

APPENDIX M  
THERESA STREET WWTF HYDRAULIC PROFILE CALCULATIONS

## Theresa Street WWTP Hydraulics

### Maximum Plant Flow at Low Creek Levels

The maximum flow allowed through the plant hydraulically is 65 mgd. This is with the following assumptions:

- Only 36 mgd is allowed through the UV Basin. The remaining effluent is pushed through the Chlorine Basin.
- A WSE of 46.03 must be maintained over the UV lamps at all times for efficient operation.
- The creek level does not exceed 45.0 ft.
- A maximum of 50 mgd is allowable through one Grit Chamber in the Headworks Facility. At influent flows greater than 50 mgd, the flow is split 50/50 between the two Grit Basins.
- The flow split between treatment trains is as follows: Central Train - 48.2%; West Train - 14.8%; East Train - 37%.
- The following are common hydraulic points, where the weirs can be adjusted to balance the water level upstream of the downstream structures:
  - Control Structure No. 1
  - Distribution Box upstream of Final Clarifiers Nos. 3 and 4
  - Distribution Box upstream of Final Clarifiers Nos. 1 and 2.
  - Distribution Box upstream of Primary Clarifier Nos. 5 and 6.
  - Influent Distribution Structure upstream of Central and West Train Aeration Basins.
  - Flow Distribution Structure downstream of Grit Collection Basins.
- No flow is sent through the Disinfection Bypass channel.

At 66 mgd, the effluent weirs in Aeration Basins Nos. 3 and 4 (East Train) are submerged.

As influent flow approaches 110 mgd, the Primary Clarifiers in the East Train will start to overflow. However, the effluent disinfection can sustain these peak flows, hydraulically, as long as the creek level remains below the discharge point.

If you tried to push 100 mg through the plant, the weirs for all Final Clarifiers would flood, as well as the Effluent Box in the Central Train Aeration Basin, and the Influent Distribution Structure upstream of the Central Train Aeration Basin.

### High Flood Level in Salt Creek

Above a creek level of 44 ft, the Chlorine Basin Effluent Weir is submerged (with or without flow). The UV Effluent is able to discharge freely up to a water level in the creek of 44.6 ft. Thus, the plant is able to discharge up to 65 mgd at the 50-year flood elevation (43.0+).

At the 100-year flood elevation in Salt Creek of 47.0+, the UV Effluent Weir is submerged but is still able to discharge at a flow rate of 36 mgd. It is above this elevation that the Control Structure No. 1 is flooded. This is assuming effluent is only going through the UV Basin (36 mgd). At this water level, the Chlorine Basin is unable to discharge any flow.



PROJECT : Therasa St WWTP, Lincoln, NE  
Hydraulic Profile

JOB # : 7498A00

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DATE : 8/20/2007

## Flow Input Sheet

### MODEL INPUT PARAMETERS

Max Month Average Day Flow MJAD 100 mgd  
Peaking Factor 0.7  
Peak Flow Peak 65 mgd

Flow Evaluated: Peak Flow **65 mgd**

Creek Elevation **20.00**  
RAS 100%

RAS as Percentage of Influent Flow

FLWS/PARAMETERS	INPUT	VALUE	LABEL	TOTAL FLOW	NOTES
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Elevations from Brown & Caldwell, and Jacobson Helgoltz Dwg's were corrected by subtracting 0.11 from the given elevation.

### Plant Influent

Total Influent Flow to Grit Basins 65.00 mgd

### Headworks Facility

Flow thru Grit Basin No. 1	<span style="border: 1px solid black; padding: 2px;">50%</span>	32.5 mgd	Grit_1		
Flow thru Grit Basin No. 2	<span style="border: 1px solid black; padding: 2px;">50%</span>	32.5 mgd	Grit_2		
Flow in Distribution Box No. 1			Dist_1	65.0	

### Influent Flow Distribution

Balance Influent Weir Elevations to achieve same WSE upstream in Flow Dist'n Structure

Influent Weir No. 1 Elevation	<span style="border: 1px solid black; padding: 2px;">62.63</span> ft		Infl1_Weir		63.69
Flow to PC No. 1	<span style="border: 1px solid black; padding: 2px;">21.0%</span>	13.65 mgd	PC1_Infl		
Influent Weir No. 2 Elevation	<span style="border: 1px solid black; padding: 2px;">62.04</span> ft		Infl2_Weir		63.69
Flow to PC No. 3	<span style="border: 1px solid black; padding: 2px;">21.0%</span>	13.65 mgd	PC3_Infl		
Influent Weir No. 3 Elevation	<span style="border: 1px solid black; padding: 2px;">62.04</span> ft		Infl3_Weir		63.69
Flow to PC No. 4	<span style="border: 1px solid black; padding: 2px;">21.0%</span>	13.65 mgd	PC4_Infl		
Influent Weir No. 4 Elevation	<span style="border: 1px solid black; padding: 2px;">62.74</span> ft		East_Weir		63.69
Flow to East Train	<span style="border: 1px solid black; padding: 2px;">37.0%</span>	24.05 mgd	East		

### CENTRAL AND WEST TRAIN PRIMARY CLARIFICATION

#### Primary Clarification

PC No. 1 V-notch Weir Elev	<span style="border: 1px solid black; padding: 2px;">56.99</span> ft		PC1_Weir		Dwg 00D801, Nitrification Improv. HDR, 2004; V-T
PC No. 1 Effluent		13.65 mgd			
PC No. 3 V-notch Weir Elev	<span style="border: 1px solid black; padding: 2px;">57.17</span> ft		PC3_Weir		Weir El. From Hyd Pro, Brown&Caldwell, 2001; V-
PC No. 3 Effluent		13.65 mgd			
PC No. 4 V-notch Weir Elev	<span style="border: 1px solid black; padding: 2px;">57.17</span> ft		PC4_Weir		Weir El. From Hyd Pro, Brown&Caldwell, 2001; V-
PC No. 4 Effluent		13.65 mgd			

Maya Scott  
Gate Range: 55.17 - 51.49

C\_W\_Infl 40.95 mgd

### CENTRAL TRAIN

Flow to Central Train 58.2% Central 31.33 mgd

#### Influent Distribution

Balance weir elevations to achieve same WSE in Flow Dist'n Structure; must match with weirs upstream of Central Aeration Basin

Flow to East AB	<span style="border: 1px solid black; padding: 2px;">50%</span>	15.67 mgd	C_EastAB		
East AB Influent Weir Elev	<span style="border: 1px solid black; padding: 2px;">62.74</span> ft		C_AB_Weir		55.02 Client Provided
East AB Anoxic Weir	<span style="border: 1px solid black; padding: 2px;">62.61</span> ft		Anox_5		
Flow to West AB	<span style="border: 1px solid black; padding: 2px;">50%</span>	15.67 mgd	C_WestAB		
West AB Influent Weir Elev	<span style="border: 1px solid black; padding: 2px;">63.74</span> ft		C_AB_Weir2		55.02 Client Provided
West AB Anoxic Weir	<span style="border: 1px solid black; padding: 2px;">62.61</span> ft		Anox_6		

Total Central AB Influent Central\_AB 31.33 mgd

Aeration Basin Effluent (Influent + RAS) Central\_ML 62.66 mgd

#### Final Clarifier Influent (Mixed Liquor)

Balance weir elevations to achieve same WSE in AB Effluent Box

FC No. 5 Influent Weir	<span style="border: 1px solid black; padding: 2px;">62.31</span> ft		FC5_Infl_weir		53.29 Client Provided
Final Clarifier No. 5	<span style="border: 1px solid black; padding: 2px;">50%</span>	31.33 mgd	FC5_Infl		
FC No. 6 Influent Weir	<span style="border: 1px solid black; padding: 2px;">62.31</span> ft		FC6_Infl_Weir		53.29 Client Provided
Final Clarifier No. 6	<span style="border: 1px solid black; padding: 2px;">50%</span>	31.33 mgd	FC6_Infl		
Total Final Clarifier Influent Flow			C_FC_Tot	62.66	

#### Final Clarifier Effluent (Clarifier Infl - RAS)

Clarifier No. 5 V-Notch Weir Elevation	<span style="border: 1px solid black; padding: 2px;">60.10</span> ft		FC5_Weir		Based on Client sketch; V-Notches are 2.5' deep
Final Clarifier No. 5	<span style="border: 1px solid black; padding: 2px;">50%</span>	15.67 mgd	FC5_Eff		
Clarifier No. 6 V-Notch Weir Elevation	<span style="border: 1px solid black; padding: 2px;">60.11</span> ft		FC6_Weir		Based on Client sketch; V-Notches are 2.5' deep
Final Clarifier No. 6	<span style="border: 1px solid black; padding: 2px;">50%</span>	15.67 mgd	FC6_Eff		
Combined Final Clarifier Effluent Flow			C_FCE_Tot	31.33	

### WEST TRAIN

Flow to West Train 14.9% West 9.62 mgd

#### Influent Distribution

Balance weir elevations to achieve same WSE in Flow Dist'n Structure; must match with weirs upstream of Central Aeration Basin

Flow to East AB	<span style="border: 1px solid black; padding: 2px;">50%</span>	4.81 mgd	W_EastAB		
West AB #1 Influent Weir Elev	<span style="border: 1px solid black; padding: 2px;">64.34</span> ft		W_AB_Weir		55.02
Flow to West AB	<span style="border: 1px solid black; padding: 2px;">50%</span>	4.81 mgd	W_WestAB		
East AB #2 Influent Weir Elev	<span style="border: 1px solid black; padding: 2px;">64.34</span> ft		W_AB_Weir2		55.02

#### Aeration Basin Influent

Weir Elevations are same for both basins

Weir Elevation #1	<span style="border: 1px solid black; padding: 2px;">62.82</span> ft		WAB_1		Client Provided
Weir Elevation #2	<span style="border: 1px solid black; padding: 2px;">62.65</span> ft		WAB_2		Client Provided
Weir Elevation #3	<span style="border: 1px solid black; padding: 2px;">62.68</span> ft		WAB_3		Client Provided
Weir Elevation #4	<span style="border: 1px solid black; padding: 2px;">62.62</span> ft		WAB_4		Client Provided

Aeration Basin Effluent (Influent + RAS) West\_ML WAB\_Weir 9.62 mgd

Effluent Weir Client Sketch

#### Final Clarifier Influent (Mixed Liquor)

Final Clarifier No. 1	<span style="border: 1px solid black; padding: 2px;">50%</span>	9.62 mgd	FC1_Infl		19.24 mgd
Final Clarifier No. 2	<span style="border: 1px solid black; padding: 2px;">50%</span>	9.62 mgd	FC2_Infl		

#### Final Clarifier Effluent (Clarifier Infl - RAS)

Clarifier No. 1 V-Notch Weir Elevation	<span style="border: 1px solid black; padding: 2px;">66.95</span> ft		FC1_Weir		Client Sketch; 2.5' deep notches
Final Clarifier No. 1	<span style="border: 1px solid black; padding: 2px;">50%</span>	4.81 mgd	FC1_Eff		
Clarifier No. 2 V-Notch Weir Elevation	<span style="border: 1px solid black; padding: 2px;">66.96</span> ft		FC2_Weir		Client Sketch; 2.5' deep notches
Final Clarifier No. 2	<span style="border: 1px solid black; padding: 2px;">50%</span>	4.81 mgd	FC2_Eff		
Combined Final Clarifier Effluent Flow			W_FCE_Tot	9.62	



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## Flow Input Sheet

### MODEL INPUT PARAMETERS

#### EAST TRAIN

Flow to East Train	37%				
<b>Primary Clarification</b>					
Flow to PC No. 5		12.03 mgd	PC5_Inf		
PC No. 5 V-notch Weir Elev	53.66 ft		PC5_Weir		Client Sketch; V-Notch is 2' deep
Flow to PC No. 6		12.03 mgd	PC6_Inf		
PC No. 6 V-notch Weir Elev	53.66 ft		PC6_Weir		Client Sketch; V-Notch is 2' deep
PC No. 5 Effluent Flow		12.03 mgd	PC5_Eff		
PC No. 6 Effluent Flow		12.03 mgd	PC6_Eff		
<b>Aeration Basin Influent</b>					
Flow to East AB		12.03 mgd	PC5_Eff		
Flow to West AB		12.03 mgd	PC6_Eff		
<i>Weir Elevations are same for both basins</i>					
Weir Elevation #1	50.71 ft		EAB_1		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #2	50.07 ft		EAB_2		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #3	49.72 ft		EAB_3		Dwg S311, Brown&Caldwell, 2005
Total East AB Influent			East_AB	24.05 mgd	
<b>Aeration Basin Effluent (Influent + RAS)</b>					
Aeration Basin Effluent Weir Elevation	50.00 ft	48.10 mgd	East_ML		Client provided
			East_AB_Weir		
<b>Final Clarifier Influent (Mixed Liquor)</b>					
Final Clarifier No. 3	50%	24.05 mgd	FC3_Inf		
Final Clarifier No. 4	50%	24.05 mgd	FC4_Inf		
Total Final Clarifier Influent Flow			E_FC_Tot	48.10 mgd	
<b>Final Clarifier Effluent (Clarifier Inf - RAS)</b>					
Clarifier No. 3 V-Notch Weir Elevation	47.59 ft		FC3_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 3	50%	12.03 mgd	FC3_Eff		
Clarifier No. 4 V-notch Weir Elevation	47.60 ft		FC4_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 4	50%	12.03 mgd	FC4_Eff		
Combined Final Clarifier Effluent Flow			E_FCE_Tot	24.05 mgd	
<b>EFFLUENT STRUCTURES</b>					
<b>Control Structures</b>					
Control Structure No. 1 TOW	47.89 ft		CS_1		Client Sketch
Control Structure No. 2 TOW	47.93 ft		CS_2		Client Sketch
Weir Elevation to CL2 Basin	45.57 ft		CS_Weir		WSE must match with WSE upstrm of UV Weir
Flow to UV Disinfection		36 mgd	UV		46.50
Flow to C12 Disinfection		29 mgd	CL		46.50
Bypass Disinfection	0%	0 mgd	FCE		
<b>Chlorine Disinfection</b>					
No. of CL2 Channels in Operation	1		CL_Ch		
C12 Basin Effluent Weir Elevation	44.09 ft		CL_Weir		Dwg C-5, Jacobson Helgoth, 2007
<b>UV Disinfection</b>					
UV Effluent Weir	44.90 ft		UV_Weir		Weir elevation must maintain WSE of 46.03 (46.1
WSE over UV Lamps					46.03)
Plant Effluent Channel			FE_Flow	65.00 mgd	
Salt Creek Elevation			River	26.00 ft	

Maya Scott:  
Gate Range: 1147.37 -  
1144.37 (47.48 - 44.48)

Maya Scott:  
Gate Range: 47.93 - 42.26  
(1148.04 - 1142.37)



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Elevation Summary

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## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
<b>**ELEVATION VALUES IN BLUE ARE COMMON HYDRAULIC POINTS. MAKE SURE THESE VALUES MATCH**</b>					
<b>**INTERNAL AERATION BASIN WEIRS SHOULD BE SUBMERGED UNDER ALL CONDITIONS**</b>					
<b>Plant Flow</b>		<b>65 mgd</b>			
<b>Creek Elevation</b>		<b>20</b>			
<u>Influent Headworks Structure</u>					
Total Influent Flow		65.00			
Top of Influent Channel Elevation	Hyd Prof, B&V/QA, 2002		66.75		
Water Elevation in Influent Channel			63.90	2.85	
Top of Vortex Grit Chamber Elevation	Hyd Prof, B&V/QA, 2002		62.50		
Water Elevation in Vortex Grit Chamber			63.90	(1.40)	
<u>Flow Distribution Structure</u>					
TO EAST TREATMENT TRAIN					
Flow, mgd		24.05			
Weir Elevation	Hyd Prof, B&V/QA, 2002		62.74		
Water Surface Elevation Upstream of Weir			63.69		0.95
Water Surface Elevation Downstream of Weir			55.20	7.54	
TO PRIMARY CLARIFIER NO. 1 (CENTRAL/WEST TRMT TRAIN)					
Flow, mgd		13.65			
Weir Elevation	Hyd Prof, B&V/QA, 2002		62.65		
Water Surface Elevation Upstream of Weir			63.69		1.04
Water Surface Elevation Downstream of Weir			57.67	4.98	
TO PRIMARY CLARIFIER NO. 3 (CENTRAL/WEST TRMT TRAIN)					
Flow, mgd		13.65			
Weir Elevation	Hyd Prof, B&V/QA, 2002		62.04		
Water Surface Elevation Upstream of Weir			63.69		1.65
Water Surface Elevation Downstream of Weir			58.13	3.91	
TO PRIMARY CLARIFIER NO. 4 (CENTRAL/WEST TRMT TRAIN)					
Flow, mgd		13.65			
Weir Elevation	Hyd Prof, B&V/QA, 2002		62.04		
Water Surface Elevation Upstream of Weir			63.69		1.65
Water Surface Elevation Downstream of Weir			58.31	3.73	
<u>CENTRAL/WEST PRIMARY TREATMENT</u>					
<u>Primary Clarification</u>					
Primary Clarifier No. 1 Flow					
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	13.65	58.39		
Water Surface in Primary Clarifier No. 1			57.17	1.22	
V-Notch Weir Elevation			56.99		0.18
Water Surface Elevation in Effluent Drop Box			55.19		
Primary Clarifier No. 3 Flow					
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	13.65	58.39		
Water Surface in Primary Clarifier No. 2			57.40	0.99	
V-Notch Weir Elevation			57.17		0.24
Water Surface Elevation in Effluent Drop Box			55.49		
Primary Clarifier No. 4 Flow					
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	13.65	58.39		
Water Surface in Primary Clarifier No. 3			57.40	0.99	
V-Notch Weir Elevation			57.17		0.24
Water Surface Elevation in Effluent Drop Box			55.37		
<u>Influent Distribution Structure</u>					
Primary Clarifiers Nos. 1, 2 & 3 Flow					
Top of Distribution Box Structure	Client Sketch	40.95	57.12		
Water Surface in Distribution Box (upstream of Central Train Weir)			55.02	2.10	
Weir Elevation			53.74		1.28
Water Surface in Distribution Box (upstream of Weir to AB No. 1)			55.02	2.10	
Weir Elevation			54.34		0.68
Water Surface in Distribution Box (upstream of Weir to AB No. 2)			55.02	2.10	
Weir Elevation			54.34		0.68
Water Surface Downstream of Central AB Influent Weir			53.53	0.21	
Water Surface Downstream West AB No. 1 Inlet Weir			53.80	0.54	
Water Surface Downstream West AB No. 2 Inlet Weir			53.78	0.56	
<u>CENTRAL TREATMENT TRAIN</u>					
<u>Aeration Basins</u>					
Flow (Primary Clarifier Effluent + RAS)					
Top of Structure	Client Sketch	62.66	55.00		
Anoxic Weir Elevation			52.61		SUBMERGED
Water Surface Elevation in Aeration Basin			53.29	1.71	
Water Surface in AB Effluent Channel			53.29	1.71	
Discharge Weir Elevation to Final Clarifier No. 5			52.31		0.98
Water Surface Elevation Downstream of FC No. 5 Influent Weir			51.22	1.09	
Water Surface Elevation Downstream of FC No. 6 Influent Weir			51.23	1.08	



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 DATE : 39317.00

**Summary**

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Flume
<b>Final Clarifier No. 5</b>					
Flow (Clarifier Effluent)	Client Sketch	15.67	52.24	1.96	0.18
Top of Structure			50.28		
Water Surface Elevation			50.10		
Invert of "V" Notch Weir Elevation			50.00		
Water Surface in Effluent Launder			46.68		
Water Elevation in Drop Box			5.56		
<b>Final Clarifier No. 6</b>					
Flow (Clarifier Effluent)	Client Sketch	15.67	52.17	1.88	0.18
Top of Structure			50.29		
Water Surface Elevation			50.11		
Invert of "V" Notch Weir Elevation			49.49		
Water Surface in Effluent Launder			46.79		
Water Elevation in Drop Box			5.38		
<b>Effluent Box</b>					
Top of Structure	Client Sketch		52.00	5.32	
Water Elevation in Box			46.68		
<b>WEST TREATMENT TRAIN</b>					
<b>Aeration Basin No. 1</b>					
Flow (Primary Clarifier Effluent + RAS)	Client Sketch	4.81	54.81	2.50	SUBMERGED
Top of Structure			53.72		
Water Surface Upstream of Weir #1			52.82		
Internal Weir Elevation #1			53.60		
Water Surface Upstream of Weir #2			52.85		
Internal Weir Elevation #2			53.40		
Water Surface Upstream of Weir #3			52.58		
Internal Weir Elevation #3			53.25		
Water Surface Upstream of Weir #4			52.12		
Internal Weir Elevation #4			53.19		
Water Surface Elevation upstream of discharge			52.83		
Discharge Weir Elevation			49.83		
Water Surface in AB Effluent Channel			3.00		
<b>Aeration Basin No. 2</b>					
Flow (Primary Clarifier Effluent + RAS)	Client Sketch	4.81	54.81	2.50	SUBMERGED
Top of Structure			53.72		
Water Surface Upstream of Weir #1			52.82		
Internal Weir Elevation #1			53.60		
Water Surface Upstream of Weir #2			52.85		
Internal Weir Elevation #2			53.40		
Water Surface Upstream of Weir #3			52.58		
Internal Weir Elevation #3			53.25		
Water Surface Upstream of Weir #4			52.12		
Internal Weir Elevation #4			53.19		
Water Surface Elevation upstream of discharge			52.83		
Discharge Weir Elevation			49.76		
Water Surface in AB Effluent Channel			3.07		
<b>Final Clarifier No. 1</b>					
Flow (Clarifier Effluent)	Client Sketch	4.81	50.77	1.70	0.11
Top of Structure			49.07		
Water Surface Elevation			48.95		
Invert of "V" Notch Weir Elevation			47.87		
Water Surface in Effluent Launder			47.77		
Water Elevation in Drop Box			3.00		
<b>Final Clarifier No. 2</b>					
Flow (Clarifier Effluent)	Client Sketch	4.81	50.85	1.77	0.11
Top of Structure			49.08		
Water Surface Elevation			48.96		
Invert of "V" Notch Weir Elevation			47.86		
Water Surface in Effluent Launder			47.77		
Water Elevation in Drop Box			3.08		
<b>Effluent Jct Structures</b>					
Top of Jct MH	Hyd Prof, Brown & Caldwell, 2001		53.84	5.93	
Water Elevation in MH			47.71		
Top of Jct Box No. 1	Hyd Prof, Brown & Caldwell, 2001		45.89		
Water Elevation in Box			47.56		
Top of Jct Box No. 2	Hyd Profiles, Carollo Engineers, 2007		54.86		
Water Elevation in Box			47.53		

**EAST TREATMENT TRAIN**

**Influent Distribution Box**



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## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
Flow to East Train		24.05			
Top of Structure	Client Sketch		58.86		
Water Surface Elevation upstream of PC No. 5 Weir			54.24	4.62	
Water Surface Elevation upstream of PC No. 6 Weir			54.24	4.62	
<b>Primary Clarifier No. 5</b>					
Flow		12.03			
Top of Basin Elevation	Client Sketch		55.16		
Water Surface in Primary Clarifier No. 5			53.78	1.38	
V-Notch Weir Elevation			53.66		0.12
Water Surface Elevation in Effluent Drop Box			51.92	1.74	
<b>Primary Clarifier No. 6</b>					
Flow		12.03			
Top of Basin Elevation	Client Sketch		55.22		
Water Surface in Primary Clarifier No. 6			53.78	1.44	
V-Notch Weir Elevation			53.66		0.12
Water Surface Elevation in Effluent Drop Box			51.92	1.74	
<b>Aeration Basin No. 3</b>					
Flow (Primary Clarifier Effluent + RAS)		12.03			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.44	4.78	
Weir Elevation #1			50.71		SUBMERGED
Water Surface Upstream of Weir #2			50.99	5.23	
Weir Elevation #2			50.07		SUBMERGED
Water Surface Upstream of Weir #3			50.80	5.42	
Weir Elevation #3			49.72		SUBMERGED
Water Surface Elevation upstream of discharge			50.68	5.54	
Discharge Weir Elevation			50.00		0.68
Water Surface in AB Effluent Channel			49.96	0.04	
<b>Aeration Basin No. 4</b>					
Flow (Primary Clarifier Effluent + RAS)		12.03			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.44	4.78	
Weir Elevation #1			50.71		SUBMERGED
Water Surface Upstream of Weir #2			50.99	5.23	
Weir Elevation #2			50.07		SUBMERGED
Water Surface Upstream of Weir #3			50.80	5.42	
Weir Elevation #3			49.72		SUBMERGED
Water Surface Elevation upstream of discharge			50.68	5.54	
Discharge Weir Elevation			50.00		0.68
Water Surface in AB Effluent Channel			49.97	0.03	
<b>Final Clarifier No. 3</b>					
Flow (Clarifier Effluent)		12.03			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.75	1.56	
Invert of "V" Notch Weir Elevation			47.59		0.15
Water Surface in Effluent Launder			47.42	0.17	
Water Elevation in Drop Box			46.95	2.36	
<b>Final Clarifier No. 4</b>					
Flow (Clarifier Effluent)		12.03			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.76	1.55	
Invert of "V" Notch Weir Elevation			47.60		0.15
Water Surface in Effluent Launder			47.41	0.19	
Water Elevation in Drop Box			46.95	2.36	
<b>DISINFECTION</b>					
<b>Disinfection Control Structure No. 1</b>					
Flow to Control Structure		40.95			
Top of Structure	Client Sketch		47.89		
Water Surface Elevation upstream of UV Disinfection			46.50	1.39	
Water Surface Upstream of CL2 Weirs			46.50	1.39	
CL2 Influent Weir Elevation			45.57		0.93
Water Surface Elevation upstream of Disinfection Bypass			41.41	6.48	
<b>UV Disinfection</b>					
Flow		36.00			
Top of Basin Elevation	Dwg P-2, Jacobson Helgoth, 2007		47.93		
Water Surface over UV Lamps			46.03	1.90	
Discharge Weir Elevation			44.90		1.13
Water Surface Elevation in Effluent Channel			41.65	3.25	
<b>CL2 Disinfection</b>					
Flow		29.00			
Top of Basin Elevation	Dwg C-7, Jacobson Helgoth, 2007		47.93		
Water Surface in CL2 Basin			45.30	2.63	
Discharge Weir Elevation	Dwg C-5, Jacobson Helgoth, 2007		44.09		1.21



PROJECT : Therasa St WWTP, Lincoln, NE  
Elevation Summary

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 DATE : 3/9/17

## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
Water Surface Elevation in Effluent Channel			40.93		3.16
<u>Control Structure No. 2</u>					
Flow to Control Structure		65.00			
Flow (Bypass of Disinfection)		0.00			
Top of Structure			47.90		
Water Surface Elevation in CS No. 2			40.80		7.10
Top of Channel	Client Sketch		47.90		
Bottom of Effluent Channel	Client Sketch		23.55		
Water Surface Elevation in Effluent Channel			40.18		7.72
Salt Creek Water Level			20.00		3.55



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**Summary**

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Flume
<b>**ELEVATION VALUES IN BLUE ARE COMMON HYDRAULIC POINTS. MAKE SURE THESE VALUES MATCH**</b>					
<b>**INTERNAL AERATION BASIN WEIRS SHOULD BE SUBMERGED UNDER ALL CONDITIONS**</b>					
<b>Plant Flow</b>		<b>65 mgd</b>			
<b>Creek Elevation</b>		<b>43</b>			
<u>Influent Headworks Structure</u>					
Total Influent Flow		65.00			
Top of Influent Channel Elevation	Hyd Prof, B&V/QA, 2002		66.75		
Water Elevation In Influent Channel			64.64	2.11	
Top of Vortex Grit Chamber Elevation	Hyd Prof, B&V/QA, 2002		62.50		
Water Elevation in Vortex Grit Chamber			64.64	(2.14)	
<u>Flow Distribution Structure</u>					
TO EAST TREATMENT TRAIN					
Flow, mgd		24.05			
Weir Elevation	Hyd Prof, B&V/QA, 2002		63.48		
Water Surface Elevation Upstream of Weir			64.43		0.95
Water Surface Elevation Downstream of Weir			55.20	8.28	
TO PRIMARY CLARIFIER NO. 1 (CENTRAL/WEST TRMT TRAIN)					
Flow, mgd		13.65			
Weir Elevation	Hyd Prof, B&V/QA, 2002		63.39		
Water Surface Elevation Upstream of Weir			64.43		1.04
Water Surface Elevation Downstream of Weir			57.67	5.72	
TO PRIMARY CLARIFIER NO. 3 (CENTRAL/WEST TRMT TRAIN)					
Flow, mgd		13.65			
Weir Elevation	Hyd Prof, B&V/QA, 2002		62.78		
Water Surface Elevation Upstream of Weir			64.43		1.65
Water Surface Elevation Downstream of Weir			58.13	4.65	
TO PRIMARY CLARIFIER NO. 4 (CENTRAL/WEST TRMT TRAIN)					
Flow, mgd		13.65			
Weir Elevation	Hyd Prof, B&V/QA, 2002		62.78		
Water Surface Elevation Upstream of Weir			64.43		1.65
Water Surface Elevation Downstream of Weir			58.31	4.47	
<u>CENTRAL/WEST PRIMARY TREATMENT</u>					
<u>Primary Clarification</u>					
Primary Clarifier No. 1 Flow					
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	13.65	58.39		
Water Surface In Primary Clarifier No. 1			57.17	1.22	
V-Notch Weir Elevation			56.99		0.18
Water Surface Elevation in Effluent Drop Box			55.19		
Primary Clarifier No. 3 Flow					
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	13.65	58.39		
Water Surface In Primary Clarifier No. 2			57.40	0.99	
V-Notch Weir Elevation			57.17		0.24
Water Surface Elevation in Effluent Drop Box			55.49		
Primary Clarifier No. 4 Flow					
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	13.65	58.39		
Water Surface In Primary Clarifier No. 3			57.40	0.99	
V-Notch Weir Elevation			57.17		0.24
Water Surface Elevation in Effluent Drop Box			55.37		
<u>Influent Distribution Structure</u>					
Primary Clarifiers Nos. 1, 2 & 3 Flow					
Top of Distribution Box Structure	Client Sketch	40.95	57.12		
Water Surface In Distribution Box (upstream of Central Train Weir)			55.02	2.10	
Weir Elevation			53.74		1.28
Water Surface In Distribution Box (upstream of Weir to AB No. 1)			55.02	2.10	
Weir Elevation			54.34		0.68
Water Surface in Distribution Box (upstream of Weir to AB No. 2)			55.02	2.10	
Weir Elevation			54.34		0.68
Water Surface Downstream of Central AB Influent Weir			53.54	0.20	
Water Surface Downstream West AB No. 1 Inlet Weir			53.80	0.54	
Water Surface Downstream West AB No. 2 Inlet Weir			53.78	0.56	
<u>CENTRAL TREATMENT TRAIN</u>					
<u>Aeration Basins</u>					
Flow (Primary Clarifier Effluent + RAS)					
Top of Structure	Client Sketch	62.66	55.00		
Anoxic Weir Elevation			52.61		SUBMERGED
Water Surface Elevation in Aeration Basin			53.30	1.70	
Water Surface In AB Effluent Channel			53.30	1.70	
Discharge Weir Elevation to Final Clarifier No. 5			52.31		0.99
Water Surface Elevation Downstream of FC No. 5 Influent Weir			51.22	1.09	
Water Surface Elevation Downstream of FC No. 6 Influent Weir			51.23	1.08	



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## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Flume
<b>Final Clarifier No. 5</b>					
Flow (Clarifier Effluent)		15.67			
Top of Structure	Client Sketch		52.24		
Water Surface Elevation			50.28	1.96	
Invert of "V" Notch Weir Elevation			50.10		0.18
Water Surface in Effluent Launder			50.00	0.10	
Water Elevation in Drop Box			46.68	5.56	
<b>Final Clarifier No. 6</b>					
Flow (Clarifier Effluent)		15.67			
Top of Structure	Client Sketch		52.17		
Water Surface Elevation			50.29	1.88	
Invert of "V" Notch Weir Elevation			50.11		0.18
Water Surface in Effluent Launder			49.49	0.62	
Water Elevation in Drop Box			46.79	5.38	
<b>Effluent Box</b>					
Top of Structure	Client Sketch		52.00		
Water Elevation in Box			46.68	5.32	
<b>WEST TREATMENT TRAIN</b>					
<b>Aeration Basin No. 1</b>					
Flow (Primary Clarifier Effluent + RAS)		4.81			
Top of Structure	Client Sketch		54.81		
Water Surface Upstream of Weir #1			53.72	2.50	
Internal Weir Elevation #1			52.82		SUBMERGED
Water Surface Upstream of Weir #2			53.60	2.62	
Internal Weir Elevation #2			52.85		SUBMERGED
Water Surface Upstream of Weir #3			53.40	2.82	
Internal Weir Elevation #3			52.58		SUBMERGED
Water Surface Upstream of Weir #4			53.25	2.97	
Internal Weir Elevation #4			52.12		SUBMERGED
Water Surface Elevation upstream of discharge			53.19	1.62	
Discharge Weir Elevation			52.83		0.36
Water Surface in AB Effluent Channel			49.83	3.00	
<b>Aeration Basin No. 2</b>					
Flow (Primary Clarifier Effluent + RAS)		4.81			
Top of Structure	Client Sketch		54.81		
Water Surface Upstream of Weir #1			53.72	2.50	
Internal Weir Elevation #1			52.82		SUBMERGED
Water Surface Upstream of Weir #2			53.60	2.62	
Internal Weir Elevation #2			52.85		SUBMERGED
Water Surface Upstream of Weir #3			53.40	2.82	
Internal Weir Elevation #3			52.58		SUBMERGED
Water Surface Upstream of Weir #4			53.25	2.97	
Internal Weir Elevation #4			52.12		SUBMERGED
Water Surface Elevation upstream of discharge			53.19	1.62	
Discharge Weir Elevation			52.83		0.36
Water Surface in AB Effluent Channel			49.76	3.07	
<b>Final Clarifier No. 1</b>					
Flow (Clarifier Effluent)		4.81			
Top of Structure	Client Sketch		50.77		
Water Surface Elevation			49.07	1.70	
Invert of "V" Notch Weir Elevation			48.95		0.11
Water Surface in Effluent Launder			47.86	1.10	
Water Elevation in Drop Box			47.77	3.00	
<b>Final Clarifier No. 2</b>					
Flow (Clarifier Effluent)		4.81			
Top of Structure	Client Sketch		50.85		
Water Surface Elevation			49.08	1.77	
Invert of "V" Notch Weir Elevation			48.96		0.11
Water Surface in Effluent Launder			47.85	1.11	
Water Elevation in Drop Box			47.77	3.08	
<b>Effluent Jct Structures</b>					
Top of Jct MH	Hyd Prof, Brown & Caldwell, 2001		53.64		
Water Elevation in MH			47.71	5.93	
Top of Jct Box No. 1	Hyd Prof, Brown & Caldwell, 2001		45.89		
Water Elevation in Box			47.56		
Top of Jct Box No. 2	Hyd Profile, Carollo Engineers, 2007		54.86		
Water Elevation in Box			47.53		
<b>EAST TREATMENT TRAIN</b>					
<b>Influent Distribution Box</b>					



PROJECT : Therasa St WWTP, Lincoln, NE  
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## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/lume
Flow to East Train		24.05			
Top of Structure	Client Sketch		58.86		
Water Surface Elevation upstream of PC No. 5 Weir			54.24	4.62	
Water Surface Elevation upstream of PC No. 6 Weir			54.24	4.62	
<b>Primary Clarifier No. 5</b>					
Flow		12.03			
Top of Basin Elevation	Client Sketch		55.16		
Water Surface in Primary Clarifier No. 5			53.78	1.38	
V-Notch Weir Elevation			53.66		0.12
Water Surface Elevation in Effluent Drop Box			51.92	1.74	
<b>Primary Clarifier No. 6</b>					
Flow		12.03			
Top of Basin Elevation	Client Sketch		55.22		
Water Surface in Primary Clarifier No. 6			53.78	1.44	
V-Notch Weir Elevation			53.66		0.12
Water Surface Elevation in Effluent Drop Box			51.92	1.74	
<b>Aeration Basin No. 3</b>					
Flow (Primary Clarifier Effluent + RAS)		12.03			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.44	4.78	
Weir Elevation #1			50.71		SUBMERGED
Water Surface Upstream of Weir #2			50.99	5.23	
Weir Elevation #2			50.07		SUBMERGED
Water Surface Upstream of Weir #3			50.80	5.42	
Weir Elevation #3			49.72		SUBMERGED
Water Surface Elevation upstream of discharge			50.68	5.54	
Discharge Weir Elevation			50.00		0.88
Water Surface in AB Effluent Channel			49.96	0.04	
<b>Aeration Basin No. 4</b>					
Flow (Primary Clarifier Effluent + RAS)		12.03			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.44	4.78	
Weir Elevation #1			50.71		SUBMERGED
Water Surface Upstream of Weir #2			50.99	5.23	
Weir Elevation #2			50.07		SUBMERGED
Water Surface Upstream of Weir #3			50.80	5.42	
Weir Elevation #3			49.72		SUBMERGED
Water Surface Elevation upstream of discharge			50.68	5.54	
Discharge Weir Elevation			50.00		0.88
Water Surface in AB Effluent Channel			49.97	0.03	
<b>Final Clarifier No. 3</b>					
Flow (Clarifier Effluent)		12.03			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.75	1.56	
Invert of "V" Notch Weir Elevation			47.59		0.15
Water Surface in Effluent Launder			47.36	0.23	
Water Elevation in Drop Box			46.95	2.36	
<b>Final Clarifier No. 4</b>					
Flow (Clarifier Effluent)		12.03			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.76	1.55	
Invert of "V" Notch Weir Elevation			47.60		0.15
Water Surface in Effluent Launder			47.36	0.24	
Water Elevation in Drop Box			46.95	2.36	
<b>DISINFECTION</b>					
<b>Disinfection Control Structure No. 1</b>					
Flow to Control Structure		40.95			
Top of Structure	Client Sketch		47.89		
Water Surface Elevation upstream of UV Disinfection			46.50	1.39	
Water Surface Upstream of CL2 Weirs			46.50	1.39	
CL2 Influent Weir Elevation			45.57		0.93
Water Surface Elevation upstream of Disinfection Bypass			43.37	4.52	
<b>UV Disinfection</b>					
Flow		36.00			
Top of Channel Elevation	Dwg P-2, Jacobson Helgoth, 2007		47.93		
Water Surface over UV Lamps			46.03	1.90	
Discharge Weir Elevation			44.90		1.13
Water Surface Elevation in Effluent Channel			43.61	1.29	
<b>CL2 Disinfection</b>					
Flow		29.00			
Top of Basin Elevation	Dwg C-7, Jacobson Helgoth, 2007		47.93		
Water Surface in CL2 Basin			44.85	3.08	
Discharge Weir Elevation	Dwg C-5, Jacobson Helgoth, 2007		44.09		0.76



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## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
Water Surface Elevation in Effluent Channel			43.33	0.76	
<b>Control Structure No. 2</b>					
Flow to Control Structure		65.00			
Flow (Bypass of Disinfection)		0.00			
Top of Structure			47.90		
Water Surface Elevation in CS No. 2			43.20	4.70	
Top of Channel	Client Sketch		47.90		
Bottom of Effluent Channel	Client Sketch		23.55		
Water Surface Elevation in Effluent Channel			43.17	4.73	
Salt Creek Water Level			43.00	(19.45)	



PROJECT : Theresa St WWTP, Lincoln, NE  
Hydraulic Profile

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## Flow Input Sheet

### MODEL INPUT PARAMETERS

Max Month Average Day Flow MMAD  mgd  
Peaking Factor   
Peak Flow  mgd

Flow Evaluated:  **Flow Creek Elevation 36 mgd**  
**RAS 44.00**  
RAS as Percentage of Influent Flow

**FLOW PARAMETERS** INPUT VALUE LABEL TOTAL FLOW NOTES

*Elevations from Brown & Caldwell, and Jacobson Helgolt Dwg were corrected by subtracting 0.11 from the given elevation.*

#### Plant Influent

Total Influent Flow to Grit Basins 38.00 mgd

#### Headworks Facility

Flow thru Grit Basin No. 1  38.0 mgd Grit\_1  
Flow thru Grit Basin No. 2  0.0 mgd Grit\_2  
Flow in Distribution Box No. 1 38.0 mgd Dist\_1

#### Influent Flow Distribution

*Balance Influent Weir Elevations to achieve same WSE upstream in Flow Dist'n Structure*

Influent Weir No. 1 Elevation  ft 7.56 mgd Int1\_Weir 43.67  
Flow to PC No. 1   
Influent Weir No. 2 Elevation  ft 7.56 mgd Int3\_Weir 43.67  
Flow to PC No. 3   
Influent Weir No. 3 Elevation  ft 7.56 mgd Int4\_Weir 43.67  
Flow to PC No. 4   
Influent Weir No. 4 Elevation  ft 13.32 mgd East\_Weir 63.67  
Flow to East Train

### CENTRAL AND WEST TRAIN PRIMARY CLARIFICATION

#### Primary Clarification

PC No. 1 V-notch Weir Elev  ft 7.56 mgd PC1\_Weir Dveg 06D801, Nitrification Improv, HDR, 2004; V-  
PC No. 1 Effluent  ft 7.56 mgd PC3\_Weir Weir El. From Hyd Pro. Brown&Caldwell, 2001, V-  
PC No. 3 Effluent  ft 7.56 mgd PC4\_Weir Weir El. From Hyd Pro. Brown&Caldwell, 2001; V-  
PC No. 4 Effluent  ft 7.56 mgd

### CENTRAL TRAIN

Flow to Central Train  **Maya Scott: Gate Range: 55.12 - 51.49** Central 17.352 mgd

#### Influent Distribution

*Balance weir elevations to achieve same WSE in Flow Dist'n Structure; must match with weirs upstream of Central Aeration Basin*

Flow to East AB  8.68 mgd C\_EastAB  
East AB Influent Weir Elev  ft C\_AB\_Weir 54.61 Client Provided  
East AB Anoxic Weir  ft Anox\_5  
Flow to West AB  8.68 mgd C\_WestAB  
West AB Influent Weir Elev  ft C\_AB\_Weir2 54.61 Client Provided  
West AB Anoxic Weir  ft Anox\_6

Total Central AB Influent Central\_AB 17.35 mgd

Aeration Basin Effluent (Influent + RAS) 34.70 mgd Central\_ML

#### Final Clarifier Influent (Mixed Liquor)

*Balance weir elevations to achieve same WSE in AB Effluent Box*

FC No. 5 Influent Weir  ft 17.35 mgd FC5\_Inf\_weir 52.99 Client Provided  
Final Clarifier No. 5   
FC No. 6 Influent Weir  ft 17.35 mgd FC6\_Inf\_Weir 52.98 Client Provided  
Final Clarifier No. 6   
Total Final Clarifier Influent Flow C\_FC\_Tot 34.70 mgd

#### Final Clarifier Effluent (Clarifier Inf - RAS)

Clarifier No. 5 V-Notch Weir Elevation  ft 8.68 mgd FC5\_Weir Based on Client sketch; V-Notches are 2.5' deep  
Final Clarifier No. 5   
Clarifier No. 6 V-Notch Weir Elevation  ft 8.68 mgd FC6\_Weir Based on Client sketch; V-Notches are 2.5' deep  
Final Clarifier No. 6   
Combined Final Clarifier Effluent Flow C\_FCE\_Tot 17.35 mgd

### WEST TRAIN

Flow to West Train  **Maya Scott: Gate Range: 55.56 - 51.51** West 5.328 mgd

#### Influent Distribution

*Balance weir elevations to achieve same WSE in Flow Dist'n Structure; must match with weirs upstream of Central Aeration Basin*

Flow to East AB  2.66 mgd W\_EastAB  
West AB #1 Influent Weir Elev  ft 2.66 mgd W\_WestAB 54.61  
Flow to West AB   
East AB #2 Influent Weir Elev  ft W\_AB\_Weir2 54.61

Aeration Basin Influent West\_AB 5.33 mgd

#### Weir Elevations are same for both basins

Weir Elevation #1  ft WAB\_1 Client Provided  
Weir Elevation #2  ft WAB\_2 Client Provided  
Weir Elevation #3  ft WAB\_3 Client Provided  
Weir Elevation #4  ft WAB\_4 Client Provided

Aeration Basin Effluent (Influent + RAS) Effluent Weir  10.88 mgd West\_ML WAB\_Weir Client Sketch

#### Final Clarifier Influent (Mixed Liquor)

Final Clarifier No. 1  5.328 mgd FC1\_Inf 10.856 mgd  
Final Clarifier No. 2  5.328 mgd FC2\_Inf

#### Final Clarifier Effluent (Clarifier Inf - RAS)

Clarifier No. 1 V-Notch Weir Elevation  ft 2.66 mgd FC1\_Weir Client Sketch; 2.5' deep notches  
Final Clarifier No. 1   
Clarifier No. 2 V-Notch Weir Elevation  ft 2.66 mgd FC2\_Weir Client Sketch; 2.5' deep notches  
Final Clarifier No. 2   
Combined Final Clarifier Effluent Flow W\_FCE\_Tot 5.33 mgd



PROJECT : Theresa St WWTP, Lincoln, NE  
Hydraulic Profile

JOB # : 7498A00

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## Flow Input Sheet

### MODEL INPUT PARAMETERS

#### EAST TRAIN

Flow to East Train	37%				
<b>Primary Clarification</b>					
Flow to PC No. 5		8.66 mgd	PC5_Inf		
PC No. 5 V-notch Weir Elev	53.68 ft		PC5_Weir		Client Sketch; V-Notch is 2' deep
Flow to PC No.6		6.66 mgd	PC6_Inf		
PC No. 6 V-notch Weir Elev	53.68 ft		PC6_Weir		Client Sketch; V-Notch is 2' deep
PC No. 5 Effluent Flow		6.66 mgd	PC5_Eff		
PC No. 6 Effluent Flow		6.66 mgd	PC6_Eff		
<b>Aeration Basin Influent</b>					
Flow to East AB		8.66 mgd	PC5_Eff		
Flow to West AB		8.66 mgd	PC6_Eff		
<i>Weir Elevations are same for both basins</i>					
Weir Elevation #1	50.71 ft		EAB_1		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #2	50.07 ft		EAB_2		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #3	49.72 ft		EAB_3		Dwg S311, Brown&Caldwell, 2005
Total East AB Influent			East_AB	13.32 mgd	
<b>Aeration Basin Effluent (Influent + RAS)</b>					
Effluent Weir Elevation	50.00 ft	26.64 mgd	East_ML		
			East_AB_Weir		Client provided
<b>Final Clarifier Influent (Mixed Liquor)</b>					
Final Clarifier No. 3	50%	13.32 mgd	FC3_Inf		
Final Clarifier No. 4	50%	13.32 mgd	FC4_Inf		
Total Final Clarifier Influent Flow			E_FC_Tot	26.64 mgd	
<b>Final Clarifier Effluent (Clarifier Inf - RAS)</b>					
Clarifier No. 3 V-Notch Weir Elevation	47.59 ft		FC3_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 3	50%	8.66 mgd	FC3_Eff		
Clarifier No. 4 V-notch Weir Elevation	47.60 ft		FC4_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 4	50%	6.66 mgd	FC4_Eff		
Combined Final Clarifier Effluent Flow			E_FCE_Tot	13.32 mgd	
<b>EFFLUENT STRUCTURES</b>					
<b>Control Structures</b>					
Control Structure No. 1 TOW	47.89 ft		CS_1		Client Sketch
Control Structure No. 2 TOW	47.90 ft		CS_2		Client Sketch
Weir Elevation to CL2 Basin	48.50 ft		CS_Weir		WSE must match with WSE upstrm of UV Weir
Flow to UV Disinfection		36 mgd	UV	46.50	
Flow to Cl2 Disinfection		0 mgd	CL	46.50	
Bypass Disinfection	0%	0 mgd	FCE		
<b>Chlorine Disinfection</b>					
No. of CL2 Channels in Operation	2		CL_Ch		
Cl2 Basin Effluent Weir Elevation	44.09 ft		CL_Weir		Dwg C-5, Jacobson Helgoth, 2007
<b>UV Disinfection</b>					
UV Effluent Weir	44.90 ft		UV_Weir		Weir elevation must maintain WSE of 48.03 (46.1
WSE over UV Lamps				46.03	
Plant Effluent Channel			FE_Flow	36.00 mgd	
Salt Creek Elevation			River	44.00 ft	

Maya Scott:  
Gate Range: 1147.37 - 1144.37 (47.48 - 44.48)

Maya Scott:  
Gate Range: 47.93 - 42.26 (1148.04 - 1142.37)



PROJECT : Therasa St WWTP, Lincoln, NE  
 Elevation Summary

CHECKED BY : M. Scott  
 DATE : 39317.00

JOB # : 7498A00 REVISION: Preliminary

**Summary**

Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
<b>**ELEVATION VALUES IN BLUE ARE COMMON HYDRAULIC POINTS. MAKE SURE THESE VALUES MATCH**</b>				
<b>**INTERNAL AERATION BASIN WEIRS SHOULD BE SUBMERGED UNDER ALL CONDITIONS**</b>				
<b>Plant Flow</b>	<b>36 mgd</b>			
<b>Creek Elevation</b>	<b>44</b>			
<u>Influent Headworks Structure</u>				
Total Influent Flow	36.00			
Top of Influent Channel Elevation	Hyd Prof, B&V/OA, 2002	66.75		
Water Elevation In Influent Channel		63.79	2.96	
Top of Vortex Grit Chamber Elevation	Hyd Prof, B&V/OA, 2002	62.50		
Water Elevation in Vortex Grit Chamber		63.79	(1.29)	
<u>Flow Distribution Structure</u>				
TO EAST TREATMENT TRAIN				
Flow, mgd	13.32			
Weir Elevation	Hyd Prof, B&V/OA, 2002	63.03		
Water Surface Elevation Upstream of Weir		63.67		0.64
Water Surface Elevation Downstream of Weir		54.21	8.82	
TO PRIMARY CLARIFIER NO. 1 (CENTRAL/WEST TRMT TRAIN)				
Flow, mgd	7.56			
Weir Elevation	Hyd Prof, B&V/OA, 2002	62.97		
Water Surface Elevation Upstream of Weir		63.67		0.70
Water Surface Elevation Downstream of Weir		57.29	5.68	
TO PRIMARY CLARIFIER NO. 3 (CENTRAL/WEST TRMT TRAIN)				
Flow, mgd	7.56			
Weir Elevation	Hyd Prof, B&V/OA, 2002	62.56		
Water Surface Elevation Upstream of Weir		63.67		1.11
Water Surface Elevation Downstream of Weir		57.58	4.98	
TO PRIMARY CLARIFIER NO. 4 (CENTRAL/WEST TRMT TRAIN)				
Flow, mgd	7.56			
Weir Elevation	Hyd Prof, B&V/OA, 2002	62.56		
Water Surface Elevation Upstream of Weir		63.67		1.11
Water Surface Elevation Downstream of Weir		57.64	4.92	
<u>CENTRAL/WEST PRIMARY TREATMENT</u>				
<u>Primary Clarification</u>				
Primary Clarifier No. 1 Flow				
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	58.39		
Water Surface in Primary Clarifier No. 1		57.13	1.26	
V-Notch Weir Elevation		56.99		0.14
Water Surface Elevation in Effluent Drop Box		54.66		
Primary Clarifier No. 3 Flow				
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	58.39		
Water Surface in Primary Clarifier No. 2		57.35	1.04	
V-Notch Weir Elevation		57.17		0.19
Water Surface Elevation in Effluent Drop Box		54.76		
Primary Clarifier No. 4 Flow				
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	58.39		
Water Surface in Primary Clarifier No. 3		57.35	1.04	
V-Notch Weir Elevation		57.17		0.19
Water Surface Elevation in Effluent Drop Box		54.72		
<u>Influent Distribution Structure</u>				
Primary Clarifiers Nos. 1, 2 & 3 Flow	22.68			
Top of Distribution Box Structure	Client Sketch	57.12		
Water Surface in Distribution Box (upstream of Central Train Weir)		54.61	2.51	
Weir Elevation		53.74		0.87
Water Surface In Distribution Box (upstream of Weir to AB No. 1)		54.61	2.51	
Weir Elevation		54.15		0.46
Water Surface in Distribution Box (upstream of Weir to AB No. 2)		54.61	2.51	
Weir Elevation		54.15		0.46
Water Surface Downstream of Central AB Influent Weir		53.19	0.55	
Water Surface Downstream West AB No. 1 Inlet Weir		53.44	0.71	
Water Surface Downstream West AB No. 2 Inlet Weir		53.44	0.71	
<u>CENTRAL TREATMENT TRAIN</u>				
<u>Aeration Basins</u>				
Flow (Primary Clarifier Effluent + RAS)	34.70			
Top of Structure	Client Sketch	55.00		
Anoxic Weir Elevation		52.61		SUBMERGED
Water Surface Elevation in Aeration Basin		52.98	2.02	
Water Surface In AB Effluent Channel		52.98	2.02	
Discharge Weir Elevation to Final Clarifier No. 5		52.31		0.67
Water Surface Elevation Downstream of FC No. 5 Influent Weir		50.53	1.78	
Water Surface Elevation Downstream of FC No. 6 Influent Weir		50.54	1.77	



PROJECT : Therasa St WWTP, Lincoln, NE  
Elevation Summary

JOB # : 7498A00

REVISION: Preliminary

CHECKED :  
DATE :

BY : M. Scott  
DATE : 39317.00

## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Flume
<b>Final Clarifier No. 5</b>					
Flow (Clarifier Effluent)		8.68			
Top of Structure	Client Sketch		52.24		
Water Surface Elevation			50.24	2.00	
Invert of "V" Notch Weir Elevation			50.10		0.14
Water Surface in Effluent Launder			49.63	0.48	
Water Elevation in Drop Box			46.56	5.68	
<b>Final Clarifier No. 6</b>					
Flow (Clarifier Effluent)		8.68			
Top of Structure	Client Sketch		52.17		
Water Surface Elevation			50.25	1.92	
Invert of "V" Notch Weir Elevation			50.11		0.14
Water Surface in Effluent Launder			49.12	1.00	
Water Elevation in Drop Box			46.59	5.58	
<b>Effluent Box</b>					
Top of Structure	Client Sketch		52.00		
Water Elevation in Box			46.56	5.44	
<b>WEST TREATMENT TRAIN</b>					
<b>Aeration Basin No. 1</b>					
Flow (Primary Clarifier Effluent + RAS)		2.66			
Top of Structure	Client Sketch		54.81		
Water Surface Upstream of Weir #1			53.42	2.80	
Internal Weir Elevation #1			52.82		SUBMERGED
Water Surface Upstream of Weir #2			53.33	2.89	
Internal Weir Elevation #2			52.85		SUBMERGED
Water Surface Upstream of Weir #3			53.17	3.05	
Internal Weir Elevation #3			52.58		SUBMERGED
Water Surface Upstream of Weir #4			53.09	3.13	
Internal Weir Elevation #4			52.12		SUBMERGED
Water Surface Elevation upstream of discharge			53.07	1.74	
Discharge Weir Elevation			52.83		0.24
Water Surface in AB Effluent Channel			49.29	3.54	
<b>Aeration Basin No. 2</b>					
Flow (Primary Clarifier Effluent + RAS)		2.66			
Top of Structure	Client Sketch		54.81		
Water Surface Upstream of Weir #1			53.42	2.80	
Internal Weir Elevation #1			52.82		SUBMERGED
Water Surface Upstream of Weir #2			53.33	2.89	
Internal Weir Elevation #2			52.85		SUBMERGED
Water Surface Upstream of Weir #3			53.17	3.05	
Internal Weir Elevation #3			52.58		SUBMERGED
Water Surface Upstream of Weir #4			53.09	3.13	
Internal Weir Elevation #4			52.12		SUBMERGED
Water Surface Elevation upstream of discharge			53.07	1.74	
Discharge Weir Elevation			52.83		0.24
Water Surface in AB Effluent Channel			49.26	3.57	
<b>Final Clarifier No. 1</b>					
Flow (Clarifier Effluent)		2.66			
Top of Structure	Client Sketch		50.77		
Water Surface Elevation			49.04	1.73	
Invert of "V" Notch Weir Elevation			48.95		0.09
Water Surface in Effluent Launder			47.03	1.92	
Water Elevation in Drop Box			46.90	3.87	
<b>Final Clarifier No. 2</b>					
Flow (Clarifier Effluent)		2.66			
Top of Structure	Client Sketch		50.85		
Water Surface Elevation			49.05	1.80	
Invert of "V" Notch Weir Elevation			48.96		0.09
Water Surface in Effluent Launder			47.03	1.93	
Water Elevation in Drop Box			46.90	3.95	
<b>Effluent Jct Structures</b>					
Top of Jct MH			53.64		
Water Elevation in MH			46.88	6.76	
Top of Jct Box No. 1			45.89		
Water Elevation in Box			46.84		
Top of Jct Box No. 2			54.86		
Water Elevation in Box			46.83		

## EAST TREATMENT TRAIN

### Influent Distribution Box



PROJECT : Therasa St WWTP, Lincoln, NE  
 Elevation Summary

JOB # : 7498A00

REVISION: Preliminary

CHECKED : \_\_\_\_\_  
 DATE : \_\_\_\_\_

BY : M. Scott  
 DATE : 3/9/17.00

**Summary**

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Flume
Flow to East Train		13.32			
Top of Structure	Client Sketch		58.86		
Water Surface Elevation upstream of PC No. 5 Weir			53.90	4.96	
Water Surface Elevation upstream of PC No. 6 Weir			53.90	4.96	
<u>Primary Clarifier No. 5</u>					
Flow		6.66			
Top of Basin Elevation	Client Sketch		55.16		
Water Surface in Primary Clarifier No. 5			53.76	1.40	
V-Notch Weir Elevation			53.66		0.09
Water Surface Elevation in Effluent Drop Box			51.32	2.35	
<u>Primary Clarifier No. 6</u>					
Flow		6.66			
Top of Basin Elevation	Client Sketch		55.22		
Water Surface in Primary Clarifier No. 6			53.76	1.46	
V-Notch Weir Elevation			53.66		0.09
Water Surface Elevation in Effluent Drop Box			51.32	2.35	
<u>Aeration Basin No. 3</u>					
Flow (Primary Clarifier Effluent + RAS)		6.66			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.17	5.05	
Weir Elevation #1			50.71		FREE FALLING
Water Surface Upstream of Weir #2			50.67	5.55	
Weir Elevation #2			50.07		SUBMERGED
Water Surface Upstream of Weir #3			50.52	5.70	
Weir Elevation #3			49.72		SUBMERGED
Water Surface Elevation upstream of discharge			50.46	5.76	
Discharge Weir Elevation			50.00		0.46
Water Surface in AB Effluent Channel			48.40	1.60	
<u>Aeration Basin No. 4</u>					
Flow (Primary Clarifier Effluent + RAS)		6.66			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.17	5.05	
Weir Elevation #1			50.71		FREE FALLING
Water Surface Upstream of Weir #2			50.67	5.55	
Weir Elevation #2			50.07		SUBMERGED
Water Surface Upstream of Weir #3			50.52	5.70	
Weir Elevation #3			49.72		SUBMERGED
Water Surface Elevation upstream of discharge			50.46	5.76	
Discharge Weir Elevation			50.00		0.46
Water Surface in AB Effluent Channel			48.41	1.59	
<u>Final Clarifier No. 3</u>					
Flow (Clarifier Effluent)		6.66			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.71	1.60	
Invert of "V" Notch Weir Elevation			47.59		0.12
Water Surface in Effluent Launder			46.84	0.75	
Water Elevation in Drop Box			46.64	2.67	
<u>Final Clarifier No. 4</u>					
Flow (Clarifier Effluent)		6.66			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.72	1.59	
Invert of "V" Notch Weir Elevation			47.60		0.12
Water Surface in Effluent Launder			46.84	0.76	
Water Elevation in Drop Box			46.64	2.67	
<u>DISINFECTION</u>					
<u>Disinfection Control Structure No. 1</u>					
Flow to Control Structure		22.68			
Top of Structure	Client Sketch		47.89		
Water Surface Elevation upstream of UV Disinfection			46.50	1.39	
Water Surface Upstream of CL2 Weirs			46.50	1.39	
CL2 Influent Weir Elevation			46.50		0.00
Water Surface Elevation upstream of Disinfection Bypass			44.08	3.81	
<u>UV Disinfection</u>					
Flow		36.00			
Top of Channel Elevation	Dwg P-2, Jacobson Helgoth, 2007		47.93		
Water Surface over UV Lamps			46.03	1.90	
Discharge Weir Elevation			44.90		1.13
Water Surface Elevation in Effluent Channel			44.32	0.58	
<u>CL2 Disinfection</u>					
Flow		0.00			
Top of Basin Elevation	Dwg C-7, Jacobson Helgoth, 2007		47.93		
Water Surface in CL2 Basin			44.09	3.84	
Discharge Weir Elevation	Dwg C-5, Jacobson Helgoth, 2007		44.09		0.00



PROJECT : Therasa St WWTP, Lincoln, NE  
 Elevation Summary

JOB # : 7498A00 REVISION: Preliminary

CHECKED : \_\_\_\_\_ BY : M. Scott  
 DATE : \_\_\_\_\_ DATE : 39317.00

**Summary**

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Flume
Water Surface Elevation in Effluent Channel			44.04	0.05	
<u>Control Structure No. 2</u>					
Flow to Control Structure		36.00			
Flow (Bypass of Disinfection)		0.00			
Top of Structure			47.90		
Water Surface Elevation in CS No. 2			44.04		3.86
Top of Channel	Client Sketch		47.90		
Bottom of Effluent Channel	Client Sketch		23.55		
Water Surface Elevation in Effluent Channel			44.04		3.86
Salt Creek Water Level			44.00		(20.45)



PROJECT : Theresa SI WWTP, Lincoln, NE  
Hydraulic Profile

JOB # : 7498A00

REVISION: Preliminary

CHECKED :  
DATE :

BY : M. Scott  
DATE : 8/20/2007

## Flow Input Sheet

### MODEL INPUT PARAMETERS

Max Month Average Day Flow MMAD  mgd  
Peaking Factor   
Peak Flow  mgd

Flow Evaluated:  **Flow Creek Elevation 36 mgd**  
**44.10**  
RAS as Percentage of Influent Flow RAS

### FLOWS/PARAMETERS

INPUT VALUE LABEL TOTAL FLOW NOTES

*Elevations from Brown & Caldwell, and Jacobson Helgoth Dwg's were corrected by subtracting 0.11 from the given elevation.*

#### Plant Influent

Total Influent Flow to Grit Basins 36.00 mgd

#### Headworks Facility

Flow thru Grit Basin No. 1  36.0 mgd Grit\_1  
Flow thru Grit Basin No. 2  0.0 mgd Grit\_2  
Flow in Distribution Box No. 1  0.0 mgd Dist\_1 36.0 mgd

#### Influent Flow Distribution

*Balance Influent Weir Elevations to achieve same WSE upstream in Flow Distr Structure*

Influent Weir No. 1 Elevation  ft Inf1\_Weir 63.67  
Flow to PC No. 1  7.56 mgd PC1\_Inf  
Influent Weir No. 2 Elevation  ft Inf2\_Weir 63.67  
Flow to PC No. 3  7.58 mgd PC3\_Inf  
Influent Weir No. 3 Elevation  ft Inf3\_Weir 63.67  
Flow to PC No. 4  7.58 mgd PC4\_Inf  
Influent Weir No. 4 Elevation  ft East\_Weir 63.67  
Flow to East Train  13.32 mgd East

### CENTRAL AND WEST TRAIN PRIMARY CLARIFICATION

#### Primary Clarification

PC No. 1 V-notch Weir Elev  ft PC1\_Weir Dwg 00D801, Nitrification Improv, HDR, 2004; V-  
PC No. 1 Effluent  ft PC3\_Weir Weir El. From Hyd Pro, Brown&Caldwell, 2001; V-  
PC No. 3 V-notch Weir Elev  ft PC4\_Weir Weir El. From Hyd Pro, Brown&Caldwell, 2001, V-  
PC No. 3 Effluent  ft  
PC No. 4 V-notch Weir Elev  ft  
PC No. 4 Effluent  ft

### CENTRAL TRAIN

Flow to Central Train   C\_W\_Inf 22.66 mgd

#### Influent Distribution

*Balance weir elevations to achieve same WSE in Flow Distr Structure; must match with weirs upstream of Central Aeration Basin*

Flow to East AB  8.88 mgd C\_EastAB  
East AB Influent Weir Elev  ft C\_AB\_Weir 54.61 Client Provided  
East AB Anoxic Weir  ft Anox\_5  
Flow to West AB  8.88 mgd C\_WestAB  
West AB Influent Weir Elev  ft C\_AB\_Weir2 54.61 Client Provided  
West AB Anoxic Weir  ft Anox\_6

Total Central AB Influent 17.35 mgd Central\_AB

#### Aeration Basin Effluent (Influent + RAS)

34.70 mgd Central\_ML

#### Final Clarifier Influent (Mixed Liquor)

*Balance weir elevations to achieve same WSE in AB Effluent Box*

FC No. 5 Influent Weir  ft FCS\_Inf\_weir 52.97 Client Provided  
Final Clarifier No. 5  17.35 mgd FCS\_Inf  
FC No. 6 Influent Weir  ft FC6\_Inf\_Weir 52.98 Client Provided  
Final Clarifier No. 6  17.35 mgd FC6\_Inf  
Total Final Clarifier Influent Flow C\_FC\_Tot 34.70 mgd

#### Final Clarifier Effluent (Clarifier In) - RAS

Clarifier No. 5 V-Notch Weir Elevation  ft FCS\_Weir Based on Client sketch; V-Notches are 2.5' deep  
Final Clarifier No. 5  8.68 mgd FCS\_Eff  
Clarifier No. 6 V-Notch Weir Elevation  ft FC6\_Weir Based on Client sketch; V-Notches are 2.5' deep  
Final Clarifier No. 6  8.68 mgd FC6\_Eff  
Combined Final Clarifier Effluent Flow C\_FCE\_Tot 17.35 mgd

### WEST TRAIN

Flow to West Train   West 5.328 mgd

#### Influent Distribution

*Balance weir elevations to achieve same WSE in Flow Distr Structure; must match with weirs upstream of Central Aeration Basin*

Flow to East AB  2.66 mgd W\_EastAB  
West AB #1 Influent Weir Elev  ft W\_AB\_Weir 54.61  
Flow to West AB  2.66 mgd W\_WestAB  
East AB #2 Influent Weir Elev  ft W\_AB\_Weir2 54.61

#### Aeration Basin Influent

*Weir Elevations are same for both basins*

Weir Elevation #1  ft WAB\_1 Client Provided  
Weir Elevation #2  ft WAB\_2 Client Provided  
Weir Elevation #3  ft WAB\_3 Client Provided  
Weir Elevation #4  ft WAB\_4 Client Provided

#### Aeration Basin Effluent (Influent + RAS)

10.66 mgd West\_ML

Effluent Weir  WAB\_Weir Client Sketch

#### Final Clarifier Influent (Mixed Liquor)

Final Clarifier No. 1  5.328 mgd FC1\_Inf 10.656 mgd  
Final Clarifier No. 2  5.328 mgd FC2\_Inf

#### Final Clarifier Effluent (Clarifier In) - RAS

Clarifier No. 1 V-Notch Weir Elevation  ft FC1\_Weir Client Sketch; 2.5' deep notches  
Final Clarifier No. 1  2.66 mgd FC1\_Eff  
Clarifier No. 2 V-Notch Weir Elevation  ft FC2\_Weir Client Sketch; 2.5' deep notches  
Final Clarifier No. 2  2.66 mgd FC2\_Eff  
Combined Final Clarifier Effluent Flow W\_FCE\_Tot 5.33 mgd



PROJECT : Theresa St WWTP, Lincoln, NE  
Hydraulic Profile

JOB # : 7498A00

REVISION: Preliminary

CHECKED : BY : M. Scott  
DATE : 8/29/2007

## Flow Input Sheet

### MODEL INPUT PARAMETERS

#### EAST TRAIN

Flow to East Train	37%				
<b>Primary Clarification</b>					
Flow to PC No. 5		6.68 mgd	PCS_Inf		
PC No. 5 V-notch Weir Elev	53.68 ft		PCS_Weir		Client Sketch; V-Notch is 2' deep
Flow to PC No.6		6.68 mgd	PC6_Inf		
PC No. 6 V-notch Weir Elev	53.68 ft		PC6_Weir		Client Sketch; V-Notch is 2' deep
PC No. 5 Effluent Flow		6.68 mgd	PCS_Eff		
PC No. 6 Effluent Flow		6.68 mgd	PC6_Eff		
<b>Aeration Basin Influent</b>					
Flow to East AB		8.66 mgd	PCS_EI#		
Flow to West AB		8.66 mgd	PC6_EI#		
<i>Weir Elevations are same for both basins</i>					
Weir Elevation #1	50.71 ft		EAB_1		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #2	50.07 ft		EAB_2		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #3	49.72 ft		EAB_3		Dwg S311, Brown&Caldwell, 2005
Total East AB Influent			Estt_AB	13.32 mgd	
<b>Aeration Basin Effluent (Influent + RAS)</b>					
Aeration Basin Effluent (Influent + RAS)		26.64 mgd	Estt_ML		
Effluent Weir Elevation	50.00 ft		East_AB_Weir		Client provided
<b>Final Clarifier Influent (Mixed Liquor)</b>					
Final Clarifier No. 3	50%	13.32 mgd	FC3_Inf		
Final Clarifier No. 4	50%	13.32 mgd	FC4_Inf		
Total Final Clarifier Influent Flow			E_FC_Tot	26.64 mgd	
<b>Final Clarifier Effluent (Clarifier Int - RAS)</b>					
Clarifier No. 3 V-Notch Weir Elevation	47.58 ft		FC3_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 3	50%	8.66 mgd	FC3_Eff		
Clarifier No. 4 V-notch Weir Elevation	47.60 ft		FC4_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 4	50%	6.66 mgd	FC4_Eff		
Combined Final Clarifier Effluent Flow			E_FCE_Tot	13.32 mgd	

#### EFFLUENT STRUCTURES

<b>Control Structures</b>					
Control Structure No. 1 TOW	47.89 ft		CS_1		Client Sketch
Control Structure No. 2 TOW	47.90 ft		CS_2		Client Sketch
Weir Elevation to CL2 Basin	46.50 ft		CS_Weir		WSE must match with WSE upstrm of UV Weir
Flow to UV Disinfection		36 mgd	UV	46.50	
Flow to CL2 Disinfection		0 mgd	CL	46.50	
Bypass Disinfection	0%	0 mgd	FCE		
<b>Chlorine Disinfection</b>					
No. of CL2 Channels in Operation	2		CL_Ch		
CL2 Basin Effluent Weir Elevation	44.08 ft		CL_Weir		Dwg C-5, Jacobson Helgoth, 2007
<b>UV Disinfection</b>					
UV Effluent Weir	44.90 ft		UV_Weir		Weir elevation must maintain WSE of 46.03 (46.1)
WSE over UV Lamps				46.03	
Plant Effluent Channel			FE_Flow	36.00 mgd	
Salt Creek Elevation			River	44.10 ft	

Maya Scott:  
Gate Range: 1147.37 - 1144.37 (47.48 - 44.48)

Maya Scott:  
Gate Range: 47.93 - 42.26 (1149.04 - 1142.37)



PROJECT : Therasa St WWTP, Lincoln, NE  
Elevation Summary

JOB # : 7498A00

REVISION: Preliminary

CHECKED : \_\_\_\_\_  
DATE : \_\_\_\_\_

BY : M. Scott  
DATE : 39317.00

## Summary

Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
<b>Plant Flow 36 mgd</b>				
<b>Creek Elevation 44.1</b>				
<u>Influent Headworks Structure</u>				
Total Influent Flow	36.00			
Top of Influent Channel Elevation		66.75		
Water Elevation in Influent Channel		63.79	2.96	
Top of Vortex Grit Chamber Elevation		62.50		
Water Elevation in Vortex Grit Chamber		63.79	(1.29)	
<u>Flow Distribution Structure</u>				
TO EAST TREATMENT TRAIN				
Flow, mgd	13.32			
Weir Elevation		63.03		
Water Surface Elevation Upstream of Weir		63.67		0.64
Water Surface Elevation Downstream of Weir		54.21	8.82	
TO PRIMARY CLARIFIER NO. 1 (CENTRAL/WEST TRMT TRAIN)				
Flow, mgd	7.56			
Weir Elevation		62.97		
Water Surface Elevation Upstream of Weir		63.67		0.70
Water Surface Elevation Downstream of Weir		57.29	5.68	
TO PRIMARY CLARIFIER NO. 3 (CENTRAL/WEST TRMT TRAIN)				
Flow, mgd	7.56			
Weir Elevation		62.56		
Water Surface Elevation Upstream of Weir		63.67		1.11
Water Surface Elevation Downstream of Weir		57.58	4.98	
TO PRIMARY CLARIFIER NO. 4 (CENTRAL/WEST TRMT TRAIN)				
Flow, mgd	7.56			
Weir Elevation		62.56		
Water Surface Elevation Upstream of Weir		63.67		1.11
Water Surface Elevation Downstream of Weir		57.64	4.92	
<u>CENTRAL/WEST PRIMARY TREATMENT</u>				
<u>Primary Clarification</u>				
Primary Clarifier No. 1 Flow				
Top of Basin Elevation	7.56	59.39		
Water Surface in Primary Clarifier No. 1		57.13	1.26	
V-Notch Weir Elevation		56.99		0.14
Water Surface Elevation in Effluent Drop Box		54.66		
Primary Clarifier No. 3 Flow				
Top of Basin Elevation	7.56	59.39		
Water Surface in Primary Clarifier No. 2		57.35	1.04	
V-Notch Weir Elevation		57.17		0.19
Water Surface Elevation in Effluent Drop Box		54.76		
Primary Clarifier No. 4 Flow				
Top of Basin Elevation	7.56	59.39		
Water Surface in Primary Clarifier No. 3		57.35	1.04	
V-Notch Weir Elevation		57.17		0.19
Water Surface Elevation in Effluent Drop Box		54.72		
<u>Influent Distribution Structure</u>				
Primary Clarifiers Nos. 1, 2 & 3 Flow	22.68			
Top of Distribution Box Structure		57.12		
Water Surface in Distribution Box (upstream of Central Train Weir)		54.61	2.51	
Weir Elevation		53.74		0.87
Water Surface in Distribution Box (upstream of Weir to AB No. 1)		54.61	2.51	
Weir Elevation		54.15		0.46
Water Surface in Distribution Box (upstream of Weir to AB No. 2)		54.61	2.51	
Weir Elevation		54.15		0.46
Water Surface Downstream of Central AB Influent Weir		53.19	0.55	
Water Surface Downstream West AB No. 1 Inlet Weir		53.44	0.71	
Water Surface Downstream West AB No. 2 Inlet Weir		53.44	0.71	
<u>CENTRAL TREATMENT TRAIN</u>				
<u>Aeration Basins</u>				
Flow (Primary Clarifier Effluent + RAS)	34.70			
Top of Structure		55.00		
Anoxic Weir Elevation		52.61		SUBMERGED
Water Surface Elevation in Aeration Basin		52.98	2.02	
Water Surface in AB Effluent Channel		52.98	2.02	
Discharge Weir Elevation to Final Clarifier No. 5		52.31		0.67
Water Surface Elevation Downstream of FC No. 5 Influent Weir		50.53	1.78	
Water Surface Elevation Downstream of FC No. 6 Influent Weir		50.54	1.77	



PROJECT : Therasa St WWTP, Lincoln, NE  
 Elevation Summary

JOB # : 7498A00

REVISION: Preliminary

CHECKED : \_\_\_\_\_  
 DATE : \_\_\_\_\_

BY : M. Scott  
 DATE : 39317.00

## Summary

Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
<b>Final Clarifier No. 5</b>				
Flow (Clarifier Effluent)	8.68			
Top of Structure	Client Sketch	52.24		
Water Surface Elevation		50.24	2.00	
Invert of "V" Notch Weir Elevation		50.10		0.14
Water Surface in Effluent Launder		49.63	0.48	
Water Elevation in Drop Box		46.56	5.68	
<b>Final Clarifier No. 6</b>				
Flow (Clarifier Effluent)	8.68			
Top of Structure	Client Sketch	52.17		
Water Surface Elevation		50.25	1.92	
Invert of "V" Notch Weir Elevation		50.11		0.14
Water Surface in Effluent Launder		49.12	1.00	
Water Elevation in Drop Box		46.59	5.58	
<b>Effluent Box</b>				
Top of Structure	Client Sketch	52.00		
Water Elevation in Box		46.56	5.44	
<b>WEST TREATMENT TRAIN</b>				
<b>Aeration Basin No. 1</b>				
Flow (Primary Clarifier Effluent + RAS)	2.66			
Top of Structure	Client Sketch	54.81		
Water Surface Upstream of Weir #1		53.42	2.80	
Internal Weir Elevation #1		52.82		SUBMERGED
Water Surface Upstream of Weir #2		53.33	2.89	
Internal Weir Elevation #2		52.85		SUBMERGED
Water Surface Upstream of Weir #3		53.17	3.05	
Internal Weir Elevation #3		52.58		SUBMERGED
Water Surface Upstream of Weir #4		53.09	3.13	
Internal Weir Elevation #4		52.12		SUBMERGED
Water Surface Elevation upstream of discharge		53.07	1.74	
Discharge Weir Elevation		52.83		0.24
Water Surface in AB Effluent Channel		49.29	3.54	
<b>Aeration Basin No. 2</b>				
Flow (Primary Clarifier Effluent + RAS)	2.66			
Top of Structure	Client Sketch	54.81		
Water Surface Upstream of Weir #1		53.42	2.80	
Internal Weir Elevation #1		52.82		SUBMERGED
Water Surface Upstream of Weir #2		53.33	2.89	
Internal Weir Elevation #2		52.85		SUBMERGED
Water Surface Upstream of Weir #3		53.17	3.05	
Internal Weir Elevation #3		52.58		SUBMERGED
Water Surface Upstream of Weir #4		53.09	3.13	
Internal Weir Elevation #4		52.12		SUBMERGED
Water Surface Elevation upstream of discharge		53.07	1.74	
Discharge Weir Elevation		52.83		0.24
Water Surface in AB Effluent Channel		49.26	3.57	
<b>Final Clarifier No. 1</b>				
Flow (Clarifier Effluent)	2.66			
Top of Structure	Client Sketch	50.77		
Water Surface Elevation		49.04	1.73	
Invert of "V" Notch Weir Elevation		48.95		0.09
Water Surface in Effluent Launder		47.03	1.92	
Water Elevation in Drop Box		46.90	3.87	
<b>Final Clarifier No. 2</b>				
Flow (Clarifier Effluent)	2.66			
Top of Structure	Client Sketch	50.85		
Water Surface Elevation		49.05	1.80	
Invert of "V" Notch Weir Elevation		48.96		0.09
Water Surface in Effluent Launder		47.03	1.93	
Water Elevation in Drop Box		46.90	3.95	
<b>Effluent Jct Structures</b>				
Top of Jct MH	Hyd Prof, Brown & Caldwell, 2001	53.64		
Water Elevation in MH		48.88	6.76	
Top of Jct Box No. 1	Hyd Prof, Brown & Caldwell, 2001	45.89		
Water Elevation in Box		46.84		
Top of Jct Box No. 2	Hyd Profile, Carollo Engineers, 2007	54.86		
Water Elevation in Box		46.83		
<b>EAST TREATMENT TRAIN</b>				
<b>Influent Distribution Box</b>				



PROJECT : Therasa St WWTP, Lincoln, NE  
 Elevation Summary

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## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
Flow to East Train		13.32			
Top of Structure	Client Sketch		58.86		
Water Surface Elevation upstream of PC No. 5 Weir			53.90	4.96	
Water Surface Elevation upstream of PC No. 6 Weir			53.90	4.96	
<b>Primary Clarifier No. 5</b>					
Flow		6.66			
Top of Basin Elevation	Client Sketch		55.16		
Water Surface in Primary Clarifier No. 5			53.76	1.40	
V-Notch Weir Elevation			53.66		0.09
Water Surface Elevation in Effluent Drop Box			51.32	2.35	
<b>Primary Clarifier No. 6</b>					
Flow		6.66			
Top of Basin Elevation	Client Sketch		55.22		
Water Surface in Primary Clarifier No. 6			53.76	1.46	
V-Notch Weir Elevation			53.66		0.09
Water Surface Elevation in Effluent Drop Box			51.32	2.35	
<b>Aeration Basin No. 3</b>					
Flow (Primary Clarifier Effluent + RAS)		6.66			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.17	5.05	FREE FALLING
Weir Elevation #1			50.71		
Water Surface Upstream of Weir #2			50.67	5.55	SUBMERGED
Weir Elevation #2			50.07		
Water Surface Upstream of Weir #3			50.52	5.70	SUBMERGED
Weir Elevation #3			49.72		
Water Surface Elevation upstream of discharge			50.46	5.76	
Discharge Weir Elevation			50.00		0.46
Water Surface in AB Effluent Channel			48.40	1.60	
<b>Aeration Basin No. 4</b>					
Flow (Primary Clarifier Effluent + RAS)		6.66			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.17	5.05	FREE FALLING
Weir Elevation #1			50.71		
Water Surface Upstream of Weir #2			50.67	5.55	SUBMERGED
Weir Elevation #2			50.07		
Water Surface Upstream of Weir #3			50.52	5.70	SUBMERGED
Weir Elevation #3			49.72		
Water Surface Elevation upstream of discharge			50.46	5.76	
Discharge Weir Elevation			50.00		0.46
Water Surface in AB Effluent Channel			48.41	1.59	
<b>Final Clarifier No. 3</b>					
Flow (Clarifier Effluent)		6.66			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.71	1.60	
Invert of "V" Notch Weir Elevation			47.59		0.12
Water Surface in Effluent Launder			46.84	0.75	
Water Elevation in Drop Box			46.64	2.67	
<b>Final Clarifier No. 4</b>					
Flow (Clarifier Effluent)		6.66			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.72	1.59	
Invert of "V" Notch Weir Elevation			47.60		0.12
Water Surface in Effluent Launder			46.84	0.76	
Water Elevation in Drop Box			46.64	2.67	
<b>DISINFECTION</b>					
<b>Disinfection Control Structure No. 1</b>					
Flow to Control Structure		22.68			
Top of Structure	Client Sketch		47.89		
Water Surface Elevation upstream of UV Disinfection			46.50	1.39	
Water Surface Upstream of CL2 Weirs			46.50	1.39	
CL2 Influent Weir Elevation			46.50		0.00
Water Surface Elevation upstream of Disinfection Bypass			44.18	3.71	
<b>UV Disinfection</b>					
Flow		36.00			
Top of Channel Elevation	Dwg P-2, Jacobson Helgoth, 2007		47.93		
Water Surface over UV Lamps			46.03	1.90	
Discharge Weir Elevation			44.90		1.13
Water Surface Elevation in Effluent Channel			44.42	0.48	
<b>CL2 Disinfection</b>					
Flow		0.00			
Top of Basin Elevation	Dwg C-7, Jacobson Helgoth, 2007		47.93		
Water Surface in CL2 Basin			#NUM!	#NUM!	
Discharge Weir Elevation	Dwg C-5, Jacobson Helgoth, 2007		44.09		#NUM!



PROJECT : Therasa St WWTP, Lincoln, NE  
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 DATE : 39317.00

**Summary**

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Time
Water Surface Elevation in Effluent Channel			44.14	(0.05)	
<u>Control Structure No. 2</u>					
Flow to Control Structure		36.00			
Flow (Bypass of Disinfection)		0.00			
Top of Structure			47.90		
Water Surface Elevation in CS No. 2			44.14	3.76	
Top of Channel	Client Sketch		47.90		
Bottom of Effluent Channel	Client Sketch		23.55		
Water Surface Elevation in Effluent Channel			44.14	3.76	
Salt Creek Water Level			44.10	(20.55)	



PROJECT : Theresa St WWTP, Lincoln, NE  
Hydraulic Profile

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## Flow Input Sheet

### MODEL INPUT PARAMETERS

Max Month Average Dsy Flow MMAD 36 mgd  
Peaking Factor 3.1  
Peak Flow Peak 110 mgd

Flow Evaluated: MMAD Flow **36 mgd**  
Creek Elevation **44.60**  
RAS as Percentage of Influent Flow RAS 100%

FLWS/PARAMETERS	INPUT	VALUE	LABEL	TOTAL FLOW	NOTES
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Elevations from Brown & Caldwell, and Jacobson Helgoth Dwg's were corrected by subtracting 0.11 from the given elevation.

#### Plant Influent

Total Influent Flow to Grit Basins 36.00 mgd

#### Headworks Facility

Flow thru Grit Basin No. 1	100%	36.0 mgd	Grit_1		
Flow thru Grit Basin No. 2	0%	0.0 mgd	Grit_2		
Flow in Distribution Box No. 1			Dist_1	36.0 mgd	

#### Influent Flow Distribution

Balance Influent Weir Elevations to achieve same WSE upstream in Flow Dist'n Structure

Influent Weir No. 1 Elevation	82.97	ft	Infl_Weir		63.67
Flow to PC No. 1	21.0%	7.56 mgd	PC1_Infl		
Influent Weir No. 2 Elevation	82.68	ft	Infl2_Weir		63.67
Flow to PC No. 3	21.0%	7.56 mgd	PC3_Infl		
Influent Weir No. 3 Elevation	82.68	ft	Infl3_Weir		63.67
Flow to PC No. 4	21.0%	7.56 mgd	PC4_Infl		
Influent Weir No. 4 Elevation	83.03	ft	East_Weir		63.67
Flow to East Train	37.0%	13.32 mgd	East		

### CENTRAL AND WEST TRAIN PRIMARY CLARIFICATION

#### Primary Clarification

PC No. 1 V-notch Weir Elev	56.99	ft	PC1_Weir		Dwg 00D801, Nitrification Improv, HDR, 2004; V-T
PC No. 1 Effluent		7.56 mgd			
PC No. 3 V-notch Weir Elev	57.17	ft	PC3_Weir		Weir El. From Hyd Pro, Brown&Caldwell, 2001; V-
PC No. 3 Effluent		7.56 mgd			
PC No. 4 V-notch Weir Elev	57.17	ft	PC4_Weir		Weir El. From Hyd Pro, Brown&Caldwell, 2001; V-
PC No. 4 Effluent		7.56 mgd			

Maya Scott:  
Gate Range: 55.12 - 51.49

### CENTRAL TRAIN

Flow to Central Train 48.2% Central 17.352 mgd

#### Influent Distribution

Balance weir elevations to achieve same WSE in Flow Dist'n Structure; must match with weirs upstream of Central Aeration Basin

Flow to East AB	50%	8.68 mgd	C_EastAB		
East AB Influent Weir Elev	53.74	ft	C_AB_Weir	54.61	Client Provided
East AB Anoxic Weir	52.61	ft	Anox_5		
Flow to West AB	50%	8.68 mgd	C_WestAB		
West AB Influent Weir Elev	53.74	ft	C_AB_Weir2	54.61	Client Provided
West AB Anoxic Weir	52.61	ft	Anox_6		

Total Central AB Influent Central\_AB 17.35 mgd

#### Aeration Basin Effluent (Influent + RAS)

34.70 mgd Central\_ML

#### Final Clarifier Influent (Mixed Liquor)

Balance weir elevations to achieve same WSE in AB Effluent Box

FC No. 5 Influent Weir	52.31	ft	FC5_Infl_weir	52.97	Client Provided
Final Clarifier No. 5	50%	17.35 mgd	FC5_Infl		
FC No. 6 Influent Weir	52.32	ft	FC6_Infl_Weir	52.98	Client Provided
Final Clarifier No. 6	50%	17.35 mgd	FC6_Infl		
Total Final Clarifier Influent Flow			C_FC_Tot	34.70 mgd	

#### Final Clarifier Effluent (Clarifier Infl - RAS)

Clarifier No. 5 V-Notch Weir Elevation	50.10	ft	FC5_Weir		Based on Client sketch; V-Notches are 2.5' deep
Final Clarifier No. 5	50%	8.68 mgd	FC5_Eff		
Clarifier No. 6 V-Notch Weir Elevation	50.11	ft	FC6_Weir		Based on Client sketch; V-Notches are 2.5' deep
Final Clarifier No. 6	50%	8.68 mgd	FC6_Eff		
Combined Final Clarifier Effluent Flow			C_FCE_Tot	17.35 mgd	

### WEST TRAIN

Flow to West Train 14.8% West 5.328 mgd

#### Influent Distribution

Balance weir elevations to achieve same WSE in Flow Dist'n Structure; must match with weirs upstream of Central Aeration Basin

Flow to East AB	50%	2.66 mgd	W_EastAB		
West AB #1 Influent Weir Elev	54.15	ft	W_AB_Weir	54.61	
Flow to West AB	50%	2.66 mgd	W_WestAB		
East AB #2 Influent Weir Elev	54.15	ft	W_AB_Weir2	54.61	

#### Aeration Basin Influent

Weir Elevations are same for both basins

Weir Elevation #1	52.82	ft	WAB_1		Client Provided
Weir Elevation #2	52.85	ft	WAB_2		Client Provided
Weir Elevation #3	52.88	ft	WAB_3		Client Provided
Weir Elevation #4	52.12	ft	WAB_4		Client Provided

#### Aeration Basin Effluent (Influent + RAS)

10.66 mgd West\_ML

Effluent Weir	52.83	ft	WAB_Weir		Client Sketch
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#### Final Clarifier Influent (Mixed Liquor)

Final Clarifier No. 1	50%	5.328 mgd	FC1_Infl		
Final Clarifier No. 2	50%	5.328 mgd	FC2_Infl		
Total Final Clarifier Influent Flow				10.656 mgd	

#### Final Clarifier Effluent (Clarifier Infl - RAS)

Clarifier No. 1 V-Notch Weir Elevation	48.95	ft	FC1_Weir		Client Sketch; 2.5' deep notches
Final Clarifier No. 1	50%	2.66 mgd	FC1_Eff		
Clarifier No. 2 V-Notch Weir Elevation	48.98	ft	FC2_Weir		Client Sketch; 2.5' deep notches
Final Clarifier No. 2	50%	2.66 mgd	FC2_Eff		
Combined Final Clarifier Effluent Flow			W_FCE_Tot	5.33 mgd	



PROJECT : Theresa St WWTP, Lincoln, NE  
 Hydraulic Profile

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## Flow Input Sheet

### MODEL INPUT PARAMETERS

EAST TRAIN					
Flow to East Train	37%				
<b>Primary Clarification</b>					
Flow to PC No. 5		6.66 mgd	PCS_Inf		
PC No. 5 V-notch Weir Elev	53.66 ft		PCS_Weir		Client Sketch; V-Notch is 2' deep
Flow to PC No. 6		6.66 mgd	PC6_Inf		
PC No. 6 V-notch Weir Elev	53.66 ft		PC6_Weir		Client Sketch; V-Notch is 2' deep
PC No. 5 Effluent Flow		6.66 mgd	PCS_Eff		
PC No. 6 Effluent Flow		6.66 mgd	PC6_Eff		
<b>Aeration Basin Influent</b>					
Flow to East AB		6.66 mgd	PCS_Eff		
Flow to West AB		6.66 mgd	PC6_Eff		
<i>Weir Elevations are same for both basins</i>					
Weir Elevation #1	50.71 ft		EAB_1		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #2	50.07 ft		EAB_2		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #3	49.72 ft		EAB_3		Dwg S311, Brown&Caldwell, 2005
Total East AB Influent			East_AB	13.32 mgd	
<b>Aeration Basin Effluent (Influent + RAS)</b>					
Effluent Weir Elevation	50.00 ft	26.04 mgd	East_ML		
			East_AB_Weir		Client provided
<b>Final Clarifier Influent (Mixed Liquor)</b>					
Final Clarifier No. 3	50%	13.32 mgd	FC3_Inf		
Final Clarifier No. 4	50%	13.32 mgd	FC4_Inf		
Total Final Clarifier Influent Flow			E_FC_Tot	26.64 mgd	
<b>Final Clarifier Effluent (Clarifier Inf - RAS)</b>					
Clarifier No. 3 V-Notch Weir Elevation	47.59 ft		FC3_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 3	50%	6.66 mgd	FC3_Eff		
Clarifier No. 4 V-notch Weir Elevation	47.60 ft		FC4_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 4	50%	6.66 mgd	FC4_Eff		
Combined Final Clarifier Effluent Flow			E_FCE_Tot	13.32 mgd	

EFFLUENT STRUCTURES					
<b>Control Structures</b>					
Control Structure No. 1 TOW	47.89 ft		CS_1		Client Sketch
Control Structure No. 2 TOW	47.90 ft		CS_2		Client Sketch
Weir Elevation to CL2 Basin	47.48 ft		CS_Weir		WSE must match with WSE upstream of UV Weir
Flow to UV Disinfection		36 mgd	UV	46.03	
Flow to CL2 Disinfection		0 mgd	CL	47.48	
Bypass Disinfection	0%	0 mgd	FCE		
<b>Chlorine Disinfection</b>					
No. of CL2 Channels in Operation	2		CL_Ch		
CL2 Basin Effluent Weir Elevation	44.09 ft		CL_Weir		Dwg C-5, Jacobson Helgoth, 2007
<b>UV Disinfection</b>					
UV Effluent Weir	44.90 ft		UV_Weir		Weir elevation must maintain WSE of 46.03 (46.1)
WSE over UV Lamps				46.03	
Plant Effluent Channel			FE_Flow	36.00 mgd	
Salt Creek Elevation			River	44.80 ft	

Mays Scott  
 Gate Range: 1147.37 - 1144.37 (47.48 - 44.48)

Mays Scott  
 Gate Range: 47.93 - 42.26 (1148.04 - 1142.37)



PROJECT : Therasa St WWTP, Lincoln, NE  
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## Summary

Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
<b>**ELEVATION VALUES IN BLUE ARE COMMON HYDRAULIC POINTS. MAKE SURE THESE VALUES MATCH**</b>				
<b>**INTERNAL AERATION BASIN WEIRS SHOULD BE SUBMERGED UNDER ALL CONDITIONS**</b>				
<b>Plant Flow</b>	<b>36 mgd</b>			
<b>Creek Elevation</b>	<b>44.6</b>			
<u>Influent Headworks Structure</u>				
Total Influent Flow	36.00			
Top of Influent Channel Elevation	Hyd Prof, B&V/QA, 2002	66.75		
Water Elevation In Influent Channel		63.79	2.96	
Top of Vortex Grit Chamber Elevation	Hyd Prof, B&V/QA, 2002	62.50		
Water Elevation in Vortex Grit Chamber		63.79	(1.29)	
<u>Flow Distribution Structure</u>				
TO EAST TREATMENT TRAIN				
Flow, mgd	13.32			
Weir Elevation	Hyd Prof, B&V/OA, 2002	63.03		
Water Surface Elevation Upstream of Weir		63.67		0.64
Water Surface Elevation Downstream of Weir		54.21	8.82	
TO PRIMARY CLARIFIER NO. 1 (CENTRAL/WEST TRMT TRAIN)				
Flow, mgd	7.56			
Weir Elevation	Hyd Prof, B&V/OA, 2002	62.97		
Water Surface Elevation Upstream of Weir		63.67		0.70
Water Surface Elevation Downstream of Weir		57.29	5.68	
TO PRIMARY CLARIFIER NO. 3 (CENTRAL/WEST TRMT TRAIN)				
Flow, mgd	7.56			
Weir Elevation	Hyd Prof, B&V/OA, 2002	62.56		
Water Surface Elevation Upstream of Weir		63.67		1.11
Water Surface Elevation Downstream of Weir		57.58	4.98	
TO PRIMARY CLARIFIER NO. 4 (CENTRAL/WEST TRMT TRAIN)				
Flow, mgd	7.56			
Weir Elevation	Hyd Prof, B&V/OA, 2002	62.56		
Water Surface Elevation Upstream of Weir		63.67		1.11
Water Surface Elevation Downstream of Weir		57.64	4.92	
<u>CENTRAL/WEST PRIMARY TREATMENT</u>				
<u>Primary Clarification</u>				
Primary Clarifier No. 1 Flow				
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	58.39		
Water Surface in Primary Clarifier No. 1		57.13	1.26	
V-Notch Weir Elevation		56.99		0.14
Water Surface Elevation in Effluent Drop Box		54.66		
Primary Clarifier No. 3 Flow				
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	58.39		
Water Surface in Primary Clarifier No. 2		57.35	1.04	
V-Notch Weir Elevation		57.17		0.19
Water Surface Elevation in Effluent Drop Box		54.76		
Primary Clarifier No. 4 Flow				
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	58.39		
Water Surface in Primary Clarifier No. 3		57.35	1.04	
V-Notch Weir Elevation		57.17		0.19
Water Surface Elevation in Effluent Drop Box		54.72		
<u>Influent Distribution Structure</u>				
Primary Clarifiers Nos. 1, 2 & 3 Flow	22.68			
Top of Distribution Box Structure	Client Sketch	57.12		
Water Surface in Distribution Box (upstream of Central Train Weir)		54.61	2.51	
Weir Elevation		53.74		0.87
Water Surface in Distribution Box (upstream of Weir to AB No. 1)		54.61	2.51	
Weir Elevation		54.15		0.46
Water Surface in Distribution Box (upstream of Weir to AB No. 2)		54.61	2.51	
Weir Elevation		54.15		0.46
Water Surface Downstream of Central AB Influent Weir		53.19	0.55	
Water Surface Downstream West AB No. 1 Inlet Weir		53.44	0.71	
Water Surface Downstream West AB No. 2 Inlet Weir		53.44	0.71	
<u>CENTRAL TREATMENT TRAIN</u>				
<u>Aeration Basins</u>				
Flow (Primary Clarifier Effluent + RAS)	34.70			
Top of Structure	Client Sketch	55.00		
Anoxic Weir Elevation		52.61		SUBMERGED
Water Surface Elevation in Aeration Basin		52.98	2.02	
Water Surface in AB Effluent Channel		52.98	2.02	
Discharge Weir Elevation to Final Clarifier No. 5		52.31		0.67
Water Surface Elevation Downstream of FC No. 5 Influent Weir		50.53	1.78	
Water Surface Elevation Downstream of FC No. 6 Influent Weir		50.54	1.77	



PROJECT : Therasa St WWTP, Lincoln, NE  
 Elevation Summary

JOB # : 7498A00

REVISION: Preliminary

CHECKED :  
 DATE :

BY : M. Scott  
 DATE : 39317.00

**Summary**

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
<b>Final Clarifier No. 5</b>					
Flow (Clarifier Effluent)	Client Sketch	8.68	52.24	2.00	0.14
Top of Structure			50.24		
Water Surface Elevation			50.10		
Invert of "V" Notch Weir Elevation			49.63		
Water Surface in Effluent Launder			47.54		
Water Elevation in Drop Box			47.54		
<b>Final Clarifier No. 6</b>					
Flow (Clarifier Effluent)	Client Sketch	8.68	52.17	1.92	0.14
Top of Structure			50.25		
Water Surface Elevation			50.11		
Invert of "V" Notch Weir Elevation			49.12		
Water Surface in Effluent Launder			47.57		
Water Elevation in Drop Box			47.57		
<b>Effluent Box</b>					
Top of Structure	Client Sketch		52.00	4.46	
Water Elevation in Box			47.54		
<b>WEST TREATMENT TRAIN</b>					
<b>Aeration Basin No. 1</b>					
Flow (Primary Clarifier Effluent + RAS)	Client Sketch	2.66	54.81	2.80	SUBMERGED
Top of Structure			53.42		
Water Surface Upstream of Weir #1			52.82		
Internal Weir Elevation #1			53.33		
Water Surface Upstream of Weir #2			52.85		
Internal Weir Elevation #2			53.17		
Water Surface Upstream of Weir #3			52.58		
Internal Weir Elevation #3			53.09		
Water Surface Upstream of Weir #4			52.12		
Internal Weir Elevation #4			53.07		
Water Surface Elevation upstream of discharge			52.83		
Discharge Weir Elevation			49.29		
Water Surface in AB Effluent Channel			49.29		
<b>Aeration Basin No. 2</b>					
Flow (Primary Clarifier Effluent + RAS)	Client Sketch	2.66	54.81	2.80	SUBMERGED
Top of Structure			53.42		
Water Surface Upstream of Weir #1			52.82		
Internal Weir Elevation #1			53.33		
Water Surface Upstream of Weir #2			52.85		
Internal Weir Elevation #2			53.17		
Water Surface Upstream of Weir #3			52.58		
Internal Weir Elevation #3			53.09		
Water Surface Upstream of Weir #4			52.12		
Internal Weir Elevation #4			53.07		
Water Surface Elevation upstream of discharge			52.83		
Discharge Weir Elevation			49.26		
Water Surface in AB Effluent Channel			49.26		
<b>Final Clarifier No. 1</b>					
Flow (Clarifier Effluent)	Client Sketch	2.66	50.77	1.73	0.09
Top of Structure			49.04		
Water Surface Elevation			48.95		
Invert of "V" Notch Weir Elevation			47.91		
Water Surface in Effluent Launder			47.88		
Water Elevation in Drop Box			47.88		
<b>Final Clarifier No. 2</b>					
Flow (Clarifier Effluent)	Client Sketch	2.66	50.85	1.80	0.09
Top of Structure			49.05		
Water Surface Elevation			48.96		
Invert of "V" Notch Weir Elevation			47.90		
Water Surface in Effluent Launder			47.88		
Water Elevation in Drop Box			47.88		
<b>Effluent Jct Structures</b>					
Top of Jct MH	Hyd Prof, Brown & Caldwell, 2001		53.64	5.78	
Water Elevation in MH			47.86		
Top of Jct Box No. 1	Hyd Prof, Brown & Caldwell, 2001		45.89		
Water Elevation in Box			47.82		
Top of Jct Box No. 2	Hyd Profile, Carollo Engineers, 2007		54.88		
Water Elevation in Box			47.81		

**EAST TREATMENT TRAIN**

**Influent Distribution Box**



PROJECT : Therasa St WWTP, Lincoln, NE  
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**Summary**

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Flume
Flow to East Train		13.32			
Top of Structure	Client Sketch		58.86		
Water Surface Elevation upstream of PC No. 5 Weir			53.90	4.96	
Water Surface Elevation upstream of PC No. 6 Weir			53.90	4.96	
<b>Primary Clarifier No. 5</b>					
Flow		6.66			
Top of Basin Elevation	Client Sketch		55.16		
Water Surface in Primary Clarifier No. 5			53.76	1.40	
V-Notch Weir Elevation			53.66		0.09
Water Surface Elevation in Effluent Drop Box			51.32	2.35	
<b>Primary Clarifier No. 6</b>					
Flow		6.66			
Top of Basin Elevation	Client Sketch		55.22		
Water Surface in Primary Clarifier No. 6			53.76	1.46	
V-Notch Weir Elevation			53.66		0.09
Water Surface Elevation in Effluent Drop Box			51.32	2.35	
<b>Aeration Basin No. 3</b>					
Flow (Primary Clarifier Effluent + RAS)		6.66			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.17	5.05	FREE FALLING
Weir Elevation #1			50.71		
Water Surface Upstream of Weir #2			50.67	5.55	SUBMERGED
Weir Elevation #2			50.07		
Water Surface Upstream of Weir #3			50.52	5.70	SUBMERGED
Weir Elevation #3			49.72		#NUM!
Water Surface Elevation upstream of discharge			50.46	5.76	
Discharge Weir Elevation			50.00		0.46
Water Surface in AB Effluent Channel			#NUM!	#NUM!	
<b>Aeration Basin No. 4</b>					
Flow (Primary Clarifier Effluent + RAS)		6.66			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.17	5.05	FREE FALLING
Weir Elevation #1			50.71		
Water Surface Upstream of Weir #2			50.67	5.55	SUBMERGED
Weir Elevation #2			50.07		
Water Surface Upstream of Weir #3			50.52	5.70	SUBMERGED
Weir Elevation #3			49.72		
Water Surface Elevation upstream of discharge			50.46	5.76	
Discharge Weir Elevation			50.00		0.46
Water Surface in AB Effluent Channel			48.38	1.62	
<b>Final Clarifier No. 3</b>					
Flow (Clarifier Effluent)		6.66			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			#NUM!	#NUM!	#NUM!
Invert of "V" Notch Weir Elevation			47.59		
Water Surface in Effluent Launder			47.69	(0.10)	
Water Elevation in Drop Box			47.62	1.69	
<b>Final Clarifier No. 4</b>					
Flow (Clarifier Effluent)		6.66			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.69	1.62	
Invert of "V" Notch Weir Elevation			47.60		0.09
Water Surface in Effluent Launder			47.69	(0.09)	
Water Elevation in Drop Box			47.62	1.69	
<b>DISINFECTION</b>					
<b>Disinfection Control Structure No. 1</b>					
Flow to Control Structure		22.68			
Top of Structure	Client Sketch		47.89		
Water Surface Elevation upstream of UV Disinfection			46.50	1.39	
Water Surface Upstream of CL2 Weirs			47.48	0.41	
CL2 Influent Weir Elevation			47.48		0.00
Water Surface Elevation upstream of Disinfection Bypass			44.67	3.22	
<b>UV Disinfection</b>					
Flow		36.00			
Top of Channel Elevation	Dwg P-2, Jacobson Helgoth, 2007		47.93		
Water Surface over UV Lamps			46.03	1.90	
Discharge Weir Elevation			44.90		1.13
Water Surface Elevation In Effluent Channel			44.90	(0.00)	
<b>CL2 Disinfection</b>					
Flow		0.00			
Top of Basin Elevation	Dwg C-7, Jacobson Helgoth, 2007		47.93		
Water Surface in CL2 Basin			44.64	3.29	
Discharge Weir Elevation	Dwg C-5, Jacobson Helgoth, 2007		44.09		0.55



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 DATE : 3/9/17.00

## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
Water Surface Elevation in Effluent Channel			44.64	(0.55)	
<u>Control Structure No. 2</u>					
Flow to Control Structure		36.00			
Flow (Bypass of Disinfection)		0.00			
Top of Structure			47.90		
Water Surface Elevation in CS No. 2			44.64		
Top of Channel	Client Sketch		47.90		3.26
Bottom of Effluent Channel	Client Sketch		23.55		
Water Surface Elevation in Effluent Channel			44.63		3.27
Salt Creek Water Level			44.60	(21.05)	



PROJECT : Theresa St WWTP, Lincoln, NE  
Hydraulic Profile

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DATE : 8/20/2007

## Flow Input Sheet

### MODEL INPUT PARAMETERS

Max Month Average Day Flow MAAD  mgd  
Peaking Factor   
Peak Flow  mgd

Flow Evaluated:  Flow  mgd

Creek Elevation   
RAS

RAS as Percentage of Influent Flow

**FLWS/PARAMETERS INPUT VALUE LABEL TOTAL FLOW NOTES**  
Elevations from Brown & Caldwell, and Jacobson Helgoth Dwg's were corrected by subtracting 0.11 from the given elevation.

#### Plant Inflow

Total Influent Flow to Grit Basins 65.00 mgd

#### Headworks Facility

Flow thru Grit Basin No. 1  32.5 mgd Grit\_1  
Flow thru Grit Basin No. 2  32.5 mgd Grit\_2  
Flow In Distribution Box No. 1 Dist\_1 65.0 mgd

#### Influent Flow Distribution

Balance Influent Weir Elevations to achieve same WSE upstream in Flow Dist'n Structure

Influent Weir No. 1 Elevation  ft 13.65 mgd In1\_Weir 64.43  
Flow to PC No. 1 PC1\_Inf  
Influent Weir No. 2 Elevation  ft 13.65 mgd In3\_Weir 64.43  
Flow to PC No. 3 PC3\_Inf  
Influent Weir No. 3 Elevation  ft 13.65 mgd In4\_Weir 64.43  
Flow to PC No. 4 PC4\_Inf  
Influent Weir No. 4 Elevation  ft 13.65 mgd East\_Weir 64.43  
Flow to East Train 37.0%

### CENTRAL AND WEST TRAIN PRIMARY CLARIFICATION

#### Primary Clarification

PC No. 1 V-notch Weir Elev  ft 13.65 mgd PC1\_Weir Dwg 00D801, Nitrification Improv, HDR, 2004; V-T  
PC No. 1 Effluent 13.65 mgd  
PC No. 3 V-notch Weir Elev  ft 13.65 mgd PC3\_Weir Weir El. From Hyd Pro, Brown&Caldwell, 2001, V-  
PC No. 3 Effluent 13.65 mgd PC4\_Weir Weir El. From Hyd Pro, Brown&Caldwell, 2001, V-  
PC No. 4 V-notch Weir Elev  ft 13.65 mgd  
PC No. 4 Effluent

Maya Scott: Gate Range: 55.13 - 51.49 C\_W\_Inf 40.95 mgd

### CENTRAL TRAIN

Flow to Central Train  Central 31.33 mgd

#### Influent Distribution

Balance weir elevations to achieve same WSE in Flow Dist'n Structure; must match with weirs upstream of Central Aeration Basin

Flow to East AB  15.67 mgd C\_EastAB  
East AB Influent Weir Elev  ft C\_AB\_Weir 55.02 Client Provided  
East AB Anoxic Weir  ft Anox\_5  
Flow to West AB  15.67 mgd C\_WestAB  
West AB Influent Weir Elev  ft C\_AB\_Weir2 55.02 Client Provided  
West AB Anoxic Weir  ft Anox\_6

Total Central AB Influent Central\_AB 31.33 mgd

#### Aeration Basin Effluent (Influent + RAS)

62.66 mgd Central\_ML

#### Final Clarifier Influent (Mixed Liquor)

Balance weir elevations to achieve same WSE in AB Effluent Box

FC No. 5 Influent Weir  ft 31.33 mgd FC5\_Inf\_Weir 53.29 Client Provided  
Final Clarifier No. 5  31.33 mgd FC5\_Inf  
FC No. 6 Influent Weir  ft 31.33 mgd FC6\_Inf\_Weir 53.30 Client Provided  
Final Clarifier No. 6  31.33 mgd FC6\_Inf  
Total Final Clarifier Influent Flow C\_FC\_Tot 62.66 mgd

#### Final Clarifier Effluent (Clarifier Inf - RAS)

Clarifier No. 5 V-Notch Weir Elevation  ft 15.67 mgd FC5\_Weir Based on Client sketch; V-Notches are 2.5" deep  
Final Clarifier No. 5  15.67 mgd FC5\_Eff  
Clarifier No. 6 V-notch Weir Elevation  ft 15.67 mgd FC6\_Weir Based on Client sketch; V-Notches are 2.5" deep  
Final Clarifier No. 6  15.67 mgd FC6\_Eff  
Combined Final Clarifier Effluent Flow C\_FCE\_Tot 31.33 mgd

### WEST TRAIN

Flow to West Train  West 9.62 mgd

#### Influent Distribution

Balance weir elevations to achieve same WSE in Flow Dist'n Structure; must match with weirs upstream of Central Aeration Basin

Flow to East AB  4.81 mgd W\_EastAB  
West AB #1 Influent Weir Elev  ft W\_AB\_Weir 55.02  
Flow to West AB  4.81 mgd W\_WestAB  
East AB #2 Influent Weir Elev  ft W\_AB\_Weir2 55.02

#### Aeration Basin Influent

West\_AB 9.62 mgd

#### Weir Elevations are same for both basins

Weir Elevation #1  ft WAB\_1 Client Provided  
Weir Elevation #2  ft WAB\_2 Client Provided  
Weir Elevation #3  ft WAB\_3 Client Provided  
Weir Elevation #4  ft WAB\_4 Client Provided

#### Aeration Basin Effluent (Influent + RAS)

19.24 mgd West\_ML

#### Effluent Weir

WAB\_Weir Client Sketch

#### Final Clarifier Influent (Mixed Liquor)

Final Clarifier No. 1  9.62 mgd FC1\_Inf 19.24 mgd  
Final Clarifier No. 2  9.62 mgd FC2\_Inf

#### Final Clarifier Effluent (Clarifier Inf - RAS)

Clarifier No. 1 V-Notch Weir Elevation  ft 4.81 mgd FC1\_Weir Client Sketch; 2.5" deep notches  
Final Clarifier No. 1  4.81 mgd FC1\_Eff  
Clarifier No. 2 V-notch Weir Elevation  ft 4.81 mgd FC2\_Weir Client Sketch; 2.5" deep notches  
Final Clarifier No. 2  4.81 mgd FC2\_Eff  
Combined Final Clarifier Effluent Flow W\_FCE\_Tot 9.62 mgd



PROJECT : Theresa St WWTP, Lincoln, NE  
Hydraulic Profile

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## Flow Input Sheet

### MODEL INPUT PARAMETERS

#### EAST TRAIN

Flow to East Train	37%				
<b>Primary Clarification</b>					
Flow to PC No. 5		12.03 mgd	PC5_Inf		
PC No. 5 V-notch Weir Elev	53.66 ft		PC5_Weir		Client Sketch; V-Notch is 2' deep
Flow to PC No.6		12.03 mgd	PC6_Inf		
PC No. 6 V-notch Weir Elev	53.66 ft		PC6_Weir		Client Sketch; V-Notch is 2' deep
PC No. 5 Effluent Flow		12.03 mgd	PC5_Eff		
PC No. 6 Effluent Flow		12.03 mgd	PC6_Eff		
<b>Aeration Basin Influent</b>					
Flow to East AB		12.03 mgd	PC5_Eff		
Flow to West AB		12.03 mgd	PC6_Eff		
<i>Weir Elevations are same for both basins</i>					
Weir Elevation #1	50.71 ft		EAB_1		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #2	50.07 ft		EAB_2		Dwg S311, Brown&Caldwell, 2005
Weir Elevation #3	49.72 ft		EAB_3		Dwg S311, Brown&Caldwell, 2005
Total East AB Influent			East_AB	24.05 mgd	
<b>Aeration Basin Effluent (Influent + RAS)</b>					
Effluent Weir Elevation	50.00 ft	48.10 mgd	East_ML		Client provided
			East_AB_Weir		
<b>Final Clarifier Influent (Mixed Liquor)</b>					
Final Clarifier No. 3	50%	24.05 mgd	FC3_Inf		
Final Clarifier No. 4	50%	24.05 mgd	FC4_Inf		
Total Final Clarifier Influent Flow			E_FC_Tot	48.10 mgd	
<b>Final Clarifier Effluent (Clarifier Inf - RAS)</b>					
Clarifier No. 3 V-Notch Weir Elevation	47.59 ft		FC3_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 3	50%	12.03 mgd	FC3_Eff		
Clarifier No. 4 V-notch Weir Elevation	47.60 ft		FC4_Weir		Client Sketch; V-Notch is 2.5' deep
Final Clarifier No. 4	50%	12.03 mgd	FC4_Eff		
Combined Final Clarifier Effluent Flow			E_FC_Tot	24.05 mgd	

#### EFFLUENT STRUCTURES

<b>Control Structures</b>					
Control Structure No. 1 TOW	47.89 ft		CS_1		Client Sketch
Control Structure No. 2 TOW	47.90 ft		CS_2		Client Sketch
Weir Elevation to CL2 Basin	45.67 ft		CS_Weir		WSE must match with WSE upstream of UV Weir
Flow to UV Disinfection		36 mgd	UV	46.50	
Flow to Cl2 Disinfection		29 mgd	CL	46.60	
Bypass Disinfection	0%	0 mgd	FCE		
<b>Chlorine Disinfection</b>					
No. of Cl2 Channels in Operation	2		CL_Ch		
Cl2 Basin Effluent Weir Elevation	44.09 ft		CL_Weir		Dwg C-5, Jacobson Helgoth, 2007
<b>UV Disinfection</b>					
UV Effluent Weir	44.75 ft		UV_Weir		Weir elevation must maintain WSE of 46.03 (46.1)
WSE over UV Lamps				46.03	
Plant Effluent Channel			FE_Flow	65.00 mgd	
Salt Creek Elevation			River	45.00 ft	

Maya Scott  
Gate Range: 1147.37 - 1144.37 (47.48 - 44.48)

Maya Scott  
Gate Range: 47.53 - 42.26 (1149.04 - 1142.37)



PROJECT : Therasa St WWTP, Lincoln, NE  
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## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Flume
<b>**ELEVATION VALUES IN BLUE ARE COMMON HYDRAULIC POINTS. MAKE SURE THESE VALUES MATCH**</b>					
<b>**INTERNAL AERATION BASIN WEIRS SHOULD BE SUBMERGED UNDER ALL CONDITIONS**</b>					
<b>Plant Flow</b>		<b>65 mgd</b>			
<b>Creek Elevation</b>		<b>45</b>			
<u>Influent Headworks Structure</u>					
Total Influent Flow		65.00			
Top of Influent Channel Elevation	Hyd Prof, B&V/QA, 2002		66.75		
Water Elevation In Influent Channel			64.64	2.11	
Top of Vortex Grit Chamber Elevation	Hyd Prof, B&V/QA, 2002		62.50		
Water Elevation in Vortex Grit Chamber			64.64	(2.14)	
<u>Flow Distribution Structure</u>					
TO EAST TREATMENT TRAIN					
Flow, mgd		24.05			
Weir Elevation	Hyd Prof, B&V/OA, 2002		63.48		
Water Surface Elevation Upstream of Weir			64.43		0.95
Water Surface Elevation Downstream of Weir			55.20	8.28	
TO PRIMARY CLARIFIER NO. 1 (CENTRAL/WEST TRMT TRAIN)					
Flow, mgd		13.65			
Weir Elevation	Hyd Prof, B&V/OA, 2002		63.39		
Water Surface Elevation Upstream of Weir			64.43		1.04
Water Surface Elevation Downstream of Weir			57.67	5.72	
TO PRIMARY CLARIFIER NO. 3 (CENTRAL/WEST TRMT TRAIN)					
Flow, mgd		13.65			
Weir Elevation	Hyd Prof, B&V/OA, 2002		62.78		
Water Surface Elevation Upstream of Weir			64.43		1.65
Water Surface Elevation Downstream of Weir			58.13	4.65	
TO PRIMARY CLARIFIER NO. 4 (CENTRAL/WEST TRMT TRAIN)					
Flow, mgd		13.65			
Weir Elevation	Hyd Prof, B&V/OA, 2002		62.79		
Water Surface Elevation Upstream of Weir			64.43		1.65
Water Surface Elevation Downstream of Weir			58.31	4.47	
<u>CENTRAL/WEST PRIMARY TREATMENT</u>					
<u>Primary Clarification</u>					
Primary Clarifier No. 1 Flow					
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	13.65	58.39		
Water Surface in Primary Clarifier No. 1			57.17	1.22	
V-Notch Weir Elevation			56.99		0.18
Water Surface Elevation in Effluent Drop Box			55.19		
Primary Clarifier No. 3 Flow					
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	13.65	58.39		
Water Surface in Primary Clarifier No. 2			57.40	0.99	
V-Notch Weir Elevation			57.17		0.24
Water Surface Elevation in Effluent Drop Box			55.49		
Primary Clarifier No. 4 Flow					
Top of Basin Elevation	Hyd Prof, Brown & Caldwell, 2001	13.65	58.39		
Water Surface in Primary Clarifier No. 3			57.40	0.99	
V-Notch Weir Elevation			57.17		0.24
Water Surface Elevation in Effluent Drop Box			55.37		
<u>Influent Distribution Structure</u>					
Primary Clarifiers Nos. 1, 2 & 3 Flow					
Top of Distribution Box Structure	Client Sketch	40.95	57.12		
Water Surface in Distribution Box (upstream of Central Train Weir)			55.02	2.10	
Weir Elevation			53.74		1.28
Water Surface in Distribution Box (upstream of Weir to AB No. 1)			55.02	2.10	
Weir Elevation			54.34		0.68
Water Surface in Distribution Box (upstream of Weir to AB No. 2)			55.02	2.10	
Weir Elevation			54.34		0.68
Water Surface Downstream of Central AB Influent Weir			53.54	0.20	
Water Surface Downstream West AB No. 1 Inlet Weir			53.80	0.54	
Water Surface Downstream West AB No. 2 Inlet Weir			53.78	0.56	
<u>CENTRAL TREATMENT TRAIN</u>					
<u>Aeration Basins</u>					
Flow (Primary Clarifier Effluent + RAS)					
Top of Structure	Client Sketch	62.66	55.00		
Anoxic Weir Elevation			52.61		SUBMERGED
Water Surface Elevation in Aeration Basin			53.30	1.70	
Water Surface in AB Effluent Channel			53.30	1.70	
Discharge Weir Elevation to Final Clarifier No. 5			52.31		0.99
Water Surface Elevation Downstream of FC No. 5 Influent Weir			51.22	1.09	
Water Surface Elevation Downstream of FC No. 6 Influent Weir			51.23	1.08	



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**Summary**

Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
<b>Final Clarifier No. 5</b>				
Flow (Clarifier Effluent)	15.67			
Top of Structure	Client Sketch	52.24		
Water Surface Elevation		50.28	1.96	
Invert of "V" Notch Weir Elevation		50.10		0.18
Water Surface in Effluent Launder		50.00	0.10	
Water Elevation in Drop Box		46.78	5.46	
<b>Final Clarifier No. 6</b>				
Flow (Clarifier Effluent)	15.67			
Top of Structure	Client Sketch	52.17		
Water Surface Elevation		50.29	1.88	
Invert of "V" Notch Weir Elevation		50.11		0.18
Water Surface in Effluent Launder		49.49	0.62	
Water Elevation in Drop Box		46.89	5.28	
<b>Effluent Box</b>				
Top of Structure	Client Sketch	52.00		
Water Elevation in Box		46.78	5.22	
<b>WEST TREATMENT TRAIN</b>				
<b>Aeration Basin No. 1</b>				
Flow (Primary Clarifier Effluent + RAS)	4.81			
Top of Structure	Client Sketch	54.81		
Water Surface Upstream of Weir #1		53.72	2.50	
Internal Weir Elevation #1		52.82		SUBMERGED
Water Surface Upstream of Weir #2		53.60	2.62	
Internal Weir Elevation #2		52.85		SUBMERGED
Water Surface Upstream of Weir #3		53.40	2.82	
Internal Weir Elevation #3		52.58		SUBMERGED
Water Surface Upstream of Weir #4		53.25	2.97	
Internal Weir Elevation #4		52.12		SUBMERGED
Water Surface Elevation upstream of discharge		53.19	1.62	
Discharge Weir Elevation		52.83		0.36
Water Surface in AB Effluent Channel		49.83	3.00	
<b>Aeration Basin No. 2</b>				
Flow (Primary Clarifier Effluent + RAS)	4.81			
Top of Structure	Client Sketch	54.81		
Water Surface Upstream of Weir #1		53.72	2.50	
Internal Weir Elevation #1		52.82		SUBMERGED
Water Surface Upstream of Weir #2		53.60	2.62	
Internal Weir Elevation #2		52.85		SUBMERGED
Water Surface Upstream of Weir #3		53.40	2.82	
Internal Weir Elevation #3		52.58		SUBMERGED
Water Surface Upstream of Weir #4		53.25	2.97	
Internal Weir Elevation #4		52.12		SUBMERGED
Water Surface Elevation upstream of discharge		53.19	1.62	
Discharge Weir Elevation		52.83		0.36
Water Surface in AB Effluent Channel		49.76	3.07	
<b>Final Clarifier No. 1</b>				
Flow (Clarifier Effluent)	4.81			
Top of Structure	Client Sketch	50.77		
Water Surface Elevation		49.07	1.70	
Invert of "V" Notch Weir Elevation		48.95		0.11
Water Surface in Effluent Launder		47.95	1.01	
Water Elevation in Drop Box		47.87	2.90	
<b>Final Clarifier No. 2</b>				
Flow (Clarifier Effluent)	4.81			
Top of Structure	Client Sketch	50.85		
Water Surface Elevation		49.08	1.77	
Invert of "V" Notch Weir Elevation		48.96		0.11
Water Surface in Effluent Launder		47.94	1.02	
Water Elevation in Drop Box		47.87	2.98	
<b>Effluent Jct Structures</b>				
Top of Jct MH	Hyd Prof, Brown & Caldwell, 2001	53.64		
Water Elevation in MH		47.81	5.83	
Top of Jct Box No. 1	Hyd Prof, Brown & Caldwell, 2001	45.89		
Water Elevation in Box		47.66		
Top of Jct Box No. 2	Hyd Profiles, Carollo Engineers, 2007	54.86		
Water Elevation in Box		47.63		

**EAST TREATMENT TRAIN**

**Influent Distribution Box**



PROJECT : Therasa St WWTP, Lincoln, NE  
Elevation Summary

JOB # : 7498A00

REVISION: Preliminary

CHECKED : \_\_\_\_\_  
 DATE : \_\_\_\_\_

BY : M. Scott  
 DATE : 3/9/17.00

**Summary**

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/Flume
Flow to East Train		24.05			
Top of Structure	Client Sketch		58.86		
Water Surface Elevation upstream of PC No. 5 Weir			54.24	4.62	
Water Surface Elevation upstream of PC No. 6 Weir			54.24	4.62	
<b>Primary Clarifier No. 5</b>					
Flow		12.03			
Top of Basin Elevation	Client Sketch		55.16		
Water Surface in Primary Clarifier No. 5			53.78	1.38	
V-Notch Weir Elevation			53.66		0.12
Water Surface Elevation in Effluent Drop Box			51.92	1.74	
<b>Primary Clarifier No. 6</b>					
Flow		12.03			
Top of Basin Elevation	Client Sketch		55.22		
Water Surface in Primary Clarifier No. 6			53.78	1.44	
V-Notch Weir Elevation			53.66		0.12
Water Surface Elevation in Effluent Drop Box			51.92	1.74	
<b>Aeration Basin No. 3</b>					
Flow (Primary Clarifier Effluent + RAS)		12.03			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.44	4.78	
Weir Elevation #1			50.71		SUBMERGED
Water Surface Upstream of Weir #2			50.99	5.23	
Weir Elevation #2			50.07		SUBMERGED
Water Surface Upstream of Weir #3			50.80	5.42	
Weir Elevation #3			49.72		SUBMERGED
Water Surface Elevation upstream of discharge			50.68	5.54	
Discharge Weir Elevation			50.00		0.68
Water Surface in AB Effluent Channel			49.96	0.04	
<b>Aeration Basin No. 4</b>					
Flow (Primary Clarifier Effluent + RAS)		12.03			
Top of Structure	Client Sketch		56.22		
Water Surface Upstream of Weir #1			51.44	4.78	
Weir Elevation #1			50.71		SUBMERGED
Water Surface Upstream of Weir #2			50.99	5.23	
Weir Elevation #2			50.07		SUBMERGED
Water Surface Upstream of Weir #3			50.80	5.42	
Weir Elevation #3			49.72		SUBMERGED
Water Surface Elevation upstream of discharge			50.68	5.54	
Discharge Weir Elevation			50.00		0.68
Water Surface in AB Effluent Channel			49.97	0.03	
<b>Final Clarifier No. 3</b>					
Flow (Clarifier Effluent)		12.03			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.75	1.56	
Invert of "V" Notch Weir Elevation			47.59		0.15
Water Surface in Effluent Launder			47.42	0.17	
Water Elevation in Drop Box			47.05	2.26	
<b>Final Clarifier No. 4</b>					
Flow (Clarifier Effluent)		12.03			
Top of Structure	Client Sketch		49.31		
Water Surface Elevation			47.76	1.55	
Invert of "V" Notch Weir Elevation			47.60		0.15
Water Surface in Effluent Launder			47.42	0.18	
Water Elevation in Drop Box			47.05	2.26	
<b>DISINFECTION</b>					
<b>Disinfection Control Structure No. 1</b>					
Flow to Control Structure		40.95			
Top of Structure	Client Sketch		47.89		
Water Surface Elevation upstream of UV Disinfection			46.50	1.39	
Water Surface Upstream of CL2 Weirs			46.60	1.29	
CL2 Influent Weir Elevation			45.67		0.93
Water Surface Elevation upstream of Disinfection Bypass			45.19	2.70	
<b>UV Disinfection</b>					
Flow		36.00			
Top of Channel Elevation	Dwg P-2, Jacobson Helgoth, 2007		47.93		
Water Surface over UV Lamps			46.03	1.90	
Discharge Weir Elevation			44.75		1.28
Water Surface Elevation in Effluent Channel			45.43	(0.68)	
<b>CL2 Disinfection</b>					
Flow		29.00			
Top of Basin Elevation	Dwg C-7, Jacobson Helgoth, 2007		47.93		
Water Surface in CL2 Basin			45.35	2.58	
Discharge Weir Elevation	Dwg C-5, Jacobson Helgoth, 2007		44.09		1.26



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 DATE : 39317.00

## Summary

	Reference	Flow	Elevations	Freeboard	Head Over Weirs/flume
Water Surface Elevation in Effluent Channel			45.23	(1.14)	
<u>Control Structure No. 2</u>					
Flow to Control Structure		65.00			
Flow (Bypass of Disinfection)		0.00			
Top of Structure			47.90		
Water Surface Elevation in CS No. 2			45.10	2.80	
Top of Channel	Client Sketch		47.90		
Bottom of Effluent Channel	Client Sketch		23.55		
Water Surface Elevation in Effluent Channel			45.09	2.81	
Salt Creek Water Level			45.00	(21.45)	