

**WATER TANK DESIGN IN RCDC -
VALIDATION OF TANK WALL FORCES WITH
STAAD MODEL**

Step 1: Section cut Interval = '1m' for Vertical & Horizontal Reinforcement

Design Element

Water Tank Structure

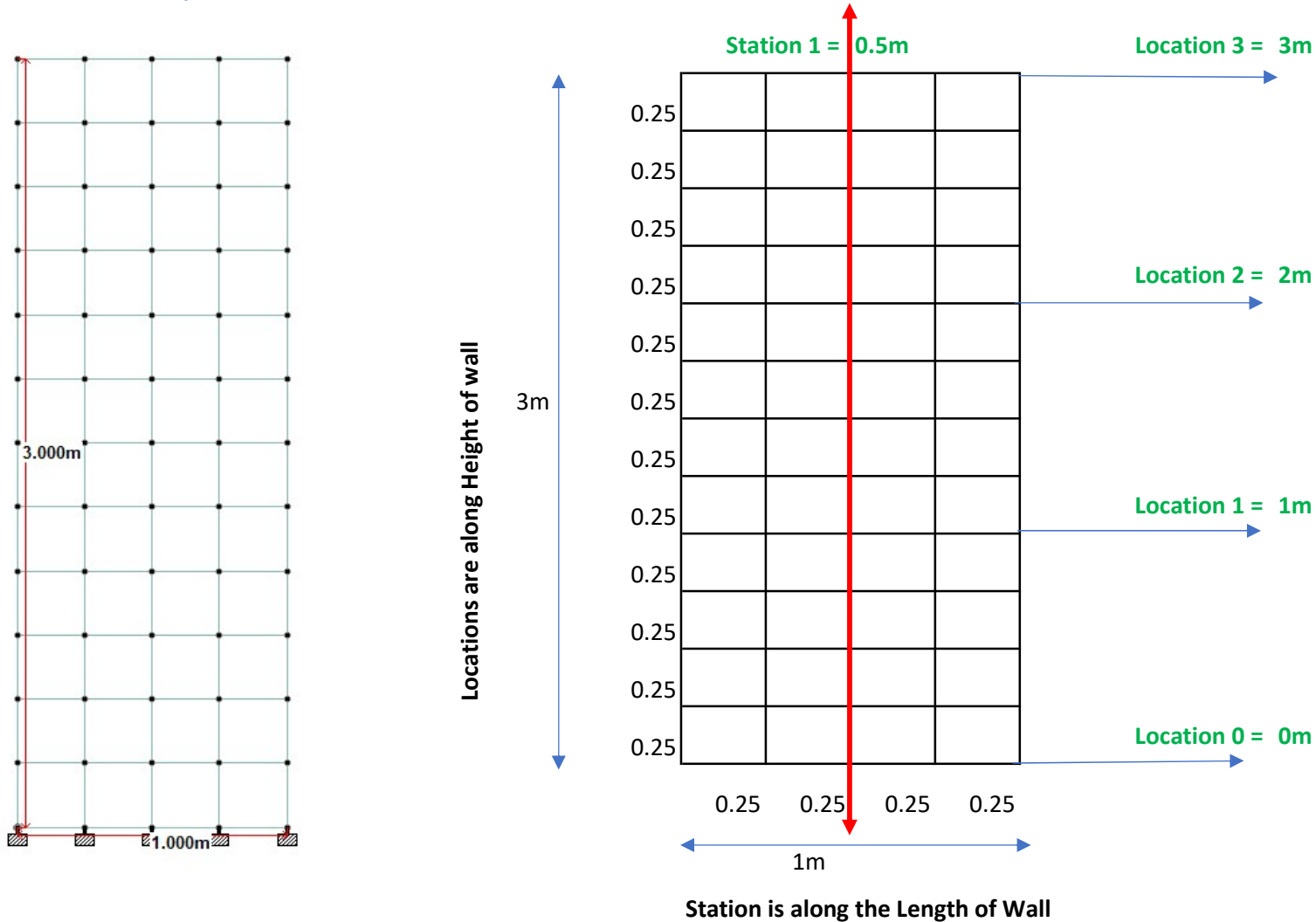
Section Cut Settings for Forces	Value
Wall Vertical Reinforcement Along Length (m)	1
Wall Vertical Reinforcement Along Height (m)	1
Wall Horizontal Reinforcement Along Height (m)	1
Wall Horizontal Reinforcement Along Length (m)	1
Tank Slab - Along Lx (m)	1
Tank Slab - Along Ly (m)	1

Step 2: A STAAD Model of 1m x 3m is modeled in STAAD and same will be imported in RCDC to match

- a. Vertical Axial Force
- b. Vertical Moment
- c. Shear

Based on Section Cut Interval mentioned, below Stations and Locations are created in RCDC

and Forces are computed at this intersections.



Analysis Forces				
Tank Wall	Analysis Surface No.	Load Case	Station - Location ↓	
W1		LOAD 1: LOAD CASE 1	0	14.37
			1	9.37
			2	4.37
			3	0.62

Step 3a Cut by a Plane option - Helps to get the exact location for matching the force

Cut by a Plane option - Cuts all the walls at that Y coordinate

Results along line

Defined Lines :

- Location 0m <Max Div :2> <Max Absolute (Line)>
- Location 1m <Max Div :2> <Max Absolute (Line)>
- Location 2m <Max Div :2> <Max Absolute (Line)>
- Location 3m <Max Div :2> <Max Absolute (Line)>

Highlight intersected Plates

Name : Location 3m

Stress Type : Max Absolute (Line) ▾

Max No Div : 2

Step 3b We need to enter 3 points to create a plane.

- 1** For matching the Vertical Forces we need to create a Horizontal Plane.
- 2** In this case, 'X' & 'Z' coordinate will remain same where as 'Y' coordinate will be a variable
- 3** For accuracy in Force matching, 'Y' coordinate should be nearest to the Incremental Section Cut Location along height of wall.

Plane 1 - Location 0m

Results along line

	X	Y	Z
First Point:	0	0.03	5
Second Point:	1	0.03	5
Third Point:	0	0.03	4.75

Redraw Plane

Cut Structure

Cancel

Plane 2 - Location 1m

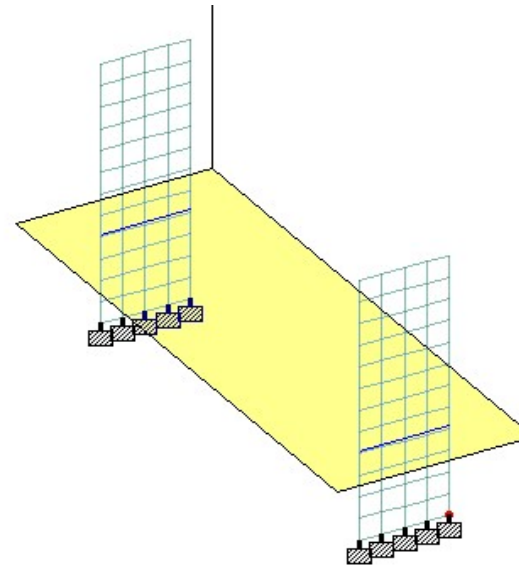
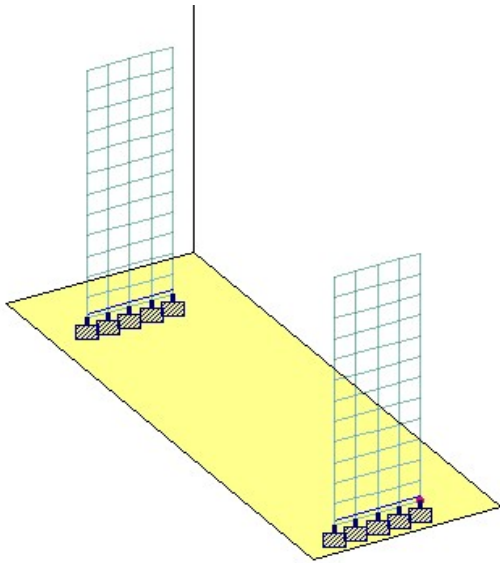
Results along line

	X	Y	Z
First Point:	0	1.02	5
Second Point:	1	1.02	5
Third Point:	0	1.02	4.75

Redraw Plane

Cut Structure

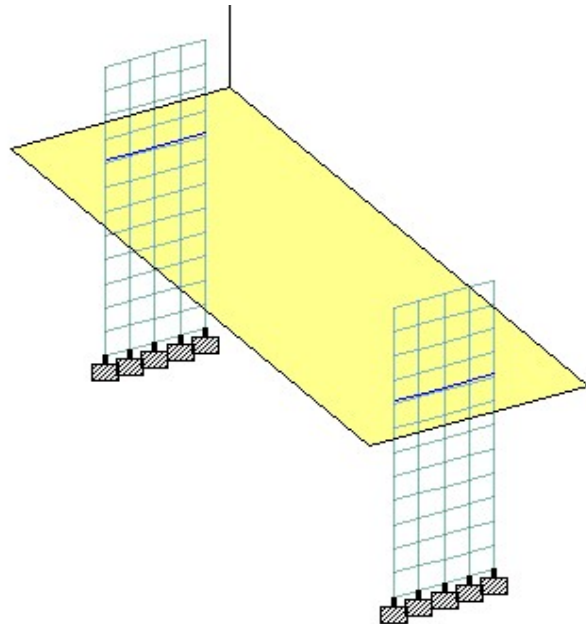
Cancel



Plane 3 - Location 2m

Results along line

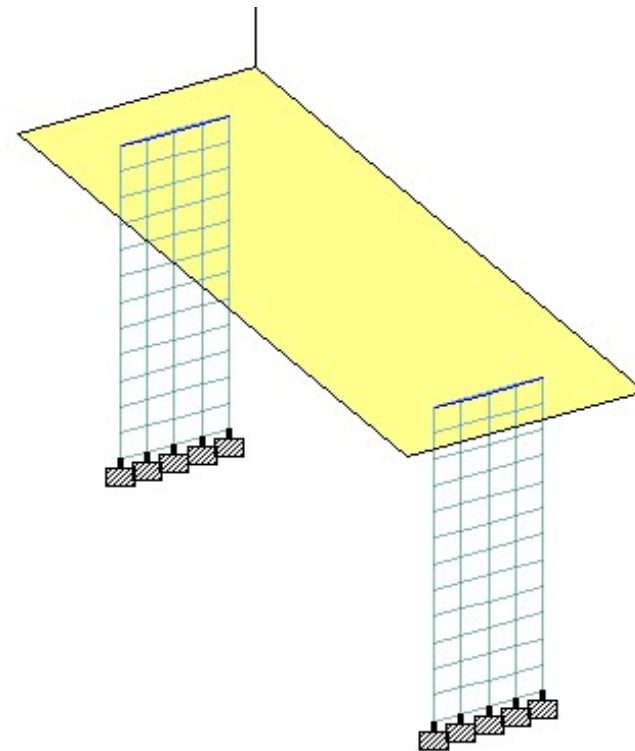
	X	Y	Z
First Point:	0	2.02	5
Second Point:	1	2.02	5
Third Point:	0	2.02	4.75



Plane 4 - Location 3m

Results along line

	X	Y	Z
First Point:	0	2.99	5
Second Point:	1	2.99	5
Third Point:	0	2.99	4.75



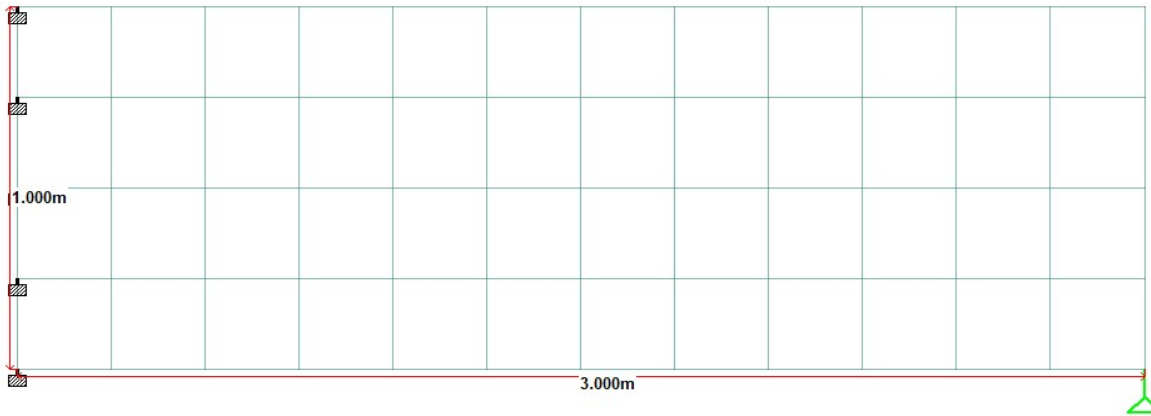
Step 4 Matching the Shear, Vertical Axial Force and Vertical Moment between STAAD & RCDC.

RCDC Notation	STAAD Notation
1 Vertical Axial Force	FT-Line
2 Horizontal Axial Force	FS-Line
3 Vertical Moment	MS-Line
4 Horizontal Moment	MT-Line
5 Shear	FR-Line

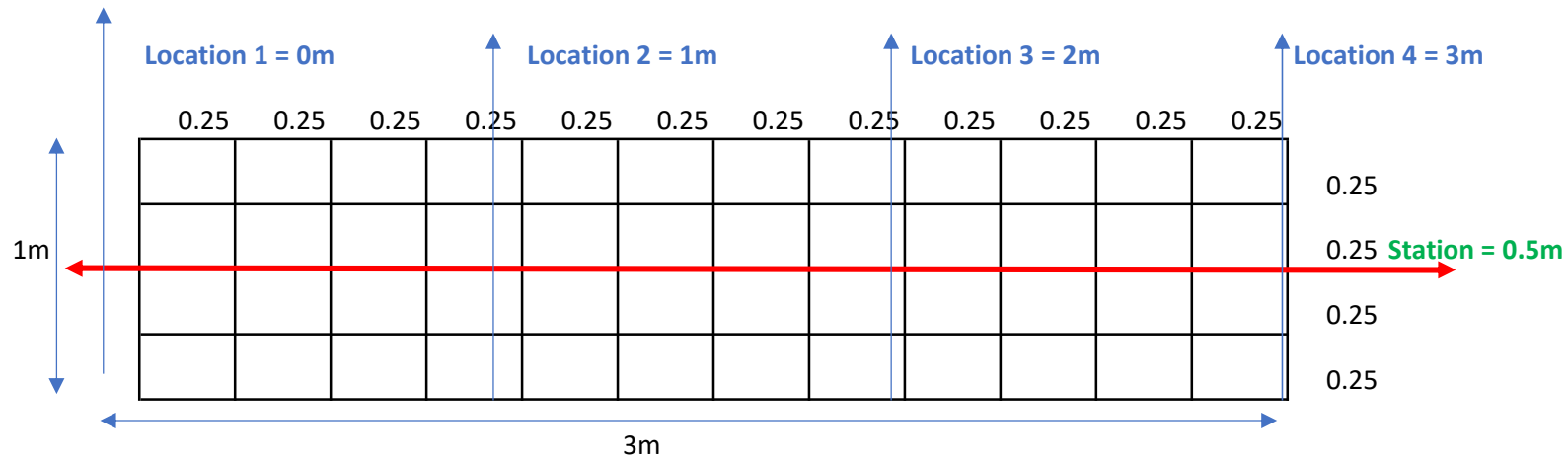
Step 5: A STAAD Model of 3m x 1m is modeled in STAAD and will be imported in RCDC to match

a. Horizontal Axial Force

b. Horizontal Moment



Locations are along Length of wall



Station is along the Height of Wall

Step 6 We need to enter 3 points to create a plane.

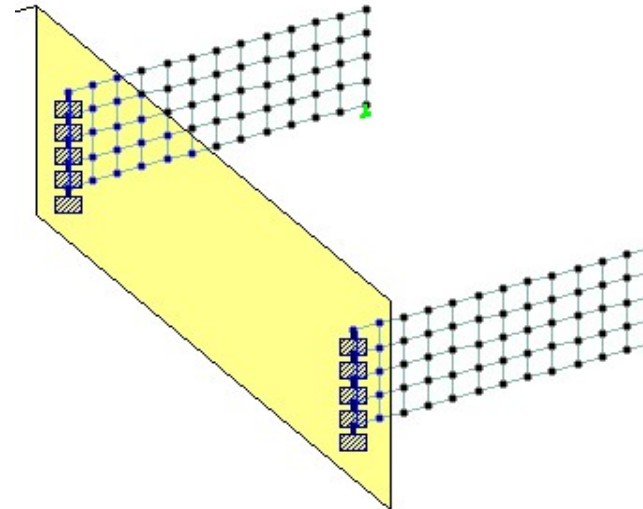
For matching the Horizontal Forces we need to create a Vertical Plane.

In this case, 'Y' & 'Z' coordinate will remain same where as 'X' coordinate will be variable

For accuracy in Force matching, 'X' coordinate should be nearest to the Incremental Section Cut Location along length of wall.

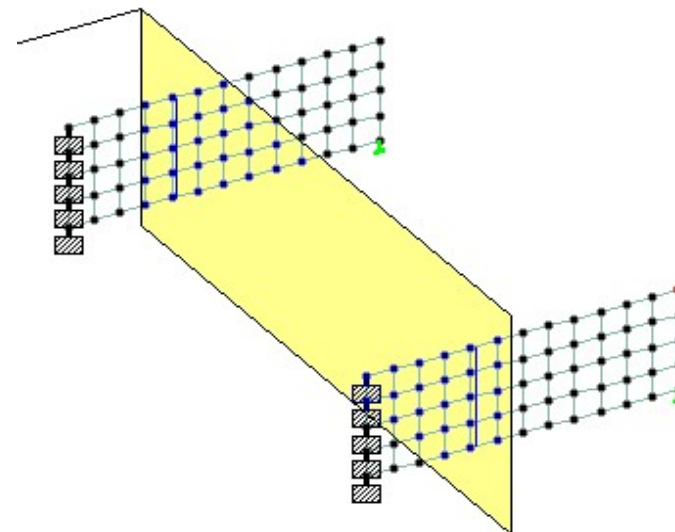
Results along line

	X	Y	Z
First Point:	<input type="text" value="0.03"/>	<input type="text" value="0"/>	<input type="text" value="5"/>
Second Point:	<input type="text" value="0.03"/>	<input type="text" value="1"/>	<input type="text" value="5"/>
Third Point:	<input type="text" value="0.03"/>	<input type="text" value="1"/>	<input type="text" value="4.75"/>



Results along line

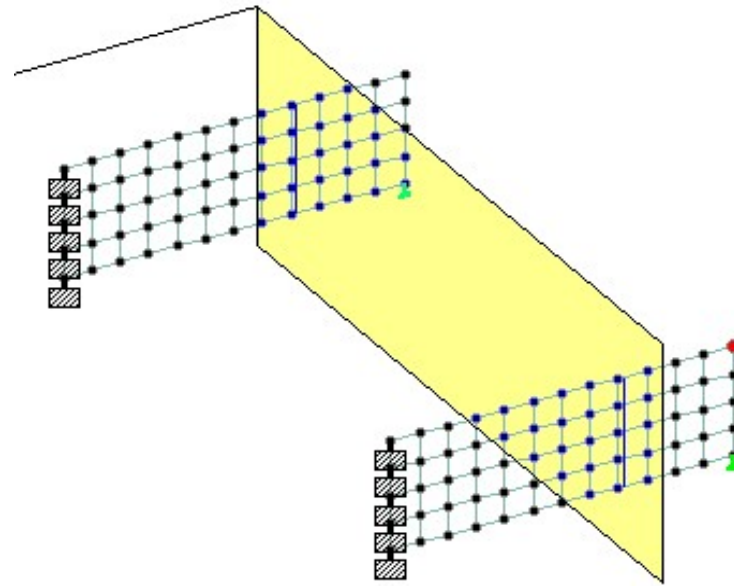
	X	Y	Z
First Point:	<input type="text" value="1.05"/>	<input type="text" value="0"/>	<input type="text" value="5"/>
Second Point:	<input type="text" value="1.05"/>	<input type="text" value="1"/>	<input type="text" value="5"/>
Third Point:	<input type="text" value="1.05"/>	<input type="text" value="1"/>	<input type="text" value="4.75"/>



Results along line

	X	Y	Z
First Point:	2.05	0	5
Second Point:	2.05	1	5
Third Point:	2.05	1	4.75

Redraw Plane **Cut Structure** Cancel



Results along line

	X	Y	Z
First Point:	2.99	0	5
Second Point:	2.99	1	5
Third Point:	2.99	1	4.75

Redraw Plane **Cut Structure** Cancel

