Design Spring 2009 Goals

Design Goals

Spring 2009 Team Members

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1. Update Variable Naming Guide (by semesters end)
    - Update naming guide based on programs currently being used. Each variable should be complete with the definition, where it is used, and where it is calculated.
2. Edit Flocculation program (By end of Feb)
    - Rewrite program from an energy dissipation approach.
        - Overall flocculation potential of the flocculator is now based on *^(1/3) rather than on G*.
        - We might need to increase the flocculation potential for future plants to improve performance under low turbidity conditions.
    - Correct placement of baffles for AutoCAD drawing. The algorithm needs to determine where the baffles start based on the entrance tank.
    - Add checks for port hole placement vs water level and baffle placement vs port hole.
3. Edit the Sedimentation Slopes program (End of Feb)
    - Correct arbitrary assumptions - velocity ratio.
    - Automate the program to check for reasonable values--add calculations that a reviewer can use as checks.
        - Compare average velocities in channels, ports, manifolds, and orifices--these should be similar.
    - Update slopes program variables to incorporate triangular and trapezoidal geometries in the other programs.
        - Create a critical design parameter that will be the maximum length of the sedimentation tank as a function of the inlet manifold geometry.
        - Inlet manifold geometry will be determined based on the length and velocity through the sedimentation tank.
    - Changes made for 4 Communities need to be incorporated into the general program.
    - New sludge drain design for the sedimentation tank.
    - Incorporate floc weir design upon confirmation that it works.
4. Update AutoCAD method of drawing sedimentation tank and floc tank (Complete by end of March)
    - Draw the sedimentation tank so that it is possible to see order of construction.
        - Begin with the rectangular tank, and then fill in the additional items (bottom slopes containing sludge channel, drop tubes, sludge weir, sludge port plates, manifold sloped plates).
        - Group related objects so they can easily be manipulated in the CAD drawing
            - For example, group all plate settlers in each sedimentation tank, group baffles similarly.
    - Add construction details including ledge that supports the plate settlers, inlet manifold plates, sludge drain channel, sludge drain plates, sedimentation tank inlet drop tubes, inlet channel port covers, etc.
    - Check AutoCAD dimensions to make sure the plant is being drawn correctly
    - Make sure code includes geometry-specific dimensions for the Sedimentation Slopes program.
    - Make sure all components draw correctly for Sedimentation Tank--location of plate settlers, exit launder.
    - Incorporate change from sludge pipe to sludge channel.
    - Inlet pipes into slopes need to be changed to concrete voids--no longer pipes. Make sure to change corresponding layer.
5. Update Algorithm Documentation for MathCAD programs (by end of semester not to begin until programs are complete)
    - Make sure rendered images are shown with dimensions.
    - Make sure variable list is updated.
    - Edit for clarity. Each member needs to review.
6. Organization (by April 1)
    - Programs for each design need to be filed (possibly on the Wiki) for easy review at a later point.
    - Detailed dimensions of each plant need to be posted on the Wiki with AutoCAD drawing.
    - Document the design of the existing facilities (as built) in a table format.
        - Should include tank dimensions, residence time for flocculator, and Vup and Vc for sedimentation tank.
7. AutoCAD Documentation (ideally by semesters end, might get pushed to next semester)
    - Update documentation for current programs--make sure variables are correct.
    - Finish adding pictures to Sedimentation Tank documentation page.
8. Work on plant designs as presented throughout the semester (Gracias by March 15, Ecuador by March 1)
    - Create a series of designs and post them on the wiki to demonstrate automated design capabilities. Show the effect of changing different user inputs.
    - Complete Gracias design.
    - Ecuador university pilot plant
    - Pakistan pilot plant
9. Develop a plan to create the detailed documentation that the partner organization needs to build the facilities (rough draft with Gracias design, final with semesters end)
    - Materials list
    - Fabrication method for the plate settlers
    - Possibility to add these details to AutoCAD?
    - Greater design detail for new partner organizations especially since it is possible that an AguaClara plant will not be on site.
10. Provide continuity training and recruitment (on going)
    - Recruit students for summer program.
    - Train students who will be continuing on the design team during the summer and next fall.

Teach-In
Final Presentation