



WATER TREATMENT PLANT SOFTWARE

User Guide



ABOUT US

iNODE Software Company is incorporated with sole aim of developing advanced SAAS products for applications in Civil Engineering. We aim to automate the pre and post tender and the design process with efficient use of Artificial Intelligence. At the same time, the software also gives equal control on the design inputs & processes solely to humans, which develops confidence amongst the designers. In addition to this, our products also provides systematic cloud storage systems thereby providing lifelong data of civil structures.



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This document guides a user with all the necessary information required to familiarize and operate iNODE WTP Design Software.

If you have any questions not covered in this user guide, please contact our helpdesk at –
support@inodedesign.com



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INTRODUCTION

1.1 GENERAL INFORMATION

iNODE WTP is a simplified SAAS product for Hydraulic Design of Drinking Water Treatment Plants. The design is in accordance with CPHEEO and relevant IS Manuals/Codes. This product is powered by Artificial Intelligence and generates standard, detailed, and explanatory Design Reports, Hydraulic Drawings and Tender Validation Reports as output.

1.2 iNODE FEATURES

- Design Management Portal
- Design and Drawing Portal
- Proof Checking Portal
- Educational Portal

This software has been designed specifically for assisting design ease for the upcoming Government Mission to facilitate Drinking Water to the entire country by the year 2024. It will boost uniform design standards wherein ultimately design and peer review time will be saved keeping in account all the necessary standard design codal practices are maintained.

As far as time is considered, iNODE enables Hydraulic Design of WTP with generating standard Design Reports and Drawings within 45 minutes which is super speedy when compared to the average design time required currently of 15 days. Further reducing peer review time in Departments and Third-Party Reviewers to 3 days is again super speedy when compared to the current requirement of minimum 30 days (Assuming 15 days at each Office). With Cloud Data Management iNODE allows users to download only the latest design documents and drawings thereby eliminating confusion. These documents can be downloaded from any device at any place.

Since all the calculations are performed on server there is no specific requirement for hardware.

1.3 USES AND SOFTWARE BENEFITS

Following are stages that the software highlights:

Pre-Tendering Stage

iNODE will provide WTP design insight report and drawings required for the proposed Water Treatment Plant. This will help the concerned authority to estimate exact land requirement, Billing of Quantities (BOQ), & Cost estimation.

Post Tendering Stage

iNODE designs Water Treatment Plant in accordance with CPHEEO Manual and Tender requirements. Further the Proof Check Portal provided by iNODE helps departments and Third-Party Proof Checkers to perform design validations efficiently with feature enabling direct contact with the designer.

1.4 SOFTWARE OUTPUT

1. Detail Design Report
2. Tender Validation
3. Design Insight Report
4. Hydraulic General Arrangement Drawings

FEATURES

Design Pace

iNODE comes with a feature of the required design data and standard design process for designing an element, compiled in a single screen. Due to which the design of an element is quicker than ever before. In addition to this the designer can be carefree about the code compliances as iNODE makes sure the design is always within the permissible requirements of the codal provisions.

Cloud Data

Loosing design Data is not a fear anymore. iNODE being a web-based software all the content inclusive of the designer's design data in the form of reports, drawings are always saved on cloud and readily available for access from any location at any defined time. Unique feature of iNODE makes sure that the user always downloads the latest updated design documents and drawings.

Precision

iNODE provides user with validation checks at every design step thereby ensuring the designer follows all the codal recommendation. PDF generate helps reduction of errors, rework and thereby minimizing duplication of work.

AI Boost

iNODE is boosted with artificial intelligence technology giving it a unique ability to recommend values to the designers on the basis of codal provisions and past design data.

 ***Reports***

The highlight of iNODE is the generation of detailed design reports inclusive of all the formula used and all the required codal provisions. Approvals is at a clinch now due to the clarity of design conveyed through the reports.

 ***Compatibility***

iNODE is compatible with most of the leading analysis software used across industry. This helps you to upgrade the design process while still using the existing infrastructure.

 ***Efficiency***

The stake holders are now always in loop with the built-in access feature to the system. iNODE ensures that stake holders use latest design provisions, and all their comments are address accordingly, thus improving overall project efficiency.

 ***Proof Check***

Proof checking the design before its execution is the need of the hour. Taking into account the importance of proof check, iNODE is powered up with a never seen before portal to check and approve the designs with pace & precision. It also ensures all the codal requirement are take into consideration.

 ***Drawing***

iNODE can generate drawings at a single click which could be used as general arrangement (GA) / concept drawings for further development and approvals.

BENEFITS

Professionals

- Design Pace & Efficiency
- Auto Documentation
- Online Submission of Design
- Time Optimization
- Revision Updates in all Documents
- Performing Online Proof Checking

Students

- Learn Hydraulic Element Designs
- Learn Hydraulic Report Generation
- Testing & Reading - Corelating Design Reports & Drawings via Special Validation Assignments
- Learn Head Loss Calculations
- Learn Hydraulic Drawing Generation

Institutes

- Helps Students Generate Industry Standard Reports & Drawings
- Institutes can Perform Design & Drawings of WTPs
- Institutes can Proof Check More Precisely and Efficiently saving Professor's Time

SYSTEM REQUIREMENT

Operating System



WINDOWS



APPLE



LINUX

Systems Configuration

- Minimum 2 GB RAM
- Compatible with all Intel Processors
- Compatible with Apple M1 Processor
- No Requirement of Graphics Card

Browsers



SAFARI
Apple



CHROME
Google



FIREFOX
Mozilla



EDGE
Microsoft

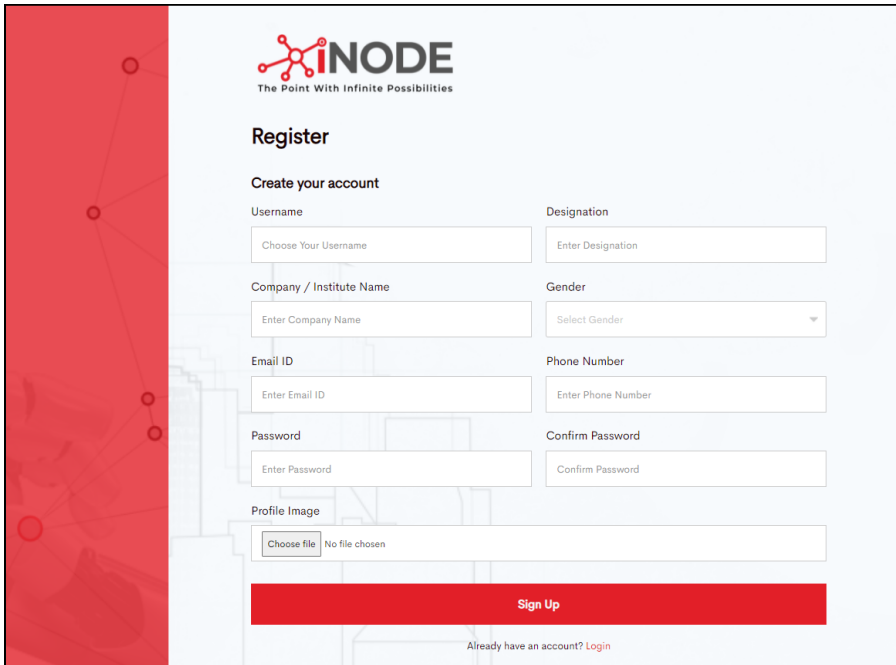
****iNODE WTP is a design software. For the best user experience it is recommended to use screens with sizes 13" and above.**



The Point With Infinite Possibilities

LOGIN AND DESIGN MANAGEMENT PORTAL

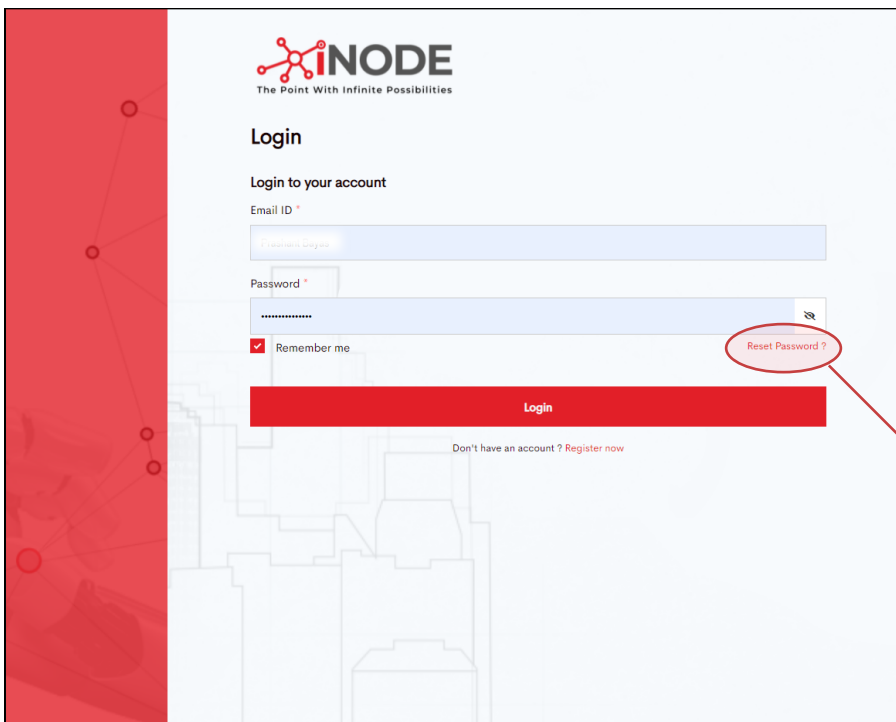




The screenshot shows the 'Register' page of the INODE system. At the top left is the INODE logo with the tagline 'The Point With Infinite Possibilities'. Below the logo is the heading 'Register' and the sub-heading 'Create your account'. The form consists of several input fields: 'Username' (with a placeholder 'Choose Your Username'), 'Designation' (with a placeholder 'Enter Designation'), 'Company / Institute Name' (with a placeholder 'Enter Company Name'), 'Gender' (a dropdown menu with 'Select Gender'), 'Email ID' (with a placeholder 'Enter Email ID'), 'Phone Number' (with a placeholder 'Enter Phone Number'), 'Password' (with a placeholder 'Enter Password'), and 'Confirm Password' (with a placeholder 'Confirm Password'). There is also a 'Profile Image' section with a 'Choose file' button and the text 'No file chosen'. A large red 'Sign Up' button is at the bottom of the form. Below the button, there is a link: 'Already have an account? [Login](#)'.

New Registration

New users can click on 'Register', enter your details and then click on 'Sign Up'.



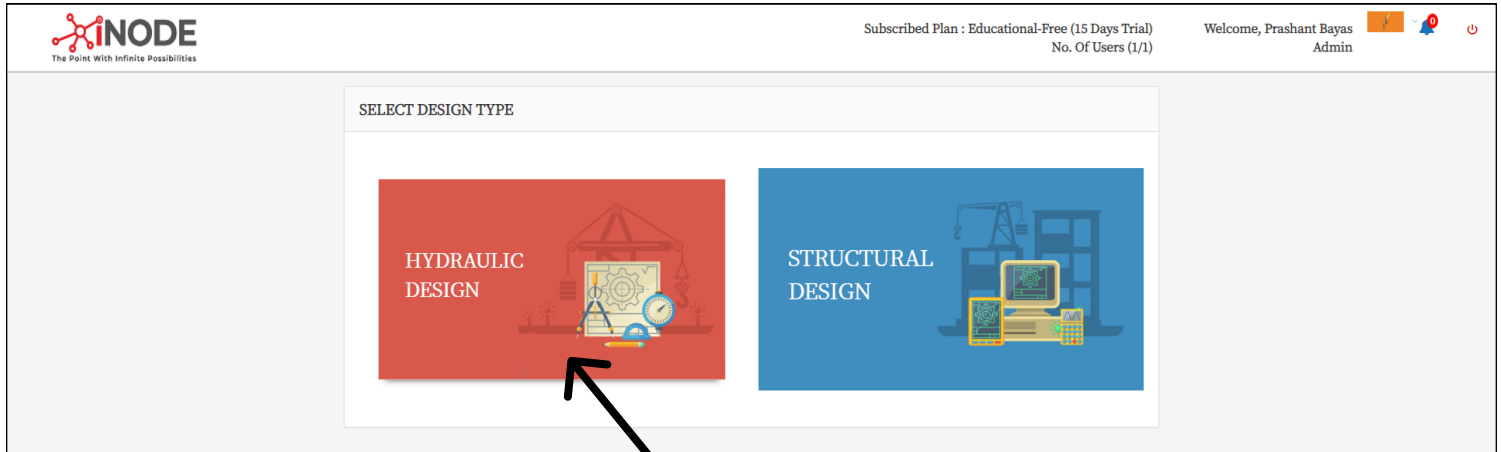
The screenshot shows the 'Login' page of the INODE system. At the top left is the INODE logo with the tagline 'The Point With Infinite Possibilities'. Below the logo is the heading 'Login' and the sub-heading 'Login to your account'. The form consists of several input fields: 'Email ID *' (with a placeholder 'Enter Email ID'), 'Password *' (with a placeholder 'Enter Password'), and a 'Remember me' checkbox. A 'Reset Password ?' link is circled in red. A large red 'Login' button is at the bottom of the form. Below the button, there is a link: 'Don't have an account? [Register now](#)'.

Existing Account

Enter your Email ID, Password and click on 'Login'

In case you forget your Password, use this.

Know Your Dashboard

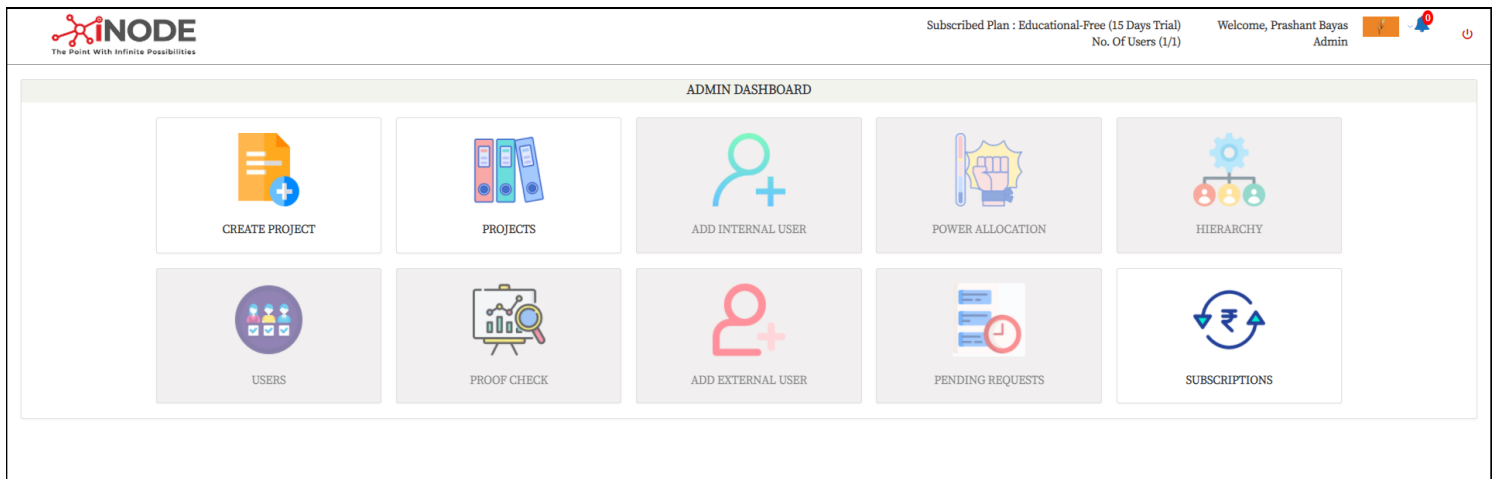


Click on
'Hydraulic Design'.

Subscription data
(Free user)

User
Information

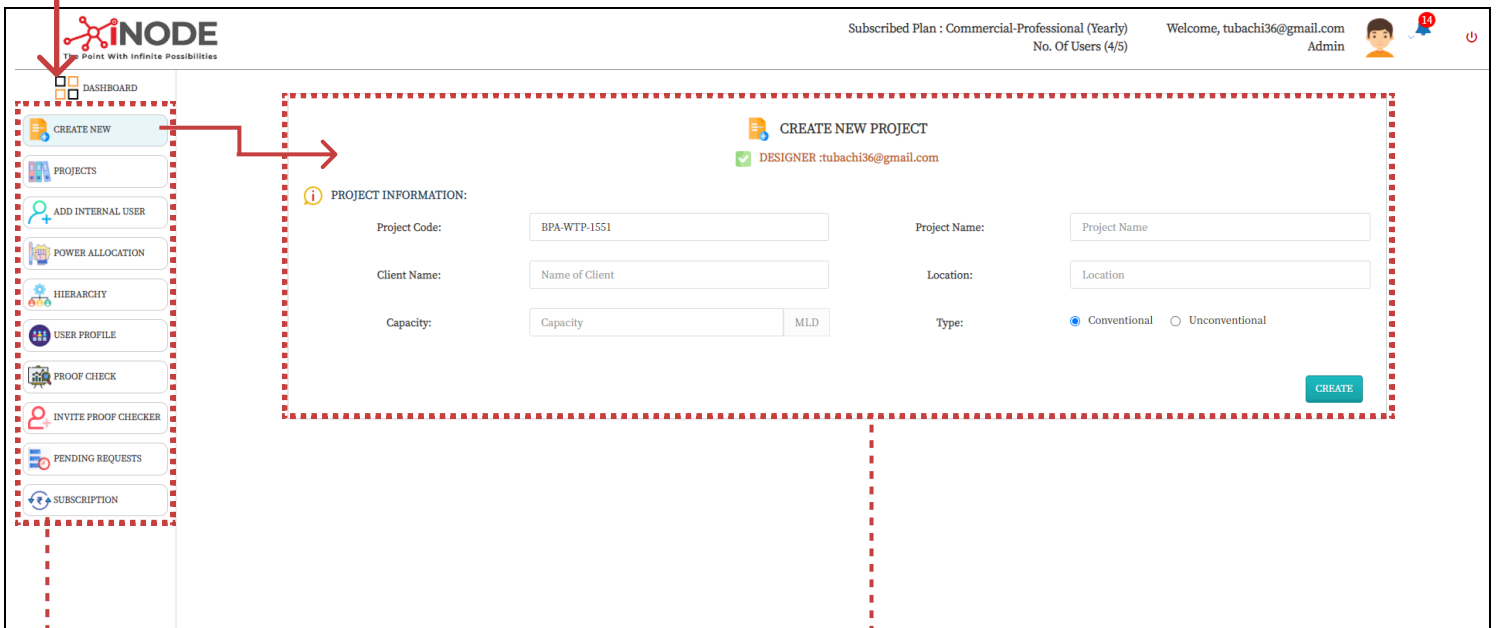
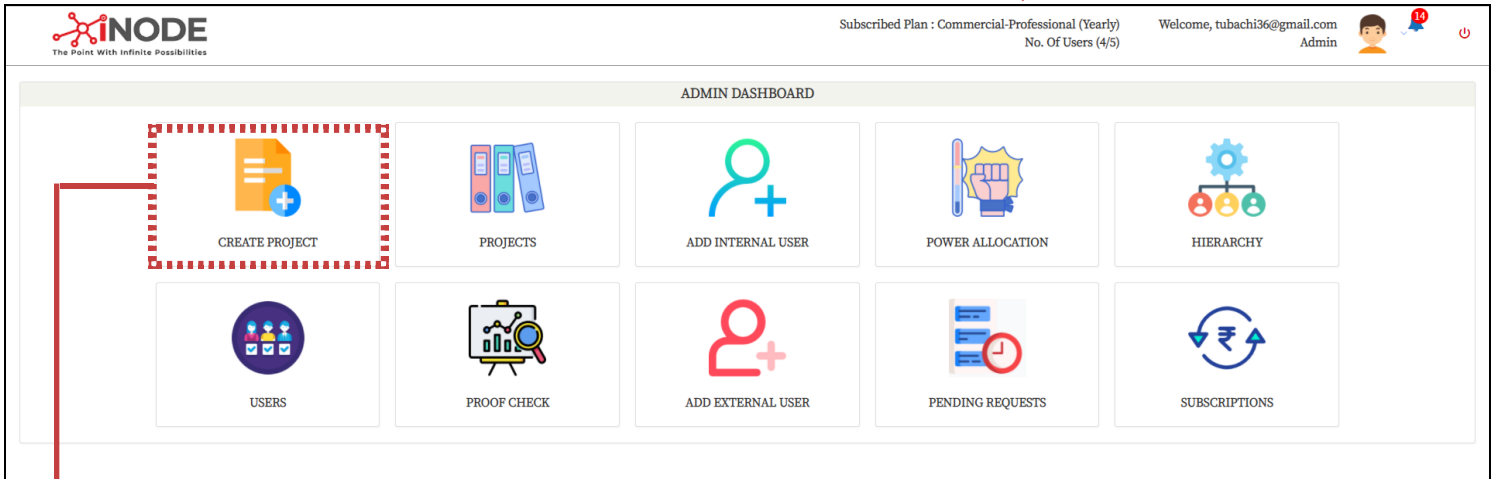
Logout



The above iNODE dashboard's user interface is specially designed for quick access and ease to view and manage data.

Knowing Individual Features

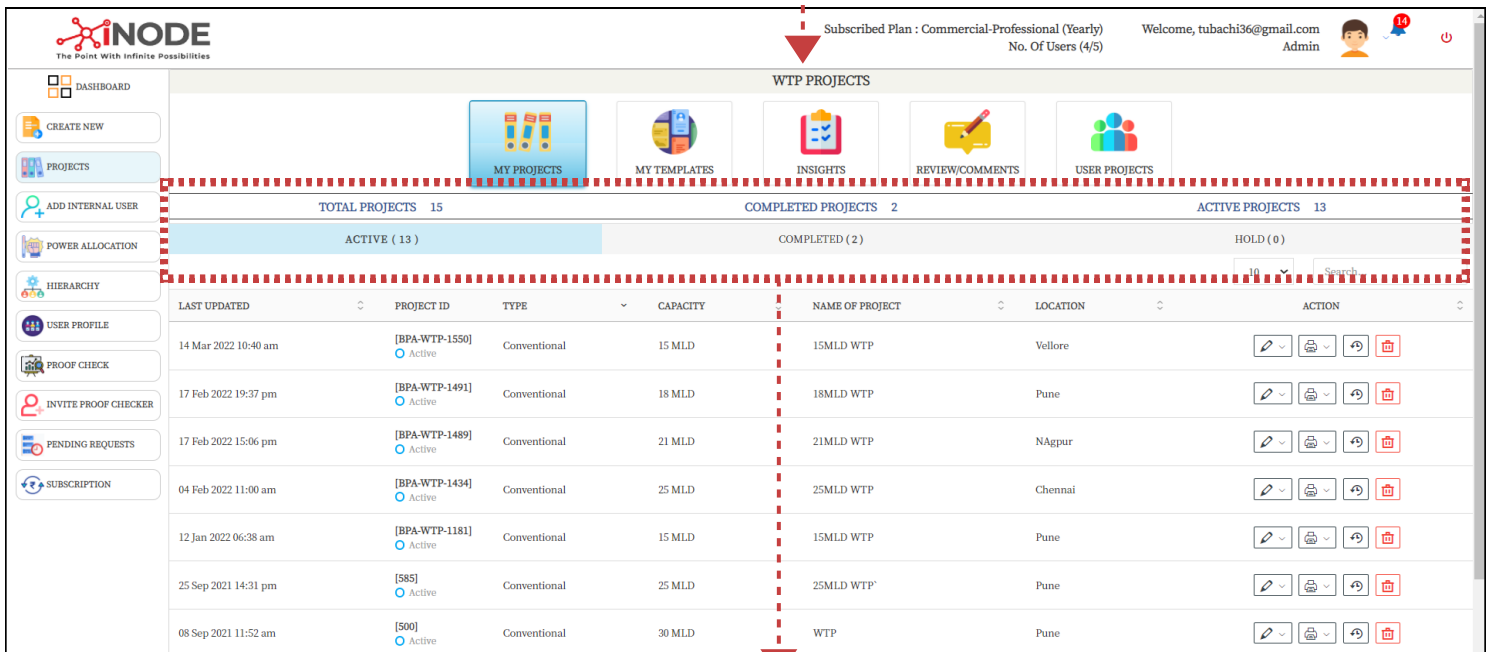
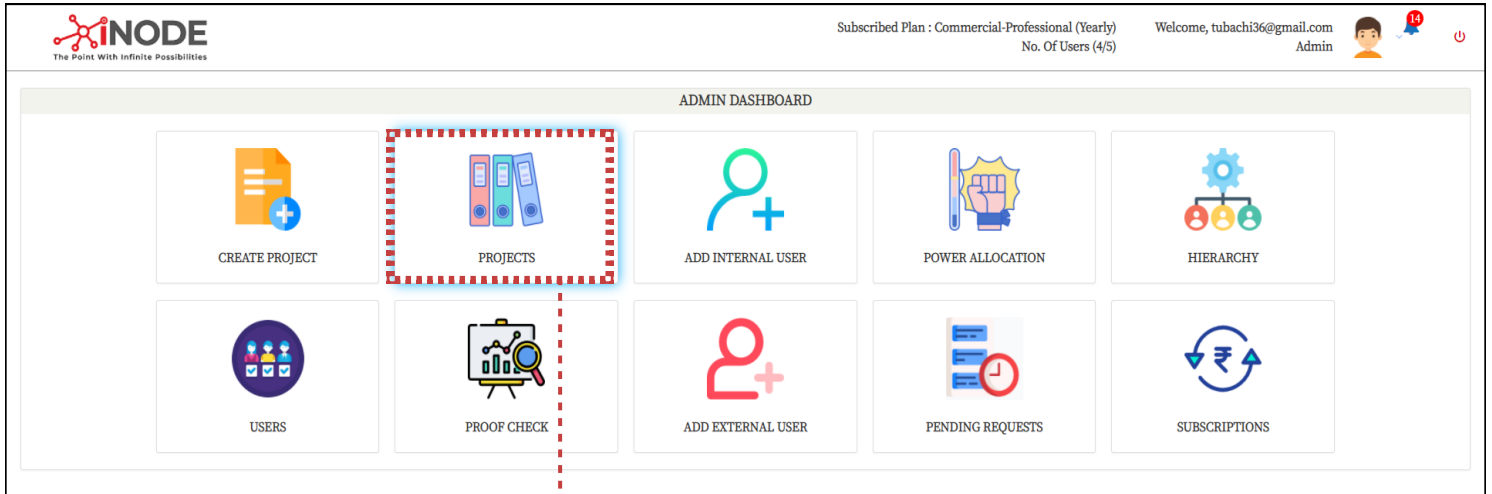
Dashboard for a Subscribed user



Main Options under Dashboard

Create a new project simply by filling the information required

Access your Projects (Completed/Ongoing)

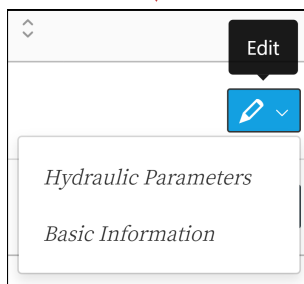


User can select the options out of these three by clicking on them for accessing active/completed or On hold projects

Understanding the Icons

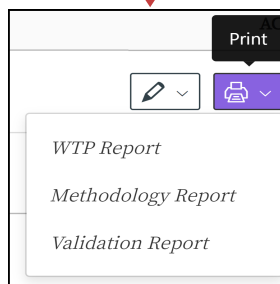


EDIT



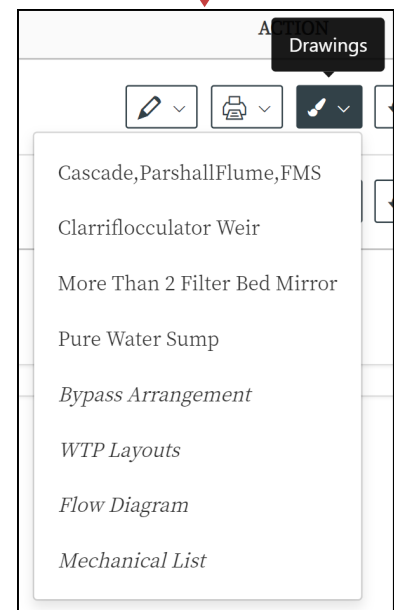
A user can edit any of the projects for its hydraulic parameters or its Basic Information by clicking on the options as shown.

PRINT



A user can print with ease by clicking on the options as shown for design reports/ methodology reports or validation reports of any particular project.

DRAWINGS



A user can print with ease by clicking on the options as shown for design drawings/ Layouts / Flow diagram or by pass arrangement where valid of any particular project.

NOTE:
On selection of completed project the same icon details can be referred.

It is recommended for a user to use the print of reports and drawings option post completion of a report for smooth functioning.



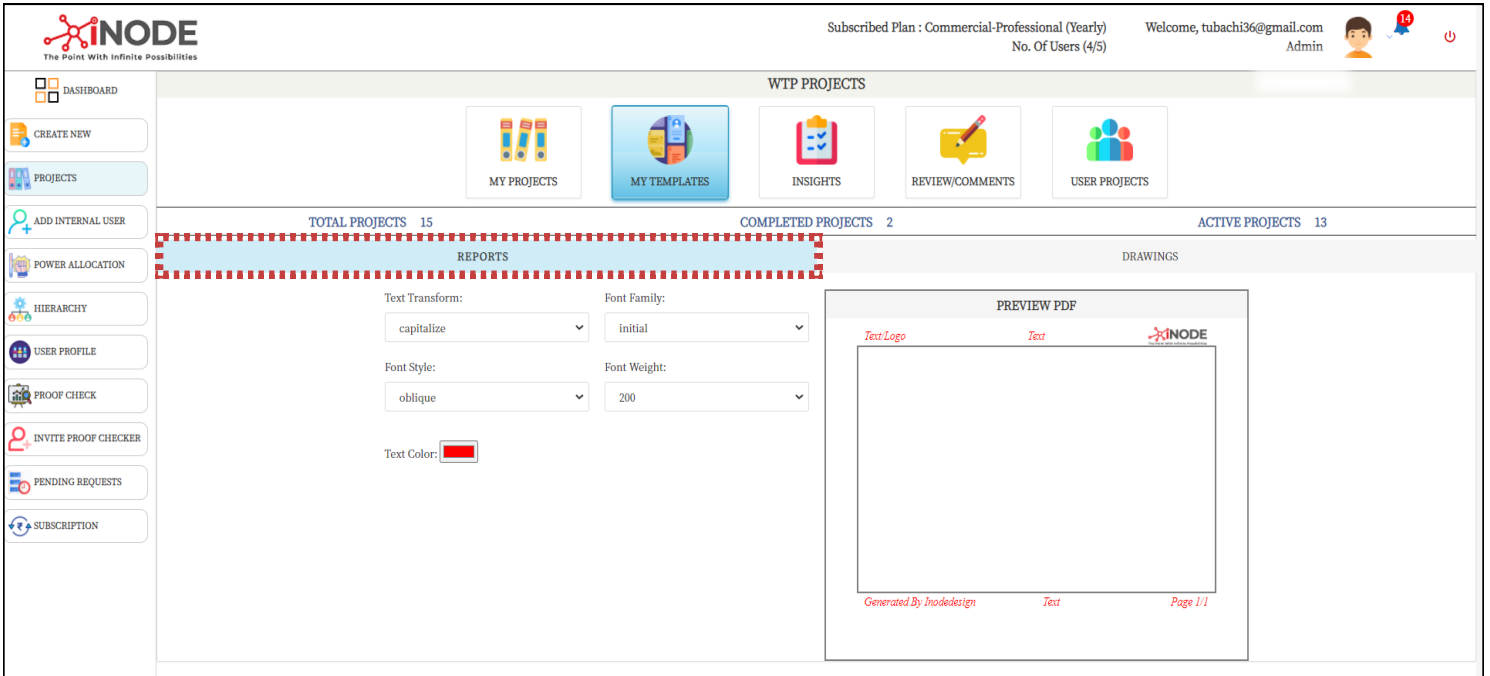
HOLD

A user can assign any project on hold whenever it is needed by clicking on the icon as shown above.

DELETE

A user can delete any project by clicking on the icon as shown above whenever needed.

Detail your Default Template for Reports & Drawings



Subscribed Plan : Commercial-Professional (Yearly) No. Of Users (4/5) Welcome, tubachi36@gmail.com Admin

WTP PROJECTS

TOTAL PROJECTS 15 COMPLETED PROJECTS 2 ACTIVE PROJECTS 13

REPORTS

Text Transform: capitalize Font Family: initial

Font Style: oblique Font Weight: 200

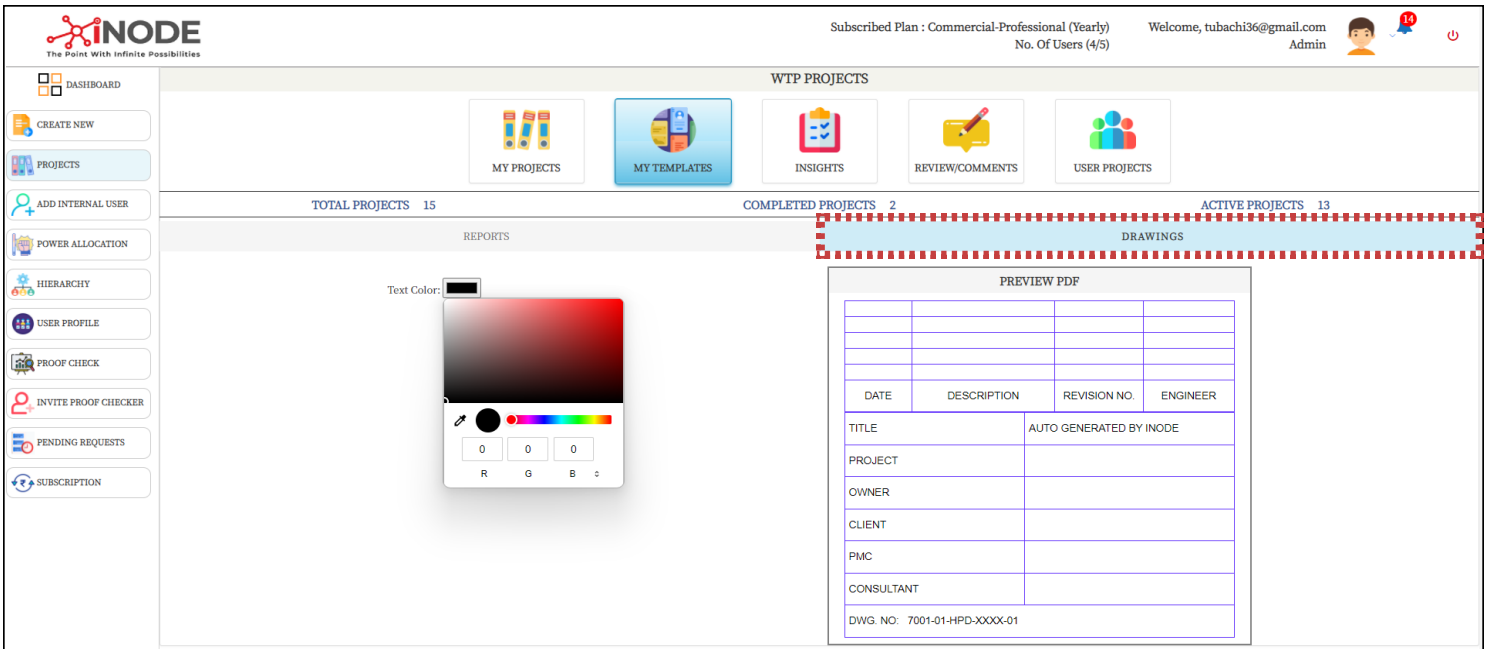
Text Color: ■

PREVIEW PDF

Text Logo Text

Generated By Inodedesign Text Page 1/1

A user can design and choose specific text forms, font style, font weight and text color for the output reports of all the projects created thereafter.



Subscribed Plan : Commercial-Professional (Yearly) No. Of Users (4/5) Welcome, tubachi36@gmail.com Admin

WTP PROJECTS

TOTAL PROJECTS 15 COMPLETED PROJECTS 2 ACTIVE PROJECTS 13

DRAWINGS

Text Color: ■

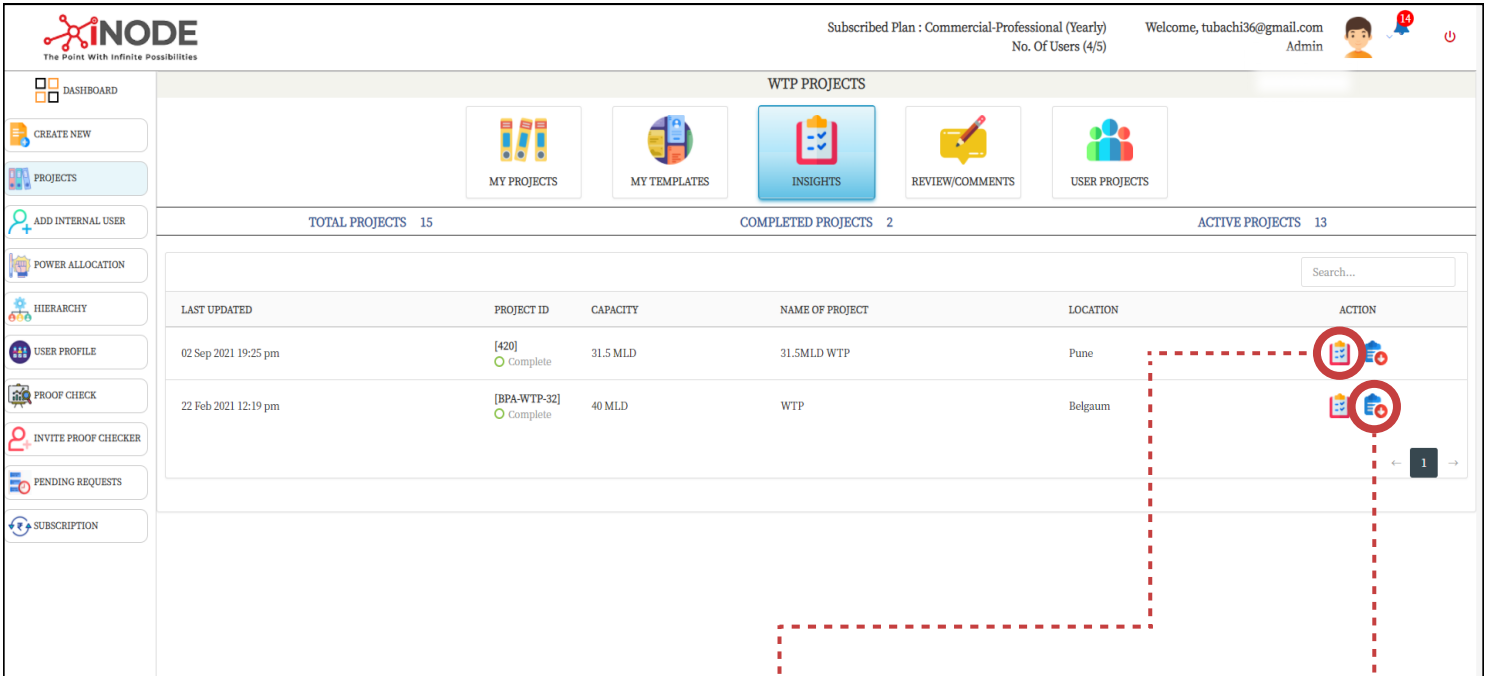
R G B

PREVIEW PDF

DATE	DESCRIPTION	REVISION NO.	ENGINEER
TITLE		AUTO GENERATED BY INODE	
PROJECT			
OWNER			
CLIENT			
PMC			
CONSULTANT			
DWG. NO: 7001-01-HPD-XXXX-01			

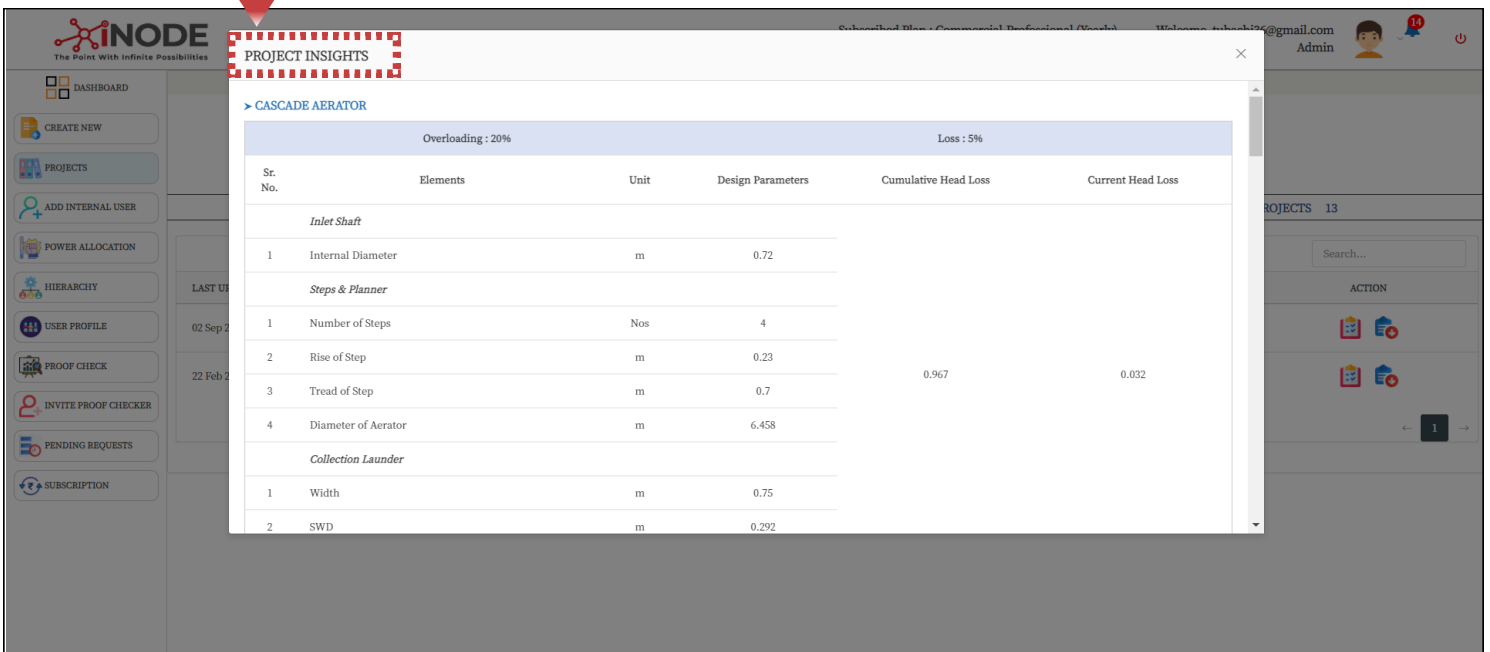
A user can choose text color for the output drawings of all the projects created thereafter. (Template data will be default as shown.)

Know your Project Insights in a Click



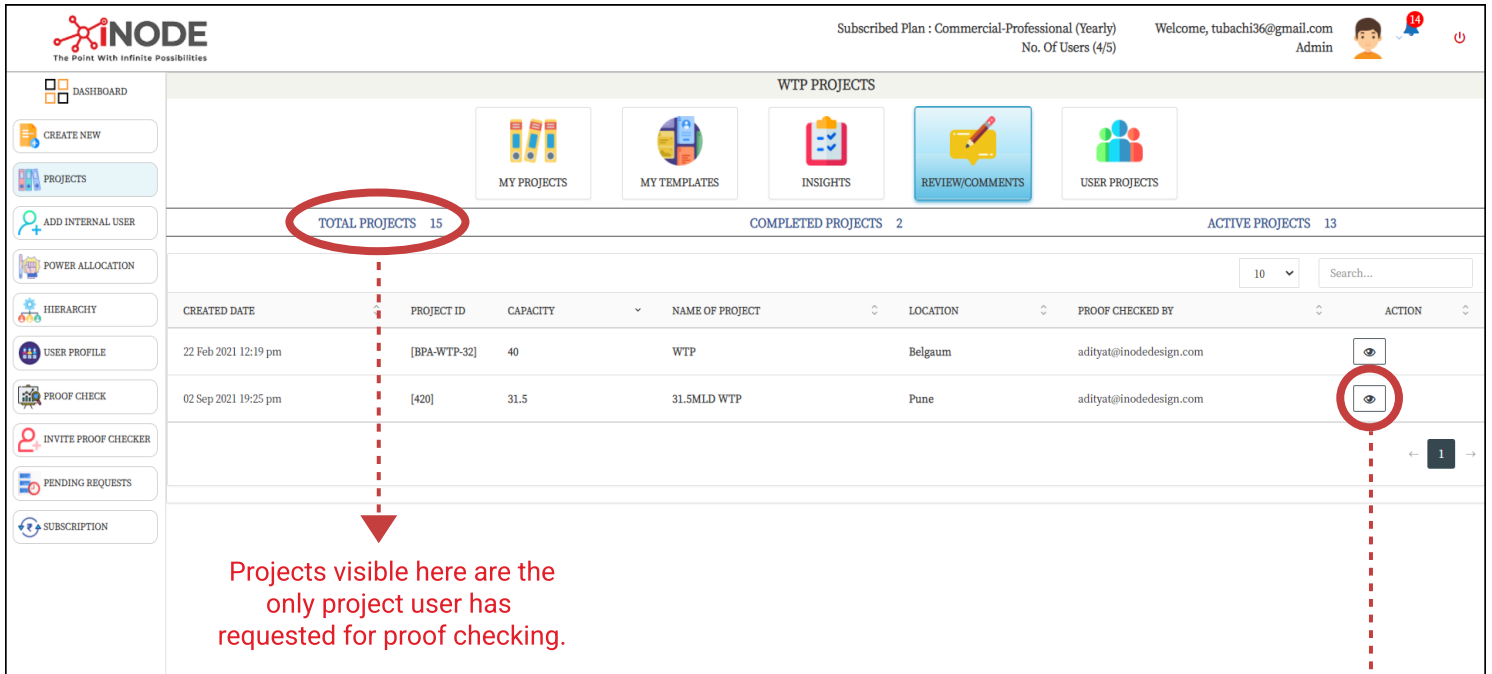
Hit on the icon indicated and view the insights indicating design overloading / loss and dimensions of each element as per the flow & their respective head losses (Current & Cumulative).

Download the particular project insights.



Sr. No.	Elements	Unit	Design Parameters	Cumulative Head Loss	Current Head Loss
<i>Inlet Shaft</i>					
1	Internal Diameter	m	0.72		
<i>Steps & Planner</i>					
1	Number of Steps	Nos	4		
2	Rise of Step	m	0.23	0.967	0.032
3	Tread of Step	m	0.7		
4	Diameter of Aerator	m	6.458		
<i>Collection Launder</i>					
1	Width	m	0.75		
2	SWD	m	0.292		

Reviews/Comments by Proof Check Authority for a Project



Subscribed Plan : Commercial-Professional (Yearly) | Welcome, tubachi36@gmail.com | No. Of Users (4/5) | Admin

WTP PROJECTS

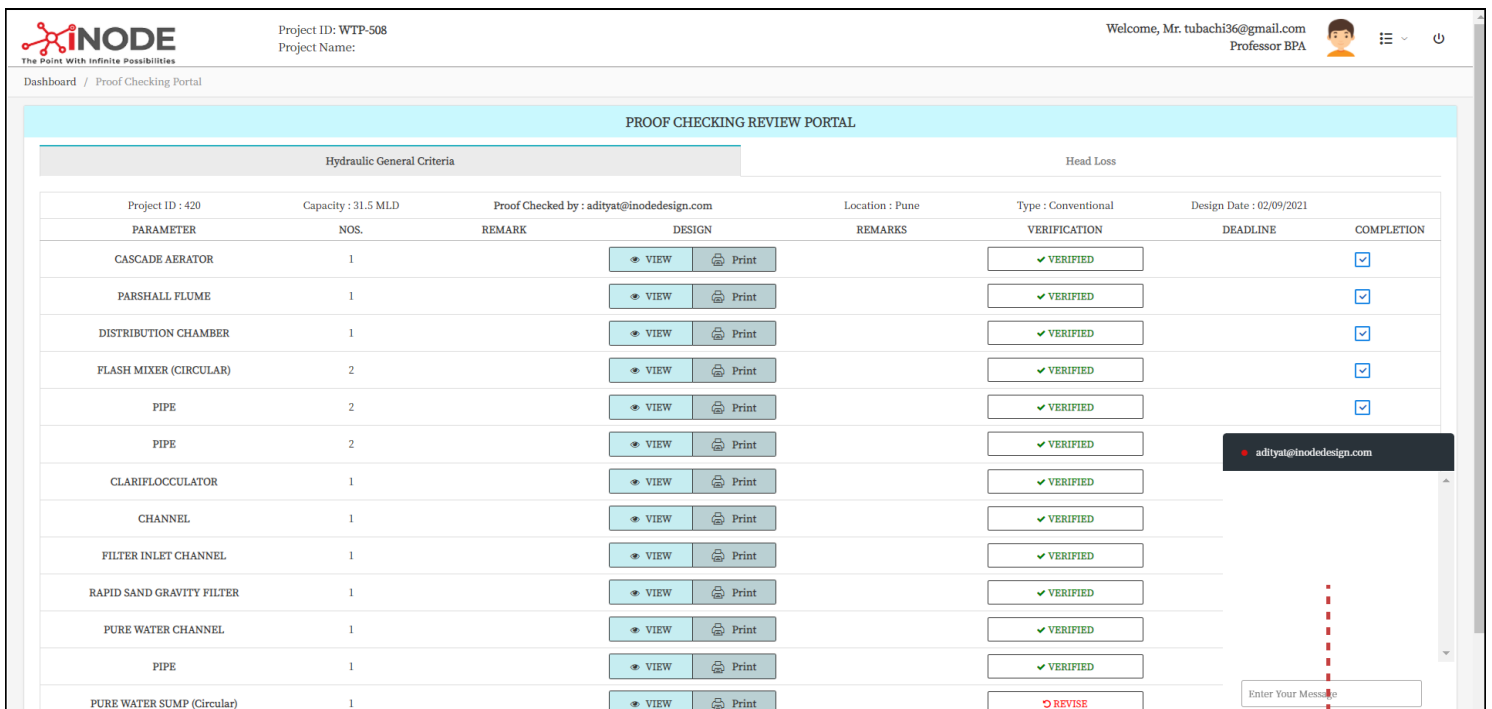
MY PROJECTS | MY TEMPLATES | INSIGHTS | **REVIEW/COMMENTS** | USER PROJECTS

TOTAL PROJECTS 15 | COMPLETED PROJECTS 2 | ACTIVE PROJECTS 13

CREATED DATE	PROJECT ID	CAPACITY	NAME OF PROJECT	LOCATION	PROOF CHECKED BY	ACTION
22 Feb 2021 12:19 pm	[BPA-WTP-32]	40	WTP	Belgaum	adityat@inodedesign.com	
02 Sep 2021 19:25 pm	[420]	31.5	31.5MLD WTP	Pune	adityat@inodedesign.com	

Projects visible here are the only project user has requested for proof checking.

A user can access the review/comments added by the proof checker by clicking on the eye icon.



Project ID: WTP-508 | Project Name: | Welcome, Mr. tubachi36@gmail.com | Professor BPA

Dashboard / Proof Checking Portal

PROOF CHECKING REVIEW PORTAL

Hydraulic General Criteria | Head Loss

Project ID : 420 | Capacity : 31.5 MLD | Proof Checked by : adityat@inodedesign.com | Location : Pune | Type : Conventional | Design Date : 02/09/2021

PARAMETER	NOS.	REMARK	DESIGN	REMARKS	VERIFICATION	DEADLINE	COMPLETION
CASCADE AERATOR	1				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
PARSHALL FLUME	1				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
DISTRIBUTION CHAMBER	1				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
FLASH MIXER (CIRCULAR)	2				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
PIPE	2				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
PIPE	2				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
CLARIFLOCCULATOR	1				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
CHANNEL	1				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
FILTER INLET CHANNEL	1				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
RAPID SAND GRAVITY FILTER	1				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
PURE WATER CHANNEL	1				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
PIPE	1				<input type="checkbox"/> VERIFIED		<input checked="" type="checkbox"/>
PURE WATER SUMP (Circular)	1				<input type="checkbox"/> REVISE		<input type="checkbox"/>

adityat@inodedesign.com

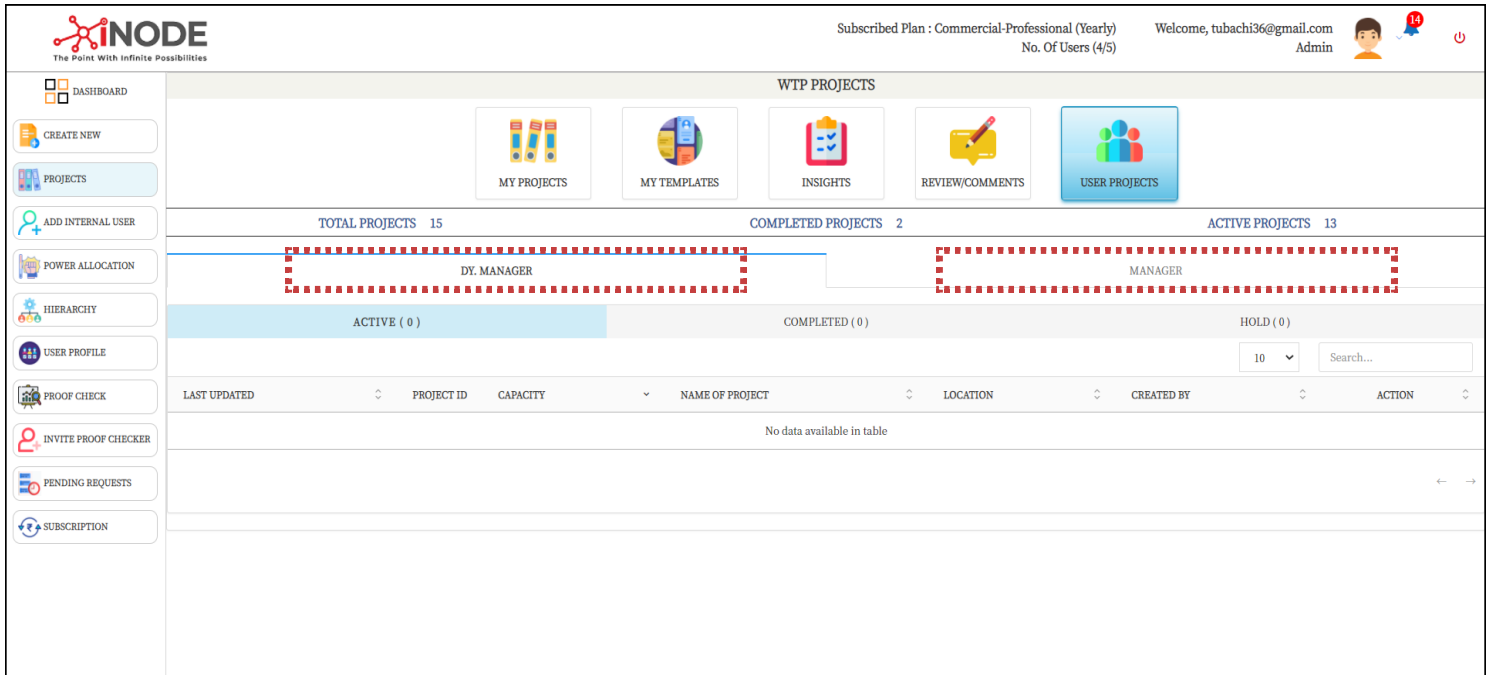
Enter Your Message

Above is a summary and further actions to be performed by the user for each individual element hydraulic design as directed by the proof checker.

User can directly have a chat with the proof checker by clicking on the bar indicated whenever the proof checker is available (Green dot will indicate the proof checker is available / Red indicates non-availability)

View Design Projects Created by other Internal Users

(User designation plays an important role in this.)



The screenshot shows the INODE dashboard interface. At the top, it displays the INODE logo, subscription details (Commercial-Professional Yearly, 4/5 users), and user information (Welcome, tubachi36@gmail.com, Admin). The main section is titled 'WTP PROJECTS' and includes several filter cards: MY PROJECTS, MY TEMPLATES, INSIGHTS, REVIEW/COMMENTS, and USER PROJECTS. Below these are summary statistics: TOTAL PROJECTS (15), COMPLETED PROJECTS (2), and ACTIVE PROJECTS (13). A bar chart shows project counts for 'DY. MANAGER' and 'MANAGER'. A table below the chart has columns for project status (ACTIVE, COMPLETED, HOLD) and a search bar. The table is currently empty, displaying 'No data available in table'.



An user can view projects created by their internal subordinates.

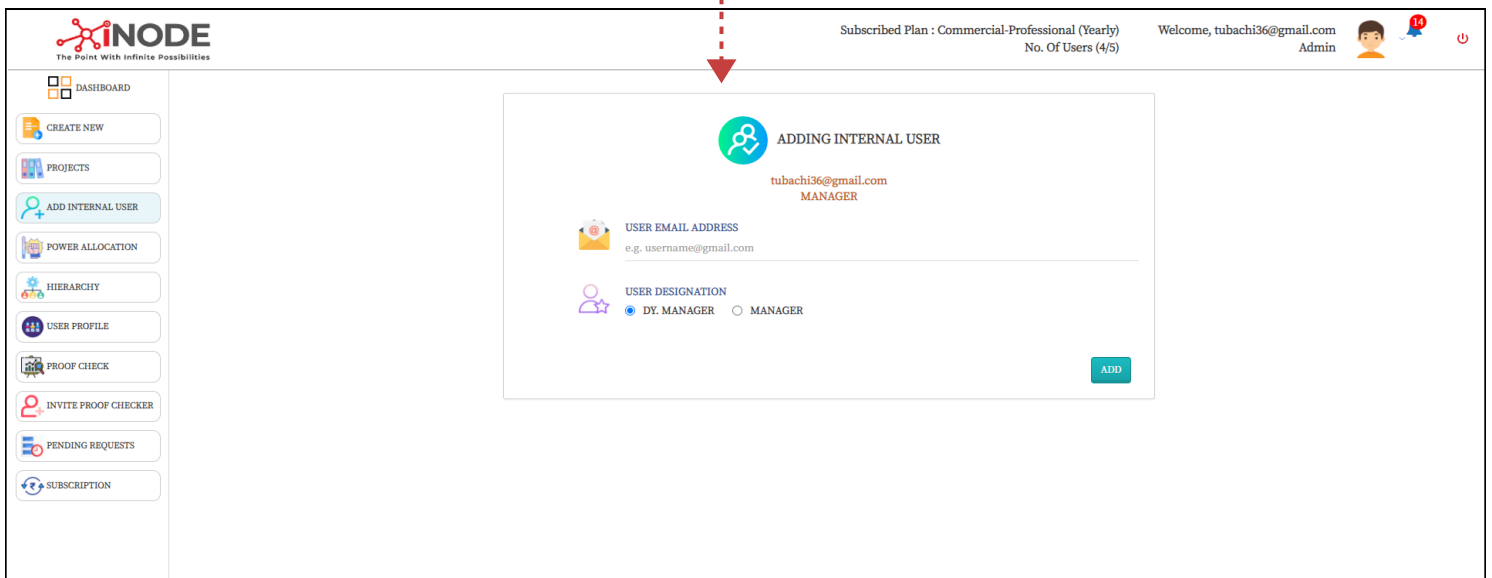
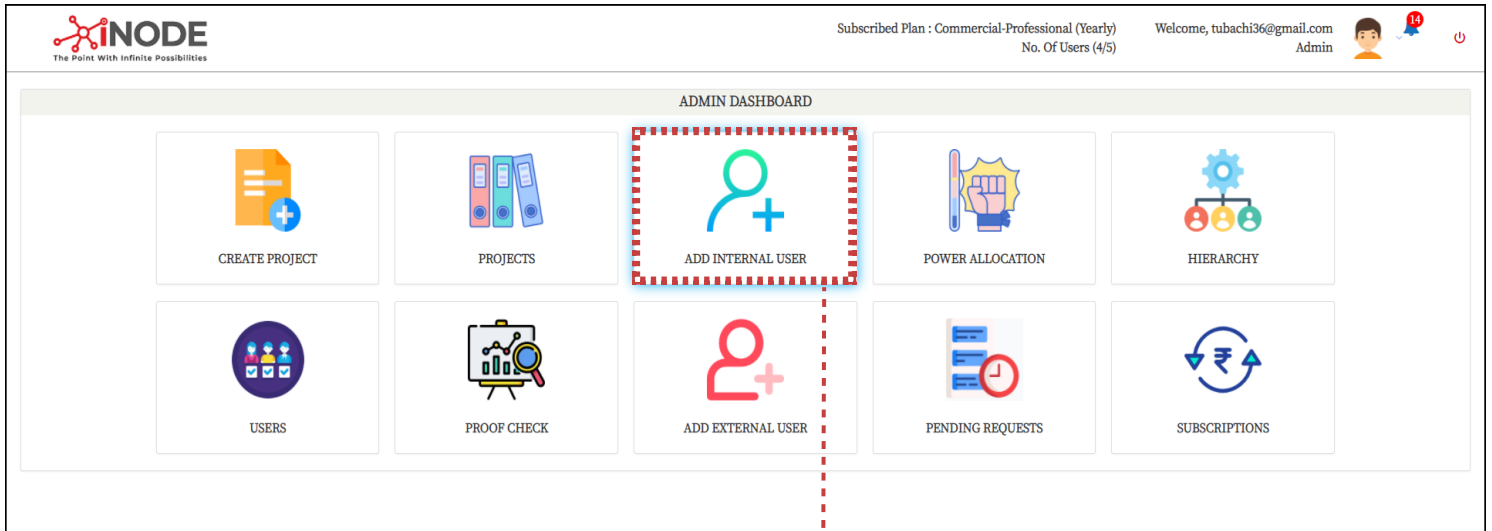
To elaborate: An user designated as "Admin" can view projects by the internal subordinates, eg. (Dy. Manager/ Manager as appointed and powered by the admin himself)

The designation of internal users and the hirerachy of internal users will be decided by the admin under "Hierarchy" as explained further.

The powers for viewing and managing the data of internal user subordinates will be decided by the admin under "Power"

Adding Internal Users

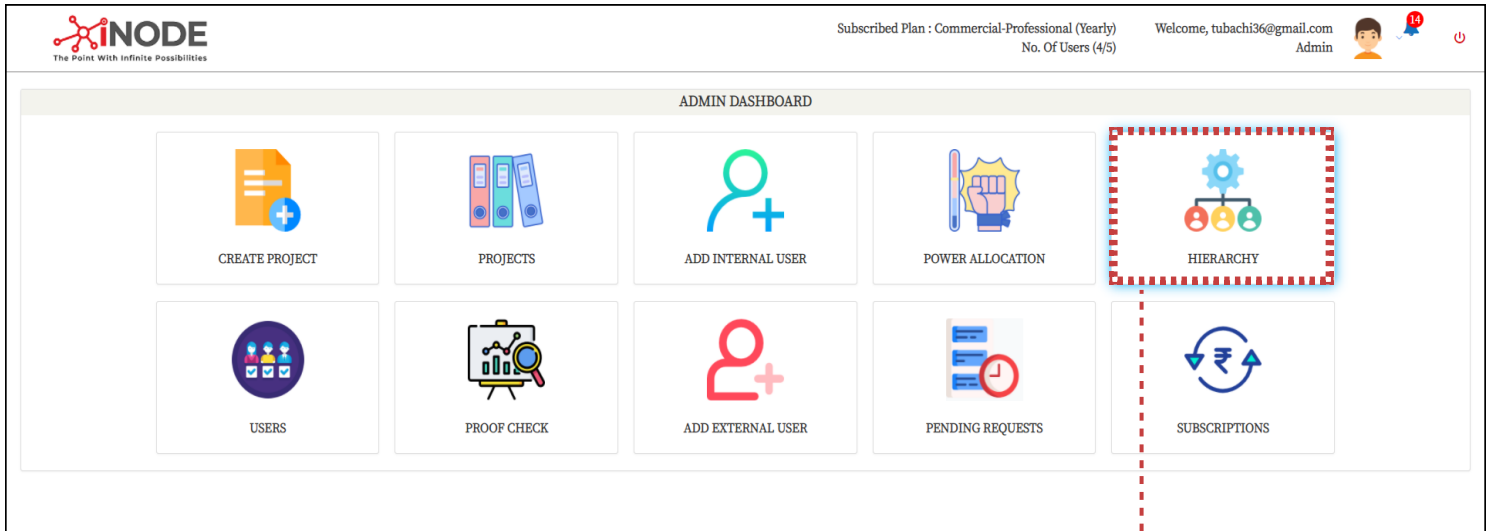
(User designation plays an important role in this)



Any user designated at higher authority by the admin can add their respective subordinates by assigning them designation.

Power Allocation of Internal Users

(User designation plays an important role in this)



ADMIN DASHBOARD

- CREATE PROJECT
- PROJECTS
- ADD INTERNAL USER
- POWER ALLOCATION
- HIERARCHY**
- USERS
- PROOF CHECK
- ADD EXTERNAL USER
- PENDING REQUESTS
- SUBSCRIPTIONS



HEIRARCHY

EDIT/UPDATE | VIEW TREE

EDIT/ UPDATE HIERARCHY:

- ✓ AUTHORITY STAGES
 - 1. ADMIN
 - 2. SUB ADMIN
 - 3. MANAGER
 - 4. DESIGNER
- ✓ LABELS

DEFAULTS	RENAME AS
ADMIN	Manager
SUB ADMIN	Dy. Manager
MANAGER	Manager

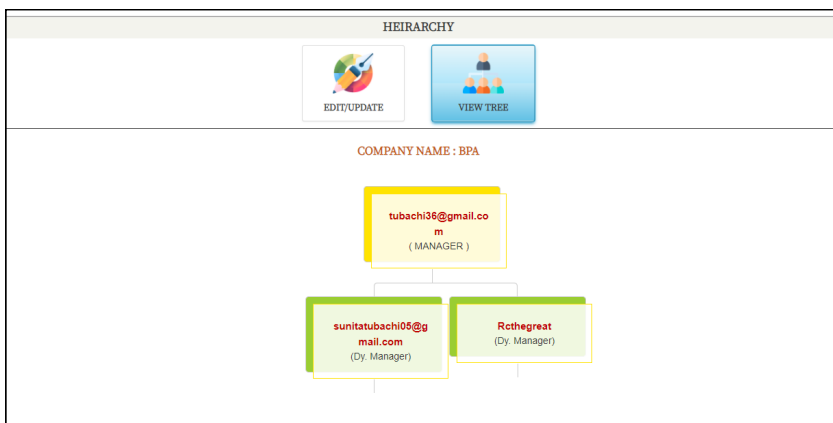
UPDATE

Note: Updating the hierarchy structure will reflect on the User Profile, User Projects, Power Allocation.

A user designated as "Admin" at registration can choose internal authority Stages / Designations for smooth functioning of internal management.

The ticks against the authority represents the authority/ designation are selected for further management. Unticking any authority will represent the authority will be absent.

A user as "Admin" can rename the default designation name as required and hit the "Update" button for the changes to be performed.



HEIRARCHY

EDIT/UPDATE | VIEW TREE

COMPANY NAME : BPA

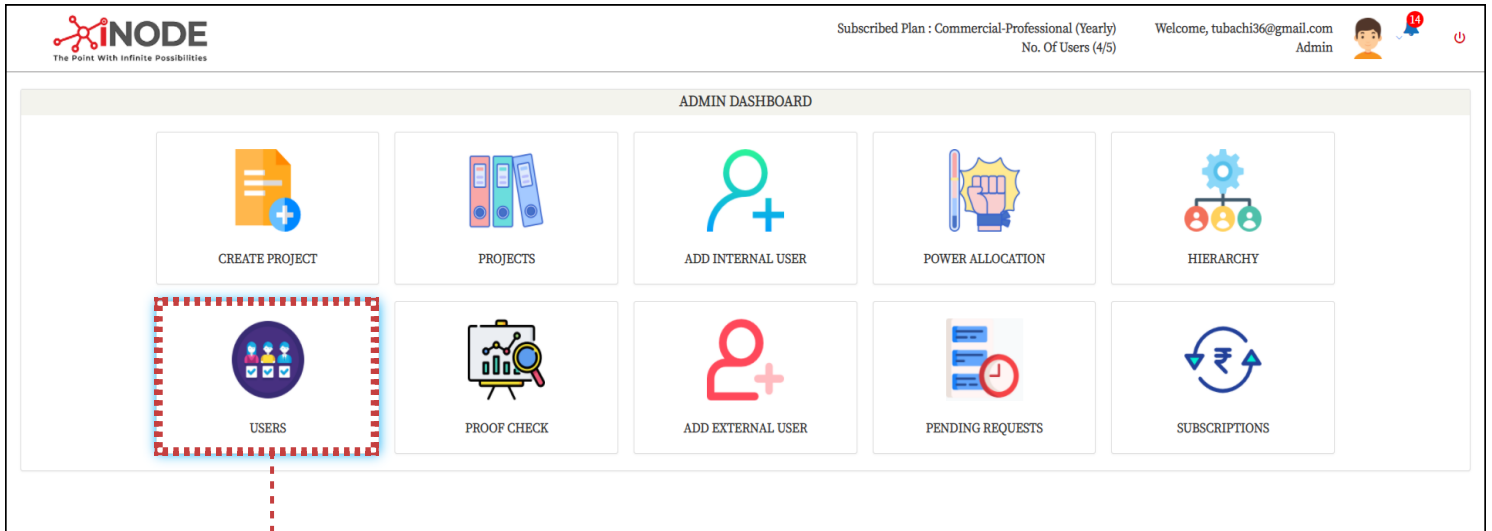
```

graph TD
    A["tubachi36@gmail.co  
m  
(MANAGER)"] --> B["sunitatubachi05@gmail.com  
mail.com  
(Dy. Manager)"]
    A --> C["Rothegreat  
(Dy. Manager)"]
  
```

THE TREE : View the entire internal hierarchy and user identities for understanding internal authorities and subordinates avoiding further confusions.

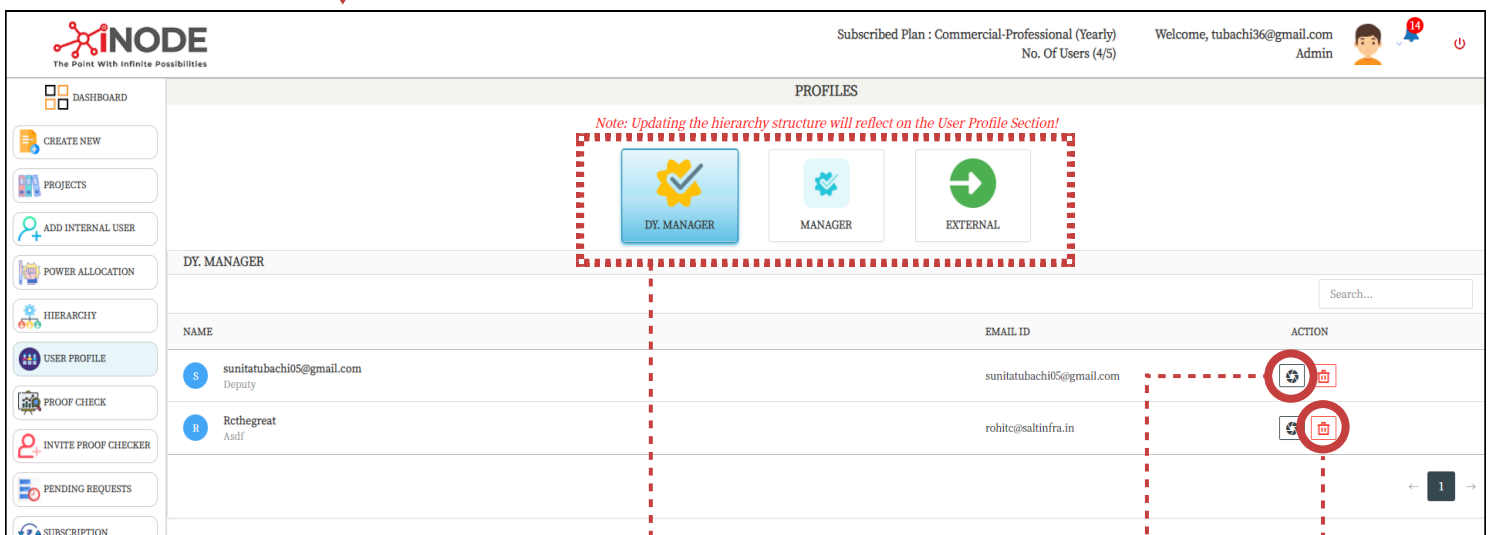
View your Subordinates & Externals

(User designation plays an important role in this)



ADMIN DASHBOARD







- CREATE PROJECT
- PROJECTS
- ADD INTERNAL USER
- POWER ALLOCATION
- HIERARCHY
- USERS**
- PROOF CHECK
- ADD EXTERNAL USER
- PENDING REQUESTS
- SUBSCRIPTIONS



PROFILES

Note: Updating the hierarchy structure will reflect on the User Profile Section!

DY. MANAGER MANAGER EXTERNAL

NAME	EMAIL ID	ACTION
 sunitatubachi05@gmail.com Deputy	sunitatubachi05@gmail.com	 
 Rcthegreat Asdf	rohitec@saltinfra.in	 

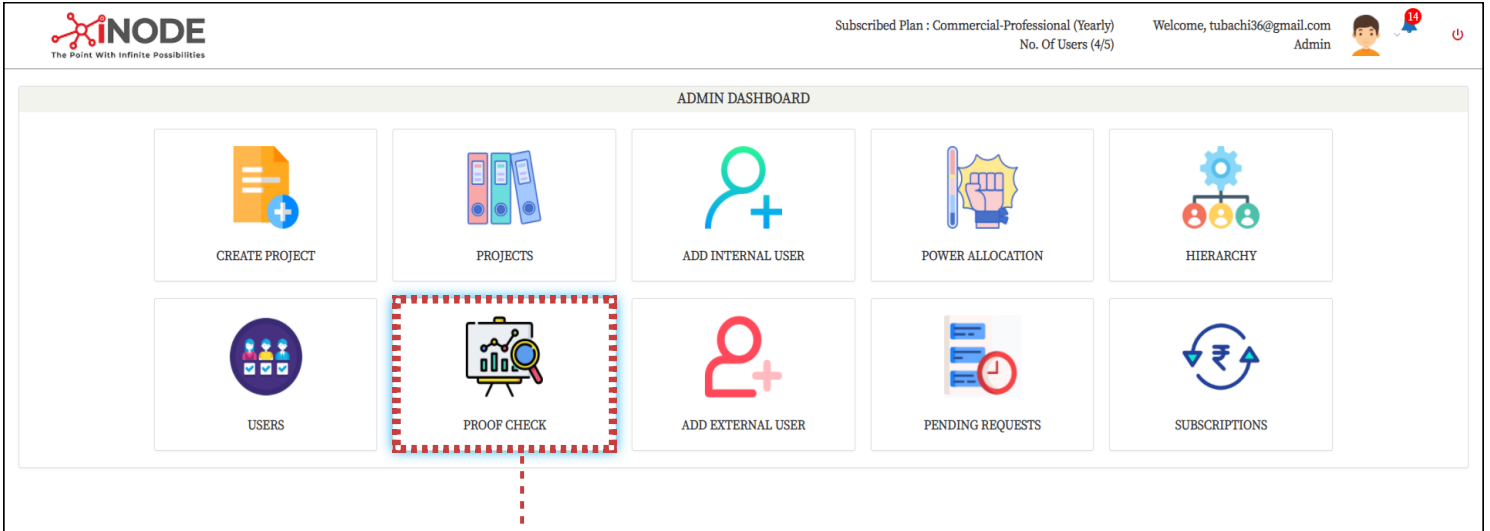
Individual subordinates of the user logged in will be displayed here and clicking the designation tabs will view the respective user list of that specific designation.

Quick access to that specific users project dashboard, profile and externals assigned.

Delete the user profile.

Proof Check Portal

(Valid for users who have the authority to as a Proof Checker)



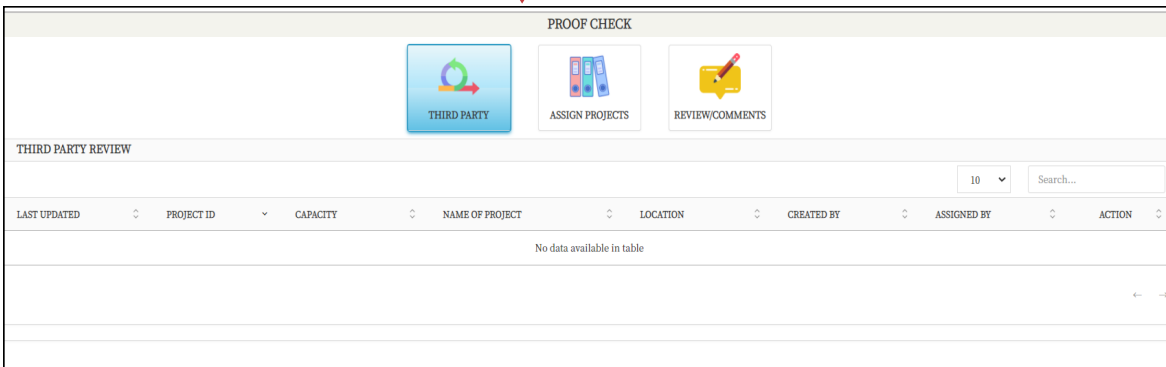
ADMIN DASHBOARD

Subscribed Plan : Commercial-Professional (Yearly)
No. Of Users (4/5)

Welcome, tubachi36@gmail.com
Admin

CREATE PROJECT | PROJECTS | ADD INTERNAL USER | POWER ALLOCATION | HIERARCHY

USERS | **PROOF CHECK** | ADD EXTERNAL USER | PENDING REQUESTS | SUBSCRIPTIONS



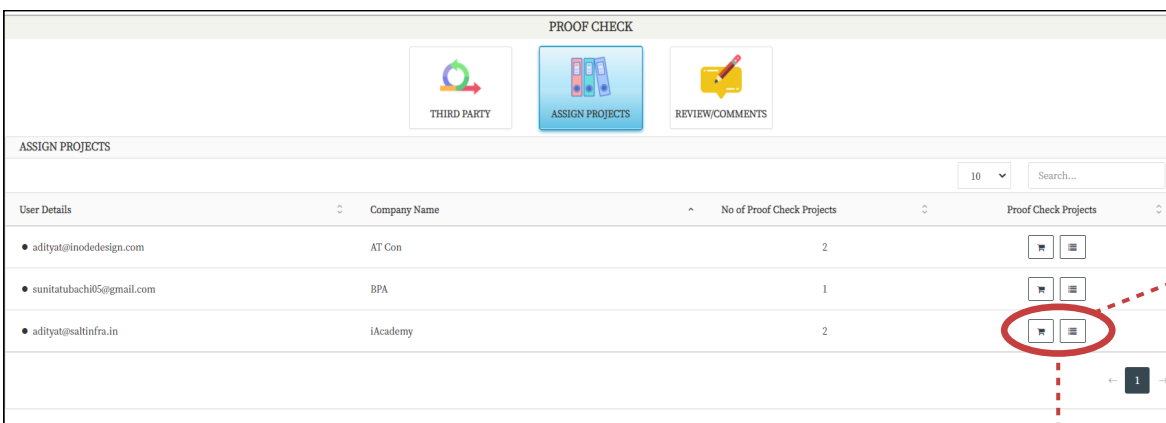
PROOF CHECK

THIRD PARTY | ASSIGN PROJECTS | REVIEW/COMMENTS

THIRD PARTY REVIEW

LAST UPDATED	PROJECT ID	CAPACITY	NAME OF PROJECT	LOCATION	CREATED BY	ASSIGNED BY	ACTION
No data available in table							







Know the list of External/
Third Party Proof check
projects user has been
assigned.



PROOF CHECK

THIRD PARTY | **ASSIGN PROJECTS** | REVIEW/COMMENTS

ASSIGN PROJECTS

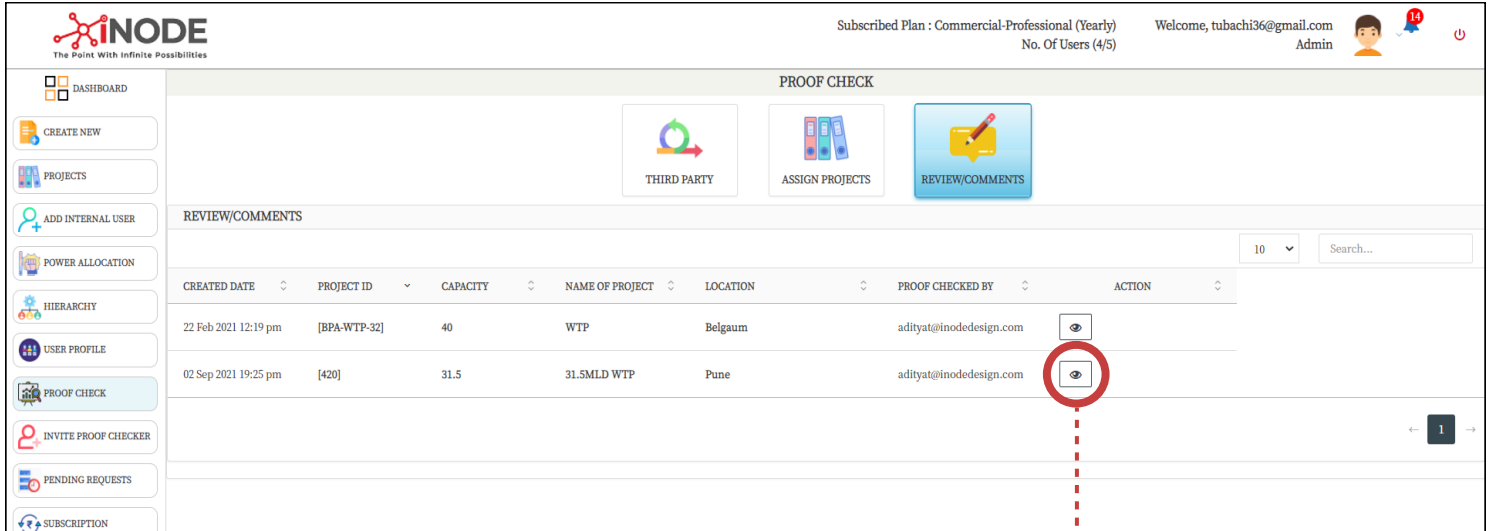
User Details	Company Name	No of Proof Check Projects	Proof Check Projects
• adityat@inodedesign.com	AT Con	2	 
• sunitatubachi05@gmail.com	BPA	1	 
• adityat@saltinfra.in	iAcademy	2	 

Bought Proof Check Projects

Buy Proof Check Projects

Proof Check Portal

(Valid for users who have the authority to as a Proof Checker)



Subscribed Plan : Commercial-Professional (Yearly)
No. Of Users (4/5)

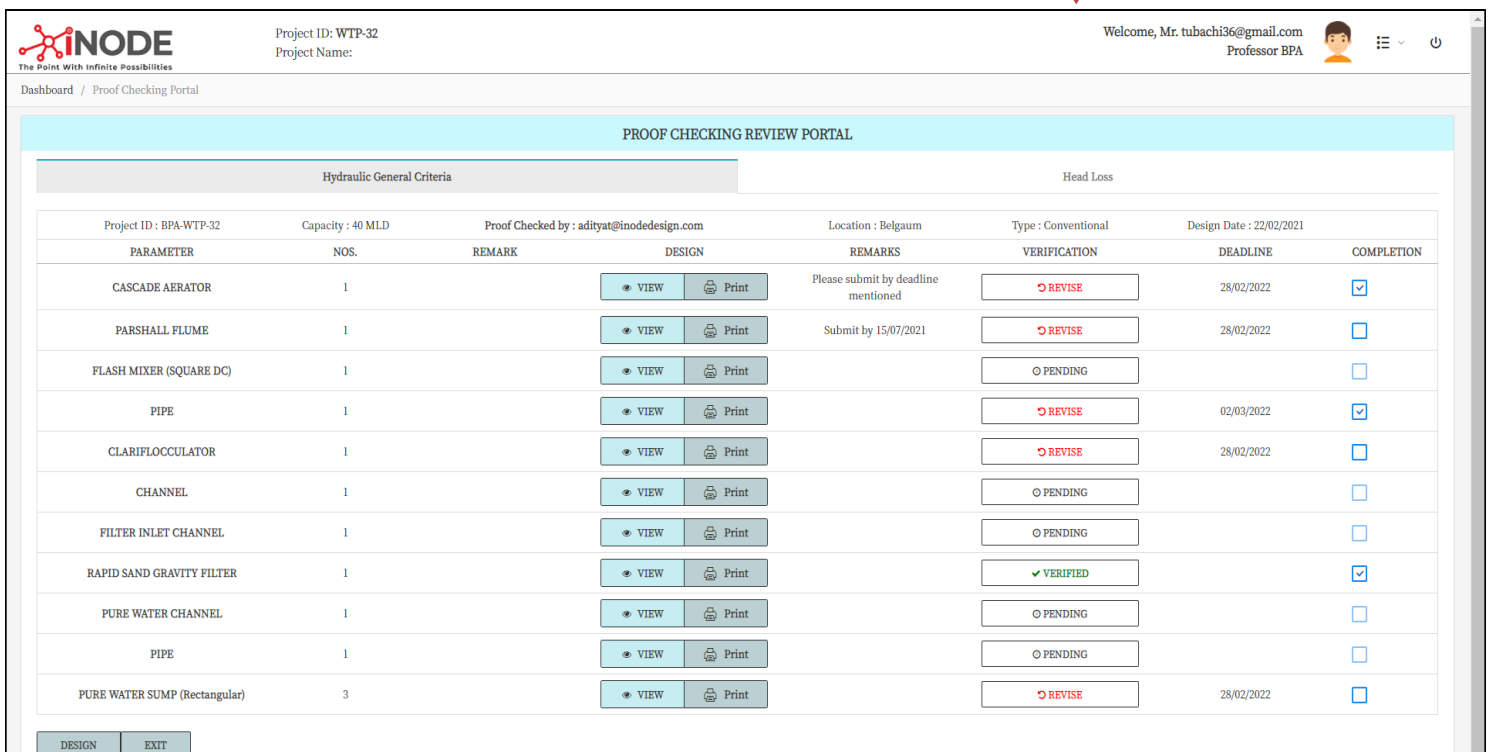
Welcome, tubachi36@gmail.com
Admin

PROOF CHECK

THIRD PARTY ASSIGN PROJECTS REVIEW/COMMENTS

REVIEW/COMMENTS

CREATED DATE	PROJECT ID	CAPACITY	NAME OF PROJECT	LOCATION	PROOF CHECKED BY	ACTION
22 Feb 2021 12:19 pm	[BPA-WTP-32]	40	WTP	Belgaum	adityat@inodedesign.com	
02 Sep 2021 19:25 pm	[420]	31.5	31.SMLD WTP	Pune	adityat@inodedesign.com	



Project ID: WTP-32
Project Name:

Welcome, Mr. tubachi36@gmail.com
Professor BPA

Dashboard / Proof Checking Portal

PROOF CHECKING REVIEW PORTAL

Hydraulic General Criteria Head Loss

PARAMETER	NOS.	REMARK	DESIGN	REMARKS	VERIFICATION	DEADLINE	COMPLETION
CASCADE AERATOR	1			Please submit by deadline mentioned		28/02/2022	<input checked="" type="checkbox"/>
PARSHALL FLUME	1			Submit by 15/07/2021		28/02/2022	<input type="checkbox"/>
FLASH MIXER (SQUARE DC)	1						<input type="checkbox"/>
PIPE	1					02/03/2022	<input checked="" type="checkbox"/>
CLARIFLOCCULATOR	1					28/02/2022	<input type="checkbox"/>
CHANNEL	1						<input type="checkbox"/>
FILTER INLET CHANNEL	1						<input type="checkbox"/>
RAPID SAND GRAVITY FILTER	1						<input checked="" type="checkbox"/>
PURE WATER CHANNEL	1						<input type="checkbox"/>
PIPE	1						<input type="checkbox"/>
PURE WATER SUMP (Rectangular)	3					28/02/2022	<input type="checkbox"/>

DESIGN EXIT

VERIFIED

Proof Checker has verified the particular element design.

PENDING

Proof Checker has not yet verified the particular element design and is pending.

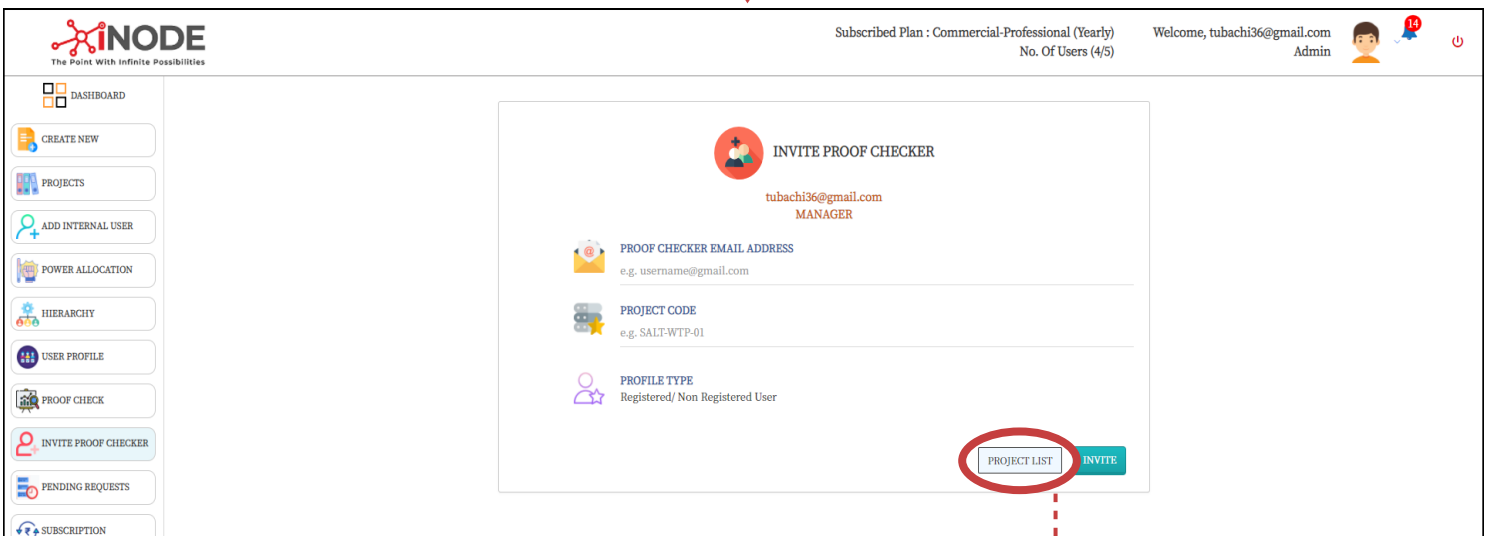
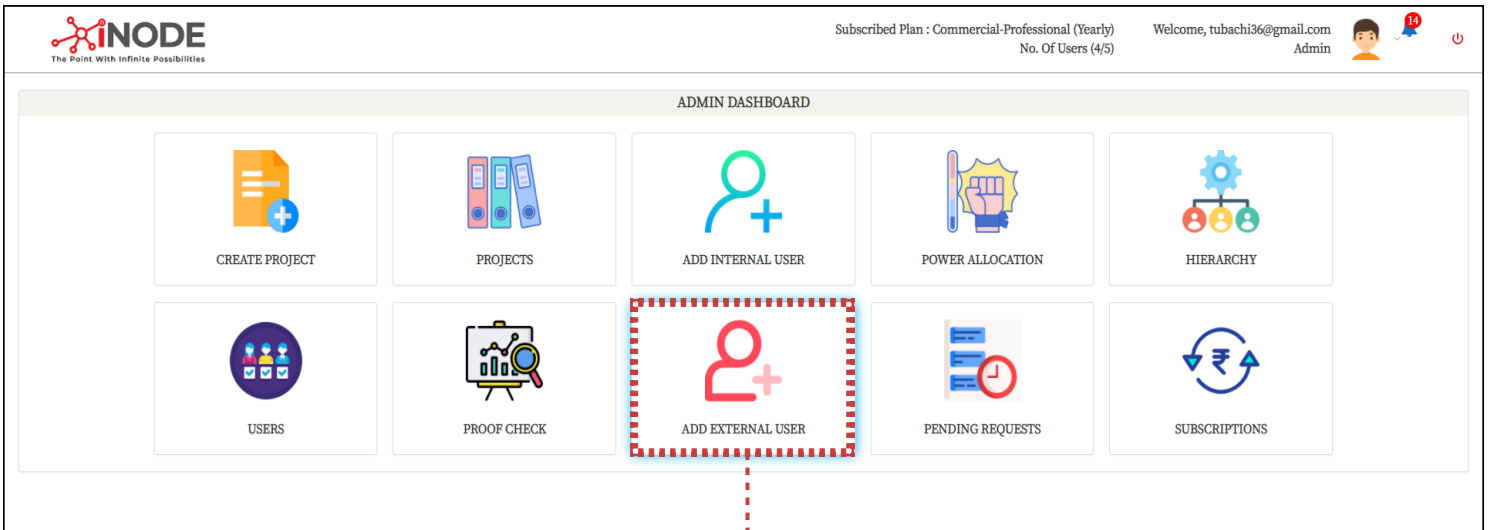
REVISE

Proof Checker wants the user to revise the design as per his mentioned remark.

Adding External User

(User designation plays an important role in this)

iNODE Feature: A user can add an existing internal user and request internal user to proof check your project by simply entering the email id of the internal user you want as proof checker thereby sending a request.

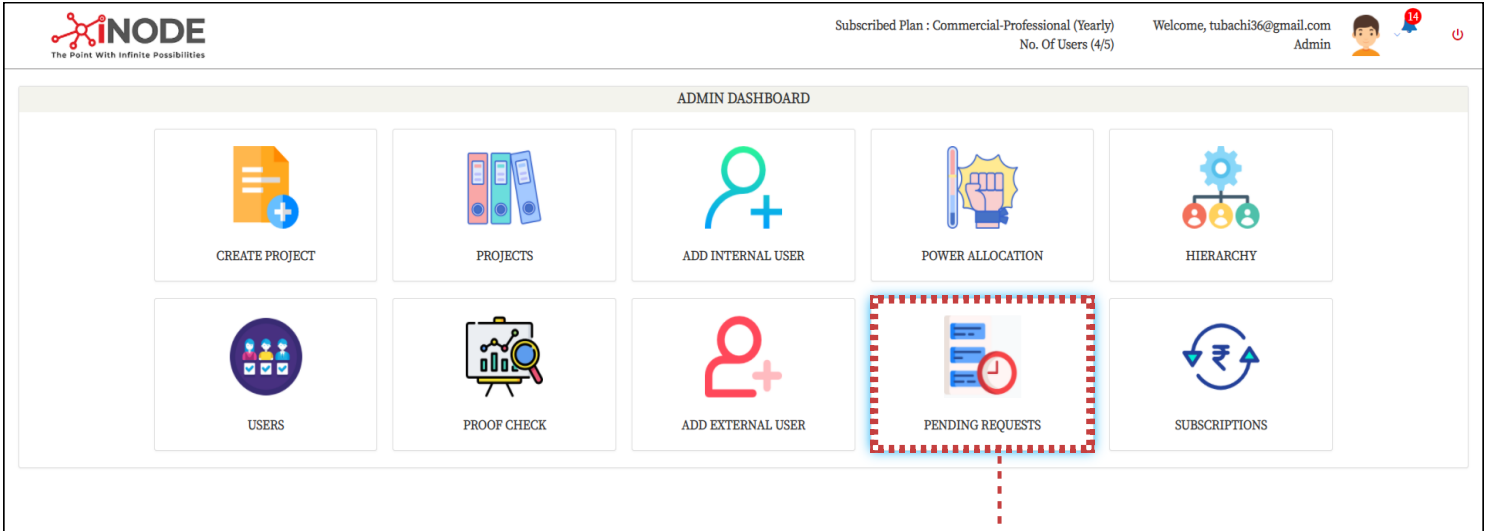


A user designated as Admin/ Subadmin & manager & if the power is allocated for the same by admin can then add an external proof checker by sending a request link to the external email id for a particular project required to be checked by simply filling the required information and paying the required amount.

Quick access to the project list for entering the required project code.

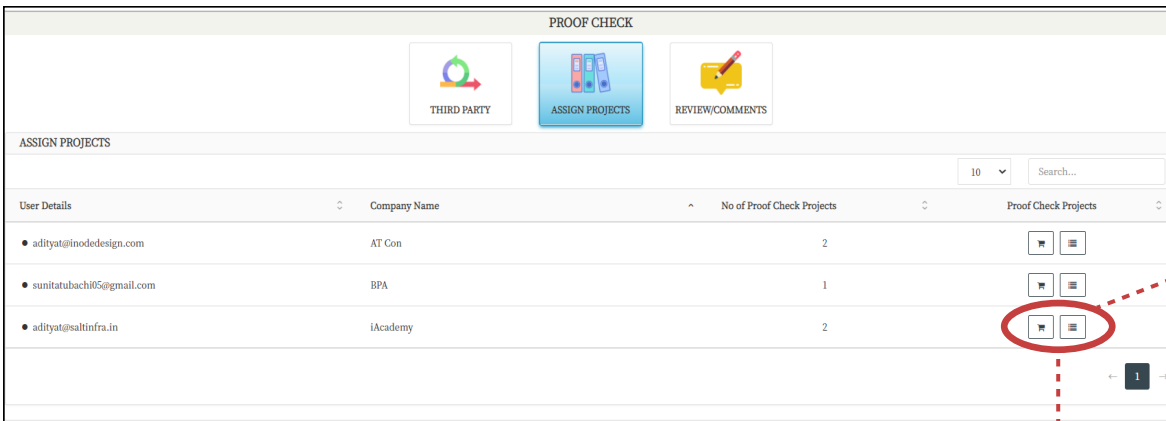
DISCLAIMER: Some of the subscription plans include specified number proof check projects for which payment will not be required.

Pending Requests



ADMIN DASHBOARD

- CREATE PROJECT
- PROJECTS
- ADD INTERNAL USER
- POWER ALLOCATION
- HIERARCHY
- USERS
- PROOF CHECK
- ADD EXTERNAL USER
- PENDING REQUESTS**
- SUBSCRIPTIONS




PROOF CHECK

THIRD PARTY | ASSIGN PROJECTS | REVIEW/COMMENTS


ASSIGN PROJECTS

User Details	Company Name	No of Proof Check Projects	Proof Check Projects
• adityat@inodedesign.com	AT Con	2	[BUY] [MENU]
• sunitatubachi05@gmail.com	BPA	1	[BUY] [MENU]
• adityat@salinfra.in	iAcademy	2	[BUY] [MENU]


Bought Proof Check Projects



Buy Proof Check Projects






Manage Subscription




Subscribed Plan : Commercial-Professional (Yearly)
No. Of Users (4/5)


Welcome, tubachi36@gmail.com
Admin


ADMIN DASHBOARD




CREATE PROJECT




PROJECTS




ADD INTERNAL USER




POWER ALLOCATION




HIERARCHY




USERS




PROOF CHECK



ADD EXTERNAL USER



PENDING REQUESTS



SUBSCRIPTIONS

SUBSCRIPTION

Educational

Commercial

INODE-ACADEMY

Silver

Gold

Platinum

UPGRADE NOW

Access Duration: 3 Months
Mode of Delivery: Online
Personalized Professional Portfolio
Downloadable Resources
Certificate of completion
Industry Insights

INSTITUTIONAL

Upto 30 User
WTP Design
Report with iNODE Logo
Drawings with iNode Logo
User Power Allocation
Advanced Dashboard

SUBSCRIPTION

Educational

INODE-ACADEMY

Silver

Gold

Platinum

UPGRADE NOW

Access Duration: 6 Months
Mode of Delivery: Online
Personalized Professional Portfolio
Downloadable Resources
Certificate of completion
Industry Insights

SUBSCRIPTION

Educational

INODE-ACADEMY

Silver

Gold

Platinum

UPGRADE NOW

Access Duration: 12 Months
Mode of Delivery: Online
Personalized Professional Portfolio
Downloadable Resources
Certificate of completion
Industry Insights

SUBSCRIPTION

Educational

Commercial

PROFESSIONAL

Upto 5 Users
WTP Design
Reports with Customized Logo
Drawings with Customized Logo
User Power Allocation
Access to Proof Checking Portal
Advanced Dashboard

MID SIZE ENTERPRISES

Upto 20 Users
WTP Design
Reports with Customized Logo
Drawings with Customized Logo
User Power Allocation
Access to Proof Checking Portal
Advanced Dashboard

LARGE ENTERPRISES

Upto 50 Users
WTP Design
Reports with Customized Logo
Drawings with Customized Logo
User Power Allocation
Access to Proof Checking Portal
Advanced Dashboard

DISCLAIMER: Some of the subscription plans include specified number proof check projects for which payment will not be required.



DESIGN PORTAL

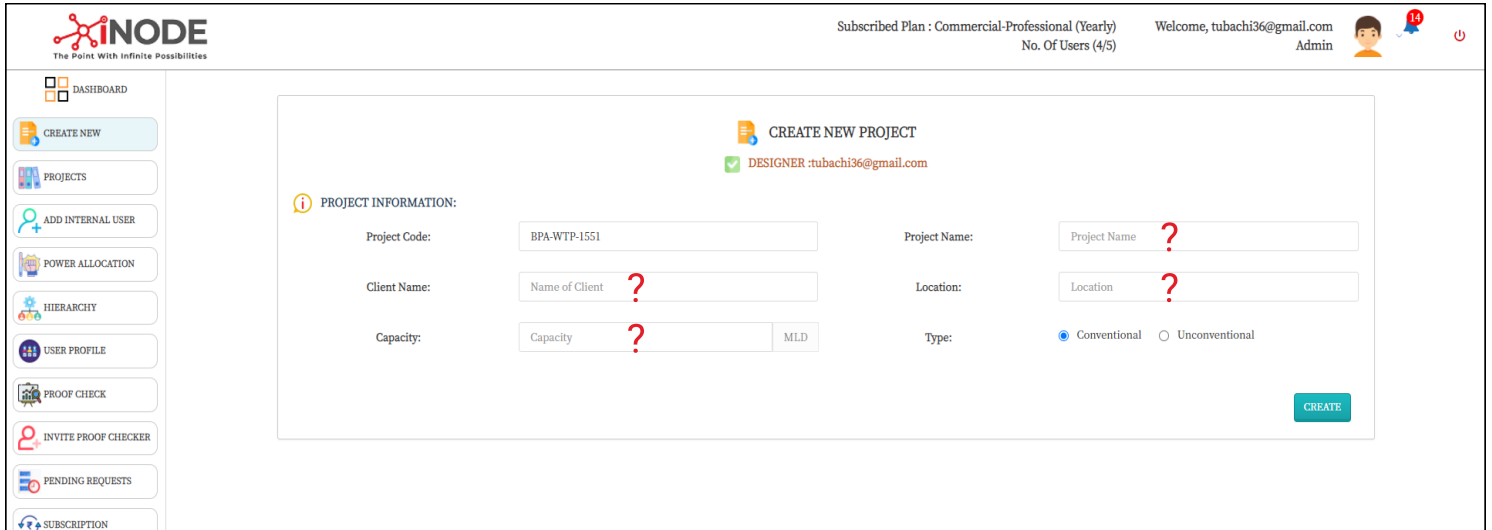




DESIGN ELEMENTS



Creating a Project



iNODE
The Point With Infinite Possibilities

Subscribed Plan : Commercial-Professional (Yearly)
No. Of Users (4/5)

Welcome, tubachi36@gmail.com
Admin

CREATE NEW PROJECT
DESIGNER :tubachi36@gmail.com

PROJECT INFORMATION:

Project Code: BPA-WTP-1551

Project Name: Project Name ?

Client Name: Name of Client ?

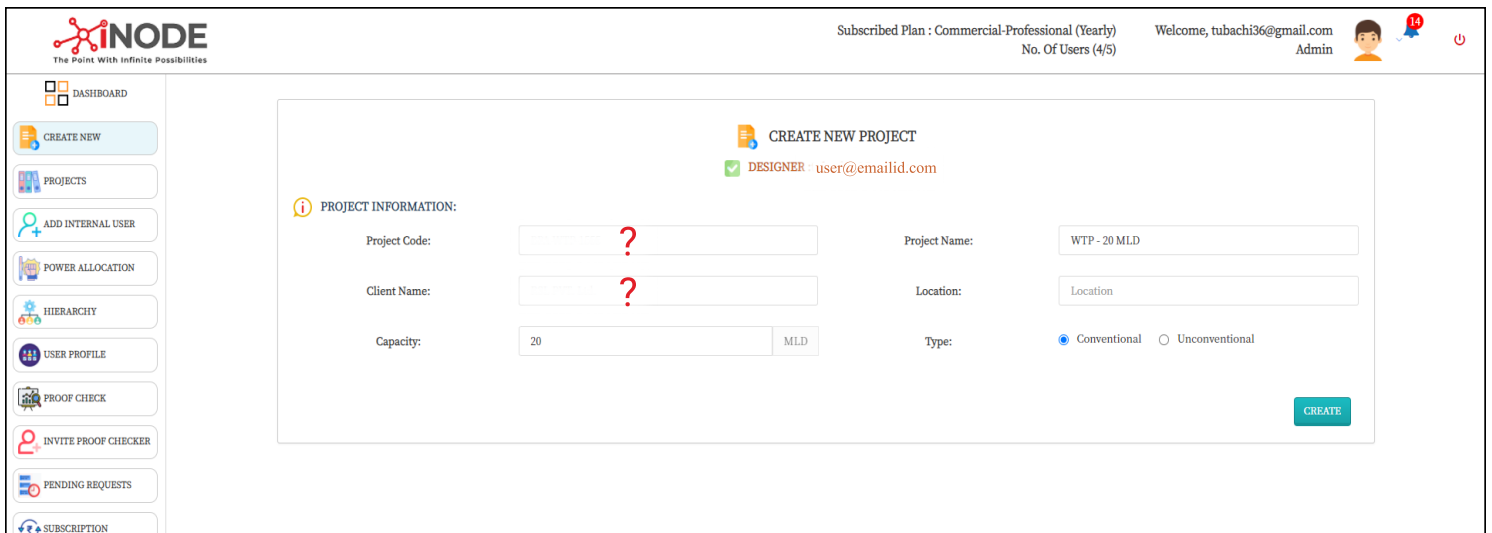
Location: Location ?

Capacity: Capacity ? MLD

Type: Conventional Unconventional

CREATE

Fill out the basic information as Project Name, Client Name, Location, Capacity in MLD and Type.



iNODE
The Point With Infinite Possibilities

Subscribed Plan : Commercial-Professional (Yearly)
No. Of Users (4/5)

Welcome, tubachi36@gmail.com
Admin

CREATE NEW PROJECT
DESIGNER user@emailid.com

PROJECT INFORMATION:

Project Code: WTP-20 MLD ?

Project Name: WTP - 20 MLD

Client Name: Name of Client ?

Location: Location

Capacity: 20 MLD

Type: Conventional Unconventional

CREATE

Hit the create button, and a new project is created to get started with.

Entering Number and Overloading / Loss for Design Elements

DESIGN ELEMENTS
Home / Select Design Elements

Numbers and Overloading
Flow Diagram

ELEMENT	NO. OF UNITS	TENDERED CRITERIA			SELECTED CRITERIA			EFFECTS ON HYDRAULIC DESIGN
		% OVERLOADING	% LOSS		% OVERLOADING	% LOSS	DESIGNED FLOW (m ³ /hr)	
		<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="checkbox"/>	<i>All Selected Values Same As Tendered</i>			
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	833.333	

NOTES:

* Cascade Aerator consists of Inlet Shaft.

* Parshall Flume consists of Upstream & Downstream Channel.

TENDERED CRITERIA: Input for values mentioned in Tender.

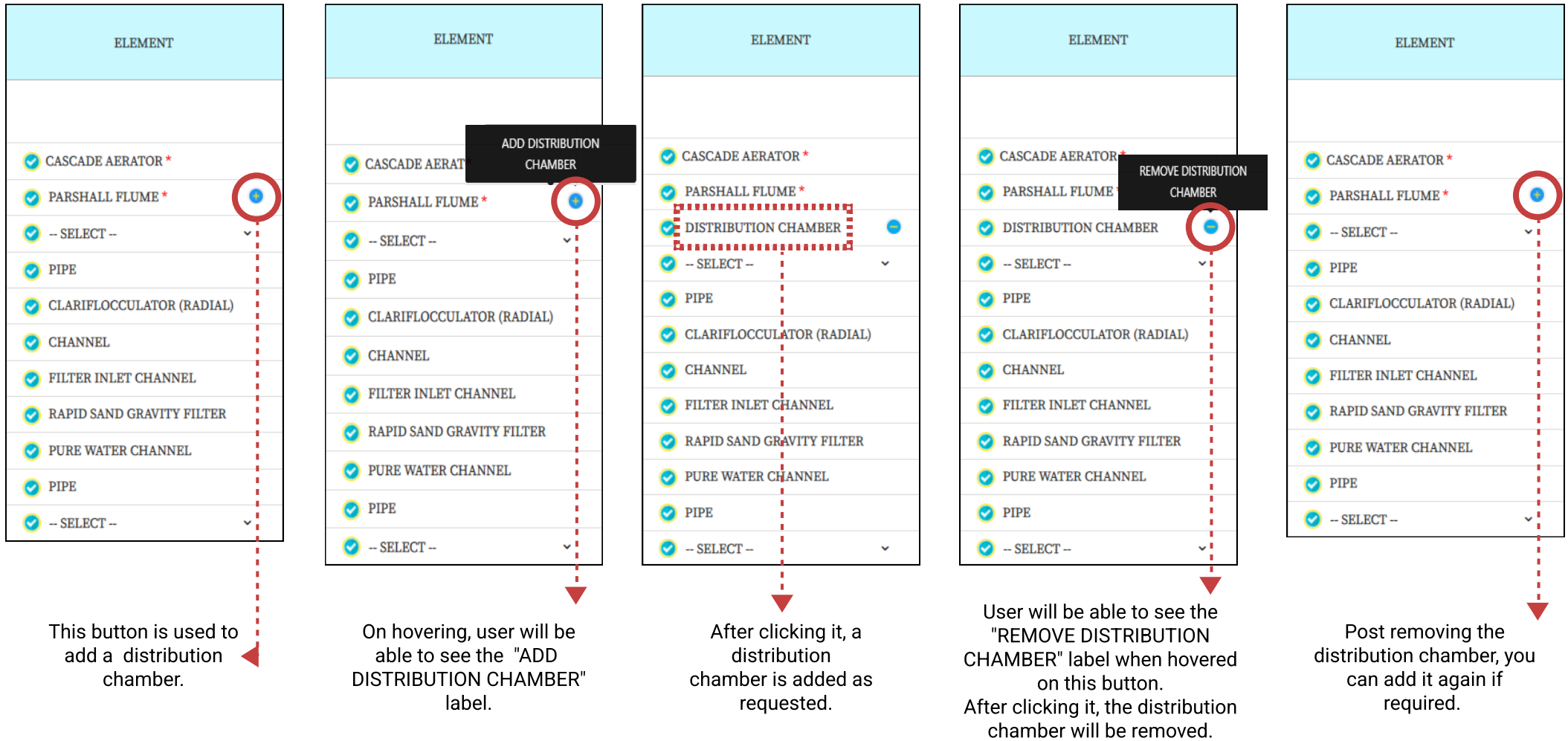
SELECTED CRITERIA: User can Input the values they want for further design purpose.

NOTE: After user has Entered values in selected criteria, for further design calculation selected criteria values will be used and tendered values will not be used.

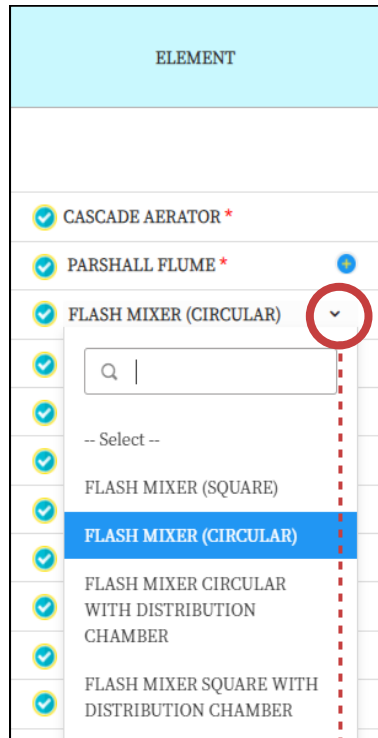
Previous
Save & Continue
?

Fill out the required fields with an detail explanation for the options and values required as provided below.

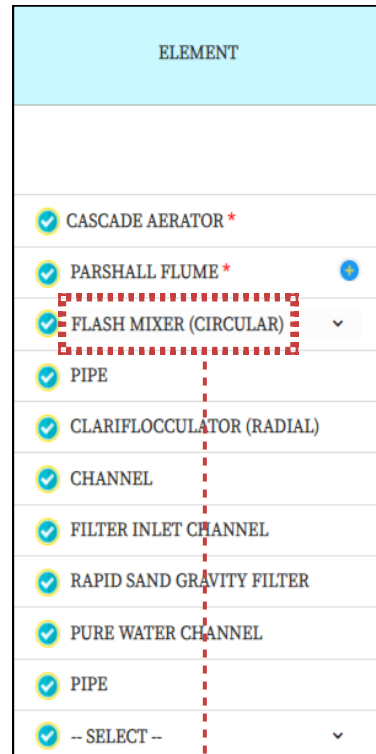
Selecting an additional Distribution Chamber as needed connecting Parshall Flume and Flash Mixer



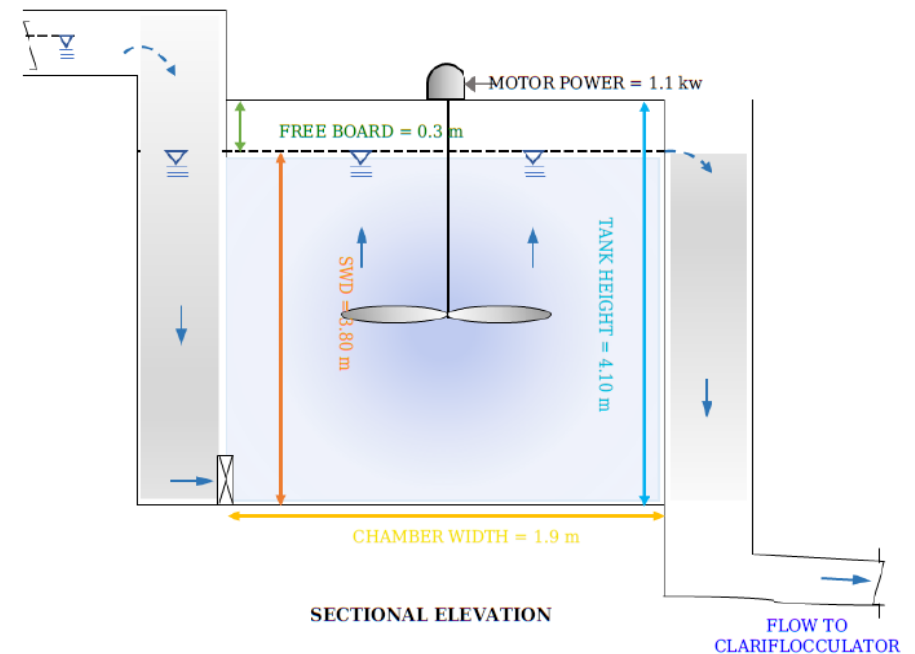
Selecting Flash Mixer & Sump Type



Post clicking the arrow a drop down list containing 4 types of flash mixer will appear.



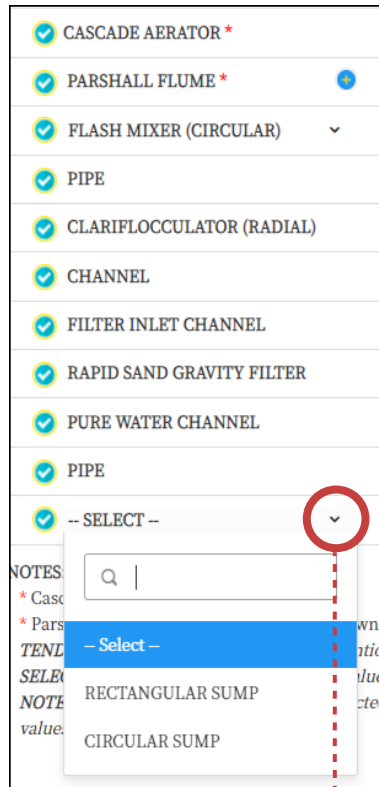
The user can select the flash mixer type as required for the WTP.



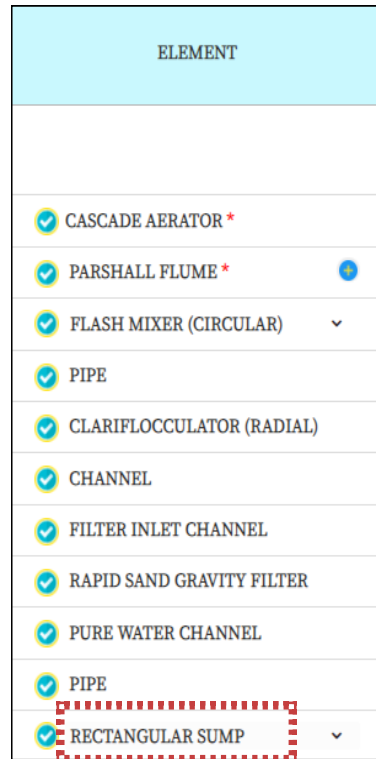
SECTIONAL ELEVATION

Figure - Flash Mixer Details
*For Schematic purpose only

Selecting Flash Mixer & Sump Type



Post clicking the arrow a drop down list containing 2 types of sump will appear.



The user can select the sump type as required for the WTP.

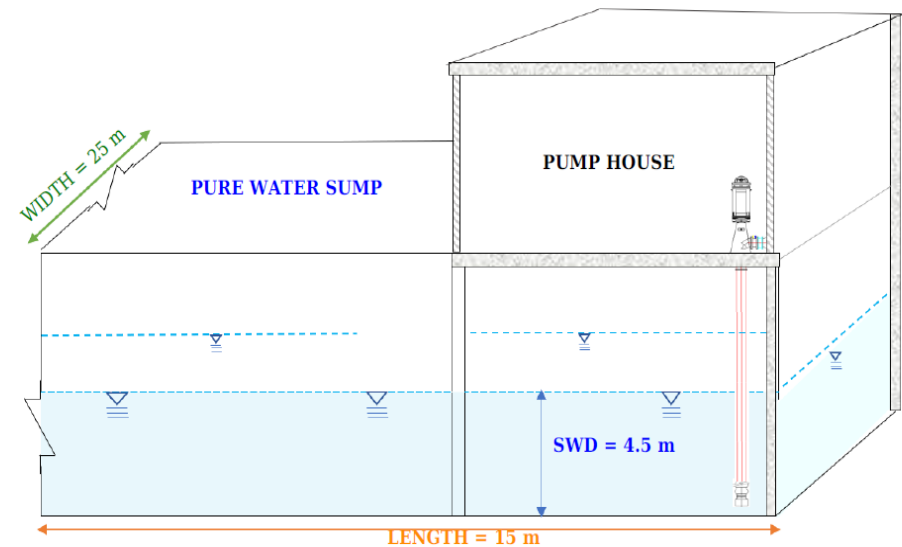





Figure - Pure Water Sump Details
*For Schematic purpose only.

Entering the Number of Units for each Element

ELEMENT	NO. OF UNITS
<input checked="" type="checkbox"/> CASCADE AERATOR *	1
<input checked="" type="checkbox"/> PARSHALL FLUME * 	1
<input checked="" type="checkbox"/> FLASH MIXER (CIRCULAR) 	<input type="text" value="1"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>
<input checked="" type="checkbox"/> CHANNEL	1
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>
<input checked="" type="checkbox"/> RECTANGULAR SUMP 	<input type="text" value="1"/>

- By default all the elements will have number of units as 1.
- User can input numbers of units for each element as per user experience.
- Channel, after clariflocculator will have by default same number as clariflocculator.

Entering Tendered Criteria for Overloading and Loss of each Element

ELEMENT	NO. OF UNITS	TENDERED CRITERIA	
		% OVERLOADING	% LOSS
		<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PARSHALL FLUME * <input checked="" type="checkbox"/>	1	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> FLASH MIXER (CIRCULAR) <input type="checkbox"/>	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> RECTANGULAR SUMP <input type="checkbox"/>	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>

- Overloading & Loss are basically an additional percentile flow value which increases the design capacity of the WTP considering unseen circumstances & losses which may occur.
- For some of the elements a defined overloading & loss value is mentioned in the tender. User can then enter the same value mentioned in the tender for that specific element.
- In cases where the values are absent in tender or a case where a tender is not issued, user can leave such fields of overloading / loss blank of tendered criteria.
- These values will reflect in the output design / validation reports.
- Note: Enter each value carefully.

Quick-fill all the tendered Values of Overloading & Loss

CASE - I All values of overloading & Loss are same for all the elements

ELEMENT	NO. OF UNITS	TENDERED CRITERIA	
		% OVERLOADING	% LOSS
		<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> FLASH MIXER (CIRCULAR) ▾	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> RECTANGULAR SUMP ▾	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>

ELEMENT	NO. OF UNITS	TENDERED CRITERIA	
		% OVERLOADING	% LOSS
		<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FLASH MIXER (CIRCULAR) ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RECTANGULAR SUMP ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>

Autofilled Values

Fields to enter values for carrying forward the same values for all the elements.

If the overloading & Loss values for each element are the same (Overloading & Loss can be different), then simply enter the values in these two field and all the other fields of each element will be auto filled carrying the value initially entered.

Quick-fill all the tendered Values of Overloading & Loss

CASE - II When only overloading values are same for all the elements

CASE - III When only loss values are same for all the elements.

ELEMENT	NO. OF UNITS	TENDERED CRITERIA	
		% OVERLOADING	% LOSS
		<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> FLASH MIXER (CIRCULAR) ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> RECTANGULAR SUMP ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value=""/>

Autofilled Values

ELEMENT	NO. OF UNITS	TENDERED CRITERIA	
		% OVERLOADING	% LOSS
		<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FLASH MIXER (CIRCULAR) ▾	<input type="text" value="1"/>	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value=""/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RECTANGULAR SUMP ▾	<input type="text" value="1"/>	<input type="text" value=""/>	<input type="text" value="5"/>

Autofilled Values

User can enter loss only "Overloading", for the same value to be carry forwarded all the elements as shown.

User can enter only "Loss" value , for the same value to be carryforwarded all the elements as shown.

Quick Trick

If values for loss and/ or overloading for maximum elements are same but for a few elements are different.

ELEMENT	NO. OF UNITS	TENDERED CRITERIA	
		% OVERLOADING	% LOSS
		<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FLASH MIXER (CIRCULAR) ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RECTANGULAR SUMP ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>

Autofilled Values

ELEMENT	NO. OF UNITS	TENDERED CRITERIA	
		% OVERLOADING	% LOSS
		<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text" value="20"/> ★	<input type="text" value="5"/> ★
<input checked="" type="checkbox"/> FLASH MIXER (CIRCULAR) ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="10"/> ★	<input type="text" value="10"/> ★
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text" value="20"/> ★	<input type="text" value="10"/> ★
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text" value="20"/>	<input type="text" value="5"/> ★
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="5"/> ★	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RECTANGULAR SUMP ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>

User should fill the value for overloading &/or loss which are same for maximum of the elements.

User can perform all the possible combinations required as starred by editing the values for the elements manually.

Quickly Entering Selected Criteria for Overloading and Loss of each Element.

ELEMENT	NO. OF UNITS	TENDERED CRITERIA			SELECTED CRITERIA	
		% OVERLOADING	% LOSS		% OVERLOADING	% LOSS
		<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/> <input type="button" value="v"/>	<i>All Selected Values Same As Tendered</i>	
<input checked="" type="checkbox"/> CASCADE AERATOR *	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> FLASH MIXER (CIRCULAR) ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="10"/>	<input type="text" value="10"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text"/>	<input type="text" value="10"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> RECTANGULAR SUMP ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Click the circled option and choose the "All" option from the list appeared.

User can use this option highlighted to quickly copy the similar tendered values in the selected field of the elements for both overloading & loss.

User can also use the check boxes for individual values of tendered criteria to be copied in the selected fields for overloading & loss.

Important Note: All the selected field values will be further used for design of each elements.

ELEMENT	NO. OF UNITS	TENDERED CRITERIA			SELECTED CRITERIA		
		% OVERLOADING	% LOSS		% OVERLOADING	% LOSS	DESIGNED FLOW (m ³ /hr)
		<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/> ▾	<i>All Selected Values Same As Tendered</i>		
<input checked="" type="checkbox"/> CASCADE AERATOR *	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="text" value="1,041.667"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	<input style="color: red; font-weight: bold; font-size: 1.2em;" type="text" value="?"/>
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="text" value="1,041.667"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="10"/>	<input type="text" value="10"/>	<input checked="" type="checkbox"/>	<input type="text" value="10"/>	<input type="text" value="10"/>	<input type="text" value="1,000.000"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text"/>	<input type="text" value="10"/>	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text" value="10"/>	<input style="color: red; font-weight: bold; font-size: 1.2em;" type="text" value="?"/>
<input checked="" type="checkbox"/> CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="text" value="1,041.667"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="text" value="1,041.667"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text"/>	<input style="color: red; font-weight: bold; font-size: 1.2em;" type="text" value="?"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="text" value="1,041.667"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="916.667"/>
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="text" value="1,041.667"/>

Post clicking the "All" option, similar values will appear in the selected field as entered in tendered.

Designed flow in m³/hr will appear for each element.

Some of the values in designed flow will not appear, which is not acceptable for further element design.

Entering Selected Criteria for Overloading and Loss of each Element Manually.

ELEMENT	NO. OF UNITS	TENDERED CRITERIA			SELECTED CRITERIA	
		% OVERLOADING	% LOSS		% OVERLOADING	% LOSS
		<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<i>All Selected Values Same As Tendered</i>	
<input checked="" type="checkbox"/> CASCADE AERATOR *	<input type="text" value="1"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="10"/>	<input type="text" value="10"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="10"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<i>Fill this Manually</i>	<input type="text"/>
<input checked="" type="checkbox"/> CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="0"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>

- A user can enter values in the fields of overloading and loss of selected criteria for each individual element as per user experience and knowledge.
- A user must be very carefull while filling the selected criteria fields as these values will be carried forward for the design capacity each element.
- A user must not leave any fields of selected criteria blank/empty. If a user has no specified value a "zero" should be entered.

Important Note: All the selected field values will be further used for design of each elements.

Quick Trick

If values for loss and/or overloading for maximum elements are same as tendered but a few are different

ELEMENT	NO. OF UNITS	TENDERED CRITERIA			SELECTED CRITERIA	
		% OVERLOADING	% LOSS		% OVERLOADING	% LOSS
		<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/> <input type="button" value="v"/>	<i>All Selected Values Same As Tendered</i>	
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="10"/>	<input type="text" value="10"/>	<input checked="" type="checkbox"/>	<input type="text" value="10"/>	<input type="text" value="10"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text"/>	<input type="text" value="10"/>	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text" value="10"/>
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text" value="20"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>

Ticks indicate that the values are copied from tender fields

Copy all the values by using this "All" option.

ELEMENT	NO. OF UNITS	TENDERED CRITERIA			SELECTED CRITERIA	
		% OVERLOADING	% LOSS		% OVERLOADING	% LOSS
		<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/> <input type="button" value="v"/>	<i>All Selected Values Same As Tendered</i>	
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="10"/>	<input type="text" value="10"/>	<input checked="" type="checkbox"/>	<input type="text" value="10"/>	<input type="text" value="10"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="10"/>	<input checked="" type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="10"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text" value="20"/>	<input type="text" value="0"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> -- SELECT --	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>

As highlighted above a user can change any of the values manually from selected criteria. In addition to this user shall make sure that none of the field are left blank/empty and a zero is entered in such fields.

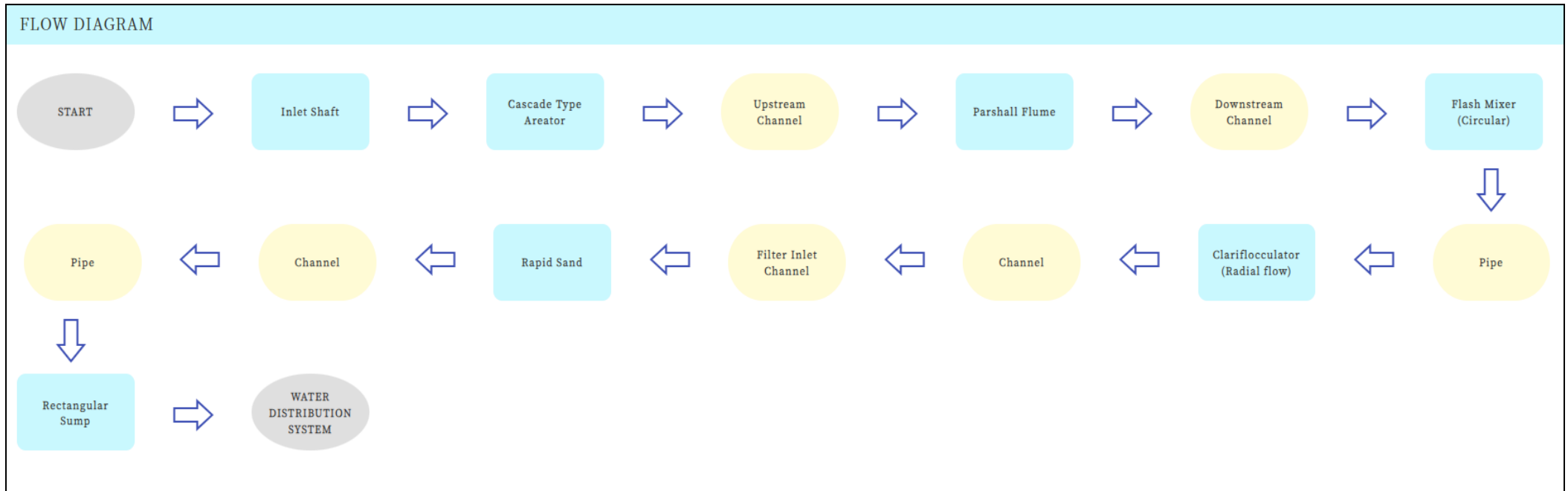
If values for loss and / or overloading for some elements are same as tendered.

ELEMENT	NO. OF UNITS	TENDERED CRITERIA			SELECTED CRITERIA	
		% OVERLOADING	% LOSS		% OVERLOADING	% LOSS
		<input type="text" value="20"/>	<input type="text" value="5"/>	<input type="checkbox"/> ▾	<i>All Selected Values Same As Tendered</i>	
<input checked="" type="checkbox"/> CASCADE AERATOR *	1	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value=""/>
<input checked="" type="checkbox"/> PARSHALL FLUME *	1	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> -- SELECT -- ▾	<input type="text" value="1"/>	<input type="text" value="10"/>	<input type="text" value="10"/>	<input type="checkbox"/>	<input type="text" value="10"/>	<input type="text" value="10"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="0"/>	<input type="text" value="10"/>	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="10"/>
<input checked="" type="checkbox"/> CLARIFLOCCULATOR (RADIAL)	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> CHANNEL	1	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> FILTER INLET CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> RAPID SAND GRAVITY FILTER	1	<input type="text" value="20"/>	<input type="text" value="0"/>	<input type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="0"/>
<input checked="" type="checkbox"/> PURE WATER CHANNEL	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> PIPE	<input type="text" value="1"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="checkbox"/>	<input type="text" value="5"/>	<input type="text" value="5"/>
<input checked="" type="checkbox"/> -- SELECT -- ▾	<input type="text" value="1"/>	<input type="text" value="20"/>	<input type="text" value="5"/>	<input checked="" type="checkbox"/>	<input type="text" value="20"/>	<input type="text" value="5"/>

- A user can simply click on check boxes for the individual elements whose values are to be copied in the selected fields.
- Rest of the fields in selected criteria can be filled manually for the remaining elements.

After entering the values, click on  to see the flow diagram.

Know the Entire Flow of Elements of your Water Treatment Plants



- After selecting the element types & filling all the necessary information user, will then be able to see the flow diagram.
- This flow diagram will be the exact representation of the user inputs and selection performed at the Number & Overloading screen.

After entering the values, click on  to see the flow diagram.

In any case the user is in doubt or wants to change anything in the numbers & overloading screen, user can click  & perform the necessary changes.

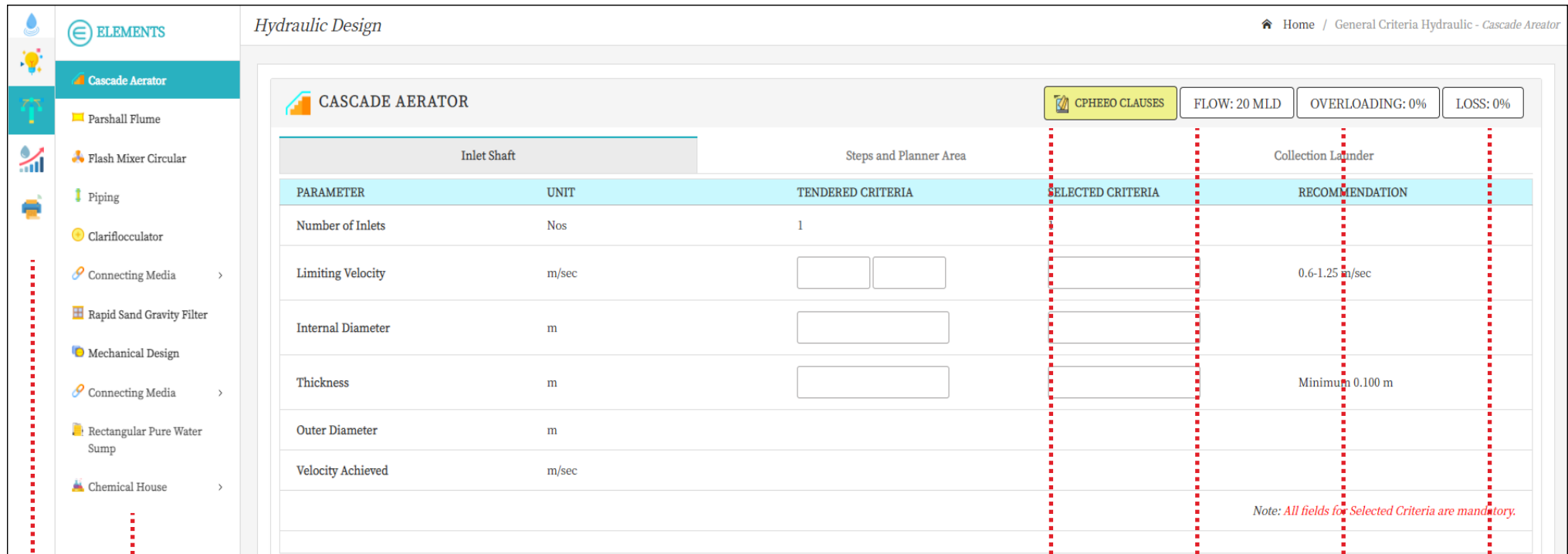


START DESIGNING THE ELEMENTS



Know your Element Design Screen Icons/Features

Part 1



Hydraulic Design Home / General Criteria Hydraulic - Cascade Aerator

CASCADE AERATOR CPHEEO CLAUSES FLOW: 20 MLD OVERLOADING: 0% LOSS: 0%

Inlet Shaft		Steps and Planner Area		Collection Launder	
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION	
Number of Inlets	Nos	1			
Limiting Velocity	m/sec	<input type="text"/>	<input type="text"/>	0.6-1.25 m/sec	
Internal Diameter	m	<input type="text"/>	<input type="text"/>		
Thickness	m	<input type="text"/>	<input type="text"/>	Minimum 0.100 m	
Outer Diameter	m	<input type="text"/>	<input type="text"/>		
Velocity Achieved	m/sec	<input type="text"/>	<input type="text"/>		

Note: All fields for Selected Criteria are mandatory.

Main Options
Element Options

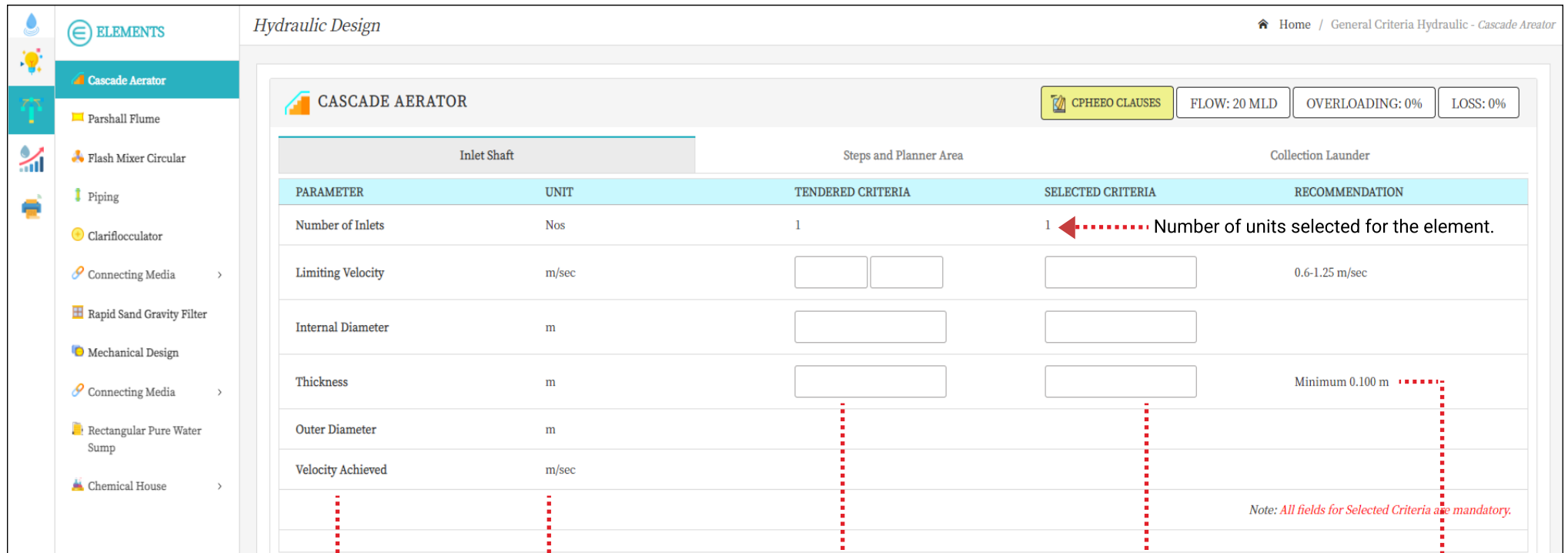
Quick access to the user for clauses mentioned in the CPEEHO Manual design clauses for each specific element.

Capacity Value entered by user during project creation.

Design Overloading & Loss values user entered / copied in selected criteria of respective fields.

Know your Element Design Screen Icons/Features

Part 2



PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
Number of Inlets	Nos	1	1	
Limiting Velocity	m/sec	<input type="text"/>	<input type="text"/>	0.6-1.25 m/sec
Internal Diameter	m	<input type="text"/>	<input type="text"/>	
Thickness	m	<input type="text"/>	<input type="text"/>	Minimum 0.100 m
Outer Diameter	m	<input type="text"/>	<input type="text"/>	
Velocity Achieved	m/sec	<input type="text"/>	<input type="text"/>	

Parameters required to be filled for the design of specific element.

Units of each individual element.

Input fields user shall enter a value if the tender has mentioned value for that specific parameter. In case of values not present in tender user can leave such fields empty / blank.

Input fields where user shall enter value for that specific parameter based on experience & knowledge of design or as mentioned in tender. These values will be further used for design of that element. In any case user cannot leave any of the field blank/empty.

This is the recommended value/ range based on either standard design/CPEEHO Manual/Reverse calculations. This ensures user input values are within standard design practices.

Detailed Icon Explanation



DESIGN ELEMENTS

Choose design elements, numbers, overloading & losses for each element.



HYDRAULIC DESIGN

Standard step by step hydraulic design of each element.



HEAD LOSSES

Performing step by step head loss calculations for each element.



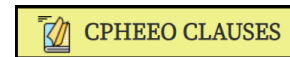
PRINT

Create templates and download/print outputs for design reports and design drawings.



ELEMENTS LIST

Represents the flow of elements selected for further designs.



List of CPHEEO manual clauses for the specific screen.



Displays the selected capacity of WTP, overloading and loss for the design element.



This specific input field is for the value mentioned in the tender for that particular element.



This specific input field is for the value the designer wants to design the particular parameter.



These are the values displayed post standard reverse calculations and/or CPHEEO manual values.

Start Designing an Element

Hydraulic Design Home / General Criteria Hydraulic - Cascade Aerator

CASCADE AERATOR CPHEEO CLAUSES FLOW: 20 MLD OVERLOADING: 15% LOSS: 5%

Inlet Shaft Steps and Planner Area Collection Launder

PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
Number of Inlets	Nos	1	1	
Limiting Velocity	m/sec	<input type="text" value="0.65"/>	<input type="text" value="0.7"/>	✔ 0.6-1.25 m/sec
Internal Diameter	m	<input type="text"/>	<input type="text" value="0.650"/>	✔ 0.649 m
Thickness	m	<input type="text"/>	<input type="text" value="0.125"/>	✔ Minimum 0.100 m
Outer Diameter	m		0.9	✔
Velocity Achieved	m/sec		0.698	✔
Note: All fields for Selected Criteria are mandatory.				


↓

Sub Element Tabs, grey fill represents the selected sub element tab.

For the start we would like to draw your attention towards the simple designing experience for which one sub - element i.e. Inlet Shaft will be designed and explained. The other elements can be designed on the same line using iNode software. In all the design elements the highlights will be mentioned further for better understanding.


Note: The screen values in the input fields are only for explaining the working of the software and in no case are recommended for actual design purpose.

Know how to fill values in tendered and selected criteria

PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
Number of Inlets	Nos	1	1	
Limiting Velocity	m/sec	<input type="text" value="0.7"/>	<input type="text" value="0.7"/>	 0.6-1.25 m/sec


Here selected value i.e. 0.7 is verified whether it is in the recommended range of 0.6 - 1.25 m/sec.

When a value of a specific parameter is mentioned in tender, user can enter the value in the tendered criteria and use the same value for further design by entering the value in selected criteria field. The value then entered in the selected criteria will be verified against the standard design / CPEEHO recommended range.

PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
Number of Inlets	Nos	1	1	
Limiting Velocity	m/sec	<input type="text" value="0.7"/>	<input type="text" value="0.57"/>	 0.6-1.25 m/sec

Here selected value i.e. 0.57 is not in the recommended range of 0.6 - 1.25 m/sec and needs to be revised.

When a value of a specific parameter is mentioned in tender, user can enter the value in the tendered criteria but in selected criteria field user can enter any other value than tendered mentioned as per user experience & knowledge and use the value for further design. The value then entered in the selected criteria will be verified against the standard design / CPEEHO recommended range. Here the software ensures user is within the Codal/standard design practice values.

PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
Number of Inlets	Nos	1	1	
Limiting Velocity	m/sec	<input type="text" value="0.5"/>	<input type="text" value="0.65"/>	 0.6-1.25 m/sec

Here selected value i.e. 0.65 is verified whether it is in the recommended range of 0.6 - 1.25 m/sec.

When a value of a specific parameter is mentioned in tender, but user can notice the value not being in the recommended ranges, user can thereby input the value as per user experience & knowledge by taking an additional help of recommended ranges and use the value for further design. The value then entered in the selected criteria will be verified against the standard design / CPEEHO recommended range. Here the software ensures user is within the Codal/standard design practice values.

The above mentioned user input ways with verification of the selected values can be followed for all the other input fields of tendered and selected criteria as specified

Know how the values entered in selected criteria affect the next parameter and reverse calculation works .

Inlet Shaft		Steps and Planner Area		Collection Launder	
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA		RECOMMENDATION
Number of Inlets	Nos	1	1		
Limiting Velocity	m/sec	0.65	0.7	✓	0.6-1.25 m/sec
Internal Diameter	m		0.650	✓	0.649 m

After the user has entered limiting velocity value, iNODE will perform reverse calculation for minimum required diameter as shown below:

Number of Units, Overloading and Loss user has entered for Cascade Aerator. In this case **Number of Units = 1, Overloading = 15% and Loss = 5%**

PARAMETER	FORMULAE USED
Designed Flow per Unit	$Designed\ Flow\ per\ Unit = \frac{Flow \times \left[\frac{Overloading}{100} + \frac{Loss}{100} \right] + Flow}{No\ of\ Units}$
Designed Flow per Unit	$Q = \frac{Designed\ Flow\ per\ Unit \times 10^3}{24 \times 60 \times 60}$
A _{shaft} required	$A_{shaft\ Required} = \frac{Q}{V_{Limiting}}$
D _{shaft} required	$D_{shaft\ Required} = \sqrt{\frac{A \times 4}{\pi}}$
D _{shaft} provided	$D_{shaft\ Provided} = Internal\ Diameter\ (provided) + 2 \times Thickness$

<p>1.1 ASSUMPTIONS:</p> <ul style="list-style-type: none"> ➤ Assume velocity of flow through Inlet Shaft (Recommended Range 0.6-1.25 m/sec) ➤ Assume thickness of Inlet Shaft <p>1.2 CALCULATIONS:</p> $Diameter\ of\ Inlet\ Shaft\ Required = \left[\frac{4 \times Designed\ Flow\ (m^3/sec)}{\pi \times Velocity\ (m/s)} \right]^{0.5}$ <p><i>Provide Internal Diameter of Inlet Shaft preferably greater or equal to the required value.</i></p> $Outer\ Diameter\ of\ Inlet\ Shaft\ Provided = Internal\ Diameter + (2 \times Thickness)$
--

The above mentioned user input ways with verification of the selected values can be followed for all the other input fields of tendered and selected criteria as specified

Know what is the minimum standard value, calculated Dimensions based on user inputs and also how user inputs effects on the parameter validations by reverse calculations

PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA		RECOMMENDATION
Thickness	m	<input type="text"/>	<input type="text" value="0.125"/>	✓	Minimum 0.100 m
Outer Diameter	m		0.9	✓	
Velocity Achieved	m/sec		0.698	✓	

iNODE reverse calculates the value on its own using standard formula. Values considered will be from selected/calculated values.

iNODE calculates the value on its own using standard formula. All the values considered will be from selected criteria.

Minimum required thickness as per design standards. Outer diameter will be further calculated by the thickness the user inputs.

Additional Screen Features

ICON

DESCRIPTION

DETAILS

SCREEN EXAMPLE



CORRECT DESIGN VALUE

This represents that the value user entered in the selected field for the parameter is within the permissible range of standard design/codal provisions.

SELECTED CRITERIA	RECOMMENDATION
1	
<input type="text" value="0.7"/>	✔ 0.6-1.25 m/sec



INCORRECT DESIGN VALUE

This represents that the value user entered in the selected field for the parameter is not within the permissible range of standard design/codal provisions.

<input type="text" value="0.650"/>	✘ 0.674 m
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CPHEEO MANUAL CLAUSES

This represents quick access to the user for noting the manual clauses for that specific element which includes clauses and page numbers. Each element has its own specific display of clauses for that element.

TYPE	CLAUSE NO	CLAUSE	PAGE NO
CASCADE AERATOR	7.2.5.3	i. Number of steps usually 4 to 6 steps.	192
	7.2.5.3	ii. Space requirements vary from 0.015 to 0.045 m ² /m ³ /hr.	192
	7.2.5.3	iii. Head requirements 6.5 to 3.0 m.	192



DESIGN METHODOLOGY

On clicking this icon the entire step by step design methodology for the particular element/sub-element appears for quick reference. It includes the theory and assumptions with all the required units to be considered. In addition to this it also helps the user to perform manual calculation for a quick heads up, building confidence in the design procedure.

DESIGN METHODOLOGY	
✓	Number of Units
✓	Designed Flow Per Unit
✓	Designed Capacity in m ³ /sec
1.1 ASSUMPTIONS:	
➤	Assume velocity of flow through Inlet Shaft (Recommended Range 0.6-1.25 m/sec)
➤	Assume thickness of Inlet Shaft
1.2 CALCULATIONS:	
Diameter of Inlet Shaft Required	$= \left[\frac{4 \times \text{Designed Flow (m}^3/\text{sec)}}{\pi \times \text{Velocity (m/s)}} \right]^{0.5}$
<i>Provide Internal Diameter of Inlet Shaft preferably greater or equal to the required value.</i>	
Outer Diameter of Inlet Shaft Provided	$= \text{Internal Diameter} + (2 \times \text{Thickness})$
1.3 VALIDATION CHECKS:	
1. Provided Diameter > Required Diameter	
2. Velocity Achieved should be in the range of 0.6-1.25 m/s	



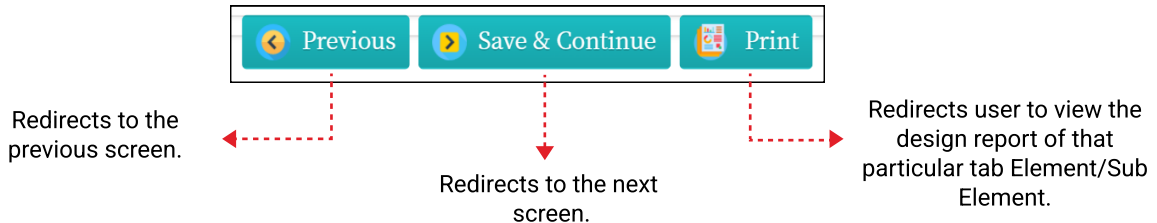
DESIGN CALCULATIONS

Simply scroll down & the icon appears. This will give the user a detailed step by step formulae and the output value obtained by performing back calculation of a particular parameter. The calculated values appear in the recommendations or in non-editable fields. This will ensure that the user has no confusion and is in the correct flow of standard design calculations.

PARAMETER	FORMULAR USED
Designed Flow per Unit	$\text{Designed Flow per Unit} = \frac{\left[\text{Flow} \times \left(\frac{\text{Overloading}}{100} + \frac{\text{Loss}}{100} \right) \right] + \text{Flow}}{\text{No of Units}}$
Designed Flow per Unit	$Q = \frac{\text{Designed Flow per Unit} \times 10^3}{24 \times 60 \times 60}$
A _{Shaft required}	$A_{\text{Shaft Required}} = \frac{Q}{V_{\text{Limiting}}}$
D _{Shaft required}	$D_{\text{Shaft Required}} = \sqrt{\frac{A \times 4}{\pi}}$
D _{Shaft provided}	$D_{\text{Shaft Provided}} = \text{Internal Diameter (provided)} + 2 \times \text{Thickness}$

Output Reports and going to the next element/ Sub Element Design

This option will appear at the end of the design of the element, only when an element is inclusive of multiple sub elements.



Standard sample Design Output Report

HYDRAULIC DESIGN OF CASCADE AERATOR

The role of Aeration is to remove undesirable dissolved gases in water and to add oxygen to water to convert undesirable substances to a more manageable form.

INLET SHAFT
 (Reference Table No. 1)

- ✓ Number of Units = 1 No
- ✓ Designed Flow Per Unit = 24.000 MLD
- ✓ Designed Capacity in m³/sec = 0.278 m³/sec

ASSUMPTIONS & CALCULATIONS:

- Assumed velocity of flow through Inlet Shaft = 0.7 m/sec
- Assumed Thickness = 0.125 m

$$\begin{aligned} \text{Diameter of Inlet Shaft Required} &= \left[\frac{4 \times \text{Designed Flow (m}^3/\text{sec)}}{\pi \times \text{Velocity (m/s)}} \right]^{0.5} \\ &= \left[\frac{4 \times 0.278}{3.14 \times 0.7} \right]^{0.5} \\ D_{\text{Required}} &= 0.711 \text{ m} \end{aligned}$$

Provided Internal Diameter of Inlet Shaft = 0.75 m

- Assumed thickness of Inlet Shaft = 0.125 m

Hence, Outer Diameter = 1.000 m

VALIDATION CHECKS:

1. Provided Diameter 0.75 > Required Diameter = 0.711 m

Diameter Provided > Diameter Required.
2. Velocity Achieved = 0.629 m/sec

Hence, Velocity achieved is within the permissible Range (0.6-1.25 m/sec)

DESIGN SUMMARY - INLET SHAFT

Velocity	= 0.629 m/sec
Internal Diameter of Inlet Shaft	= 0.75 m
Thickness of Inlet Shaft	= 0.125 m
Outer Diameter of Inlet Shaft	= 1.000 m

Standard sample Design Output Report when user enters incorrect values, which will be reflected in the report.

PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
Number of Inlets	Nos	1	1	
Limiting Velocity	m/sec	<input type="text" value="0.65"/>	<input type="text" value="0.5"/>	✘ 0.6-1.25 m/sec
Internal Diameter	m	<input type="text"/>	<input type="text" value="0.4"/>	✘ 0.841 m
Thickness	m	<input type="text"/>	<input type="text" value="0.09"/>	✘ Minimum 0.100 m
Outer Diameter	m		0.580	
Velocity Achieved	m/sec		2.212	✘

Design Output Report for the above screen

HYDRAULIC DESIGN OF CASCADE AERATOR

The role of Aeration is to remove undesirable dissolved gases in water and to add oxygen to water to convert undesirable substances to a more manageable form.

INLET SHAFT
 (Reference Table No. 1)

- ✓ Number of Units = 1 No
- ✓ Designed Flow Per Unit = 24.000 MLD
- ✓ Designed Capacity in m³/sec = 0.278 m³/sec

ASSUMPTIONS & CALCULATIONS:

- Assumed velocity of flow through Inlet Shaft = 0.5 m/sec
- Assumed Thickness = 0.09 m

$$\text{Diameter of Inlet Shaft Required} = \left[\frac{4 \times \text{Designed Flow (m}^3/\text{sec)}}{\pi \times \text{Velocity (m/s)}} \right]^{0.5}$$

$$= \left[\frac{4 \times 0.278}{3.14 \times 0.5} \right]^{0.5}$$

$$D_{\text{Required}} = 0.841 \text{ m}$$

Provided Internal Diameter of Inlet Shaft = 0.4 m

- Assumed thickness of Inlet Shaft = 0.09 m

Hence, Outer Diameter = 0.580 m

VALIDATION CHECKS:

1. Provided Diameter 0.4 < Required Diameter = 0.841 m

Hence Revise.

2. Velocity Achieved = 2.212 m/sec

Hence, Velocity is not achieved within the permissible Range (0.6-1.25 m/sec)

DESIGN SUMMARY - INLET SHAFT

Velocity = 2.212 m/sec

Internal Diameter of Inlet Shaft = 0.4 m

Thickness of Inlet Shaft = 0.09 m

Outer Diameter of Inlet Shaft = 0.580 m

Additional Features of Report

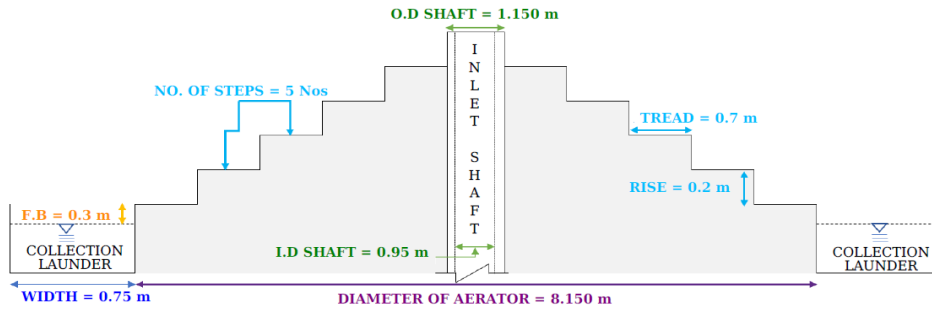


Figure - Cascade Aerator Details
*For Schematic purpose only

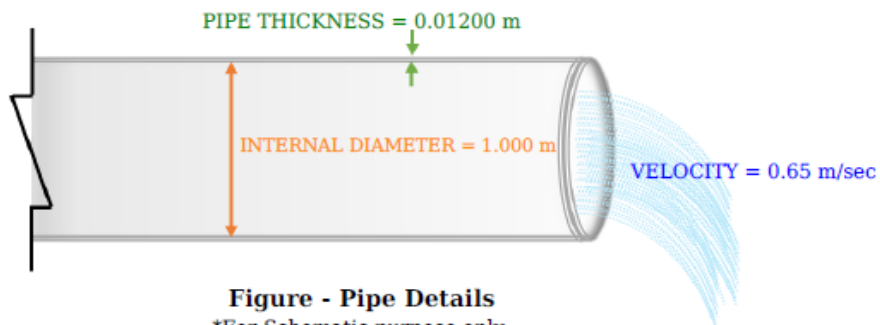
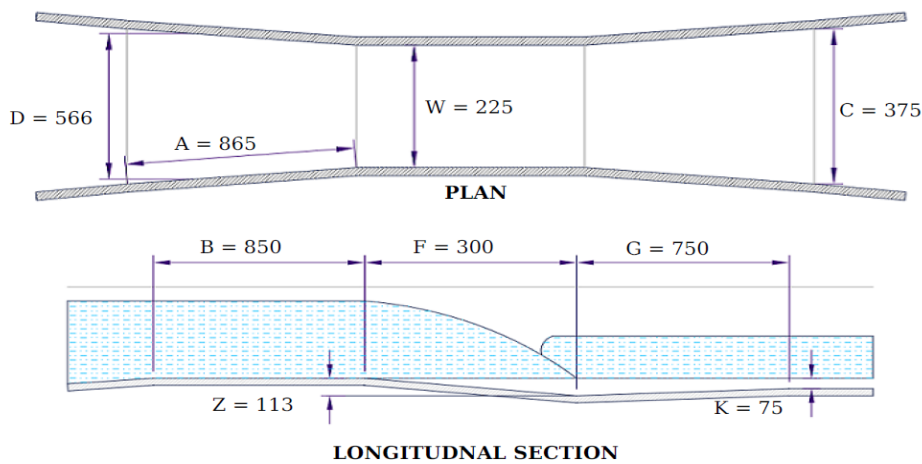


Figure - Pipe Details
*For Schematic purpose only.

Additional Features of Report

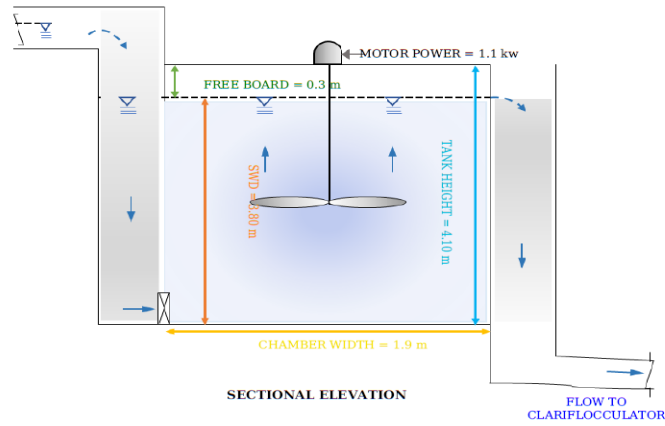


Figure - Flash Mixer Details
*For Schematic purpose only

TYPICAL CLARIFLOCCULATOR SKETCH

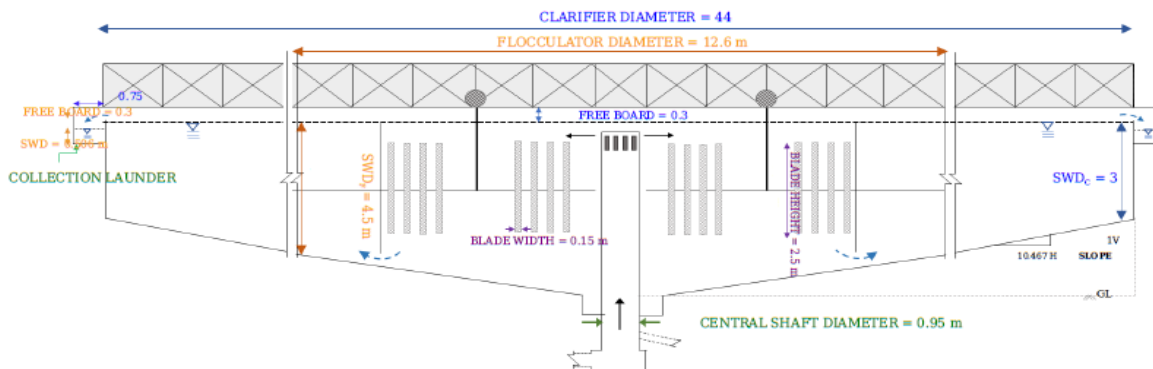


Figure - Clariflocculator Details
*For Schematic purpose only.

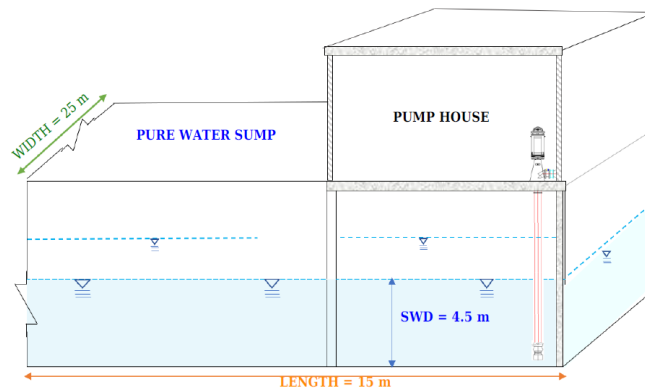


Figure - Pure Water Sump Details
*For Schematic purpose only.



UNIQUE DESIGN ELEMENT FEATURES



Parshall Flume Screen Features

PARSHALL FLUME:
CPHEEO CLAUSES
FLOW: 20 MLD
OVERLOADING: 15%
LOSS: 5%

Parshall Flume		Upstream Channel		Downstream Channel	
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA		RECOMMENDATION
No of Parshall flume	Nos	1	1	✓	1 Nos.
Designed Flow	MLD	20	20	✓	20 MLD
Flow for Parshall Flume	MLD	20	<input type="text" value="22"/>	✓	20 to 24 MLD

Sub-elements:
Upstream &
Downstream

In above case when user enters the value 22, the lower limit and its set of dimensions will be selected for the Parshall Flume.

A user should always be careful while entering a value for parshall flume after noting the assumed overloading/Loss and the space requirements availability.

Parshall Flume Table (Reference : Manual on Sewerage and Sewage Treatment - Table 5.5)

Dimensions of Parshall Flume in mm.

Flow Range Q _{max} (MLD)	W	A	B	C	D	F	G	K	Z
Upto 5	75	460	450	175	255	150	300	25	56
5 to 30	150	610	600	315	391	300	600	75	113
30 to 45	225	865	850	375	566	300	750	75	113
45 to 170	300	1350	1322	600	831	600	900	75	225
170 to 250	450	1425	1357	750	1010	600	900	75	225
250 to 350	600	1500	1472	900	1188	600	900	75	225
350 to 500	900	1650	1619	1200	1547	600	900	75	225
500 to 700	1200	1800	1766	1500	1906	600	900	75	225
700 to 850	1500	2100	2060	2100	2625	600	900	75	225
850 to 1400	2400	2400	2353	2700	3344	600	900	75	225

Close

Parshall Flume Screen Features

DOWNSTREAM CHANNEL FEATURES

PARSHALL FLUME:

CPHEEO CLAUSES

FLOW: 20 MLD

OVERLOADING: 15%

LOSS: 5%

Parshall Flume	Upstream Channel	Downstream Channel		
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
			<input type="radio"/> Keep Width Same as U/S Channel <input checked="" type="radio"/> Keep Velocity Same as U/S Channel	
Velocity of Flow	m/sec	<input type="text"/>	<input type="text" value="0.75"/>	0.6-0.9 m/sec
Hydraulic Jump Coefficient	-	<input type="text"/>	<input type="text" value="0.5"/> ✔	0.4-0.7 h_u
Ht of water u/s of Hydraulic jump (h_u)	m		<input type="text" value="0.901"/>	
Depth of Water at Downstream Channel (h_d)	m		<input type="text" value="0.451"/>	

For downstream channel design user can select either to keep width or velocity as upstream channel.

Flash Mixer Features

All types of Flash Mixers

FLASH MIXER (CIRCULAR)

FLOW: 20 MLD

OVERLOADING: 15%

LOSS: 5%

NO OF UNITS: 1 NOS

Chamber					Power Requirement
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION	
No of Units	Nos	1	1	✓	
Detention Time	Sec		60	20-60 sec	
Ratio of Tank height to Diameter	-		60	(1-3) : 1	
Diameter of Flash Mixer	m		40	2.197	
SWD	m		30	2.197	
Free Board	m		25	2.197	
Free Board	m		20	Minimum 0.3	
Total Chamber Height	m	6.50		Actual Ratio Maintained = 2.000	

Standard detention time list to be selected from. ←

Flash Mixer Features

All types of Flash Mixers

Chamber		Power Requirement			
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION	
No of Units	Nos	1	1	✓	
Detention Time	Sec	<input type="text"/>	60 <input type="text"/>	20-60 sec	
Ratio of Tank height to Diameter	-	<input type="text"/>	2 <input type="text"/>	✓	(1-3) : 1
Diameter of Flash Mixer	m	<input type="text"/>	3 <input type="text"/>	✓	2.197
SWD	m	<input type="text"/>	6.00 m <input type="text"/>		
Free Board	m	<input type="text"/>	0.5 <input type="text"/>	✓	Minimum 0.3
Total Chamber Height	m	<input type="text"/>	6.50 <input type="text"/>	Actual Ratio Maintained = 2.000	
Actual Detention Time	sec	<input type="text"/>	152.48 <input type="text"/>		

Standard Ratio to be maintained.

SWD calculated in accordance to diameter entered and ratio.

Auto calculated for the user design clarity.

Flash Mixer Features

FLASH MIXER (CIRCULAR)		FLOW: 20 MLD OVERLOADING: 15% LOSS: 5% NO OF UNITS: 1 NOS		
Chamber		Power Requirement		
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
No of Units	Nos	1	1	✓
Velocity Gradient	Sec ⁻¹		300	300
Detention Time	Sec		60	60
Absolute Viscosity	kg/m/s		0.00089	0.89 x 10 ⁻³ kg/m.s
Power	kw	<input type="text"/>	4	3.395 kw

Note: All fields for Selected Criteria are mandatory.


Detention time pulled from the previous screen as user entered & corresponding standard Velocity gradient pulled.

Standard Value

DESIGN CALCULATIONS		
PARAMETER	FORMULAE USED	CALCULATED VALUES
Volume of Each Flash Mixer	$Volume = \frac{\pi}{4} \times diameter\ provided^2 \times SWD\ provided$	42.39 m ³
Power Requirement(Range 1)	$G = \sqrt{\left[\frac{P}{\mu(Vol)}\right]}$	3.395 kw
Power Requirement(Range 2)		3.052 kw
Power Provided		4 kw

Maximum value of the two. (Value pulled from standard table provided by CPEEHO manual)

Pipe Screen Features

 PIPE

FLOW: 20 MLD

OVERLOADING: 15%

LOSS: 5%

PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
No of Pipes	Nos	1	1	
Velocity	m/sec	<input type="text"/>	<input type="text" value="1"/> ✔	0.6-1.8 m/sec
			<input checked="" type="radio"/> Standard DI Pipe <input type="radio"/> Manual Input	
Internal Diameter (D.I)	m		0.595 m SELECT DIAMETER	
Thickness of Pipe	m		0.01130	Class -K9
Outer Diameter (O.D.)	m		0.773	
Length of Pipe	m	<input type="text"/>	<input type="text" value="2"/> ✔	
<div style="border: 1px solid gray; display: inline-block; padding: 5px;">D.I Pipe Size : 2 m (Length) and 0.773 m (Outer Diameter), Class K9</div>				
*Length parameter will be further used for calculating Head Loss only.			Note: All fields for Selected Criteria are mandatory.	

A user has the option to select a standard DI pipe conforming to codal provisions or can enter a pipe diameter manually as per availability.

Automatically Calculated

Pop Up will appear post clicking the "SELECT DIAMETER"

Pipe Screen Features

Recommended Diameter = 595 mm

All dimensions in millimetres.

NOMINAL DIAMETER		BARREL WALL THICKNESS 'E'			
DN		<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
		K7	K8	K9	K10
<input type="radio"/> 600	600	7.7	8.8	9.9	11.0
<input type="radio"/> 700	700	9.0	9.6	10.8	12.0
<input checked="" type="radio"/> 750	750	9.7	10.0	11.3	12.5
<input type="radio"/> 800	800	10.4	10.4	11.7	13.0
<input type="radio"/> 900	900	11.2	11.2	12.6	14.0
<input type="radio"/> 1000	1000	12.0	12.0	13.5	15.0
<input type="radio"/> 1100	1100	14.4	14.4	14.4	16.0
<input type="radio"/> 1200	1200	15.3	15.3	15.3	17.0

CASE 1: When user selects "Standard DI Pipe"

➔ User has to select diameter and barrel wall thickness class.

➔ Diameters are displayed only greater to recommended (minimum required diameter calculated)

PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
No of Pipes	Nos	1	1	
Velocity	m/sec	<input type="text"/>	<input type="text" value="1"/>	✓ 0.6-1.8 m/sec
			<input type="radio"/> Standard DI Pipe <input checked="" type="radio"/> Manual Input	
Internal Diameter (D.I)	m	<input type="text"/>	<input type="text" value="0.6"/>	✓ 0.595 m
Thickness of Pipe	m	<input type="text"/>	<input type="text" value="0.2"/>	✓
Outer Diameter (O.D.)	m		1.000	
Length of Pipe	m	<input type="text"/>	<input type="text" value="2"/>	✓

CASE 2: When user selects "Manual Input"

➔ When user selects "Manual Input", an input field will appear, where the user can enter value for internal diameter referring to the recommended diameter. In addition to this user also needs to enter the thickness of the pipe.

Clariflocculator Screen Features

CLARIFLOCCULATOR
CPHEEO CLAUSES
FLOW: 20 MLD
OVERLOADING: 15%
LOSS: 5%

Central Shaft And Ports
Flocculator
Power Requirement
Circular Clarifier
Peripheral Launder

CENTRAL SHAFT +

PORTS -

Velocity through Ports	m/s	<input type="text" value=""/>	<input type="text" value="0.8"/>	✔	0.6-1.25 m/sec
Number of Rows	Nos	<input type="text" value=""/>	<input type="text" value="2"/>		1-2
Clear Spacing of Ports	m	<input type="text" value=""/>	<input type="text" value="0.250"/>		
Number of Ports per row	Nos	<input type="text" value=""/>	Select Number of ports/row		
Port (Width)	m	<input type="text" value=""/>	<input type="text" value="0.300"/>		
Port (Height)	m	<input type="text" value=""/>	<input type="text" value="0.2"/>	✔	0.147
Area of Each Port	m ²	<input type="text" value=""/>	Provided = 0.060 m ²	>	Required = 0.044 m ²

RECOMMENDED PORT DIMENSIONS			
NUMBER OF PORTS PER ROW	AREA REQUIRED	WIDTH OF PORT	HEIGHT
<input checked="" type="radio"/> 4	0.044 m ²	0.300 m	0.147 m
<input type="radio"/> 5	0.035 m ²	0.190 m	0.184 m
<input type="radio"/> 6	0.029 m ²	0.116 m	0.250 m
<input type="radio"/> 7	0.025 m ²	0.064 m	0.391 m
<input type="radio"/> 8	0.022 m ²	0.025 m	0.880 m

SAVE

Default calculated values for selected number of rows and clear spacing of ports.

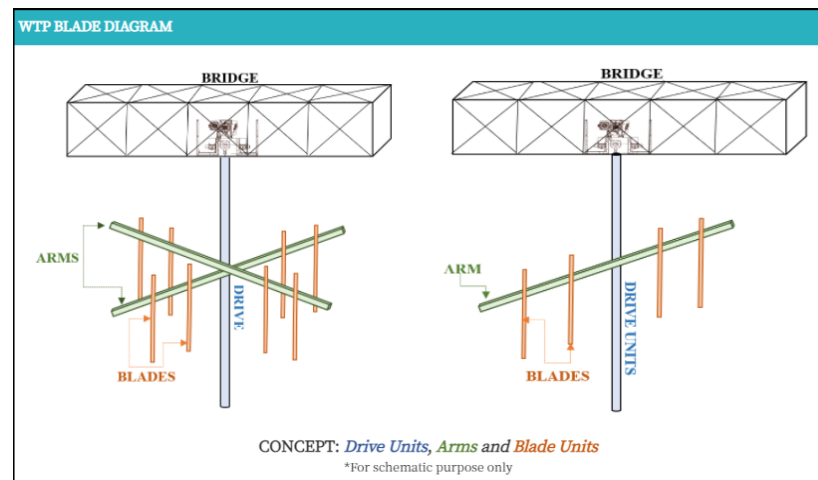
Standard Spacing drop down list.

- select--

 - 0.150
 - 0.200
 - 0.250
 - 0.300
 - 0.350
 - 0.400
 - 0.450

Clariflocculator Screen Features

Central Shaft And Ports		Flocculator	Power Requirement	Circular Clarifier	Peripheral Launder
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION	
No of Clariflocculators Units	Nos	1	1	✓	
Velocity Gradient	sec ⁻¹		60		
Paddle Tip Velocity	m / Sec	<input type="text"/>	0.5	✓	0.2-0.6 m /sec
Water velocity at Paddle Tip	m / Sec	<input type="text"/>	0.125	✓	0.125 m/sec
Absolute Viscosity	kg/m/s		0.00089		0.89 × 10 ⁻³ kg/m.s
Power Required	kw		1.685		
Drag Coefficient		<input type="text"/>	1.8	✓	0.8-2.3
Area Of Paddle Required	m ²		35.879		BLADE DIAGRAM
No. of Drive Units		<input type="text"/>	4	✓	Minimum 2 And Even Number



Clariflocculator Screen Features


CLARIFLOCCULATOR		CPHEEO CLAUSES		FLOW: 20 MLD	OVERLOADING: 15%	LOSS: 5%
Central Shaft And Ports	Flocculator	Power Requirement	Circular Clarifier	Orifice	Peripheral Launder	
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION		
No of Clariflocculator Units	Nos		1	✓		
Flocculator Diameter	m		15			
Detention Time	Hours	<input type="text"/>	3	✓	Min 2.5 Hours	
Bottom slope of flocculator	1	in	10	▼		
Thickness of Partition Wall between Flocculator and Clarifier	m	<input type="text"/>	0.2	✓	0.1-0.25	
Side Water Depth	m	<input type="text"/>	2	✓	< 3 m	
Diameter of Clarifier	m	<input type="text"/>	46.22	✓	46.22 m	Lower diameter can be adopted if Additional Weir Length is Provided.
Actual slope maintained	1	in	15.610			
Surface Overflow Rate	m ³ /m ² .d	<input type="text"/>	75	✓	25-75 m ³ /m ² .d	
Weir Loading	m ³ /m.d	<input type="text"/>	300	✓	200-300 m ³ /m.d	
Actual Detention Time	Hours		3.354	✓	3	

Default sub design Tabs of "ORIFICE" when additional weir loading is not required.

Additional weir can be provided.

Rapid Sand Gravity Filter Screen Features

Filter Bed

PARAMETER		UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION
No. of Units	Nos		1	1	
Water for Backwashing	%		<input type="text"/>	3	✓ 2-5 % of filtered Water
Cumulative Time For Backwashing	min		<input type="text"/>	20	✓ 10-30 min / 24 hrs
Rate of Filtration	m ³ /m ² .h.		<input type="text"/>	5	✓ 4.8-6 m ³ /m ² .hr.
Area of Each Filter Bed	m ²		<input type="text"/>	30	✓ 29.591-49.318 
No. of Filter Beds Per Unit	Nos.			7	Generally should be an even number.
Length / Width Ratio			<input type="text"/>	1.5	✓ 1.11-1.66
Initial Width of Bed	m		<input type="text"/>	5	✓ 4.460
Initial Length of Bed	m		<input type="text"/>	7	✓ 6.691
Actual Length/Width Ratio				1.400	✓

Sub tabs elements for RSGF

Minimum dimensions requirements.

Each design case has its own calculated ideal area recommendation.

AREA OF EACH FILTER BED RECOMMENDATION

- Ideal recommendation for area of each filter bed - 39.45 m² considering suitable tank dimensions, further piping arrangements and maintenance.
- Selection of Minimum value will reflect in increased number of Filter beds, Number of partition walls, further piping arrangements and their maintenance.
- Selection of Maximum value will reflect in higher wash water tank capacity also higher dimensions for further piping arrangements.

* Note: The recommended number of Filter Beds according to the general practices followed in their hydraulic design is always an even number. It is recommended to select the area of each filter bed from the recommended range of values, such that the number of filter beds will be reflected as an even digit.

Rapid Sand Gravity Filter Screen Features

Sand and Gravel

☰ RAPID SAND GRAVITY FILTER
CPHEEO CLAUSES
FLOW: 20 MLD
OVERLOADING: 15%
LOSS: 5%

Filter Bed	Sand & Gravel	Depth of Water	Under Drain System	Back Washing of Filter	Wash Water Troughs	Gullet / Gutter	Wash Water Tank
PARAMETER	UNIT	TENDERED CRITERIA		SELECTED CRITERIA	RECOMMENDATION		
SAND							
Depth of Sand	m	<input type="text"/>	<input type="text"/>	<input type="text" value="0.7"/>	<input checked="" type="checkbox"/>	0.6-0.75 m	
Effective Size of Sand (D ₆₀)	mm	<input type="text"/>		<input type="text" value="0.8"/>	<input checked="" type="checkbox"/>	0.75-0.900 mm	
Effective Size of Sand (D ₁₀)	mm	<input type="text"/>		<input type="text" value="0.5"/>	<input checked="" type="checkbox"/>	0.45-0.7 mm	
GRAVEL							
Depth of Gravel	mm	<input type="text"/>		<input type="text" value="500"/>	<input checked="" type="checkbox"/>	500 mm	
<i>Note: All fields for Selected Criteria are mandatory.</i>							
GRAVEL DEPTH RANGE							
SR. NO.	RANGE IN SIZE (mm)	RANGE IN DEPTH (mm)		DEPTH TO BE PROVIDED (mm)			
1	2-5	50-80		<input type="text" value="70"/>	<input checked="" type="checkbox"/>		
2	5-12	50-80		<input type="text" value="70"/>	<input checked="" type="checkbox"/>		
3	12-20	80-130		<input type="text" value="105"/>	<input checked="" type="checkbox"/>		
4	20-38	80-130		<input type="text" value="105"/>	<input checked="" type="checkbox"/>		
5	38-65	130-200		<input type="text" value="150"/>	<input checked="" type="checkbox"/>		
Total Depth Maintained (mm)				500	<input checked="" type="checkbox"/>		

Detailed Design for Sand and Gravel.

Rapid Sand Gravity Filter Screen Features

Under Drain System

RAPID SAND GRAVITY FILTER

CPHEEO CLAUSES

FLOW: 20 MLD

OVERLOADING: 15%

LOSS: 5%

Filter Bed	Sand & Gravel	Depth of Water	Under Drain System	Back Washing of Filter	Wash Water Troughs	Gullet / Gutter	Wash Water Tank
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA	RECOMMENDATION			
MANIFOLD							+
LATERAL							+
ORIFICE							+

↓

Individual detailed Design of
Manifold, Laterals and Orifice.

Mechanical Design Screen Features

MECHANICAL DESIGN		FLOW: 20 MLD		OVERLOADING: 15%		LOSS: 5%	
Filter Inlet	Filter Outlet	Wash Water Inlet	Wash Water Outlet	Air Blower Design	Wash Water Pump		
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA			RECOMMENDATION	
No of Filter Units	Nos	1	1				
Rate of flow from each Filter	m ³ /hour		149.215				
Velocity at Inlet	m/sec	<input type="text"/>	<input type="text" value="0.9"/>	<input checked="" type="checkbox"/>		0.6-1.2 m/sec	
Area Of Opening Required	m ²		0.046				
Pipe Diameter	m	<input type="text"/>	<input type="text" value="0.242"/>	<input checked="" type="checkbox"/>		0.242 m	
Area Of Opening Provided	m ²		0.046				



Sub tabs elements for Mechanical Design.

Chemical House Screen Features

CHLORINATION					FLOW: 20 MLD	OVERLOADING: 0%	LOSS: 0%
Chlorine Requirement		Emergency Chlorination/Emergency Bleaching		Chlorine Storage and Tonner Room			
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA		RECOMMENDATION		
Dose of Chlorine	mg/l	<input type="text"/>	<input type="text" value="2"/>	✓	2mg/l to achieve 0.2mg/l at far end of DS or as per chemical lab officer.		
Chlorine Requirement	kg/d	<input type="text"/>	<input type="text" value="40"/>	✓	40 kg/d		

Sub tabs elements for Chlorination.

ALUM REQUIREMENT					FLOW: 20 MLD	OVERLOADING: 0%	LOSS: 0%
Alum Solution Tanks		Preperation of Solutions		Alum and TCL Space			
PARAMETER	UNIT	TENDERED CRITERIA	SELECTED CRITERIA		RECOMMENDATION		
AVERAGE DOSE OF ALUM REQUIREMENT							
Monsoon Season	mg/l	<input type="text"/>	<input type="text" value="80"/>	✓	70 mg/l		
Winter Season	mg/l	<input type="text"/>	<input type="text" value="40"/>	✓	30 mg/l		
Summer Season	mg/l	<input type="text"/>	<input type="text" value="15"/>	✓	10 mg/l		
Purity for Alum Cakes	%	<input type="text"/>	<input type="text" value="75"/>	✓	75 %		
Number of Alum Tanks	Nos	<input type="text"/>	<input type="text" value="3"/>	✓	Minimum 2 Nos (2 Working + 1 Standby)		
Duration of Tank to Serve (Shift)	Hrs	<input type="text"/>	<input type="text" value="9"/>	✓	Minimum 8 Hours		

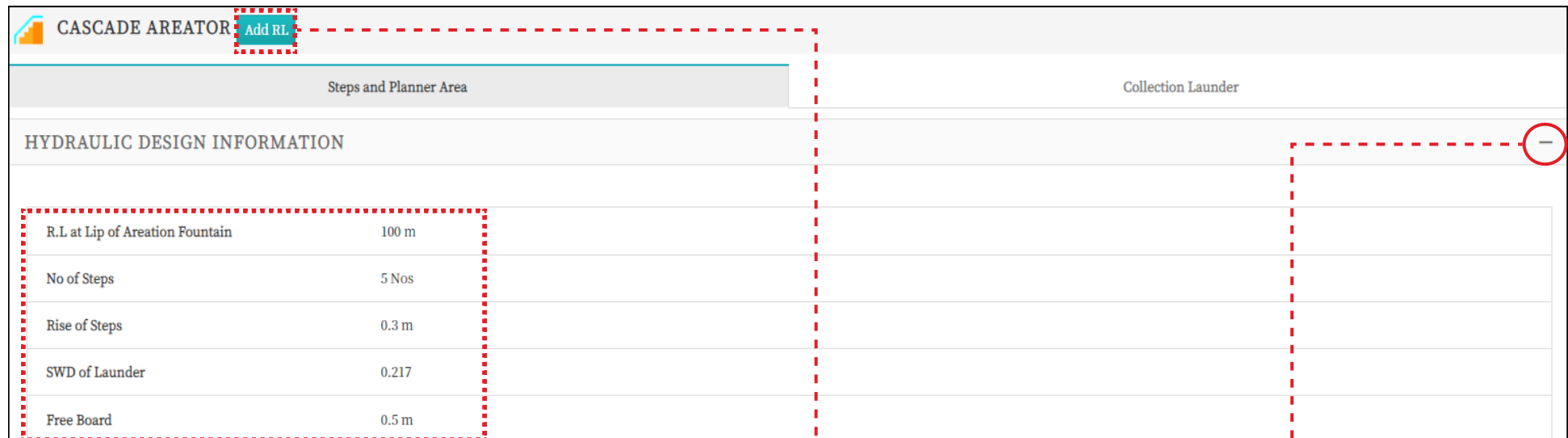
Sub tabs elements for Alum requirement.



HEAD LOSSES



Understanding How to fill the Values & Highlights



HYDRAULIC DESIGN INFORMATION	
R.L at Lip of Aeration Fountain	100 m
No of Steps	5 Nos
Rise of Steps	0.3 m
SWD of Launder	0.217
Free Board	0.5 m

Quickly review your design hydraulic parameters entered during the design of the element.

A user at any instance can add/ change the RL at start or ground levels of elements.

Minimize the hydraulic information.

Understanding How to fill the Values & Highlights

HEAD LOSSES AND LEVELS						
PARAMETER	UNIT	CALCULATED	OVERWRITE	REMARK	RL AT START: 100	
Free fall from last step to collection Launder	m		<input type="text" value="0.1"/> m			
Total loss from lip of fountain	m	1.600	1.600 m			
Additional Losses	m	0 m	<input type="text" value="0.2"/> m		<input type="text"/>	
TWL of collection Launder at start	m	98.200 m	98.200 m			
R.L of launder bottom at Start	m	97.983 m	97.983 m			

Values calculated by iNODE software using standard formulae.

User can overwrite the calculated values as per user knowledge which will be used for further calculations of head loss.

Note: It is not necessary for the user to overwrite values. User can use the software calculated values and proceed further in all the cases, except when a value needs to be entered for further calculations.

Know the RL at the start of your each element.

CUMULATIVE HEAD LOSS: 1.800
CURRENT HEAD LOSS: 1.800
CURRENT ELEMENT LAST RL: 97.983
Previous
Save & Continue
Print
Info

User can know these updated levels on each screen at a glance.

User can print individual Head loss Report.

User can enter "Additional Loss" for an assumed value with a justification to be entered in remarks.

Head Loss Features

Starting Head Loss

Head Loss RL and GL Information ×

R. L. INPUT

R. L. at Start:

GROUND LEVEL

Cascade Aerator:

Flash Mixer:

Clariflocculator:

Rapid Sand Gravity Filter:

Pure Water Sump:

Start with filling the basic information i.e. RL at start or assuming a value. If the user has additional information regarding ground levels of each element, they can fill the same as shown.

Head Loss Features

Design Methodology for Cascade Aerator

ASSUMPTIONS:

- R.L at Lip of Aeration Fountain
- RL of top at Start
- Free Fall from last step to collection launder
- Assume Total Loss from Lip of Fountain
- Assume Additional Head Losses Remark
- Frictional Loss in Launder, Using Manning's Formula and taking Manning's Coefficient for R.C.C as n
- Assume Frictional Loss in Launder
- Assume Additional Head Losses Remark

CALCULATIONS:

Total Loss from lip of fountain = $(No\ of\ Steps \times Rise_{Step}) + Free\ Fall$

TWL of Collection Launder at start = $RL\ of\ Lip - (Total\ Loss + Additional\ Losses)$

R.L of Collection Launder at Bottom = $TWL\ of\ Collection\ Launder - SWD\ of\ Launder$

R.L of Collection Launder at Top = $TWL\ of\ Collection\ Launder + Free\ Board$

Length of Launder = $\frac{\pi}{2} \times Diameter_{Aerator} + Width_{Launder}$

RL



Reduced Level

TWL



Total Water Level

**CUMMULATIVE
HEAD LOSS**



Successive additions of Head Losses

**CURRENT
HEAD LOSS**



Current element/sub-element Head Loss

**CURRENT
ELEMENT LAST RL**



Reduced Level at the end of current element

Head Loss in Pipe

PIPE				
HEAD LOSSES AND LEVELS				LAST ELEMENT RL: 91.451
PARAMETER	UNIT	CALCULATED	OVERWRITE	REMARKS
TWL at end of previous connecting element	m	97.451		
+ Select Head Losses				
Loss due to Entry	m	0.0011	<input type="text"/>	m

A user has to select the loss by clicking on the check box.

Head Loss Selection	Formula	Coefficient	Calculated
<input checked="" type="checkbox"/> Loss due to Entry (m)	$h_{en} = \frac{K_{en} \times V^2}{2g}$	$K_{en} = $ <input type="text" value="0.0225"/> ⓘ	0.0011
<input checked="" type="checkbox"/> Loss due to Exit (m)	$h_{ex} = \frac{K_{ex} \times V^2}{2g}$	$K_{ex} = $ <input type="text" value="0.0225"/> ⓘ	0.0011
<input checked="" type="checkbox"/> Loss due to Bend (m)	$h_b = \frac{K_b \times V^2}{2g}$	$K_b = $ <input type="text"/> ⓘ	0.0011
<input checked="" type="checkbox"/> Loss due to Sudden Enlargment (m)	$h_{se} = \frac{K_{se} \times V_1^2}{2g}$	$K_{se} = $ <input type="text"/> ⓘ	0.0011
<input checked="" type="checkbox"/> Loss due to Sudden Contraction (m)	$h_{sc} = \frac{K_{sc} \times V_2^2}{2g}$	$K_{sc} = $ <input type="text"/> ⓘ	0.0011
<input type="radio"/> Frictional Losses by Hazen William Equation (m)	$h_{fr} = \left[\frac{V}{0.85 \times CR^{0.63}} \right]^{1.49} \times L$	$C = $ <input type="text"/> ⓘ	0.0038
<input checked="" type="radio"/> Frictional Losses by Darcy Weisbach Formula Equation (m)	$h_f = \left[\frac{fLQ^2}{12.1 \times d^5} \right]$	$f = $ <input type="text"/> ⓘ	0.0011

A user can select either of these two frictional losses.

A user has to enter a coefficient for further calculations

A user can click the "i" for standard coefficient value table.

After entering the value, the software auto calculates the value for that specific head loss by taking the coefficient entered by the user.

Head Loss in Pipe

Post selecting head losses

PIPE				
HEAD LOSSES AND LEVELS				LAST ELEMENT RL: 91.451
PARAMETER	UNIT	CALCULATED	OVERWRITE	REMARKS
TWL at end of previous connecting element	m	97.451		
<input type="button" value="+ Select Head Losses"/>				
Loss due to Entry	m	0.0011	<input type="text"/>	m
Loss due to Exit	m	0.0011	<input type="text"/>	m
Loss due to Bend	m	0.0011	<input type="text"/>	m
Loss due to Sudden Enlargement	m	0.0011	<input type="text"/>	m
Loss due to Sudden Contraction	m	0.0011	<input type="text"/>	m
Frictional Losses by Darcy Weisbach Formula Equation (m)	m	0.0011	<input type="text"/>	m
Additional Losses	m	0.000 m	<input type="text"/>	<input type="text"/>
Total Losses	m	0.007	0.007	
TWL at start of next connecting element	m	97.444	97.444	

Selected head losses will reflect on the screen.

User can overwrite the values as needed.

User can enter additional loss as needed with a remark which will reflect further in the calculation and in the report.

Head Loss in Rapid Sand Gravity Filter

Detailed

RAPID SAND FILTER					
HYDRAULIC DESIGN INFORMATION +					
HEAD LOSSES AND LEVELS LAST ELEMENT RL: 90.079					
PARAMETER	UNIT	RECOMMENDED	OVERWRITE	REMARKS	
TWL of last Media at End	m	90.281 m			
F.S.L in Filter at start	m	90.281 m			
R.L of Filter Bottom	m	86.081 m			
			<input checked="" type="radio"/> Assumed <input type="radio"/> Detailed		
Assumed Value of Head Loss through Filter	m	1.5 m	<input type="text"/>	m	<input type="text"/>
Drop	m	0.300 m	<input type="text"/>	m	
TWL for next unit	m	88.481 m	88.481 m		

A user has two options of assuming a head loss through filter or calculate in detail.

If user selects "Assume", user can enter a value for the same & give a remark or by default will be 1.5m

Head Loss in Rapid Sand Gravity Filter Detailed


RAPID SAND FILTER				
HEAD LOSSES AND LEVELS LAST ELEMENT RL: 90.079				
PARAMETER	UNIT	RECOMMENDED	OVERWRITE	REMARKS
TWL of last Media at End	m	90.281 m		
F.S.L in Filter at start	m	90.281 m		
R.L of Filter Bottom	m	86.081 m		
			<input type="radio"/> Assumed <input checked="" type="radio"/> Detailed	
Depth of Sand	m	0.7 m		
% Expansion of Sand	%	50		25-50%
Depth of Gravel (lg)	m	0.500 m		
Porosity (f_e)		0.6		<input type="text" value="0.6"/>
Back Wash Velocity	m/hr	0.011		
Density of Sand	kg/m ³	2650		<input type="button" value="SELECT DENSITY"/>
Density of Water	kg/m ³	998		
Orifice Coefficient (a)		0.6		<input type="text" value="0.6"/> 0.6 to 0.8
Orifice/ Filter Bed Area (b)		0.005		

Porosity (f_e)	
DESCRIPTION	POROSITY
Sand; Coarse	0.26-0.43
Sand; Fine	0.29-0.46
Sand/Gravelly Sand; Well Graded; Little to No Fines	0.22-0.42
Sand/Gravelly Sand; Poorly Graded; Little to No Fines	0.23-0.43
Silty Sands	0.25-0.49
Clayey Sands	0.15-0.37
Inorganic Silt/Silty Sand; Slight Plasticity	0.21-0.56
Gravel	0.23-0.38
Gravel/Sandy Gravel; Well Graded; Little to No Fines	0.21-0.32
Gravel/Sandy Gravel; Poorly Graded; Little to No Fines	0.21-0.32
Gravel/Silty Sandy Gravel	0.15-0.22
Clayey Gravel/Clayey Sandy Gravel	0.17-0.27
Inorganic Silt; Uniform	0.29-0.52
Organic Silt/Silty Clay; Low Plasticity	0.42-0.68

When the user selects detailed option, these details will appear for further calculations.

Head Loss in Rapid Sand Gravity Filter

Detailed

RAPID SAND FILTER				
HEAD LOSSES AND LEVELS LAST ELEMENT RL: 90.079				
PARAMETER	UNIT	RECOMMENDED	OVERWRITE	REMARKS
TWL of last Media at End	m	90.281 m		
F.S.L in Filter at start	m	90.281 m		
R.L of Filter Bottom	m	86.081 m		
			<input type="radio"/> Assumed <input checked="" type="radio"/> Detailed	
Depth of Sand	m	0.7 m		
% Expansion of Sand	%	50		25-50%
Depth of Gravel (lg)	m	0.500 m		
Porosity (fe)		0.6	<input type="text"/>	
Back Wash Velocity	m/hr	0.011		
Density of Sand	kg/m ³	2650	<input type="button" value="SELECT DENSITY"/>	
Density of Water	kg/m ³	998		
Orifice Coefficient (a)		0.6	<input type="text"/>	0.6 to 0.8
Orifice/ Filter Bed Area (b)		0.005		

DENSITY OF SAND.	
SAND	DENSITY
<input type="radio"/> User Input	<input type="text"/>
<input type="radio"/> Sand, dry	1600 kg/m ³
<input type="radio"/> Brick, common red	1920 kg/m ³
<input type="radio"/> Mud, packed	1906 kg/m ³
<input type="radio"/> Concrete, Gravel	2400 kg/m ³
<input type="radio"/> Torpedo Sand	1602 kg/m ³
<input type="radio"/> Earth, wet, excavated	1602 kg/m ³
<input type="radio"/> Earth, packed	1522 kg/m ³
<input type="radio"/> Sandstone, solid	2323 kg/m ³
<input type="radio"/> Gravel, loose, dry	1520 kg/m ³
<input type="radio"/> Sand, loose	1442 kg/m ³

A user can perform detailed calculations for head loss through filters. After selecting the porosity, density & Orifice coefficient, the software will calculate the required losses using standard formulae.

Head Loss in Channel

PURE WATER CHANNEL				
HYDRAULIC DESIGN INFORMATION				
HEAD LOSSES AND LEVELS				LAST ELEMENT RL: 86.081
PARAMETER	UNIT	RECOMMENDED	OVERWRITE	REMARKS
TWL at end of previous connecting element	m	88.481 m		
Drop	m	<input type="text"/>		
TWL of Channel at start	m	88.481		
RL of Channel bottom at start	m	88.275		
Frictional Loss in Channel	m	0.00233	<input type="text"/> m	
Additional Losses in Channel	m		<input type="text"/> m	<input type="text"/>
TWL of Channel at End	m	88.479	88.479	<input type="checkbox"/> SLOPE
R.L of Channel bottom at End	m	88.275	88.275	

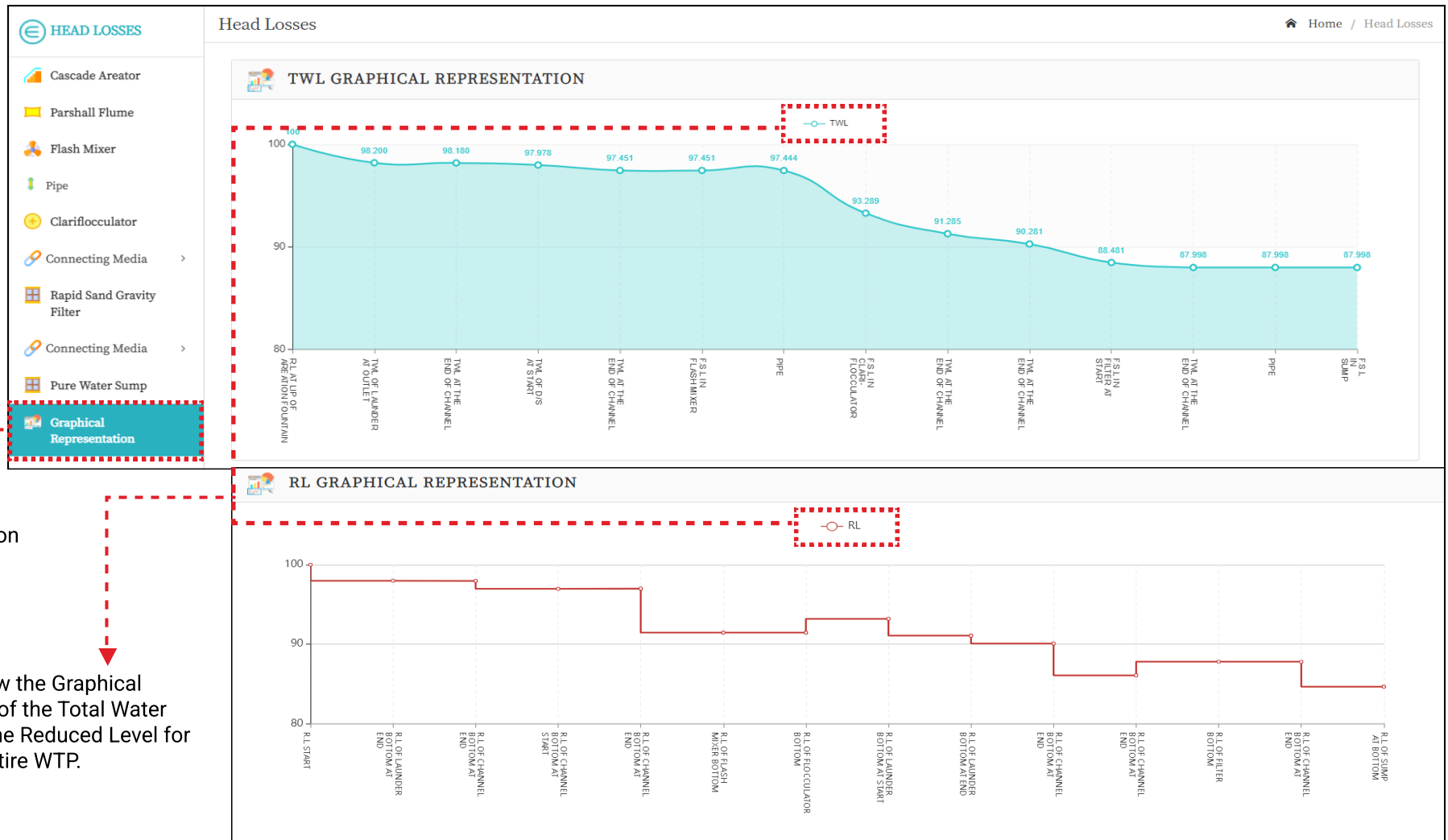
When slope is not considered, only TWL will be affected by frictional loss, whereas, RL at start of the Channel and at the end of the Channel will be equal considering no slope.

Head Loss in Channel

PURE WATER CHANNEL				
HYDRAULIC DESIGN INFORMATION				
HEAD LOSSES AND LEVELS				LAST ELEMENT RL: 86.081
PARAMETER	UNIT	RECOMMENDED	OVERWRITE	REMARKS
TWL at end of previous connecting element	m	88.481 m		
Drop	m	<input type="text"/>		
TWL of Channel at start	m	88.481		
RL of Channel bottom at start	m	88.275		
Frictional Loss in Channel	m	0.00233	<input type="text"/> m	
Additional Losses in Channel	m		<input type="text"/> m	<input type="text"/>
TWL of Channel at End	m	88.479	88.479	<input checked="" type="checkbox"/> SLOPE
R.L of Channel bottom at End	m	88.273	88.273	

When slope is considered, only TWL & RL at end will be affected by frictional loss. RL at start and end of the channel will be unequal considering slope.

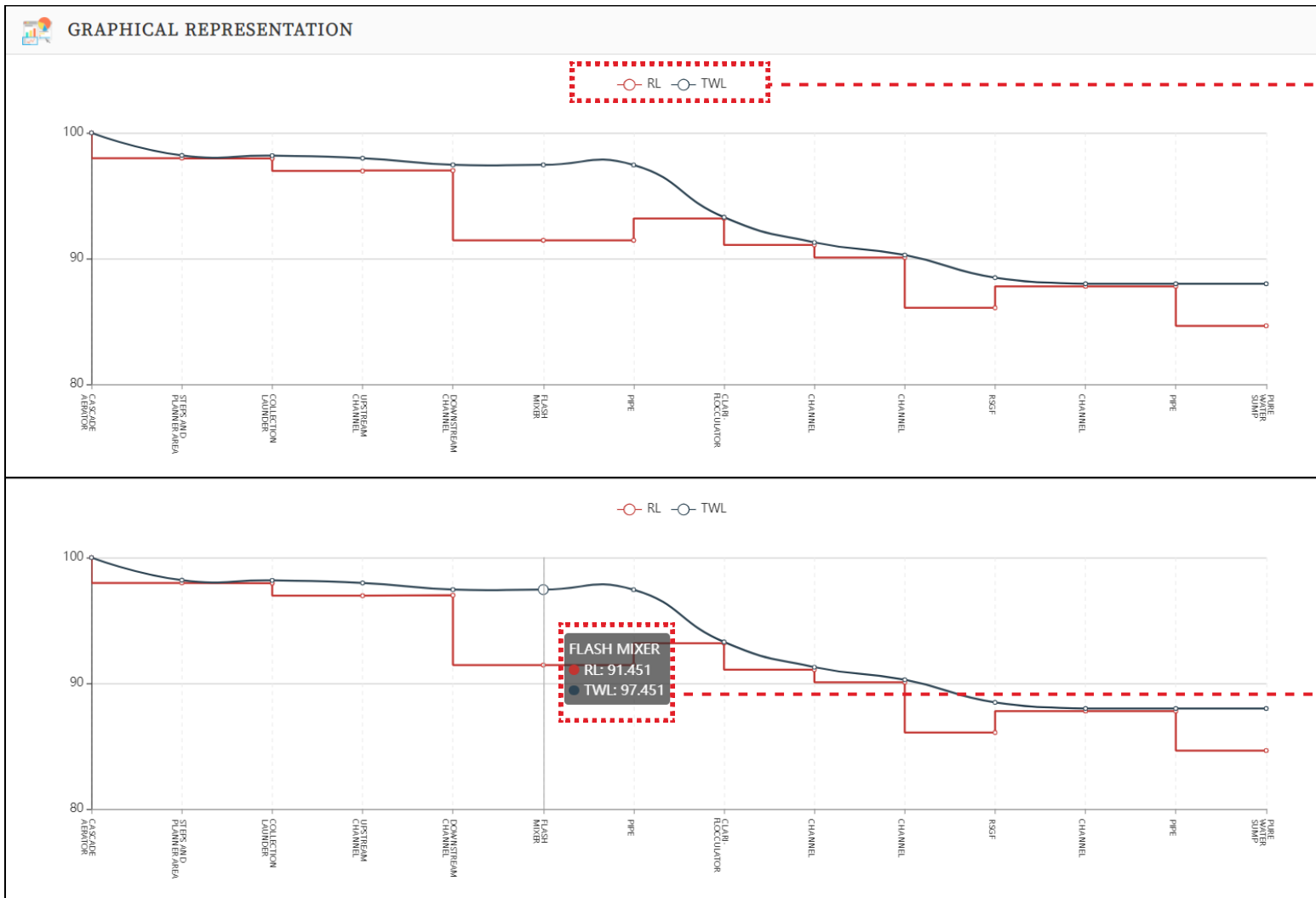
Graphical Representation of Head Loss



User can view the Graphical representation using this option

User can view the Graphical representation of the Total Water Level as well as the Reduced Level for the entire WTP.

Graphical Representation of Head Loss



User can view the Graphical representation of Reduced Level & Total Water Level for the entire WTP.

User can hover the cursor over the graph and know the level of any point of any element.

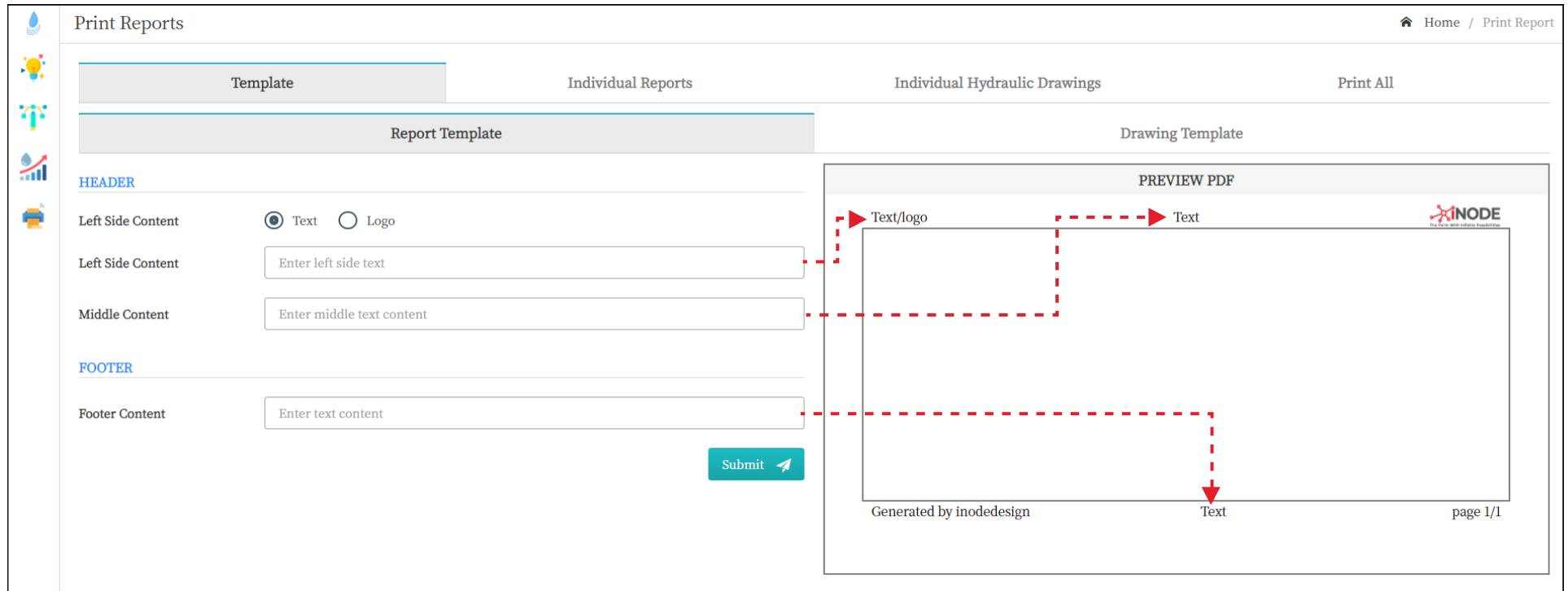


PRINTING



Printing Design Reports & Drawings

Creating a custom report template



In this template option, user can create custom format in which all the element reports are to be saved/printed/downloaded for the project.

A user can download/view output reports of any element on their individual design screen. Here, is another option for customized report.

Printing Design Reports & Drawings

Creating a custom drawing template

Template
Individual Reports
Individual Hydraulic Drawings
Print All

Report Template

DRAWING DETAILS

Project Name Enter Project Name

Owner Name Enter Owner Name

Owner Address Enter Owner Address

Client Name Enter Client Name

PMC Enter PMC

Consultant Enter Consultant

DWG Number Enter DWG

REVISION TABLE

Revision Number Enter Revision Number

Revision Description Enter Revision Description

Date Enter Date

Engineer Enter Engineer

Submit

Drawing Template






















PREVIEW PDF

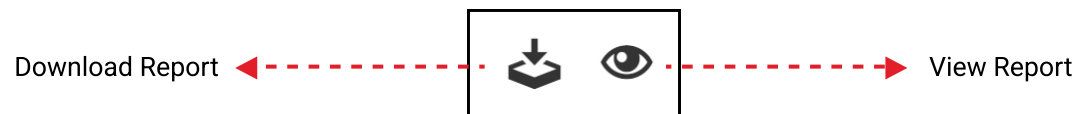
R4	R4	R4	R4
R3	R3	R3	R3
R2	R2	R2	R2
R1	R1	R1	R1
R0	R0	R0	R0
DATE	DESCRIPTION	REVISION NO.	ENGINEER
TITLE		AUTO GENERATED BY INODE	
PROJECT		WTP -20MLD	
OWNER		iNODE SOFTWARE CO. • Pune Branch • Office 508 • Nyati Emporium Near The Orchid Hotel • Baner • Pune • India	
CLIENT		iNODE SOFTWARE CO.	
PMC		iNODE SOFTWARE CO.	
CONSULTANT		iNODE SOFTWARE CO.	
DWG. NO: 7001-01-RCC-XXXX-01			

User can fill all the necessary information and create their own individual template for Drawings output generated for the project.

Printing Design Reports & Drawings

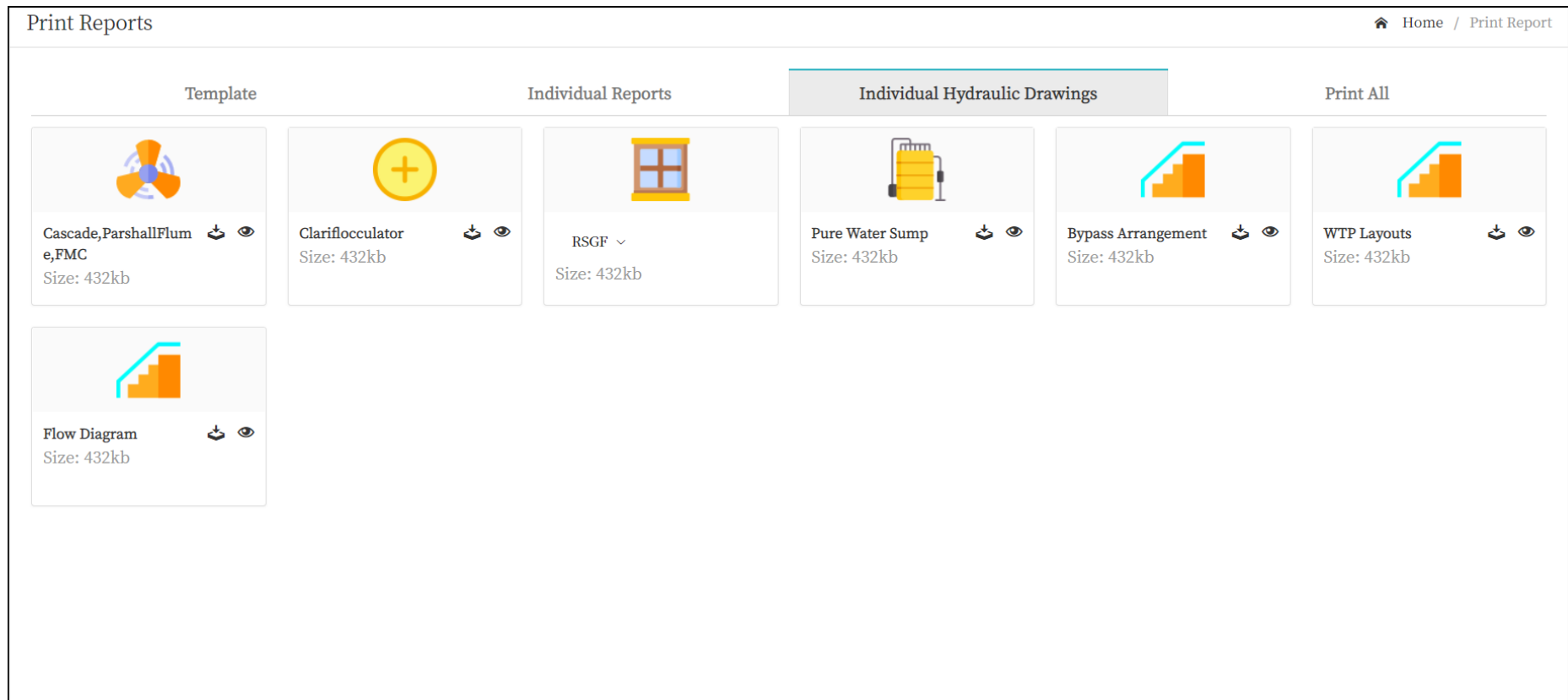
Viewing/ Downloading Individual Element Design Report

Template	Individual Reports	Individual Hydraulic Drawings	Print All
HYDRAULIC DESIGN			
 Cascade Aerator Size: 432kb	 Parshall Flume Size: 432kb	 Flash Mixer (Circular) Size: 432kb	 Pipe Size: 432kb
 Clariflocculator Size: 432kb	 Channel Size: 432kb	 RSGF Size: 432kb	 Mechanical Design Size: 432kb
 Pure Water Channel Size: 432kb	 Pipe Size: 432kb	 Pure Water Sump Size: 432kb	
HEAD LOSS			
 Cascade Aerator Size: 432kb	 Parshall Flume Size: 432kb	 Flash Mixer Size: 432kb	 Pipe Size: 432kb
 Clariflocculator Size: 432kb	 Channel Size: 432kb	 RSGF Size: 432kb	 Pure Water Channel Size: 432kb
 Pipe Size: 432kb	 Pure Water Sump Size: 432kb		



Printing Design Reports & Drawings

Viewing/ Downloading Individual Hydraulic Drawing



The screenshot shows a web interface titled "Print Reports" with a breadcrumb trail "Home / Print Report". The interface is divided into four main sections: "Template", "Individual Reports", "Individual Hydraulic Drawings" (which is highlighted), and "Print All".

- Template:** Contains one item: "Cascade,ParshallFlume,FMC" with a size of 432kb.
- Individual Reports:** Contains one item: "Clarifloculator" with a size of 432kb.
- Individual Hydraulic Drawings:** Contains three items: "RSGF" (with a dropdown arrow), "Pure Water Sump" (with a size of 432kb), and "Bypass Arrangement" (with a size of 432kb).
- Print All:** Contains one item: "WTP Layouts" with a size of 432kb.

Each item card includes an icon, the item name, a size of 432kb, and small icons for download and view.

Download Drawing



View Drawing

Sample Drawing

Contains all the design details and dimensions.

