weir invert (top of weir) = 2551.13
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 2 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 32 cms
Head over weir = 0.51 m

Enter Pipe BOX 1 **2551.84**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2
Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 1.28 m/s
Units on−line = 4
Total flow, all units = 32 cms
Friction loss = 0.06 m
Fitting loss = 0.14 m
Total loss = 0.2 m
0

General Box Gate **2551.87**

Opening type = rectangular gate

Section Description	Water Surface Elevation

Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.44 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 32 cms
Gate loss = 0.03 m
Downstream water level = 2551.84
Upstream water level = 2551.87

General box 1 Weir **2552.69**

Weir invert (top of weir) = 2551.89
Weir length = 6.1 m
Weir height = 3 m
Weir ′C′ coefficient = 1.843
Flow over weir = 8 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 32 cms
Head over weir = 0.8 m

R Mix to Clarifiers Pipe **2552.94**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 16 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.08 m
Fitting loss = 0.18 m
Total loss = 0.26 m
0

RM Exit Channel **2552.94**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 32 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 222.09 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on−line = 1
Total flow, all units = 32 cms
Depth downstream = 6.94 m
Bend loss = 0 m
Depth upstream = 6.94 m
Velocity = 0.14 m/s

RM Exit Gate **2552.95**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 8 cms
Total area of opening(s) = 50.27 m^2
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 32 cms
Gate loss = 0 m
Downstream water level = 2552.94
Upstream water level = 2552.95

RM **2552.95**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 8 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 63.57 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on−line = 4

Section Description	Water Surface Elevation

Total flow, all units = 32 cms
Depth downstream = 7.95 m
Bend loss = 0 m
Depth upstream = 7.95 m
Velocity = 0.13 m/s

RM Enter Gate **2553**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 8 cms
Total area of opening(s) = 12.57 m^2
Velocity through gate(s) = 0.64 m/s
Flow behavior = orifice, downstream control
Units on–line = 4
Total flow, all units = 32 cms
Gate loss = 0.06 m
Downstream water level = 2552.95
Upstream water level = 2553

RM Enter Channel **2553.01**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 32 cms
Downstream channel invert = 2546.5
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 208.17 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on–line = 1
Total flow, all units = 32 cms
Depth downstream = 6.5 m
Bend loss = 0 m
Depth upstream = 6.51 m
Velocity = 0.15 m/s

Grit Channel to RM Pipe **2553.18**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 16 cms

Section Description **Water Surface Elevation**

Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 1.31 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.02 m
Fitting loss = 0.16 m
Total loss = 0.17 m
0

Junction Tank Grit Channel **2553.18**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 16 cms
Downstream channel invert = 2547
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 279.36 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.234 m
Units on−line = 2
Total flow, all units = 32 cms
Depth downstream = 6.18 m
Bend loss = 0 m
Depth upstream = 6.18 m
Velocity = 0.06 m/s

Grit Weir **2553.47**

Weir invert (top of weir) = 2553.2
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 3.2 cms
Weir submergence = unsubmerged
Units on−line = 10
Total flow, all units = 32 cms
Head over weir = 0.27 m

Grit Channel **2553.47**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 2.29 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 50.81 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.246 m
Units on−line = 14
Total flow, all units = 32 cms
Depth downstream = 8.47 m
Bend loss = 0 m
Depth upstream = 8.47 m
Velocity = 0.05 m/s

Screening Exit Channel Gate **2553.55**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 3.2 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.8 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2553.47
Upstream water level = 2553.55

Screen Channel 1 - 2 **2553.56**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.4 m
Flow = 2.67 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 15.25 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.501 m
Units on−line = 12

Section Description	**Water Surface Elevation**

Total flow, all units = 32 cms
Depth downstream = 6.35 m
Bend loss = 0 m
Depth upstream = 6.36 m
Velocity = 0.17 m/s

Fine Screen	**2553.57**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 3.2 cms
Bar width = 5 mm
Bar spacing = 10 mm
Percent blocked = 0%
Net rack open area = 6.67 m^2
Downstream depth = 5.56 m
Velocity in channel = 0.29 m/s
Velocity through bars = 0.48 m/s
Units on−line = 10
Total flow, all units = 32 cms
Rack head loss = 0.01 m

Screen Channel 2 -3	**2553.57**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.4 m
Flow = 2.67 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 15.28 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.501 m
Units on−line = 12
Total flow, all units = 32 cms
Depth downstream = 6.37 m
Bend loss = 0 m
Depth upstream = 6.37 m
Velocity = 0.17 m/s

Medium Screen	**2553.58**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 3.2 cms
Bar width = 10 mm

Section Description	Water Surface Elevation

Bar spacing = 30 mm
Percent blocked = 0%
Net rack open area = 7.52 m^2
Downstream depth = 5.57 m
Velocity in channel = 0.29 m/s
Velocity through bars = 0.43 m/s
Units on–line = 10
Total flow, all units = 32 cms
Rack head loss = 0.01 m

Screen Channel 3 - 4 **2553.58**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.4 m
Flow = 2.67 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 13.86 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.501 m
Units on–line = 12
Total flow, all units = 32 cms
Depth downstream = 5.78 m
Bend loss = 0 m
Depth upstream = 5.78 m
Velocity = 0.19 m/s

Screening Enter Channel Gate **2553.66**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 3.2 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.8 m/s
Flow behavior = orifice, downstream control
Units on–line = 10
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2553.58
Upstream water level = 2553.66

Screening Distribution Channel **2553.66**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 16 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 245.66 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.246 m
Units on−line = 2
Total flow, all units = 32 cms
Depth downstream = 5.86 m
Bend loss = 0 m
Depth upstream = 5.86 m
Velocity = 0.07 m/s

Initial Pipe **2553.78**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 14 m^2
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 1.14 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.01 m
Fitting loss = 0.11 m
Total loss = 0.12 m
0

Initial Gate **2553.86**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 16 cms
Total area of opening(s) = 20 m^2
Velocity through gate(s) = 0.8 m/s

Section Description	**Water Surface Elevation**

Flow behavior = orifice, downstream control
Units on−line = 2
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2553.78
Upstream water level = 2553.86

Inicial Junction Tank	**2553.87**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 32 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 196.64 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.551 m
Units on−line = 1
Total flow, all units = 32 cms
Depth downstream = 7.86 m
Bend loss = 0 m
Depth upstream = 7.87 m
Velocity = 0.16 m/s

Anexo 3.2. Perfil hidráulico alternativa 2 Cota de inicio 2542.38

HP CANOAS Cota 2542 - 38 - 22 nov Q16 L2 - V9.vhf

Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
13.6 cms	9.18 cms	-----	-----

Section Description	**Water Surface Elevation**
Starting water surface elevation	**2543.03**
Exit Pipe	**2543.08**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m^2
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on−line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.05 m
0

Chlorination Exit Tank **2543.08**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 13.6 cms
Downstream channel invert = 2540.45
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 406.28 m^2
Flow profile = Mild
Normal depth = 0.28 m
Critical depth = 0.093 m
Units on−line = 1

Section Description	Water Surface Elevation

Total flow, all units = 13.6 cms
Depth downstream = 2.63 m
Bend loss = 0 m
Depth upstream = 2.63 m
Velocity = 0.03 m/s

Chlorination Tank Weir **2544.03**

Weir invert (top of weir) = 2543.84
Weir length = 23 m
Weir height = 5.1 m
Weir 'C' coefficient = 1.794
Flow over weir = 3.4 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 13.6 cms
Head over weir = 0.19 m

Chlorination Tank **2544.03**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 356.5 m
Channel width/diameter = 8 m
Flow = 3.4 cms
Downstream channel invert = 2540
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 32.09 m^2
Flow profile = Mild
Normal depth = 0.76 m
Critical depth = 0.264 m
Units on−line = 4
Total flow, all units = 13.6 cms
Depth downstream = 4.03 m
Bend loss = 0 m
Depth upstream = 3.99 m
Velocity = 0.11 m/s

Chlorination Tank - Enter Gate **2544.03**

Opening type = rectangular gate
Opening diameter/width = 8000 mm
Gate height = 4000 mm
Invert = 2540
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 32 m^2
Velocity through gate(s) = 0.11 m/s
Flow behavior = orifice, downstream control
Units on−line = 4

Section Description	**Water Surface Elevation**

Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2544.03
Upstream water level = 2544.03

Chlorination Enter Tank — **2544.03**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 13.6 cms
Downstream channel invert = 2540
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 370.81 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.131 m
Units on−line = 1
Total flow, all units = 13.6 cms
Depth downstream = 4.03 m
Bend loss = 0 m
Depth upstream = 4.03 m
Velocity = 0.04 m/s

Secondary Clarifier - Chlorination Pipe — **2544.11**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on−line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.05 m
Fitting loss = 0.03 m
Total loss = 0.08 m
0

Secondary Clarifier Exit Pipe — **2544.15**

Pipe shape = Circular

Section Description	**Water Surface Elevation**

Diameter = 1500 mm
Length = 117 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on–line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.04 m

2 Clarifier Orifice **2544.18**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 0.85 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.48 m/s
Flow behavior = orifice, downstream control
Units on–line = 16
Total flow, all units = 13.6 cms
Orifice loss = 0.03 m
Downstream water level = 2544.15
Upstream water level = 2544.18

Launder Channel 2 C **2544.57**

Launder invert = 2544
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.43 cms
Critical depth = 0.2 m
Units on–line = 32
Total flow, all units = 13.6 cms
Downstream depth = 0.2 m
Upstream depth = 0.2 m

Weir 2 Clarifier **2545.14**

Invert of V notch = 2545.09
Angle of V notch = 90 degrees

Section Description	Water Surface Elevation

Number of notches = 911
Total flow over weir = 0.68 cms
Weir submergence = unsubmerged
Units on−line = 20
Total flow, all units = 13.6 cms
Head over weir = 0.05 m

2 Clarifier Enter Pipe **2545.21**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 1.42 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.81 m/s
Units on−line = 16
Total flow, all units = 22.8 cms
Friction loss = 0.02 m
Fitting loss = 0.05 m
Total loss = 0.07 m

Gate Clarifier Distribution Box **2545.22**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 1.42 cms
Total area of opening(s) = 6 m^2
Velocity through gate(s) = 0.24 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 22.8 cms
Gate loss = 0.01 m
Downstream water level = 2545.21
Upstream water level = 2545.22

Box 2 Weir **2545.84**

Weir invert (top of weir) = 2545.43
Weir length = 3.05 m
Weir height = 5.04 m
Weir 'C' coefficient = 1.807
Flow over weir = 1.42 cms

Section Description	**Water Surface Elevation**

Weir submergence = unsubmerged
Units on–line = 16
Total flow, all units = 22.8 cms
Head over weir = 0.41 m

Enter Pipe BOX 2 **2545.9**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 120.4 m
Flow = 5.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m^2
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on–line = 4
Total flow, all units = 22.8 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m
0

General Box 2 Gate **2545.9**

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 21 m^2
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on–line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2545.9
Upstream water level = 2545.9

General box 2 Weir **2546.83**

Weir invert (top of weir) = 2546.28
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 5.7 cms

Section Description	Water Surface Elevation
Weir submergence = unsubmerged Units on−line = 4 Total flow, all units = 22.8 cms Head over weir = 0.55 m	
Aeration Exit pipe	**2547**
Pipe shape = Rectangular Height = 3500 mm Width = 6000 mm Length = 971 m Flow = 18.19 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 21 m^2 Pipe hydraulic radius = 1.105 Age factor = 1 Solids factor = 1 Velocity = 0.87 m/s Units on−line = 1 Total flow, all units = 18.2 cms Friction loss = 0.11 m Fitting loss = 0.06 m Total loss = 0.17 m 0	
Aeration Exit Channel	**2547**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 309.5 m Channel width/diameter = 4 m Flow = 3.8 cms Downstream channel invert = 2542 Channel slope = 0.002 m/m Channel side slope = not applicable Area of flow = 18.76 m^2 Flow profile = Mild Normal depth = 0.51 m Critical depth = 0.452 m Units on−line = 6 Total flow, all units = 22.8 cms Depth downstream = 5 m Bend loss = 0 m Depth upstream = 4.38 m Velocity = 0.19 m/s	
AB Tank Weir	**2547.85**
Weir invert (top of weir) = 2547.79	

Section Description	Water Surface Elevation

Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 0.95 cms
Weir submergence = unsubmerged
Units on–line = 24
Total flow, all units = 22.8 cms
Head over weir = 0.06 m

Aeration Basin **2547.86**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 0.95 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 97.4 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.091 m
Units on–line = 24
Total flow, all units = 22.8 cms
Depth downstream = 8.85 m
Bend loss = 0 m
Depth upstream = 8.86 m
Velocity = 0.01 m/s

Aeration Enter Gate **2547.86**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 0.95 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.08 m/s
Flow behavior = orifice, downstream control
Units on–line = 24
Total flow, all units = 22.8 cms
Gate loss = 0 m
Downstream water level = 2547.86
Upstream water level = 2547.86

AB Distribution Pipe **2547.96**

Pipe shape = Circular
Diameter = 1200 mm

Section Description	**Water Surface Elevation**

Length = 77 m
Flow = 0.95 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m^2
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 0.84 m/s
Units on−line = 24
Total flow, all units = 22.8 cms
Friction loss = 0.05 m
Fitting loss = 0.05 m
Total loss = 0.1 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2547.96**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 0.95 cms
Total area of opening(s) = 6.5 m^2
Velocity through gate(s) = 0.15 m/s
Flow behavior = orifice, downstream control
Units on−line = 24
Total flow, all units = 22.8 cms
Gate loss = 0 m
Downstream water level = 2547.96
Upstream water level = 2547.96

AB Distribution Box Weir **2548.55**

Weir invert (top of weir) = 2548.24
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815
Flow over weir = 0.95 cms
Weir submergence = unsubmerged
Units on−line = 24
Total flow, all units = 22.8 cms
Head over weir = 0.31 m

Aeration Enter Pipe **2548.6**

Pipe shape = Rectangular
Height = 2500 mm

Section Description	**Water Surface Elevation**

Width = 3500 mm
Length = 375 m
Flow = 4.53 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m^2
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.52 m/s
Units on−line = 3
Total flow, all units = 13.6 cms
Friction loss = 0.03 m
Fitting loss = 0.02 m
Total loss = 0.05 m
0

General aeration box Weir Gate — **2548.63**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 4.53 cms
Total area of opening(s) = 10 m^2
Velocity through gate(s) = 0.45 m/s
Flow behavior = orifice, downstream control
Units on−line = 3
Total flow, all units = 13.6 cms
Gate loss = 0.03 m
Downstream water level = 2548.6
Upstream water level = 2548.63

General Aeration Box Weir — **2549.62**

Weir invert (top of weir) = 2549.15
Weir length = 7.62 m
Weir height = 3 m
Weir 'C' coefficient = 1.846
Flow over weir = 4.53 cms
Weir submergence = unsubmerged
Units on−line = 3
Total flow, all units = 13.6 cms
Head over weir = 0.47 m

Clarifier Junction Exit Pipe — **2549.69**

Pipe shape = Rectangular
Height = 3500 mm

Section Description	Water Surface Elevation

Width = 3500 mm
Length = 652 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.56 m/s
Units on−line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.04 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

Clarifier Exit Pipe **2549.73**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on−line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.04 m

Clarifier Orifice **2549.76**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 0.85 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.48 m/s
Flow behavior = orifice, downstream control
Units on−line = 16

Section Description	**Water Surface Elevation**

Total flow, all units = 13.6 cms
Orifice loss = 0.03 m
Downstream water level = 2549.73
Upstream water level = 2549.76

Clarifier Launder **2550.03**

Launder invert = 2549.5
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.43 cms
Critical depth = 0.2 m
Units on−line = 32
Total flow, all units = 13.6 cms
Downstream depth = 0.26 m
Upstream depth = 0.2 m

Weir Clarifier **2550.85**

Invert of V notch = 2550.79
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 0.85 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 13.6 cms
Head over weir = 0.06 m

Clarifier Enter Pipe **2550.87**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on−line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.02 m
Total loss = 0.02 m

Distribution Box Gate **2550.87**

Opening type = rectangular gate

Section Description	**Water Surface Elevation**

Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 0.85 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2550.87
Upstream water level = 2550.87

Box 1 Weir **2551.34**

Weir invert (top of weir) = 2551.05
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 0.85 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 13.6 cms
Head over weir = 0.29 m

Enter Pipe BOX 1 **2551.37**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 3.4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2
Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.54 m/s
Units on−line = 4
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.03 m
Total loss = 0.04 m
0

General Box Gate **2551.37**

Opening type = rectangular gate

Section Description	**Water Surface Elevation**

Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on–line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2551.37
Upstream water level = 2551.37

General box 1 Weir **2552.26**

Weir invert (top of weir) = 2551.81
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 3.4 cms
Weir submergence = unsubmerged
Units on–line = 4
Total flow, all units = 13.6 cms
Head over weir = 0.45 m

R Mix to Clarifiers Pipe **2552.31**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on–line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.03 m
Total loss = 0.05 m
0

RM Exit Channel **2552.31**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 13.6 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 201.94 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on−line = 1
Total flow, all units = 13.6 cms
Depth downstream = 6.31 m
Bend loss = 0 m
Depth upstream = 6.31 m
Velocity = 0.07 m/s

RM Exit Gate **2552.31**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 50.27 m^2
Velocity through gate(s) = 0.07 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2552.31
Upstream water level = 2552.31

RM **2552.31**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 3.4 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 58.51 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on−line = 4

Section Description	Water Surface Elevation

Total flow, all units = 13.6 cms
Depth downstream = 7.31 m
Bend loss = 0 m
Depth upstream = 7.31 m
Velocity = 0.06 m/s

RM Enter Gate **2552.32**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 12.57 m^2
Velocity through gate(s) = 0.27 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 13.6 cms
Gate loss = 0.01 m
Downstream water level = 2552.31
Upstream water level = 2552.32

RM Enter Channel **2552.33**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 13.6 cms
Downstream channel invert = 2546.5
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 186.41 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on−line = 1
Total flow, all units = 13.6 cms
Depth downstream = 5.82 m
Bend loss = 0 m
Depth upstream = 5.83 m
Velocity = 0.07 m/s

Grit Channel to RM Pipe **2552.36**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 6.8 cms

Section Description | **Water Surface Elevation**

Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.56 m/s
Units on−line = 2
Total flow, all units = 13.6 cms
Friction loss = 0 m
Fitting loss = 0.03 m
Total loss = 0.03 m
0

Junction Tank Grit Channel **2552.36**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 6.8 cms
Downstream channel invert = 2547
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 242.3 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.132 m
Units on−line = 2
Total flow, all units = 13.6 cms
Depth downstream = 5.36 m
Bend loss = 0 m
Depth upstream = 5.36 m
Velocity = 0.03 m/s

Grit Weir **2553.27**

Weir invert (top of weir) = 2553.12
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 1.36 cms
Weir submergence = unsubmerged
Units on−line = 10
Total flow, all units = 13.6 cms
Head over weir = 0.15 m

Grit Channel **2553.27**

Channel shape = Rectangular

Section Description | **Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 0.97 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 49.63 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.139 m
Units on–line = 14
Total flow, all units = 13.6 cms
Depth downstream = 8.27 m
Bend loss = 0 m
Depth upstream = 8.27 m
Velocity = 0.02 m/s

Screening Exit Channel Gate **2553.29**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 1.36 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.34 m/s
Flow behavior = orifice, downstream control
Units on–line = 10
Total flow, all units = 13.6 cms
Gate loss = 0.02 m
Downstream water level = 2553.27
Upstream water level = 2553.29

Screen Channel 1 - 2 **2553.29**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.4 m
Flow = 1.13 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.61 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.284 m
Units on–line = 12

Section Description	**Water Surface Elevation**

Total flow, all units = 13.6 cms
Depth downstream = 6.09 m
Bend loss = 0 m
Depth upstream = 6.09 m
Velocity = 0.08 m/s

Fine Screen **2553.29**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 1.36 cms
Bar width = 5 mm
Bar spacing = 10 mm
Percent blocked = 0%
Net rack open area = 6.35 m^2
Downstream depth = 5.29 m
Velocity in channel = 0.13 m/s
Velocity through bars = 0.21 m/s
Units on−line = 10
Total flow, all units = 13.6 cms
Rack head loss = 0 m

Screen Channel 2 -3 **2553.29**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.4 m
Flow = 1.13 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.62 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.284 m
Units on−line = 12
Total flow, all units = 13.6 cms
Depth downstream = 6.09 m
Bend loss = 0 m
Depth upstream = 6.09 m
Velocity = 0.08 m/s

Medium Screen **2553.3**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 1.36 cms
Bar width = 10 mm

Section Description	Water Surface Elevation
Bar spacing = 30 mm Percent blocked = 0% Net rack open area = 7.15 m^2 Downstream depth = 5.29 m Velocity in channel = 0.13 m/s Velocity through bars = 0.19 m/s Units on−line = 10 Total flow, all units = 13.6 cms Rack head loss = 0 m	
Screen Channel 3 - 4 Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 7 m Channel width/diameter = 2.4 m Flow = 1.13 cms Downstream channel invert = 2547.8 Channel slope = 0 m/m Channel side slope = not applicable Area of flow = 13.19 m^2 Flow profile = Horizontal Normal depth = Infinite Critical depth = 0.284 m Units on−line = 12 Total flow, all units = 13.6 cms Depth downstream = 5.5 m Bend loss = 0 m Depth upstream = 5.5 m Velocity = 0.09 m/s	**2553.3**
Screening Enter Channel Gate Opening type = rectangular gate Opening diameter/width = 2000 mm Gate height = 2000 mm Invert = 2548 Number of gates = 1 Flow through gate(s) = 1.36 cms Total area of opening(s) = 4 m^2 Velocity through gate(s) = 0.34 m/s Flow behavior = orifice, downstream control Units on−line = 10 Total flow, all units = 13.6 cms Gate loss = 0.02 m Downstream water level = 2553.3 Upstream water level = 2553.31	**2553.31**
Screening Distribution Channel Channel shape = Rectangular	**2553.32**

Section Description	Water Surface Elevation

Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 6.8 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 231.02 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.139 m
Units on−line = 2
Total flow, all units = 13.6 cms
Depth downstream = 5.51 m
Bend loss = 0 m
Depth upstream = 5.52 m
Velocity = 0.03 m/s

Initial Pipe **2553.34**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 14 m^2
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.49 m/s
Units on−line = 2
Total flow, all units = 13.6 cms
Friction loss = 0 m
Fitting loss = 0.02 m
Total loss = 0.02 m
0

Initial Gate **2553.36**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 6.8 cms
Total area of opening(s) = 20 m^2
Velocity through gate(s) = 0.34 m/s

Section Description	Water Surface Elevation

Flow behavior = orifice, downstream control
Units on–line = 2
Total flow, all units = 13.6 cms
Gate loss = 0.02 m
Downstream water level = 2553.34
Upstream water level = 2553.36

Inicial Junction Tank	**2553.36**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 13.6 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 183.9 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.312 m
Units on–line = 1
Total flow, all units = 13.6 cms
Depth downstream = 7.36 m
Bend loss = 0 m
Depth upstream = 7.36 m
Velocity = 0.07 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
16 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation
Starting water surface elevation	**2543.12**

Exit Pipe — **2543.19**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m^2
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.67 m/s
Units on−line = 2
Total flow, all units = 16 cms
Friction loss = 0.03 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

Chlorination Exit Tank — **2543.19**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 16 cms
Downstream channel invert = 2540.45
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 423.25 m^2
Flow profile = Mild
Normal depth = 0.31 m
Critical depth = 0.103 m
Units on−line = 1

Section Description	Water Surface Elevation

Total flow, all units = 16 cms
Depth downstream = 2.74 m
Bend loss = 0 m
Depth upstream = 2.74 m
Velocity = 0.04 m/s

Chlorination Tank Weir **2544.05**

Weir invert (top of weir) = 2543.84
Weir length = 23 m
Weir height = 5.1 m
Weir 'C' coefficient = 1.794
Flow over weir = 4 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 16 cms
Head over weir = 0.21 m

Chlorination Tank **2544.05**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 356.5 m
Channel width/diameter = 8 m
Flow = 4 cms
Downstream channel invert = 2540
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 32.26 m^2
Flow profile = Mild
Normal depth = 0.84 m
Critical depth = 0.295 m
Units on−line = 4
Total flow, all units = 16 cms
Depth downstream = 4.05 m
Bend loss = 0 m
Depth upstream = 4.01 m
Velocity = 0.12 m/s

Chlorination Tank - Enter Gate **2544.05**

Opening type = rectangular gate
Opening diameter/width = 8000 mm
Gate height = 4000 mm
Invert = 2540
Number of gates = 1
Flow through gate(s) = 4 cms
Total area of opening(s) = 32 m^2
Velocity through gate(s) = 0.12 m/s
Flow behavior = orifice, downstream control
Units on−line = 4

Section Description | **Water Surface Elevation**

Total flow, all units = 16 cms
Gate loss = 0 m
Downstream water level = 2544.05
Upstream water level = 2544.05

Chlorination Enter Tank **2544.05**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 16 cms
Downstream channel invert = 2540
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 372.88 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.146 m
Units on–line = 1
Total flow, all units = 16 cms
Depth downstream = 4.05 m
Bend loss = 0 m
Depth upstream = 4.05 m
Velocity = 0.04 m/s

Secondary Clarifier - Chlorination Pipe **2544.17**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on–line = 2
Total flow, all units = 16 cms
Friction loss = 0.07 m
Fitting loss = 0.04 m
Total loss = 0.11 m
0

Secondary Clarifier Exit Pipe **2544.22**

Pipe shape = Circular

Section Description	Water Surface Elevation
Diameter = 1500 mm Length = 117 m Flow = 1 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.63 Pipe area = 1.767 m^2 Pipe hydraulic radius = 0.375 Age factor = 1 Solids factor = 1 Velocity = 0.57 m/s Units on–line = 16 Total flow, all units = 16 cms Friction loss = 0.02 m Fitting loss = 0.03 m Total loss = 0.05 m	
2 Clarifier Orifice	**2544.27**
Opening type = circular orifice Opening diameter/width = 1500 mm Opening height = not applicable Invert = 2540 Number of openings = 1 Flow through opening(s) = 1 cms Total area of opening(s) = 1.77 m^2 Velocity through opening(s) = 0.57 m/s Flow behavior = orifice, downstream control Units on–line = 16 Total flow, all units = 16 cms Orifice loss = 0.05 m Downstream water level = 2544.22 Upstream water level = 2544.27	
Launder Channel 2 C	**2544.59**
Launder invert = 2544 Launder length = 91 m Launder width = 1.5 m Launder slope = 0.004 m/m Flow through launder = 0.5 cms Critical depth = 0.22 m Units on–line = 32 Total flow, all units = 16 cms Downstream depth = 0.27 m Upstream depth = 0.22 m	
Weir 2 Clarifier	**2545.14**
Invert of V notch = 2545.09 Angle of V notch = 90 degrees	

Section Description	Water Surface Elevation

Number of notches = 911
Total flow over weir = 0.8 cms
Weir submergence = unsubmerged
Units on−line = 20
Total flow, all units = 16 cms
Head over weir = 0.05 m

2 Clarifier Enter Pipe **2545.23**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 1.57 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.89 m/s
Units on−line = 16
Total flow, all units = 25.2 cms
Friction loss = 0.02 m
Fitting loss = 0.06 m
Total loss = 0.08 m

Gate Clarifier Distribution Box **2545.24**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 1.57 cms
Total area of opening(s) = 6 m^2
Velocity through gate(s) = 0.26 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 25.2 cms
Gate loss = 0.01 m
Downstream water level = 2545.23
Upstream water level = 2545.24

Box 2 Weir **2545.86**

Weir invert (top of weir) = 2545.43
Weir length = 3.05 m
Weir height = 5.04 m
Weir ′C′ coefficient = 1.807
Flow over weir = 1.57 cms

Section Description	Water Surface Elevation
Weir submergence = unsubmerged Units on–line = 16 Total flow, all units = 25.2 cms Head over weir = 0.43 m	
Enter Pipe BOX 2	**2545.94**
Pipe shape = Rectangular Height = 2500 mm Width = 3000 mm Length = 120.4 m Flow = 6.3 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 7.5 m^2 Pipe hydraulic radius = 0.682 Age factor = 1 Solids factor = 1 Velocity = 0.84 m/s Units on–line = 4 Total flow, all units = 25.2 cms Friction loss = 0.02 m Fitting loss = 0.05 m Total loss = 0.08 m 0	
General Box 2 Gate	**2545.94**
Opening type = rectangular gate Opening diameter/width = 7000 mm Gate height = 3000 mm Invert = 2542 Number of gates = 1 Flow through gate(s) = 4 cms Total area of opening(s) = 21 m^2 Velocity through gate(s) = 0.19 m/s Flow behavior = orifice, downstream control Units on–line = 4 Total flow, all units = 16 cms Gate loss = 0 m Downstream water level = 2545.94 Upstream water level = 2545.94	
General box 2 Weir	**2546.87**
Weir invert (top of weir) = 2546.28 Weir length = 7.62 m Weir height = 4 m Weir 'C' coefficient = 1.828 Flow over weir = 6.3 cms	

Section Description	Water Surface Elevation

Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 25.2 cms
Head over weir = 0.59 m

Aeration Exit pipe **2547.08**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 20.59 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 0.98 m/s
Units on−line = 1
Total flow, all units = 20.6 cms
Friction loss = 0.14 m
Fitting loss = 0.07 m
Total loss = 0.21 m
0

Aeration Exit Channel **2547.08**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 4.2 cms
Downstream channel invert = 2542
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 19.08 m^2
Flow profile = Mild
Normal depth = 0.54 m
Critical depth = 0.483 m
Units on−line = 6
Total flow, all units = 25.2 cms
Depth downstream = 5.08 m
Bend loss = 0 m
Depth upstream = 4.46 m
Velocity = 0.21 m/s

AB Tank Weir **2547.86**

Weir invert (top of weir) = 2547.79

Section Description	**Water Surface Elevation**

Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.05 cms
Weir submergence = unsubmerged
Units on–line = 24
Total flow, all units = 25.2 cms
Head over weir = 0.07 m

Aeration Basin **2547.86**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.05 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 97.45 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.098 m
Units on–line = 24
Total flow, all units = 25.2 cms
Depth downstream = 8.86 m
Bend loss = 0 m
Depth upstream = 8.86 m
Velocity = 0.01 m/s

Aeration Enter Gate **2547.86**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.05 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.09 m/s
Flow behavior = orifice, downstream control
Units on–line = 24
Total flow, all units = 25.2 cms
Gate loss = 0 m
Downstream water level = 2547.86
Upstream water level = 2547.86

AB Distribution Pipe **2547.98**

Pipe shape = Circular
Diameter = 1200 mm

Section Description	**Water Surface Elevation**

Length = 77 m
Flow = 1.05 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m^2
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 0.93 m/s
Units on−line = 24
Total flow, all units = 25.2 cms
Friction loss = 0.06 m
Fitting loss = 0.07 m
Total loss = 0.12 m
Total loss = 0.17 m
0

AB Distribution Box Gate — **2547.98**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.05 cms
Total area of opening(s) = 6.5 m^2
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on−line = 24
Total flow, all units = 25.2 cms
Gate loss = 0 m
Downstream water level = 2547.98
Upstream water level = 2547.98

AB Distribution Box Weir — **2548.57**

Weir invert (top of weir) = 2548.24
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815
Flow over weir = 1.05 cms
Weir submergence = unsubmerged
Units on−line = 24
Total flow, all units = 25.2 cms
Head over weir = 0.33 m

Aeration Enter Pipe — **2548.64**

Pipe shape = Rectangular
Height = 2500 mm

Section Description	Water Surface Elevation

Width = 3500 mm
Length = 375 m
Flow = 5.33 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m^2
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.61 m/s
Units on–line = 3
Total flow, all units = 16 cms
Friction loss = 0.04 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

General aeration box Weir Gate **2548.68**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 5.33 cms
Total area of opening(s) = 10 m^2
Velocity through gate(s) = 0.53 m/s
Flow behavior = orifice, downstream control
Units on–line = 3
Total flow, all units = 16 cms
Gate loss = 0.04 m
Downstream water level = 2548.64
Upstream water level = 2548.68

General Aeration Box Weir **2549.67**

Weir invert (top of weir) = 2549.15
Weir length = 7.62 m
Weir height = 3 m
Weir 'C' coefficient = 1.846
Flow over weir = 5.33 cms
Weir submergence = unsubmerged
Units on–line = 3
Total flow, all units = 16 cms
Head over weir = 0.52 m

Clarifier Junction Exit Pipe **2549.77**

Pipe shape = Rectangular
Height = 3500 mm

Section Description	Water Surface Elevation

Width = 3500 mm
Length = 652 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on–line = 2
Total flow, all units = 16 cms
Friction loss = 0.06 m
Fitting loss = 0.04 m
Total loss = 0.1 m
0

Clarifier Exit Pipe **2549.82**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 1 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on–line = 16
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m

Clarifier Orifice **2549.87**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 1 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.57 m/s
Flow behavior = orifice, downstream control
Units on–line = 16

Section Description	**Water Surface Elevation**
Total flow, all units = 16 cms Orifice loss = 0.05 m Downstream water level = 2549.82 Upstream water level = 2549.87	
Clarifier Launder	**2550.05**
Launder invert = 2549.5 Launder length = 81.7 m Launder width = 1.5 m Launder slope = 0.004 m/m Flow through launder = 0.5 cms Critical depth = 0.22 m Units on−line = 32 Total flow, all units = 16 cms Downstream depth = 0.37 m Upstream depth = 0.22 m	
Weir Clarifier	**2550.85**
Invert of V notch = 2550.79 Angle of V notch = 90 degrees Number of notches = 864 Total flow over weir = 1 cms Weir submergence = unsubmerged Units on−line = 16 Total flow, all units = 16 cms Head over weir = 0.06 m	
Clarifier Enter Pipe	**2550.88**
Pipe shape = Circular Diameter = 1500 mm Length = 45 m Flow = 1 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 1.767 m^2 Pipe hydraulic radius = 0.375 Age factor = 1 Solids factor = 1 Velocity = 0.57 m/s Units on−line = 16 Total flow, all units = 16 cms Friction loss = 0.01 m Fitting loss = 0.02 m Total loss = 0.03 m	
Distribution Box Gate	**2550.89**
Opening type = rectangular gate	

Section Description	Water Surface Elevation

Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 1 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.22 m/s
Flow behavior = orifice, downstream control
Units on–line = 16
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2550.88
Upstream water level = 2550.89

Box 1 Weir **2551.37**

Weir invert (top of weir) = 2551.05
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 1 cms
Weir submergence = unsubmerged
Units on–line = 16
Total flow, all units = 16 cms
Head over weir = 0.32 m

Enter Pipe BOX 1 **2551.42**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2
Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.64 m/s
Units on–line = 4
Total flow, all units = 16 cms
Friction loss = 0.01 m
Fitting loss = 0.04 m
Total loss = 0.05 m
0

General Box Gate **2551.43**

Opening type = rectangular gate

Section Description	Water Surface Elevation

Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 4 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.22 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2551.42
Upstream water level = 2551.43

General box 1 Weir **2552.31**
Weir invert (top of weir) = 2551.81
Weir length = 6.1 m
Weir height = 3 m
Weir ′C′ coefficient = 1.843
Flow over weir = 4 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 16 cms
Head over weir = 0.5 m

R Mix to Clarifiers Pipe **2552.38**
Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 8 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on−line = 2
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m
0

RM Exit Channel **2552.38**
Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 16 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 204.17 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on−line = 1
Total flow, all units = 16 cms
Depth downstream = 6.38 m
Bend loss = 0 m
Depth upstream = 6.38 m
Velocity = 0.08 m/s

RM Exit Gate **2552.38**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 4 cms
Total area of opening(s) = 50.27 m^2
Velocity through gate(s) = 0.08 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 16 cms
Gate loss = 0 m
Downstream water level = 2552.38
Upstream water level = 2552.38

RM **2552.38**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 4 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 59.07 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on−line = 4

Section Description	Water Surface Elevation

Total flow, all units = 16 cms
Depth downstream = 7.38 m
Bend loss = 0 m
Depth upstream = 7.38 m
Velocity = 0.07 m/s

RM Enter Gate **2552.4**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 4 cms
Total area of opening(s) = 12.57 m^2
Velocity through gate(s) = 0.32 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2552.38
Upstream water level = 2552.4

RM Enter Channel **2552.4**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 16 cms
Downstream channel invert = 2546.5
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 188.79 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on−line = 1
Total flow, all units = 16 cms
Depth downstream = 5.9 m
Bend loss = 0 m
Depth upstream = 5.9 m
Velocity = 0.08 m/s

Grit Channel to RM Pipe **2552.44**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 8 cms

Section Description	**Water Surface Elevation**

Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on−line = 2
Total flow, all units = 16 cms
Friction loss = 0 m
Fitting loss = 0.04 m
Total loss = 0.04 m
0

Junction Tank Grit Channel **2552.44**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 8 cms
Downstream channel invert = 2547
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 245.91 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.148 m
Units on−line = 2
Total flow, all units = 16 cms
Depth downstream = 5.44 m
Bend loss = 0 m
Depth upstream = 5.44 m
Velocity = 0.03 m/s

Grit Weir **2553.29**

Weir invert (top of weir) = 2553.12
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 1.6 cms
Weir submergence = unsubmerged
Units on−line = 10
Total flow, all units = 16 cms
Head over weir = 0.17 m

Grit Channel **2553.29**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 1.14 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 49.73 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.155 m
Units on−line = 14
Total flow, all units = 16 cms
Depth downstream = 8.29 m
Bend loss = 0 m
Depth upstream = 8.29 m
Velocity = 0.02 m/s

Screening Exit Channel Gate **2553.31**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 1.6 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.4 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 16 cms
Gate loss = 0.02 m
Downstream water level = 2553.29
Upstream water level = 2553.31

Screen Channel 1 - 2 **2553.31**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.4 m
Flow = 1.33 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.67 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.316 m
Units on−line = 12

Section Description	Water Surface Elevation
Total flow, all units = 16 cms Depth downstream = 6.11 m Bend loss = 0 m Depth upstream = 6.11 m Velocity = 0.09 m/s	
Fine Screen	**2553.32**
Rack invert = 2548 Rack width = 1.8 m Channel width = 2 m Flow through rack = 1.6 cms Bar width = 5 mm Bar spacing = 10 mm Percent blocked = 0% Net rack open area = 6.38 m^2 Downstream depth = 5.31 m Velocity in channel = 0.15 m/s Velocity through bars = 0.25 m/s Units on−line = 10 Total flow, all units = 16 cms Rack head loss = 0 m	
Screen Channel 2 -3	**2553.32**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 6 m Channel width/diameter = 2.4 m Flow = 1.33 cms Downstream channel invert = 2547.2 Channel slope = 0 m/m Channel side slope = not applicable Area of flow = 14.68 m^2 Flow profile = Horizontal Normal depth = Infinite Critical depth = 0.316 m Units on−line = 12 Total flow, all units = 16 cms Depth downstream = 6.12 m Bend loss = 0 m Depth upstream = 6.12 m Velocity = 0.09 m/s	
Medium Screen	**2553.32**
Rack invert = 2548 Rack width = 1.8 m Channel width = 2 m Flow through rack = 1.6 cms Bar width = 10 mm	

Section Description	**Water Surface Elevation**

Bar spacing = 30 mm
Percent blocked = 0%
Net rack open area = 7.18 m^2
Downstream depth = 5.32 m
Velocity in channel = 0.15 m/s
Velocity through bars = 0.22 m/s
Units on−line = 10
Total flow, all units = 16 cms
Rack head loss = 0 m

Screen Channel 3 - 4 **2553.32**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.4 m
Flow = 1.33 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 13.25 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.316 m
Units on−line = 12
Total flow, all units = 16 cms
Depth downstream = 5.52 m
Bend loss = 0 m
Depth upstream = 5.52 m
Velocity = 0.1 m/s

Screening Enter Channel Gate **2553.34**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 1.6 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.4 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 16 cms
Gate loss = 0.02 m
Downstream water level = 2553.32
Upstream water level = 2553.34

Screening Distribution Channel **2553.35**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 8 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 232.29 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.155 m
Units on−line = 2
Total flow, all units = 16 cms
Depth downstream = 5.54 m
Bend loss = 0 m
Depth upstream = 5.55 m
Velocity = 0.03 m/s

Initial Pipe **2553.38**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 14 m^2
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on−line = 2
Total flow, all units = 16 cms
Friction loss = 0 m
Fitting loss = 0.03 m
Total loss = 0.03 m
0

Initial Gate **2553.4**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 20 m^2
Velocity through gate(s) = 0.4 m/s

Section Description	**Water Surface Elevation**

Flow behavior = orifice, downstream control
Units on−line = 2
Total flow, all units = 16 cms
Gate loss = 0.02 m
Downstream water level = 2553.38
Upstream water level = 2553.4

Inicial Junction Tank **2553.4**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 16 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 185.04 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.347 m
Units on−line = 1
Total flow, all units = 16 cms
Depth downstream = 7.4 m
Bend loss = 0 m
Depth upstream = 7.4 m
Velocity = 0.09 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
21.4 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation
Starting water surface elevation	**2543.29**
Exit Pipe	**2543.41**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 10.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m^2
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.89 m/s
Units on−line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.06 m
Fitting loss = 0.06 m
Total loss = 0.12 m
0

Chlorination Exit Tank **2543.41**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 21.4 cms
Downstream channel invert = 2540.45
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 457.24 m^2
Flow profile = Mild
Normal depth = 0.36 m
Critical depth = 0.125 m
Units on−line = 1

Section Description	**Water Surface Elevation**
Total flow, all units = 21.4 cms Depth downstream = 2.96 m Bend loss = 0 m Depth upstream = 2.96 m Velocity = 0.05 m/s	
Chlorination Tank Weir	**2544.1**
Weir invert (top of weir) = 2543.84 Weir length = 23 m Weir height = 5.1 m Weir 'C' coefficient = 1.794 Flow over weir = 5.35 cms Weir submergence = unsubmerged Units on−line = 4 Total flow, all units = 21.4 cms Head over weir = 0.26 m	
Chlorination Tank	**2544.1**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 356.5 m Channel width/diameter = 8 m Flow = 5.35 cms Downstream channel invert = 2540 Channel slope = 0.0001 m/m Channel side slope = not applicable Area of flow = 32.62 m^2 Flow profile = Mild Normal depth = 1.01 m Critical depth = 0.358 m Units on−line = 4 Total flow, all units = 21.4 cms Depth downstream = 4.1 m Bend loss = 0 m Depth upstream = 4.06 m Velocity = 0.16 m/s	
Chlorination Tank - Enter Gate	**2544.1**
Opening type = rectangular gate Opening diameter/width = 8000 mm Gate height = 4000 mm Invert = 2540 Number of gates = 1 Flow through gate(s) = 5.35 cms Total area of opening(s) = 32 m^2 Velocity through gate(s) = 0.17 m/s Flow behavior = orifice, downstream control Units on−line = 4	

Section Description **Water Surface Elevation**

Total flow, all units = 21.4 cms
Gate loss = 0 m
Downstream water level = 2544.1
Upstream water level = 2544.1

Chlorination Enter Tank **2544.1**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 21.4 cms
Downstream channel invert = 2540
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 377.23 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.177 m
Units on−line = 1
Total flow, all units = 21.4 cms
Depth downstream = 4.1 m
Bend loss = 0 m
Depth upstream = 4.1 m
Velocity = 0.06 m/s

Secondary Clarifier - Chlorination Pipe **2544.3**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 10.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.02 m/s
Units on−line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.12 m
Fitting loss = 0.08 m
Total loss = 0.2 m
0

Secondary Clarifier Exit Pipe **2544.39**

Pipe shape = Circular

Section Description	Water Surface Elevation

Diameter = 1500 mm
Length = 117 m
Flow = 1.34 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on–line = 16
Total flow, all units = 21.4 cms
Friction loss = 0.04 m
Fitting loss = 0.05 m
Total loss = 0.09 m

2 Clarifier Orifice **2544.47**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 1.34 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.76 m/s
Flow behavior = orifice, downstream control
Units on–line = 16
Total flow, all units = 21.4 cms
Orifice loss = 0.08 m
Downstream water level = 2544.39
Upstream water level = 2544.47

Launder Channel 2 C **2544.64**

Launder invert = 2544
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.67 cms
Critical depth = 0.27 m
Units on–line = 32
Total flow, all units = 21.4 cms
Downstream depth = 0.47 m
Upstream depth = 0.27 m

Weir 2 Clarifier **2545.15**

Invert of V notch = 2545.09
Angle of V notch = 90 degrees

Section Description **Water Surface Elevation**

Number of notches = 911
Total flow over weir = 1.07 cms
Weir submergence = unsubmerged
Units on−line = 20
Total flow, all units = 21.4 cms
Head over weir = 0.06 m

2 Clarifier Enter Pipe **2545.27**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 1.91 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.08 m/s
Units on−line = 16
Total flow, all units = 30.6 cms
Friction loss = 0.04 m
Fitting loss = 0.09 m
Total loss = 0.13 m

Gate Clarifier Distribution Box **2545.28**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 1.91 cms
Total area of opening(s) = 6 m^2
Velocity through gate(s) = 0.32 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 30.6 cms
Gate loss = 0.01 m
Downstream water level = 2545.27
Upstream water level = 2545.28

Box 2 Weir **2545.92**

Weir invert (top of weir) = 2545.43
Weir length = 3.05 m
Weir height = 5.04 m
Weir 'C' coefficient = 1.807
Flow over weir = 1.91 cms

Section Description	**Water Surface Elevation**

Weir submergence = unsubmerged
Units on–line = 16
Total flow, all units = 30.6 cms
Head over weir = 0.49 m

Enter Pipe BOX 2 **2546.04**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 120.4 m
Flow = 7.64 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m^2
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 1.02 m/s
Units on–line = 4
Total flow, all units = 30.6 cms
Friction loss = 0.04 m
Fitting loss = 0.08 m
Total loss = 0.11 m
0

General Box 2 Gate **2546.05**

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1
Flow through gate(s) = 5.35 cms
Total area of opening(s) = 21 m^2
Velocity through gate(s) = 0.25 m/s
Flow behavior = orifice, downstream control
Units on–line = 4
Total flow, all units = 21.4 cms
Gate loss = 0.01 m
Downstream water level = 2546.04
Upstream water level = 2546.05

General box 2 Weir **2546.95**

Weir invert (top of weir) = 2546.28
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 7.64 cms

Section Description	**Water Surface Elevation**

Weir submergence = unsubmerged
Units on–line = 4
Total flow, all units = 30.6 cms
Head over weir = 0.67 m

Aeration Exit pipe	**2547.29**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 25.99 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 1.24 m/s
Units on–line = 1
Total flow, all units = 26 cms
Friction loss = 0.22 m
Fitting loss = 0.12 m
Total loss = 0.34 m
0

Aeration Exit Channel	**2547.29**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 5.1 cms
Downstream channel invert = 2542
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 19.92 m^2
Flow profile = Mild
Normal depth = 0.62 m
Critical depth = 0.55 m
Units on–line = 6
Total flow, all units = 30.6 cms
Depth downstream = 5.29 m
Bend loss = 0 m
Depth upstream = 4.67 m
Velocity = 0.24 m/s

AB Tank Weir	**2547.87**

Weir invert (top of weir) = 2547.79

Section Description | **Water Surface Elevation**

Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.27 cms
Weir submergence = unsubmerged
Units on–line = 24
Total flow, all units = 30.5 cms
Head over weir = 0.08 m

Aeration Basin **2547.87**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.27 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 97.56 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.111 m
Units on–line = 24
Total flow, all units = 30.6 cms
Depth downstream = 8.87 m
Bend loss = 0 m
Depth upstream = 8.87 m
Velocity = 0.01 m/s

Aeration Enter Gate **2547.87**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.27 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.11 m/s
Flow behavior = orifice, downstream control
Units on–line = 24
Total flow, all units = 30.6 cms
Gate loss = 0 m
Downstream water level = 2547.87
Upstream water level = 2547.87

AB Distribution Pipe **2548.05**

Pipe shape = Circular
Diameter = 1200 mm

Section Description	Water Surface Elevation

Length = 77 m
Flow = 1.27 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m^2
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on–line = 24
Total flow, all units = 30.6 cms
Friction loss = 0.08 m
Fitting loss = 0.1 m
Total loss = 0.18 m
Total loss = 0.17 m
0

AB Distribution Box Gate — **2548.06**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.27 cms
Total area of opening(s) = 6.5 m^2
Velocity through gate(s) = 0.2 m/s
Flow behavior = orifice, downstream control
Units on–line = 24
Total flow, all units = 30.6 cms
Gate loss = 0.01 m
Downstream water level = 2548.05
Upstream water level = 2548.06

AB Distribution Box Weir — **2548.61**

Weir invert (top of weir) = 2548.24
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815
Flow over weir = 1.27 cms
Weir submergence = unsubmerged
Units on–line = 24
Total flow, all units = 30.5 cms
Head over weir = 0.38 m

Aeration Enter Pipe — **2548.74**

Pipe shape = Rectangular
Height = 2500 mm

Section Description	**Water Surface Elevation**

Width = 3500 mm
Length = 375 m
Flow = 7.13 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m^2
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.82 m/s
Units on−line = 3
Total flow, all units = 21.4 cms
Friction loss = 0.06 m
Fitting loss = 0.06 m
Total loss = 0.13 m
0

General aeration box Weir Gate **2548.81**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 7.13 cms
Total area of opening(s) = 10 m^2
Velocity through gate(s) = 0.71 m/s
Flow behavior = orifice, downstream control
Units on−line = 3
Total flow, all units = 21.4 cms
Gate loss = 0.07 m
Downstream water level = 2548.74
Upstream water level = 2548.81

General Aeration Box Weir **2549.79**

Weir invert (top of weir) = 2549.15
Weir length = 7.62 m
Weir height = 3 m
Weir 'C' coefficient = 1.846
Flow over weir = 7.13 cms
Weir submergence = unsubmerged
Units on−line = 3
Total flow, all units = 21.4 cms
Head over weir = 0.64 m

Clarifier Junction Exit Pipe **2549.96**

Pipe shape = Rectangular
Height = 3500 mm

Section Description	**Water Surface Elevation**

Width = 3500 mm
Length = 652 m
Flow = 10.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.87 m/s
Units on−line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.1 m
Fitting loss = 0.07 m
Total loss = 0.17 m
0

Clarifier Exit Pipe **2550.05**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 1.34 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on−line = 16
Total flow, all units = 21.4 cms
Friction loss = 0.04 m
Fitting loss = 0.05 m
Total loss = 0.09 m

Clarifier Orifice **2550.13**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 1.34 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.76 m/s
Flow behavior = orifice, downstream control
Units on−line = 16

Section Description	**Water Surface Elevation**

Total flow, all units = 21.4 cms
Orifice loss = 0.08 m
Downstream water level = 2550.05
Upstream water level = 2550.13

Clarifier Launder — **2550.19**

Launder invert = 2549.5
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.67 cms
Critical depth = 0.27 m
Units on−line = 32
Total flow, all units = 21.4 cms
Downstream depth = 0.63 m
Upstream depth = 0.36 m

Weir Clarifier — **2550.86**

Invert of V notch = 2550.79
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 1.34 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 21.4 cms
Head over weir = 0.07 m

Clarifier Enter Pipe — **2550.92**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 1.34 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on−line = 16
Total flow, all units = 21.4 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m

Distribution Box Gate — **2550.93**

Opening type = rectangular gate

Section Description	**Water Surface Elevation**

Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 1.34 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.3 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 21.4 cms
Gate loss = 0.01 m
Downstream water level = 2550.92
Upstream water level = 2550.93

Box 1 Weir **2551.44**

Weir invert (top of weir) = 2551.05
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 1.34 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 21.4 cms
Head over weir = 0.39 m

Enter Pipe BOX 1 **2551.53**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 5.35 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2
Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.86 m/s
Units on−line = 4
Total flow, all units = 21.4 cms
Friction loss = 0.03 m
Fitting loss = 0.06 m
Total loss = 0.09 m
0

General Box Gate **2551.54**

Opening type = rectangular gate

Section Description	Water Surface Elevation

Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 5.35 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.3 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 21.4 cms
Gate loss = 0.01 m
Downstream water level = 2551.53
Upstream water level = 2551.54

General box 1 Weir **2552.42**

Weir invert (top of weir) = 2551.81
Weir length = 6.1 m
Weir height = 3 m
Weir ′C′ coefficient = 1.843
Flow over weir = 5.35 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 21.4 cms
Head over weir = 0.61 m

R Mix to Clarifiers Pipe **2552.53**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 10.7 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.02 m/s
Units on−line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.04 m
Fitting loss = 0.08 m
Total loss = 0.11 m
0

RM Exit Channel **2552.53**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 21.4 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 208.98 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.358 m
Units on−line = 1
Total flow, all units = 21.4 cms
Depth downstream = 6.53 m
Bend loss = 0 m
Depth upstream = 6.53 m
Velocity = 0.1 m/s

RM Exit Gate **2552.53**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 5.35 cms
Total area of opening(s) = 50.27 m^2
Velocity through gate(s) = 0.11 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 21.4 cms
Gate loss = 0 m
Downstream water level = 2552.53
Upstream water level = 2552.53

RM **2552.54**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 5.35 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 60.27 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.358 m
Units on−line = 4

Section Description	Water Surface Elevation

Total flow, all units = 21.4 cms
Depth downstream = 7.53 m
Bend loss = 0 m
Depth upstream = 7.54 m
Velocity = 0.09 m/s

RM Enter Gate **2552.56**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 5.35 cms
Total area of opening(s) = 12.57 m^2
Velocity through gate(s) = 0.43 m/s
Flow behavior = orifice, downstream control
Units on–line = 4
Total flow, all units = 21.4 cms
Gate loss = 0.03 m
Downstream water level = 2552.54
Upstream water level = 2552.56

RM Enter Channel **2552.56**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 21.4 cms
Downstream channel invert = 2546.5
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 193.98 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.358 m
Units on–line = 1
Total flow, all units = 21.4 cms
Depth downstream = 6.06 m
Bend loss = 0 m
Depth upstream = 6.06 m
Velocity = 0.11 m/s

Grit Channel to RM Pipe **2552.64**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 10.7 cms

Section Description	Water Surface Elevation

Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.87 m/s
Units on−line = 2
Total flow, all units = 21.4 cms
Friction loss = 0.01 m
Fitting loss = 0.07 m
Total loss = 0.08 m
0

Junction Tank Grit Channel **2552.64**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 10.7 cms
Downstream channel invert = 2547
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 254.95 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.179 m
Units on−line = 2
Total flow, all units = 21.4 cms
Depth downstream = 5.64 m
Bend loss = 0 m
Depth upstream = 5.64 m
Velocity = 0.04 m/s

Grit Weir **2553.32**

Weir invert (top of weir) = 2553.12
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 2.14 cms
Weir submergence = unsubmerged
Units on−line = 10
Total flow, all units = 21.4 cms
Head over weir = 0.2 m

Grit Channel **2553.33**

Channel shape = Rectangular

Section Description | **Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 1.53 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 49.95 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.188 m
Units on−line = 14
Total flow, all units = 21.4 cms
Depth downstream = 8.32 m
Bend loss = 0 m
Depth upstream = 8.33 m
Velocity = 0.03 m/s

Screening Exit Channel Gate **2553.36**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 2.14 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.54 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 21.4 cms
Gate loss = 0.04 m
Downstream water level = 2553.33
Upstream water level = 2553.36

Screen Channel 1 - 2 **2553.37**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.4 m
Flow = 1.78 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.79 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.384 m
Units on−line = 12

Section Description	**Water Surface Elevation**

Total flow, all units = 21.4 cms
Depth downstream = 6.16 m
Bend loss = 0 m
Depth upstream = 6.17 m
Velocity = 0.12 m/s

Fine Screen **2553.37**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 2.14 cms
Bar width = 5 mm
Bar spacing = 10 mm
Percent blocked = 0%
Net rack open area = 6.44 m^2
Downstream depth = 5.37 m
Velocity in channel = 0.2 m/s
Velocity through bars = 0.33 m/s
Units on−line = 10
Total flow, all units = 21.4 cms
Rack head loss = 0.01 m

Screen Channel 2 -3 **2553.37**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.4 m
Flow = 1.78 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 14.81 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.384 m
Units on−line = 12
Total flow, all units = 21.4 cms
Depth downstream = 6.17 m
Bend loss = 0 m
Depth upstream = 6.17 m
Velocity = 0.12 m/s

Medium Screen **2553.38**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 2.14 cms
Bar width = 10 mm

Section Description | **Water Surface Elevation**

Bar spacing = 30 mm
Percent blocked = 0%
Net rack open area = 7.25 m^2
Downstream depth = 5.37 m
Velocity in channel = 0.2 m/s
Velocity through bars = 0.3 m/s
Units on−line = 10
Total flow, all units = 21.4 cms
Rack head loss = 0 m

Screen Channel 3 - 4 **2553.38**
Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.4 m
Flow = 1.78 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 13.38 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.384 m
Units on−line = 12
Total flow, all units = 21.4 cms
Depth downstream = 5.58 m
Bend loss = 0 m
Depth upstream = 5.58 m
Velocity = 0.13 m/s

Screening Enter Channel Gate **2553.42**
Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 2.14 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.54 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 21.4 cms
Gate loss = 0.04 m
Downstream water level = 2553.38
Upstream water level = 2553.42

Screening Distribution Channel **2553.42**
Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 10.7 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 235.34 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.188 m
Units on−line = 2
Total flow, all units = 21.4 cms
Depth downstream = 5.62 m
Bend loss = 0 m
Depth upstream = 5.62 m
Velocity = 0.05 m/s

Initial Pipe **2553.47**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 10.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 14 m^2
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on−line = 2
Total flow, all units = 21.4 cms
Friction loss = 0 m
Fitting loss = 0.05 m
Total loss = 0.05 m
0

Initial Gate **2553.51**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 10.7 cms
Total area of opening(s) = 20 m^2
Velocity through gate(s) = 0.53 m/s

Section Description	**Water Surface Elevation**

Flow behavior = orifice, downstream control
Units on–line = 2
Total flow, all units = 21.4 cms
Gate loss = 0.04 m
Downstream water level = 2553.47
Upstream water level = 2553.51

Inicial Junction Tank **2553.51**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 21.4 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 187.71 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.422 m
Units on–line = 1
Total flow, all units = 21.4 cms
Depth downstream = 7.51 m
Bend loss = 0 m
Depth upstream = 7.51 m
Velocity = 0.11 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
32 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation

Starting water surface elevation **2543.56**

Exit Pipe **2543.82**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m^2
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 1.33 m/s
Units on–line = 2
Total flow, all units = 32 cms
Friction loss = 0.13 m
Fitting loss = 0.14 m
Total loss = 0.26 m
0

Chlorination Exit Tank **2543.82**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 32 cms
Downstream channel invert = 2540.45
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 520.61 m^2
Flow profile = Mild
Normal depth = 0.46 m
Critical depth = 0.164 m
Units on–line = 1

Section Description	Water Surface Elevation

Total flow, all units = 32 cms
Depth downstream = 3.37 m
Bend loss = 0 m
Depth upstream = 3.37 m
Velocity = 0.06 m/s

Chlorination Tank Weir **2544.17**

Weir invert (top of weir) = 2543.84
Weir length = 23 m
Weir height = 5.1 m
Weir 'C' coefficient = 1.794
Flow over weir = 8 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 32 cms
Head over weir = 0.33 m

Chlorination Tank **2544.18**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 356.5 m
Channel width/diameter = 8 m
Flow = 8 cms
Downstream channel invert = 2540
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 33.26 m^2
Flow profile = Mild
Normal depth = 1.32 m
Critical depth = 0.467 m
Units on−line = 4
Total flow, all units = 32 cms
Depth downstream = 4.17 m
Bend loss = 0 m
Depth upstream = 4.14 m
Velocity = 0.24 m/s

Chlorination Tank - Enter Gate **2544.19**

Opening type = rectangular gate
Opening diameter/width = 8000 mm
Gate height = 4000 mm
Invert = 2540
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 32 m^2
Velocity through gate(s) = 0.25 m/s
Flow behavior = orifice, downstream control
Units on−line = 4

Section Description	**Water Surface Elevation**

Total flow, all units = 32 cms
Gate loss = 0.01 m
Downstream water level = 2544.18
Upstream water level = 2544.19

Chlorination Enter Tank **2544.19**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 32 cms
Downstream channel invert = 2540
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 385.18 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.231 m
Units on−line = 1
Total flow, all units = 32 cms
Depth downstream = 4.19 m
Bend loss = 0 m
Depth upstream = 4.19 m
Velocity = 0.08 m/s

Secondary Clarifier - Chlorination Pipe **2544.64**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.27 m
Fitting loss = 0.18 m
Total loss = 0.45 m
0

Secondary Clarifier Exit Pipe **2544.84**

Pipe shape = Circular

Section Description	Water Surface Elevation
Diameter = 1500 mm Length = 117 m Flow = 2 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.63 Pipe area = 1.767 m^2 Pipe hydraulic radius = 0.375 Age factor = 1 Solids factor = 1 Velocity = 1.13 m/s Units on−line = 16 Total flow, all units = 32 cms Friction loss = 0.09 m Fitting loss = 0.11 m Total loss = 0.2 m	
2 Clarifier Orifice	**2545.02**
Opening type = circular orifice Opening diameter/width = 1500 mm Opening height = not applicable Invert = 2540 Number of openings = 1 Flow through opening(s) = 2 cms Total area of opening(s) = 1.77 m^2 Velocity through opening(s) = 1.13 m/s Flow behavior = orifice, downstream control Units on−line = 16 Total flow, all units = 32 cms Orifice loss = 0.18 m Downstream water level = 2544.84 Upstream water level = 2545.02	
Launder Channel 2 C	**2545.07**
Launder invert = 2544 Launder length = 91 m Launder width = 1.5 m Launder slope = 0.004 m/m Flow through launder = 1 cms Critical depth = 0.36 m Units on−line = 32 Total flow, all units = 32 cms Downstream depth = 1.02 m Upstream depth = 0.71 m	
Weir 2 Clarifier	**2545.16**
Invert of V notch = 2545.09 Angle of V notch = 90 degrees	

Section Description	**Water Surface Elevation**

Number of notches = 911
Total flow over weir = 1.6 cms
Weir submergence = unsubmerged
Units on−line = 20
Total flow, all units = 32 cms
Head over weir = 0.07 m

2 Clarifier Enter Pipe **2545.39**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 2.57 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.46 m/s
Units on−line = 16
Total flow, all units = 41.2 cms
Friction loss = 0.06 m
Fitting loss = 0.16 m
Total loss = 0.23 m

Gate Clarifier Distribution Box **2545.41**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 2.57 cms
Total area of opening(s) = 6 m^2
Velocity through gate(s) = 0.43 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 41.2 cms
Gate loss = 0.02 m
Downstream water level = 2545.39
Upstream water level = 2545.41

Box 2 Weir **2546.03**

Weir invert (top of weir) = 2545.43
Weir length = 3.05 m
Weir height = 5.04 m
Weir ′C′ coefficient = 1.807
Flow over weir = 2.57 cms

Section Description	**Water Surface Elevation**
Weir submergence = unsubmerged Units on−line = 16 Total flow, all units = 41.2 cms Head over weir = 0.6 m	
Enter Pipe BOX 2	**2546.24**
Pipe shape = Rectangular Height = 2500 mm Width = 3000 mm Length = 120.4 m Flow = 10.3 cms Friction method = Manning′s Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 7.5 m^2 Pipe hydraulic radius = 0.682 Age factor = 1 Solids factor = 1 Velocity = 1.37 m/s Units on−line = 4 Total flow, all units = 41.2 cms Friction loss = 0.06 m Fitting loss = 0.14 m Total loss = 0.21 m 0	
General Box 2 Gate	**2546.26**
Opening type = rectangular gate Opening diameter/width = 7000 mm Gate height = 3000 mm Invert = 2542 Number of gates = 1 Flow through gate(s) = 8 cms Total area of opening(s) = 21 m^2 Velocity through gate(s) = 0.38 m/s Flow behavior = orifice, downstream control Units on−line = 4 Total flow, all units = 32 cms Gate loss = 0.02 m Downstream water level = 2546.24 Upstream water level = 2546.26	
General box 2 Weir	**2547.1**
Weir invert (top of weir) = 2546.28 Weir length = 7.62 m Weir height = 4 m Weir ′C′ coefficient = 1.828 Flow over weir = 10.3 cms	

Section Description	**Water Surface Elevation**

Weir submergence = unsubmerged
Units on–line = 4
Total flow, all units = 41.2 cms
Head over weir = 0.82 m

Aeration Exit pipe **2547.77**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 36.59 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 1.74 m/s
Units on–line = 1
Total flow, all units = 36.6 cms
Friction loss = 0.44 m
Fitting loss = 0.23 m
Total loss = 0.67 m
0

Aeration Exit Channel **2547.77**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 6.87 cms
Downstream channel invert = 2542
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 21.84 m^2
Flow profile = Mild
Normal depth = 0.75 m
Critical depth = 0.67 m
Units on–line = 6
Total flow, all units = 41.2 cms
Depth downstream = 5.77 m
Bend loss = 0 m
Depth upstream = 5.15 m
Velocity = 0.3 m/s

AB Tank Weir **2547.89**

Weir invert (top of weir) = 2547.79

Section Description | **Water Surface Elevation**

Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.71 cms
Weir submergence = unsubmerged
Units on–line = 24
Total flow, all units = 41.1 cms
Head over weir = 0.1 m

Aeration Basin **2547.89**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.71 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 97.75 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.136 m
Units on–line = 24
Total flow, all units = 41.1 cms
Depth downstream = 8.89 m
Bend loss = 0 m
Depth upstream = 8.89 m
Velocity = 0.02 m/s

Aeration Enter Gate **2547.89**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.71 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.14 m/s
Flow behavior = orifice, downstream control
Units on–line = 24
Total flow, all units = 41.2 cms
Gate loss = 0 m
Downstream water level = 2547.89
Upstream water level = 2547.89

AB Distribution Pipe **2548.21**

Pipe shape = Circular
Diameter = 1200 mm

Section Description	**Water Surface Elevation**

Length = 77 m
Flow = 1.71 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m^2
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on−line = 24
Total flow, all units = 41.1 cms
Friction loss = 0.15 m
Fitting loss = 0.18 m
Total loss = 0.32 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2548.22**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.71 cms
Total area of opening(s) = 6.5 m^2
Velocity through gate(s) = 0.26 m/s
Flow behavior = orifice, downstream control
Units on−line = 24
Total flow, all units = 41.2 cms
Gate loss = 0.01 m
Downstream water level = 2548.21
Upstream water level = 2548.22

AB Distribution Box Weir **2548.7**

Weir invert (top of weir) = 2548.24
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815
Flow over weir = 1.71 cms
Weir submergence = unsubmerged
Units on−line = 24
Total flow, all units = 41.1 cms
Head over weir = 0.46 m

Aeration Enter Pipe **2548.98**

Pipe shape = Rectangular
Height = 2500 mm

Section Description	**Water Surface Elevation**

Width = 3500 mm
Length = 375 m
Flow = 10.67 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m^2
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 1.22 m/s
Units on−line = 3
Total flow, all units = 32 cms
Friction loss = 0.14 m
Fitting loss = 0.14 m
Total loss = 0.28 m
0

General aeration box Weir Gate **2549.13**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 10.67 cms
Total area of opening(s) = 10 m^2
Velocity through gate(s) = 1.07 m/s
Flow behavior = orifice, downstream control
Units on−line = 3
Total flow, all units = 32 cms
Gate loss = 0.15 m
Downstream water level = 2548.98
Upstream water level = 2549.13

General Aeration Box Weir **2549.98**

Weir invert (top of weir) = 2549.15
Weir length = 7.62 m
Weir height = 3 m
Weir 'C' coefficient = 1.846
Flow over weir = 10.67 cms
Weir submergence = unsubmerged
Units on−line = 3
Total flow, all units = 32 cms
Head over weir = 0.83 m

Clarifier Junction Exit Pipe **2550.36**

Pipe shape = Rectangular
Height = 3500 mm

Section Description | **Water Surface Elevation**

Width = 3500 mm
Length = 652 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 1.31 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.22 m
Fitting loss = 0.16 m
Total loss = 0.38 m
0

Clarifier Exit Pipe **2550.56**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on−line = 16
Total flow, all units = 32 cms
Friction loss = 0.08 m
Fitting loss = 0.12 m
Total loss = 0.2 m

Clarifier Orifice **2550.74**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 2 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 1.13 m/s
Flow behavior = orifice, downstream control
Units on−line = 16

Section Description	Water Surface Elevation

Total flow, all units = 32 cms
Orifice loss = 0.18 m
Downstream water level = 2550.56
Upstream water level = 2550.74

Clarifier Launder — **2550.77**

Launder invert = 2549.5
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 1 cms
Critical depth = 0.36 m
Units on−line = 32
Total flow, all units = 32 cms
Downstream depth = 1.24 m
Upstream depth = 0.95 m

Weir Clarifier — **2550.87**

Invert of V notch = 2550.79
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 2 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 32 cms
Head over weir = 0.08 m

Clarifier Enter Pipe — **2551**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on−line = 16
Total flow, all units = 32 cms
Friction loss = 0.04 m
Fitting loss = 0.1 m
Total loss = 0.13 m

Distribution Box Gate — **2551.03**

Opening type = rectangular gate

Section Description | **Water Surface Elevation**

Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 2 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.44 m/s
Flow behavior = orifice, downstream control
Units on−line = 16
Total flow, all units = 32 cms
Gate loss = 0.03 m
Downstream water level = 2551
Upstream water level = 2551.03

Box 1 Weir — **2551.56**

Weir invert (top of weir) = 2551.05
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 2 cms
Weir submergence = unsubmerged
Units on−line = 16
Total flow, all units = 32 cms
Head over weir = 0.51 m

Enter Pipe BOX 1 — **2551.76**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2
Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 1.28 m/s
Units on−line = 4
Total flow, all units = 32 cms
Friction loss = 0.06 m
Fitting loss = 0.14 m
Total loss = 0.2 m
0

General Box Gate — **2551.79**

Opening type = rectangular gate

Section Description	**Water Surface Elevation**

Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.44 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 32 cms
Gate loss = 0.03 m
Downstream water level = 2551.76
Upstream water level = 2551.79

General box 1 Weir **2552.61**

Weir invert (top of weir) = 2551.81
Weir length = 6.1 m
Weir height = 3 m
Weir ′C′ coefficient = 1.843
Flow over weir = 8 cms
Weir submergence = unsubmerged
Units on−line = 4
Total flow, all units = 32 cms
Head over weir = 0.8 m

R Mix to Clarifiers Pipe **2552.86**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 16 cms
Friction method = Manning′s Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.08 m
Fitting loss = 0.18 m
Total loss = 0.26 m
0

RM Exit Channel **2552.86**

Channel shape = Rectangular

Section Description	Water Surface Elevation

Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 32 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 219.54 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on−line = 1
Total flow, all units = 32 cms
Depth downstream = 6.86 m
Bend loss = 0 m
Depth upstream = 6.86 m
Velocity = 0.15 m/s

RM Exit Gate **2552.87**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 8 cms
Total area of opening(s) = 50.27 m^2
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 32 cms
Gate loss = 0 m
Downstream water level = 2552.86
Upstream water level = 2552.87

RM **2552.87**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 8 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 62.93 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on−line = 4

Section Description	Water Surface Elevation

Total flow, all units = 32 cms
Depth downstream = 7.87 m
Bend loss = 0 m
Depth upstream = 7.87 m
Velocity = 0.13 m/s

RM Enter Gate **2552.93**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 8 cms
Total area of opening(s) = 12.57 m^2
Velocity through gate(s) = 0.64 m/s
Flow behavior = orifice, downstream control
Units on−line = 4
Total flow, all units = 32 cms
Gate loss = 0.06 m
Downstream water level = 2552.87
Upstream water level = 2552.93

RM Enter Channel **2552.93**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 32 cms
Downstream channel invert = 2546.5
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 205.62 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on−line = 1
Total flow, all units = 32 cms
Depth downstream = 6.43 m
Bend loss = 0 m
Depth upstream = 6.43 m
Velocity = 0.16 m/s

Grit Channel to RM Pipe **2553.1**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 16 cms

Section Description	**Water Surface Elevation**

Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 1.31 m/s
Units on−line = 2
Total flow, all units = 32 cms
Friction loss = 0.02 m
Fitting loss = 0.16 m
Total loss = 0.17 m
0

Junction Tank Grit Channel **2553.1**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 16 cms
Downstream channel invert = 2547
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 275.75 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.234 m
Units on−line = 2
Total flow, all units = 32 cms
Depth downstream = 6.1 m
Bend loss = 0 m
Depth upstream = 6.1 m
Velocity = 0.06 m/s

Grit Weir **2553.39**

Weir invert (top of weir) = 2553.12
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 3.2 cms
Weir submergence = unsubmerged
Units on−line = 10
Total flow, all units = 32 cms
Head over weir = 0.27 m

Grit Channel **2553.39**

Channel shape = Rectangular

Section Description	**Water Surface Elevation**

Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 2.29 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 50.33 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.246 m
Units on−line = 14
Total flow, all units = 32 cms
Depth downstream = 8.39 m
Bend loss = 0 m
Depth upstream = 8.39 m
Velocity = 0.05 m/s

Screening Exit Channel Gate **2553.47**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 3.2 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.8 m/s
Flow behavior = orifice, downstream control
Units on−line = 10
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2553.39
Upstream water level = 2553.47

Screen Channel 1 - 2 **2553.48**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.4 m
Flow = 2.67 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 15.06 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.501 m
Units on−line = 12

Section Description	Water Surface Elevation

Total flow, all units = 32 cms
Depth downstream = 6.27 m
Bend loss = 0 m
Depth upstream = 6.28 m
Velocity = 0.18 m/s

Fine Screen **2553.49**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 3.2 cms
Bar width = 5 mm
Bar spacing = 10 mm
Percent blocked = 0%
Net rack open area = 6.57 m^2
Downstream depth = 5.48 m
Velocity in channel = 0.29 m/s
Velocity through bars = 0.49 m/s
Units on−line = 10
Total flow, all units = 32 cms
Rack head loss = 0.01 m

Screen Channel 2 -3 **2553.49**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.4 m
Flow = 2.67 cms
Downstream channel invert = 2547.2
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 15.09 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.501 m
Units on−line = 12
Total flow, all units = 32 cms
Depth downstream = 6.29 m
Bend loss = 0 m
Depth upstream = 6.29 m
Velocity = 0.18 m/s

Medium Screen **2553.5**

Rack invert = 2548
Rack width = 1.8 m
Channel width = 2 m
Flow through rack = 3.2 cms
Bar width = 10 mm

Section Description	Water Surface Elevation

Bar spacing = 30 mm
Percent blocked = 0%
Net rack open area = 7.41 m^2
Downstream depth = 5.49 m
Velocity in channel = 0.29 m/s
Velocity through bars = 0.43 m/s
Units on–line = 10
Total flow, all units = 32 cms
Rack head loss = 0.01 m

Screen Channel 3 - 4 **2553.5**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.4 m
Flow = 2.67 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 13.67 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.501 m
Units on–line = 12
Total flow, all units = 32 cms
Depth downstream = 5.7 m
Bend loss = 0 m
Depth upstream = 5.7 m
Velocity = 0.2 m/s

Screening Enter Channel Gate **2553.58**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 3.2 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.8 m/s
Flow behavior = orifice, downstream control
Units on–line = 10
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2553.5
Upstream water level = 2553.58

Screening Distribution Channel **2553.59**

Channel shape = Rectangular

Section Description	Water Surface Elevation

Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 16 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 242.34 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.246 m
Units on–line = 2
Total flow, all units = 32 cms
Depth downstream = 5.78 m
Bend loss = 0 m
Depth upstream = 5.79 m
Velocity = 0.07 m/s

Initial Pipe **2553.71**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 14 m^2
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 1.14 m/s
Units on–line = 2
Total flow, all units = 32 cms
Friction loss = 0.01 m
Fitting loss = 0.11 m
Total loss = 0.12 m
0

Initial Gate **2553.79**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 16 cms
Total area of opening(s) = 20 m^2
Velocity through gate(s) = 0.8 m/s

Section Description	**Water Surface Elevation**

Flow behavior = orifice, downstream control
Units on−line = 2
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2553.71
Upstream water level = 2553.79

Inicial Junction Tank	**2553.8**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 32 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 194.89 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.551 m
Units on−line = 1
Total flow, all units = 32 cms
Depth downstream = 7.79 m
Bend loss = 0 m
Depth upstream = 7.8 m
Velocity = 0.16 m/s

Anexo 3.3. Perfil hidráulico alternativa 1 Cota de inicio 2540.23

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
13.6 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation
Starting water surface elevation	**2540.88**
Exit Pipe	**2540.92**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 227.5 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m²
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.04 m
0

Chlorination Exit Tank **2540.92**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 13.6 cms
Downstream channel invert = 2538.63
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 353.73 m²
Flow profile = Mild
Normal depth = 0.28 m
Critical depth = 0.093 m

Section Description	Water Surface Elevation
Units on-line = 1	
Total flow, all units = 13.6 cms	
Depth downstream = 2.29 m	
Bend loss = 0 m	
Depth upstream = 2.29 m	
Velocity = 0.04 m/s	
Chlorination Tank Weir	**2541.84**
Weir invert (top of weir) = 2541.65	
Weir length = 23 m	
Weir height = 5.1 m	
Weir 'C' coefficient = 1.794	
Flow over weir = 3.4 cms	
Weir submergence = unsubmerged	
Units on-line = 4	
Total flow, all units = 13.6 cms	
Head over weir = 0.19 m	
Chlorination Tank	**2541.84**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 356.5 m	
Channel width/diameter = 8 m	
Flow = 3.4 cms	
Downstream channel invert = 2540	
Channel slope = 0.0001 m/m	
Channel side slope = not applicable	
Area of flow = 14.58 m^2	
Flow profile = Mild	
Normal depth = 0.76 m	
Critical depth = 0.264 m	
Units on-line = 4	
Total flow, all units = 13.6 cms	
Depth downstream = 1.84 m	
Bend loss = 0 m	
Depth upstream = 1.81 m	
Velocity = 0.23 m/s	
Chlorination Tank - Enter Gate	**2541.84**
Opening type = rectangular gate	
Opening diameter/width = 8000 mm	
Gate height = 4000 mm	
Invert = 2540	
Number of gates = 1	
Flow through gate(s) = 3.4 cms	
Total area of opening(s) = 32 m^2	
Velocity through gate(s) = 0.11 m/s	

Section Description	**Water Surface Elevation**

Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2541.84
Upstream water level = 2541.84

Chlorination Enter Tank **2541.85**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 13.6 cms
Downstream channel invert = 2539.02
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 259.9 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.131 m
Units on-line = 1
Total flow, all units = 13.6 cms
Depth downstream = 2.82 m
Bend loss = 0 m
Depth upstream = 2.83 m
Velocity = 0.05 m/s

Secondary Clarifier - Chlorination Pipe **2541.97**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 1003 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.09 m
Fitting loss = 0.03 m
Total loss = 0.13 m
0

Section Description	Water Surface Elevation
Secondary Clarifier Exit Pipe	**2542.01**

Pipe shape = Circular
Diameter = 1500 mm
Length = 118 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on-line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.04 m

2 Clarifier Orifice — **2542.04**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 0.85 cms
Total area of opening(s) = 1.77 m²
Velocity through opening(s) = 0.48 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 13.6 cms
Orifice loss = 0.03 m
Downstream water level = 2542.01
Upstream water level = 2542.04

Launder Channel 2 C — **2543.07**

Launder invert = 2542.5
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.43 cms
Critical depth = 0.2 m
Units on-line = 32
Total flow, all units = 13.6 cms
Downstream depth = 0.2 m
Upstream depth = 0.2 m

Section Description	**Water Surface Elevation**
Weir 2 Clarifier	**2543.35**

Invert of V notch = 2543.3
Angle of V notch = 90 degrees
Number of notches = 911
Total flow over weir = 0.85 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 13.6 cms
Head over weir = 0.05 m

2 Clarifier Enter Pipe	**2543.42**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 1.42 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.81 m/s
Units on-line = 16
Total flow, all units = 22.8 cms
Friction loss = 0.02 m
Fitting loss = 0.05 m
Total loss = 0.07 m

Gate Clarifier Distribution Box	**2543.43**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 1.42 cms
Total area of opening(s) = 6 m²
Velocity through gate(s) = 0.24 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 22.8 cms
Gate loss = 0.01 m
Downstream water level = 2543.42
Upstream water level = 2543.43

Box 2 Weir	**2544.06**

Section Description	**Water Surface Elevation**

Weir invert (top of weir) = 2543.65
Weir length = 3.05 m
Weir height = 5.04 m
Weir 'C' coefficient = 1.807
Flow over weir = 1.42 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 22.8 cms
Head over weir = 0.41 m

Enter Pipe BOX 2 **2544.15**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 285.5 m
Flow = 5.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m²
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 4
Total flow, all units = 22.8 cms
Friction loss = 0.05 m
Fitting loss = 0.04 m
Total loss = 0.09 m
0

General Box 2 Gate **2544.15**

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 21 m²
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2544.15
Upstream water level = 2544.15

Section Description	Water Surface Elevation
General box 2 Weir	**2545.15**

Weir invert (top of weir) = 2544.6
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 5.7 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 22.8 cms
Head over weir = 0.55 m

Aeration Exit pipe — **2545.25**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 336 m
Flow = 18.19 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 0.87 m/s
Units on-line = 1
Total flow, all units = 18.2 cms
Friction loss = 0.04 m
Fitting loss = 0.06 m
Total loss = 0.09 m
0

Aeration Exit Channel — **2545.25**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 3.8 cms
Downstream channel invert = 2542.8
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 8.57 m^2
Flow profile = Mild
Normal depth = 0.51 m
Critical depth = 0.452 m
Units on-line = 6
Total flow, all units = 22.8 cms

Section Description	**Water Surface Elevation**

Depth downstream = 2.45 m
Bend loss = 0 m
Depth upstream = 1.83 m
Velocity = 0.39 m/s

AB Tank Weir **2545.91**

Weir invert (top of weir) = 2545.85
Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 0.95 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 22.8 cms
Head over weir = 0.06 m

Aeration Basin **2545.92**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 0.95 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 76.06 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.091 m
Units on-line = 24
Total flow, all units = 22.8 cms
Depth downstream = 6.91 m
Bend loss = 0 m
Depth upstream = 6.92 m
Velocity = 0.01 m/s

Aeration Enter Gate **2545.92**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 0.95 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.08 m/s
Flow behavior = orifice, downstream control
Units on-line = 24

Section Description	**Water Surface Elevation**

Total flow, all units = 22.8 cms
Gate loss = 0 m
Downstream water level = 2545.92
Upstream water level = 2545.92

AB Distribution Pipe **2546.02**

Pipe shape = Circular
Diameter = 1200 mm
Length = 77 m
Flow = 0.95 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m²
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 0.84 m/s
Units on-line = 24
Total flow, all units = 22.8 cms
Friction loss = 0.05 m
Fitting loss = 0.05 m
Total loss = 0.1 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2546.02**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 0.95 cms
Total area of opening(s) = 6.5 m²
Velocity through gate(s) = 0.15 m/s
Flow behavior = orifice, downstream control
Units on-line = 24
Total flow, all units = 22.8 cms
Gate loss = 0 m
Downstream water level = 2546.02
Upstream water level = 2546.02

AB Distribution Box Weir **2546.61**

Weir invert (top of weir) = 2546.3
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815

Section Description	**Water Surface Elevation**

Flow over weir = 0.95 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 22.8 cms
Head over weir = 0.31 m

Aeration Enter Pipe **2546.66**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3500 mm
Length = 375 m
Flow = 4.53 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m²
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.52 m/s
Units on-line = 3
Total flow, all units = 13.6 cms
Friction loss = 0.03 m
Fitting loss = 0.02 m
Total loss = 0.05 m
0

General aeration box Weir Gate **2546.69**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 4.53 cms
Total area of opening(s) = 10 m²
Velocity through gate(s) = 0.45 m/s
Flow behavior = orifice, downstream control
Units on-line = 3
Total flow, all units = 13.6 cms
Gate loss = 0.03 m
Downstream water level = 2546.66
Upstream water level = 2546.69

General Aeration Box Weir **2547.68**

Weir invert (top of weir) = 2547.21
Weir length = 7.62 m
Weir height = 3 m

Section Description	Water Surface Elevation

Weir 'C' coefficient = 1.846
Flow over weir = 4.53 cms
Weir submergence = unsubmerged
Units on-line = 3
Total flow, all units = 13.6 cms
Head over weir = 0.47 m

Clarifier Junction Exit Pipe **2547.73**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 273 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.56 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m
0

Clarifier Exit Pipe **2547.76**

Pipe shape = Circular
Diameter = 1500 mm
Length = 81.6 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on-line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.02 m
Total loss = 0.03 m

Section Description	**Water Surface Elevation**

Clarifier Orifice **2547.79**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 0.85 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.48 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 13.6 cms
Orifice loss = 0.03 m
Downstream water level = 2547.76
Upstream water level = 2547.79

Clarifier Launder **2548.73**

Launder invert = 2548.2
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.43 cms
Critical depth = 0.2 m
Units on-line = 32
Total flow, all units = 13.6 cms
Downstream depth = 0.2 m
Upstream depth = 0.2 m

Weir Clarifier **2548.96**

Invert of V notch = 2548.9
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 0.85 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 13.6 cms
Head over weir = 0.06 m

Clarifier Enter Pipe **2548.98**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on-line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.02 m
Total loss = 0.02 m

Distribution Box Gate **2548.98**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 0.85 cms
Total area of opening(s) = 4.5 m²
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2548.98
Upstream water level = 2548.98

Box 1 Weir **2549.44**

Weir invert (top of weir) = 2549.15
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 0.85 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 13.6 cms
Head over weir = 0.29 m

Enter Pipe BOX 1 **2549.49**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 262.7 m
Flow = 3.4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m²

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.54 m/s
Units on-line = 4
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m
0

General Box Gate **2549.49**

Opening type = rectangular gate
Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2549.49
Upstream water level = 2549.49

General box 1 Weir **2550.45**

Weir invert (top of weir) = 2550
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 3.4 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 13.6 cms
Head over weir = 0.45 m

R Mix to Clarifiers Pipe **2550.49**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 77.5 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5

Section Description	Water Surface Elevation

Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.03 m
Total loss = 0.04 m
0

RM Exit Channel **2550.49**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 13.6 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 47.7 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on-line = 1
Total flow, all units = 13.6 cms
Depth downstream = 1.49 m
Bend loss = 0 m
Depth upstream = 1.49 m
Velocity = 0.29 m/s

RM Exit Gate **2550.49**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 50.27 m²
Velocity through gate(s) = 0.07 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2550.49
Upstream water level = 2550.49

Section Description	**Water Surface Elevation**

RM — **2550.49**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 3.4 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 35.95 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on-line = 4
Total flow, all units = 13.6 cms
Depth downstream = 4.49 m
Bend loss = 0 m
Depth upstream = 4.49 m
Velocity = 0.09 m/s

RM Enter Gate — **2550.5**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 12.57 m^2
Velocity through gate(s) = 0.27 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0.01 m
Downstream water level = 2550.49
Upstream water level = 2550.5

RM Enter Channel — **2550.51**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 13.6 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 80.17 m^2

Section Description	**Water Surface Elevation**

Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on-line = 1
Total flow, all units = 13.6 cms
Depth downstream = 2.5 m
Bend loss = 0 m
Depth upstream = 2.51 m
Velocity = 0.17 m/s

Grit Channel to RM Pipe **2550.54**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.56 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0 m
Fitting loss = 0.03 m
Total loss = 0.03 m
0

Junction Tank Grit Channel **2550.54**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 6.8 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 114.83 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.132 m
Units on-line = 2
Total flow, all units = 13.6 cms
Depth downstream = 2.54 m

Section Description	Water Surface Elevation
Bend loss = 0 m Depth upstream = 2.54 m Velocity = 0.06 m/s	
Grit Weir	**2551.43**
Weir invert (top of weir) = 2551.28 Weir length = 12 m Weir height = 0.43 m Weir 'C' coefficient = 1.931 Flow over weir = 1.36 cms Weir submergence = unsubmerged Units on-line = 10 Total flow, all units = 13.6 cms Head over weir = 0.15 m	
Grit Channel	**2551.43**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 55 m Channel width/diameter = 4 m Flow = 0.97 cms Downstream channel invert = 2546.55 Channel slope = 0 m/m Channel side slope = not applicable Area of flow = 19.53 m^2 Flow profile = Horizontal Normal depth = Infinite Critical depth = 0.182 m Units on-line = 14 Total flow, all units = 13.6 cms Depth downstream = 4.88 m Bend loss = 0 m Depth upstream = 4.88 m Velocity = 0.05 m/s	
Screening Exit Channel Gate	**2551.49**
Opening type = rectangular gate Opening diameter/width = 2000 mm Gate height = 2000 mm Invert = 2548 Number of gates = 1 Flow through gate(s) = 2.72 cms Total area of opening(s) = 4 m^2 Velocity through gate(s) = 0.68 m/s Flow behavior = orifice, downstream control Units on-line = 5 Total flow, all units = 13.6 cms	

Section Description	Water Surface Elevation

Gate loss = 0.06 m
Downstream water level = 2551.43
Upstream water level = 2551.49

Screen Channel 1 - 2 — **2551.5**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.5 m
Flow = 2.72 cms
Downstream channel invert = 2549.24
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 5.64 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.495 m
Units on-line = 5
Total flow, all units = 13.6 cms
Depth downstream = 2.25 m
Bend loss = 0 m
Depth upstream = 2.26 m
Velocity = 0.48 m/s

Fine Screen — **2551.68**

Rack invert = 2550.3
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 2.72 cms
Bar width = 6 mm
Bar spacing = 6 mm
Percent blocked = 0%
Net rack open area = 1.49 m²
Downstream depth = 1.2 m
Velocity in channel = 0.91 m/s
Velocity through bars = 1.82 m/s
Units on-line = 5
Total flow, all units = 13.6 cms
Rack head loss = 0.18 m

Screen Channel 2 -3 — **2551.68**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.5 m
Flow = 2.72 cms
Downstream channel invert = 2550

Section Description	Water Surface Elevation

Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 4.19 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.495 m
Units on-line = 5
Total flow, all units = 13.6 cms
Depth downstream = 1.68 m
Bend loss = 0 m
Depth upstream = 1.68 m
Velocity = 0.65 m/s

Medium Screen **2551.71**

Rack invert = 2550
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 2.72 cms
Bar width = 10 mm
Bar spacing = 25 mm
Percent blocked = 0%
Net rack open area = 2.98 m²
Downstream depth = 1.68 m
Velocity in channel = 0.65 m/s
Velocity through bars = 0.91 m/s
Units on-line = 5
Total flow, all units = 13.6 cms
Rack head loss = 0.03 m

Screen Channel 3 - 4 **2551.71**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.5 m
Flow = 2.72 cms
Downstream channel invert = 2550
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 4.27 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.495 m
Units on-line = 5
Total flow, all units = 13.6 cms
Depth downstream = 1.71 m
Bend loss = 0 m
Depth upstream = 1.71 m

Section Description	Water Surface Elevation

Velocity = 0.64 m/s

Screening Enter Channel Gate **2551.77**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 2.72 cms
Total area of opening(s) = 4 m²
Velocity through gate(s) = 0.68 m/s
Flow behavior = orifice, downstream control
Units on-line = 5
Total flow, all units = 13.6 cms
Gate loss = 0.06 m
Downstream water level = 2551.71
Upstream water level = 2551.77

Screening Distribution Channel **2551.77**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 6.8 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 166.48 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.139 m
Units on-line = 2
Total flow, all units = 13.6 cms
Depth downstream = 3.97 m
Bend loss = 0 m
Depth upstream = 3.97 m
Velocity = 0.04 m/s

Initial Pipe **2551.8**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7

Section Description	Water Surface Elevation

Pipe area = 14 m²
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.49 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0 m
Fitting loss = 0.02 m
Total loss = 0.02 m
0

Initial Gate **2551.82**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 6.8 cms
Total area of opening(s) = 20 m²
Velocity through gate(s) = 0.34 m/s
Flow behavior = orifice, downstream control
Units on-line = 2
Total flow, all units = 13.6 cms
Gate loss = 0.02 m
Downstream water level = 2551.8
Upstream water level = 2551.82

Inicial Junction Tank **2551.82**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 13.6 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 145.4 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.312 m
Units on-line = 1
Total flow, all units = 13.6 cms
Depth downstream = 5.82 m
Bend loss = 0 m
Depth upstream = 5.82 m
Velocity = 0.09 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
16 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation

Starting water surface elevation **2540.97**

Exit Pipe **2541.02**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 227.5 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m²
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.67 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m
0

Chlorination Exit Tank **2541.02**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 16 cms
Downstream channel invert = 2538.63
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 369.2 m²
Flow profile = Mild
Normal depth = 0.31 m
Critical depth = 0.103 m

Section Description	Water Surface Elevation
Units on-line = 1 Total flow, all units = 16 cms Depth downstream = 2.39 m Bend loss = 0 m Depth upstream = 2.39 m Velocity = 0.04 m/s	
Chlorination Tank Weir	**2541.86**
Weir invert (top of weir) = 2541.65 Weir length = 23 m Weir height = 5.1 m Weir 'C' coefficient = 1.794 Flow over weir = 4 cms Weir submergence = unsubmerged Units on-line = 4 Total flow, all units = 16 cms Head over weir = 0.21 m	
Chlorination Tank	**2541.87**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 356.5 m Channel width/diameter = 8 m Flow = 4 cms Downstream channel invert = 2540 Channel slope = 0.0001 m/m Channel side slope = not applicable Area of flow = 14.75 m² Flow profile = Mild Normal depth = 0.84 m Critical depth = 0.295 m Units on-line = 4 Total flow, all units = 16 cms Depth downstream = 1.86 m Bend loss = 0 m Depth upstream = 1.83 m Velocity = 0.27 m/s	
Chlorination Tank - Enter Gate	**2541.87**
Opening type = rectangular gate Opening diameter/width = 8000 mm Gate height = 4000 mm Invert = 2540 Number of gates = 1 Flow through gate(s) = 4 cms Total area of opening(s) = 32 m² Velocity through gate(s) = 0.12 m/s	

Section Description	Water Surface Elevation
Flow behavior = orifice, downstream control	
Units on-line = 4	
Total flow, all units = 16 cms	
Gate loss = 0 m	
Downstream water level = 2541.87	
Upstream water level = 2541.87	
Chlorination Enter Tank	**2541.87**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 8 m	
Channel width/diameter = 92 m	
Flow = 16 cms	
Downstream channel invert = 2539.02	
Channel slope = 0 m/m	
Channel side slope = not applicable	
Area of flow = 262.14 m²	
Flow profile = Horizontal	
Normal depth = Infinite	
Critical depth = 0.146 m	
Units on-line = 1	
Total flow, all units = 16 cms	
Depth downstream = 2.85 m	
Bend loss = 0 m	
Depth upstream = 2.85 m	
Velocity = 0.06 m/s	
Secondary Clarifier - Chlorination Pipe	**2542.05**
Pipe shape = Rectangular	
Height = 3000 mm	
Width = 3500 mm	
Length = 1003 m	
Flow = 8 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 10.5 m²	
Pipe hydraulic radius = 0.808	
Age factor = 1	
Solids factor = 1	
Velocity = 0.76 m/s	
Units on-line = 2	
Total flow, all units = 16 cms	
Friction loss = 0.13 m	
Fitting loss = 0.04 m	
Total loss = 0.18 m	
0	

Section Description	Water Surface Elevation
Secondary Clarifier Exit Pipe	**2542.1**

Pipe shape = Circular
Diameter = 1500 mm
Length = 118 m
Flow = 1 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 16
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m

2 Clarifier Orifice **2542.15**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 1 cms
Total area of opening(s) = 1.77 m²
Velocity through opening(s) = 0.57 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 16 cms
Orifice loss = 0.05 m
Downstream water level = 2542.1
Upstream water level = 2542.15

Launder Channel 2 C **2543.09**

Launder invert = 2542.5
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.5 cms
Critical depth = 0.22 m
Units on-line = 32
Total flow, all units = 16 cms
Downstream depth = 0.22 m
Upstream depth = 0.22 m

Section Description	Water Surface Elevation
Weir 2 Clarifier	**2543.36**
Invert of V notch = 2543.3	
Angle of V notch = 90 degrees	
Number of notches = 911	
Total flow over weir = 1 cms	
Weir submergence = unsubmerged	
Units on-line = 16	
Total flow, all units = 16 cms	
Head over weir = 0.06 m	
2 Clarifier Enter Pipe	**2543.44**
Pipe shape = Circular	
Diameter = 1500 mm	
Length = 48.8 m	
Flow = 1.57 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 1.767 m^2	
Pipe hydraulic radius = 0.375	
Age factor = 1	
Solids factor = 1	
Velocity = 0.89 m/s	
Units on-line = 16	
Total flow, all units = 25.2 cms	
Friction loss = 0.02 m	
Fitting loss = 0.06 m	
Total loss = 0.08 m	
Gate Clarifier Distribution Box	**2543.45**
Opening type = rectangular gate	
Opening diameter/width = 1500 mm	
Gate height = 4000 mm	
Invert = 2541	
Number of gates = 1	
Flow through gate(s) = 1.57 cms	
Total area of opening(s) = 6 m^2	
Velocity through gate(s) = 0.26 m/s	
Flow behavior = orifice, downstream control	
Units on-line = 16	
Total flow, all units = 25.2 cms	
Gate loss = 0.01 m	
Downstream water level = 2543.44	
Upstream water level = 2543.45	
Box 2 Weir	**2544.08**

Section Description	Water Surface Elevation

Weir invert (top of weir) = 2543.65
Weir length = 3.05 m
Weir height = 5.04 m
Weir 'C' coefficient = 1.807
Flow over weir = 1.57 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 25.2 cms
Head over weir = 0.43 m

Enter Pipe BOX 2 — **2544.19**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 285.5 m
Flow = 6.3 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m²
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 0.84 m/s
Units on-line = 4
Total flow, all units = 25.2 cms
Friction loss = 0.06 m
Fitting loss = 0.05 m
Total loss = 0.11 m
0

General Box 2 Gate — **2544.19**

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1
Flow through gate(s) = 4 cms
Total area of opening(s) = 21 m²
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 16 cms
Gate loss = 0 m
Downstream water level = 2544.19
Upstream water level = 2544.19

Section Description	Water Surface Elevation
General box 2 Weir	**2545.19**

Weir invert (top of weir) = 2544.6
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 6.3 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 25.2 cms
Head over weir = 0.59 m

Aeration Exit pipe **2545.31**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 336 m
Flow = 20.59 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m²
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 0.98 m/s
Units on-line = 1
Total flow, all units = 20.6 cms
Friction loss = 0.05 m
Fitting loss = 0.07 m
Total loss = 0.12 m
0

Aeration Exit Channel **2545.31**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 4.2 cms
Downstream channel invert = 2542.8
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 8.81 m²
Flow profile = Mild
Normal depth = 0.54 m
Critical depth = 0.483 m
Units on-line = 6
Total flow, all units = 25.2 cms

Section Description	Water Surface Elevation
Depth downstream = 2.51 m Bend loss = 0 m Depth upstream = 1.89 m Velocity = 0.42 m/s	
AB Tank Weir	**2545.92**
Weir invert (top of weir) = 2545.85 Weir length = 32.6 m Weir height = 6.5 m Weir 'C' coefficient = 1.782 Flow over weir = 1.05 cms Weir submergence = unsubmerged Units on-line = 24 Total flow, all units = 25.2 cms Head over weir = 0.07 m	
Aeration Basin	**2545.92**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 686 m Channel width/diameter = 11 m Flow = 1.05 cms Downstream channel invert = 2539 Channel slope = 0 m/m Channel side slope = not applicable Area of flow = 76.11 m² Flow profile = Horizontal Normal depth = Infinite Critical depth = 0.098 m Units on-line = 24 Total flow, all units = 25.2 cms Depth downstream = 6.92 m Bend loss = 0 m Depth upstream = 6.92 m Velocity = 0.01 m/s	
Aeration Enter Gate	**2545.92**
Opening type = rectangular gate Opening diameter/width = 3000 mm Gate height = 4000 mm Invert = 2543 Number of gates = 1 Flow through gate(s) = 1.05 cms Total area of opening(s) = 12 m² Velocity through gate(s) = 0.09 m/s Flow behavior = orifice, downstream control Units on-line = 24	

Section Description	**Water Surface Elevation**
Total flow, all units = 25.2 cms Gate loss = 0 m Downstream water level = 2545.92 Upstream water level = 2545.92	
AB Distribution Pipe	**2546.04**
Pipe shape = Circular Diameter = 1200 mm Length = 77 m Flow = 1.05 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 1.131 m² Pipe hydraulic radius = 0.3 Age factor = 1 Solids factor = 1 Velocity = 0.93 m/s Units on-line = 24 Total flow, all units = 25.2 cms Friction loss = 0.06 m Fitting loss = 0.07 m Total loss = 0.12 m Total loss = 0.17 m 0	
AB Distribution Box Gate	**2546.04**
Opening type = rectangular gate Opening diameter/width = 1300 mm Gate height = 5000 mm Invert = 2543 Number of gates = 1 Flow through gate(s) = 1.05 cms Total area of opening(s) = 6.5 m² Velocity through gate(s) = 0.16 m/s Flow behavior = orifice, downstream control Units on-line = 24 Total flow, all units = 25.2 cms Gate loss = 0 m Downstream water level = 2546.04 Upstream water level = 2546.04	
AB Distribution Box Weir	**2546.63**
Weir invert (top of weir) = 2546.3 Weir length = 3.05 m Weir height = 3 m Weir 'C' coefficient = 1.815	

Section Description	**Water Surface Elevation**

Flow over weir = 1.05 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 25.2 cms
Head over weir = 0.33 m

Aeration Enter Pipe **2546.7**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3500 mm
Length = 375 m
Flow = 5.33 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m²
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.61 m/s
Units on-line = 3
Total flow, all units = 16 cms
Friction loss = 0.04 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

General aeration box Weir Gate **2546.74**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 5.33 cms
Total area of opening(s) = 10 m²
Velocity through gate(s) = 0.53 m/s
Flow behavior = orifice, downstream control
Units on-line = 3
Total flow, all units = 16 cms
Gate loss = 0.04 m
Downstream water level = 2546.7
Upstream water level = 2546.74

General Aeration Box Weir **2547.73**

Weir invert (top of weir) = 2547.21
Weir length = 7.62 m
Weir height = 3 m

Section Description	Water Surface Elevation

Weir 'C' coefficient = 1.846
Flow over weir = 5.33 cms
Weir submergence = unsubmerged
Units on-line = 3
Total flow, all units = 16 cms
Head over weir = 0.52 m

Clarifier Junction Exit Pipe **2547.8**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 273 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m
0

Clarifier Exit Pipe **2547.85**

Pipe shape = Circular
Diameter = 1500 mm
Length = 81.6 m
Flow = 1 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 16
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m

Section Description	Water Surface Elevation
Clarifier Orifice	**2547.9**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 1 cms
Total area of opening(s) = 1.77 m²
Velocity through opening(s) = 0.57 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 16 cms
Orifice loss = 0.05 m
Downstream water level = 2547.85
Upstream water level = 2547.9

Clarifier Launder **2548.75**

Launder invert = 2548.2
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.5 cms
Critical depth = 0.22 m
Units on-line = 32
Total flow, all units = 16 cms
Downstream depth = 0.22 m
Upstream depth = 0.22 m

Weir Clarifier **2548.96**

Invert of V notch = 2548.9
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 1 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 16 cms
Head over weir = 0.06 m

Clarifier Enter Pipe **2548.99**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 1 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m²

Section Description | **Water Surface Elevation**

Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 16
Total flow, all units = 16 cms
Friction loss = 0.01 m
Fitting loss = 0.02 m
Total loss = 0.03 m

Distribution Box Gate | **2549**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 1 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.22 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2548.99
Upstream water level = 2549

Box 1 Weir | **2549.47**

Weir invert (top of weir) = 2549.15
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 1 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 16 cms
Head over weir = 0.32 m

Enter Pipe BOX 1 | **2549.54**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 262.7 m
Flow = 4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.64 m/s
Units on-line = 4
Total flow, all units = 16 cms
Friction loss = 0.03 m
Fitting loss = 0.04 m
Total loss = 0.07 m
0

General Box Gate	**2549.55**

Opening type = rectangular gate
Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 4 cms
Total area of opening(s) = 18 m²
Velocity through gate(s) = 0.22 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2549.54
Upstream water level = 2549.55

General box 1 Weir	**2550.5**

Weir invert (top of weir) = 2550
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 4 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 16 cms
Head over weir = 0.5 m

R Mix to Clarifiers Pipe	**2550.56**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 77.5 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5

Section Description	Water Surface Elevation

Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0.01 m
Fitting loss = 0.04 m
Total loss = 0.05 m
0

RM Exit Channel **2550.56**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 16 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 49.94 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on-line = 1
Total flow, all units = 16 cms
Depth downstream = 1.56 m
Bend loss = 0 m
Depth upstream = 1.56 m
Velocity = 0.32 m/s

RM Exit Gate **2550.56**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 4 cms
Total area of opening(s) = 50.27 m²
Velocity through gate(s) = 0.08 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 16 cms
Gate loss = 0 m
Downstream water level = 2550.56
Upstream water level = 2550.56

Section Description	Water Surface Elevation

RM **2550.56**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 4 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 36.51 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on-line = 4
Total flow, all units = 16 cms
Depth downstream = 4.56 m
Bend loss = 0 m
Depth upstream = 4.56 m
Velocity = 0.11 m/s

RM Enter Gate **2550.58**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 4 cms
Total area of opening(s) = 12.57 m²
Velocity through gate(s) = 0.32 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2550.56
Upstream water level = 2550.58

RM Enter Channel **2550.58**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 16 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 82.56 m²

Section Description	**Water Surface Elevation**

Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on-line = 1
Total flow, all units = 16 cms
Depth downstream = 2.58 m
Bend loss = 0 m
Depth upstream = 2.58 m
Velocity = 0.19 m/s

Grit Channel to RM Pipe **2550.62**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0 m
Fitting loss = 0.04 m
Total loss = 0.04 m
0

Junction Tank Grit Channel **2550.62**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 8 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 118.45 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.148 m
Units on-line = 2
Total flow, all units = 16 cms
Depth downstream = 2.62 m

Section Description	Water Surface Elevation
Bend loss = 0 m Depth upstream = 2.62 m Velocity = 0.07 m/s	
Grit Weir	**2551.45**
Weir invert (top of weir) = 2551.28 Weir length = 12 m Weir height = 0.43 m Weir 'C' coefficient = 1.931 Flow over weir = 1.6 cms Weir submergence = unsubmerged Units on-line = 10 Total flow, all units = 16 cms Head over weir = 0.17 m	
Grit Channel	**2551.45**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 55 m Channel width/diameter = 4 m Flow = 1.14 cms Downstream channel invert = 2546.55 Channel slope = 0 m/m Channel side slope = not applicable Area of flow = 19.59 m² Flow profile = Horizontal Normal depth = Infinite Critical depth = 0.203 m Units on-line = 14 Total flow, all units = 16 cms Depth downstream = 4.9 m Bend loss = 0 m Depth upstream = 4.9 m Velocity = 0.06 m/s	
Screening Exit Channel Gate	**2551.51**
Opening type = rectangular gate Opening diameter/width = 2000 mm Gate height = 2000 mm Invert = 2548 Number of gates = 1 Flow through gate(s) = 2.67 cms Total area of opening(s) = 4 m² Velocity through gate(s) = 0.67 m/s Flow behavior = orifice, downstream control Units on-line = 6 Total flow, all units = 16 cms	

Section Description	**Water Surface Elevation**

Gate loss = 0.06 m
Downstream water level = 2551.45
Upstream water level = 2551.51

Screen Channel 1 - 2 — **2551.51**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.5 m
Flow = 2.67 cms
Downstream channel invert = 2549.24
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 5.67 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.488 m
Units on-line = 6
Total flow, all units = 16 cms
Depth downstream = 2.27 m
Bend loss = 0 m
Depth upstream = 2.27 m
Velocity = 0.47 m/s

Fine Screen — **2551.68**

Rack invert = 2550.3
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 2.67 cms
Bar width = 6 mm
Bar spacing = 6 mm
Percent blocked = 0%
Net rack open area = 1.51 m^2
Downstream depth = 1.21 m
Velocity in channel = 0.88 m/s
Velocity through bars = 1.76 m/s
Units on-line = 6
Total flow, all units = 16 cms
Rack head loss = 0.17 m

Screen Channel 2 -3 — **2551.68**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.5 m
Flow = 2.67 cms
Downstream channel invert = 2550

Section Description	Water Surface Elevation

Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 4.2 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.488 m
Units on-line = 6
Total flow, all units = 16 cms
Depth downstream = 1.68 m
Bend loss = 0 m
Depth upstream = 1.68 m
Velocity = 0.63 m/s

Medium Screen **2551.71**

Rack invert = 2550
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 2.67 cms
Bar width = 10 mm
Bar spacing = 25 mm
Percent blocked = 0%
Net rack open area = 2.99 m²
Downstream depth = 1.68 m
Velocity in channel = 0.63 m/s
Velocity through bars = 0.89 m/s
Units on-line = 6
Total flow, all units = 16 cms
Rack head loss = 0.03 m

Screen Channel 3 - 4 **2551.71**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.5 m
Flow = 2.67 cms
Downstream channel invert = 2550
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 4.28 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.488 m
Units on-line = 6
Total flow, all units = 16 cms
Depth downstream = 1.71 m
Bend loss = 0 m
Depth upstream = 1.71 m

Section Description	**Water Surface Elevation**

Velocity = 0.62 m/s

Screening Enter Channel Gate **2551.77**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 2.67 cms
Total area of opening(s) = 4 m²
Velocity through gate(s) = 0.67 m/s
Flow behavior = orifice, downstream control
Units on-line = 6
Total flow, all units = 16 cms
Gate loss = 0.06 m
Downstream water level = 2551.71
Upstream water level = 2551.77

Screening Distribution Channel **2551.77**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 8 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 166.48 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.155 m
Units on-line = 2
Total flow, all units = 16 cms
Depth downstream = 3.97 m
Bend loss = 0 m
Depth upstream = 3.97 m
Velocity = 0.05 m/s

Initial Pipe **2551.8**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7

Section Description	Water Surface Elevation

Pipe area = 14 m²
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0 m
Fitting loss = 0.03 m
Total loss = 0.03 m
0

Initial Gate **2551.82**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 20 m²
Velocity through gate(s) = 0.4 m/s
Flow behavior = orifice, downstream control
Units on-line = 2
Total flow, all units = 16 cms
Gate loss = 0.02 m
Downstream water level = 2551.8
Upstream water level = 2551.82

Inicial Junction Tank **2551.82**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 16 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 145.54 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.347 m
Units on-line = 1
Total flow, all units = 16 cms
Depth downstream = 5.82 m
Bend loss = 0 m
Depth upstream = 5.82 m
Velocity = 0.11 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
21.6 cms	9.18 cms	-----	-----

Section Description	**Water Surface Elevation**
Starting water surface elevation	**2541.14**

Exit Pipe **2541.24**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 227.5 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m²
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.9 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0.04 m
Fitting loss = 0.06 m
Total loss = 0.1 m
0

Chlorination Exit Tank **2541.24**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 21.6 cms
Downstream channel invert = 2538.63
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 403.18 m²
Flow profile = Mild
Normal depth = 0.37 m
Critical depth = 0.126 m

Section Description	**Water Surface Elevation**

Units on-line = 1
Total flow, all units = 21.6 cms
Depth downstream = 2.61 m
Bend loss = 0 m
Depth upstream = 2.61 m
Velocity = 0.05 m/s

Chlorination Tank Weir **2541.91**

Weir invert (top of weir) = 2541.65
Weir length = 23 m
Weir height = 5.1 m
Weir 'C' coefficient = 1.794
Flow over weir = 5.4 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 21.6 cms
Head over weir = 0.26 m

Chlorination Tank **2541.92**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 356.5 m
Channel width/diameter = 8 m
Flow = 5.4 cms
Downstream channel invert = 2540
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 15.14 m^2
Flow profile = Mild
Normal depth = 1.02 m
Critical depth = 0.36 m
Units on-line = 4
Total flow, all units = 21.6 cms
Depth downstream = 1.91 m
Bend loss = 0.01 m
Depth upstream = 1.88 m
Velocity = 0.35 m/s

Chlorination Tank - Enter Gate **2541.92**

Opening type = rectangular gate
Opening diameter/width = 8000 mm
Gate height = 4000 mm
Invert = 2540
Number of gates = 1
Flow through gate(s) = 5.4 cms
Total area of opening(s) = 32 m^2
Velocity through gate(s) = 0.17 m/s

Section Description	Water Surface Elevation

Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0 m
Downstream water level = 2541.92
Upstream water level = 2541.92

Chlorination Enter Tank **2541.92**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 21.6 cms
Downstream channel invert = 2539.02
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 267.06 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.178 m
Units on-line = 1
Total flow, all units = 21.6 cms
Depth downstream = 2.9 m
Bend loss = 0 m
Depth upstream = 2.9 m
Velocity = 0.08 m/s

Secondary Clarifier - Chlorination Pipe **2542.24**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 1003 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.03 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0.24 m
Fitting loss = 0.08 m
Total loss = 0.32 m
0

Section Description	**Water Surface Elevation**

Secondary Clarifier Exit Pipe — **2542.33**

Pipe shape = Circular
Diameter = 1500 mm
Length = 118 m
Flow = 1.35 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 16
Total flow, all units = 21.6 cms
Friction loss = 0.04 m
Fitting loss = 0.05 m
Total loss = 0.09 m

2 Clarifier Orifice — **2542.41**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 1.35 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.76 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 21.6 cms
Orifice loss = 0.08 m
Downstream water level = 2542.33
Upstream water level = 2542.41

Launder Channel 2 C — **2543.14**

Launder invert = 2542.5
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.68 cms
Critical depth = 0.27 m
Units on-line = 32
Total flow, all units = 21.6 cms
Downstream depth = 0.27 m
Upstream depth = 0.27 m

Section Description	Water Surface Elevation
Weir 2 Clarifier	**2543.36**

Invert of V notch = 2543.3
Angle of V notch = 90 degrees
Number of notches = 911
Total flow over weir = 1.35 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 21.6 cms
Head over weir = 0.06 m

2 Clarifier Enter Pipe **2543.49**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 1.92 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.09 m/s
Units on-line = 16
Total flow, all units = 30.8 cms
Friction loss = 0.04 m
Fitting loss = 0.09 m
Total loss = 0.13 m

Gate Clarifier Distribution Box **2543.5**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 1.92 cms
Total area of opening(s) = 6 m^2
Velocity through gate(s) = 0.32 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 30.8 cms
Gate loss = 0.01 m
Downstream water level = 2543.49
Upstream water level = 2543.5

Box 2 Weir **2544.15**

Section Description	Water Surface Elevation

Weir invert (top of weir) = 2543.65
Weir length = 3.05 m
Weir height = 5.04 m
Weir 'C' coefficient = 1.807
Flow over weir = 1.92 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 30.8 cms
Head over weir = 0.5 m

Enter Pipe BOX 2 **2544.31**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 285.5 m
Flow = 7.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m²
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 1.03 m/s
Units on-line = 4
Total flow, all units = 30.8 cms
Friction loss = 0.08 m
Fitting loss = 0.08 m
Total loss = 0.17 m
0

General Box 2 Gate **2544.32**

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1
Flow through gate(s) = 5.4 cms
Total area of opening(s) = 21 m²
Velocity through gate(s) = 0.26 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0.01 m
Downstream water level = 2544.31
Upstream water level = 2544.32

Section Description	**Water Surface Elevation**

General box 2 Weir — **2545.27**

Weir invert (top of weir) = 2544.6
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 7.7 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 30.8 cms
Head over weir = 0.67 m

Aeration Exit pipe — **2545.47**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 336 m
Flow = 26.19 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 1.25 m/s
Units on-line = 1
Total flow, all units = 26.2 cms
Friction loss = 0.08 m
Fitting loss = 0.12 m
Total loss = 0.2 m
0

Aeration Exit Channel — **2545.47**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 5.13 cms
Downstream channel invert = 2542.8
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 9.45 m^2
Flow profile = Mild
Normal depth = 0.62 m
Critical depth = 0.552 m
Units on-line = 6
Total flow, all units = 30.8 cms

Section Description	Water Surface Elevation
Depth downstream = 2.67 m Bend loss = 0 m Depth upstream = 2.05 m Velocity = 0.48 m/s	
AB Tank Weir	**2545.93**
Weir invert (top of weir) = 2545.85 Weir length = 32.6 m Weir height = 6.5 m Weir 'C' coefficient = 1.782 Flow over weir = 1.28 cms Weir submergence = unsubmerged Units on-line = 24 Total flow, all units = 30.7 cms Head over weir = 0.08 m	
Aeration Basin	**2545.93**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 686 m Channel width/diameter = 11 m Flow = 1.28 cms Downstream channel invert = 2539 Channel slope = 0 m/m Channel side slope = not applicable Area of flow = 76.22 m² Flow profile = Horizontal Normal depth = Infinite Critical depth = 0.112 m Units on-line = 24 Total flow, all units = 30.8 cms Depth downstream = 6.93 m Bend loss = 0 m Depth upstream = 6.93 m Velocity = 0.02 m/s	
Aeration Enter Gate	**2545.93**
Opening type = rectangular gate Opening diameter/width = 3000 mm Gate height = 4000 mm Invert = 2543 Number of gates = 1 Flow through gate(s) = 1.28 cms Total area of opening(s) = 12 m² Velocity through gate(s) = 0.11 m/s Flow behavior = orifice, downstream control Units on-line = 24	

Section Description	Water Surface Elevation

Total flow, all units = 30.8 cms
Gate loss = 0 m
Downstream water level = 2545.93
Upstream water level = 2545.93

AB Distribution Pipe **2546.11**

Pipe shape = Circular
Diameter = 1200 mm
Length = 77 m
Flow = 1.28 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m²
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on-line = 24
Total flow, all units = 30.7 cms
Friction loss = 0.08 m
Fitting loss = 0.1 m
Total loss = 0.18 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2546.12**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.28 cms
Total area of opening(s) = 6.5 m²
Velocity through gate(s) = 0.2 m/s
Flow behavior = orifice, downstream control
Units on-line = 24
Total flow, all units = 30.8 cms
Gate loss = 0.01 m
Downstream water level = 2546.11
Upstream water level = 2546.12

AB Distribution Box Weir **2546.68**

Weir invert (top of weir) = 2546.3
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815

Section Description	**Water Surface Elevation**

Flow over weir = 1.28 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 30.7 cms
Head over weir = 0.38 m

Aeration Enter Pipe **2546.8**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3500 mm
Length = 375 m
Flow = 7.2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m²
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.82 m/s
Units on-line = 3
Total flow, all units = 21.6 cms
Friction loss = 0.07 m
Fitting loss = 0.06 m
Total loss = 0.13 m
0

General aeration box Weir Gate **2546.87**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 7.2 cms
Total area of opening(s) = 10 m²
Velocity through gate(s) = 0.72 m/s
Flow behavior = orifice, downstream control
Units on-line = 3
Total flow, all units = 21.6 cms
Gate loss = 0.07 m
Downstream water level = 2546.8
Upstream water level = 2546.87

General Aeration Box Weir **2547.85**

Weir invert (top of weir) = 2547.21
Weir length = 7.62 m
Weir height = 3 m

Section Description	Water Surface Elevation

Weir 'C' coefficient = 1.846
Flow over weir = 7.2 cms
Weir submergence = unsubmerged
Units on-line = 3
Total flow, all units = 21.6 cms
Head over weir = 0.64 m

Clarifier Junction Exit Pipe **2547.96**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 273 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.88 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0.04 m
Fitting loss = 0.07 m
Total loss = 0.11 m
0

Clarifier Exit Pipe **2548.04**

Pipe shape = Circular
Diameter = 1500 mm
Length = 81.6 m
Flow = 1.35 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 16
Total flow, all units = 21.6 cms
Friction loss = 0.03 m
Fitting loss = 0.05 m
Total loss = 0.08 m

Section Description	Water Surface Elevation
Clarifier Orifice	**2548.12**
Opening type = circular orifice	
Opening diameter/width = 1500 mm	
Opening height = not applicable	
Invert = 2545	
Number of openings = 1	
Flow through opening(s) = 1.35 cms	
Total area of opening(s) = 1.77 m²	
Velocity through opening(s) = 0.76 m/s	
Flow behavior = orifice, downstream control	
Units on-line = 16	
Total flow, all units = 21.6 cms	
Orifice loss = 0.08 m	
Downstream water level = 2548.04	
Upstream water level = 2548.12	
Clarifier Launder	**2548.8**
Launder invert = 2548.2	
Launder length = 81.7 m	
Launder width = 1.5 m	
Launder slope = 0.004 m/m	
Flow through launder = 0.68 cms	
Critical depth = 0.27 m	
Units on-line = 32	
Total flow, all units = 21.6 cms	
Downstream depth = 0.27 m	
Upstream depth = 0.27 m	
Weir Clarifier	**2548.97**
Invert of V notch = 2548.9	
Angle of V notch = 90 degrees	
Number of notches = 864	
Total flow over weir = 1.35 cms	
Weir submergence = unsubmerged	
Units on-line = 16	
Total flow, all units = 21.6 cms	
Head over weir = 0.07 m	
Clarifier Enter Pipe	**2549.03**
Pipe shape = Circular	
Diameter = 1500 mm	
Length = 45 m	
Flow = 1.35 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 1.767 m²	

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 16
Total flow, all units = 21.6 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m

Distribution Box Gate **2549.04**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 1.35 cms
Total area of opening(s) = 4.5 m²
Velocity through gate(s) = 0.3 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 21.6 cms
Gate loss = 0.01 m
Downstream water level = 2549.03
Upstream water level = 2549.04

Box 1 Weir **2549.54**

Weir invert (top of weir) = 2549.15
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 1.35 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 21.6 cms
Head over weir = 0.39 m

Enter Pipe BOX 1 **2549.67**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 262.7 m
Flow = 5.4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m²

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.86 m/s
Units on-line = 4
Total flow, all units = 21.6 cms
Friction loss = 0.06 m
Fitting loss = 0.06 m
Total loss = 0.13 m
0

General Box Gate **2549.68**

Opening type = rectangular gate
Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 5.4 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.3 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0.01 m
Downstream water level = 2549.67
Upstream water level = 2549.68

General box 1 Weir **2550.61**

Weir invert (top of weir) = 2550
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 5.4 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 21.6 cms
Head over weir = 0.61 m

R Mix to Clarifiers Pipe **2550.71**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 77.5 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5

Section Description	**Water Surface Elevation**

Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.03 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0.02 m
Fitting loss = 0.08 m
Total loss = 0.1 m
0

RM Exit Channel **2550.71**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 21.6 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 54.73 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.36 m
Units on-line = 1
Total flow, all units = 21.6 cms
Depth downstream = 1.71 m
Bend loss = 0 m
Depth upstream = 1.71 m
Velocity = 0.39 m/s

RM Exit Gate **2550.71**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 5.4 cms
Total area of opening(s) = 50.27 m²
Velocity through gate(s) = 0.11 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0 m
Downstream water level = 2550.71
Upstream water level = 2550.71

Section Description	**Water Surface Elevation**
RM	**2550.72**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 5.4 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 37.71 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.36 m
Units on-line = 4
Total flow, all units = 21.6 cms
Depth downstream = 4.71 m
Bend loss = 0 m
Depth upstream = 4.72 m
Velocity = 0.14 m/s

RM Enter Gate **2550.74**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 5.4 cms
Total area of opening(s) = 12.57 m²
Velocity through gate(s) = 0.43 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0.03 m
Downstream water level = 2550.72
Upstream water level = 2550.74

RM Enter Channel **2550.74**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 21.6 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 87.75 m²

Section Description	Water Surface Elevation

Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.36 m
Units on-line = 1
Total flow, all units = 21.6 cms
Depth downstream = 2.74 m
Bend loss = 0 m
Depth upstream = 2.74 m
Velocity = 0.25 m/s

Grit Channel to RM Pipe **2550.82**
Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.88 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0.01 m
Fitting loss = 0.07 m
Total loss = 0.08 m
0

Junction Tank Grit Channel **2550.82**
Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 10.8 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 127.49 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.18 m
Units on-line = 2
Total flow, all units = 21.6 cms
Depth downstream = 2.82 m

Section Description	**Water Surface Elevation**
Bend loss = 0 m	
Depth upstream = 2.82 m	
Velocity = 0.08 m/s	
Grit Weir	**2551.49**
Weir invert (top of weir) = 2551.28	
Weir length = 12 m	
Weir height = 0.43 m	
Weir 'C' coefficient = 1.931	
Flow over weir = 2.16 cms	
Weir submergence = unsubmerged	
Units on-line = 10	
Total flow, all units = 21.6 cms	
Head over weir = 0.21 m	
Grit Channel	**2551.49**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 55 m	
Channel width/diameter = 4 m	
Flow = 1.54 cms	
Downstream channel invert = 2546.55	
Channel slope = 0 m/m	
Channel side slope = not applicable	
Area of flow = 19.74 m²	
Flow profile = Horizontal	
Normal depth = Infinite	
Critical depth = 0.248 m	
Units on-line = 14	
Total flow, all units = 21.6 cms	
Depth downstream = 4.94 m	
Bend loss = 0 m	
Depth upstream = 4.94 m	
Velocity = 0.08 m/s	
Screening Exit Channel Gate	**2551.53**
Opening type = rectangular gate	
Opening diameter/width = 2000 mm	
Gate height = 2000 mm	
Invert = 2548	
Number of gates = 1	
Flow through gate(s) = 2.16 cms	
Total area of opening(s) = 4 m²	
Velocity through gate(s) = 0.54 m/s	
Flow behavior = orifice, downstream control	
Units on-line = 10	
Total flow, all units = 21.6 cms	

Section Description	Water Surface Elevation
Gate loss = 0.04 m	
Downstream water level = 2551.49	
Upstream water level = 2551.53	
Screen Channel 1 - 2	**2551.53**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 5 m	
Channel width/diameter = 2.5 m	
Flow = 2.16 cms	
Downstream channel invert = 2549.24	
Channel slope = 0 m/m	
Channel side slope = not applicable	
Area of flow = 5.72 m²	
Flow profile = Horizontal	
Normal depth = Infinite	
Critical depth = 0.424 m	
Units on-line = 10	
Total flow, all units = 21.6 cms	
Depth downstream = 2.29 m	
Bend loss = 0 m	
Depth upstream = 2.29 m	
Velocity = 0.38 m/s	
Fine Screen	**2551.64**
Rack invert = 2550.3	
Rack width = 2.5 m	
Channel width = 2.5 m	
Flow through rack = 2.16 cms	
Bar width = 6 mm	
Bar spacing = 6 mm	
Percent blocked = 0%	
Net rack open area = 1.53 m²	
Downstream depth = 1.23 m	
Velocity in channel = 0.7 m/s	
Velocity through bars = 1.41 m/s	
Units on-line = 10	
Total flow, all units = 21.6 cms	
Rack head loss = 0.11 m	
Screen Channel 2 -3	**2551.64**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 6 m	
Channel width/diameter = 2.5 m	
Flow = 2.16 cms	
Downstream channel invert = 2550	

<u>**Section Description**</u>	<u>**Water Surface Elevation**</u>

Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 4.09 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.424 m
Units on-line = 10
Total flow, all units = 21.6 cms
Depth downstream = 1.64 m
Bend loss = 0 m
Depth upstream = 1.64 m
Velocity = 0.53 m/s

Medium Screen **2551.66**

Rack invert = 2550
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 2.16 cms
Bar width = 10 mm
Bar spacing = 25 mm
Percent blocked = 0%
Net rack open area = 2.91 m^2
Downstream depth = 1.64 m
Velocity in channel = 0.53 m/s
Velocity through bars = 0.74 m/s
Units on-line = 10
Total flow, all units = 21.6 cms
Rack head loss = 0.02 m

Screen Channel 3 - 4 **2551.66**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.5 m
Flow = 2.16 cms
Downstream channel invert = 2550
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 4.15 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.424 m
Units on-line = 10
Total flow, all units = 21.6 cms
Depth downstream = 1.66 m
Bend loss = 0 m
Depth upstream = 1.66 m

Section Description	Water Surface Elevation

Velocity = 0.52 m/s

Screening Enter Channel Gate **2551.7**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 2.16 cms
Total area of opening(s) = 4 m²
Velocity through gate(s) = 0.54 m/s
Flow behavior = orifice, downstream control
Units on-line = 10
Total flow, all units = 21.6 cms
Gate loss = 0.04 m
Downstream water level = 2551.66
Upstream water level = 2551.7

Screening Distribution Channel **2551.7**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 10.8 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 163.4 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.19 m
Units on-line = 2
Total flow, all units = 21.6 cms
Depth downstream = 3.9 m
Bend loss = 0 m
Depth upstream = 3.9 m
Velocity = 0.07 m/s

Initial Pipe **2551.76**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7

Section Description	Water Surface Elevation

Pipe area = 14 m²
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.77 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0 m
Fitting loss = 0.05 m
Total loss = 0.05 m
0

Initial Gate **2551.8**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 10.8 cms
Total area of opening(s) = 20 m²
Velocity through gate(s) = 0.54 m/s
Flow behavior = orifice, downstream control
Units on-line = 2
Total flow, all units = 21.6 cms
Gate loss = 0.04 m
Downstream water level = 2551.76
Upstream water level = 2551.8

Inicial Junction Tank **2551.8**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 21.6 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 144.98 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.424 m
Units on-line = 1
Total flow, all units = 21.6 cms
Depth downstream = 5.8 m
Bend loss = 0 m
Depth upstream = 5.8 m
Velocity = 0.15 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
32 cms	9.18 cms	-----	-----

Section Description	**Water Surface Elevation**
Starting water surface elevation	**2541.41**
Exit Pipe	**2541.63**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 227.5 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m²
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 1.33 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.08 m
Fitting loss = 0.14 m
Total loss = 0.22 m
0

Chlorination Exit Tank **2541.63**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 32 cms
Downstream channel invert = 2538.63
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 463.42 m²
Flow profile = Mild
Normal depth = 0.46 m
Critical depth = 0.164 m

Section Description	Water Surface Elevation
Units on-line = 1	
Total flow, all units = 32 cms	
Depth downstream = 3 m	
Bend loss = 0 m	
Depth upstream = 3 m	
Velocity = 0.07 m/s	
Chlorination Tank Weir	**2541.98**
Weir invert (top of weir) = 2541.65	
Weir length = 23 m	
Weir height = 5.1 m	
Weir 'C' coefficient = 1.794	
Flow over weir = 8 cms	
Weir submergence = unsubmerged	
Units on-line = 4	
Total flow, all units = 32 cms	
Head over weir = 0.33 m	
Chlorination Tank	**2542.01**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 356.5 m	
Channel width/diameter = 8 m	
Flow = 8 cms	
Downstream channel invert = 2540	
Channel slope = 0.0001 m/m	
Channel side slope = not applicable	
Area of flow = 15.77 m²	
Flow profile = Mild	
Normal depth = 1.32 m	
Critical depth = 0.467 m	
Units on-line = 4	
Total flow, all units = 32 cms	
Depth downstream = 1.98 m	
Bend loss = 0.02 m	
Depth upstream = 1.97 m	
Velocity = 0.5 m/s	
Chlorination Tank - Enter Gate	**2542.02**
Opening type = rectangular gate	
Opening diameter/width = 8000 mm	
Gate height = 4000 mm	
Invert = 2540	
Number of gates = 1	
Flow through gate(s) = 8 cms	
Total area of opening(s) = 32 m²	
Velocity through gate(s) = 0.25 m/s	

Section Description	**Water Surface Elevation**

Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 32 cms
Gate loss = 0.01 m
Downstream water level = 2542.01
Upstream water level = 2542.02

Chlorination Enter Tank	**2542.02**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 32 cms
Downstream channel invert = 2539.02
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 275.78 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.231 m
Units on-line = 1
Total flow, all units = 32 cms
Depth downstream = 3 m
Bend loss = 0 m
Depth upstream = 3 m
Velocity = 0.12 m/s

Secondary Clarifier - Chlorination Pipe	**2542.72**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 1003 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.52 m
Fitting loss = 0.18 m
Total loss = 0.7 m
0

Section Description	Water Surface Elevation
Secondary Clarifier Exit Pipe	**2542.92**

Pipe shape = Circular
Diameter = 1500 mm
Length = 118 m
Flow = 2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on-line = 16
Total flow, all units = 32 cms
Friction loss = 0.09 m
Fitting loss = 0.11 m
Total loss = 0.2 m

2 Clarifier Orifice **2543.1**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 2 cms
Total area of opening(s) = 1.77 m²
Velocity through opening(s) = 1.13 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 32 cms
Orifice loss = 0.18 m
Downstream water level = 2542.92
Upstream water level = 2543.1

Launder Channel 2 C **2543.24**

Launder invert = 2542.5
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 1 cms
Critical depth = 0.36 m
Units on-line = 32
Total flow, all units = 32 cms
Downstream depth = 0.6 m
Upstream depth = 0.37 m

Section Description	**Water Surface Elevation**

Weir 2 Clarifier — **2543.38**

Invert of V notch = 2543.3
Angle of V notch = 90 degrees
Number of notches = 911
Total flow over weir = 2 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 32 cms
Head over weir = 0.08 m

2 Clarifier Enter Pipe — **2543.6**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 2.57 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.46 m/s
Units on-line = 16
Total flow, all units = 41.2 cms
Friction loss = 0.06 m
Fitting loss = 0.16 m
Total loss = 0.23 m

Gate Clarifier Distribution Box — **2543.62**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 2.57 cms
Total area of opening(s) = 6 m²
Velocity through gate(s) = 0.43 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 41.2 cms
Gate loss = 0.02 m
Downstream water level = 2543.6
Upstream water level = 2543.62

Box 2 Weir — **2544.25**

Section Description	Water Surface Elevation

Weir invert (top of weir) = 2543.65
Weir length = 3.05 m
Weir height = 5.04 m
Weir 'C' coefficient = 1.807
Flow over weir = 2.57 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 41.2 cms
Head over weir = 0.6 m

Enter Pipe BOX 2 — **2544.55**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 285.5 m
Flow = 10.3 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m²
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 1.37 m/s
Units on-line = 4
Total flow, all units = 41.2 cms
Friction loss = 0.15 m
Fitting loss = 0.14 m
Total loss = 0.3 m
0

General Box 2 Gate — **2544.57**

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 21 m²
Velocity through gate(s) = 0.38 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 32 cms
Gate loss = 0.02 m
Downstream water level = 2544.55
Upstream water level = 2544.57

Section Description	Water Surface Elevation
General box 2 Weir	**2545.42**

Weir invert (top of weir) = 2544.6
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 10.3 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 41.2 cms
Head over weir = 0.82 m

Aeration Exit pipe **2545.8**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 336 m
Flow = 36.59 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m²
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 1.74 m/s
Units on-line = 1
Total flow, all units = 36.6 cms
Friction loss = 0.15 m
Fitting loss = 0.23 m
Total loss = 0.38 m
0

Aeration Exit Channel **2545.81**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 6.86 cms
Downstream channel invert = 2542.8
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 10.78 m²
Flow profile = Mild
Normal depth = 0.75 m
Critical depth = 0.67 m
Units on-line = 6
Total flow, all units = 41.2 cms

Section Description	**Water Surface Elevation**

Depth downstream = 3 m
Bend loss = 0 m
Depth upstream = 2.39 m
Velocity = 0.57 m/s

AB Tank Weir — **2545.95**

Weir invert (top of weir) = 2545.85
Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.71 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 41.1 cms
Head over weir = 0.1 m

Aeration Basin — **2545.95**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.71 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 76.41 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.136 m
Units on-line = 24
Total flow, all units = 41.1 cms
Depth downstream = 6.95 m
Bend loss = 0 m
Depth upstream = 6.95 m
Velocity = 0.02 m/s

Aeration Enter Gate — **2545.95**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.71 cms
Total area of opening(s) = 12 m^2
Velocity through gate(s) = 0.14 m/s
Flow behavior = orifice, downstream control
Units on-line = 24

Section Description	Water Surface Elevation

Total flow, all units = 41.2 cms
Gate loss = 0 m
Downstream water level = 2545.95
Upstream water level = 2545.95

AB Distribution Pipe **2546.27**

Pipe shape = Circular
Diameter = 1200 mm
Length = 77 m
Flow = 1.71 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m²
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on-line = 24
Total flow, all units = 41.1 cms
Friction loss = 0.15 m
Fitting loss = 0.18 m
Total loss = 0.32 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2546.28**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.71 cms
Total area of opening(s) = 6.5 m²
Velocity through gate(s) = 0.26 m/s
Flow behavior = orifice, downstream control
Units on-line = 24
Total flow, all units = 41.2 cms
Gate loss = 0.01 m
Downstream water level = 2546.27
Upstream water level = 2546.28

AB Distribution Box Weir **2546.76**

Weir invert (top of weir) = 2546.3
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815

Section Description	**Water Surface Elevation**

Flow over weir = 1.71 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 41.1 cms
Head over weir = 0.46 m

Aeration Enter Pipe **2547.04**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3500 mm
Length = 375 m
Flow = 10.67 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m²
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 1.22 m/s
Units on-line = 3
Total flow, all units = 32 cms
Friction loss = 0.14 m
Fitting loss = 0.14 m
Total loss = 0.28 m
0

General aeration box Weir Gate **2547.19**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 10.67 cms
Total area of opening(s) = 10 m²
Velocity through gate(s) = 1.07 m/s
Flow behavior = orifice, downstream control
Units on-line = 3
Total flow, all units = 32 cms
Gate loss = 0.15 m
Downstream water level = 2547.04
Upstream water level = 2547.19

General Aeration Box Weir **2548.04**

Weir invert (top of weir) = 2547.21
Weir length = 7.62 m
Weir height = 3 m

Section Description	Water Surface Elevation
Weir 'C' coefficient = 1.846 Flow over weir = 10.67 cms Weir submergence = unsubmerged Units on-line = 3 Total flow, all units = 32 cms Head over weir = 0.83 m	
Clarifier Junction Exit Pipe	**2548.29**
Pipe shape = Rectangular Height = 3500 mm Width = 3500 mm Length = 273 m Flow = 16 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.8 Pipe area = 12.25 m² Pipe hydraulic radius = 0.875 Age factor = 1 Solids factor = 1 Velocity = 1.31 m/s Units on-line = 2 Total flow, all units = 32 cms Friction loss = 0.09 m Fitting loss = 0.16 m Total loss = 0.25 m 0	
Clarifier Exit Pipe	**2548.47**
Pipe shape = Circular Diameter = 1500 mm Length = 81.6 m Flow = 2 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.8 Pipe area = 1.767 m² Pipe hydraulic radius = 0.375 Age factor = 1 Solids factor = 1 Velocity = 1.13 m/s Units on-line = 16 Total flow, all units = 32 cms Friction loss = 0.07 m Fitting loss = 0.12 m Total loss = 0.18 m	

Section Description	**Water Surface Elevation**

Clarifier Orifice — **2548.65**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2545
Number of openings = 1
Flow through opening(s) = 2 cms
Total area of opening(s) = 1.77 m²
Velocity through opening(s) = 1.13 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 32 cms
Orifice loss = 0.18 m
Downstream water level = 2548.47
Upstream water level = 2548.65

Clarifier Launder — **2548.88**

Launder invert = 2548.2
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 1 cms
Critical depth = 0.36 m
Units on-line = 32
Total flow, all units = 32 cms
Downstream depth = 0.45 m
Upstream depth = 0.36 m

Weir Clarifier — **2548.98**

Invert of V notch = 2548.9
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 2 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 32 cms
Head over weir = 0.08 m

Clarifier Enter Pipe — **2549.11**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m²

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on-line = 16
Total flow, all units = 32 cms
Friction loss = 0.04 m
Fitting loss = 0.1 m
Total loss = 0.13 m

Distribution Box Gate **2549.14**
Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 2 cms
Total area of opening(s) = 4.5 m²
Velocity through gate(s) = 0.44 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 32 cms
Gate loss = 0.03 m
Downstream water level = 2549.11
Upstream water level = 2549.14

Box 1 Weir **2549.66**
Weir invert (top of weir) = 2549.15
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 2 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 32 cms
Head over weir = 0.51 m

Enter Pipe BOX 1 **2549.94**
Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 262.7 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m²

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 1.28 m/s
Units on-line = 4
Total flow, all units = 32 cms
Friction loss = 0.14 m
Fitting loss = 0.14 m
Total loss = 0.28 m
0

General Box Gate **2549.97**

Opening type = rectangular gate
Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.44 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 32 cms
Gate loss = 0.03 m
Downstream water level = 2549.94
Upstream water level = 2549.97

General box 1 Weir **2550.8**

Weir invert (top of weir) = 2550
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 8 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 32 cms
Head over weir = 0.8 m

R Mix to Clarifiers Pipe **2551.02**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 77.5 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5

Section Description	**Water Surface Elevation**

Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.04 m
Fitting loss = 0.18 m
Total loss = 0.22 m
0

RM Exit Channel **2551.02**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 32 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 64.66 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on-line = 1
Total flow, all units = 32 cms
Depth downstream = 2.02 m
Bend loss = 0 m
Depth upstream = 2.02 m
Velocity = 0.5 m/s

RM Exit Gate **2551.03**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 8 cms
Total area of opening(s) = 50.27 m²
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 32 cms
Gate loss = 0 m
Downstream water level = 2551.02
Upstream water level = 2551.03

Section Description	Water Surface Elevation
RM	**2551.03**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 8 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 40.21 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on-line = 4
Total flow, all units = 32 cms
Depth downstream = 5.03 m
Bend loss = 0 m
Depth upstream = 5.03 m
Velocity = 0.2 m/s

RM Enter Gate — **2551.08**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 4
Flow through gate(s) = 8 cms
Total area of opening(s) = 12.57 m²
Velocity through gate(s) = 0.64 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 32 cms
Gate loss = 0.06 m
Downstream water level = 2551.03
Upstream water level = 2551.08

RM Enter Channel — **2551.09**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 32 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 98.73 m²

Section Description	**Water Surface Elevation**

Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on-line = 1
Total flow, all units = 32 cms
Depth downstream = 3.08 m
Bend loss = 0 m
Depth upstream = 3.09 m
Velocity = 0.32 m/s

Grit Channel to RM Pipe **2551.26**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 1.31 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.02 m
Fitting loss = 0.16 m
Total loss = 0.17 m
0

Junction Tank Grit Channel **2551.26**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 16 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 147.38 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.234 m
Units on-line = 2
Total flow, all units = 32 cms
Depth downstream = 3.26 m

Section Description	Water Surface Elevation

Bend loss = 0 m
Depth upstream = 3.26 m
Velocity = 0.11 m/s

Grit Weir **2551.55**

Weir invert (top of weir) = 2551.28
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 3.2 cms
Weir submergence = unsubmerged
Units on-line = 10
Total flow, all units = 32 cms
Head over weir = 0.27 m

Grit Channel **2551.55**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 55 m
Channel width/diameter = 4 m
Flow = 2.29 cms
Downstream channel invert = 2546.55
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 19.99 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.322 m
Units on-line = 14
Total flow, all units = 32 cms
Depth downstream = 5 m
Bend loss = 0 m
Depth upstream = 5 m
Velocity = 0.11 m/s

Screening Exit Channel Gate **2551.63**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 3.2 cms
Total area of opening(s) = 4 m²
Velocity through gate(s) = 0.8 m/s
Flow behavior = orifice, downstream control
Units on-line = 10
Total flow, all units = 32 cms

Section Description	Water Surface Elevation

Gate loss = 0.08 m
Downstream water level = 2551.55
Upstream water level = 2551.63

Screen Channel 1 - 2	**2551.64**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.5 m
Flow = 3.2 cms
Downstream channel invert = 2549.24
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 5.99 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.551 m
Units on-line = 10
Total flow, all units = 32 cms
Depth downstream = 2.39 m
Bend loss = 0 m
Depth upstream = 2.4 m
Velocity = 0.53 m/s

Fine Screen	**2551.84**

Rack invert = 2550.3
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 3.2 cms
Bar width = 6 mm
Bar spacing = 6 mm
Percent blocked = 0%
Net rack open area = 1.67 m²
Downstream depth = 1.34 m
Velocity in channel = 0.96 m/s
Velocity through bars = 1.92 m/s
Units on-line = 10
Total flow, all units = 32 cms
Rack head loss = 0.2 m

Screen Channel 2 -3	**2551.84**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.5 m
Flow = 3.2 cms
Downstream channel invert = 2550

Section Description	Water Surface Elevation
Channel slope = 0 m/m	
Channel side slope = not applicable	
Area of flow = 4.59 m²	
Flow profile = Horizontal	
Normal depth = Infinite	
Critical depth = 0.551 m	
Units on-line = 10	
Total flow, all units = 32 cms	
Depth downstream = 1.84 m	
Bend loss = 0 m	
Depth upstream = 1.84 m	
Velocity = 0.7 m/s	
Medium Screen	**2551.87**
Rack invert = 2550	
Rack width = 2.5 m	
Channel width = 2.5 m	
Flow through rack = 3.2 cms	
Bar width = 10 mm	
Bar spacing = 25 mm	
Percent blocked = 0%	
Net rack open area = 3.26 m²	
Downstream depth = 1.84 m	
Velocity in channel = 0.7 m/s	
Velocity through bars = 0.98 m/s	
Units on-line = 10	
Total flow, all units = 32 cms	
Rack head loss = 0.03 m	
Screen Channel 3 - 4	**2551.88**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 7 m	
Channel width/diameter = 2.5 m	
Flow = 3.2 cms	
Downstream channel invert = 2550	
Channel slope = 0 m/m	
Channel side slope = not applicable	
Area of flow = 4.69 m²	
Flow profile = Horizontal	
Normal depth = Infinite	
Critical depth = 0.551 m	
Units on-line = 10	
Total flow, all units = 32 cms	
Depth downstream = 1.87 m	
Bend loss = 0 m	
Depth upstream = 1.88 m	

Section Description	Water Surface Elevation
Velocity = 0.68 m/s	

Screening Enter Channel Gate — **2551.96**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 3.2 cms
Total area of opening(s) = 4 m²
Velocity through gate(s) = 0.8 m/s
Flow behavior = orifice, downstream control
Units on-line = 10
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2551.88
Upstream water level = 2551.96

Screening Distribution Channel — **2551.96**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 16 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 174.36 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.246 m
Units on-line = 2
Total flow, all units = 32 cms
Depth downstream = 4.16 m
Bend loss = 0 m
Depth upstream = 4.16 m
Velocity = 0.09 m/s

Initial Pipe — **2552.08**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7

Section Description	Water Surface Elevation

Pipe area = 14 m²
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 1.14 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.01 m
Fitting loss = 0.11 m
Total loss = 0.12 m
0

Initial Gate **2552.17**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 16 cms
Total area of opening(s) = 20 m²
Velocity through gate(s) = 0.8 m/s
Flow behavior = orifice, downstream control
Units on-line = 2
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2552.08
Upstream water level = 2552.17

Inicial Junction Tank **2552.17**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 32 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 154.14 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.551 m
Units on-line = 1
Total flow, all units = 32 cms
Depth downstream = 6.17 m
Bend loss = 0 m
Depth upstream = 6.17 m
Velocity = 0.21 m/s

Anexo 3.4.Perfil hidráulico alternativa 2 Cota de inicio 2540.23

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
13.6 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation
Starting water surface elevation	**2540.88**
Exit Pipe	**2540.93**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m²
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.05 m
0

Chlorination Exit Tank **2540.93**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 13.6 cms
Downstream channel invert = 2538.67
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 349.09 m²
Flow profile = Mild
Normal depth = 0.28 m
Critical depth = 0.093 m

Section Description	**Water Surface Elevation**
Units on-line = 1	
Total flow, all units = 13.6 cms	
Depth downstream = 2.26 m	
Bend loss = 0 m	
Depth upstream = 2.26 m	
Velocity = 0.04 m/s	
Chlorination Tank Weir	**2541.87**
Weir invert (top of weir) = 2541.68	
Weir length = 23 m	
Weir height = 5.1 m	
Weir 'C' coefficient = 1.794	
Flow over weir = 3.4 cms	
Weir submergence = unsubmerged	
Units on-line = 4	
Total flow, all units = 13.6 cms	
Head over weir = 0.19 m	
Chlorination Tank	**2541.87**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 356.5 m	
Channel width/diameter = 8 m	
Flow = 3.4 cms	
Downstream channel invert = 2539	
Channel slope = 0.0001 m/m	
Channel side slope = not applicable	
Area of flow = 22.81 m²	
Flow profile = Mild	
Normal depth = 0.76 m	
Critical depth = 0.264 m	
Units on-line = 4	
Total flow, all units = 13.6 cms	
Depth downstream = 2.87 m	
Bend loss = 0 m	
Depth upstream = 2.83 m	
Velocity = 0.15 m/s	
Chlorination Tank - Enter Gate	**2541.87**
Opening type = rectangular gate	
Opening diameter/width = 8000 mm	
Gate height = 4000 mm	
Invert = 2540	
Number of gates = 1	
Flow through gate(s) = 3.4 cms	
Total area of opening(s) = 32 m²	
Velocity through gate(s) = 0.11 m/s	

Section Description	Water Surface Elevation

Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2541.87
Upstream water level = 2541.87

Chlorination Enter Tank **2541.87**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 13.6 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 264.14 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.131 m
Units on-line = 1
Total flow, all units = 13.6 cms
Depth downstream = 2.87 m
Bend loss = 0 m
Depth upstream = 2.87 m
Velocity = 0.05 m/s

Secondary Clarifier - Chlorination Pipe **2541.95**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.05 m
Fitting loss = 0.03 m
Total loss = 0.08 m
0

Section Description	Water Surface Elevation

Secondary Clarifier Exit Pipe **2541.99**

Pipe shape = Circular
Diameter = 1500 mm
Length = 117 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on-line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.04 m

2 Clarifier Orifice **2542.02**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 0.85 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.48 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 13.6 cms
Orifice loss = 0.03 m
Downstream water level = 2541.99
Upstream water level = 2542.02

Launder Channel 2 C **2542.57**

Launder invert = 2542
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.43 cms
Critical depth = 0.2 m
Units on-line = 32
Total flow, all units = 13.6 cms
Downstream depth = 0.2 m
Upstream depth = 0.2 m

Section Description	Water Surface Elevation
Weir 2 Clarifier	**2543**

Invert of V notch = 2542.95
Angle of V notch = 90 degrees
Number of notches = 911
Total flow over weir = 0.85 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 13.6 cms
Head over weir = 0.05 m

2 Clarifier Enter Pipe — **2543.07**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 1.42 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.81 m/s
Units on-line = 16
Total flow, all units = 22.8 cms
Friction loss = 0.02 m
Fitting loss = 0.05 m
Total loss = 0.07 m

Gate Clarifier Distribution Box — **2543.08**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 1.42 cms
Total area of opening(s) = 6 m²
Velocity through gate(s) = 0.24 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 22.8 cms
Gate loss = 0.01 m
Downstream water level = 2543.07
Upstream water level = 2543.08

Box 2 Weir — **2543.69**

Section Description	Water Surface Elevation

Weir invert (top of weir) = 2543.28
Weir length = 3.05 m
Weir height = 5.04 m
Weir 'C' coefficient = 1.807
Flow over weir = 1.42 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 22.8 cms
Head over weir = 0.41 m

Enter Pipe BOX 2 **2543.75**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 120.4 m
Flow = 5.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m²
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 4
Total flow, all units = 22.8 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m
0

General Box 2 Gate **2543.75**

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 21 m²
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2543.75
Upstream water level = 2543.75

Section Description	Water Surface Elevation
General box 2 Weir	**2544.68**

Weir invert (top of weir) = 2544.13
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 5.7 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 22.8 cms
Head over weir = 0.55 m

Aeration Exit pipe **2544.85**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 18.19 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 0.87 m/s
Units on-line = 1
Total flow, all units = 18.2 cms
Friction loss = 0.11 m
Fitting loss = 0.06 m
Total loss = 0.17 m
0

Aeration Exit Channel **2544.85**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 3.8 cms
Downstream channel invert = 2540
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 18.16 m^2
Flow profile = Mild
Normal depth = 0.51 m
Critical depth = 0.452 m
Units on-line = 6
Total flow, all units = 22.8 cms

Section Description	Water Surface Elevation

Depth downstream = 4.85 m
Bend loss = 0 m
Depth upstream = 4.23 m
Velocity = 0.2 m/s

AB Tank Weir **2545.7**

Weir invert (top of weir) = 2545.64
Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 0.95 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 22.8 cms
Head over weir = 0.06 m

Aeration Basin **2545.71**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 0.95 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 73.75 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.091 m
Units on-line = 24
Total flow, all units = 22.8 cms
Depth downstream = 6.7 m
Bend loss = 0 m
Depth upstream = 6.71 m
Velocity = 0.01 m/s

Aeration Enter Gate **2545.71**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 0.95 cms
Total area of opening(s) = 12 m²
Velocity through gate(s) = 0.08 m/s
Flow behavior = orifice, downstream control
Units on-line = 24

Section Description	Water Surface Elevation

Total flow, all units = 22.8 cms
Gate loss = 0 m
Downstream water level = 2545.71
Upstream water level = 2545.71

AB Distribution Pipe **2545.81**

Pipe shape = Circular
Diameter = 1200 mm
Length = 77 m
Flow = 0.95 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m²
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 0.84 m/s
Units on-line = 24
Total flow, all units = 22.8 cms
Friction loss = 0.05 m
Fitting loss = 0.05 m
Total loss = 0.1 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2545.81**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 0.95 cms
Total area of opening(s) = 6.5 m²
Velocity through gate(s) = 0.15 m/s
Flow behavior = orifice, downstream control
Units on-line = 24
Total flow, all units = 22.8 cms
Gate loss = 0 m
Downstream water level = 2545.81
Upstream water level = 2545.81

AB Distribution Box Weir **2546.4**

Weir invert (top of weir) = 2546.09
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815

Section Description	Water Surface Elevation

Flow over weir = 0.95 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 22.8 cms
Head over weir = 0.31 m

Aeration Enter Pipe	**2546.45**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3500 mm
Length = 375 m
Flow = 4.53 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m²
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.52 m/s
Units on-line = 3
Total flow, all units = 13.6 cms
Friction loss = 0.03 m
Fitting loss = 0.02 m
Total loss = 0.05 m
0

General aeration box Weir Gate	**2546.48**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 4.53 cms
Total area of opening(s) = 10 m²
Velocity through gate(s) = 0.45 m/s
Flow behavior = orifice, downstream control
Units on-line = 3
Total flow, all units = 13.6 cms
Gate loss = 0.03 m
Downstream water level = 2546.45
Upstream water level = 2546.48

General Aeration Box Weir	**2547.47**

Weir invert (top of weir) = 2547
Weir length = 7.62 m
Weir height = 3 m

Section Description	**Water Surface Elevation**

Weir 'C' coefficient = 1.846
Flow over weir = 4.53 cms
Weir submergence = unsubmerged
Units on-line = 3
Total flow, all units = 13.6 cms
Head over weir = 0.47 m

Clarifier Junction Exit Pipe **2547.54**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 652 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.56 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.04 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

Clarifier Exit Pipe **2547.58**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 0.85 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on-line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.02 m
Fitting loss = 0.02 m
Total loss = 0.04 m

Section Description	Water Surface Elevation
Clarifier Orifice	**2547.61**
Opening type = circular orifice	
Opening diameter/width = 1500 mm	
Opening height = not applicable	
Invert = 2546	
Number of openings = 1	
Flow through opening(s) = 0.85 cms	
Total area of opening(s) = 1.77 m²	
Velocity through opening(s) = 0.48 m/s	
Flow behavior = orifice, downstream control	
Units on-line = 16	
Total flow, all units = 13.6 cms	
Orifice loss = 0.03 m	
Downstream water level = 2547.58	
Upstream water level = 2547.61	
Clarifier Launder	**2548.53**
Launder invert = 2548	
Launder length = 81.7 m	
Launder width = 1.5 m	
Launder slope = 0.004 m/m	
Flow through launder = 0.43 cms	
Critical depth = 0.2 m	
Units on-line = 32	
Total flow, all units = 13.6 cms	
Downstream depth = 0.2 m	
Upstream depth = 0.2 m	
Weir Clarifier	**2548.81**
Invert of V notch = 2548.75	
Angle of V notch = 90 degrees	
Number of notches = 864	
Total flow over weir = 0.85 cms	
Weir submergence = unsubmerged	
Units on-line = 16	
Total flow, all units = 13.6 cms	
Head over weir = 0.06 m	
Clarifier Enter Pipe	**2548.83**
Pipe shape = Circular	
Diameter = 1500 mm	
Length = 45 m	
Flow = 0.85 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 1.767 m²	

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.48 m/s
Units on-line = 16
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.02 m
Total loss = 0.02 m

Distribution Box Gate **2548.83**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 0.85 cms
Total area of opening(s) = 4.5 m²
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2548.83
Upstream water level = 2548.83

Box 1 Weir **2549.29**

Weir invert (top of weir) = 2549
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 0.85 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 13.6 cms
Head over weir = 0.29 m

Enter Pipe BOX 1 **2549.32**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 3.4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m²

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.54 m/s
Units on-line = 4
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.03 m
Total loss = 0.04 m
0

General Box Gate **2549.32**

Opening type = rectangular gate
Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.19 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2549.32
Upstream water level = 2549.32

General box 1 Weir **2550.21**

Weir invert (top of weir) = 2549.76
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 3.4 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 13.6 cms
Head over weir = 0.45 m

R Mix to Clarifiers Pipe **2550.26**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5

Section Description	**Water Surface Elevation**

Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0.01 m
Fitting loss = 0.03 m
Total loss = 0.05 m
0

RM Exit Channel **2550.26**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 13.6 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 40.34 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on-line = 1
Total flow, all units = 13.6 cms
Depth downstream = 1.26 m
Bend loss = 0 m
Depth upstream = 1.26 m
Velocity = 0.34 m/s

RM Exit Gate **2550.26**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 50.27 m²
Velocity through gate(s) = 0.07 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0 m
Downstream water level = 2550.26
Upstream water level = 2550.26

Section Description	**Water Surface Elevation**

RM **2550.26**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 3.4 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 42.11 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on-line = 4
Total flow, all units = 13.6 cms
Depth downstream = 5.26 m
Bend loss = 0 m
Depth upstream = 5.26 m
Velocity = 0.08 m/s

RM Enter Gate **2550.57**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2550
Number of gates = 4
Flow through gate(s) = 3.4 cms
Total area of opening(s) = 2.98 m²
Velocity through gate(s) = 1.14 m/s
Flow behavior = weir control
Units on-line = 4
Total flow, all units = 13.6 cms
Gate loss = 0.57 m
Downstream water level = 2550.26
Upstream water level = 2550.57

RM Enter Channel **2550.58**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 13.6 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 82.4 m²

Section Description	Water Surface Elevation

Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.264 m
Units on-line = 1
Total flow, all units = 13.6 cms
Depth downstream = 2.57 m
Bend loss = 0 m
Depth upstream = 2.58 m
Velocity = 0.17 m/s

Grit Channel to RM Pipe **2550.61**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.56 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0 m
Fitting loss = 0.03 m
Total loss = 0.03 m
0

Junction Tank Grit Channel **2550.61**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 6.8 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 72.8 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.132 m
Units on-line = 2
Total flow, all units = 13.6 cms
Depth downstream = 1.61 m

Section Description	Water Surface Elevation

Bend loss = 0 m
Depth upstream = 1.61 m
Velocity = 0.09 m/s

Grit Weir	**2551.26**

Weir invert (top of weir) = 2551.11
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 1.36 cms
Weir submergence = unsubmerged
Units on-line = 10
Total flow, all units = 13.6 cms
Head over weir = 0.15 m

Grit Channel	**2551.26**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 0.97 cms
Downstream channel invert = 2548.59
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 16.03 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.139 m
Units on-line = 14
Total flow, all units = 13.6 cms
Depth downstream = 2.67 m
Bend loss = 0 m
Depth upstream = 2.67 m
Velocity = 0.06 m/s

Screening Exit Channel Gate	**2551.32**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 2.72 cms
Total area of opening(s) = 4 m^2
Velocity through gate(s) = 0.68 m/s
Flow behavior = orifice, downstream control
Units on-line = 5
Total flow, all units = 13.6 cms

Section Description	**Water Surface Elevation**

Gate loss = 0.06 m
Downstream water level = 2551.26
Upstream water level = 2551.32

Screen Channel 1 - 2 **2551.33**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.5 m
Flow = 2.72 cms
Downstream channel invert = 2549.28
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 5.11 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.495 m
Units on-line = 5
Total flow, all units = 13.6 cms
Depth downstream = 2.04 m
Bend loss = 0 m
Depth upstream = 2.05 m
Velocity = 0.53 m/s

Fine Screen **2551.57**

Rack invert = 2550.3
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 2.72 cms
Bar width = 6 mm
Bar spacing = 6 mm
Percent blocked = 0%
Net rack open area = 1.28 m^2
Downstream depth = 1.03 m
Velocity in channel = 1.06 m/s
Velocity through bars = 2.12 m/s
Units on-line = 5
Total flow, all units = 13.6 cms
Rack head loss = 0.25 m

Screen Channel 2 -3 **2551.59**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.5 m
Flow = 2.72 cms
Downstream channel invert = 2550.9

Section Description	**Water Surface Elevation**

Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 1.7 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.495 m
Units on-line = 5
Total flow, all units = 13.6 cms
Depth downstream = 0.67 m
Bend loss = 0 m
Depth upstream = 0.69 m
Velocity = 1.62 m/s

Medium Screen **2551.62**

Rack invert = 2550
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 2.72 cms
Bar width = 10 mm
Bar spacing = 25 mm
Percent blocked = 0%
Net rack open area = 2.82 m²
Downstream depth = 1.59 m
Velocity in channel = 0.69 m/s
Velocity through bars = 0.97 m/s
Units on-line = 5
Total flow, all units = 13.6 cms
Rack head loss = 0.03 m

Screen Channel 3 - 4 **2551.63**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.5 m
Flow = 2.72 cms
Downstream channel invert = 2550.9
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 1.81 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.495 m
Units on-line = 5
Total flow, all units = 13.6 cms
Depth downstream = 0.72 m
Bend loss = 0 m
Depth upstream = 0.73 m

Section Description	Water Surface Elevation

Velocity = 1.51 m/s

Screening Enter Channel Gate **2551.69**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 2.72 cms
Total area of opening(s) = 4 m²
Velocity through gate(s) = 0.68 m/s
Flow behavior = orifice, downstream control
Units on-line = 5
Total flow, all units = 13.6 cms
Gate loss = 0.06 m
Downstream water level = 2551.63
Upstream water level = 2551.69

Screening Distribution Channel **2551.7**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 6.8 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 163.16 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.139 m
Units on-line = 2
Total flow, all units = 13.6 cms
Depth downstream = 3.89 m
Bend loss = 0 m
Depth upstream = 3.9 m
Velocity = 0.04 m/s

Initial Pipe **2551.72**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 6.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7

Section Description	Water Surface Elevation

Pipe area = 14 m²
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.49 m/s
Units on-line = 2
Total flow, all units = 13.6 cms
Friction loss = 0 m
Fitting loss = 0.02 m
Total loss = 0.02 m
0

Initial Gate **2551.74**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 6.8 cms
Total area of opening(s) = 20 m²
Velocity through gate(s) = 0.34 m/s
Flow behavior = orifice, downstream control
Units on-line = 2
Total flow, all units = 13.6 cms
Gate loss = 0.02 m
Downstream water level = 2551.72
Upstream water level = 2551.74

Inicial Junction Tank **2551.74**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 13.6 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 143.4 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.312 m
Units on-line = 1
Total flow, all units = 13.6 cms
Depth downstream = 5.74 m
Bend loss = 0 m
Depth upstream = 5.74 m
Velocity = 0.09 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
16 cms	9.18 cms	-----	-----

Section Description	**Water Surface Elevation**
Starting water surface elevation	**2540.97**
Exit Pipe	**2541.04**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m²
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 0.67 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0.03 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

Chlorination Exit Tank **2541.04**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 16 cms
Downstream channel invert = 2538.67
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 366.11 m²
Flow profile = Mild
Normal depth = 0.31 m
Critical depth = 0.103 m

Section Description	Water Surface Elevation

Units on-line = 1
Total flow, all units = 16 cms
Depth downstream = 2.37 m
Bend loss = 0 m
Depth upstream = 2.37 m
Velocity = 0.04 m/s

Chlorination Tank Weir **2541.89**

Weir invert (top of weir) = 2541.68
Weir length = 23 m
Weir height = 5.1 m
Weir 'C' coefficient = 1.794
Flow over weir = 4 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 16 cms
Head over weir = 0.21 m

Chlorination Tank **2541.89**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 356.5 m
Channel width/diameter = 8 m
Flow = 4 cms
Downstream channel invert = 2539
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 22.99 m²
Flow profile = Mild
Normal depth = 0.84 m
Critical depth = 0.295 m
Units on-line = 4
Total flow, all units = 16 cms
Depth downstream = 2.89 m
Bend loss = 0 m
Depth upstream = 2.86 m
Velocity = 0.17 m/s

Chlorination Tank - Enter Gate **2541.89**

Opening type = rectangular gate
Opening diameter/width = 8000 mm
Gate height = 4000 mm
Invert = 2540
Number of gates = 1
Flow through gate(s) = 4 cms
Total area of opening(s) = 32 m²
Velocity through gate(s) = 0.12 m/s

Section Description	Water Surface Elevation

Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 16 cms
Gate loss = 0 m
Downstream water level = 2541.89
Upstream water level = 2541.89

Chlorination Enter Tank **2541.9**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 16 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 266.32 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.146 m
Units on-line = 1
Total flow, all units = 16 cms
Depth downstream = 2.89 m
Bend loss = 0 m
Depth upstream = 2.9 m
Velocity = 0.06 m/s

Secondary Clarifier - Chlorination Pipe **2542.01**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0.07 m
Fitting loss = 0.04 m
Total loss = 0.11 m
0

Section Description	**Water Surface Elevation**

Secondary Clarifier Exit Pipe — **2542.06**

Pipe shape = Circular
Diameter = 1500 mm
Length = 117 m
Flow = 1 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 16
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m

2 Clarifier Orifice — **2542.11**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 1 cms
Total area of opening(s) = 1.77 m²
Velocity through opening(s) = 0.57 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 16 cms
Orifice loss = 0.05 m
Downstream water level = 2542.06
Upstream water level = 2542.11

Launder Channel 2 C — **2542.59**

Launder invert = 2542
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.5 cms
Critical depth = 0.22 m
Units on-line = 32
Total flow, all units = 16 cms
Downstream depth = 0.22 m
Upstream depth = 0.22 m

Section Description — **Water Surface Elevation**

Weir 2 Clarifier — **2543.01**

Invert of V notch = 2542.95
Angle of V notch = 90 degrees
Number of notches = 911
Total flow over weir = 1 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 16 cms
Head over weir = 0.06 m

2 Clarifier Enter Pipe — **2543.09**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 1.57 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.89 m/s
Units on-line = 16
Total flow, all units = 25.2 cms
Friction loss = 0.02 m
Fitting loss = 0.06 m
Total loss = 0.08 m

Gate Clarifier Distribution Box — **2543.1**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 1.57 cms
Total area of opening(s) = 6 m^2
Velocity through gate(s) = 0.26 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 25.2 cms
Gate loss = 0.01 m
Downstream water level = 2543.09
Upstream water level = 2543.1

Box 2 Weir — **2543.71**

Section Description	Water Surface Elevation
Weir invert (top of weir) = 2543.28 Weir length = 3.05 m Weir height = 5.04 m Weir 'C' coefficient = 1.807 Flow over weir = 1.57 cms Weir submergence = unsubmerged Units on-line = 16 Total flow, all units = 25.2 cms Head over weir = 0.43 m	
Enter Pipe BOX 2	**2543.79**
Pipe shape = Rectangular Height = 2500 mm Width = 3000 mm Length = 120.4 m Flow = 6.3 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 7.5 m² Pipe hydraulic radius = 0.682 Age factor = 1 Solids factor = 1 Velocity = 0.84 m/s Units on-line = 4 Total flow, all units = 25.2 cms Friction loss = 0.02 m Fitting loss = 0.05 m Total loss = 0.08 m 0	
General Box 2 Gate	**2543.79**
Opening type = rectangular gate Opening diameter/width = 7000 mm Gate height = 3000 mm Invert = 2542 Number of gates = 1 Flow through gate(s) = 4 cms Total area of opening(s) = 21 m² Velocity through gate(s) = 0.19 m/s Flow behavior = orifice, downstream control Units on-line = 4 Total flow, all units = 16 cms Gate loss = 0 m Downstream water level = 2543.79 Upstream water level = 2543.79	

Section Description	**Water Surface Elevation**

General box 2 Weir **2544.72**

Weir invert (top of weir) = 2544.13
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 6.3 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 25.2 cms
Head over weir = 0.59 m

Aeration Exit pipe **2544.93**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 20.59 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 0.98 m/s
Units on-line = 1
Total flow, all units = 20.6 cms
Friction loss = 0.14 m
Fitting loss = 0.07 m
Total loss = 0.21 m
0

Aeration Exit Channel **2544.93**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 4.2 cms
Downstream channel invert = 2540
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 18.48 m^2
Flow profile = Mild
Normal depth = 0.54 m
Critical depth = 0.483 m
Units on-line = 6
Total flow, all units = 25.2 cms

Section Description	**Water Surface Elevation**

Depth downstream = 4.93 m
Bend loss = 0 m
Depth upstream = 4.31 m
Velocity = 0.21 m/s

AB Tank Weir — **2545.71**

Weir invert (top of weir) = 2545.64
Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.05 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 25.2 cms
Head over weir = 0.07 m

Aeration Basin — **2545.71**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.05 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 73.8 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.098 m
Units on-line = 24
Total flow, all units = 25.2 cms
Depth downstream = 6.71 m
Bend loss = 0 m
Depth upstream = 6.71 m
Velocity = 0.01 m/s

Aeration Enter Gate — **2545.71**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.05 cms
Total area of opening(s) = 12 m²
Velocity through gate(s) = 0.09 m/s
Flow behavior = orifice, downstream control
Units on-line = 24

Section Description	Water Surface Elevation

Total flow, all units = 25.2 cms
Gate loss = 0 m
Downstream water level = 2545.71
Upstream water level = 2545.71

AB Distribution Pipe **2545.83**

Pipe shape = Circular
Diameter = 1200 mm
Length = 77 m
Flow = 1.05 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m²
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 0.93 m/s
Units on-line = 24
Total flow, all units = 25.2 cms
Friction loss = 0.06 m
Fitting loss = 0.07 m
Total loss = 0.12 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2545.83**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.05 cms
Total area of opening(s) = 6.5 m²
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on-line = 24
Total flow, all units = 25.2 cms
Gate loss = 0 m
Downstream water level = 2545.83
Upstream water level = 2545.83

AB Distribution Box Weir **2546.42**

Weir invert (top of weir) = 2546.09
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815

Section Description	Water Surface Elevation

Flow over weir = 1.05 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 25.2 cms
Head over weir = 0.33 m

Aeration Enter Pipe **2546.49**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3500 mm
Length = 375 m
Flow = 5.33 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m²
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.61 m/s
Units on-line = 3
Total flow, all units = 16 cms
Friction loss = 0.04 m
Fitting loss = 0.03 m
Total loss = 0.07 m
0

General aeration box Weir Gate **2546.53**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 5.33 cms
Total area of opening(s) = 10 m²
Velocity through gate(s) = 0.53 m/s
Flow behavior = orifice, downstream control
Units on-line = 3
Total flow, all units = 16 cms
Gate loss = 0.04 m
Downstream water level = 2546.49
Upstream water level = 2546.53

General Aeration Box Weir **2547.52**

Weir invert (top of weir) = 2547
Weir length = 7.62 m
Weir height = 3 m

Section Description **Water Surface Elevation**

Weir 'C' coefficient = 1.846
Flow over weir = 5.33 cms
Weir submergence = unsubmerged
Units on-line = 3
Total flow, all units = 16 cms
Head over weir = 0.52 m

Clarifier Junction Exit Pipe **2547.62**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 652 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0.06 m
Fitting loss = 0.04 m
Total loss = 0.1 m
0

Clarifier Exit Pipe **2547.67**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 1 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 16
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.03 m
Total loss = 0.05 m

Section Description	Water Surface Elevation
Clarifier Orifice	**2547.72**
Opening type = circular orifice	
Opening diameter/width = 1500 mm	
Opening height = not applicable	
Invert = 2546	
Number of openings = 1	
Flow through opening(s) = 1 cms	
Total area of opening(s) = 1.77 m²	
Velocity through opening(s) = 0.57 m/s	
Flow behavior = orifice, downstream control	
Units on-line = 16	
Total flow, all units = 16 cms	
Orifice loss = 0.05 m	
Downstream water level = 2547.67	
Upstream water level = 2547.72	
Clarifier Launder	**2548.55**
Launder invert = 2548	
Launder length = 81.7 m	
Launder width = 1.5 m	
Launder slope = 0.004 m/m	
Flow through launder = 0.5 cms	
Critical depth = 0.22 m	
Units on-line = 32	
Total flow, all units = 16 cms	
Downstream depth = 0.22 m	
Upstream depth = 0.22 m	
Weir Clarifier	**2548.81**
Invert of V notch = 2548.75	
Angle of V notch = 90 degrees	
Number of notches = 864	
Total flow over weir = 1 cms	
Weir submergence = unsubmerged	
Units on-line = 16	
Total flow, all units = 16 cms	
Head over weir = 0.06 m	
Clarifier Enter Pipe	**2548.84**
Pipe shape = Circular	
Diameter = 1500 mm	
Length = 45 m	
Flow = 1 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 1.767 m²	

Section Description	**Water Surface Elevation**

Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 16
Total flow, all units = 16 cms
Friction loss = 0.01 m
Fitting loss = 0.02 m
Total loss = 0.03 m

Distribution Box Gate **2548.85**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 1 cms
Total area of opening(s) = 4.5 m^2
Velocity through gate(s) = 0.22 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2548.84
Upstream water level = 2548.85

Box 1 Weir **2549.32**

Weir invert (top of weir) = 2549
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 1 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 16 cms
Head over weir = 0.32 m

Enter Pipe BOX 1 **2549.37**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m^2

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.64 m/s
Units on-line = 4
Total flow, all units = 16 cms
Friction loss = 0.01 m
Fitting loss = 0.04 m
Total loss = 0.05 m
0

General Box Gate **2549.38**

Opening type = rectangular gate
Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 4 cms
Total area of opening(s) = 18 m^2
Velocity through gate(s) = 0.22 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 16 cms
Gate loss = 0.01 m
Downstream water level = 2549.37
Upstream water level = 2549.38

General box 1 Weir **2550.26**

Weir invert (top of weir) = 2549.76
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 4 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 16 cms
Head over weir = 0.5 m

R Mix to Clarifiers Pipe **2550.33**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5

Section Description	Water Surface Elevation

Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m
0

RM Exit Channel **2550.33**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 16 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 42.58 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on-line = 1
Total flow, all units = 16 cms
Depth downstream = 1.33 m
Bend loss = 0 m
Depth upstream = 1.33 m
Velocity = 0.38 m/s

RM Exit Gate **2550.33**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 4 cms
Total area of opening(s) = 50.27 m²
Velocity through gate(s) = 0.08 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 16 cms
Gate loss = 0 m
Downstream water level = 2550.33
Upstream water level = 2550.33

Section Description	Water Surface Elevation
RM	**2550.34**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 4 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 42.67 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on-line = 4
Total flow, all units = 16 cms
Depth downstream = 5.33 m
Bend loss = 0 m
Depth upstream = 5.34 m
Velocity = 0.09 m/s

RM Enter Gate — **2550.63**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2550
Number of gates = 4
Flow through gate(s) = 4 cms
Total area of opening(s) = 3.38 m²
Velocity through gate(s) = 1.18 m/s
Flow behavior = weir control
Units on-line = 4
Total flow, all units = 16 cms
Gate loss = 0.63 m
Downstream water level = 2550.33
Upstream water level = 2550.63

RM Enter Channel — **2550.63**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 16 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 84.1 m²

Section Description	Water Surface Elevation

Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.295 m
Units on-line = 1
Total flow, all units = 16 cms
Depth downstream = 2.63 m
Bend loss = 0 m
Depth upstream = 2.63 m
Velocity = 0.19 m/s

Grit Channel to RM Pipe **2550.67**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.65 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0 m
Fitting loss = 0.04 m
Total loss = 0.04 m
0

Junction Tank Grit Channel **2550.67**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 8 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 75.5 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.148 m
Units on-line = 2
Total flow, all units = 16 cms
Depth downstream = 1.67 m

Section Description	Water Surface Elevation
Bend loss = 0 m Depth upstream = 1.67 m Velocity = 0.11 m/s	
Grit Weir	**2551.28**
Weir invert (top of weir) = 2551.11 Weir length = 12 m Weir height = 0.43 m Weir 'C' coefficient = 1.931 Flow over weir = 1.6 cms Weir submergence = unsubmerged Units on-line = 10 Total flow, all units = 16 cms Head over weir = 0.17 m	
Grit Channel	**2551.28**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 40.5 m Channel width/diameter = 6 m Flow = 1.14 cms Downstream channel invert = 2548.59 Channel slope = 0 m/m Channel side slope = not applicable Area of flow = 16.13 m² Flow profile = Horizontal Normal depth = Infinite Critical depth = 0.155 m Units on-line = 14 Total flow, all units = 16 cms Depth downstream = 2.69 m Bend loss = 0 m Depth upstream = 2.69 m Velocity = 0.07 m/s	
Screening Exit Channel Gate	**2551.34**
Opening type = rectangular gate Opening diameter/width = 2000 mm Gate height = 2000 mm Invert = 2547 Number of gates = 1 Flow through gate(s) = 2.67 cms Total area of opening(s) = 4 m² Velocity through gate(s) = 0.67 m/s Flow behavior = orifice, downstream control Units on-line = 6 Total flow, all units = 16 cms	

Section Description	Water Surface Elevation
Gate loss = 0.06 m Downstream water level = 2551.28 Upstream water level = 2551.34	

Screen Channel 1 - 2 **2551.34**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.5 m
Flow = 2.67 cms
Downstream channel invert = 2549.28
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 5.15 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.488 m
Units on-line = 6
Total flow, all units = 16 cms
Depth downstream = 2.06 m
Bend loss = 0 m
Depth upstream = 2.06 m
Velocity = 0.52 m/s

Fine Screen **2551.57**

Rack invert = 2550.3
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 2.67 cms
Bar width = 6 mm
Bar spacing = 6 mm
Percent blocked = 0%
Net rack open area = 1.3 m²
Downstream depth = 1.04 m
Velocity in channel = 1.02 m/s
Velocity through bars = 2.05 m/s
Units on-line = 6
Total flow, all units = 16 cms
Rack head loss = 0.23 m

Screen Channel 2 -3 **2551.59**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.5 m
Flow = 2.67 cms
Downstream channel invert = 2550.9

Section Description	**Water Surface Elevation**

Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 1.69 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.488 m
Units on-line = 6
Total flow, all units = 16 cms
Depth downstream = 0.67 m
Bend loss = 0 m
Depth upstream = 0.69 m
Velocity = 1.59 m/s

Medium Screen **2551.62**

Rack invert = 2550
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 2.67 cms
Bar width = 10 mm
Bar spacing = 25 mm
Percent blocked = 0%
Net rack open area = 2.81 m²
Downstream depth = 1.59 m
Velocity in channel = 0.67 m/s
Velocity through bars = 0.95 m/s
Units on-line = 6
Total flow, all units = 16 cms
Rack head loss = 0.03 m

Screen Channel 3 - 4 **2551.63**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.5 m
Flow = 2.67 cms
Downstream channel invert = 2550.9
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 1.81 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.488 m
Units on-line = 6
Total flow, all units = 16 cms
Depth downstream = 0.72 m
Bend loss = 0 m
Depth upstream = 0.73 m

Section Description	Water Surface Elevation
Velocity = 1.49 m/s	
Screening Enter Channel Gate	**2551.69**
Opening type = rectangular gate	
Opening diameter/width = 2000 mm	
Gate height = 2000 mm	
Invert = 2548	
Number of gates = 1	
Flow through gate(s) = 2.67 cms	
Total area of opening(s) = 4 m²	
Velocity through gate(s) = 0.67 m/s	
Flow behavior = orifice, downstream control	
Units on-line = 6	
Total flow, all units = 16 cms	
Gate loss = 0.06 m	
Downstream water level = 2551.63	
Upstream water level = 2551.69	
Screening Distribution Channel	**2551.69**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 14.55 m	
Channel width/diameter = 41.9 m	
Flow = 8 cms	
Downstream channel invert = 2547.8	
Channel slope = 0 m/m	
Channel side slope = not applicable	
Area of flow = 162.95 m²	
Flow profile = Horizontal	
Normal depth = Infinite	
Critical depth = 0.155 m	
Units on-line = 2	
Total flow, all units = 16 cms	
Depth downstream = 3.89 m	
Bend loss = 0 m	
Depth upstream = 3.89 m	
Velocity = 0.05 m/s	
Initial Pipe	**2551.72**
Pipe shape = Rectangular	
Height = 3500 mm	
Width = 4000 mm	
Length = 28 m	
Flow = 8 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.7	

<u>Section Description</u> **<u>Water Surface Elevation</u>**

Pipe area = 14 m²
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.57 m/s
Units on-line = 2
Total flow, all units = 16 cms
Friction loss = 0 m
Fitting loss = 0.03 m
Total loss = 0.03 m
0

Initial Gate **2551.74**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 20 m²
Velocity through gate(s) = 0.4 m/s
Flow behavior = orifice, downstream control
Units on-line = 2
Total flow, all units = 16 cms
Gate loss = 0.02 m
Downstream water level = 2551.72
Upstream water level = 2551.74

Inicial Junction Tank **2551.74**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 16 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 143.54 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.347 m
Units on-line = 1
Total flow, all units = 16 cms
Depth downstream = 5.74 m
Bend loss = 0 m
Depth upstream = 5.74 m
Velocity = 0.11 m/s

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
21.6 cms	9.18 cms	-----	-----

Section Description	Water Surface Elevation

Secondary Clarifier Exit Pipe **2542.24**

Pipe shape = Circular
Diameter = 1500 mm
Length = 117 m
Flow = 1.35 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 16
Total flow, all units = 21.6 cms
Friction loss = 0.04 m
Fitting loss = 0.05 m
Total loss = 0.09 m

2 Clarifier Orifice **2542.32**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 1.35 cms
Total area of opening(s) = 1.77 m²
Velocity through opening(s) = 0.76 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 21.6 cms
Orifice loss = 0.08 m
Downstream water level = 2542.24
Upstream water level = 2542.32

Launder Channel 2 C **2542.64**

Section Description	**Water Surface Elevation**
Launder invert = 2542	
Launder length = 91 m	
Launder width = 1.5 m	
Launder slope = 0.004 m/m	
Flow through launder = 0.68 cms	
Critical depth = 0.27 m	
Units on-line = 32	
Total flow, all units = 21.6 cms	
Downstream depth = 0.32 m	
Upstream depth = 0.27 m	
Weir 2 Clarifier	**2543.01**
Invert of V notch = 2542.95	
Angle of V notch = 90 degrees	
Number of notches = 911	
Total flow over weir = 1.35 cms	
Weir submergence = unsubmerged	
Units on-line = 16	
Total flow, all units = 21.6 cms	
Head over weir = 0.06 m	
2 Clarifier Enter Pipe	**2543.14**
Pipe shape = Circular	
Diameter = 1500 mm	
Length = 48.8 m	
Flow = 1.92 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 1.767 m^2	
Pipe hydraulic radius = 0.375	
Age factor = 1	
Solids factor = 1	
Velocity = 1.09 m/s	
Units on-line = 16	
Total flow, all units = 30.8 cms	
Friction loss = 0.04 m	
Fitting loss = 0.09 m	
Total loss = 0.13 m	
Gate Clarifier Distribution Box	**2543.15**
Opening type = rectangular gate	
Opening diameter/width = 1500 mm	
Gate height = 4000 mm	
Invert = 2541	
Number of gates = 1	
Flow through gate(s) = 1.92 cms	

Section Description	Water Surface Elevation

Total area of opening(s) = 6 m²
Velocity through gate(s) = 0.32 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 30.8 cms
Gate loss = 0.01 m
Downstream water level = 2543.14
Upstream water level = 2543.15

Box 2 Weir — **2543.78**

Weir invert (top of weir) = 2543.28
Weir length = 3.05 m
Weir height = 5.04 m
Weir 'C' coefficient = 1.807
Flow over weir = 1.92 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 30.8 cms
Head over weir = 0.5 m

Enter Pipe BOX 2 — **2543.89**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3000 mm
Length = 120.4 m
Flow = 7.7 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 7.5 m²
Pipe hydraulic radius = 0.682
Age factor = 1
Solids factor = 1
Velocity = 1.03 m/s
Units on-line = 4
Total flow, all units = 30.8 cms
Friction loss = 0.04 m
Fitting loss = 0.08 m
Total loss = 0.12 m
0

General Box 2 Gate — **2543.9**

Opening type = rectangular gate
Opening diameter/width = 7000 mm
Gate height = 3000 mm
Invert = 2542
Number of gates = 1

Section Description	**Water Surface Elevation**

Flow through gate(s) = 5.4 cms
Total area of opening(s) = 21 m²
Velocity through gate(s) = 0.26 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0.01 m
Downstream water level = 2543.89
Upstream water level = 2543.9

General box 2 Weir **2544.8**

Weir invert (top of weir) = 2544.13
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 7.7 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 30.8 cms
Head over weir = 0.67 m

Aeration Exit pipe **2545.15**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 26.19 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m²
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 1.25 m/s
Units on-line = 1
Total flow, all units = 26.2 cms
Friction loss = 0.22 m
Fitting loss = 0.12 m
Total loss = 0.34 m
0

Aeration Exit Channel **2545.15**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m

Section Description	Water Surface Elevation

Flow = 5.13 cms
Downstream channel invert = 2540
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 19.36 m²
Flow profile = Mild
Normal depth = 0.62 m
Critical depth = 0.552 m
Units on-line = 6
Total flow, all units = 30.8 cms
Depth downstream = 5.15 m
Bend loss = 0 m
Depth upstream = 4.53 m
Velocity = 0.25 m/s

AB Tank Weir **2545.72**

Weir invert (top of weir) = 2545.64
Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.28 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 30.7 cms
Head over weir = 0.08 m

Aeration Basin **2545.72**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.28 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 73.91 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.112 m
Units on-line = 24
Total flow, all units = 30.8 cms
Depth downstream = 6.72 m
Bend loss = 0 m
Depth upstream = 6.72 m
Velocity = 0.02 m/s

Aeration Enter Gate **2545.72**

Section Description	**Water Surface Elevation**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.28 cms
Total area of opening(s) = 12 m²
Velocity through gate(s) = 0.11 m/s
Flow behavior = orifice, downstream control
Units on-line = 24
Total flow, all units = 30.8 cms
Gate loss = 0 m
Downstream water level = 2545.72
Upstream water level = 2545.72

AB Distribution Pipe **2545.9**

Pipe shape = Circular
Diameter = 1200 mm
Length = 77 m
Flow = 1.28 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.131 m²
Pipe hydraulic radius = 0.3
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on-line = 24
Total flow, all units = 30.8 cms
Friction loss = 0.08 m
Fitting loss = 0.1 m
Total loss = 0.18 m
Total loss = 0.17 m
0

AB Distribution Box Gate **2545.91**

Opening type = rectangular gate
Opening diameter/width = 1300 mm
Gate height = 5000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.28 cms
Total area of opening(s) = 6.5 m²
Velocity through gate(s) = 0.2 m/s
Flow behavior = orifice, downstream control
Units on-line = 24

Section Description	Water Surface Elevation

Total flow, all units = 30.8 cms
Gate loss = 0.01 m
Downstream water level = 2545.9
Upstream water level = 2545.91

AB Distribution Box Weir	**2546.47**

Weir invert (top of weir) = 2546.09
Weir length = 3.05 m
Weir height = 3 m
Weir 'C' coefficient = 1.815
Flow over weir = 1.28 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 30.7 cms
Head over weir = 0.38 m

Aeration Enter Pipe	**2546.59**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3500 mm
Length = 375 m
Flow = 7.2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m²
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 0.82 m/s
Units on-line = 3
Total flow, all units = 21.6 cms
Friction loss = 0.07 m
Fitting loss = 0.06 m
Total loss = 0.13 m
0

General aeration box Weir Gate	**2546.66**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 7.2 cms
Total area of opening(s) = 10 m²
Velocity through gate(s) = 0.72 m/s
Flow behavior = orifice, downstream control

Section Description	Water Surface Elevation
Units on-line = 3	
Total flow, all units = 21.6 cms	
Gate loss = 0.07 m	
Downstream water level = 2546.59	
Upstream water level = 2546.66	
General Aeration Box Weir	**2547.64**
Weir invert (top of weir) = 2547	
Weir length = 7.62 m	
Weir height = 3 m	
Weir 'C' coefficient = 1.846	
Flow over weir = 7.2 cms	
Weir submergence = unsubmerged	
Units on-line = 3	
Total flow, all units = 21.6 cms	
Head over weir = 0.64 m	
Clarifier Junction Exit Pipe	**2547.81**
Pipe shape = Rectangular	
Height = 3500 mm	
Width = 3500 mm	
Length = 652 m	
Flow = 10.8 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.8	
Pipe area = 12.25 m²	
Pipe hydraulic radius = 0.875	
Age factor = 1	
Solids factor = 1	
Velocity = 0.88 m/s	
Units on-line = 2	
Total flow, all units = 21.6 cms	
Friction loss = 0.1 m	
Fitting loss = 0.07 m	
Total loss = 0.17 m	
0	
Clarifier Exit Pipe	**2547.9**
Pipe shape = Circular	
Diameter = 1500 mm	
Length = 105.4 m	
Flow = 1.35 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.8	
Pipe area = 1.767 m²	

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 16
Total flow, all units = 21.6 cms
Friction loss = 0.04 m
Fitting loss = 0.05 m
Total loss = 0.09 m

Clarifier Orifice **2547.98**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2546
Number of openings = 1
Flow through opening(s) = 1.35 cms
Total area of opening(s) = 1.77 m^2
Velocity through opening(s) = 0.76 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 21.6 cms
Orifice loss = 0.08 m
Downstream water level = 2547.9
Upstream water level = 2547.98

Clarifier Launder **2548.6**

Launder invert = 2548
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 0.68 cms
Critical depth = 0.27 m
Units on-line = 32
Total flow, all units = 21.6 cms
Downstream depth = 0.27 m
Upstream depth = 0.27 m

Weir Clarifier **2548.82**

Invert of V notch = 2548.75
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 1.35 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 21.6 cms
Head over weir = 0.07 m

Section Description	Water Surface Elevation
Clarifier Enter Pipe	**2548.88**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 1.35 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 0.76 m/s
Units on-line = 16
Total flow, all units = 21.6 cms
Friction loss = 0.02 m
Fitting loss = 0.04 m
Total loss = 0.06 m

Distribution Box Gate **2548.89**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 1.35 cms
Total area of opening(s) = 4.5 m²
Velocity through gate(s) = 0.3 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 21.6 cms
Gate loss = 0.01 m
Downstream water level = 2548.88
Upstream water level = 2548.89

Box 1 Weir **2549.39**

Weir invert (top of weir) = 2549
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 1.35 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 21.6 cms
Head over weir = 0.39 m

<u>**Section Description**</u>	<u>**Water Surface Elevation**</u>

Enter Pipe BOX 1 **2549.48**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 5.4 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m²
Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 0.86 m/s
Units on-line = 4
Total flow, all units = 21.6 cms
Friction loss = 0.03 m
Fitting loss = 0.06 m
Total loss = 0.09 m
0

General Box Gate **2549.49**

Opening type = rectangular gate
Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 5.4 cms
Total area of opening(s) = 18 m²
Velocity through gate(s) = 0.3 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0.01 m
Downstream water level = 2549.48
Upstream water level = 2549.49

General box 1 Weir **2550.37**

Weir invert (top of weir) = 2549.76
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 5.4 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 21.6 cms
Head over weir = 0.61 m

Section Description	Water Surface Elevation
R Mix to Clarifiers Pipe	**2550.49**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.03 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0.04 m
Fitting loss = 0.08 m
Total loss = 0.12 m
0

RM Exit Channel **2550.49**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 21.6 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 47.7 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.36 m
Units on-line = 1
Total flow, all units = 21.6 cms
Depth downstream = 1.49 m
Bend loss = 0 m
Depth upstream = 1.49 m
Velocity = 0.45 m/s

RM Exit Gate **2550.49**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547

Section Description	Water Surface Elevation

Number of gates = 4
Flow through gate(s) = 5.4 cms
Total area of opening(s) = 50.27 m²
Velocity through gate(s) = 0.11 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0 m
Downstream water level = 2550.49
Upstream water level = 2550.49

RM **2550.5**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 5.4 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 43.95 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.36 m
Units on-line = 4
Total flow, all units = 21.6 cms
Depth downstream = 5.49 m
Bend loss = 0 m
Depth upstream = 5.5 m
Velocity = 0.12 m/s

RM Enter Gate **2550.74**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2550
Number of gates = 4
Flow through gate(s) = 5.4 cms
Total area of opening(s) = 4.22 m²
Velocity through gate(s) = 1.28 m/s
Flow behavior = weir control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0.74 m
Downstream water level = 2550.5
Upstream water level = 2550.74

Section Description	Water Surface Elevation
RM Enter Channel	**2550.74**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 21.6 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 87.68 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.36 m
Units on-line = 1
Total flow, all units = 21.6 cms
Depth downstream = 2.74 m
Bend loss = 0 m
Depth upstream = 2.74 m
Velocity = 0.25 m/s

Grit Channel to RM Pipe **2550.82**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 0.88 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0.01 m
Fitting loss = 0.07 m
Total loss = 0.08 m
0

Junction Tank Grit Channel **2550.82**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 10.8 cms

Section Description	Water Surface Elevation

Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 82.29 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.18 m
Units on-line = 2
Total flow, all units = 21.6 cms
Depth downstream = 1.82 m
Bend loss = 0 m
Depth upstream = 1.82 m
Velocity = 0.13 m/s

Grit Weir **2551.32**

Weir invert (top of weir) = 2551.11
Weir length = 12 m
Weir height = 0.43 m
Weir 'C' coefficient = 1.931
Flow over weir = 2.16 cms
Weir submergence = unsubmerged
Units on-line = 10
Total flow, all units = 21.6 cms
Head over weir = 0.21 m

Grit Channel **2551.32**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 40.5 m
Channel width/diameter = 6 m
Flow = 1.54 cms
Downstream channel invert = 2548.59
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 16.36 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.189 m
Units on-line = 14
Total flow, all units = 21.6 cms
Depth downstream = 2.73 m
Bend loss = 0 m
Depth upstream = 2.73 m
Velocity = 0.09 m/s

Screening Exit Channel Gate **2551.4**

Opening type = rectangular gate

Section Description	**Water Surface Elevation**
Opening diameter/width = 2000 mm	
Gate height = 2000 mm	
Invert = 2547	
Number of gates = 1	
Flow through gate(s) = 3.09 cms	
Total area of opening(s) = 4 m²	
Velocity through gate(s) = 0.77 m/s	
Flow behavior = orifice, downstream control	
Units on-line = 7	
Total flow, all units = 21.6 cms	
Gate loss = 0.08 m	
Downstream water level = 2551.32	
Upstream water level = 2551.4	
Screen Channel 1 - 2	**2551.4**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 5 m	
Channel width/diameter = 2.5 m	
Flow = 3.09 cms	
Downstream channel invert = 2549.28	
Channel slope = 0 m/m	
Channel side slope = not applicable	
Area of flow = 5.29 m²	
Flow profile = Horizontal	
Normal depth = Infinite	
Critical depth = 0.538 m	
Units on-line = 7	
Total flow, all units = 21.6 cms	
Depth downstream = 2.12 m	
Bend loss = 0 m	
Depth upstream = 2.12 m	
Velocity = 0.58 m/s	
Fine Screen	**2551.68**
Rack invert = 2550.3	
Rack width = 2.5 m	
Channel width = 2.5 m	
Flow through rack = 3.09 cms	
Bar width = 6 mm	
Bar spacing = 6 mm	
Percent blocked = 0%	
Net rack open area = 1.37 m²	
Downstream depth = 1.1 m	
Velocity in channel = 1.12 m/s	
Velocity through bars = 2.25 m/s	
Units on-line = 7	

Section Description	**Water Surface Elevation**

Total flow, all units = 21.6 cms
Rack head loss = 0.28 m

Screen Channel 2 -3 **2551.69**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.5 m
Flow = 3.09 cms
Downstream channel invert = 2550.9
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 1.95 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.538 m
Units on-line = 7
Total flow, all units = 21.6 cms
Depth downstream = 0.78 m
Bend loss = 0 m
Depth upstream = 0.79 m
Velocity = 1.59 m/s

Medium Screen **2551.73**

Rack invert = 2550
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 3.09 cms
Bar width = 10 mm
Bar spacing = 25 mm
Percent blocked = 0%
Net rack open area = 2.99 m^2
Downstream depth = 1.69 m
Velocity in channel = 0.73 m/s
Velocity through bars = 1.03 m/s
Units on-line = 7
Total flow, all units = 21.6 cms
Rack head loss = 0.04 m

Screen Channel 3 - 4 **2551.74**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.5 m
Flow = 3.09 cms
Downstream channel invert = 2550.9
Channel slope = 0 m/m

Section Description	Water Surface Elevation

Channel side slope = not applicable
Area of flow = 2.08 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.538 m
Units on-line = 7
Total flow, all units = 21.6 cms
Depth downstream = 0.83 m
Bend loss = 0 m
Depth upstream = 0.84 m
Velocity = 1.49 m/s

Screening Enter Channel Gate **2551.82**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 3.09 cms
Total area of opening(s) = 4 m²
Velocity through gate(s) = 0.77 m/s
Flow behavior = orifice, downstream control
Units on-line = 7
Total flow, all units = 21.6 cms
Gate loss = 0.08 m
Downstream water level = 2551.74
Upstream water level = 2551.82

Screening Distribution Channel **2551.82**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 10.8 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 168.27 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.19 m
Units on-line = 2
Total flow, all units = 21.6 cms
Depth downstream = 4.02 m
Bend loss = 0 m
Depth upstream = 4.02 m
Velocity = 0.06 m/s

Section Description	Water Surface Elevation
Initial Pipe	**2551.87**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 14 m²
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 0.77 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0 m
Fitting loss = 0.05 m
Total loss = 0.05 m
0

Initial Gate **2551.91**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 10.8 cms
Total area of opening(s) = 20 m²
Velocity through gate(s) = 0.54 m/s
Flow behavior = orifice, downstream control
Units on-line = 2
Total flow, all units = 21.6 cms
Gate loss = 0.04 m
Downstream water level = 2551.87
Upstream water level = 2551.91

Inicial Junction Tank **2551.91**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 21.6 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable

Section Description	Water Surface Elevation
Area of flow = 147.73 m²	
Flow profile = Horizontal	
Normal depth = Infinite	
Critical depth = 0.424 m	
Units on-line = 1	
Total flow, all units = 21.6 cms	
Depth downstream = 5.91 m	
Bend loss = 0 m	
Depth upstream = 5.91 m	
Velocity = 0.15 m/s	
Starting water surface elevation	**2541.14**
Exit Pipe	**2541.26**
Pipe shape = Rectangular	
Height = 3000 mm	
Width = 4000 mm	
Length = 343 m	
Flow = 10.8 cms	
Friction method = Manning's Equation	
Friction factor = 0.013	
Total fitting K value = 1.5	
Pipe area = 12 m²	
Pipe hydraulic radius = 0.857	
Age factor = 1	
Solids factor = 1	
Velocity = 0.9 m/s	
Units on-line = 2	
Total flow, all units = 21.6 cms	
Friction loss = 0.06 m	
Fitting loss = 0.06 m	
Total loss = 0.12 m	
0	
Chlorination Exit Tank	**2541.26**
Channel shape = Rectangular	
Manning's 'n' = 0.013	
Channel length = 8 m	
Channel width/diameter = 154.5 m	
Flow = 21.6 cms	
Downstream channel invert = 2538.67	
Channel slope = 0.0001 m/m	
Channel side slope = not applicable	
Area of flow = 400.09 m²	
Flow profile = Mild	
Normal depth = 0.37 m	
Critical depth = 0.126 m	

Section Description	Water Surface Elevation

Units on-line = 1
Total flow, all units = 21.6 cms
Depth downstream = 2.59 m
Bend loss = 0 m
Depth upstream = 2.59 m
Velocity = 0.05 m/s

Chlorination Tank Weir **2541.94**
Weir invert (top of weir) = 2541.68
Weir length = 23 m
Weir height = 5.1 m
Weir 'C' coefficient = 1.794
Flow over weir = 5.4 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 21.6 cms
Head over weir = 0.26 m

Chlorination Tank **2541.94**
Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 356.5 m
Channel width/diameter = 8 m
Flow = 5.4 cms
Downstream channel invert = 2539
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 23.36 m²
Flow profile = Mild
Normal depth = 1.02 m
Critical depth = 0.36 m
Units on-line = 4
Total flow, all units = 21.6 cms
Depth downstream = 2.94 m
Bend loss = 0 m
Depth upstream = 2.9 m
Velocity = 0.23 m/s

Chlorination Tank - Enter Gate **2541.94**
Opening type = rectangular gate
Opening diameter/width = 8000 mm
Gate height = 4000 mm
Invert = 2540
Number of gates = 1
Flow through gate(s) = 5.4 cms
Total area of opening(s) = 32 m²
Velocity through gate(s) = 0.17 m/s

Section Description	Water Surface Elevation

Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 21.6 cms
Gate loss = 0 m
Downstream water level = 2541.94
Upstream water level = 2541.94

Chlorination Enter Tank **2541.95**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 21.6 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 270.9 m^2
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.178 m
Units on-line = 1
Total flow, all units = 21.6 cms
Depth downstream = 2.94 m
Bend loss = 0 m
Depth upstream = 2.95 m
Velocity = 0.08 m/s

Secondary Clarifier - Chlorination Pipe **2542.15**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 10.8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m^2
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.03 m/s
Units on-line = 2
Total flow, all units = 21.6 cms
Friction loss = 0.12 m
Fitting loss = 0.08 m
Total loss = 0.2 m
0

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Hydraulic Profile

Current flow conditions

Forward Flow	Return I Flow	Return II Flow	Return III Flow
32 cms	9.18 cms	-----	-----

Section Description — **Water Surface Elevation**

Starting water surface elevation **2541.41**

Exit Pipe **2541.67**

Pipe shape = Rectangular
Height = 3000 mm
Width = 4000 mm
Length = 343 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 12 m²
Pipe hydraulic radius = 0.857
Age factor = 1
Solids factor = 1
Velocity = 1.33 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.13 m
Fitting loss = 0.14 m
Total loss = 0.26 m
0

Chlorination Exit Tank **2541.67**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 154.5 m
Flow = 32 cms
Downstream channel invert = 2538.67
Channel slope = 0.0001 m/m
Channel side slope = not applicable
Area of flow = 463.42 m²
Flow profile = Mild
Normal depth = 0.46 m
Critical depth = 0.164 m

Section Description	Water Surface Elevation
Units on-line = 1 Total flow, all units = 32 cms Depth downstream = 3 m Bend loss = 0 m Depth upstream = 3 m Velocity = 0.07 m/s	
Chlorination Tank Weir Weir invert (top of weir) = 2541.68 Weir length = 23 m Weir height = 5.1 m Weir 'C' coefficient = 1.794 Flow over weir = 8 cms Weir submergence = unsubmerged Units on-line = 4 Total flow, all units = 32 cms Head over weir = 0.33 m	**2542.01**
Chlorination Tank Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 356.5 m Channel width/diameter = 8 m Flow = 8 cms Downstream channel invert = 2539 Channel slope = 0.0001 m/m Channel side slope = not applicable Area of flow = 23.99 m^2 Flow profile = Mild Normal depth = 1.32 m Critical depth = 0.467 m Units on-line = 4 Total flow, all units = 32 cms Depth downstream = 3.01 m Bend loss = 0.01 m Depth upstream = 2.99 m Velocity = 0.33 m/s	**2542.02**
Chlorination Tank - Enter Gate Opening type = rectangular gate Opening diameter/width = 8000 mm Gate height = 4000 mm Invert = 2540 Number of gates = 1 Flow through gate(s) = 8 cms Total area of opening(s) = 32 m^2 Velocity through gate(s) = 0.25 m/s	**2542.03**

Section Description	**Water Surface Elevation**

Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 32 cms
Gate loss = 0.01 m
Downstream water level = 2542.02
Upstream water level = 2542.03

Chlorination Enter Tank	**2542.03**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 92 m
Flow = 32 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 278.92 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.231 m
Units on-line = 1
Total flow, all units = 32 cms
Depth downstream = 3.03 m
Bend loss = 0 m
Depth upstream = 3.03 m
Velocity = 0.11 m/s

Secondary Clarifier - Chlorination Pipe	**2542.48**

Pipe shape = Rectangular
Height = 3000 mm
Width = 3500 mm
Length = 522 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.27 m
Fitting loss = 0.18 m
Total loss = 0.45 m
0

Section Description	**Water Surface Elevation**

Secondary Clarifier Exit Pipe **2542.68**

Pipe shape = Circular
Diameter = 1500 mm
Length = 117 m
Flow = 2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.63
Pipe area = 1.767 m²
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on-line = 16
Total flow, all units = 32 cms
Friction loss = 0.09 m
Fitting loss = 0.11 m
Total loss = 0.2 m

2 Clarifier Orifice **2542.86**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2540
Number of openings = 1
Flow through opening(s) = 2 cms
Total area of opening(s) = 1.77 m²
Velocity through opening(s) = 1.13 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 32 cms
Orifice loss = 0.18 m
Downstream water level = 2542.68
Upstream water level = 2542.86

Launder Channel 2 C **2542.93**

Launder invert = 2542
Launder length = 91 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 1 cms
Critical depth = 0.36 m
Units on-line = 32
Total flow, all units = 32 cms
Downstream depth = 0.86 m
Upstream depth = 0.57 m

Section Description	Water Surface Elevation
Weir 2 Clarifier	**2543.03**

Invert of V notch = 2542.95
Angle of V notch = 90 degrees
Number of notches = 911
Total flow over weir = 2 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 32 cms
Head over weir = 0.08 m

2 Clarifier Enter Pipe — **2543.25**

Pipe shape = Circular
Diameter = 1500 mm
Length = 48.8 m
Flow = 2.57 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.46 m/s
Units on-line = 16
Total flow, all units = 41.2 cms
Friction loss = 0.06 m
Fitting loss = 0.16 m
Total loss = 0.23 m

Gate Clarifier Distribution Box — **2543.27**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 4000 mm
Invert = 2541
Number of gates = 1
Flow through gate(s) = 2.57 cms
Total area of opening(s) = 6 m^2
Velocity through gate(s) = 0.43 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 41.2 cms
Gate loss = 0.02 m
Downstream water level = 2543.25
Upstream water level = 2543.27

Box 2 Weir — **2543.88**

Section Description	Water Surface Elevation
Weir invert (top of weir) = 2543.28 Weir length = 3.05 m Weir height = 5.04 m Weir 'C' coefficient = 1.807 Flow over weir = 2.57 cms Weir submergence = unsubmerged Units on-line = 16 Total flow, all units = 41.2 cms Head over weir = 0.6 m	
Enter Pipe BOX 2 Pipe shape = Rectangular Height = 2500 mm Width = 3000 mm Length = 120.4 m Flow = 10.3 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 7.5 m² Pipe hydraulic radius = 0.682 Age factor = 1 Solids factor = 1 Velocity = 1.37 m/s Units on-line = 4 Total flow, all units = 41.2 cms Friction loss = 0.06 m Fitting loss = 0.14 m Total loss = 0.21 m 0	**2544.09**
General Box 2 Gate Opening type = rectangular gate Opening diameter/width = 7000 mm Gate height = 3000 mm Invert = 2542 Number of gates = 1 Flow through gate(s) = 8 cms Total area of opening(s) = 21 m² Velocity through gate(s) = 0.38 m/s Flow behavior = orifice, downstream control Units on-line = 4 Total flow, all units = 32 cms Gate loss = 0.02 m Downstream water level = 2544.09 Upstream water level = 2544.11	**2544.11**

Section Description	Water Surface Elevation
General box 2 Weir	**2544.95**

Weir invert (top of weir) = 2544.13
Weir length = 7.62 m
Weir height = 4 m
Weir 'C' coefficient = 1.828
Flow over weir = 10.3 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 41.2 cms
Head over weir = 0.82 m

Aeration Exit pipe **2545.62**

Pipe shape = Rectangular
Height = 3500 mm
Width = 6000 mm
Length = 971 m
Flow = 36.59 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 21 m^2
Pipe hydraulic radius = 1.105
Age factor = 1
Solids factor = 1
Velocity = 1.74 m/s
Units on-line = 1
Total flow, all units = 36.6 cms
Friction loss = 0.44 m
Fitting loss = 0.23 m
Total loss = 0.67 m
0

Aeration Exit Channel **2545.62**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 309.5 m
Channel width/diameter = 4 m
Flow = 6.86 cms
Downstream channel invert = 2540
Channel slope = 0.002 m/m
Channel side slope = not applicable
Area of flow = 21.25 m^2
Flow profile = Mild
Normal depth = 0.75 m
Critical depth = 0.67 m
Units on-line = 6
Total flow, all units = 41.2 cms

Section Description	Water Surface Elevation

Depth downstream = 5.62 m
Bend loss = 0 m
Depth upstream = 5 m
Velocity = 0.31 m/s

AB Tank Weir **2545.74**

Weir invert (top of weir) = 2545.64
Weir length = 32.6 m
Weir height = 6.5 m
Weir 'C' coefficient = 1.782
Flow over weir = 1.71 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 41.1 cms
Head over weir = 0.1 m

Aeration Basin **2545.74**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 686 m
Channel width/diameter = 11 m
Flow = 1.71 cms
Downstream channel invert = 2539
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 74.09 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.136 m
Units on-line = 24
Total flow, all units = 41.1 cms
Depth downstream = 6.74 m
Bend loss = 0 m
Depth upstream = 6.74 m
Velocity = 0.02 m/s

Aeration Enter Gate **2545.74**

Opening type = rectangular gate
Opening diameter/width = 3000 mm
Gate height = 4000 mm
Invert = 2543
Number of gates = 1
Flow through gate(s) = 1.71 cms
Total area of opening(s) = 12 m²
Velocity through gate(s) = 0.14 m/s
Flow behavior = orifice, downstream control
Units on-line = 24

Section Description	Water Surface Elevation
Total flow, all units = 41.2 cms Gate loss = 0 m Downstream water level = 2545.74 Upstream water level = 2545.74	
AB Distribution Pipe	**2546.06**
Pipe shape = Circular Diameter = 1200 mm Length = 77 m Flow = 1.71 cms Friction method = Manning's Equation Friction factor = 0.013 Total fitting K value = 1.5 Pipe area = 1.131 m² Pipe hydraulic radius = 0.3 Age factor = 1 Solids factor = 1 Velocity = 1.52 m/s Units on-line = 24 Total flow, all units = 41.1 cms Friction loss = 0.15 m Fitting loss = 0.18 m Total loss = 0.32 m Total loss = 0.17 m 0	
AB Distribution Box Gate	**2546.07**
Opening type = rectangular gate Opening diameter/width = 1300 mm Gate height = 5000 mm Invert = 2543 Number of gates = 1 Flow through gate(s) = 1.71 cms Total area of opening(s) = 6.5 m² Velocity through gate(s) = 0.26 m/s Flow behavior = orifice, downstream control Units on-line = 24 Total flow, all units = 41.2 cms Gate loss = 0.01 m Downstream water level = 2546.06 Upstream water level = 2546.07	
AB Distribution Box Weir	**2546.55**
Weir invert (top of weir) = 2546.09 Weir length = 3.05 m Weir height = 3 m Weir 'C' coefficient = 1.815	

Section Description	**Water Surface Elevation**

Flow over weir = 1.71 cms
Weir submergence = unsubmerged
Units on-line = 24
Total flow, all units = 41.1 cms
Head over weir = 0.46 m

Aeration Enter Pipe — **2546.83**

Pipe shape = Rectangular
Height = 2500 mm
Width = 3500 mm
Length = 375 m
Flow = 10.67 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 8.75 m^2
Pipe hydraulic radius = 0.729
Age factor = 1
Solids factor = 1
Velocity = 1.22 m/s
Units on-line = 3
Total flow, all units = 32 cms
Friction loss = 0.14 m
Fitting loss = 0.14 m
Total loss = 0.28 m
0

General aeration box Weir Gate — **2546.98**

Opening type = rectangular gate
Opening diameter/width = 2500 mm
Gate height = 4000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 10.67 cms
Total area of opening(s) = 10 m^2
Velocity through gate(s) = 1.07 m/s
Flow behavior = orifice, downstream control
Units on-line = 3
Total flow, all units = 32 cms
Gate loss = 0.15 m
Downstream water level = 2546.83
Upstream water level = 2546.98

General Aeration Box Weir — **2547.83**

Weir invert (top of weir) = 2547
Weir length = 7.62 m
Weir height = 3 m

Section Description	Water Surface Elevation

Weir 'C' coefficient = 1.846
Flow over weir = 10.67 cms
Weir submergence = unsubmerged
Units on-line = 3
Total flow, all units = 32 cms
Head over weir = 0.83 m

Clarifier Junction Exit Pipe **2548.21**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 652 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m^2
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 1.31 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.22 m
Fitting loss = 0.16 m
Total loss = 0.38 m
0

Clarifier Exit Pipe **2548.41**

Pipe shape = Circular
Diameter = 1500 mm
Length = 105.4 m
Flow = 2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 1.767 m^2
Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on-line = 16
Total flow, all units = 32 cms
Friction loss = 0.08 m
Fitting loss = 0.12 m
Total loss = 0.2 m

Section Description	Water Surface Elevation

Clarifier Orifice **2548.59**

Opening type = circular orifice
Opening diameter/width = 1500 mm
Opening height = not applicable
Invert = 2546
Number of openings = 1
Flow through opening(s) = 2 cms
Total area of opening(s) = 1.77 m²
Velocity through opening(s) = 1.13 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 32 cms
Orifice loss = 0.18 m
Downstream water level = 2548.41
Upstream water level = 2548.59

Clarifier Launder **2548.73**

Launder invert = 2548
Launder length = 81.7 m
Launder width = 1.5 m
Launder slope = 0.004 m/m
Flow through launder = 1 cms
Critical depth = 0.36 m
Units on-line = 32
Total flow, all units = 32 cms
Downstream depth = 0.59 m
Upstream depth = 0.4 m

Weir Clarifier **2548.83**

Invert of V notch = 2548.75
Angle of V notch = 90 degrees
Number of notches = 864
Total flow over weir = 2 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 32 cms
Head over weir = 0.08 m

Clarifier Enter Pipe **2548.96**

Pipe shape = Circular
Diameter = 1500 mm
Length = 45 m
Flow = 2 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5
Pipe area = 1.767 m²

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.375
Age factor = 1
Solids factor = 1
Velocity = 1.13 m/s
Units on-line = 16
Total flow, all units = 32 cms
Friction loss = 0.04 m
Fitting loss = 0.1 m
Total loss = 0.13 m

Distribution Box Gate **2548.99**

Opening type = rectangular gate
Opening diameter/width = 1500 mm
Gate height = 3000 mm
Invert = 2545
Number of gates = 1
Flow through gate(s) = 2 cms
Total area of opening(s) = 4.5 m²
Velocity through gate(s) = 0.44 m/s
Flow behavior = orifice, downstream control
Units on-line = 16
Total flow, all units = 32 cms
Gate loss = 0.03 m
Downstream water level = 2548.96
Upstream water level = 2548.99

Box 1 Weir **2549.51**

Weir invert (top of weir) = 2549
Weir length = 3.05 m
Weir height = 3.5 m
Weir 'C' coefficient = 1.813
Flow over weir = 2 cms
Weir submergence = unsubmerged
Units on-line = 16
Total flow, all units = 32 cms
Head over weir = 0.51 m

Enter Pipe BOX 1 **2549.71**

Pipe shape = Rectangular
Height = 2500 mm
Width = 2500 mm
Length = 110.9 m
Flow = 8 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7
Pipe area = 6.25 m²

Section Description	Water Surface Elevation

Pipe hydraulic radius = 0.625
Age factor = 1
Solids factor = 1
Velocity = 1.28 m/s
Units on-line = 4
Total flow, all units = 32 cms
Friction loss = 0.06 m
Fitting loss = 0.14 m
Total loss = 0.2 m
0

General Box Gate — **2549.74**

Opening type = rectangular gate
Opening diameter/width = 6000 mm
Gate height = 3000 mm
Invert = 2544
Number of gates = 1
Flow through gate(s) = 8 cms
Total area of opening(s) = 18 m²
Velocity through gate(s) = 0.44 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 32 cms
Gate loss = 0.03 m
Downstream water level = 2549.71
Upstream water level = 2549.74

General box 1 Weir — **2550.56**

Weir invert (top of weir) = 2549.76
Weir length = 6.1 m
Weir height = 3 m
Weir 'C' coefficient = 1.843
Flow over weir = 8 cms
Weir submergence = unsubmerged
Units on-line = 4
Total flow, all units = 32 cms
Head over weir = 0.8 m

R Mix to Clarifiers Pipe — **2550.81**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3000 mm
Length = 150.43 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.5

Section Description	Water Surface Elevation

Pipe area = 10.5 m²
Pipe hydraulic radius = 0.808
Age factor = 1
Solids factor = 1
Velocity = 1.52 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.08 m
Fitting loss = 0.18 m
Total loss = 0.26 m
0

RM Exit Channel **2550.81**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 32 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 57.94 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on-line = 1
Total flow, all units = 32 cms
Depth downstream = 1.81 m
Bend loss = 0 m
Depth upstream = 1.81 m
Velocity = 0.55 m/s

RM Exit Gate **2550.82**

Opening type = circular gate
Opening diameter/width = 4000 mm
Gate height = 4000 mm
Invert = 2547
Number of gates = 4
Flow through gate(s) = 8 cms
Total area of opening(s) = 50.27 m²
Velocity through gate(s) = 0.16 m/s
Flow behavior = orifice, downstream control
Units on-line = 4
Total flow, all units = 32 cms
Gate loss = 0 m
Downstream water level = 2550.81
Upstream water level = 2550.82

Section Description	**Water Surface Elevation**
RM	**2550.82**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 9 m
Channel width/diameter = 8 m
Flow = 8 cms
Downstream channel invert = 2545
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 46.53 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on-line = 4
Total flow, all units = 32 cms
Depth downstream = 5.82 m
Bend loss = 0 m
Depth upstream = 5.82 m
Velocity = 0.17 m/s

RM Enter Gate **2550.92**

Opening type = circular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2550
Number of gates = 4
Flow through gate(s) = 8 cms
Total area of opening(s) = 5.62 m²
Velocity through gate(s) = 1.42 m/s
Flow behavior = weir control
Units on-line = 4
Total flow, all units = 32 cms
Gate loss = 0.92 m
Downstream water level = 2550.82
Upstream water level = 2550.92

RM Enter Channel **2550.92**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 8 m
Channel width/diameter = 32 m
Flow = 32 cms
Downstream channel invert = 2548
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 93.34 m²

Section Description	**Water Surface Elevation**

Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.467 m
Units on-line = 1
Total flow, all units = 32 cms
Depth downstream = 2.92 m
Bend loss = 0 m
Depth upstream = 2.92 m
Velocity = 0.34 m/s

Grit Channel to RM Pipe **2551.09**

Pipe shape = Rectangular
Height = 3500 mm
Width = 3500 mm
Length = 43.77 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.8
Pipe area = 12.25 m²
Pipe hydraulic radius = 0.875
Age factor = 1
Solids factor = 1
Velocity = 1.31 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.02 m
Fitting loss = 0.16 m
Total loss = 0.17 m
0

Junction Tank Grit Channel **2551.09**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 4 m
Channel width/diameter = 45.2 m
Flow = 16 cms
Downstream channel invert = 2549
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 94.49 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.234 m
Units on-line = 2
Total flow, all units = 32 cms
Depth downstream = 2.09 m

Section Description	Water Surface Elevation
Bend loss = 0 m Depth upstream = 2.09 m Velocity = 0.17 m/s	
Grit Weir	**2551.38**
Weir invert (top of weir) = 2551.11 Weir length = 12 m Weir height = 0.43 m Weir 'C' coefficient = 1.931 Flow over weir = 3.2 cms Weir submergence = unsubmerged Units on-line = 10 Total flow, all units = 32 cms Head over weir = 0.27 m	
Grit Channel	**2551.38**
Channel shape = Rectangular Manning's 'n' = 0.013 Channel length = 40.5 m Channel width/diameter = 6 m Flow = 2.29 cms Downstream channel invert = 2548.59 Channel slope = 0 m/m Channel side slope = not applicable Area of flow = 16.73 m² Flow profile = Horizontal Normal depth = Infinite Critical depth = 0.246 m Units on-line = 14 Total flow, all units = 32 cms Depth downstream = 2.79 m Bend loss = 0 m Depth upstream = 2.79 m Velocity = 0.14 m/s	
Screening Exit Channel Gate	**2551.46**
Opening type = rectangular gate Opening diameter/width = 2000 mm Gate height = 2000 mm Invert = 2547 Number of gates = 1 Flow through gate(s) = 3.2 cms Total area of opening(s) = 4 m² Velocity through gate(s) = 0.8 m/s Flow behavior = orifice, downstream control Units on-line = 10 Total flow, all units = 32 cms	

Section Description	**Water Surface Elevation**

Gate loss = 0.08 m
Downstream water level = 2551.38
Upstream water level = 2551.46

Screen Channel 1 - 2 **2551.47**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 5 m
Channel width/diameter = 2.5 m
Flow = 3.2 cms
Downstream channel invert = 2549.28
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 5.46 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.551 m
Units on-line = 10
Total flow, all units = 32 cms
Depth downstream = 2.18 m
Bend loss = 0 m
Depth upstream = 2.19 m
Velocity = 0.59 m/s

Fine Screen **2551.73**

Rack invert = 2550.3
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 3.2 cms
Bar width = 6 mm
Bar spacing = 6 mm
Percent blocked = 0%
Net rack open area = 1.46 m²
Downstream depth = 1.17 m
Velocity in channel = 1.1 m/s
Velocity through bars = 2.2 m/s
Units on-line = 10
Total flow, all units = 32 cms
Rack head loss = 0.26 m

Screen Channel 2 -3 **2551.74**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 6 m
Channel width/diameter = 2.5 m
Flow = 3.2 cms
Downstream channel invert = 2550.9

Section Description	**Water Surface Elevation**

Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 2.09 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.551 m
Units on-line = 10
Total flow, all units = 32 cms
Depth downstream = 0.83 m
Bend loss = 0 m
Depth upstream = 0.84 m
Velocity = 1.54 m/s

Medium Screen **2551.78**

Rack invert = 2550
Rack width = 2.5 m
Channel width = 2.5 m
Flow through rack = 3.2 cms
Bar width = 10 mm
Bar spacing = 25 mm
Percent blocked = 0%
Net rack open area = 3.09 m²
Downstream depth = 1.74 m
Velocity in channel = 0.74 m/s
Velocity through bars = 1.04 m/s
Units on-line = 10
Total flow, all units = 32 cms
Rack head loss = 0.04 m

Screen Channel 3 - 4 **2551.79**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 7 m
Channel width/diameter = 2.5 m
Flow = 3.2 cms
Downstream channel invert = 2550.9
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 2.21 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.551 m
Units on-line = 10
Total flow, all units = 32 cms
Depth downstream = 0.88 m
Bend loss = 0 m
Depth upstream = 0.89 m

Section Description	**Water Surface Elevation**

Velocity = 1.46 m/s

Screening Enter Channel Gate **2551.87**

Opening type = rectangular gate
Opening diameter/width = 2000 mm
Gate height = 2000 mm
Invert = 2548
Number of gates = 1
Flow through gate(s) = 3.2 cms
Total area of opening(s) = 4 m²
Velocity through gate(s) = 0.8 m/s
Flow behavior = orifice, downstream control
Units on-line = 10
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2551.79
Upstream water level = 2551.87

Screening Distribution Channel **2551.88**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 14.55 m
Channel width/diameter = 41.9 m
Flow = 16 cms
Downstream channel invert = 2547.8
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 170.69 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.246 m
Units on-line = 2
Total flow, all units = 32 cms
Depth downstream = 4.07 m
Bend loss = 0 m
Depth upstream = 4.08 m
Velocity = 0.09 m/s

Initial Pipe **2552**

Pipe shape = Rectangular
Height = 3500 mm
Width = 4000 mm
Length = 28 m
Flow = 16 cms
Friction method = Manning's Equation
Friction factor = 0.013
Total fitting K value = 1.7

Section Description	Water Surface Elevation

Pipe area = 14 m²
Pipe hydraulic radius = 0.933
Age factor = 1
Solids factor = 1
Velocity = 1.14 m/s
Units on-line = 2
Total flow, all units = 32 cms
Friction loss = 0.01 m
Fitting loss = 0.11 m
Total loss = 0.12 m
0

Initial Gate **2552.08**

Opening type = rectangular gate
Opening diameter/width = 4000 mm
Gate height = 5000 mm
Invert = 2547
Number of gates = 1
Flow through gate(s) = 16 cms
Total area of opening(s) = 20 m²
Velocity through gate(s) = 0.8 m/s
Flow behavior = orifice, downstream control
Units on-line = 2
Total flow, all units = 32 cms
Gate loss = 0.08 m
Downstream water level = 2552
Upstream water level = 2552.08

Inicial Junction Tank **2552.09**

Channel shape = Rectangular
Manning's 'n' = 0.013
Channel length = 13 m
Channel width/diameter = 25 m
Flow = 32 cms
Downstream channel invert = 2546
Channel slope = 0 m/m
Channel side slope = not applicable
Area of flow = 152.14 m²
Flow profile = Horizontal
Normal depth = Infinite
Critical depth = 0.551 m
Units on-line = 1
Total flow, all units = 32 cms
Depth downstream = 6.08 m
Bend loss = 0 m
Depth upstream = 6.09 m
Velocity = 0.21 m/s