## Design Spring 2009 Goals

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## 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). 0
          - 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